JEFFERSON PARISH

2020 MULTIJURISDICTIONAL HAZARD MITIGATION PLAN UPDATE

JUNE 2020

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Section 1 Executive Summary

On October 30, 2000, the President signed into law the Disaster Mitigation Act of 2000, also known as DMA2K. Among its other features, DMA2K established a requirement that in order to remain eligible for Federal disaster assistance and grant funds, local and State governments must develop and adopt Hazard Mitigation Plans (HMPs). Title 44, Chapter 1, Part 201 (44 CFR Part 201) of the Code of Federal Regulations (CFR) contains requirements and procedures to implement the hazard mitigation planning provisions of the Stafford Act. 44 CFR Part 201 provides detailed descriptions of both the planning process that States and localities are required to observed and the contents of the plan that emerges. The original version of the Parish HMP was approved by the State and the Federal Emergency Management Agency (FEMA) in 2005, and updates to the HMP were also approved by the State and FEMA in 2010 and 2015. Both were subsequently adopted by the Jefferson Parish Council.

Hazard mitigation is defined as any sustained action taken to reduce or eliminate the long-term risk to life and property from hazard events. The 2020 HMP update is a comprehensive re-evaluation of all parts of the plan, including hazard profiles, risk assessment, mitigation goals, strategies, and mitigation priorities. This update was approved by the State and FEMA in 2020 and adopted by the Jefferson Parish Council and all municipalities.

The Jefferson Parish Charter authorizes the Planning Department to develop a master plan for the social, economic, and physical development of the Parish. The Parish Comprehensive Plan serves as this master plan, and it is the plan under which the 2020 HMP update rests. The HMP update is a subsidiary implementing tool of the Comprehensive Plan.

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1.1 Organization of the Plan

The Jefferson Parish Hazard Mitigation Plan Update is organized to parallel the structure provided in Title 44, Chapter 1, Part 201 (44 CFR Part 201). The Plan has six sections and seven Appendices (A-G).

Section 1 **Executive Summary**
Section 2 **Background**
Section 3 **Planning Process**
Section 4 **Hazard Identification, Ranking, and Risk Assessment**
Section 5 **Mitigation Strategy**
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Appendix A **Meeting and Outreach Documentation, Public Notices, and Public Participation Survey**
Appendix B **Summary of Changes**
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1.2 Background

The purpose of a mitigation plan is to rationalize the process of determining appropriate hazard mitigation actions. The document includes a detailed description of natural hazards in Jefferson Parish; a risk assessment that describes potential losses to physical assets, people, and operations; a set of goals, objectives, strategies, and actions that will guide the Parish's mitigation activities, and a detailed plan for implementing and monitoring the Plan. This Plan focuses on hazards with the highest potential for damaging physical assets, people, and operations in Jefferson Parish. Two sets of hazard rankings were developed to determine high-risk hazards for the area inside the Hurricane and Storm Damage Risk Reduction System (HSSDRS), or levee system, and the area outside the HSSDRS. Both the risk assessment section and goals sections reflect this emphasis, which was the result of careful consideration and a numerical ranking process carried out by the Hazard Mitigation Plan Advisory Committee (HMPAC).

1.3 Hazards and Risks

1.3.1 Hazards

Section 4 of this Plan Update includes a detailed description of Jefferson Parish's risks from natural hazards, risk assessments for the Parish as a whole as well as individual municipalities, and more detailed assessments for Parish assets. Fourteen hazards were identified and profiled by the HMPAC:

1. Floods
2. Hurricanes and Tropical Storms
3. Storm Surge
4. Subsidence

5. Coastal Erosion
6. Sea Level Rise
7. Tornadoes
8. Extreme Heat
9. Hailstorms
10. Lightning
11. Winter Storms
12. Drought
13. Wildfires
14. Earthquakes

For each of these hazards, the profiles in Section 4 include:

- Description of the Hazard
- Location and Extent of the Hazard
- Severity of the Hazard
- Impact on Life and Property
- Occurrences of the Hazard

After these fourteen hazards were profiled, the HMPAC used a ranking system with seven criteria to reduce the range of hazards to those with the most potential to impact the Parish. Hazard rankings were assigned for the area inside the HSSDRS and the area outside the HSSDRS. The ranking and criteria are also discussed in detail in Section 4. The criteria included: (1) History, (2) Future Probability, (3) Spatial Extent/Location, (4) Potential for Mitigation, (5) Impact/Vulnerability, (6) Data Availability, and (7) Federal Disaster Declarations and Local Emergency Declarations. The classification process provided a stratification of the hazards shown in **Table 1** and **Table 2**.

Table 1
Jefferson Parish HMPAC Hazard Ranking – Inside HSSDRS

Hazard	History	Future Probability	Spatial Extent/ Location	Mitigation Potential	Impact/ Vulnerability	Data Availability	Disaster Declarations	Total
Floods	3	3	3	3	3	3	3	21
Hurricanes and Tropical Storms	3	3	3	3	3	3	3	21
Storm Surge	3	3	2	3	3	3	1	18
Subsidence	3	3	3	2	3	1	1	16
Sea Level Rise	1	3	2	3	3	2	1	15
Tornadoes	2	2	3	2	2	2	1	14
Extreme Heat	3	3	3	1	1	2	1	14
Coastal Erosion	3	3	2	1	2	1	1	13
Hailstorms	2	2	3	1	2	2	1	13
Lightning	2	2	3	2	2	1	1	13
Winter Storms	1	1	3	1	2	2	1	11
Drought	1	1	3	1	1	1	1	9
Wildfires	1	1	1	1	1	1	1	7

Hazard	History	Future Probability	Spatial Extent/ Location	Mitigation Potential	Impact/ Vulnerability	Data Availability	Disaster Declarations	Total
Earthquakes	1	1	1	1	1	1	1	7

Table 2
Jefferson Parish HMPAC Hazard Ranking – Outside HSSDRS

Hazard	History	Future Probability	Spatial Extent/ Location	Mitigation Potential	Impact/ Vulnerability	Data Availability	Disaster Declarations	Total
Floods	3	3	3	3	3	3	3	21
Hurricanes and Tropical Storms	3	3	3	3	3	3	3	21
Storm Surge	3	3	2	3	3	3	1	18
Coastal Erosion	3	3	3	2	3	1	2	17
Subsidence	3	3	3	2	3	1	1	16
Sea Level Rise	1	3	2	3	3	2	1	15
Tornadoes	2	2	3	2	2	2	1	14
Extreme Heat	3	3	3	1	1	2	1	14
Hailstorms	2	2	3	1	2	2	1	13
Lightning	2	2	3	2	2	1	1	13
Winter Storms	1	1	3	1	2	2	1	11
Drought	1	1	3	1	1	1	1	9
Wildfires	1	1	1	1	1	1	1	7
Earthquakes	1	1	1	1	1	1	1	7

1.3.2 Risks

Risk is a numerical calculation of potential future damages. Although all of the events have some potential to affect the Parish, floods and hurricanes and tropical storms are clearly the most significant hazards (based on the ranking criteria), followed by storm surge, subsidence, and coastal erosion outside the HSSDRS. These five hazards were selected for more detailed assessments and estimations of future damages. Where possible, assessments were also conducted for the remaining hazards but may not be as detailed. Section 4 includes details about calculation methodologies and results of the risk assessment.

1.4 Summary of Goals, Objectives, Strategies, and Actions

Section 5 of this Plan describes Jefferson Parish's priorities for mitigation actions. The section prioritizes the actions, describes the funding required, identifies potential sources of funding, designates responsible coordinating entity, gives anticipated year of completion, and analyzes benefits. The section also includes the Parish's hazard mitigation goals, objectives, and strategies.

1.4.1 Hazard Mitigation Goals

1. Identify and pursue preventive measures that will reduce future damages from hazards.

2. Enhance public awareness and understanding of preparedness and risks through education and notification programs.
3. Identify and pursue protective measures that will benefit the built environment and natural systems.
4. Facilitate sound development in the Parish through local plans and regulations to reduce or eliminate the potential impact of hazards.
5. Invest in structural and green infrastructure projects to manage future risk.

1.4.2 Hazard Mitigation Objectives

Objectives are well-defined intermediate points in the process of achieving goals. Jefferson Parish mitigation planning objectives include:

1. Reduce the exposure of residential areas to flooding and storm surge from the Mississippi River, Lake Pontchartrain, and the Gulf of Mexico.
2. Mitigate properties listed on the Jefferson Parish repetitive loss list and severe repetitive loss (SRL) list, and properties that meet substantial damage.
3. Ensure that Parish critical facilities remain functional during natural hazard events.
4. Find and develop opportunities to work with other agencies to leverage mitigation funds, and to share information about the risks of natural hazards.
5. Improve the early warning and Public Alert System for hazards such as flash floods and tornadoes to save lives and reduce damages to property.
6. Promote partnerships among Federal, State, Parish, Interstate Commissions, and Local Governments to identify, prioritize and implement mitigation actions.
7. Improve the Parish's CRS rating through the NFIP to allow citizens to purchase flood insurance at a discounted price.
8. Maintain continuity of operations and economic productivity of Jefferson Parish businesses by preventing damages from hazards.
9. Ensure that the Parish maximizes its opportunities for access to Federal and State grants and other kinds of assistance.
10. Reduce wind damages to residential and commercial buildings through hazard mitigation and effective implementation of building codes.
11. Provide effective implementation of existing floodplain regulations and building codes.
12. Ensure that the Parish continues to be represented in the determination of region-wide mitigation actions.
13. Stay involved with citizen and technical groups concerning measures related to hazard mitigation.

1.4.3 Hazard Mitigation Strategies

Strategies are specific courses of action to achieve the objectives. Jefferson Parish mitigation planning strategies include:

1. Maintain awareness of the potential effects of natural hazards on Jefferson Parish assets. Use new information from damaging events to increase local knowledge of risks.
2. Undertake vulnerability and risk studies to better understand the potential for future damages.
3. Ensure the Parish Emergency Operations Plan is maintained and updated and enhance Public Alert System.

4. Implement cost-effective projects and actions to reduce risk from natural hazards, both for Parish assets and operations, as well as for residents and businesses in the planning area.
5. Elevate, reconstruct, or acquire qualifying residential structures from the Jefferson Parish repetitive loss list and severe repetitive loss list.
6. Install emergency backup generators at all critical facilities.
7. Distribute information to the public concerning the hazards associated with flooding. Include with the material opportunities about mitigation measures that can reduce flooding.
8. Monitor mitigation measures to ensure they are functioning efficiently.
9. Promote the purchase of flood insurance.
10. Continuously monitor this Plan Update to ensure that it remains current with regard to risks, strategies, priorities and mitigation actions.
11. Promote public understanding, support and demand for hazard mitigation.
12. Pursue drainage projects that will reduce local flooding in the Parish.
13. Seek Federal and State grants to fund mitigation activities.
14. Upgrade the local shelters to allow more people access during hazardous events.
15. Encourage and facilitate the development or updating of General Plans, Drainage Plans, Land and Zoning, Building Construction, Fire Protection and Floodplain Management Ordinances to limit development in hazard areas.
16. Implement elements of the Plan and monitor results.

1.4.4 Action Items

The 2020 Plan Update outlines the Parish's current priorities for specific activities to achieve the five goals listed above. Section 5 (Mitigation Strategy) gives details for the Parish's approach to addressing the Hazards profiled in Section 4 (Hazard Identification, Ranking, and Risk Assessment) and reducing their risk to Jefferson Parish.

1.5 The Planning Process

Section 3 provides details about the process that was used to develop this Plan Update. The process closely followed the guidance in the FEMA Local Mitigation Planning Handbook, resulting in a four-stage process for the development of this mitigation plan update.

Step 1 Organize the planning process and resources
Step 2 Assess risks
Step 3 Develop a mitigation strategy
Step 4 Adopt and implement the plan

Step 1 includes identification of a Hazard Mitigation Plan Advisory Committee (HMPAC) that acts as the primary conduit for plan updates and development. All of the communities that are participating in this Plan update have dedicated representatives to the committee to ensure that their community's interests are addressed and that they are fully engaged in the planning process. The committee is also composed of members of the public to ensure that citizen input is integrated into the plan. The Parish Council and each municipality's council are the approving authority for the Plan.

Step 2 was completed by the HMPAC and is included as Section 4 of the Plan.

Step 3 is described in Section 3 (Planning Process). The section includes details about who was involved, the processes that were used, and the products that were developed.

Step 4 is described in the Mitigation Strategy Section (Section 5), which includes details about who is responsible for implementation of specific strategies and actions, and in Section 6, the Plan Monitoring and Maintenance section, which describes long-term implementation through periodic updates and reviews.

1.6 Approval and Adoption Processes

Appendix C discusses the Approval and Adoption of the Plan Update. The Parish Council and each municipality's council are responsible for approving and adopting the 2020 Hazard Mitigation Plan Update. Each municipality adopted 2020 Plan Update on the following dates:

- Jefferson Parish – May 13, 2020
- City of Gretna – May 13, 2020
- City of Harahan – May 21, 2020
- City of Kenner – May 7, 2020
- City of Westwego – May 11, 2020
- Town of Grand Isle – May 12, 2020
- Town Jean Lafitte – May 20, 2020

1.7 Implementation Process

The implementation process is described as part of the specific actions in the Mitigation Strategy Section (Section 5).

1.8 Monitoring and Updating Processes

Section 6 (Plan Monitoring and Maintenance) describes the schedule and procedures for ensuring that the Plan Update stays current. The section identifies when the Plan must be updated, who is responsible for monitoring the Plan, and ensuring that the update procedures are implemented. The section also provides a combination of cyclical dates (oriented toward FEMA requirements) and triggering events that will initiate amendments and updates to the Plan. The Parish Department of Floodplain Management and Hazard Mitigation is responsible for monitoring the Plan and initiating the cyclical update process.

Section 2 Background

2.1 Introduction

In 2005, Jefferson Parish prepared its original Hazard Mitigation Plan (HMP) to be better equipped for disasters before they occur. It was also developed to objectively evaluate the hazards that occur in the Parish and prioritize the actions needed to provide a safe place to live. In February of 2003 the Parish was awarded a planning grant through the Hazard Mitigation Grant Program (HMGP). The HMGP grants are used by the Federal Emergency Management Agency (FEMA) to help States, Counties (Parishes) and Municipalities mitigate against future damages. The Plan was also developed to satisfy the Disaster Mitigation Act of 2000 (DMA 2000) which required local governments to develop an HMP that complied with specific regulations. If a Plan was not developed by the specified deadline, local governments would no longer be eligible for future HMGP funding. Over the next two years the Plan was developed and approved by the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) and FEMA in July of 2005.

What follows in Section 2 is a description of the "scope of the Plan" which addresses why the Plan was originally prepared and is now being updated, maps of the planning area, background about Jefferson Parish, and an overview of the Louisiana State Mitigation Plan.

2.1.1 Scope of the Plan

The original Jefferson Parish HMP was a concerted effort on the part of the Parish to develop an all hazards, Parish-wide approach to disaster damage reduction. In order to focus on a process needed to attain a sustainable future, Jefferson Parish utilized a FEMA approved process to identify and assess all potential hazards that may affect the community and develop an action plan to address those hazards. The original Plan was updated in 2010 and again in 2015. It has been utilized to better articulate accurate needs for the community based on a process that involves all stakeholders including the general public, government, business, and industry.

The Jefferson Parish HMP Update included re-evaluating the original hazards, the risk assessment, mitigation goals, strategies, and mitigation priorities. As part of the 2020 update process, all sections of the Plan were re-assessed to identify changes and updates that may have occurred since the 2015 version or as a result of any disaster declarations since that time.

In addition to the unincorporated areas of the Parish there are six municipalities, all of which are participating in the 2020 HMP Update, including Gretna, Harahan, Kenner, Westwego, Grand Isle, and Jean Lafitte. The risk assessments, background, goals, and mitigation actions have been updated based on an analysis of hazard events, population changes, and other factors that impacted the risk within each municipality. The updates completed for each municipality can be found within each Hazard Profile in Section 4 of the Plan.

2.2 Organization, Objectives, and Mission of Jefferson Parish

This section of the Plan describes the purpose, structure, and operations of Jefferson Parish. The Parish is governed by a President who carries out the policies adopted by the Parish Council, the legislative body of the Parish. The Council is composed of five district Council Members and two at-

large Council Members who are together responsible for levies, taxes, special assessments, service charges, and license fees.

The mission of the Parish as described on its website is to "provide the services, leadership, and vision to improve the quality of life in Jefferson Parish." The Parish includes over 50 different departments that are overseen by the Parish President and a Chief Administrative Assistant. The Jefferson Parish Department of Emergency Management, the Planning Department, the Department of Capital Projects, and the Floodplain Management and Hazard Mitigation Department are the main Parish departments associated with emergency management activities and hazard mitigation. The four departments are summarized below:

- The Jefferson Parish Department of Emergency Management is responsible for developing a coordinated and effective response for the protection of lives and property of citizens in Jefferson Parish during natural or man-made disasters. Additional functions include the development and implementation of an "All Hazard Emergency Operations Plan" and activating and manning the Emergency Operations Center (EOC) during emergencies. The EOC provides disaster planning information including the development and maintenance of the Parish emergency operations plans. The EOC also provides information about the Parish flood warning system and property protection. Jefferson Parish also shares emergency operations responsibilities with several organizations including the State, the municipalities, and national coordination with FEMA.

- The Planning Department is responsible for planning activities and development regulatory activities in the unincorporated areas of Jefferson Parish. It provides written recommendations on major subdivision, zoning, and planning matters to the Planning Advisory Board, Old Metairie Commission, and the Parish Council. The department is divided into two divisions: the Current Planning Division and the Long-Range Division. The Current Planning Division reviews changes to property boundaries and zoning, confirms a property's zoning, reviews and approves site plans in special districts, and processes applications for a special permitted use/conditional use. The Long-Range Division of the Planning Department maintains the Unified Development Code, the Comprehensive Zoning Ordinance, and the Comprehensive Plan. By conducting studies and other types of research, the department makes recommendations to the Parish Council and other decision makers responsible for the Parish's long- and short-term growth and development. The Planning Department also furnishes technical planning assistance to the Parish Administration and other parish government departments, collaborates with the Regional Planning Commission regarding issues affecting Jefferson Parish, and maintains the zoning, future land use, and parcel maps housed in the Parish's Geographic Information System (GIS).

- The Department of Capital Projects provides support to other Public Works departments. Additional responsibilities include coordinating the Southeast Louisiana Flood Control Program (SELA) for Jefferson Parish. The program began in 1996 to reduce flood damages by improving segments of the Parish primary drainage system.

- The Floodplain Management and Hazard Mitigation Department provides flood zone determinations and flood map inquiries to property owners, insurance agents, and mortgage companies and provides information about flood preparedness including the importance of purchasing and maintaining flood insurance. The department also oversees and coordinates the development of the Hazard Mitigation Plan. Additional services include education and outreach for natural hazards and resilience efforts as well as analysis of elevation certificates

and flood insurance declaration pages. This department also provides guidance on various mitigation methods including but not limited to: oversight of Hazard Mitigation Assistance (HMA) Grants, updating the Parish's Hazard Mitigation Plan, and working through the Community Rating System (CRS) program for Jefferson Parish.

Four additional Parish departments are also involved in hazard mitigation and had representation on the HMPAC. The four departments are summarized below:

- The Inspection and Code Enforcement Department ensures compliance with laws pertaining to structural development within Jefferson Parish in an efficient manner and abates abandoned and blighted structures for the overall safety of citizens and visitors.

- The Drainage Department is responsible for the administration, direction, coordination, and implementation of major drainage and flood control programs and direct operation, construction, and maintenance of: 340 miles of drainage canals, drainage ditches, crossdrains, culverts, and levee systems; 1,465 miles of street subsurface drainage systems; and operation and maintenance of 53 drainage pump stations.

- The Department of Environmental Affairs is responsible for the following federally-mandated programs: (1) Industrial Pretreatment; (2) Stormwater Management; (3) Coastal Zone Management; (4) Industrial Development and Research; (5) Solid Waste Management; and (6) Mosquito and Rodent Control. In addition to these six major programs, the department responds to all citizen complaints/inquiries of an environmental nature and provide field investigation and research to advise Parish Administration, Council, and local municipalities on matters related to the environment. The department also assists all Parish departments and agencies in maintaining overall compliance with federal, state, and local environmental regulations.

- The Public Information Office is a comprehensive information resource for citizens and visitors of Jefferson Parish where service to provide helpful information to the public is the mission and goal.

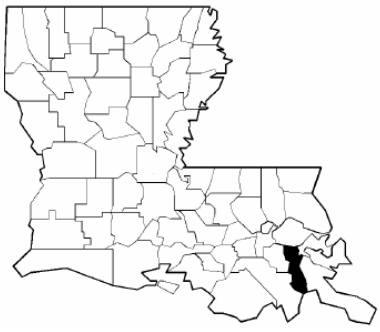
2.3 Background Information about Jefferson Parish

Prior to addressing the hazards that our community faces, this Plan presents a brief overview of Jefferson Parish, taking into account the geography, history, climate, transportation, community assets, and population and growth.

2.3.1 Geography and Environment

Jefferson Parish lies in southeastern Louisiana and is bordered by Lake Pontchartrain on the north, Orleans and Plaquemines Parishes to the east, the Gulf of Mexico to the south, and Lafourche and St. Charles Parishes to the west. **Figure 1** identifies the Parish's location within the State of Louisiana.

Figure 1
Jefferson Parish Location Map



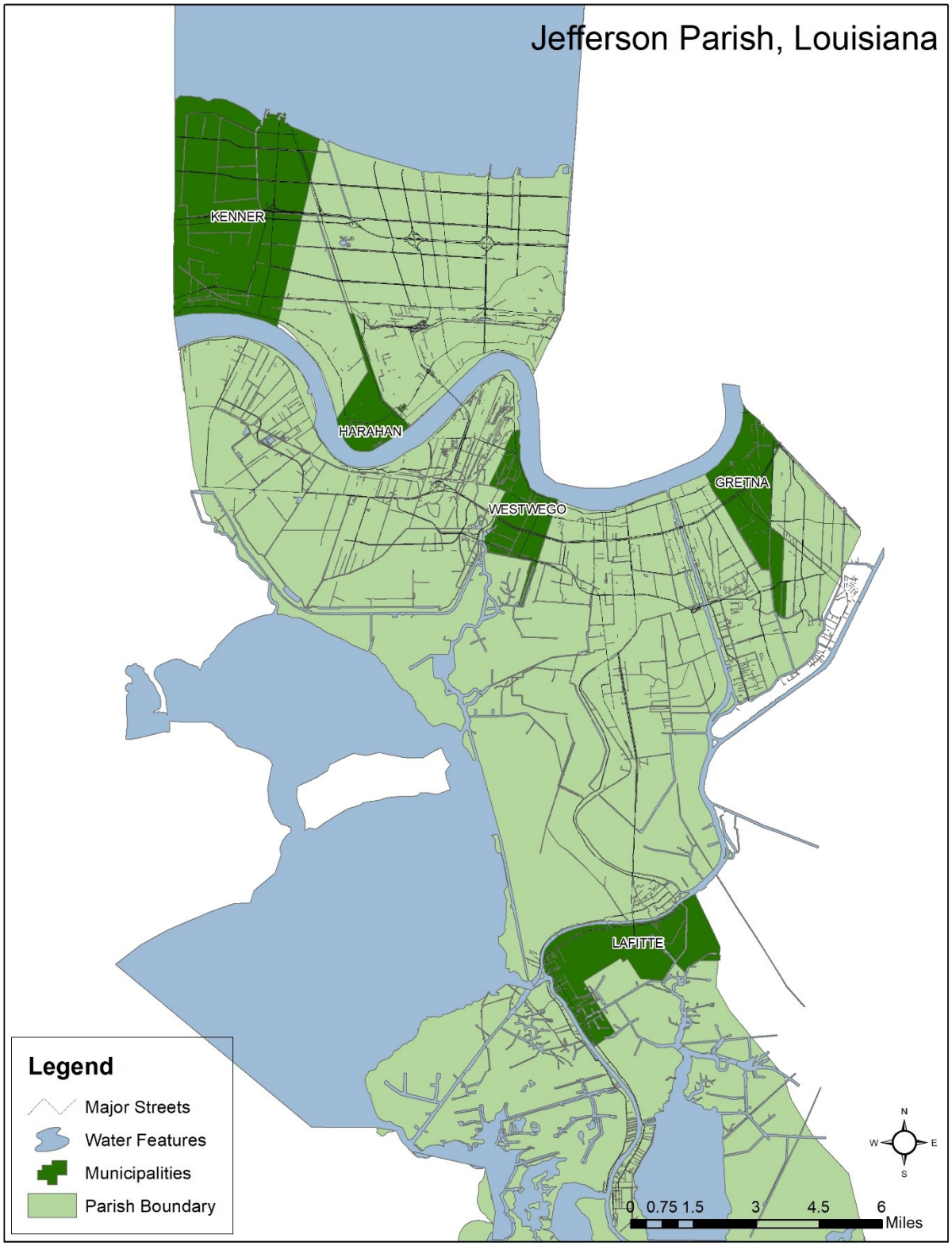
Principal physiographic features of the area are the Mississippi River channel, natural levee ridges along its banks

and along the banks of abandoned distributary channels, and low marshlands situated between and bordering the channels. Jefferson Parish is divided into an East and West Bank by the Mississippi River which meanders through the northern section of the Parish. The highest land in the Parish is approximately 8.885 feet above the North American Vertical Datum (NAVD) along the natural levee that borders the Mississippi River. The East Bank is nearly surrounded by water and bound by the Mississippi River to the south, Lake Pontchartrain to the north, the 17th Street Canal to the east, and St. Charles Parish to the west. The West Bank of Jefferson Parish, east of the Harvey canal, is bound by the Donner Canal to the east, the Mississippi River to the north, the Harvey Canal to the west, and the Intracoastal Waterway to the south.

As mentioned earlier in this section, the Parish consists of six incorporated areas. In addition to the incorporated areas, Metairie is the Parish's largest community, an unincorporated area that comprises almost all of East Jefferson Parish. Smaller unincorporated areas include River Ridge and Jefferson. East Jefferson cities include Kenner and Harahan while cities such as Gretna and Westwego are in West Jefferson.

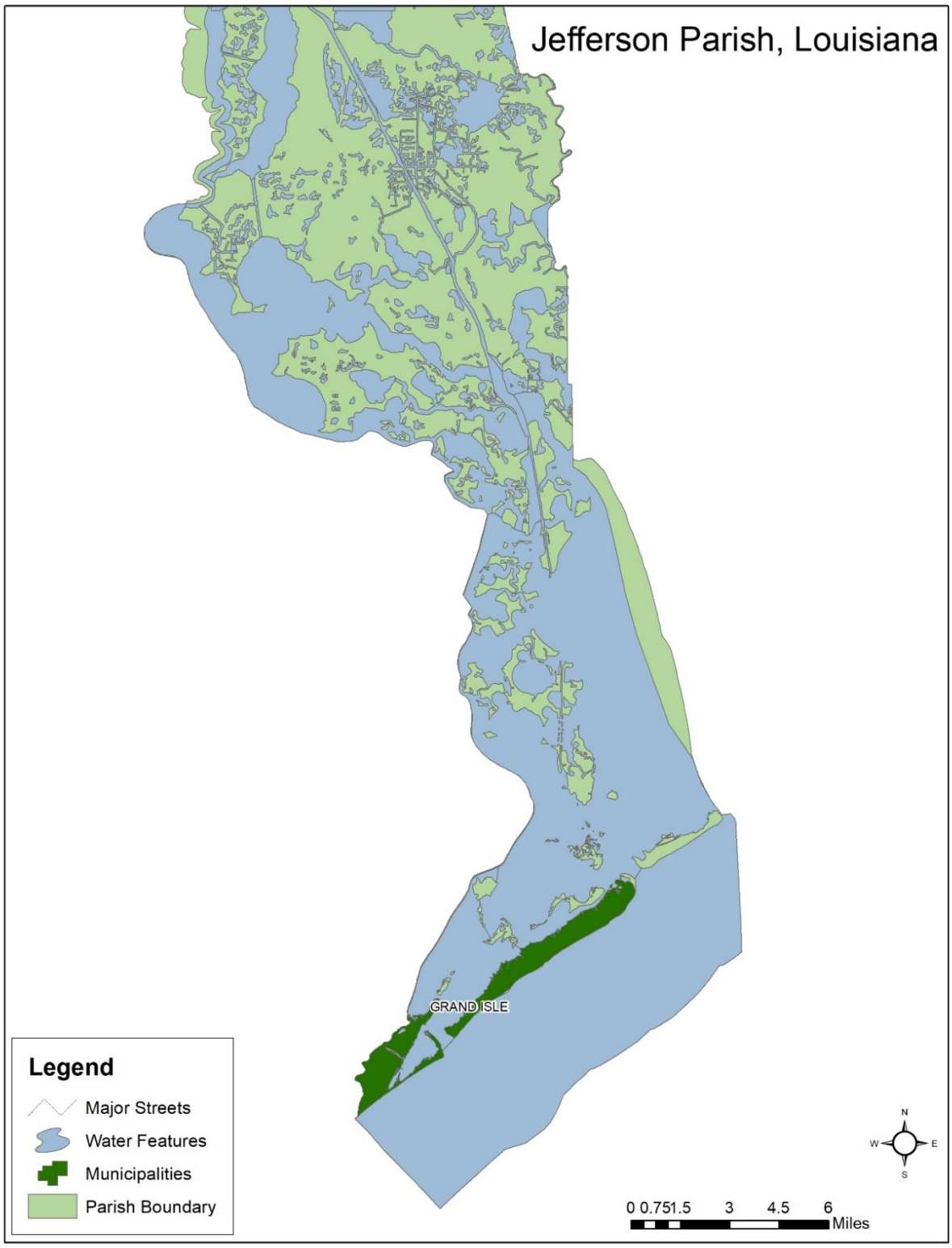
Jefferson Parish consists of a land area of 305 square miles or 195,793 acres and a water area of 336 miles or 215,358 acres. The Parish extends about 55 miles in a north-south direction from the southern shores of Lake Pontchartrain to the Gulf of Mexico. **Figure 2** and **Figure 3** are maps of Northern and Southern Jefferson Parish.

Figure 2
Map of Northern Jefferson Parish



Source: Jefferson Parish GIS Department

Figure 3
Map of Southern Jefferson Parish

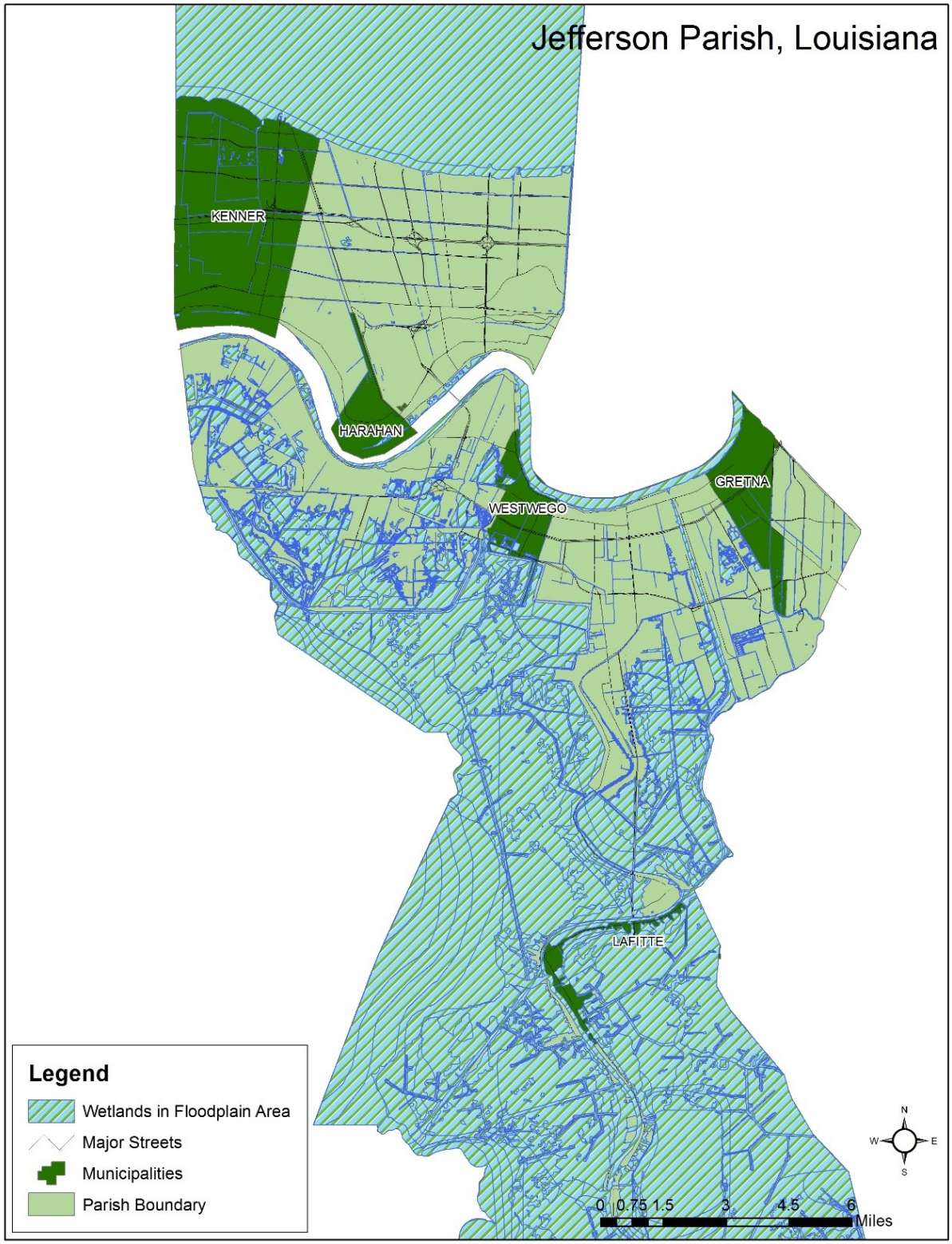


Source: Jefferson Parish GIS Department

The land use in Jefferson Parish has been developed for a variety of purposes including residential, commercial, industrial, institutional, transportation, and other public infrastructure use. The hurricane risk reduction or levee system functions as the de-facto growth limit line, and north of the West Bank part of the system is mostly urbanized and is part of the New Orleans Metropolitan Area. This area predominately consists of residential, commercial, industrial, and infrastructure developed for transportation, utility, and communications. Within this largely developed area, the Parish has purchased 610 acres of vacant property on the West Bank, primarily wetland areas to be used as a park with much of the wetlands area to remain as wetlands.

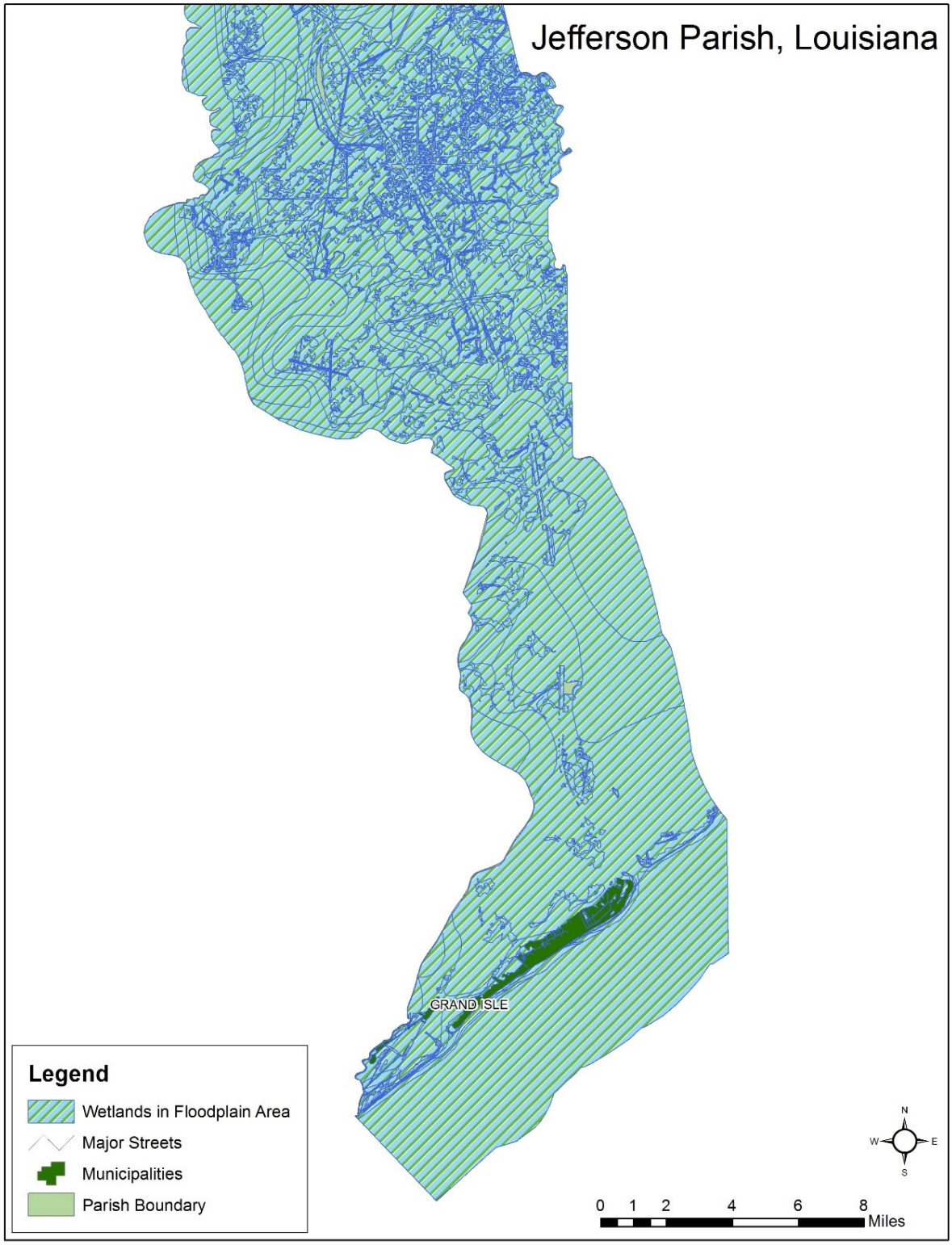
The southern part of the Parish, outside of the hurricane risk reduction system on the West Bank, is less populated and is characterized by estuarine systems that lead in from the Gulf of Mexico. The Towns of Jean Lafitte and Grand Isle are located in this area. The coastal marshes, wetlands, and estuaries contain numerous bodies of shallow water. These bodies of water and wetlands make up over 85 percent of the Parish and provide 234,320 acres of beneficial natural floodplain functions such as water storage and filtration. **Figure 4** and **Figure 5** are maps showing wetlands in Jefferson Parish as identified by the US Fish and Wildfire Service (FWS) National Wetlands Inventory (NWI).

Figure 4
Northern Jefferson Parish Wetlands



Source: United States Fish and Wildlife Service

Figure 5
Southern Jefferson Parish Wetlands



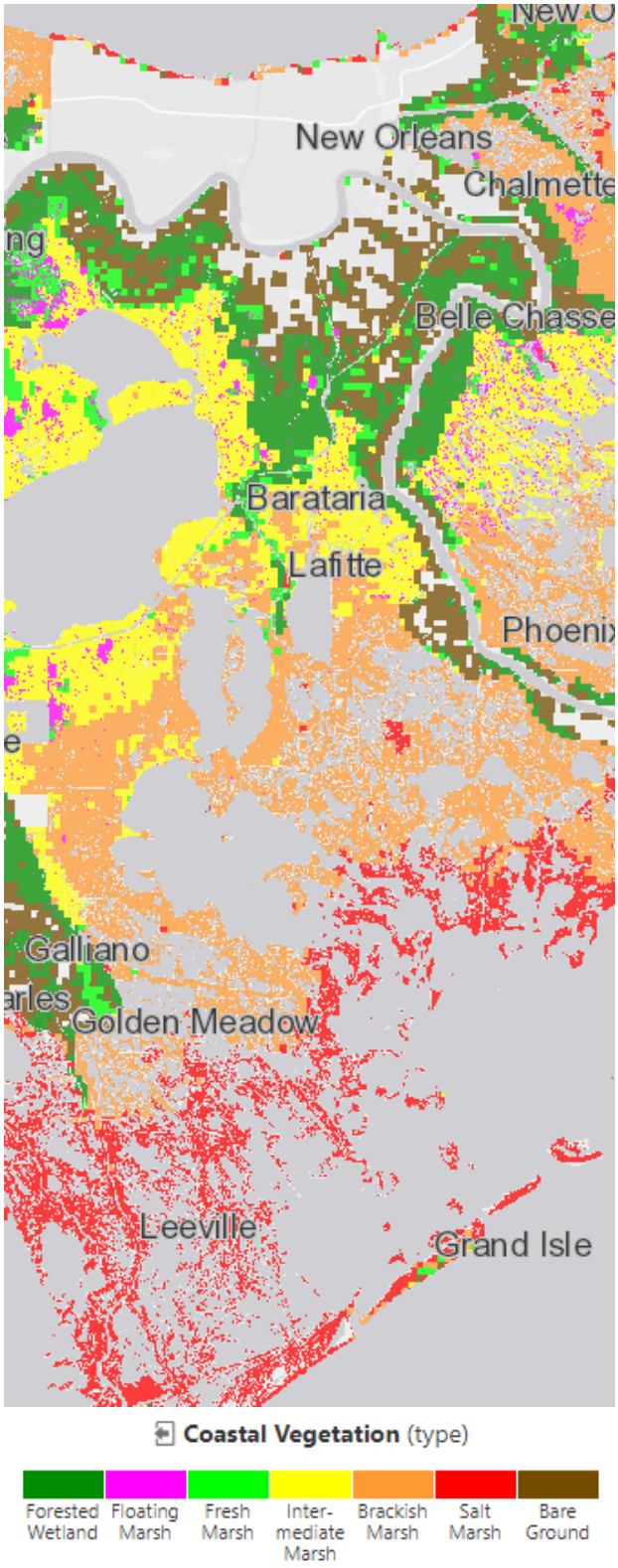
Source: United States Fish and Wildlife Service

Flood protection in northern Jefferson Parish is achieved by a system of levees, floodwalls, canals, and drainage pump stations. The Parish has 340 miles of canal waterways, drainage ditches, cross drains, culverts, and internal levee systems. There are also 53 drainage pump stations containing 154 pumps installed throughout the Parish drainage system for a total capacity of 47,100 cfs (Source: Jefferson Parish Drainage Department). With the exception of some areas inside the levee protected areas of northern Jefferson Parish, most of the land is located within FEMA's 100-year floodplain. The land area outside of the 100-year floodplain may still be subject to flooding if a levee failure were to occur.

As noted in the Louisiana Coastal Master Plan 2017, Louisiana's coast is a precious natural, economic, and cultural resource. It is an area rich in ecological abundance that supports world-class commercial and recreational fisheries and is home to an array of waterfowl, migratory birds, reptiles, and amphibians. This complex and fragile ecosystem is disappearing at an alarming rate. Between 1932 and 2010, Louisiana's coast lost more than 1,800 square miles of land. From 2004 through 2008 alone, more than 300 square miles of marshland were lost to Hurricanes Katrina, Rita, Gustav, and Ike. The major causes of this land loss include the effects of climate change, sea level rise, subsidence, hurricanes, storm surges, disconnection of the Mississippi River from coastal marshes, and human impacts.

Figure 6 below from the Louisiana Coastal Master Plan shows the types and locations of coastal vegetation within Jefferson Parish currently. As the plan explains, this environment may change drastically in the coming years depending on whether steps are taken to protect coastal habitats and resources.

Figure 6
Coastal Vegetation Types in Jefferson Parish



Source: Louisiana Coastal Master Plan

Wetlands are a valuable component of Louisiana's coastal system that not only help protect human infrastructure and the built environment from storm surge and flooding, but are also critical to the survival of many important species in the area. The loss of land and habitat described above has a serious impact on many of these species that require the wetland areas for survival. This has an impact on the species as well as the local economy which relies on the fishing and seafood industry as one of its key sectors. According to the Louisiana Coastal Master Plan, in 2015, Louisiana had the highest commercial fishing landings in the lower 48 states, which is only possible because the wetlands provide habitats for the varying stages in their lives.

In addition, there are a number of endangered, threatened, and rare animal and plant species that make their home in the wetland areas of Jefferson Parish. **Table 3** below describes the endangered or threatened species that have been identified in Jefferson Parish by the Louisiana Department of Wildlife and Fisheries. Protection of wetlands and other sensitive areas within the parish are key to ensuring the survival of these species, all of which rely on the unique environment that exists along Louisiana's coast.

Table 3
Endangered and Threatened Species in Jefferson Parish

Scientific Name	Common Name	Status
Acipenser oxyrinchus desotoi	Gulf Sturgeon	Threatened
Charadrius alexandrinus	Snowy Plover	Rare
Charadrius melodus	Piping Plover	Threatened/Endangered
Egretta rufescens	Reddish Egret	Rare
Malaclemys terrapin	Diamondback Terrapin	Restricted Harvest
Ophisaurus ventralis	Eastern Glass Lizard	Rare
Pelecanus occidentalis	Brown Pelican	Endangered
Scaphirhynchus albus	Pallid Sturgeon	Endangered
Amaranthus greggii	Gregg's Amaranth	Rare
Asclepias incarnata	Swamp Milkweed	Rare
Canna flaccida	Golden Canna	Rare
Cenchrus myosuroides	Big Sandbur	Rare
Cenchrus tribuloides	Dune Sandbur	Rare
Ceratopteris pteridoides	Floating Antler-fern	Rare
Chamaesyce bombensis	Sand Dune Spurge	Rare
Eleocharis geniculata	Canada Spikesedge	Rare
Eleocharis tricostata	Three-angle Spikerush	Rare
Lipocarpha micrantha	Small Flower Hemicarpha	Rare
Physalis angustifolia	Coastal Ground Cherry	Rare
Sabatia arenicola	Sand Rose-gentian	Rare
Schizachyrium maritimum	Gulf Bluestem	Rare
Uniola paniculata	Sea Oats	Rare

As described in the Louisiana Coastal Master Plan, the vastness of Louisiana's wetlands encompasses many different kinds of habitat. This means that birds, fish, and mammals depend on the wetlands as much as humans do. These wetlands and estuaries support breeding, spawning, feeding, and nursery

habitat for many fish species and winter habitat for more than 5 million migratory waterfowl – an astonishing 20% of the entire North American continent's water bird population. Millions of other migratory birds use the marshes as stopover habitat. Some are considered Species of Greatest Conservation Need. Almost a third of the species so classified depend on Louisiana wetlands for their continued survival.

2.3.2 Parish History

From the early 16th century European explorers recognized the strategic and economic potential of the lower reaches of the Mississippi River. Fertile soil and access to the Mississippi River were the area's most attractive features. French and Spanish land grants made during the colonial period set the pattern for development in what was to become the Greater New Orleans area. The French and Spanish heritage is the basis for the present division of the State of Louisiana into parish governmental units rather than the county which is used in other parts of the United States.

Jefferson Parish was established in 1825 and was named in honor of Thomas Jefferson, commemorating his role in purchasing the Louisiana Territory from France in 1803. The Parish originally extended from present day Felicity Street in New Orleans to the St. Charles Parish line. As Orleans Parish grew, it annexed from Jefferson Parish and established areas as the Garden District, Lafayette, Jefferson, and Carrollton. The present boundary was set in 1874 and the seat of the Parish government was transferred to Gretna, where it has remained.

Once, a largely rural area of farms and vast tracts of undeveloped land, Jefferson Parish is New Orleans' first suburb. It is a bedroom community west of the city that received the first migration of middle class families from the 1950s to the 1970s.

In 1935 the Huey P. Long Bridge was constructed across the Mississippi River connecting the East and West Bank of Jefferson Parish. At the time, the bridge was constructed too far upstream along the Mississippi River to benefit most residents of New Orleans. Constructed to be used by both automobile and rail traffic, it is the largest and highest steel railroad bridge in the United States. In 1958 the first span of the Crescent City Connection opened providing Jefferson Parish residents bridge access over the Mississippi River to New Orleans for the first time. Prior to this ferry boats provided the only link between the banks. The second span of the Crescent City Connection opened in 1988.

With the rapid economic development taking place throughout Jefferson, great growth was also seen in the Parish's population - from the 1970's to the year 2000 the census increased by almost 100,000. This growth trend might have continued had the Parish not been devastated by Hurricane Katrina in August of 2005. Katrina made landfall as a powerful Category 3 Hurricane with maximum sustained winds of 130 mph and a massive storm surge of up to 28 feet that completely destroyed parts of the gulf coast. Approximately 78,000 housing units in Jefferson Parish were damaged by high winds, localized flooding, and/or storm surge. As a result, large numbers of residents were displaced from their homes, causing a population shift that was evident in the 2010 census that was 22,914 lower than the previous decade.

Despite the harsh impact of the costliest disaster in US History, the Parish continues to be a leading Louisiana Parish in terms of population and economic viability.

2.3.3 Climate

Jefferson Parish has a semitropical climate. Variations in daily temperature are determined by distance from the Gulf of Mexico and, to a lesser degree, by differences in elevation. The average annual temperature for the State as a whole is 67.4ºF. January is the coldest month averaging 59ºF, and July and August the warmest, averaging 83ºF for Jefferson Parish. Jefferson Parish enjoys a complete seasonal cycle with pleasant spring and fall seasons. Winter months are usually mild with cold spells of short duration. Snowfall is less than two inches per year. The summer months are quite warm, with an average daily maximum temperature in July and August of 83ºF degrees. Average annual precipitation for the area is 64.16 inches.

2.3.4 Transportation

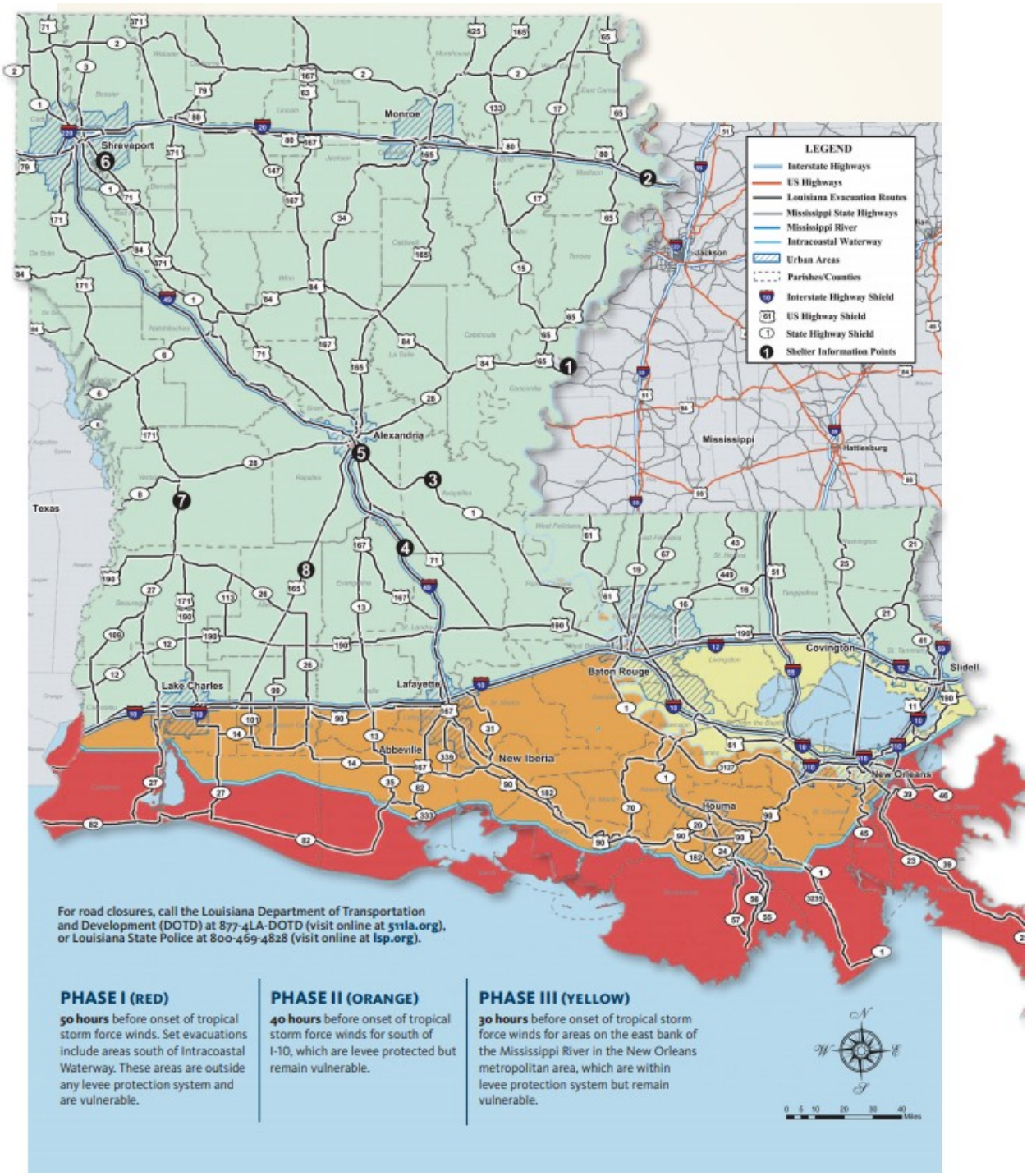
The main transportation arteries through Jefferson Parish are Interstate 10, U.S. Highways 61 and 90, and numerous State routes. Interstate Highway 10 cuts through the northern portion of the Parish while U. S. Highway 61 runs south of I-10, parallel to the interstate. U.S. Highway 90 runs east and west, crossing the Mississippi River. The highways are well used and are maintained for commercial traffic. Some of these roadways are significant evacuation routes for Jefferson Parish, as well as surrounding Parishes during states of emergency.

Jefferson Parish is served by the Union Pacific, Southern Pacific, Southern Pacific Rail, New Orleans Lower Coast, New Orleans Public Belt, and Illinois Central Railroads. All of the tracks run east and west, parallel to the Mississippi River and the major highways. Rail rates in Louisiana for many commodities tend to be lower than those in the other States because of the competition from barge carriers. All lines handle a significant volume of containers, trailers on flat cars and carload traffic between New Orleans and other parts of America.

One important element of the transportation system as it relates to disaster and hazard mitigation planning, especially in coastal communities, is identifying and publicizing evacuation routes and protocols. Evacuation plans are normally activated in advance of major, predictable storm systems such as hurricanes and tropical storms as there is frequently advance notice that allows for evacuation to be leveraged as a viable option to protect lives.

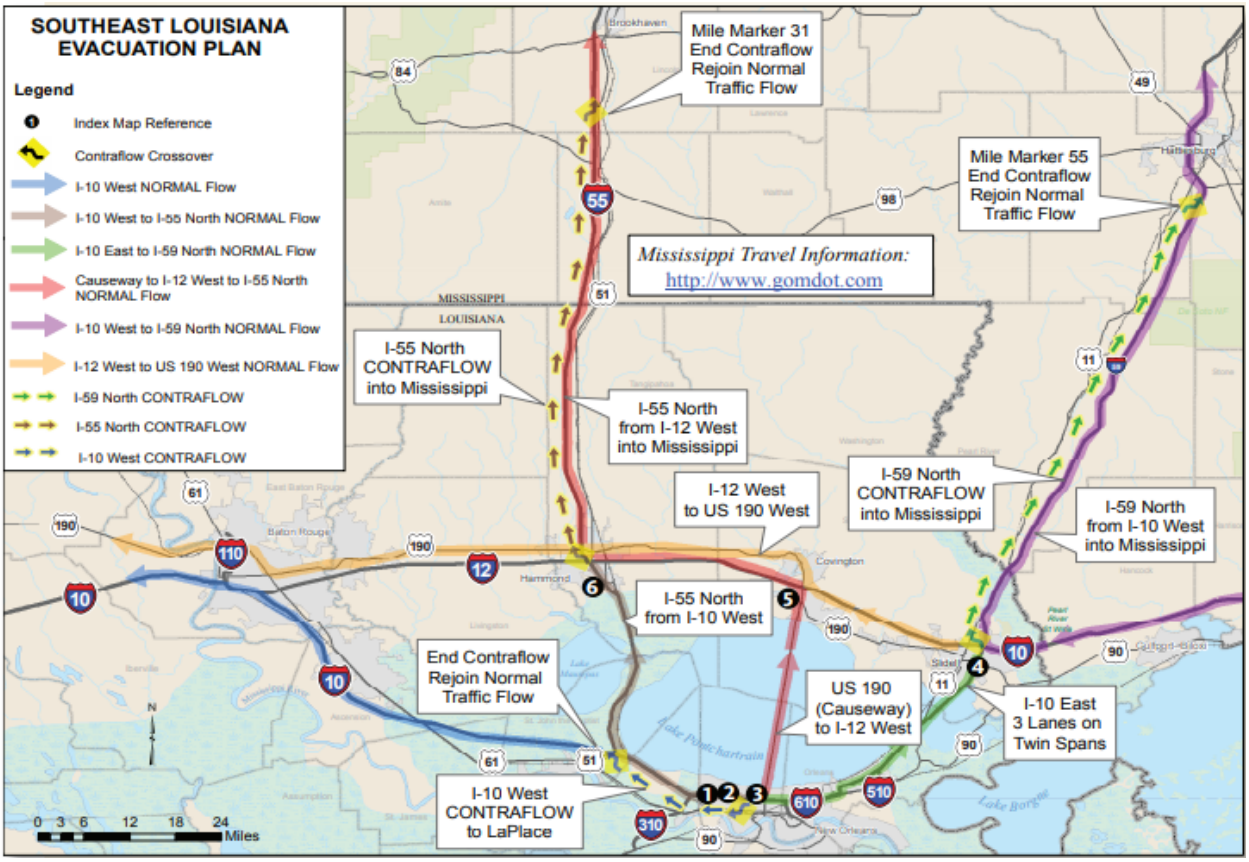
Jefferson Parish Emergency Management coordinates with other state agencies and stakeholders on evacuations and is critical to the evacuation process. Providing warning and evacuation procedures to residents and visitors is an important role for officials at all levels of government, and evacuation routes have been identified by the Louisiana State Police through the Louisiana Emergency Preparedness Guide to assist in the process. **Figure 7, Figure 8,** and **Figure 9** are maps from this Guide that show evacuation routes in Louisiana and specific areas where contraflow will begin within Jefferson Parish. In addition, the Jefferson Parish Emergency Operations Plan identifies the evacuation plan for transit in the parish. A map of the evacuation plan for transit is found in **Figure 10.**

Figure 7
Emergency Evacuation Map of Louisiana



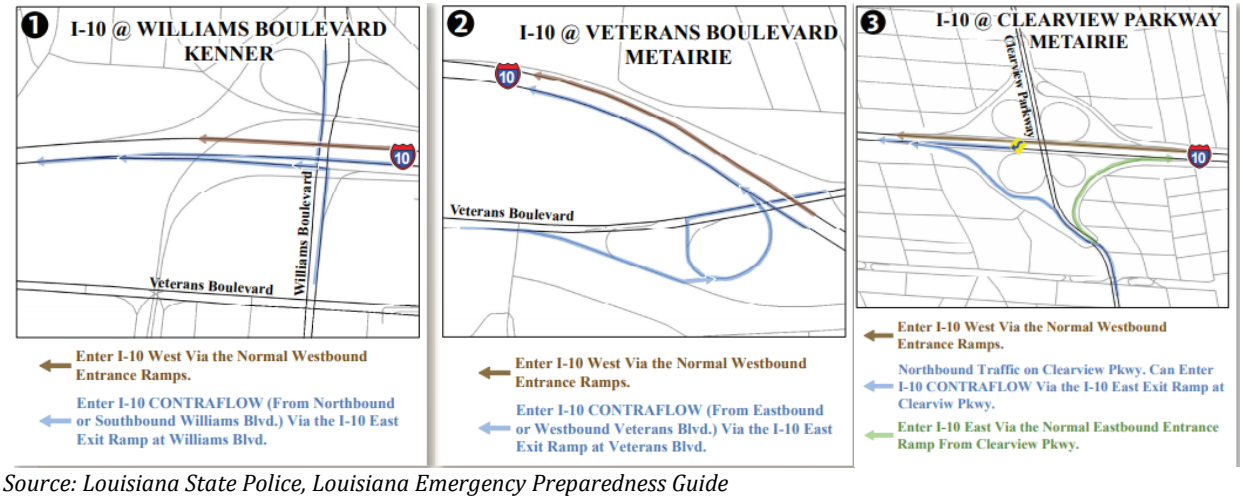
Source: Louisiana State Police, Louisiana Emergency Preparedness Guide

Figure 8
Contraflow Maps for Evacuation of Southeast Louisiana



Source: Louisiana State Police, Louisiana Emergency Preparedness Guide

Figure 9
Contraflow Starting Locations in Jefferson Parish



Source: Louisiana State Police, Louisiana Emergency Preparedness Guide

Figure 10
Jefferson Parish Transit Evacuation Map

Source: Jefferson Parish Emergency Management, Emergency Operations Plan

2.3.5 Community Assets

An inventory of geo-referenced assets within Jefferson Parish was compiled in order to identify and characterize those properties potentially at risk to the identified hazards. By understanding the type and number of assets that exist and where they are located in relation to known hazard areas, the relative risk and vulnerability for such assets can be assessed. Under this assessment, two categories of physical assets were created and then further assessed through GIS analysis. Additionally, social assets are addressed to determine population at risk to the identified hazards. The two categories of physical assets consist of:

1. Improved Property: Includes all improved properties in the Jefferson Parish according to parcel and building footprint data provided by Jefferson Parish GIS Department. The information has been expressed in terms of the number of buildings and parcels that may be exposed to the identified hazards.

2. Critical Facilities: Critical facilities vary by municipality. For this assessment, identified facilities from past plans were updated by the Parish. It should be noted that this listing is not necessarily all-inclusive for assets located in the Parish and it is anticipated that it will be expanded and adjusted during future plan updates as needs and information change.

The following tables provide a detailed listing of the geo-referenced assets that have been identified in the Parish. Additional information on the assets can be found in Appendix F, Asset Inventory.

Table 4 includes the building counts in each community based on best available spatial data. Replacement value information was not readily available for these structures, so an estimate of replacement value was calculated based on an average cost per square foot of $125. This base cost per square foot may overestimate or underestimate any specific building but can be useful in providing a high-level analysis of replacement value across a community. This allowed the planning team to develop some estimate of potential risk for a number of hazards where a structural level analysis tool did not exist.

Table 4
Improved Property in Jefferson Parish

Name	Count of Buildings	Estimated Replacement Value*
Jefferson Parish	142,429	$43,063,207,222
City of Gretna	7,584	$2,403,237,017
City of Harahan	4,553	$1,191,381,174
City of Kenner	22,576	$7,478,745,811
City of Westwego	4,127	$1,107,137,105
Town of Grand Isle	2,610	$605,627,472
Town of Jean Lafitte	814	$228,552,478
Grand Total	184,693	$56,077,888,279

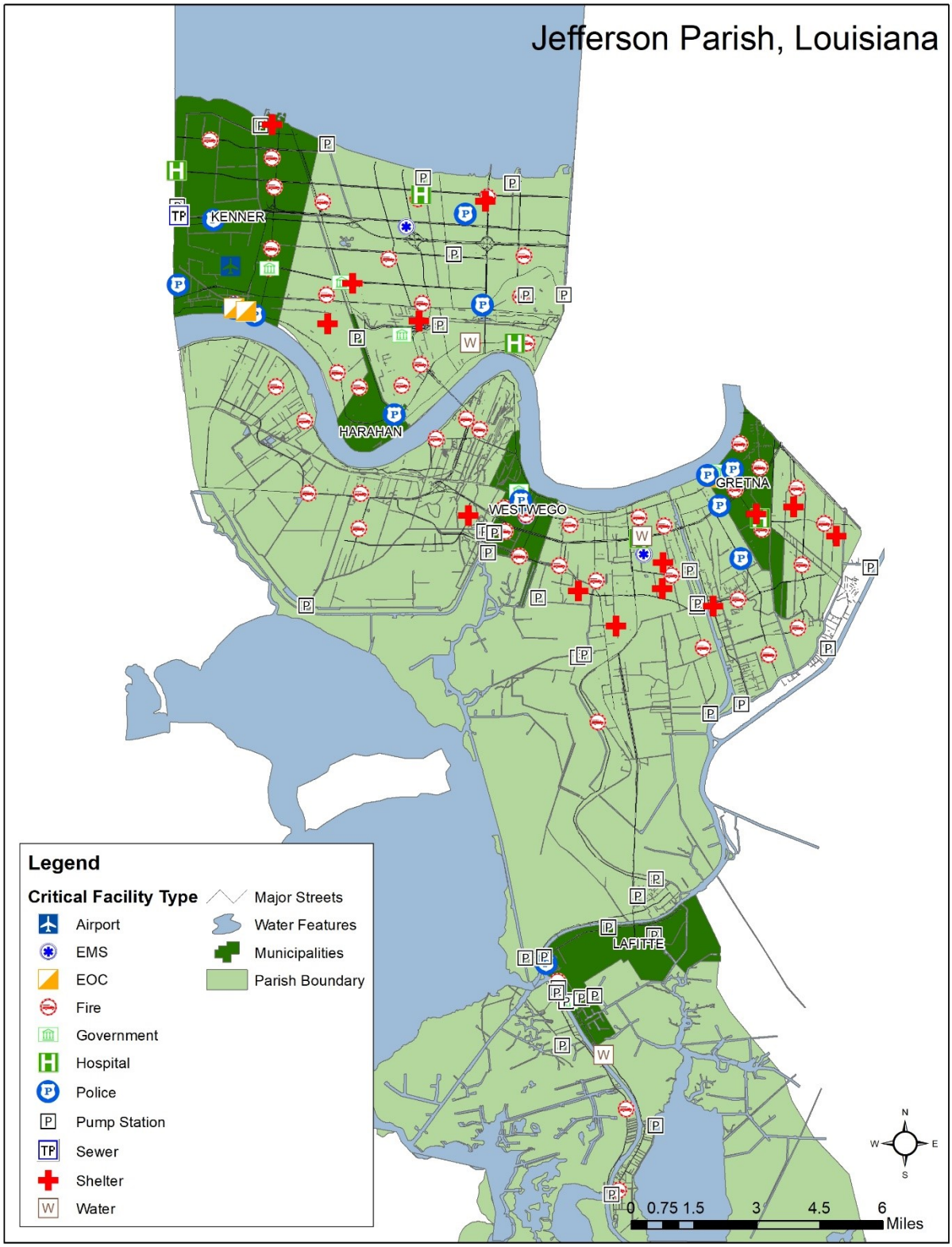
*As noted above, this value was estimated based on an average value of $125/sq ft and does not reflect a structure level assessment of each building's replacement value in the Parish

Table 5 lists the critical facilities located in Jefferson Parish by type and location according to data provided by local government officials and according to building assessments carried out during this plan update. In addition, **Figure 11** and **Figure 12** show the locations of critical facilities in Jefferson Parish. It should be noted that the table below may show that some communities do not have any critical facilities of a certain type, when in reality, that particular type of facility may be located within the community. This may occur because the facility was not identified as a critical facility or because the facility may have been classified under a different category type for that particular community because certain facilities serve multiple functions (i.e. fire and EMS).

Table 5
Critical Facilities in Jefferson Parish

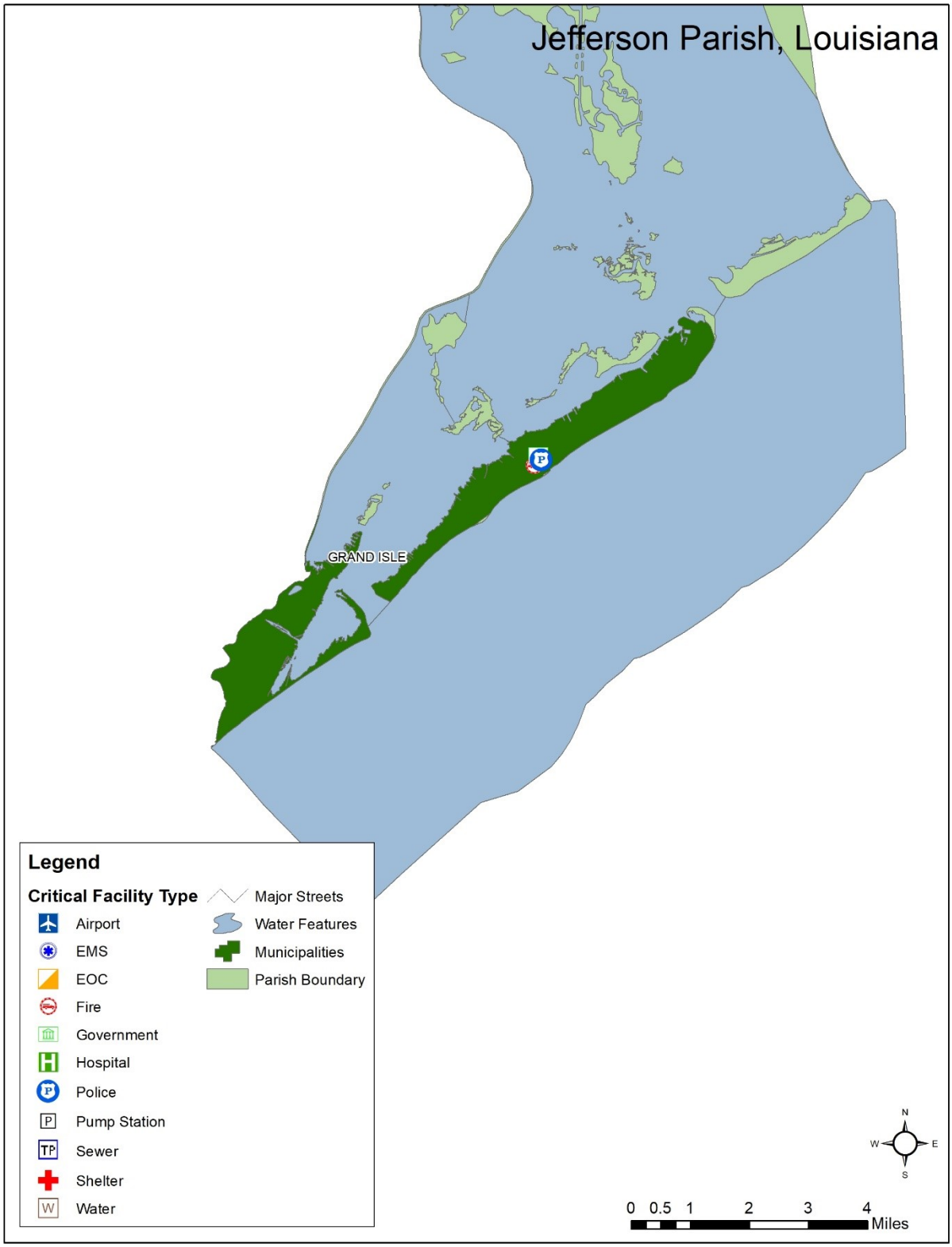
Name	Airp	EMS	EOC	Fire	Govt	Hosp	Poli	Pump	Sew	Shelt	Water
Jefferson Parish	0	2	0	32	2	3	4	18	0	10	2
City of Gretna	0	0	1	6	5	1	2	0	0	1	0
City of Harahan	0	0	0	3	1	0	1	1	0	1	0
City of Kenner	1	0	2	6	1	1	4	2	1	1	0
City of Westwego	0	1	0	5	1	0	1	3	0	1	0
Town of Grand Isle	0	0	0	1	1	0	1	0	0	0	0
Town of Jean Lafitte	0	0	0	2	1	0	1	14	0	0	1
Grand Total	1	3	1	54	12	5	11	38	1	14	3

Figure 11
North Jefferson Parish Critical Facilities



Source: Jefferson Parish GIS Department

Figure 12
South Jefferson Parish Critical Facilities



Source: Jefferson Parish GIS Department

Within an hour's drive of Jefferson Parish there are fifteen major colleges and universities. These universities are nationally recognized for sponsoring extensive research activities, for their schools of law, medicine, fine arts, and engineering curriculum.

- University of New Orleans – 10 miles
- Delgado Community College – New Orleans – 10 miles
- Tulane University – New Orleans – 10 miles
- Loyola University – New Orleans – 10 miles
- Southern University at New Orleans – 10 miles
- New Orleans Baptist Theological Seminary – 10 miles
- Xavier University – New Orleans – 10 miles
- Louisiana State University Medical Center – New Orleans – 10 miles
- Dillard University – New Orleans – 10 miles
- Our Lady of Holy Cross College – New Orleans – 10 miles
- Notre Dame Seminary School of Theology – New Orleans – 10 miles
- Nunez Community College – St. Bernard – 15 miles
- Southeastern Louisiana University – Hammond – 50 miles
- Louisiana State University – Baton Rouge - 60 miles
- Southern University – Baton Rouge – 60 miles

Parks and Recreation – There is an abundance of outdoor recreational activities available to local residents. There are many bayous, lakes, and rivers, which offer miles of navigable waters to boaters and wonderful fishing, camping, and hunting grounds for residents and visitors. There are several swamp tours within the Parish, where visitors may see various types of wildlife including alligators, rare birds, nutria, and more.

2.3.6 Population and Growth of the Planning Area

Population

Of the 64 Parishes within the State, Jefferson Parish is the second most populous accounting for almost 10 percent of the overall population of Louisiana. The Parish experienced significant growth during the 1970's, with an increase in population of 117,024 people from the 1970 U.S. Census to the 1980 U.S. Census. The population leveled off in the 1980's and remained around 450,000 residents between 1980 and 2000. However, the Parish's population, according to the 2010 U.S. Census, experienced a slight decline of approximately 5 percent. According to the 2013-2017 American Community Survey 5-Year Estimates, the population has begun to slightly increase again (approximately 1 percent). See **Table 6** for the population of the Parish and cities for years 1980, 1990, 2000, 2010, and 2017.[1]

Table 6
Jefferson Parish Population

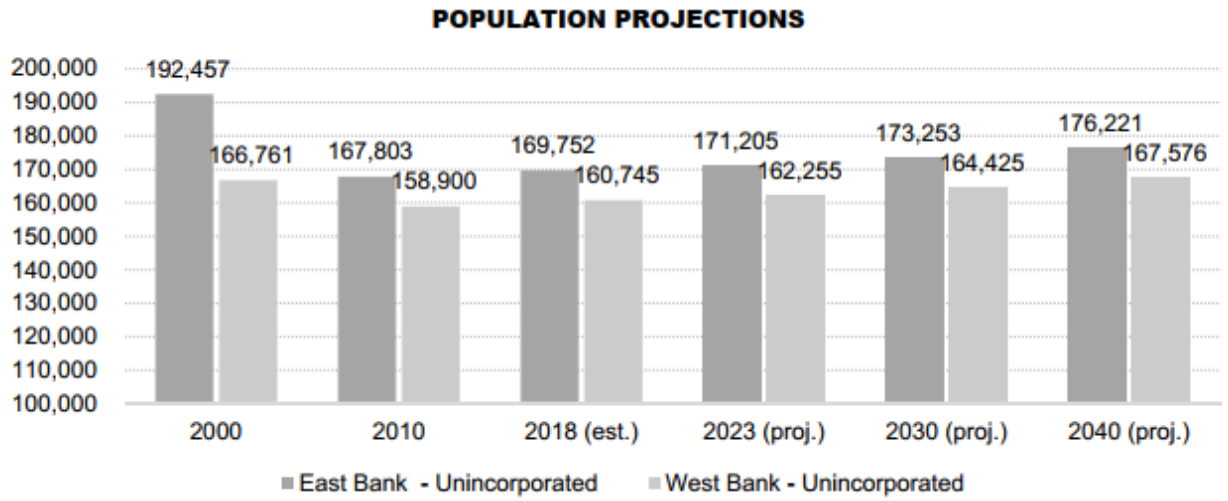
Name	Total 2017 Population	Total 2010 Population	Total 2000 Population	Total 1990 Population	Total 1980 Population
Jefferson Parish	437,038	432,552	455,466	448,306	454,592
Metairie, CDP	144,822	138,481	146,136	149,428	164,160
Kenner, City of	67,253	66,702	70,517	72,033	66,382

Name	Total 2017 Population	Total 2010 Population	Total 2000 Population	Total 1990 Population	Total 1980 Population
Marrero, CDP	31,425	33,141	36,165	36,671	36,548
Terrytown, CDP	24,216	23,319	25,430	23,787	N/A
Harvey, CDP	20,311	20,348	22,226	21,222	22,709
Gretna, City of	17,888	17,736	17,423	17,208	20,615
Estelle, CDP	16,791	16,377	15,880	14,091	N/A
River Ridge, CDP	13,809	13,494	14,588	14,800	N/A
Woodmere, CDP	11,114	12,080	13,058	N/A	N/A
Jefferson, CDP	10,469	11,193	11,843	14,521	N/A
Timberlane, CDP	10,655	10,243	11,405	12,614	N/A
Westwego, City of	8,557	8,534	10,763	11,218	N/A
Harahan, City of	9,367	9,277	9,885	9,927	N/A
Waggaman, CDP	9,712	10,015	9,435	9,405	N/A
Bridge City, CDP	6,957	7,706	8,323	8,327	N/A
Avondale, CDP	5,226	4,954	5,441	5,813	N/A
Elmwood, CDP	5,037	4,635	4,270	N/A	N/A
Jean Lafitte, Town of	1,839	1,903	2,137	1,469	N/A
Lafitte, CDP	886	972	1,576	N/A	N/A
Grand Isle, Town of	760	1,296	1,541	1,455	N/A
Barataria, CDP	1,090	1,109	1,333	1,160	N/A
Unincorporated Area Not In CDP	18,854	19,037	16,091	23,157	N/A

As a result of Hurricanes Katrina, Rita, Gustav, and Ike, large numbers of residents were displaced from the State of Louisiana. Hurricane Katrina alone forced an immediate and massive relocation of hundreds of thousands of people, making it difficult to track the population shift. This displacement has caused a parish wide decrease in population from the 2000 census to the 2010 data. Between 2010 and 2017, the Parish's population has begun to grow again. According to the Jefferson Parish Comprehensive Plan: Envision 2040, the current population in unincorporated Jefferson Parish is still below the population in 2000 and represents only 92% of the 2000 population.

For the next five years, the population in unincorporated Jefferson Parish is projected to grow at an average annual rate of 0.17% on the East Bank and 0.19% on the West Bank. Extending these annual growth rates into the future predicts a total population of 337,678 in 2030 and 343,797 in 2040 from the current number of 331,374. Therefore, if this slow-growth trend persists, the 2040 population in the unincorporated areas would remain below the 2000 population – 92.8%. **Figure 13** below shows population projections through 2040 for the unincorporated areas of the East Bank and West Bank of Jefferson Parish.

Figure 13
Population Projections for Unincorporated Jefferson Parish



Source: Jefferson Parish Planning Department, Comprehensive Plan: Envision 2040

Growth

The 2017 population estimates from the U.S. Census Bureau indicate that, over the last seven years, growth has begun to gradually increase again after declining during the ten years prior. This demonstrates that, in the future, there will likely continue to be more and more people at risk to the effects of flooding and other natural hazards that impact the parish. This growth in population has many positive aspects, but also indicates a need to ensure proper strategies are carried out to reduce the negative impacts on the growing population.

Population growth is one indication of development trends - building permits are another. Building permits issued can give insight on the amount of new construction and development in the parish. Commercial development in the Parish has been declining over the last four years, continuing the steady decrease experienced from 2007 to 2013. See **Table 7** for the annual building permits issued for commercial development in the Parish from 2015 to 2018 as reported by Jefferson Parish Inspection and Code Enforcement. This slight decline in commercial growth has been relatively small and shows that commercial growth has been taking place at a relatively steady pace.

Table 7
Jefferson Parish Commercial Building Permits

Name	2015 Commercial Permits Issued	2016 Commercial Permits Issued	2017 Commercial Permits Issued	2018 Commercial Permits Issued
District 1	162	148	143	123
District 2	331	314	319	295
District 3	196	205	136	158
District 4	72	48	70	70
District 5	401	406	422	373
Not Assigned	2	0	3	0

Name	2015 Commercial Permits Issued	2016 Commercial Permits Issued	2017 Commercial Permits Issued	2018 Commercial Permits Issued
TOTAL	1,164	1,121	1,093	1,019

At the same time, residential development in the Parish has been increasing fairly significantly over the last four years. See **Table 8** for the annual building permits issued for residential development in the Parish from 2015 to 2018 as reported by Jefferson Parish Inspection and Code Enforcement. These growth number show that residential development is on the rise in the parish and that, as with the population numbers, more and more people and structures are coming into the parish. These represent potentially increased risk.

Table 8
Jefferson Parish Residential Building Permits

Name	2015 Residential Permits Issued	2016 Residential Permits Issued	2017 Residential Permits Issued	2018 Residential Permits Issued
District 1	1	5	11	51
District 2	10	33	43	76
District 3	9	8	22	108
District 4	3	2	14	20
District 5	25	46	60	137
TOTAL	48	94	150	392

The East Bank of the Parish is primarily built-out, with little vacant land available in the unincorporated areas. Although, there is considerable redevelopment activity located on the East Bank. Building permits indicate a trend towards redevelopment on the East Bank and more new developments on the West Bank. See **Table 9** for the building permits issued for residential development and redevelopment in the Parish from 2015 to 2018 as reported by Jefferson Parish Inspection and Code Enforcement.

Table 9
Jefferson Parish Residential Building Permits (2015-2018)

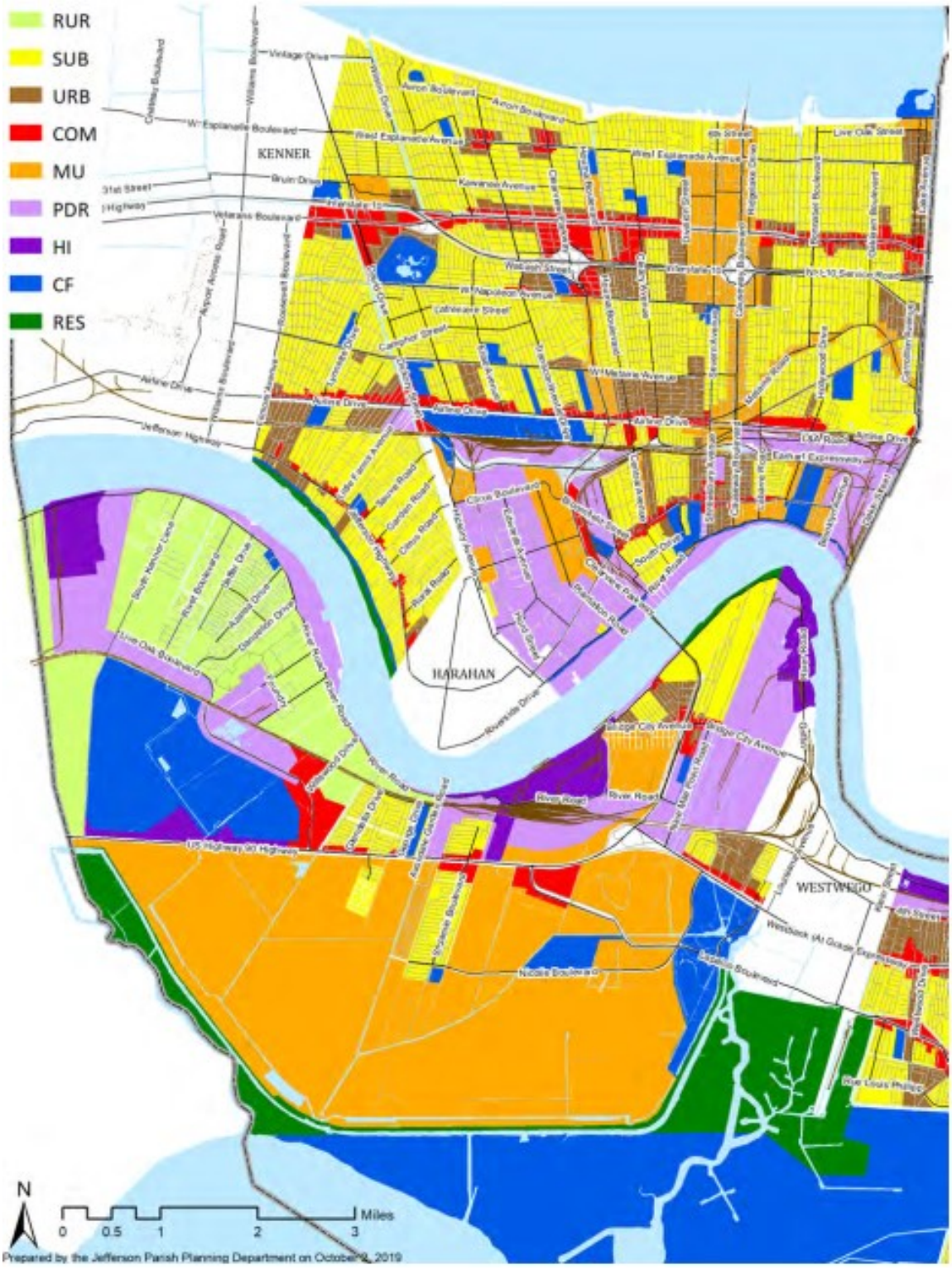
Name	Redevelopment Permits	New Development Permits
East Bank	212	249
West Bank	33	189
TOTAL	245	438

In addition to development permits, the Future Land Use Map (FLUM) that was developed by the Parish can be used as a guide to anticipate future growth, development, and re-development in the Parish. The most up-to-date version of the FLUM is housed in the Parish's GIS, but a version from the time of development of this plan can be found in **Figure 14** and **Figure 15**. As the map indicates, most of the expected growth in the parish will come in the form of redevelopment of areas where existing development is already in place. Since most new development will be redevelopment, natural

resources, such as wetlands, will generally be preserved and growth will be driven away from those sensitive areas.

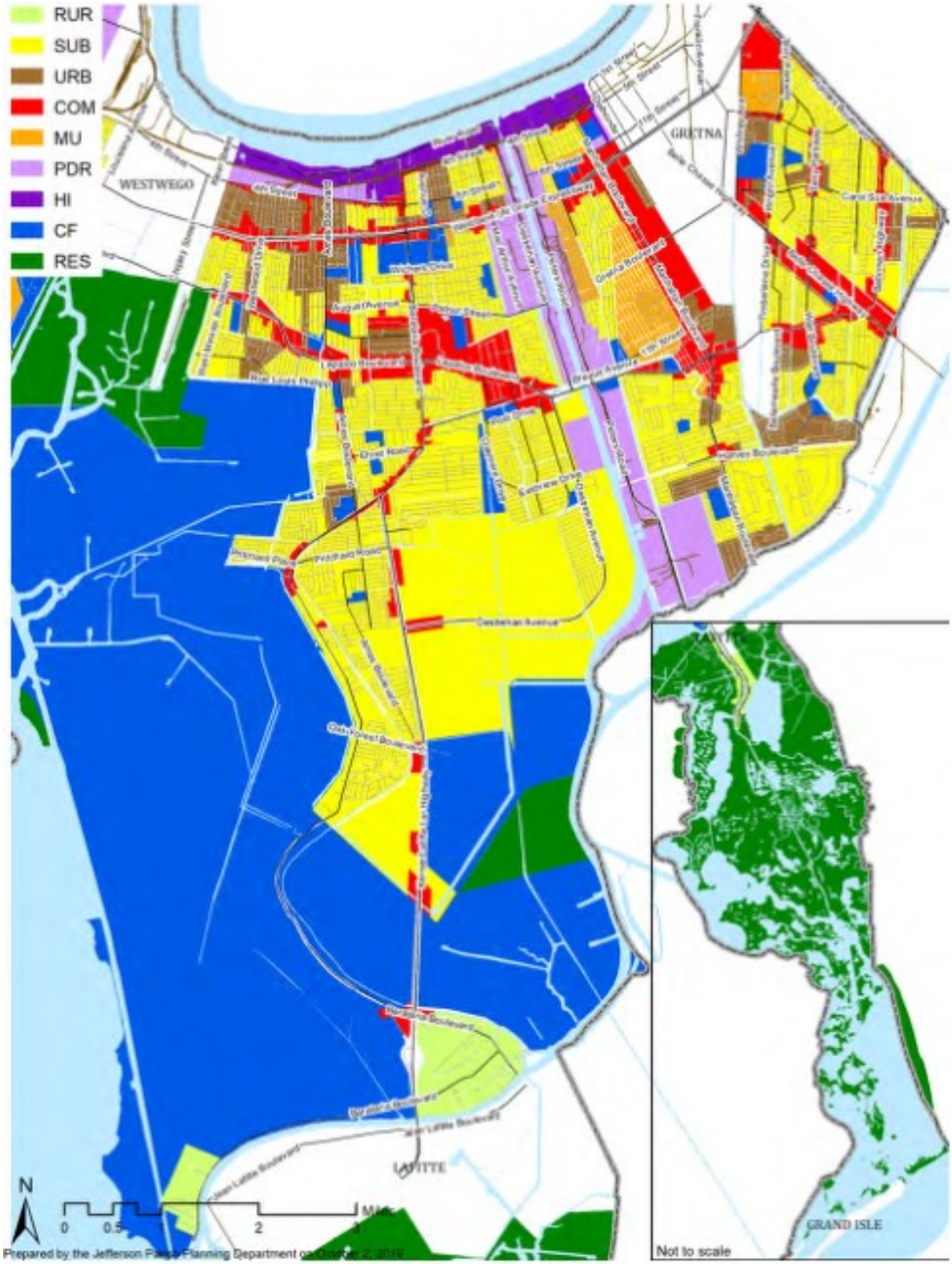
Overall, changes in development in Jefferson Parish and its municipalities have not impacted the community's vulnerability since the local hazard mitigation plan was previously approved.

Figure 14
Upriver FLUM for Jefferson Parish



Source: Jefferson Parish Planning Department, Comprehensive Plan: Envision 2040

Figure 15
Downriver FLUM for Jefferson Parish



Source: Jefferson Parish Planning Department, Comprehensive Plan: Envision 2040

As explained in Envision 2040, to address some of the potential impacts of development on stormwater-related flooding in the community, the Parish began a study in late 2019 of integrated storm water management with funding from the Louisiana Department of Community Development, Disaster Recovery Unit. This study also will evaluate enhancing existing incentives for low-impact development in the parish's development regulations. These incentives, adopted in 2017, provide relaxed requirements such as setbacks and parking to developers if they use LID measures. A comprehensive review of parking requirements is included in the study, since impervious paving impacts run-off and drainage.

Outside of the hurricane risk reduction system are vast areas of marshland and estuarine areas leading to the Gulf of Mexico that will remain undeveloped. In March of 1979, the Jefferson Parish Council adopted an ordinance establishing a Growth Limit Line in the area south of Crown Point on the West Bank as part of an agreement with the Federal Government to limit the availability of potable water and similar infrastructure in these sensitive areas. The Growth Limit Line limits the types of structures and uses that can be established in critical wetland areas.

Jefferson Parish has seen growth primarily in the oil industry, tourism, retail centers, and business. In 2006 construction began on the Churchill Technology and Business Park located in Avondale near the center of the Parish. Other production includes manufacturing and industrial plants, shipyards, and port facilities. The fishing, hunting, and trapping industries are also important to the Parish.[2] See **Table 10** for a list of the top 25 employers in Jefferson Parish reported by the Jefferson Parish Economic Development Commission as of October of 2016.[3]

Table 10
Jefferson Parish Top 25 Employers

Name	Product or Service	No. of Employees
Ochsner Health System	General Medical & Surgical Hospital	16,771
Jefferson Parish School Board	Education	6,387
East Jefferson General Hospital	Medical	3,000
Jefferson Parish	Parish Government	2,485
Acme Truck Line	Transportation	2,100
Laitram Corporation, LLC	Shrimp Processing Equipment, Plastic Conveyor Belting & Alternating Tread Stair Manufacturer	2,065
West Jefferson Medical Center	Health Care	2,000
Jefferson Parish Sheriff's Office	Law Enforcement/Government	1,440
Al Copeland Investments	Franchises	1,352
Cox Communications	Communications	1,300
Superior Energy Services	Provider of Production Related Services, Rental Tools and Liftboats	1,200
Peoples Health, Inc.	Health Services	1,000
Blessey Marine Services, Inc.	Inland Water Passenger Transportation/Towing	832
Ochsner Medical Center Kenner	Hospital and Doctors' Office	775
Treasure Chest Casino	Casino	725

Name	Product or Service	No. of Employees
City of Kenner	Municipal Government	700
Boomtown	Casino	630
Cross Road Centers	Warehouse and Transportation	600
Pellerin Milnor Corporation	Manufacturer of Industrial Laundry Equipment	510
MCC Electric	Electrical Contractors	500
Imperial Trading Co, Inc.	Food Distributor and Food Services	500
Republic National Distributing	Wholesale Wine and Alcoholic Beverages	500
Cornerstone Chemical	Chemical Manufacturer	494
Stress Engineering Services	Engineering Services	413
Whitney Bank	Financial Institution	408

The Parish's Economic Development Strategy, Jefferson EDGE 2020, identifies five industry clusters as the greatest opportunity for growth in strategic areas of interest and strength in coordination with regional efforts. The five target clusters are:

- Food, Beverage, Fishing and Seafood
- Water Transportation, Distribution and Logistics
- Health Care
- IT Systems and Products
- Water, Coastal, and Environmental Industries

Economic Impact of Disasters

Jefferson Parish has seen its share of major disasters in recent years that have had significant impacts on the local economy. Hurricane Katrina in 2005 had a devastating effect on the local economy as it displaced tens of thousands of people, many of whom never returned to the area. This loss of population and workforce population had an impact across all industries and the parish is still recovering that lost workforce today. The storm had a particularly devastating impact on many local businesses as well, with many forced to shut down their operations after extensive damage from the storm. As FEMA has indicated through past studies, on average, 40% of businesses that close after a major storm event never re-open, and another 25% that do re-open, fail within the first year. Katrina was no exception in Jefferson Parish, as many businesses that closed down after the storm never re-opened their doors.

Although it was not a natural disaster, the BP oil spill in 2012 had a debilitating impact on a number of key industries in Jefferson Parish. Several of the target clusters that have been identified in the EDGE 2020 plan were among the most impacted from this event, including the Food, Beverage, Fishing, and Seafood sector and the Water, Coastal, and Environmental Industries sector. In the wake of the recession, this event caused major disruptions to many of these industries that were already suffering from the downturn in the economy and further exacerbated the challenges of the recovery from Hurricane Katrina, which was still ongoing.

One economic outcome of the long history of flooding that has impacted the parish has been the development of a localized industry of water management. According to EDGE 2020, this special cluster comprises elements of multiple traded clusters in Water Management, a strong specialization

for both Jefferson Parish and the greater New Orleans region. The major industries or sub-clusters are:

- Engineering Services
- Fabricated pipe manufacturing
- Heavy and civil engineering construction
- Power and communication line construction
- Water and sewer line construction
- Industrial building construction, and other professional and scientific services.

This industry cluster has been a focus post-Katrina and was defined through case-making research from Deloitte that was commissioned by Greater New Orleans, Inc. (GNO Inc). Water Management has also been the focus of multiple regional and state plans, including the Greater New Orleans Urban Water Plan and the state's Coastal Master Plan. Both of these plans would provide tens of billions in economic impact for the region if they were to be fully funded and implemented. The cluster is also one of five areas of special consideration for economic resilience in the Comprehensive Economic Development Strategy (CEDS) prepared by the New Orleans Regional Planning Commission (RPC) and discussed in the next section of this memo. The Data Center has also conducted some research in this cluster, showing projected job growth of over 7,500 new jobs in the region through 2020.

Many of those jobs share skills and projects with other clusters in our region, like Energy and Petrochemical, Construction, and Engineering. Water Management in Jefferson Parish is already a prominent cluster. Below are some highlights of the cluster's current performance using EMSI data:

- Over 10,165 jobs in 2015
- Employment is projected to grow 16% to 11,751 by 2024
- Average wage of $72,867
- The largest sub-cluster is Engineering Services, with nearly 3,000 jobs

When examined this way, Water Management is the second-largest traded cluster in Jefferson Parish.

Looking forward, the parish is focused on building back its economy so it is more resilient than ever before. Using the lessons learned from the series of major disasters that impacted the parish through the early part of the century, the parish has developed a plan to diversify and improve its economy and continue the growth it has experienced in the past several years.

Envision Jefferson 2020[4]

On August 6, 2003, the Parish Council adopted Ordinance No. 21939 making the Comprehensive Plan part of the Jefferson Parish Code of Ordinances. Effective March 27, 2004, Envision Jefferson 2020 became Article 6 of Chapter 25, Planning and Development which currently contains five elements: Land Use, Transportation, Housing, Open Space and Recreation, and Implementation. The Comprehensive Plan provides a guide for policy decisions regarding physical growth and development in Jefferson Parish. **Table 11** identifies the Land Use Element goals and objectives specifically related to environmental issues. The intent of these environmental goals and objectives is to promote a quality environment in Jefferson Parish to help enhance the overall quality of life for residents. The issue of protection of the coastal wetlands outside of the hurricane protection levee system with the intent of helping to reduce coastal erosion in Jefferson Parish is addressed, as well as the issue of hazard mitigation in Jefferson Parish. The Comprehensive Plan was recently updated

to guide the parish over the next 20 years. The update to the plan, Envision Jefferson 2040, was adopted by the Parish Council on November 6, 2019.

Table 11
Envision Jefferson 2020 Environmental Goals, Objectives, and Policies

Goal/Objective #	Description
Land Use Element Goal 6	**Natural environments provide protection, habitation, recreation, and livelihood.**
Objective 6.1	Collaborate with Federal and State agencies and neighboring parishes and cities to preserve natural resources and enhance environmental protection and quality.
Objective 6.2	Engage in programs and projects that safeguard natural processes and resources and promote environmental protection and quality for the long-term sustainability of the parish.
Objective 6.3	Provide waterfront activities or facilities for recreation and access to the water.
Objective 6.4	Balance economic activities such as oil and gas production with environmental efforts that restore and preserve wetlands and sustain coastal communities.
Objective 6.5	Promote activities like fishing, hunting, and boating as sport and livelihood.
Land Use Element Goal 9	**Development and redevelopment minimizes detrimental impacts on the Parish's air, water, and other resources and promotes sustainability.**
Objective 9.1	Provide regulatory or other incentives for construction methods and designs that minimize environmental impacts, promote environmental quality, or mitigate climatic changes and extreme weather events.
Objective 9.2	Protect waterways from pollutants or erosion caused by stormwater runoff or wastewater discharge.
Objective 9.3	Collaborate with Federal, State, and regional agencies or entities to establish or administer programs and projects for environmental protection.
Objective 9.4	Administer and enforce environmental programs and regulations for which the Parish has authority or jurisdiction.
Land Use Element Goal 10	**Land use practices and policies enhance sustainability and reduce risk to life and property from hazards.**
Objective 10.1	Implement and periodically update mitigation plans and programs to minimize threat to life and property caused by natural hazards and hazards related to human activities.
Objective 10.2	Coordinate with Federal, State, and regional agencies, interstate commissions, and other local governments on practices and policies that necessitate a broad approach.
Objective 10.3	Encourage integrated storm water management, green infrastructure, and other low-impact development techniques to minimize flooding and mitigate impacts of climate.
Objective 10.4	Reduce and mitigate the risks of hazardous materials activities.
Objective 10.5	Balance development activities with conservation measures to protect and enhance coastal wetlands and communities outside the Hurricane and Storm Damage Risk Reduction System (HSSDRS).
Objective 10.6	Promote development and site design that are less vulnerable to damages from flood, wind, subsidence, and other hazards.
Objective 10.7	Design and build infrastructure that is less vulnerable to flooding and includes low-impact development measures or integrated storm water management where practical.
Land Use Element Goal 12	**Residents, businesses, and government embrace environmental and technological changes with innovative, resilient approaches for renovation, construction, and use of structures and land.**
Objective 12.1	Expand opportunities for disseminating public information and receiving public input.
Objective 12.2	Provide effective and efficient management and administration of projects, programs, and procedures.

Goal/Objective #	Description
Objective 12.3	Promote integrated approaches and multifunctional systems to achieve broader environmental or design-based objectives.
Objective 12.4	Consider the broader transition from traditional businesses or institutions serving customers or clients in buildings, to online business approaches or near real-time service delivery from remote locations when adopting and administering regulations, programs, and procedures or enabling 5G or similar networks.
Objective 12.5	Incubate businesses and organizations by facilitating the sharing of resources such as buildings, equipment, and media.

ACCORDING TO THE JEFFERSON PARISH HOUSING STOCK ENHANCEMENT PLAN[5]

Demographic Trends in Jefferson Parish

Existing and Projected Population

The Census Bureau estimates that the 2017 population in Jefferson Parish was 439,036. As **Table 12** below shows, the population decreased in the last decade following Hurricane Katrina and a global recession but has shown slight increases over the last seven years. The Regional Planning Commission, which uses population and employment projections for purposes on modeling transportation system demands, projects that the population will decrease by approximately 3 percent by 2030 and an additional 1 percent by the year 2040.

Table 12
Jefferson Parish Population Growth Trends

	Year					
	1990	2000	2010	2013	2015	2017
Population	448,306	455,466	432,552	434,767	436,275	439,036
Percent Change		1.60%	-5.03%	0.51%	0.35%	0.63%

Source: U.S. Census Bureau, Decennial Census and American Community Survey 1-Year Estimates

Jefferson Parish's population growth has been lagging the Metropolitan Statistical Area (the MSA includes Jefferson, Orleans, Plaquemines, St. Bernard, St. Charles, St. James, St. John, and St. Tammany parishes). Between 2010 and 2015, the Parish's population increased by 0.9 percent, while the MSA's population increased by 5.8 percent. The greatest numerical gains were experienced by Orleans (45,788 people) and St. Tammany (16,348 people) parishes.

Future Housing Needs

The trends and projections cited above indicate that, without changes, Jefferson Parish's population will remain stable or decrease slightly over the next two decades. The overall population is likely to be older than the current population and to have fewer children. This changing population means an increased demand for higher density residences that require less yard maintenance than traditional single family homes. This is consistent with national trends that show increased demands for higher density developments in neighborhoods with greater mobility and amenities. The recent Jefferson Parish West Bank Revitalization Study found that, while there is still a demand for large lot detached single family dwellings, there is also a desire for mixed-use walkable neighborhood developments that provide greater mobility and amenities.

However, Jefferson Parish's lack of projected growth also means that new housing developed in the Parish to meet these demands will result in smaller household sizes and higher vacancy rates in the remaining units unless the Parish attracts new residents who can invest in new or existing housing. Failure to generate demand for new units or to increase household incomes required to maintain and upgrade existing units could result in disinvestment and deterioration of the existing housing stock.

Redevelopment

The weaknesses in the current housing are reflected in demographic trends that include decreasing household sizes, decreasing household incomes, and senior population that is increasing more rapidly than the region's. The Parish's Comprehensive Plan update process was completed in November 2019. It already supports revitalization of the existing housing stock and the creation of new housing opportunities. While its goals, objectives, background data, and implementation strategies will be updated, the Parish's Comprehensive Plan already provides strong policies that reflect public desires to protect existing stable neighborhoods and promote the revitalization of neighborhoods that are stagnating or are in transition. The Parish has been successful with efforts that have developed strategies for specific neighborhoods (e.g., Fat City), which is consistent with the strategies employed by similarly situated communities.

Through subarea plans for the Fat City, Bucktown, and Fairfield neighborhoods and several zoning districts, the existing Comprehensive Plan and Unified Development Code support and provide many of the regulatory tools that facilitate development of walkable, mixed-use developments in appropriate greenfield, infill, and redevelopment areas. Regulatory tools to facilitate clustering, planned development, and compatible connectivity between neighborhood-scale commercial development and neighborhoods are supported by the Plan. These efforts and consideration of other housing stock enhancement strategies are supported further through the Housing Stock Enhancement Strategic Plan developed and adopted by the Jefferson Economic Development Commission (JEDCO), which partners with the Parish Government on issues like housing stock revitalization. **Table 13** identifies the Housing Stock Enhancement Strategic Plan strategies that support revitalization and development in the Parish.

Table 13
Strategic Plan Strategies for Revitalization of the Existing Housing Stock and Creation of New Housing Opportunities

Proposed Initiation	Strategic Tool	Strategy	Lead Entity/Partners
2017	Housing Rehabilitation Pilot Study	Identify a developer to invest in rehabilitation of a few housing units and to document the costs and processes for the revitalization efforts. While this effort would ideally be coordinated with one or both of neighborhood revitalization pilot programs, other neighborhoods may be considered if the information is used to inform subsequent revitalization efforts.	JEDCO
2017	Housing Financing Consortium	Coordinate with local lenders to secure dedicated funding for some of the housing initiatives identified in this Strategic Plan.	JEDCO/Jefferson Parish Finance Authority and local lending entities

Proposed Initiation	Strategic Tool	Strategy	Lead Entity/Partners
2017	Comprehensive Plan	Consider changes to the future land use map and future land use categories to allow for a wider array of development patterns within residential and non-residential categories. • Plan amendments may identify the settings where development patterns are most applicable so that stable neighborhoods retain existing protections and neighborhoods with greater mobility potential (transit and pedestrian) have options to facilitate compatible infill and redevelopment. • When evaluating changes to the future land use map, identify senior housing opportunities in neighborhoods with easy access to medical, transportation and other services. • Consider policy options to support density and intensity bonuses for specified public purposes (e.g., senior housing, pedestrian/transit-oriented development patterns) and identify general design parameters that should be required to secure density and intensity bonuses.	Jefferson Parish Planning
2017	Comprehensive Plan	Consider this strategic Plan's recommendations as modifications required to update the Jefferson Parish Comprehensive Plan Housing Element. While some data updates and review of policies and programs for low, very-low and moderate income households may be required, the review conducted as part of this project confirmed the validity of existing Housing Element goals, objectives and policies except as specifically noted herein.	Jefferson Parish Planning
2017	Unified Development Code	Create a Planned Development (PD) district that encourages well designed redevelopment, infill and greenfield development throughout the Parish. PD districts are most effective when they provide clear guidance on design and scale to ensure that internal and external compatibility are achieved for developments that deviate from conventional height, bulk and area standards.	Jefferson Parish Planning
2017 - Ongoing	Code Enforcement	Continue using targeted code enforcement efforts in coordination with neighborhood revitalization efforts.	Jefferson Parish Blight Eradication; Property Maintenance/Zoning/ Quality of Life; Code
2017 - Ongoing	Capital Planning	Reserve a portion of capital improvement funding for streetscape and other capital improvements for areas subject to neighborhood revitalization plans as they are developed and implemented.	Jefferson Parish Public Works
2017 – Ongoing	Development Monitoring	Establish a publicly accessible database of development and redevelopment projects within Jefferson Parish.	Jefferson Parish Code Enforcement

Proposed Initiation	Strategic Tool	Strategy	Lead Entity/Partners
2017 - Ongoing	Grants	Coordinate with Jefferson Parish, JEDCO and professional organizations to pursue grants that will support neighborhood revitalization priorities (see funding section).	Jefferson Parish Finance Authority/JED CO; Jefferson
2017 - Ongoing	Private Contributions	Coordinate with commercial property owners and businesses in conjunction with neighborhood revitalization efforts to solicit contributions or improvements for the public and private realms.	JEDCO and Jefferson Parish
2017-18	Condemnation for Tax Delinquency	Coordinate zoning education and enforcement actions with Sheriff Department procedures for condemnation and resale of vacant and delinquent properties to help bring residential properties into conformity with zoning regulations and neighborhood character.	Jefferson Parish Sheriff; Blight Eradication; Property Maintenance/
2017-18	Renovation Assistance Program	Establish a renovation assistance program to fund a portion of targeted improvements through forgivable loans to qualified households that are consistent with the criteria for the homebuyer assistance program. Criteria for improvements should establish minimum thresholds for improvements and should focus on expansion and revitalization improvements that enhance streetscapes in eligible neighborhoods.	Jefferson Parish Finance Authority in coordination with Parish Community Development
2017-18	Employee Housing Program	Coordinate with JEDCO and major employers to facilitate establishment of employee housing programs within Jefferson Parish that provide incentives for homeownership in neighborhood near major employment centers. Ochsner Medical Center has the potential to serve as an effective pilot program based on prior JEDCO technical memorandum (see Appendix G).	Jefferson Parish Finance Authority/JED CO and major employers
2017-18	Marketing	Coordinate with local realty and apartment management entities to establish a marketing program to attract middle and upper- income residents to Jefferson Parish by emphasizing local assets and quality of life benefits and provide links to clearinghouse information.	JEDCO/NOMA R and other local professional organizations

Proposed Initiation	Strategic Tool	Strategy	Lead Entity/Partners
2018-19	Unified Development Code	Facilitate the development of compatible neighborhood-scale commercial at the edges of neighborhoods with improved pedestrian connectivity to neighborhoods also improves mobility options residents. To achieve Parish goals for compatibility and neighborhood stability, clear standards are required for design, scale and uses. This could be implemented through refinements to the current CPZ overlay district (e.g., Metairie Road CPZ), the creation of a PD district and/or compatibility and design criteria within existing commercial districts.	Jefferson Parish
2018-19	Unified Development Code	Increase flexibility to cluster residential and mixed-use development through the planned development district and/or by right development patterns within other existing zoning districts or targeted neighborhoods. By allowing for greater flexibility in lot sizes without increasing densities, developers have the opportunity to increase housing choices and reduce development costs (e.g., utilities, streets, stormwater management and fill).	Jefferson Parish
2018-19	Unified Development Code	Create by-right density/intensity bonuses for mixed-use and senior development projects in pedestrian-oriented and transit- supportive neighborhoods. Bonuses should be subject to safe, compatible and pedestrian-oriented building and site design standards.	Jefferson Parish
2018-19	Location Efficient Mortgages	Coordinate with lending institutions to evaluate the potential for location-efficient mortgages in pedestrian-oriented and transit- supportive neighborhoods.	Jefferson Parish Finance Authority
2018-19 Ongoing	Consolidated Plan	Coordinate allocations to federally funded programs as identified in the Consolidated Plan with neighborhood planning and revitalization initiatives and geographic priorities. Consider refining existing distribution policies to allow for the focusing of housing resources to strengthen neighborhood revitalization efforts.	Jefferson Parish/Jeffers on Parish Finance Authority & other housing service

Jefferson Parish has extensive zoning and building code regulations that address use and height of buildings, density of residential development, and lot, construction, and occupancy requirements. The zoning ordinances address over 30 different types of districts in the Parish, ranging from suburban residential, medical, mixed-use, to industrial. Development approval is granted through ministerial, quasi-judicial, or legislative action, by the Planning Director, Inspection and Code Enforcement Director, Board of Zoning Adjustments, or the Parish Council, as authorized in the Parish's Code of Ordinances. The Planning Advisory Board and Old Metairie Commission are appointed boards that issue recommendations to the Parish Council on certain development

proposals. The Planning Department must provide a written recommendation to the Council and Planning Advisory Board before the Parish Council enacts or amends development regulations.

2.4 The Louisiana State Hazard Mitigation Plan

The Louisiana Governor's Office of Homeland Security and Emergency Preparedness, together with the Louisiana State University Departments of Geography & Anthropology and Construction Management and the University of New Orleans Center for Hazards Assessment, Response & Technology, completed the State of Louisiana Hazard Mitigation Plan (HMP) 5-year update in 2019. The updated HMP was reviewed and approved by FEMA on March 27, 2019 and adopted by the State thereafter.

The State HMP profiled fifteen (15) hazards affecting Louisiana, fourteen (14) of which are profiled within this Jefferson Parish 2020 Plan Update. Descriptions and assessments of associated risk from these hazards can be found in Section 4 (Hazard Identification, Ranking, and Risk Assessment) of this Plan Update.

The goals outlined in the State HMP are listed below:

Goal 1 - Protect the people, property and natural resources of Louisiana, by promoting strategies and policies that increase resiliency, and minimize vulnerability to natural hazards.

Goal 2 - Increase public and private sector awareness and support of mitigation activities and opportunities in Louisiana.

Goal 3 - Support local and regional mitigation initiatives and strategies.

Goal 4 - Reduce Louisiana's repetitive and severe repetitive loss property inventory.

Goal 5 - Implement and maintain a comprehensive and effective enhanced statewide hazard mitigation plan.

The State HMP used the profiled hazards and risk assessments to develop a statewide mitigation strategy and action plan for future utilization in reducing risk across all jurisdictions within Louisiana.

Section 3 Planning Process

As part of the 2020 Plan Update, portions of the original Hazard Mitigation Plan (HMP) were preserved, including some of the terms and language. The original Plan was updated in 2010 and again in 2015. The 2020 update process was guided by a Hazard Mitigation Plan Advisory Committee (HMPAC), which will act as the primary conduit for plan updates and development and will make determinations on items such as actions that the community should adopt to try to reduce risk.

The "Planning Process" (Section 5) of the original Plan was re-structured to highlight the 44 CFR requirements. As part of the Update, Section 3.2, Federal Mitigation Planning Requirements, has been added to highlight and review some of the other FEMA programs that are related to hazard mitigation planning. These FEMA programs include specific planning requirements as prerequisite for eligibility. Additional details about specific changes and updates from the original Plan can be found in Appendix B, Summary of Changes.

3.1 44 CFR Requirements for the Planning Process

44 CFR §201.6(c)(1): [*The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.*

44 CFR §201.6(b): *An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:*

44 CFR §201.6(b)(1): *(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;*

44 CFR §201.6(b)(2): *(2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and*

44 CFR §201.6(b)(3): *(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information*.

44 CFR §201.6(c)(4)(ii): [*The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.*

3.2 Federal Mitigation Planning Requirements

As mentioned in Section 2.1, the Disaster Mitigation Act of 2000 requires State and local governments to develop and adopt natural hazard mitigation plans in order to be eligible for some types of federal assistance, including mitigation grants. The Act authorizes up to seven percent of HMGP funds available to a State after a disaster to be used for the development of State, tribal, and local mitigation Plans. Mitigation planning requirements are set forth in various FEMA policies and guidance documents, including the 44 CFR Part 201 and the FEMA Local Mitigation Planning Handbook. The

following series of bullets briefly describes the FEMA's three hazard mitigation programs, all of which require some form of mitigation plan in order for communities to be eligible for grants.

- **Flood Mitigation Assistance Program (FMA).** To qualify to receive grant funds to implement projects such as acquisition or elevation of flood-prone homes, local jurisdictions must prepare a mitigation plan. The plan must include specific elements and be prepared following the process outlined in the NFIP's Community Rating System.
- **Hazard Mitigation Grant Program (HMGP).** To qualify for post-disaster mitigation funds, local jurisdictions must have adopted a mitigation plan that is approved by FEMA.
- **Pre-Disaster Mitigation Grant Program (PDM).** To qualify for pre-disaster mitigation funds, local jurisdictions must adopt a mitigation plan that is approved by FEMA.

3.3 Description of the Planning Process

3.3.1 How the Plan was Prepared and Updated

The original Jefferson Parish Hazard Mitigation Plan was prepared in accordance with the process established in the FEMA How-To Guides as well as the requirements of the 44 CFR. The How-To guides provided the structure for the process that was used to develop the original Plan. Other sections of this Plan include details about how the 44 CFR requirements were met and the process that was used to obtain and interpret data and eventually make decisions in areas such as mitigation goals as well as project and action priorities. These are discussed only generally in this section.

Section 3 provides details about the process that was used to develop this Plan Update. The process closely followed the guidance in the FEMA Local Mitigation Planning Handbook, resulting in a four-stage process for the development of this mitigation plan update.

Step 1 Organize the planning process and resources
Step 2 Assess risks
Step 3 Develop a mitigation strategy
Step 4 Adopt and implement the Plan

As part of the 2020 Plan Update, certain elements of the original Plan have been retained, while irrelevant or outdated information has been summarized or removed. In some cases, the updated Plan includes cross references to particular information in the original version of the Plan. For the current version, there is a particular focus on incorporating new hazard information, updating the Parish risk assessment, and describing meetings and presentations held as part of the Update.

3.3.2 Step 1 - Organize the Planning Process and Resources

Jefferson Parish used a standard organization to develop its Hazard Mitigation Plan and Update. The organization has three tiers;

- Advisory Committee (HMPAC)
- Outside Stakeholder Agencies/Organizations
- Jefferson Parish Council/Administration

As noted elsewhere, the Jefferson Parish Plan Update was funded through a grant from FEMA. In the Update process, Jefferson Parish procured the services of Atkins, a professional planning consultant, to facilitate the process.

Composition of the Jefferson Parish Hazard Mitigation Plan Advisory Committee

As part of the Update, all of the participating communities have dedicated representatives to the planning committee to ensure that their community's interests are addressed and that they are fully engaged in the mitigation planning process. The committee is also composed of members of the public to ensure that citizen input in integrated into the plan. **Table 14** lists the individuals that comprise the HMPAC.

Table 14
Jefferson Parish Hazard Mitigation Plan, Hazard Mitigation Plan Advisory Committee

Committee Member	Community	Department/ Organization	Representation	Member of Public (Y/N)
Aimee Vallot	Jefferson Parish	Dept. of Inspection and Code Enforcement	Preventive Measures	N
Anatola Thompson	Jefferson Parish	Solutient	Preventive Measures	Y
Antwan Harris	Jefferson Parish	Public Information Office	Public Information	N
Bruce Layburn	Jefferson Parish	Private	Property Protection	Y
Cody Muller	Westwego	Muller's Auto Supply	Emergency Services	Y
Danika Gorrondona	Gretna	Dept. of Building & Regulatory Inspections	Property Protection	N
Dena Frickey	Jean Lafitte	Levee Board	Structural Flood Control Projects	Y
Doug Dodt	Kenner	Office of Emergency Management	Emergency Services	N
Edwin Lauricella	Harahan	Dept. of Maintenance	Preventive Measures	N
Haley Delery	Gretna		Preventive Measures	Y
Joe Valiente	Jefferson Parish	Dept. of Emergency Management	Emergency Services	N
John Young	Metairie		Natural Resource Protection	Y
Kazem Alikhani	Jefferson Parish	ECM Consultants, Inc.	Structural Flood Control Projects	Y
Kevin Guffey	Kenner	Guffey Insurance	Public Information	Y
Lisa Tapia	Westwego	City Clerk	Public Information	N
Maggie Talley	Jefferson Parish	Dept. of Floodplain Management and Hazard Mitigation	Property Protection	N
Michael Wesley	Gretna		Member of the Public	Y
Michelle Gonzales	Harahan	Rostan	Property Protection	Y
Mike Lockwood	Jefferson Parish	Dept. of Environmental Affairs	Natural Resource Protection	N
Mike Stewart	Jefferson Parish	Bryant Hammett & Associates	Property Protection	Y

Committee Member	Community	Department/ Organization	Representation	Member of Public (Y/N)
Mitch Theriot	Jefferson Parish	Dept. of Drainage	Structural Flood Control Projects	N
Nicole Cooper	Jean Lafitte	Capital Projects	Natural Resource Protection	N
Nora Combel	Grand Isle	Building Dept.	Preventive Measures	N
Oneil Malbrough	Grand Isle	GIS Engineering, LLC	Natural Resource Protection	Y
Patrick Hamby	Jefferson Parish	Entergy	Emergency Services	Y
Ryan Daul	Jefferson Parish	Daul Insurance	Public Information	Y
Scott Eustis	Jefferson Parish	Gulf Restoration Network	Natural Resource Protection	Y
Shane Yokum	Jefferson Parish		Member of the Public	Y
Stephen Romig	Jefferson Parish		Community Land Use and Comprehensive Planning	Y
Terri Wilkinson	Jefferson Parish	Dept. of Planning and Zoning	Community Land Use and Comprehensive Planning	N
Walter Baudier	Metairie		Structural Flood Control Projects	Y

Hazard Mitigation Plan Advisory Committee Meeting Schedule

The HMPAC and the consultant hired by the Parish were responsible for completing the Plan Update and project scoping including all of its component sections. The HMPAC met five times during the Plan Update. The meetings took place at the JEDCO Conference Center in Westwego and Yenni Building (4th floor) in Jefferson. Appendix A of the updated Plan includes minutes and attendees of all meetings. See Appendix for further clarification of the committee members roles.

Meeting 1 August 21, 2018 – Kickoff and Hazards
Meeting 2 September 18, 2018 – Problems/Risk
Meeting 3 October 23, 2018 – Goals
Meeting 4 December 4, 2018 – Possible Activities
Meeting 5 January 15, 2019 – Actions

HMPAC members had an opportunity to provide input and feedback on the content and process of the Plan Update during these meetings. The committee members were also asked to review and provide comments on meeting minutes, the updated Plan structure, as well as the draft and final Plan Updates. Government officials participating on the committee were also asked to provide data and insight to various components of the plan.

Composition of the Outside Stakeholder Agencies/Organizations

Early in the update process the Parish determined that a group of knowledgeable participants, neighboring communities, businesses, academia, and other organizations and individuals with an interest in the Jefferson Parish Plan Update and Project Scoping should be identified. These Outside Stakeholder Agencies/Organizations were contacted to ask for input on the planning process and to contribute important information and data from their respective fields. This stakeholder group was

identified by the HMPAC and, when possible, were contacted through either in-person communication or phone calls.

As drafts of the updated Plan were prepared, the Parish used email to distribute them to Outside Stakeholders and requested that they provide comments. Outside Stakeholders were requested to provide feedback through email or by telephoning the Jefferson Parish POC or a member of the consultant team. The consultant was responsible for archiving the comments and including them in edited versions of the Plan.

The HMPAC contacted and coordinated with a variety of agencies outside of the Jefferson Parish governmental structure throughout the plan update process. **Table 15** lists the agencies/organizations, how they were contacted, the date contact was made, and any relevant topics discussed

Table 15
Jefferson Parish Hazard Mitigation Plan, Outside Stakeholder Agencies/Organizations

Coordinating Agencies					
Agency	**Contacted by Email**	**Meeting/ Phone**	**Date**	**Points**	**Topic**
City of New Orleans		Yes	2/26/2019	2	Call about hazard mitigation plan update and request for input
CPRA		Yes	3/6/2019	2	Call about hazard mitigation plan update and request for input
LPBF		Yes	2/12/2019	2	Call about hazard mitigation plan update and request for input
NOAA		Yes	2/20/2019	2	Call about hazard mitigation plan update and request for input
USDA/NRCA		Yes	2/28/2019	2	Call about hazard mitigation plan update and request for input
OCD		Yes	2/26/2019	2	Call about hazard mitigation plan update and request for input
Wright National Flood Insurance Services, LLC		Yes	2/27/2019	2	Call about hazard mitigation plan update and request for input
NORPC	Yes		10/19/2019	1	Request for relevant RPC plans for incorporation
Greater New Orleans Foundation		Yes	3/7/2019	2	Call about hazard mitigation plan update and request for input
Water Collaborative of Greater New Orleans		Yes	2/28/2019	2	Call about hazard mitigation plan update and request for input
Water Institute of the Gulf		Yes	2/25/2019	2	Call about hazard mitigation plan update and request for input
SLFPA – Flood Protection Authority		Yes	2/8/2019	2	Call about hazard mitigation plan update and request for input
Flood Protection Authority - East	Yes	Yes	3/6/2019	2	Call about hazard mitigation plan update and request for input
Lafourche Parish Government Floodplain Department		Yes	3/18/2019	2	Call about hazard mitigation plan update and request for input
UNO-CHART		Yes	3/18/2019	2	Call about hazard mitigation plan update and request for input
LSU Bert S. Turner Department of	Yes		3/14/2019	1	Request for relevant data for risk assessment analysis

Coordinating Agencies					
Agency	**Contacted by Email**	**Meeting/ Phone**	**Date**	**Points**	**Topic**
Construction Management					
			Total Points	**30**	

*supporting documentation is included in Appendix A

3.3.3 Step 2 - Assess Risks

In accordance with general mitigation planning practice, as well as the process FEMA established in its Local Hazard Mitigation Handbook, the risk assessment forms the basis for the hazard mitigation Plan by quantifying and rationalizing information about how natural hazards affect the Parish. The processes used to complete the hazard identification and risk assessments, and the results of these activities, are described in detail in Sections 4 of this Plan. The assessment determined several aspects of the risks of natural hazards faced by the Parish and each municipality:

- The natural hazards that are most likely to affect the Parish
- How often hazards are expected to impact the Parish
- The expected severity of the hazards
- What areas of Jefferson Parish are likely to be affected by hazards
- How Parish assets, operations, people, and infrastructure may be impacted by hazards
- How private and commercial assets, operations, and infrastructure may be impacted by hazards
- The expected future losses if the risk is not mitigated

Through a rating system (explained in detail in Section 4), the HMPAC determined five of the initial hazards pose the predominant risks to the area. These five hazards are: floods, hurricanes and tropical storms, storm surge, subsidence, and coastal erosion. For each of these hazards the advisory committee performed detailed risk assessments, i.e., calculations of future expected damages expressed in dollars. Where possible, assessments were also conducted for the remaining hazards but may not be as detailed. These findings were presented to the HMPAC, discussed by the group, and approved as the basis for later phases of the planning process. The results of the risk assessment were also made available to the public during the public presentations noted elsewhere in this Plan. As noted above, a fuller description of this process and its results are presented in Section 4.

3.3.4 Step 3 – Develop a Mitigation Strategy

As part of the planning initiative, potential hazard mitigation projects were identified and scoped in accordance with the requirements of the program. The Parish and each of the six municipalities provided a list of potential mitigation projects that were reviewed and screened to identify those most likely to qualify for funding under the HMGP and other FEMA mitigation grant programs. For those projects, the scoping phase includes conceptual design (feasibility analysis), environmental review, benefit-cost analysis, and a final feasibility analysis. The identified projects are included in Section 5, Mitigation Strategy, of the Plan Update. The process employed to develop the Mitigation Strategy was based on the FEMA Local Mitigation Planning Handbook which outlines hazard mitigation planning procedures in accordance with the requirements of 44 CFR.

3.3.5 Step 4 – Adopt and Implement the Plan

Once approved by FEMA and formally adopted by Jefferson Parish and the six participating municipalities, this Plan must be updated every five years in order for the Parish to maintain its eligibility for various FEMA grant programs and funds. During this five-year period, the Plan is periodically reviewed to ensure compliance with FEMA and the State of Louisiana requirements for plan maintenance (See Section 6, Plan Monitoring and Maintenance, for more details). After the 2020 Plan Update is approved, the Parish will implement specific actions to achieve the goals and objectives described in Section 5, Mitigation Strategy. In addition to listing the mitigation strategies and actions the Parish is pursuing, the section describes the progress the Parish has made towards reaching the individual goals since the Plan was originally adopted.

The Jefferson Parish Council governs the Parish and has the final decision on what projects are worked on and how and when they will be accomplished. The action items fall under their jurisdiction and they will delegate the tasks of the action items. Therefore, the Council will coordinate with the Parish Floodplain Manager and Responsible Coordinating Entity of each mitigation item to accomplish the goals and action items. The Responsible Coordinating Entity will follow any current procedures the Parish has while completing the action items. The Annual Progress Report and status reports (meeting minutes) will be submitted to the Parish Council, which will reflect progress on each item and on the Hazard Mitigation Plan.

3.4 How the Public and Municipalities were Involved

During the 2020 Plan Update, the public was involved by requesting their attendance and participation in three public presentations/meetings. In accordance with legal requirements, the Parish published public notice about the meeting on the Parish website and in the public library branches at least two weeks before each meeting. The municipalities also posted the public meeting notices in each of their respective locations. The flyers explained the purpose of the meeting and provided the date, time, and location of the meeting place. The first public meeting was held at the East Bank Regional Library in August 2018. The second public meeting was held at the West Bank Regional Library in October of 2018. The third public meeting was held in April 2020. Due to the national health emergency caused by COVID-19, this public meeting was held virtually and was broadcast on JPTV and Facebook Live. Public notices, sign-in sheets, agendas, and minutes of meetings can all be found in Appendix A of this plan.

- Public meeting 1 (East Bank) August 22, 2018
- Public meeting 2 (West Bank) October 9, 2018
- Public meeting 3 (Virtual) April 16, 2020

Additionally, WDSU News provided media coverage of the Public Meeting held on October 9. The news clip and article highlighted the purpose of hazard mitigation plan as well as the opportunity for Parish residents to complete a survey and voice their concerns and any feedback.

3.4.1 Public Participation Survey

Jefferson Parish was successful in getting citizens to provide input to the mitigation planning process through the use of the *Public Participation Survey*. The *Public Participation Survey* was designed to capture data and information from Parish residents that might not be able to participate through

other means in the mitigation planning process, such as attending a public meeting at a specific time and location.

Hard copies of the *Public Participation Survey* were distributed to the HMPAC to be made available for residents to complete at local public offices. A link to an electronic version of the survey was also posted at various locations on the internet.

A total of 167 survey responses were received, which provided valuable input for the HMPAC to consider in the development of the Plan Update. Selected survey results are presented below.

- Approximately 87 percent of survey respondents were at least moderately concerned about the possibility of being impacted by a disaster.
- Respondents ranked Hurricane and Tropical Storm as the highest threat to their neighborhood (89 percent), followed by Flood (79 percent).
- About 84 percent of respondents felt they were at least moderately prepared if a disaster were to occur.
- 41 percent of respondents do not know what office to contact regarding reducing their risks to hazards.
- Emergency Services, Structural Projects, and Prevention were ranked as the most important activities for communities to pursue in reducing risks.

Public survey results were presented to the HMPAC at the Possible Activities Meeting on December 4, 2018. A copy of the survey and a detailed summary of the results are provided in Appendix A.

3.5 Other Local Planning Mechanisms

As required by 44 CFR that governs mitigation planning, actions and strategies from the Parish mitigation plan must be incorporated into other planning mechanisms, as applicable, during the routine re-evaluation and update of the Parish Plans. Jefferson Parish as well as the cities of Gretna, Harahan, Kenner, and Westwego and the Towns of Grand Isle and Jean Lafitte are members of the NFIP and have Floodplain Management Ordinances. When the municipalities or Parish update their Floodplain Ordinances, information and lessons learned from the HMP will be included in the revisions. This HMP will be made available to each committee leader responsible for revising their Floodplain Ordinance.

Both the Parish and the municipalities will use specific actions from the Strategies section of this plan as part of their capital budgeting processes, in particular when projects require local match for federal grants. Where possible, the Parish will also use elements of this HMP to supplement CRS planning and mitigation activities. The Parish will also look for opportunities to use the updated HMP in conjunction with drainage plans.

The Parish and the municipalities follow the Southern Standard Building Code guidelines. The Southern Standard Building Codes were developed by the International Code Council and were adopted by the Cities and Parish. If the Parish or Cities decide to amend any of the Southern Standard Building Codes, within the process of amending them, they will take into account the requirements from this HMP.

The Parish Department of Emergency Management has jurisdiction over the incorporated areas during disaster events; therefore, the incorporated areas follow the recommended guidelines in the Parish Emergency Operations Procedure.

3.6 Review and Incorporation of Plans, Studies, Reports and other Information

Other planning documents can be used as a valuable resource for integrating information related to hazard mitigation into the HMP. The 2015 version of the HMP included the review and incorporation of other Plans, studies, and reports that are applicable to the hazards discussed in the Plan. These documents were reviewed again as part of the 2020 Plan Update and any new information or changes have been incorporated into the HMP. A search was also conducted to identify additional Plans or studies that may have been completed since the release of the original Plan.

The following Parish plans and other documents were considered during the 2020 Jefferson Parish Plan Update: the Comprehensive Plan, Coastal Wetland Conservation and Restoration Plan (in process of obtaining funding), Comprehensive Drainage Master Plans, Emergency Operations Plan, Stormwater Management Plan, Economic Development Strategic Plan, Housing Stock Enhancement Strategic Plan, and Repetitive Loss Area Analysis. This HMP Plan Update will be made available to each committee leader responsible for updating these other Plans. In addition, any changes or updates to the State's Hazard Mitigation Plan, Coastal Master Plan, and other relevant state and regional plans are reflected in the Plan Update.

The specific Plans, Studies, and Reports are listed below along with a discussion on how they were incorporated into the HMP Update.

- Louisiana State Hazard Mitigation Plan –The goals and strategies in the State plan were considered by the HMPAC as the advisory committee updated the Jefferson Parish plan and to the extent possible the committee patterned the update to reflect the spirit and details of the State document.
- Floodplain Ordinances – Jefferson Parish and the six municipalities participate in the National Flood Insurance Program (NFIP) and therefore have adopted floodplain ordinances. These ordinances have been continually reviewed to incorporate any new requirements, such as adoption of the FEMA Advisory Base Flood Elevations (ABFE) after Katrina, higher regulatory standards implemented in 2011, the adoption of a Freeboard Ordinance in 2014, and the latest ordinance adoption in November 2017 to adopt the 2018 Flood Insurance Rate Maps.
- Jefferson Parish Emergency Operations Plan (EOP) –The EOP was reviewed to determine what action items were needed to improve emergency preparedness. The Parish updated the EOP in March of 2018.
- Parish Comprehensive Plan – The Parish recently updated its Comprehensive Plan. The updated Plan is entitled Envision Jefferson 2040. The updated plan was used to gather data on the Parish's growth strategies and planning initiatives. In the present plan update, this information was used in Section 2.3.6, Population and Growth of the Planning Area.
- Jefferson Parish Repetitive Loss Area Analysis – The Parish Repetitive Loss Area Analysis (RLAA), included as Appendix E, examines potential mitigation measures for specific repetitive loss areas and increases the Parish's credit in the CRS Program. Five repetitive

loss subareas were identified and selected for the RLAA. The subareas consist of repetitive loss properties and the surrounding properties that experience the same or similar flooding conditions, whether or not the buildings on those surrounding properties have been damaged by flooding. The RLAA generates specific guidance on mitigation solutions for individual buildings or areas and provides an understanding of the flood risk, flooding sources, and resources for mitigation. RLAAs were also conducted for Gretna, Jean Lafitte, Kenner, and Westwego and can be found in Appendix E.

- Parish Economic Development Strategic Plan – This is a 5-year plan that was updated by the Parish to the Jefferson EDGE 2020 Economic Development Strategy. The existing Plan was reviewed to obtain demographic data and information on planned growth. This information was used in several sections of Sections 2.3, Background Information about Jefferson Parish.
- Jefferson Parish Housing Stock Enhancement Strategic Plan – This strategic plan for neighborhood revitalization is intended to help the Parish ensure that its housing stock fits the needs of existing and future residents and contributes to restoring the Parish as the premier place to live, work, and play in southern Louisiana. This information was used in Section 2.3.6, Population and Growth of the Planning Area.
- State of Louisiana Wetlands Conservation and Restoration Plan – This Plan was reviewed along with the State's Coastal 2050 Plan to determine the problems associates with Coastal conservation and restoration. Data from these Plans was used to assist with the development of the hazard profiles for coastal erosion and storm surge in Section 4, Hazard Identification, Ranking, and Risk Assessment. The Wetlands Conservation Plan also assisted with the identification of projects that have been completed towards reaching the goal of reducing future damages from hazards discussed in Section 5, Mitigation Strategy.
- Stormwater Management Plan – This Plan, along with the Jefferson Parish Flood Insurance Study, was reviewed to assess the complex drainage system in place in the Parish that controls stormwater during hurricanes, thunderstorms, and other heavy rain events. By summarizing what is already in place, Plans can be made to determine what improvements are needed.
- Flood Insurance Rate Maps (FIRMs) – These maps were used to evaluate the risk associated with the Flood Zones AE, X, and VE. Data from these maps was also used to summarize the flood hazard in Section 4.3.
- Sea Lake and Overland Surges from Hurricanes (SLOSH) Model – This model was evaluated to determine the potential impact to the Parish and municipalities from storm surges. The SLOSH model output for Maximum of Maximums (MOMs) for a Category 1 and Category 4 storm was included to show estimated storm surge. This information is contained in Section 4.5.2.
- Comprehensive Drainage Master Plans – East Bank and West Bank Master Drainage Plans were developed to address the inefficiencies in the Parish's subsurface drainage system. The plans help to determine, prioritize, and optimize drainage projects to reduce local flooding and propose drainage facilities, construction priorities, multi-use canal facilities, as well as funding sources and capital improvements.
- Greater New Orleans Urban Water Plan – This is a resiliency planning study to develop sustainable strategies for managing the water resources of St. Bernard and the east banks of Jefferson and Orleans Parishes. The project addresses three basic issues: flooding

caused by heavy rainfall, subsidence caused by pumping of stormwater, and the misuse of water resources. The plan was reviewed to evaluate proposed projects to reduce the region's flooding and subsidence issues and add value to the region's quality of life and economic prosperity.

- Louisiana Coastal Master Plan – Louisiana's Comprehensive Master Plan for a Sustainable Coast sets an ambitious path to respond to the loss of coastal land and the threats from storm surge events. The master plan is a list of projects that build or maintain land and reduce risk to the state's communities. The master plan identifies a long-term program of construction, operations and maintenance, and adaptive management that is guided by a robust and continuous planning process to be implemented as funds become available.
- LA SAFE – This project portfolio includes a wide range of adaptation strategies that respond to community impacts caused by increasing flood risk and the needs across five adaptation categories that residents and stakeholders from the six LA SAFE parishes identified during the engagement process. The two projects for Jefferson Parish were reviewed to evaluate existing projects that have been selected to make Jefferson Parish more resilient to increasing flood risk in the future. These two projects are the Gretna Resilience District Kickstart, a public park that stores stormwater, and the Louisiana Wetland Education Center, an education center focused on coastal ecology.
- RESTORE Plan – This plan is a multi-year plan focused entirely on Grand Isle that identifies projects that could potentially be funded with RESTORE Act Direct Component funds available to Jefferson Parish as a result of the Deepwater Horizon oil spill. This includes segmented near-shore rock breakwaters needed for beach erosion control and to protect the natural resources and infrastructure from wave action. The Grand Isle Levee District has designed and permitted 16 breakwaters, and the first installment of RESTORE grant funds will be used to construct approximately 8 of these designed breakwaters to protect a vulnerable section of the island and for project administration.
- Southeast Louisiana Hurricane Evacuation Study Transportation Analysis Report – This study is the transportation analysis portion of the Southeast Louisiana Hurricane Evacuation Study, and it provides estimates of time needed to evacuate residents of the Southeast Louisiana evacuation zones, including Jefferson Parish, under a variety of evacuation scenarios. The clearance time estimates are inputs to the state and local storm planning efforts directed toward the formalization of evacuation protocols.
- Jean Lafitte Tomorrow Town Resiliency Plan – This plan is intended to facilitate the translation of the town's vision of resilience into reality through specific short- and long-term goals and objectives to preserve the local bayou character and culture in the face of adversity and enhance the prospect for a high quality of life for existing and future generations. This includes six principles for resilience – assess opportunities and threats, enhance local assets, focus on the heart of the town, diversity mobility options, build strong and safer, and live with water – and their associated goals and policies. The plan also identifies priority actions to achieve these principles.

Section 4 Hazard Identification, Ranking, and Risk Assessment

As mentioned elsewhere, during the 2020 Plan Update some parts of the previous Plan were preserved. Where applicable, portions of the historical hazard data have been retained. One of the major updates for this section included updating all hazards that have occurred since the 2015 Plan.

As part of the Update, the list of hazards profiled in the previous Plan has been slightly modified. For this section, Extreme Heat was added to the hazard identification, profiling, and ranking processes and Sea Level Rise was addressed as an individual hazard (separately from Subsidence).

4.1 Hazard Identification

In accordance with 44 CFR requirements, and as part of its efforts to support and encourage hazard mitigation initiatives, Jefferson Parish's Hazard Mitigation Plan Advisory Committee (HMPAC) prepared this general assessment of the hazards that have potential to impact the Parish. The following subsections provide an overview of past hazard events in Jefferson Parish, descriptions of the 14 hazards identified as having the potential to impact the Parish, and risk assessments for each hazard with more in-depth analysis for the hazards identified as high risk.

The term "planning area" is used frequently in this section. This term refers to the geographic limits of the Parish. The risk assessments address the effects of hazards on Jefferson Parish and its citizens.

4.1.1 Overview of Jefferson Parish's Natural Hazards History

According to the National Oceanic Atmospheric Administration's (NOAA) National Centers for Environmental Information (NCEI) Storm Events Database (formerly the National Climatic Data Center (NCDC)), between January 1950 and May 2018, Jefferson Parish has experienced 49 flood events, 26 storm surge events, 16 hurricanes, 26 tropical storms, 56 tornadoes, 169 thunderstorm and high wind events, 15 lighting events, 65 hailstorms, and 6 winter storms. A number of these events caused property damage, injuries, and deaths. [6]

Numerous federal agencies maintain a variety of records regarding losses associated with natural hazards. Unfortunately, no single source is considered to offer a definitive accounting of all losses. The Federal Emergency Management Agency (FEMA) maintains records on federal expenditures associated with declared major disasters. The U.S. Army Corps of Engineers and the Natural Resources Conservation Service collect data on losses during the course of some of their ongoing projects and studies. Additionally, NOAA and the NCEI collect and maintain data about natural hazards in summary format. The data includes occurrences, dates, injuries, deaths, and costs.

In the absence of definitive data on some of the natural hazards that may occur in Jefferson Parish, illustrative examples are useful. In 1953, the federal government began to maintain records of events deemed significant enough to warrant declaration of a major disaster by the U.S. President. Since 1953 Jefferson Parish has received 24 Presidential Disaster Declarations which are summarized below in **Table 16**.[7] This list is not meant to capture every event that has affected the area, rather highlight significant events that have occurred here in the past. A number of these events caused property damage and injuries. These figures and events are discussed in more detail in the hazard-specific subsections that follow.

Table 16
Natural Hazards and Declared Major Disasters in Jefferson Parish, Louisiana
(1953 to August 2018)[8]

Disaster (DR) & Date	Nature of Event	Description
FEMA-DR-208 9/10/1965	HURRICANE BETSY	Category 3 Hurricane that hit west of New Orleans with 140 mile per hour (MPH) winds. The hurricane killed 70 people and caused significant property damage from high winds and flooding. The storm surge at Grand Isle was estimated at 15.5 feet and flooded the entire island.
FEMA-DR-272 8/14/1969	HURRICANE CAMILLE	Hurricane Camille affected the States of Louisiana, Alabama, Mississippi, Virginia, and West Virginia. Storm surge was estimated at 24 feet in the Pass Christian – Long Beach area.
FEMA-DR-374 4/27/1973	SEVERE STORM, FLOOD	Spring rains flooded major portions of Louisiana. Flooding occurs along the Mississippi River for more than 1500 miles.
FEMA-DR-448 9/23/1974	HURRICANE CARMEN	Category 4 Hurricane made landfall ten miles west of Grand Isle with winds up to 80 MPH winds and 6-foot storm surge in Southeastern Louisiana. Low lying areas of Jefferson Parish were evacuated. Almost 5,600 people were in Jefferson Parish shelters.
FEMA-DR-556 5/9/78	SEVERE STORM, FLOOD	The severe storms and flooding caused over $87 million in damage to Jefferson Parish. Heavy rains from the storm resulted in over 10 inches of rain in less than 24 hours.
FEMA-DR-616 4/9/1980	SEVERE STORM, FLOOD	The severe storms resulted in 10 inches of rain over several days. Drainage pumps throughout the Parish were overwhelmed and most shutdown during the event. Flooding in low-lying areas.
FEMA-DR-679 4/20/1983	SEVERE STORM, FLOOD	Drainage pumps throughout the Parish were overwhelmed during the event. There was moderate flooding in the low-lying areas.
FEMA-DR-752 11/1/85	HURRICANE JUAN	Storm stalled over Louisiana for several days and flooded more than 2,200 homes in Jefferson Parish. The storm caused $46.5 million in damages. Extensive flooding occurred when a breach occurred in the Harvey Canal levee.
FEMA-DR-849 11/19/1989	HURRICANE, RAIN, STORM, FLOOD	Homes and business were flooded due to heavy rain.
FEMA-DR-956 8/26/1992	HURRICANE ANDREW	Category 3 Hurricane with winds over 100 MPH at the time it made landfall for the second time in Louisiana. Grand Isle and coastal areas were completely evacuated.
FEMA-DR-1049 5/10/1995	SEVERE STORM, FLOOD	Heavy rains from the event resulted in 9-18 inches of rain within several hours. Tornadoes and flooding throughout the Parish caused significant damages to homes and businesses.
FEMA-DR-1246 9/13/1998	TROPICAL STORM FRANCES & HURRICANE GEORGE	Strong Category 3 Hurricane that made landfall to the east of New Orleans near Ocean-Springs-Biloxi, MS. In preparation for the event mandatory evacuation orders were given for Grand Isle and a voluntary evacuation for Jefferson Parish.

Disaster (DR) & Date	Nature of Event	Description
FEMA-DR-1380 6/11/2001	TROPICAL STORM ALLISON, FLOOD	Widespread flooding from the slow-moving Tropical Storm. In Gretna the National Weather Service recorded 21.30 inches of rain from the event. The worst flooding occurred on June 6-7 when an estimated 59 homes and two businesses were flooded in Jefferson Parish.
FEMA-DR-1435 9/27/2002	TROPICAL STORM ISIDORE	The Tropical Storm came ashore near Grand Isle with sustained winds of 35-45 MPH. Heavy rains from the storm resulted in 4-6 inches of rain in 6 hours. A total of 881 residential homes were reported flooded from the event. Drainage pumps throughout the Parish were overwhelmed.
FEMA-DR-1437 10/03/2002	HURRICANE LILI	Hurricane Lili made landfall as a Category 1 storm only 3 months after TS Isidore. The already saturated soils resulted in flooding mainly in the lower western section of Jefferson Parish.
FEMA-DR-1548 9/15/2004	HURRICANE IVAN	Impacted parish as a hurricane on September 16, 2004 and then moved through the eastern U.S. and then cycled back into the gulf and came ashore again as a Tropical Depression on September 26, 2004.
FEMA-DR-1601 7/5/05	TROPICAL STORM CINDY	The Tropical Storm came ashore just southwest of Grand Isle with wind gust as high as 70 MPH and a storms surge of approximately 4-6 feet. The storm knocked out power to an estimated 300,000 residents throughout southern Louisiana.
FEMA-DR-1603 8/29/05	HURRICANE KATRINA	Hurricane Katrina made landfall as a strong Category 3 storm that had a devastating impact on New Orleans and the entire gulf coast. Catastrophic flooding from storm surge and levee failures caused unprecedented flooding throughout New Orleans and the surrounding areas. Katrina caused an estimated $81 billion dollars in damage from flooding, high winds, and storm surge. An estimated 147,000 structures were flooded.
FEMA-DR-1607 9/24/05	HURRICANE RITA	Hurricane Rita made landfall as a strong Category 3 hurricane in extreme southwestern Louisiana just west of Johnson's Bayou. Rita made landfall less than a month after Hurricane Katrina while sections of the City of New Orleans were still being drained of floodwaters. An estimated 10,000 structures were flooded.
FEMA-DR-1685 2/13/07	SEVERE STORMS AND TORNADOES	Tornadoes and severe storms impacted Jefferson, Orleans, and St. Martins Parishes. An F2 Tornado moved through the City of Westwego and the Carrollton area of New Orleans. A total of 295 houses in New Orleans were damaged and 231 in Jefferson Parish. A total of 79 houses were destroyed. Individual assistance available for residents impacted by the disaster.
FEMA-DR-1786 9/2/08	HURRICANE GUSTAV	Hurricane Gustav made landfall as a Category 2 hurricane near Cocodrie, Louisiana. Storm surge around Lake Pontchartrain was 4 to 5 feet above normal and affected many low-lying coastal areas. Hurricane Gustav affected over 100 homes in the lower portion of Jefferson Parish with 4 homes being destroyed, 41 receiving major damage, and around 40 homes with minor damage. Substantial damage also occurred in lower Jefferson Parish.

Disaster (DR) & Date	Nature of Event	Description
FEMA-DR-1792 9/13/08	HURRICANE IKE	Hurricane Ike made landfall near Galveston, Texas as a Category 2 hurricane. The distant hurricane generated an unusually high storm surge of approximately 5 feet above normal in Lake Pontchartrain, which flooded approximately 2,500 structures in southern Jefferson Parish.
FEMA-DR-4041 10/28/11	TROPICAL STORM LEE	Tropical Storm Lee's slow forward speed caused both storm surge and rainfall as it circulated over the region for several days. Storm surge associated with Lee caused tide values to be 3 to 5 feet above normal causing low land flooding.
FEMA-DR-4080 8/29/12	HURRICANE ISAAC	Hurricane Isaac made landfall in Plaquemines Parish, Louisiana as a Category 1 hurricane and weakened to a tropical storm (and then a tropical depression) as it traveled further inland. Tropical Storm force winds lasted in excess of 48 hours, storm tides were 5 to 9 feet, and many areas of Southeast Louisiana received 8 to 12 inches of rain.

According to the NCEI Storm Events Database, Jefferson Parish has experienced 40 deaths and 82 injuries from natural hazards in the period from January 1950 to May 2018. [9]

4.2 Identifying Natural Hazards for Additional Analysis

Various national, regional, and local sources were used to identify and classify different hazards for Jefferson Parish. In order to identify these hazards and broadly characterize the level of risk they pose to the Parish, a scoring classification of low (1), medium (2), and high (3) was given to each hazard based on seven criteria. The resulting numerical rankings were used to determine which hazards would be given priority in developing detailed risk assessments later in the process. The criteria used were:

1. **History.** High rating indicates that the hazard has affected the jurisdiction often in the past, and that the hazard has occurred often and/or with widespread or severe consequences.

2. **Future Probability.** High rating indicates that there is a high likelihood that the hazard may impact the jurisdiction in the future.

3. **Spatial Extent/Location.** High rating indicates that there is a large geographic area that may be impacted by the hazard.

4. **Potential for mitigation.** High rating indicates that there are ways to address the hazard, and that the methods are technically feasible and have the potential to be cost-effective [i.e. mitigation measures are available at a reasonable cost, and damages to property, lives and/or community functions would be reduced or eliminated.]

5. **Presence of susceptible areas.** High rating indicates that Jefferson Parish has numerous facilities, operations or populations that may be subjected to damage from the hazard.

6. **Data availability.** High rating indicates that sufficient quality data is available to permit an accurate and comprehensive risk assessment.

7. **Federal disaster declarations and local emergency declarations.** High rating indicates that Jefferson Parish has received numerous disaster declarations for the particular hazard.

Table 17 and **Table 18** are the hazard rankings produced by applying the seven criteria to the hazards profiled for Jefferson Parish. Two sets of hazard rankings, each specific to either the area inside the Hurricane and Storm Damage Risk Reduction System (HSSDRS), or levee system, and the area outside the HSSDRS, were developed. The HMPAC reviewed and approved the hazard rankings as part of the Plan Update.

Table 17
Jefferson Parish HMPAC Hazard Ranking – Inside HSSDRS

Hazard	History	Future Probability	Spatial Extent/ Location	Mitigation Potential	Impact/ Vulnerability	Data Availability	Disaster Declarations	Total
Floods	3	3	3	3	3	3	3	21
Hurricanes and Tropical Storms	3	3	3	3	3	3	3	21
Storm Surge	3	3	2	3	3	3	1	18
Subsidence	3	3	3	2	3	1	1	16
Sea Level Rise	1	3	2	3	3	2	1	15
Tornadoes	2	2	3	2	2	2	1	14
Extreme Heat	3	3	3	1	1	2	1	14
Coastal Erosion	3	3	2	1	2	1	1	13
Hailstorms	2	2	3	1	2	2	1	13
Lightning	2	2	3	2	2	1	1	13
Winter Storms	1	1	3	1	2	2	1	11
Drought	1	1	3	1	1	1	1	9
Wildfires	1	1	1	1	1	1	1	7
Earthquakes	1	1	1	1	1	1	1	7

Table 18
Jefferson Parish HMPAC Hazard Ranking – Outside HSSDRS

Hazard	History	Future Probability	Spatial Extent/ Location	Mitigation Potential	Impact/ Vulnerability	Data Availability	Disaster Declarations	Total
Floods	3	3	3	3	3	3	3	21
Hurricanes and Tropical Storms	3	3	3	3	3	3	3	21
Storm Surge	3	3	2	3	3	3	1	18
Coastal Erosion	3	3	3	2	3	1	2	17
Subsidence	3	3	3	2	3	1	1	16
Sea Level Rise	1	3	2	3	3	2	1	15
Tornadoes	2	2	3	2	2	2	1	14

Hazard	History	Future Probability	Spatial Extent/ Location	Mitigation Potential	Impact/ Vulnerability	Data Availability	Disaster Declarations	Total
Extreme Heat	3	3	3	1	1	2	1	14
Hailstorms	2	2	3	1	2	2	1	13
Lightning	2	2	3	2	2	1	1	13
Winter Storms	1	1	3	1	2	2	1	11
Drought	1	1	3	1	1	1	1	9
Wildfires	1	1	1	1	1	1	1	7
Earthquakes	1	1	1	1	1	1	1	7

The classification process provided a clear stratification of the hazards with Floods and Hurricanes and Tropical Storms at the top of the ranking. The HMPAC considered this hazard scoring and the mission of the Advisory Committee and determined that in addition to Floods and Hurricanes and Tropical Storms, the hazards Storm Surge, Subsidence, and Coastal Erosion outside the HSSDRS should be classified as high-risk hazards and would be the focus of additional risk assessment and vulnerability studies.

Based on the outcome of this ranking, the Hazard Mitigation Plan Advisory Committee conducted more in-depth assessments for the most significant hazards in Jefferson Parish:

- Floods
- Hurricanes and Tropical Storms
- Storm Surge
- Subsidence
- Coastal Erosion

4.3 Floods

4.3.1 Description of the Flood Hazard

Flooding is defined as the accumulation of water within a water body and the overflow of excess water onto adjacent floodplain lands. The floodplain is the land adjoining the channel of a river, stream, ocean, lake, or other watercourse or water body that is susceptible to flooding.

Hundreds of floods occur each year in the United States, including overbank flooding of rivers and streams and shoreline inundation along lakes and coasts. Flooding typically results from large-scale weather systems generating prolonged rainfall. Flooding in Jefferson Parish can be the result of the following weather events: hurricanes, thunderstorms (convectional and frontal), storm surge, or winter storms. Flooding-related impacts from other hazards such as storm surge are covered the respective sections on those hazards. See Appendix D, General Descriptions of Natural Hazards, for a more detailed description and definition of the flood hazard.

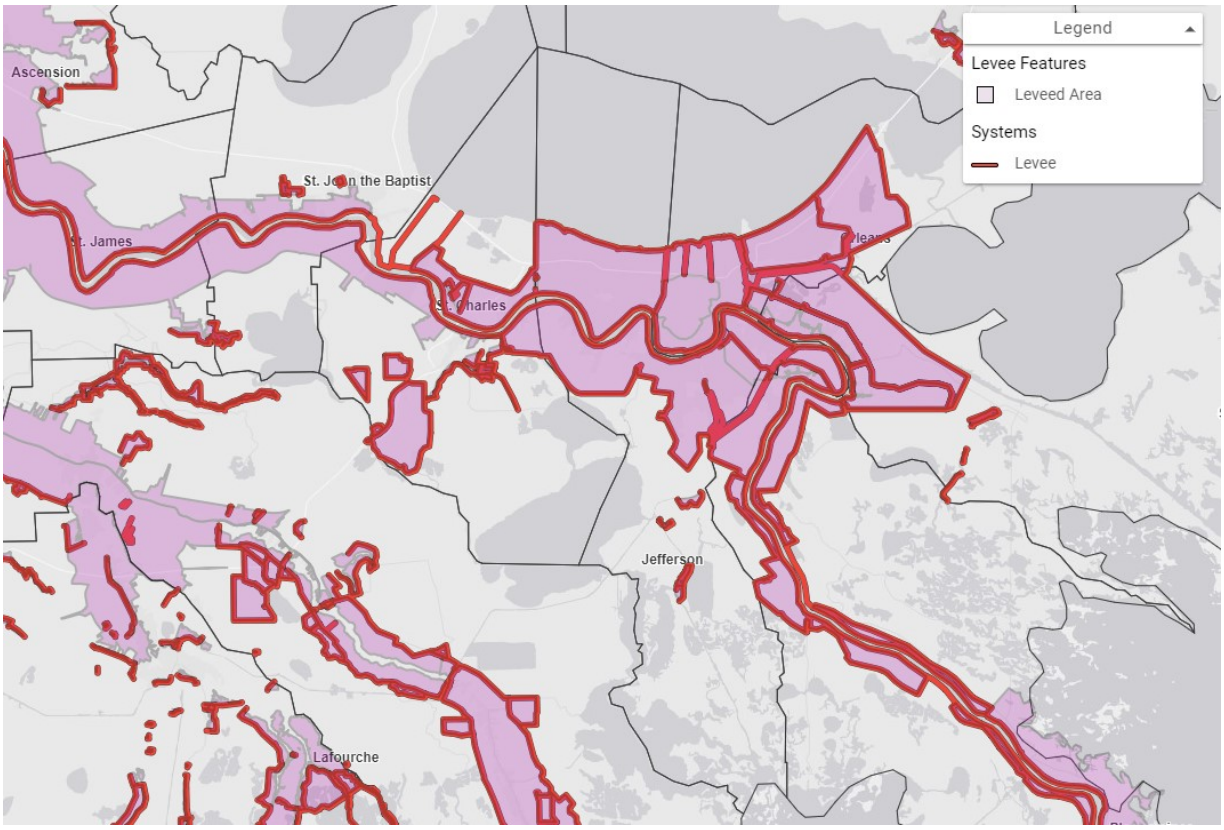
4.3.2 Location and Extent of the Flood Hazard

As described in Section 2.3.1, Geography, Jefferson Parish lies in southeastern Louisiana and is bordered by Lake Pontchartrain on the north, Orleans and Plaquemines Parishes to the east, the Gulf of Mexico to the south, and Lafourche and St. Charles Parishes to the west.

The Mississippi River divides the Parish into two distinctly different communities. Development on the East Bank of the Mississippi River consists mainly of residential and commercial improvements. Although some industrial development is located on the East Bank of the river, most of the heavy industrial concentration is found on the West Bank. In recent years, the West Bank area has also experienced rapid residential development. Development on the west bank ranges from small fishing villages at Lafitte and Barataria in the southernmost portion of the Parish to heavily urbanized areas along the Mississippi River.

Since most of Jefferson Parish's land mass is below sea level, a levee and pump system is employed for drainage. The levees protect the Parish from natural overbank flooding of these surrounding water bodies, including the Mississippi River, Lakes Pontchartrain and Cataouatche, and coastal marshes. Pumping is necessary to remove runoff from the drainage system over the levees into the outlying water bodies. **Figure 16** is a map of the U.S. Army Corps of Engineers levees[10] located in Jefferson Parish. **Table 19** provides an inventory of U.S. Army Corps of Engineers levee systems and the parishes within which those systems are located.

Figure 16
U.S. Army Corps of Engineers Levees and Protected Areas



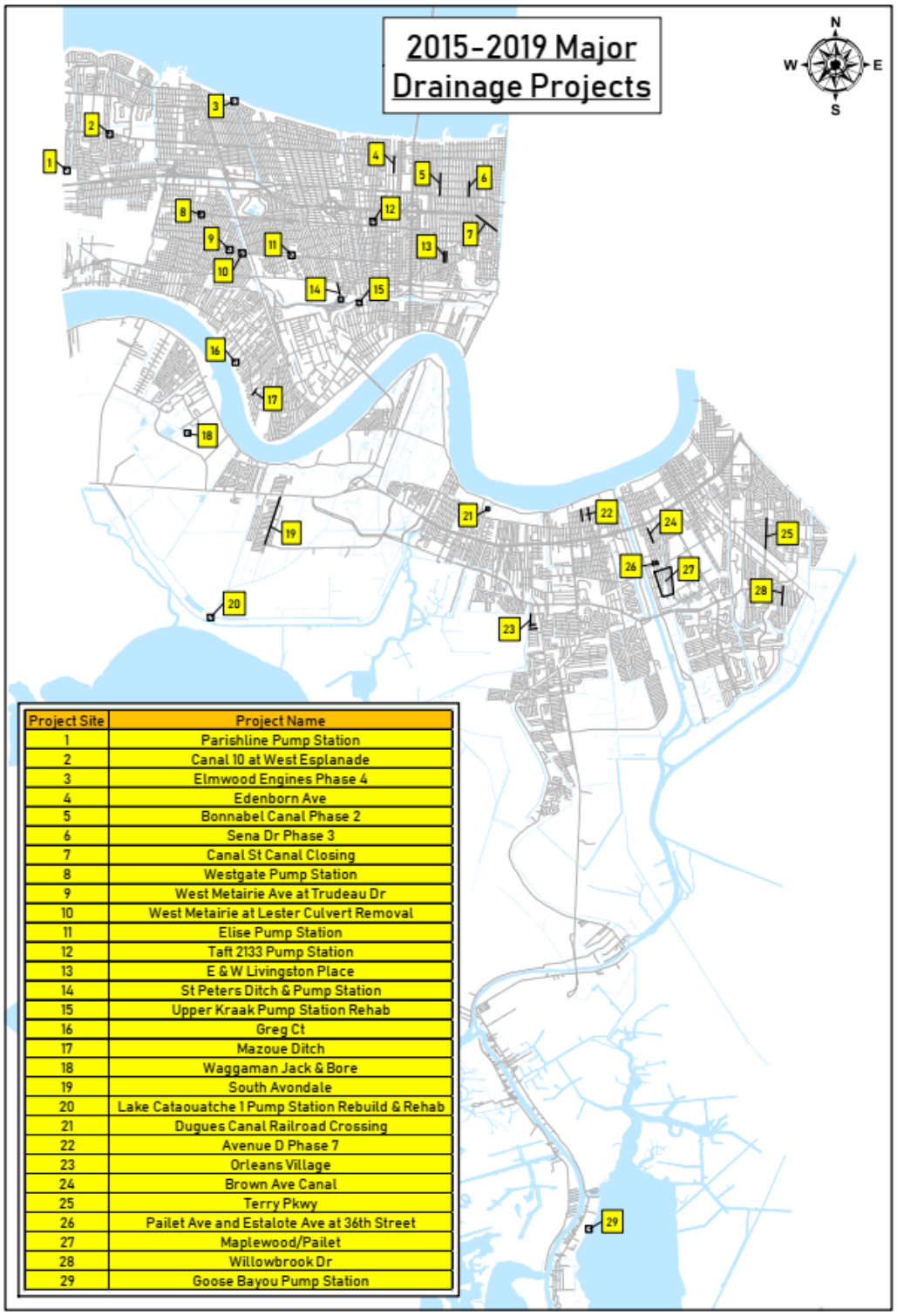
Source: United States Army Corps of Engineers

Table 19
U.S. Army Corps of Engineers Levee Systems Located within Jefferson Parish

Levee System	Associated Parishes
Donner Canal West Bank Sub System	Jefferson, Orleans, Plaquemines
East Jefferson System	Jefferson, Orleans
Grand Isle System	Jefferson
Jean Lafitte Fisherman Blvd North System	Jefferson
Jean Lafitte Northeast System	Jefferson
Jean Lafitte System	Jefferson
Lafitte Area Levee 10	Jefferson
Lafitte Area System	Jefferson
Lake Pontchartrain Segment	Jefferson
New Orleans East Bank	Jefferson, Orleans, Plaquemines, St. Bernard, St. Charles
New Orleans West Bank	Jefferson, Orleans, Plaquemines, St. Charles
West Jefferson Coastal System	Jefferson
West Return Segment	Jefferson

Drainage of floodwaters in Jefferson Parish is accomplished by a system of structures and canals, which outflow to pumping stations. Historically, these pumping stations have been inadequate in capacity to handle the volume of floodwaters reaching the stations and have operated at less than full capacity during floods. In addition, drainage structures through some man-made barriers, such as highway and railroad embankments, have proven inadequate during some rainfall events. **Figure 17** below depicts the location of drainage projects in Jefferson Parish that have been completed since the previous plan update in 2015 in an attempt to address these drainage deficiencies.

Figure 17
Jefferson Parish Major Drainage Projects (2015-2019)



Project Site	Project Name
1	Parishline Pump Station
2	Canal 10 at West Esplanade
3	Elmwood Engines Phase 4
4	Edenborn Ave
5	Bonnabel Canal Phase 2
6	Sena Dr Phase 3
7	Canal St Canal Closing
8	Westgate Pump Station
9	West Metairie Ave at Trudeau Dr
10	West Metairie at Lester Culvert Removal
11	Elise Pump Station
12	Taft 2133 Pump Station
13	E & W Livingston Place
14	St Peters Ditch & Pump Station
15	Upper Kraak Pump Station Rehab
16	Greg Ct
17	Mazoue Ditch
18	Waggaman Jack & Bore
19	South Avondale
20	Lake Cataouatche 1 Pump Station Rebuild & Rehab
21	Dugues Canal Railroad Crossing
22	Avenue D Phase 7
23	Orleans Village
24	Brown Ave Canal
25	Terry Pkwy
26	Pailet Ave and Estalote Ave at 36th Street
27	Maplewood/Pailet
28	Willowbrook Dr
29	Goose Bayou Pump Station

Source: Jefferson Parish Drainage Department

According to the NCEI Storm Events Database, there have been 54 floods recorded in Jefferson Parish in the period from January 1996 to May 2018. The principle sources of flooding are rainfall ponding, levee overtopping, and hurricane or tropical storm surges originating in the Gulf of Mexico from Lake Pontchartrain on the East Bank and Lakes Salvador and Cataouatche on the West Bank. The East Bank of Jefferson Parish has many flood problem areas. The flood-prone areas, such as Hoey's Basin in Old Metairie, are scattered throughout the Parish and are caused by land subsidence, and inadequate capacity of canals and culverts. Often, they are in low areas, while other areas flood because of inadequacies in downstream parts of the system.

The area of Jefferson Parish outside the levee protection system, including Jean Lafitte and Grand Isle, in the southern part of the Parish is most vulnerable to storm surge flooding. Additional information on this specific flood risk is covered in the storm surge hazard section.

Based on past records, the planning area can expect future flood events throughout the Parish as deep as 18 inches.

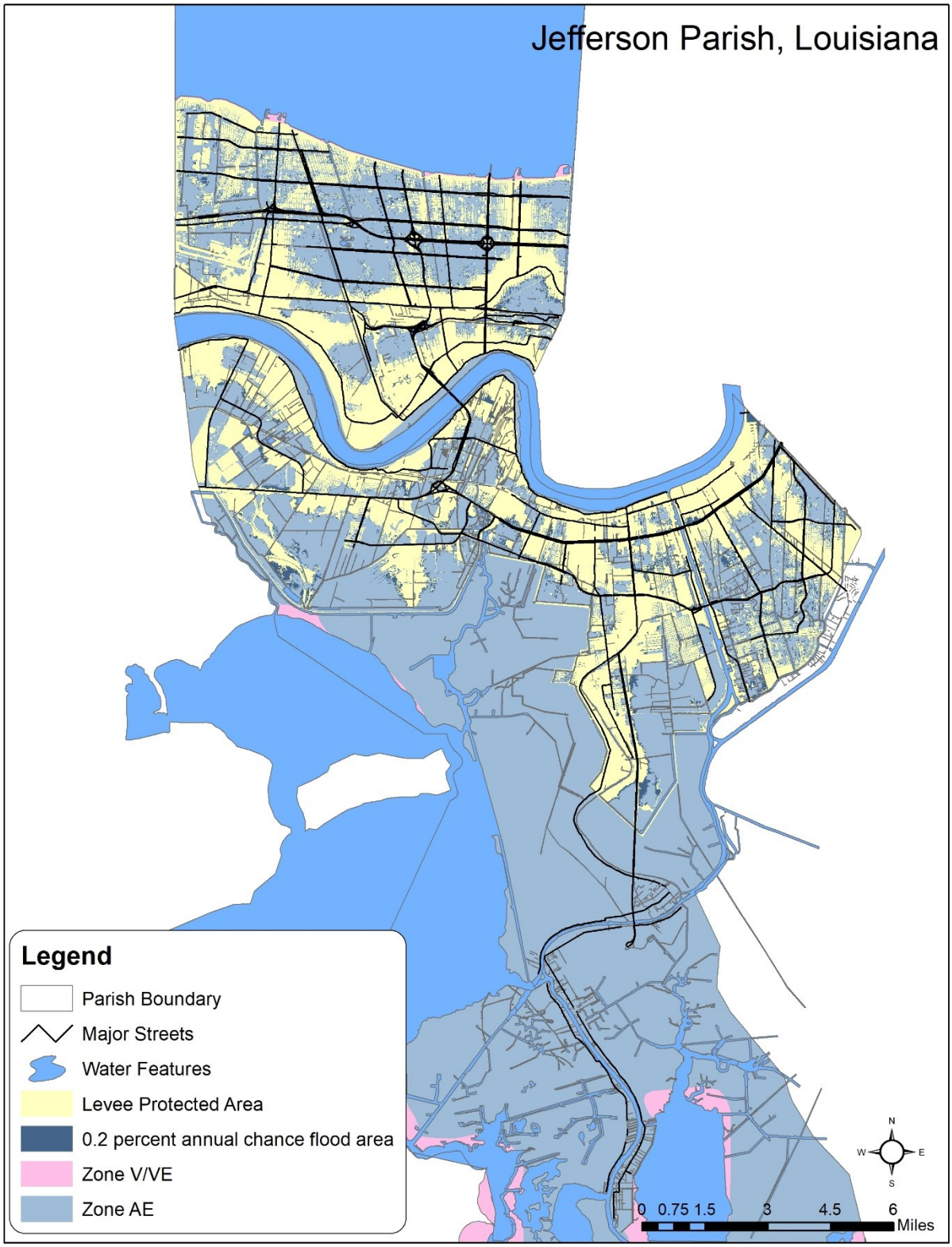
In June of 1973, FEMA produced a Flood Insurance Study (FIS) for Jefferson Parish, and it was most recently revised on February 2, 2018. A FIS details the flood hazard areas within a particular area or community and typically includes flood elevations, a history of flooding, and the engineering methods used to complete the analysis. The FIS includes the incorporated areas of the Parish. A Flood Insurance Rate Map (FIRM) is developed in conjunction with the FIS. The FIRM is the official map of a community on which FEMA has delineated both the special hazard areas and the risk premium zones.

Map 22051C is the FIRM map for Jefferson Parish. The map panels display the different flood zones found within the unincorporated areas of Jefferson Parish and the municipalities. The flood zone designations are defined as follows:

- **Zone AE:** Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. In most instances, base flood elevations derived from detailed analyses are shown at selected intervals within these zones. Mandatory flood insurance purchase requirements and floodplain management standards apply.
- **Zone X:** Areas outside the 1% annual chance floodplain and 0.2 percent chance floodplain, areas of 1% annual chance sheet flow flooding where average depths are less than 1 foot, areas of 1% annual chance stream flooding where the contributing drainage area is less than 1 square mile, or areas protected from the 1% annual chance flood by levees. No Base Flood Elevations or depths are shown within this zone. Note: Zone X is indicated by "0.2 percent annual chance flood area" in the floodplain figures that follow.
- **Zone VE:** Coastal areas subject to inundation by the 1-percent-annual-chance flood event with additional hazards due to storm-induced velocity wave action. Base Flood Elevations (BFEs) derived from detailed hydraulic analyses are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.[11]

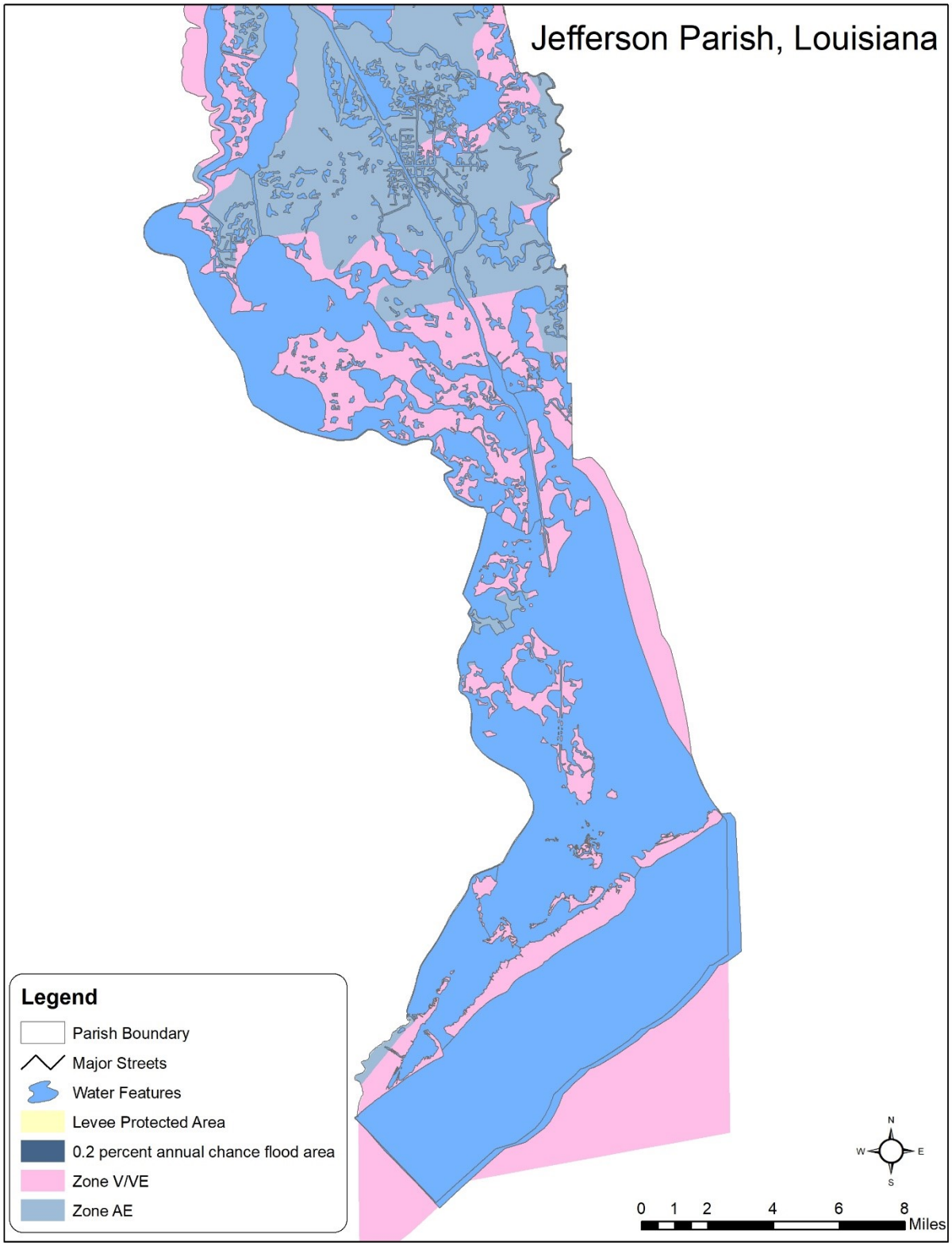
Figure 18 and **Figure 19** are maps of the floodplains in Jefferson Parish. It should be noted that nearly all levee protected areas are developed and flooding would result if these levees failed or were overtopped during a flood.

Figure 18
North Jefferson Parish Floodplains



Source: Federal Emergency Management Agency

Figure 19
South Jefferson Parish Floodplains



Source: Federal Emergency Management Agency

Table 20 includes the building counts and estimated replacement value of structures located within each of the identified flood zones in the Parish. **Table 21** provides a breakdown based on the occupancy type on a parish-wide level. The Miscellaneous/Unknown category primarily encompasses structures that were considered accessory structures such as garages, sheds, or carports and those which did not have any classification in the parish database. As such, there may be some structures included in the Miscellaneous/Unknown category that are not accessory structures, and for which an occupancy could not be determined at this time.

Note that this analysis does not take into consideration structure elevation as this information was unavailable spatially. It simply identifies whether a structure is located within a flood zone and is therefore at risk to flooding on the property. Structures were each only counted as being in the zone of highest risk in which they were located. So a structure that is partially located within the 1.0 percent annual chance flood area and the 0.2 percent annual chance flood area would be counted as within the 1.0 percent annual chance flood area only.

Table 20
Improved Property in Flood Zones in Jefferson Parish

Name	1.0% annual chance flood zone Count of Buildings	1.0% annual chance flood zone Estimated Replacement Value*	0.2% annual chance flood zone Count of Buildings	0.2% annual chance flood zone Estimated Replacement Value*	V/VE zone Count of Buildings	V/VE zone Estimated Replacement Value*
Jefferson Parish	55,571	$17,734,701,844	10,520	$2,951,694,955	18	$6,985,718
City of Gretna	3,405	$1,063,863,216	326	$150,022,327	0	$0
City of Harahan	366	$97,672,401	36	$8,527,455	0	$0
City of Kenner	9,093	$2,981,381,489	2,003	$649,109,096	0	$0
City of Westwego	1,371	$406,563,039	379	$97,155,752	0	$0
Town of Grand Isle	141	$25,352,706	0	$0	2,469	$580,274,766
Town of Jean Lafitte	814	$228,552,478	0	$0	0	$0
Grand Total	**70,761**	**$22,538,087,173**	**13,264**	**$3,856,509,585**	**2,487**	**$587,260,484**

*As noted above, this value was estimated based on an average value of $125/sq ft and does not reflect a structure level assessment of each building's replacement value in the Parish

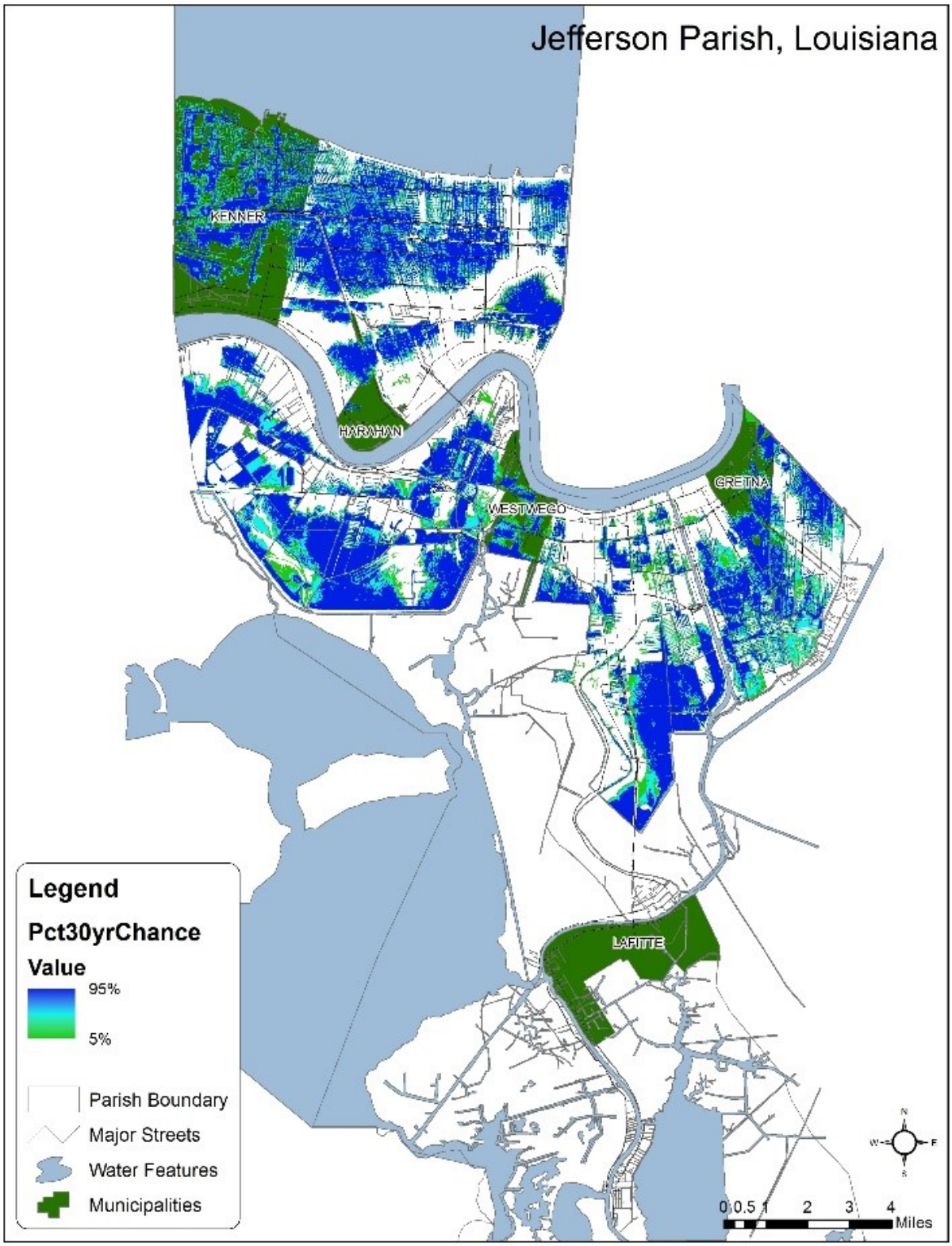
Table 21
Improved Property in Flood Zones by Occupancy Type in Jefferson Parish

Name	1.0% annual chance flood zone Count of Buildings	1.0% annual chance flood zone Estimated Replacement Value*	0.2% annual chance flood zone Count of Buildings	0.2% annual chance flood zone Estimated Replacement Value*	V/VE zone Count of Buildings	V/VE zone Estimated Replacement Value*
Residential	49,111	$13,519,207,843	8,757	$2,453,080,885	2	$795,500
Commercial	1,533	$2,121,063,991	244	$366,353,750	0	$0
Miscellaneous/ Unknown	20,117	$6,897,815,338	4,263	$1,037,074,949	2,485	$586,464,984
Grand Total	**70,761**	**$22,538,087,173**	**13,264**	**$3,856,509,585**	**2,487**	**$587,260,484**

*As noted above, this value was estimated based on an average value of $125/sq ft and does not reflect a structure level assessment of each building's replacement value in the Parish

Figure 20 shows the percent chance of flooding over a 30-year period for areas in North Jefferson Parish. This information is primarily helpful to demonstrate what the likelihood of flooding is in a given area over the course of standard 30-year mortgage.

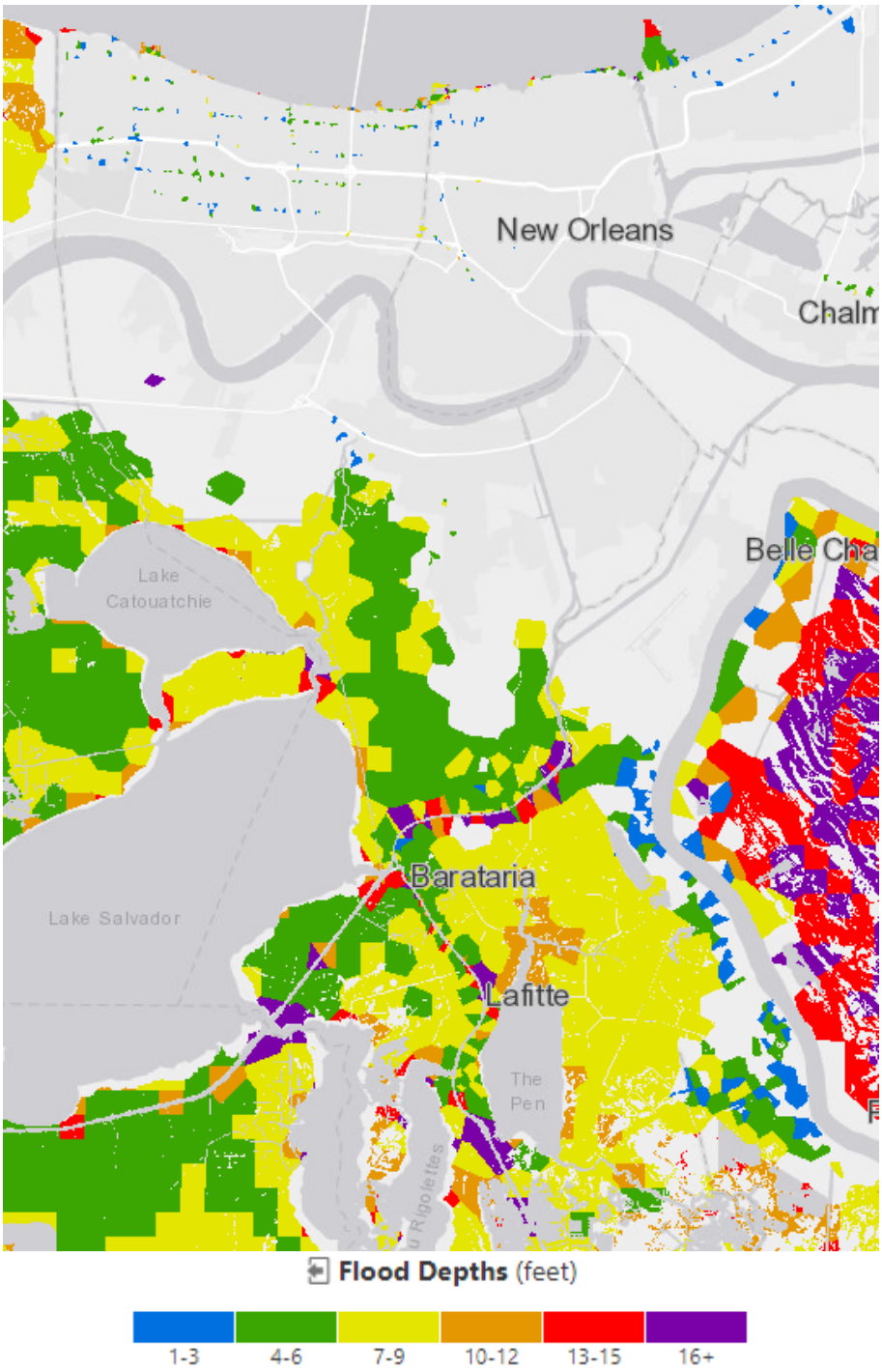
Figure 20
North Jefferson Parish 30-year percent chance of flooding



Source: Federal Emergency Management Agency

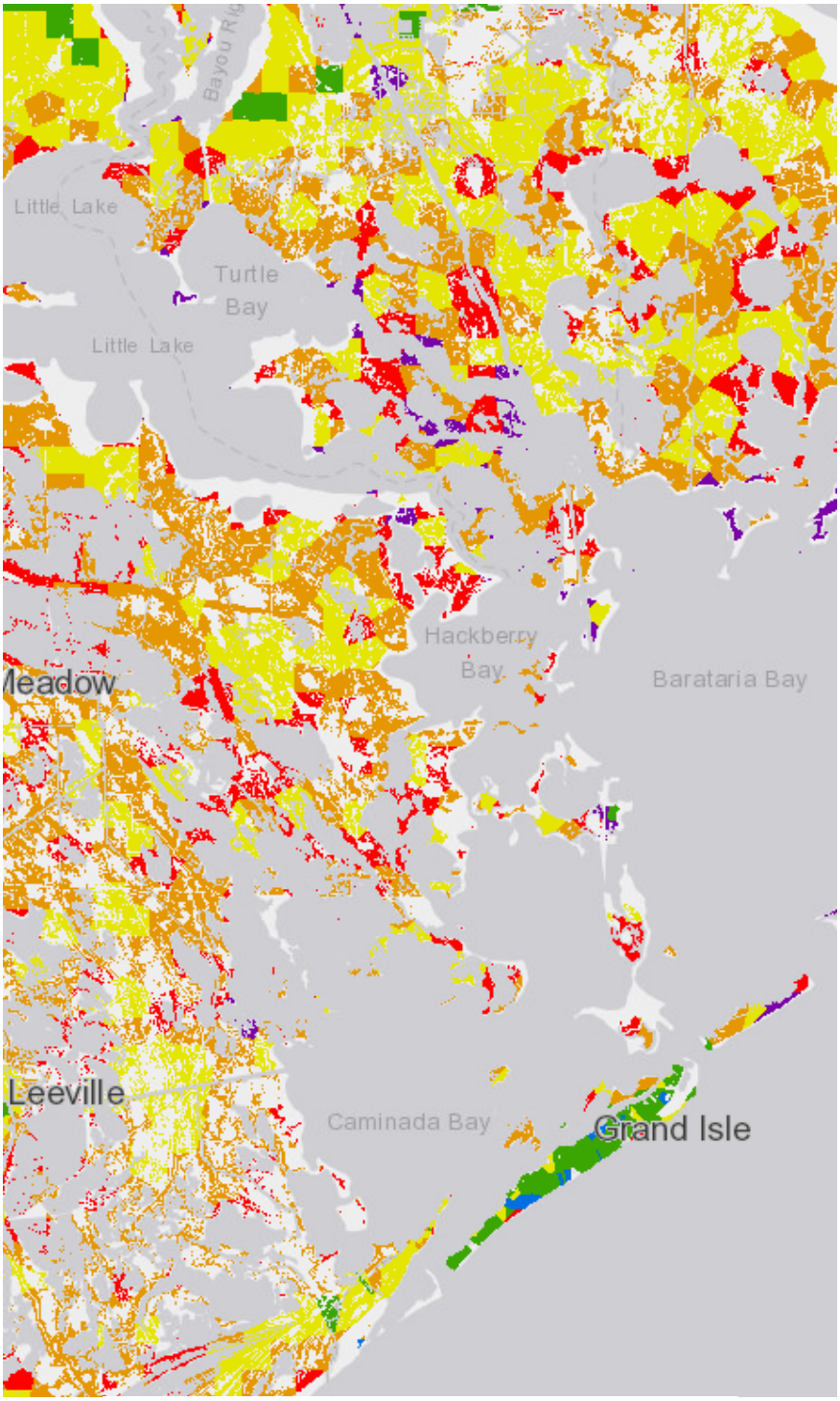
The maps in **Figure 21** and **Figure 22** were developed by the Coastal Protection and Restoration Authority (CPRA) and show the different projected depths of flooding to the 1.0 percent annual chance flood under current conditions. The full report explains that in 50 years, if no action is taken to reduce risk, flood depths may increase by upwards of 6 feet in some areas.[12]

Figure 21
North Jefferson Parish 1.0 percent Annual Chance Flood Depths



Source: Louisiana Coastal Master Plan

Figure 22
South Jefferson Parish 1.0 percent Annual Chance Flood Depths



Source: Louisiana Coastal Master Plan

Additional locations in the Parish that are vulnerable to flooding were identified by the Hazard Mitigation Plan Advisory Committee at the Kickoff and Hazards Meeting. These locations and flooding issues are described in **Table 22** and shown in **Figure 23** and **Figure 24** below.

Table 22
Jefferson Parish Existing and Future Flooding Issues

Map #	Location	Past vs Future Flood Risk	Frequency	Extent	Source	Cause	Will it Get Worse?	Dam/ Levee Issue?	Studies Available?
1	Map 1 – Outside Levee System – JL Privateer	Past and Future	Often	2-3 ft	Marsh, Barataria Waterway, Gulf of Mexico	Rain, storm surge, tidal	Yes- FD, CC	Yes	CPRA - blocky
2	Map 1 – Lincolnshire	Less for houses, same cars	Upon heavy rains	1-2 ft	Rain	Subsidence, poor neighborhood planning	Yes- FD, CC	Yes	Unknown CPRA – former wetland area
3	Map 1 – Airline Park	Past – drainage projects underway	Street flooding daily	1-2 ft	Rain	Subsidence, density too high, lack of enforcement on culvert size/quality	No	No	Unknown
4	Map 1 – New Garden Park	Past and Future	Frequent	Several inches	Rain	Unknown	Possibly- CC	No	Unknown
5	Map 1 – Sam's	Past and Future	When rain exceeds 1 in in 1st hr and 0.5 in in 2nd hr	2-3 ft	Rain	No pervious areas/no pace for runoff, settlement/ storm drainage, drainage broken/pipes, lack of detention ordinance enforcement	Yes- CC	No	No
6	Map 1 – Fat City	Past and Future	Regular occurrence	Shallow flooding	High intensity, short-duration rainfall	Too high density, large swaths of concrete increase runoff and overload system capacity, getting water to canal	Yes- FD, CC	No	No

Map #	Location	Past vs Future Flood Risk	Frequency	Extent	Source	Cause	Will it Get Worse?	Dam/ Levee Issue?	Studies Available?
7	Map 1 – University	Past and Future	Heavy rainfall in short time	Shallow	Rain	Settlement, subsidence, poorly drained/ pumped to canals, elevation causes dry pumps and cannot run/ inadequate pumping	No	Yes	State funding grant – study for new pump station
8	Map 2 – 1	Street	Several times annually	1-2 feet	Rain	Inadequate street drainage, too much concrete, over development, subsidence	No	No	No
9	Map 2 – 2	Houses/ street	Regular	1 foot	Rain	Lack of pumping capacity	No	No	Unknown
10	Map 2 – 3	Street/ businesses	Every rain	Airline to RR	Rain	Old drainage airport capacity concrete	Yes- FD, CC	No	FMA 13 project
11	Map 2 – 4	Houses/ street	Several times annually	1-2 feet	Rain	Low-lying and poorly drained	Yes- FD, CC	No	No
12	Map 2 – 5	Businesses/ street	Several times annually	Ponding of water	Rain	Too much pavement/ concrete, drainage not pumped away	Yes- FD, CC	No	No
13	Map 2 – 6	Business/ street	Heavy rain	Btwn Airline Hwy and RR	Rain	Small drain lines and huge houses, low elevation, subsidence	Possibly- FD, CC	No	No
14	Map 2 – 7	Street flood	On a regular basis	Inches to feet	Rain	New development will lead to reduced natural systems	Yes- FD, CC	No	No
15	Map 2 – 8	Houses/ street	Ongoing, will continue, frequent	<1 foot	Rain	Slab on grade construction	Yes- FD, CC	No	RLAA
16	Map 2 – 9	Houses/ street	Ongoing	Several feet	Tidal flooding, storm/tidal surge	Low-lying area, no levee protection, West Closure Complex, infrastructure /homes need to be elevated	Yes- FD, CC	Yes	No
17	Map 3 – Live Oak – Conveyance restrictions – trash, etc.	Past and Future	Several times per year	1-2 feet	Rain	Improper drainage solutions, drainage issues	Yes- FD, CC	No	No

Map #	Location	Past vs Future Flood Risk	Frequency	Extent	Source	Cause	Will it Get Worse?	Dam/ Levee Issue?	Studies Available?
18	Map 3 – Metairie – Not enough street and many trees	Past and Future	Several times per year	1 foot	Rain	Not enough street drainage, drains not cleaned	Yes- CC	No	No
19	Map 3 – Causeway – Low lying area concrete	Past and Future	Several times per year	1-2 feet	Rain	Impervious paving	Yes- FD, CC	No	No
20	Map 3 – Buck Tunnel – Topography and hydrography (For pump)	Past and Future	Ongoing	Several feet	17th St Canal	Need pumps to get water out of levee system	Yes- CC	Yes	No
21	Map 3 – Huey P Long – Elmwood over development	Past and Future	Ongoing	Several feet	Rain	Too much concrete/ impervious, need more drainage	Yes- FD, CC	No	No
22	Map 3 – Labauve - a low area	Past and Future	Multiple times per year	Ave A, Sala Ave	Rain	Streets are low, hold water	Yes- FD, CC	No	No
23	Map 3 – Westwood/ Ames – Low area	Past and Future	Annual	Several feet	Rain	Low area	No	No	No
24	Map 3 – Westbank – Downtown Gretna – drainage	Ongoing	Heavy rain	2”-6” standing water in streets	Rain	Too much concrete, no pumping capacity, rely on gravity drainage	No	No	?
25	Whitney – New England Court prone to flooding	Ongoing	Ongoing, will continue, frequent	<1 foot	Rain	Slab on grade construction	Yes- FD, CC	No	RLAA
26	Map 3 – Rosethorne – No levees and tidal surge	Past and Future	Multiple yearly	1-3 feet	Coastal flooding and tidal/storm surge	Subsidence, elevation causes dry pumps and cannot run/ inadequate pumping, no levee protection, West Closure Complex, infrastructure /homes need to be elevated	Yes- FD, CC	Yes	No

Map #	Location	Past vs Future Flood Risk	Frequency	Extent	Source	Cause	Will it Get Worse?	Dam/ Levee Issue?	Studies Available?
27	Map 3 – Crucial point – no levees and tidal surge	Past and Future	During major storms	Multiple feet	Coastal flooding and tidal/storm surge	Subsidence, elevation causes dry pumps and cannot run/ inadequate pumping, no levee protection, West Closure Complex, infrastructure /homes need to be elevated	Yes- FD, CC	Yes	No
28	Map 3 – Privateer – Most at risk – no levees and tidal surge	Past and Future	During major storms	Multiple feet	Coastal flooding and tidal/storm surge	Subsidence, elevation causes dry pumps and cannot run/ inadequate pumping, no levee protection, West Closure Complex, infrastructure /homes need to be elevated	Yes- FD, CC	Yes	No
29	Map 3 – Barataria – no levees and tidal surge	Past and Future	During major storms	Multiple feet	Coastal flooding and tidal/storm surge	Subsidence, elevation causes dry pumps and cannot run/ inadequate pumping, no levee protection, West Closure Complex, infrastructure /homes need to be elevated	Yes- FD, CC	Yes	No
30	Grand Isle – Western end of Grand Isle	Past	Typically every other year (maybe annually)	3' or 4' of water	Northern winds storm surge plus rainfall	Tidal/TS that pass east of GI plus rainfall	Yes- CC	GIILD has a Master Plan for "back levee" that would mitigate	GIILD Master Plan
31	Grand Isle – Central portion of GI	Past	Typically every year	3' or 4' of water	Northern winds storm surge plus rainfall	Tidal/TS that pass east of GI plus rainfall	Yes-CC	GIILD has a Master Plan for "back levee" that would mitigate	GIILD Master Plan

Map #	Location	Past vs Future Flood Risk	Frequency	Extent	Source	Cause	Will it Get Worse?	Dam/ Levee Issue?	Studies Available?
32	Grand Isle – Eastern end of Grand Isle	Past	Typically every year	3' or 4' of water	Northern winds storm surge plus rainfall	Tidal/TS that pass east of GI plus rainfall	Yes-CC	Restoration of FiFi Island as a buffer for storm surge from Barataria Bay	GIILD Master Plan
33	Grand Isle – Cheniere Caminada (portion of the Town of Grand Isle (TOGI) located along Hwy 1 north of the GI Bridge)	Past	Typically every year	3' or 4' of water	Northern and easterly winds and rainfall	Tidal/TS that pass east of GI plus rainfall	Yes-CC	GI Levee System Master Plan	GIILD Master Plan
34	Kenner- Lincoln Manor/31st Street	Past	Annually several times	Several inches	Drainage canals on three sides	Substandard drainage infrastructure, low pipe capacity, low lying land, a nearby interstate highway, newly constructed airport, and heavily trafficked roadways, and lack of open green space	Yes- FD, CC	No	Yes

FD- Changes in Floodplain Development and Demographics
WD- Watershed Development
CC- Climate Change/Sea Level Rise

Many of the areas described above are at risk to future flooding as a result of floodplain development, watershed development, and climate change/sea level rise.

Development within the floodplain and watershed will both reduce the amount of impervious surface area that flood waters typically use for infiltration into the ground. This, in turn, will create conditions wherein additional volumes of water are "trapped" on the surface and cause flooding to people within Jefferson Parish and their property.

Climate change and sea level rise will contribute to worsening future flood conditions as these phenomena will effectively raise the water level within the community such that lesser volumes of rainwater from storms will be required to cause similar amounts of flooding that communities have experienced in the past. With a higher baseline water table, impacts to people and property will come with smaller storm events as there will be a reduced volume available for water infiltrate in to and so flooding will begin more quickly in future conditions.

These conditions may all contribute to worsening the impacts of flooding on the community's people, property, and the natural functions of the floodplain. Some of the impacts of flooding on these important assets of the community are described below.

Impacts on People

During flood events, people are often stranded and may have to be rescued by first responders. Often lives are lost or people are injured. Even when injuries and fatalities are avoided, the impact of flooding on the public can be great, as many people will be forced into shelters or will need to find temporary refuge as they wait for flooding to recede. They may be unable to return to their homes if the damage is great and may find their homes uninhabitable if personal property has become waterlogged and is unusable.

Another major impact on people can be the deteriorating health conditions that result from flooding. After floodwaters recede, homes and personal property that were affected by water may begin to become infested with mold which can create serious health risks. Additionally, waterborne diseases can be pervasive in areas impacted by flooded sewer and water systems. Mosquitoes and other carriers of illnesses often thrive in post-flood conditions, increasing the chances of transmitting vector-borne diseases.

All of the areas of potential future flooding described in the table above may experience these impacts, though areas that are more residential occupancy, such as map locations 2, 11, and 15, for example, will affect people more directly. Areas such as map locations 12 and 13, that are more commercial-centric will have impacts on people as well as these businesses may have to be shut down, thereby hurting the economy and indirectly impacting the entire parish.

Finally, public confidence is often impacted by flood events, especially when impacted people do not have flood insurance and are not covered by their home insurance policy. This can create conflict between local officials and the public and result in a loss of public confidence.

Impacts on Property

Many buildings and structures could be impacted by a flood event, but critical infrastructure and facilities within the Parish are especially important to identify. When these facilities are located in flood-prone areas, there is a substantial risk to important functions such as law enforcement and medical care. This also includes any assets, systems, and networks that are vital to the continued operation of government services such as power generation facilities, transmission infrastructure, and road networks, among others.

The incapacitation or destruction of these resources would have a debilitating and costly effect on many aspects of the Parish's normal functionality. When flooding occurs, water and wastewater infrastructure are some of the most prominently impacted. Since these types of infrastructure deal directly with water, often they are located in the most flood prone areas and may be severely impacted during flood events. When these facilities or infrastructure are flooded, it complicates recovery and impacts people who are unable to utilize normal water sources for drinking, sanitation, and other everyday uses.

In addition, personal property such as homes and businesses have been impacted by past flooding events and are a major concern in future flooding events. Although a great deal of effort has been undertaken to reduce the number of properties at risk through the use of progressively improved risk assessment and mitigation techniques, there are still a significant number of structures in the Parish that are located in flood zones or which have not been properly mitigated to reduce risk. These

properties may sustain millions of dollars of damage during future flood events and are often a major focus of post-disaster recovery efforts.

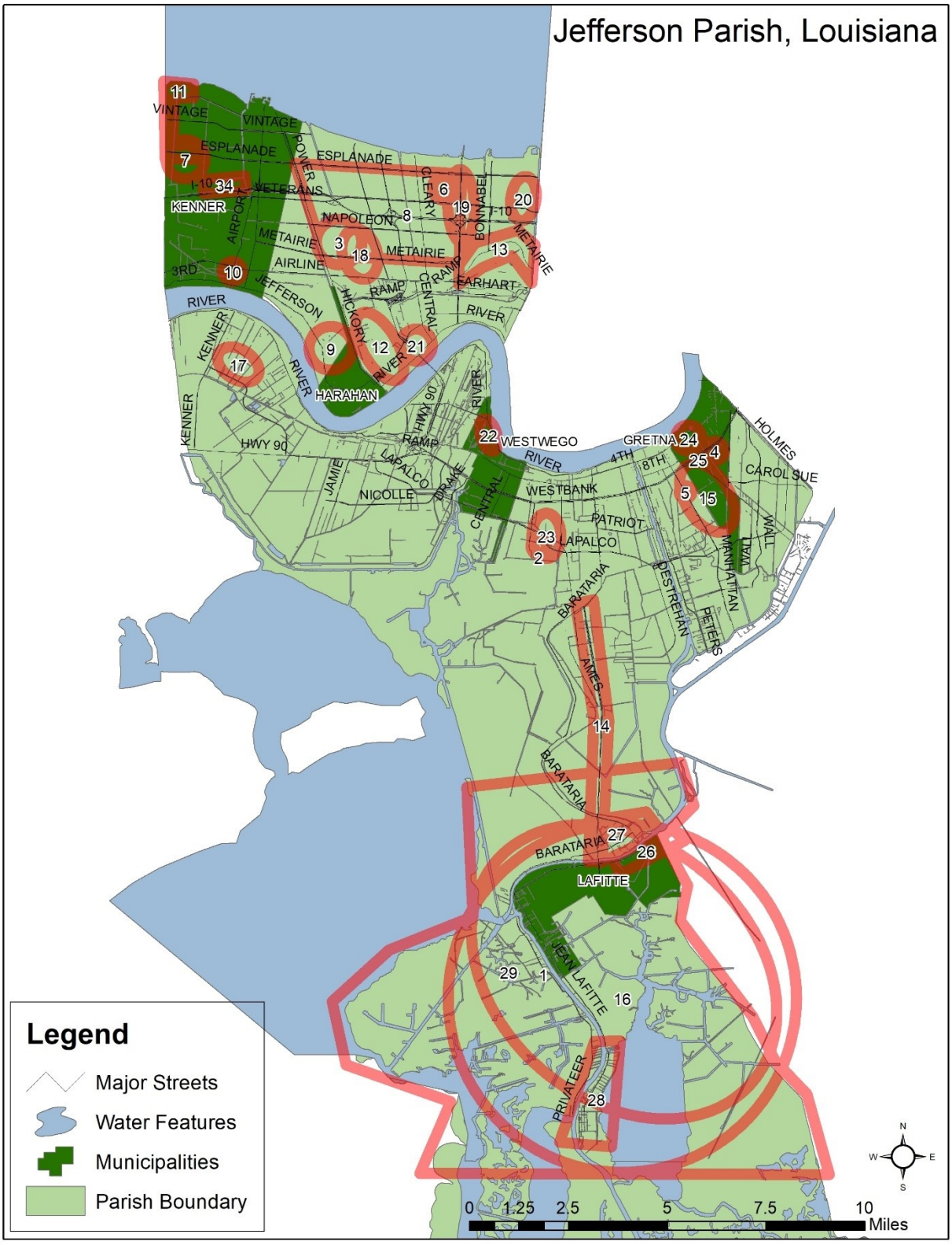
Nearly all of the areas identified in the table above are areas that, if impacted, could have a serious effect on the built environment. Homes and businesses are one of the primary concerns throughout most of the parish and flood considerations tend to revolve around the impact on the built environment because it also has an impact on people's lives. Map locations 5, 19, and 32 are all examples of areas that may experience significant impacts to the built environment.

Impacts on Natural Floodplain Functions

The fluctuation of water levels in a wetland, especially flood waters, supports the biological diversity of low-lying areas by releasing nutrients into the soil and germinating wetland flora. Flooding also offers some control of invasive water weeds. Most features of the environment have come to adapt to the effects of a flood event and adjust quickly to events, although it is possible that some species may not be resilient enough to survive and will experience population loss.

Areas that have been modified by human activity tend to suffer more negative consequences from flooding which can result from modifying stream banks or removing vegetation from riverside. When these modifications are present, flooding can cause unnatural erosion of sediment into the waterway and create an imbalance of nutrients in the water which may harm ecosystems and have a negative impact on downstream water quality.

Figure 23
North Jefferson Parish Flood Locations



Source: Jefferson Parish Hazard Mitigation Plan Committee

Figure 24
Grand Isle Flood Locations

Source: Jefferson Parish Hazard Mitigation Plan Committee

Problem statements describing what is going on in those identified areas to cause the flooding were also developed by the Hazard Mitigation Plan Advisory Committee at the Problems and Risk Assessment Meeting. These problem statements are listed in **Table 23**.

Table 23
Jefferson Parish Flooding Problem Statements

Map #	Location	Problem Statement(s)
1	Map 1 – Outside Levee System – JL Privateer	In Crown Point, JL, Barataria, and Grand Isle are at risk to coastal flooding and storm surge. Drainage pumps do help for local rain (small) events.
		Coastal flooding; often tide comes up; also Barataria Bay flooding.
		No levees/inadequate levees; overtopping of levees.
		Structures need elevation – all should be elevated or build an adequate levee.
		In Lafitte, Barataria, and Crown Point, flooding is caused by: 1. No levee protection; 2. West Closure Complex; 3. Storm/tidal surge; 4. Infrastructure/homes need to be elevated.
		Without levee protection, Jean Lafitte and Barataria are subject to storm surge and tidal influences.
2	Map 1 – Lincolnshire	Poor planning/neighborhood design has led to houses vulnerable to flood – slab on grade and subsidence.
		Small drain lines – 2 year storm design – should be 10 year storm by today's criteria.
		Elevation of homes/subdivision too low.
		This neighborhood was developed in a bowl. The levee system, Lapalco, and canal lead to flooding.
3	Map 1 – Airline Park	Historically been prone to flooding, but drainage projects are underway to help alleviate the problem.
		Pump station; West Napoleon; 2 new pump stations constructed, another not completed.
		Lack of enforcement on culvert size and quality; small pipes/drain lines - 2 year storm design. 1981 change to 10 year (historically 2 year); replace 2 year with 10 year (should be 10 year storm by today's criteria). $1.4 million to replace all 2 year, 1,500 mi drain line, ~100 mi has been improved.
		Additional drainage and pump stations.
		Density too high.
		Subsidence leads to serious street flooding.
		Street flooding was a daily occurrence.
4	Map 1 – New Garden Park	
5	Map 1 – Sam's	When rain exceeds an inch in the 1st hour and half an inch in the 2nd hour, then flooding gets bad enough for complaints. No pervious areas and possibly not any place for runoff to soak in.
		Settlement/storm drainage; drainage broken/pipes; SELA projects canals.
		2 year pipes; lack of detention ordinance enforcement (detention ordinance 15 years Walmart Jeff Hwy) – east bank Sam's? older.
6	Map 1 – Fat City	Experiences regular flooding that needs better drainage to handle the shallow flooding. Drainage improvements happening on Severn may help this area.
		18th and Edenborn; Severn; RPC Median Park; high intensity short duration rainfalls; getting water to the canal.
		High intensity, short duration; 18 St shallow curb looks like a lot; 14,00 mi of 2 year.
		Too high density, commercial.
		Large swaths of concrete will cause increased runoff and will overload system capacity.
7	Map 1 – University City	In heavy rainfall in a short time, this area gets flooded easily. This area is also an area experiencing high rates of subsidence.
		State funding grant – study for new pump station; settlement; subsidence; drainage not enough to get to canals fast enough.
		Rapid surface subsidence; elevation causes pumps to be too dry, dry pump cannot run.
		Low lying area abuts/next to the levee and flood wall to the west, adjacent to LaBranche wetlands. Nowhere for the water to go. Inadequate pumping and poorly drained/pumped to nearby canals. Increase of pumping capacity would assist in direct outflow to nearby canals.

Map #	Location	Problem Statement(s)
8	Map 2 –Street	Inadequate street drainage.
		Planned drainage does not lead to green storage solutions (filter into lagoon system like at City Park).
		Problems most likely caused by too much concrete, over development, subsidence (all combined).
9	Map 2 –Houses/ street	New pump to River should help.
10	Map 2 –Street/ businesses, Airline to RR	Runoff, inadequate drainage, old infrastructure.
		Old, insufficient drainage south of and north of RR tracks from Airline to River Road. Nearby airport affects drainage throughout immediate area. Pump to river would assist.
11	Map 2 –Houses/ street	Low lying and poorly drained/pumped to nearby canals. Increase of pumping capacity would assist in direct outflow to nearby canals.
12	Map 2 – Businesses/ street	Too much pavement/concrete; drainage not pumped away; ponding of water – nowhere to go. Need more greenspace.
13	Map 2 – Business/ street	Small drain lines and huge houses.
		Metairie Road floods during heavy rain – old drainage pipes need to be enlarged and cleaned out. Low elevation and subsidence have led to slab-on-grade homes vulnerable to flooding.
		Natural Ridge – needs better drainage.
14	Map 2 – Street flood	Too much wetlands.
		New development along Leo Kerner will lead to reduced natural systems to retain and absorb flood water.
15	Map 2 – Houses/ street	
16	Map 2 – Houses/ street	In Lafitte, Barataria, and Crown Point, flooding is caused by: 1. No levee protection; 2. West Closure Complex; 3. Storm/tidal surge; 4. Infrastructure/homes need to be elevated.
		Low lying area subject to tidal flooding.
17	Map 3 – Live Oak – Conveyance restrictions – trash, etc.	Improper drainage solutions/drainage issues.
18	Map 3 – Metairie – Not enough street ??? and many trees	Need more street drainage and drain cleaning.
19	Map 3 – Causeway – Low lying area concrete	Impervious paving.
20	Map 3 – Bucktown – Topography and hydrography (*??? For pump)	Needs pumps to get water out of levee system.
		17th Street canal.
21	Map 3 – Huey P Long – Elmwood over development	Too much concrete/impervious in the Elmwood development. Water cannot go anywhere.
		More drainage.
22	Map 3 – Labauve - a low area	Ave A, Sala Ave – streets are low and holds a lot of water.
23	Map 3 – Westwood/ Ames – Low area	
24	Map 3 – Westbank – Downtown Gretna – drainage	No pumping capacity, must rely upon gravity drainage.
25	Whitney – New England Court prone to flooding	
26	Map 3 – Rosethorne – No levees and tidal surge	In Crown Point, JL, Barataria, and Grand Isle are at risk to coastal flooding and storm surge. Drainage pumps do help for local rain (small) events.
		Rapid surface subsidence; elevation causes pumps to be too dry, dry pump cannot run; additional pump.
		Need to elevate.
		In Lafitte, Barataria, and Crown Point, flooding is caused by: 1. No levee protection; 2. West Closure Complex; 3. Storm/tidal surge; 4. Infrastructure/homes need to be elevated.

Map #	Location	Problem Statement(s)
27	Map 3 – Crucial point – no levees and tidal surge	In Crown Point, JL, Barataria, and Grand Isle are at risk to coastal flooding and storm surge. Drainage pumps do help for local rain (small) events.
		Rapid surface subsidence; elevation causes pumps to be too dry, dry pump cannot run.
		Elevate.
28	Map 3 – Privateer – Most at risk – no levees and tidal surge	In Crown Point, JL, Barataria, and Grand Isle are at risk to coastal flooding and storm surge. Drainage pumps do help for local rain (small) events.
		Rapid surface subsidence; elevation causes pumps to be too dry, dry pump cannot run.
		Elevate.
		In Lafitte, Barataria, and Crown Point, flooding is caused by: 1. No levee protection; 2. West Closure Complex; 3. Storm/tidal surge; 4. Infrastructure/homes need to be elevated.
29	Map 3 – Barataria – no levees and tidal surge	In Crown Point, JL, Barataria, and Grand Isle are at risk to coastal flooding and storm surge. Drainage pumps do help for local rain (small) events.
		Rapid surface subsidence; elevation causes pumps to be too dry, dry pump cannot run.
		Elevate.
		In Lafitte, Barataria, and Crown Point, flooding is caused by: 1. No levee protection; 2. West Closure Complex; 3. Storm/tidal surge; 4. Infrastructure/homes need to be elevated.
30	Grand Isle – Western end of Grand Isle	Rapid surface subsidence; elevation causes pumps to be too dry, dry pump cannot run.
		Elevate.
31	Grand Isle – Central portion of GI	
32	Grand Isle – Eastern end of Grand Isle	
33	Grand Isle – Cheniere Caminada (portion of the Town of Grand Isle (TOGI) located along Hwy 1 north of the GI Bridge)	
34	Kenner- Lincoln Manor/31st Street	It is a low to moderate income neighborhood. The neighborhood is surrounded on three sides by drainage canals. Substandard drainage infrastructure, low pipe capacity, low lying land, a nearby interstate highway, newly constructed airport, and heavily trafficked roadways, and lack of open green space all contribute to the problem. Increased pumping capacity, planning considerations, and other initiatives, including elevating structures, would elevate some of the flooding in this area.

4.3.3 Severity of the Flood Hazard

Flood severity is measured in several ways, including frequency, depth, velocity, and duration, among others. For Jefferson Parish, generally speaking the severity relates to how frequent floods occur. Floods have been and continue to be the most frequent, destructive, and costly natural hazard facing Jefferson Parish. As demonstrated by Hurricanes Katrina and Ike, the northern part of the Parish including Metairie and Kenner are vulnerable to flooding from storm surge from Lake Pontchartrain. In the southern part of the Parish, the Town of Grand Isle is also susceptible to storm surge from the Gulf of Mexico. One of the lowest points in the northern part of Jefferson Parish is Hoey's Basin located in the area of Old Metairie.

The most densely populated areas of Jefferson Parish are protected from flooding by levees, drainage canals, and drainage pump stations. The City of Gretna is served by the Hero and Planters pumping stations, which are located in Jefferson Parish along Barataria. The major canal within the City of Gretna is Verret Canal. The City of Harahan is served by Pump Station No. 3, which is located in Jefferson Parish along Elmwood Canal. The major canal in the City of Harahan is Soniat Canal. The

City of Kenner is served by Pumping Station No. 4, which is located in the city along Duncan Canal, Pumping Station No. 3, and Kenner Relief Pumping Station, which is located in the Parish Line Canal approximately 3.9 miles below Lake Pontchartrain. The major canals in the City of Kenner are Duncan Canal, Canal No. 1, Canal No. 2, and Canal No. 13. The City of Westwego is served by the Westwego and Bayou Segnette pumping stations, which are located in the southwestern portion of the city along Bayou Segnette. The City of Westwego is partially protected from hurricane surges from Lake Salvador and Lake Cataouatche by Parish-built levees. (Flood Insurance Study, Jefferson Parish, Louisiana and Incorporated Areas, Revised February 2, 2018).

4.3.4 Flood Protection Measures

Jefferson Parish is protected by levees from flooding of the Mississippi and its tributaries due to high stages in the Mississippi River. On the East Bank of the Parish, the Lake Pontchartrain and vicinity hurricane protection levee prevent flooding by hurricane surge from Lake Pontchartrain. The West Bank area is partially protected from hurricane surge from the Gulf of Mexico by Parish-built levees. Levees that exist in the study area provide the Parish with some degree of protection against flooding. However, Hurricane Katrina proved that some of these levees may not protect the Parish from strong events such as a 100-year flood or storm surge from future hurricanes (Flood Insurance Study, Jefferson Parish, Louisiana, and Incorporated Areas, Revised February 2, 2018).

From 2015 – 2019 Jefferson Parish has completed 29 infrastructure/drainage improvement projects through multiple funding sources. **Figure 9** identifies the type and location of these projects.

In addition to engineered protection from flooding, Unincorporated Jefferson Parish and incorporated communities within Jefferson Parish also participate in the National Flood Insurance Program (NFIP). Participation requires that the community(ies) adopt a floodplain ordinance that meets or exceeds the minimum NFIP criteria and must also adopt any FIRM for the community. In doing so, Jefferson Parish provides flood protection to its residents, commercial building, and critical facilities by enforcing floodplain ordinance requirements for new construction, substantial improvements, and all-over applicable permitting. Unincorporated Jefferson Parish and the incorporated communities within Jefferson Parish will continue to conform to all NFIP requirements through professional development and education/outreach events. **Table 24** below gives greater detail regarding the Parish's participation with the NFIP.

Table 24
Jefferson Parish NFIP Participation

	Uninc. Jefferson Parish	City of Gretna	City of Harahan	City of Kenner	City of Westwego	Town of Grand Isle	Town of Jean Lafitte
Insurance Summary							
How many NFIP policies are in the community? What is the total premium and coverage?	policies = 84,802 total premium = $55,743,578 total coverage = $23,067,072,100	policies = 3,185 total premium = $2,824,828 total coverage = $809,001,700	policies = 2,602 total premium = $1,132,129 total coverage = $785,375,500	policies = 15,714 total premium = $10,454,709 total coverage = $4,087,304,300	policies = 1,346 total premium = $796,299 total coverage = $357,752,400	policies = 773 total premium = $1,587,178 total coverage = $140,024,700	policies = 307 total premium = $375,288 total coverage = $71,172,700
	*NFIP policy statistics as of 9/30/2018						

	Uninc. Jefferson Parish	City of Gretna	City of Harahan	City of Kenner	City of Westwego	Town of Grand Isle	Town of Jean Lafitte
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	# of claims = 101,535 amount pd = $2,755,336,810 sub damage = 39	# of claims = 4,384 amount pd = $40,536,177 sub damage = 0	# of claims = 2,185 amount pd = $29,829,057 sub damage = 0	# of claims = 15,143 amount pd = $504,721,058 sub damage = 0	# of claims = 1,399 amount pd = $9,375,254 sub damage = 0	# of claims = 4,052 amount pd = $60,912,605 sub damage = 0	# of claims = 451 amount pd = $9,866,817 sub damage = 16
	*NFIP claim statistics as of 9/30/2018 **Sub damage count is only since last plan update (2015-present)						
How many structures are exposed to flood risk within the community?	All	All	All	All	All	All	All
Staff Resources							
Is the Community FPA or NFIP Coordinator certified?	Yes	Yes	No	Yes	No	No	No
Is floodplain management an auxiliary function?	No	Yes	Yes	Yes	Yes	Yes	Yes
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability).	Yes to all	Yes to all	Yes to all but GIS	Yes to all	Yes to all but GIS	Yes to all	Yes to all but GIS
What are the barriers to running an effective NFIP program in the community if any?	Mapping process	Community's understanding of substantial damage; community knowledge of compliance as a whole	Community knowledge of NFIP	Public awareness of how critical the NFIP is; subsidence		15 feet in the air and can't have a shed; keeping up w/FEMA regs	
Compliance History							
Is the community in good standing with the NFIP?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Are there any outstanding compliance issues (i.e., current violations)?	No	No	No	No	No	No	No
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	CAC was in July 2014	CAV-2012	CAV-2013	CAV-August 2013	CAV-August 2011	CAV-March 2013	CAV-2014
Is a CAV or CAC scheduled or needed? If so, when?	No	No	No	No	No	No	No
Regulation							
When did the community enter the NFIP?	10/1/1971	6/18/1971	6/15/1973	6/25/1971	12/28/1976	10/30/1970	10/1/1971
Are the FIRMs digital or paper?	Both	Both	Both	Both	Both	Both	Both
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	Yes, 2 feet of Freeboard outside of levee; nothing below -3.5 NAVD; enclosures no bigger than 299 sqft	Yes, 3 ft above street	Yes, require elevation above street in Zone X	Yes	Yes, Zone X needs to be higher than the street	Yes	Yes, 2 feet of Freeboard; enclosures no bigger than 299 sqft

	Uninc. Jefferson Parish	City of Gretna	City of Harahan	City of Kenner	City of Westwego	Town of Grand Isle	Town of Jean Lafitte
Community Rating System (CRS)							
Does the community participate in CRS?	Yes	Yes	Yes	Yes	Yes	No	Yes
What is the community's CRS Class Ranking?	5	8	8	7	8	-	8
Does the plan include CRS planning requirements?	Yes	Yes	Yes	Yes	Yes	No	Yes

4.3.5 Impact on Life and Property

There have been 54 floods recorded in Jefferson Parish in the period from January 1996 to May 2018, with 16 of those events resulting in property damages slightly over $6.1 million dollars. This count includes coastal floods, floods, and flash floods. This total does not include flooding that has occurred as a direct result of hurricane events such as Katrina and Rita in August and September of 2005, Gustav and Ike in September of 2008, or Hurricane Isaac in 2012. Hurricane events and all the associated damages, such as flooding, are tracked as a separate hazard category in the National Centers for Environmental Information Storm Events Database. Jefferson Parish also has no reported deaths or injuries due to floods. The section below on the National Flood Insurance Program includes a much more detailed discussion of flood impacts on the Parish, in particular the history of NFIP claims and the number of FEMA "repetitive loss" properties. With 54 flood events between 1996 and 2018, Jefferson Parish experiences a flood on average about two times per year. The 54 recorded flood events have occurred over a period of 22 years which calculates to a 100% annual probability of future flood occurrences.

While no injuries have been reported due to floods, the impact floods can have to one's health can be detrimental. Floodwater may contain toxins such as bacteria, oil, pesticides, and sewage as well as sharp objects that may cause injury and lead to infection.

To help keep Jefferson Parish residents safe, it is vital to warn them when there are impending hazards. To do this, the Jefferson Parish Emergency Management (JPEM) has an Emergency Alert System called JPAlert that is used for flood warnings and evacuations. This system is capable of sending out automated and manual alerts by text, email, or voice phone calls providing flood-related warnings due to inclement weather. This system works in conjunction with watches and warnings issued by the National Weather Service; river gauge and other levee protection water heights, as well as real-time data from the Parish's Supervisory Control and Data Acquisition system (SCADA). As the user, Jefferson Parish, initiates warnings by sending out messages by city, zip codes, geographic drawn shapes, predesignated groups, individuals, or to all residents & businesses.

JPEM has 24-7 coverage by an emergency coordinator via regular work schedule and on-call basis that requires continued monitoring of all systems for advance notices of impending flood or other weather-related warnings. If a notification is not something that generates an automated message to be sent out; the on-call coordinator will evaluate the information to determine if a manual alert needs to be sent out. Another resource in hand for JPEM to communicate flood watches and warnings is the cable network override program. This allows the parish the ability to send an EAS message over the television via voice and word scroll.

Should an evacuation be called in response to a flooding event, persons to be evacuated should be given as much warning time as possible.

1. Evacuation Warning: All warning modes will be utilized to direct the affected population to evacuate. Wherever possible, the warning should be given on a direct basis as well as through the media. The use of law enforcement and fire emergency vehicles moving through the affected area with sirens and public address is usually effective. However, if used, this procedure should be communicated to the public in advance so as to preclude public confusion concerning the use of these vehicles. When used, two vehicles should be deployed, if possible. The first will get the attention of the people, and the second will deliver the evacuation message. Door to door notification should be considered, particularly in rural areas. Residential and health care institutions will be notified by the Emergency Operations Center or on-scene authorities for hazardous materials incidents. Law enforcement personnel will canvass the evacuated area to insure all persons have been advised and have responded. Public Services may not be available to those who refuse to evacuate.

2. Emergency Public Information: The Public Information Officer (PIO) will ensure that evacuation information is disseminated to the media on a timely basis. Instructions to the public such as traffic routes to be followed, location of shelters as well as situation updates will be issued as that information becomes available. The PIO will use local media, weather channel trailers and Entergy Company's re-entry PSA's in the other radio/television markets of Louisiana and surrounding states.

3. Evacuation Route Signs (Out-of-Parish): Evacuation Route Signs along the designated evacuation routes will indicate which EAS radio station to monitor for the particular area of the state through which the evacuee is traveling. The latest road conditions and area shelter locations will be broadcasted to evacuating vehicles via the radio. WWL Radio 870AM or 101.9FM are the official EAS station for the New Orleans area.

4.3.5-1 Impact on Public Health

Floodwaters wreak havoc on public health. If the water is unable to drain within a few days, mosquitoes begin to breed and spread infectious diseases. Animals living in nearby waterways such as alligators and snakes may become displaced, posing a serious threat to the public. Once the floodwater subsides, people can begin drying out their flooded homes. If they are not able to access their homes for an extended period of time, mold could begin growing. When there is no electricity to dry out a flooded home and the air is humid, mold spreads very quickly in the moist heat. Mold has been linked to respiratory conditions including asthma and allergies. Additionally, displacement from one's home and/or community can affect mental health and often results in post-traumatic stress disorder (PTSD).

4.3.5-2 Impact Statements

Impact statements identifying potential issues from flooding related to life safety, public health, critical facilities, economy and employers, number/type of buildings, and public buildings were developed by the Hazard Mitigation Plan Advisory Committee at the Problems and Risk Assessment Meeting. These impact statements as well as any solutions are listed in **Table 25**.

Table 25
Jefferson Parish Flooding Impact Statements

Category	Issue	Solutions?
Life Safety	People could die/get seriously injured due to being trapped in homes (e.g., in attic) or car/drown; lack of heed to warning; lack of money to evacuate	Evacuate; educate on assisted evacuation efforts; city code – accessible roofs
	Downed power lines/loss of electricity; no electricity/air conditioning could lead to heat stroke, spoiled medications, danger to heat sensitive population	Bring in additional fuel options; emergency generators for at-risk populations; "cooling centers" for elderly
	Vulnerable populations (e.g., elderly)	Educate on assisted evacuation efforts; evacuation plan – evacuspots "area floods" evacuation network
	Flood depths normally seen have low chance of life threat; levee breaches, overtopping present higher chance of threat to life	Maintain pumping system; maintain levee system
	Cell phone batteries die – STR/where will you go? Timeshare?	
	Need for rescue, relocation, evacuation/mandatory evacuation, road closures/road clearing, emergency response time	Evacuation planning; equip first responders with necessary assets; warning system upgrades; social media notification; need shelters
	Dangerous structures, utilities	Public information campaign
	Majority of people leave Town of Lafitte so there is hardly any life safety	
	Flooded roadways mixing with flooded canals or under bridges/overpass; underpasses – people driving into, they drown	Local signs with solar panel powered lights and a depth scale located at roadways/intersections notorious for holding water; block underpasses; permanent signage
	Lack of water	Keep power or have gravity-based water supply
Public Health	Medicine requiring refrigeration	
	Timely removal of debris from side of road – debris includes spoiled food and other health concerns	Debris removal plan; adequate debris sites
	Mold can cause respiratory issues	Provide proper remediation tools; public education on supplies needed to mitigate it
	Mosquitoes breeding	Spray for mosquitoes after major events
	Vulnerable populations (e.g., elderly)	Educate on identifying
	Drinking water, food, heat	
	Contamination; loss of sanitary sewer and fresh water supplies increasing risk of disease; raw sewage and chemicals in flood waters; no utilities; open manholes that cannot be seen under water	Preparedness/awareness; emergency generator/pumps for water/sewer systems; educate public on proper sanitizing; make tetanus shots readily available; avoid contact with flood waters; provide proper remediation tools; water testing; include info on water bill relaying potential hazards during flooding
	Wildlife (e.g., snakes, gators, coyotes)	
	If medical needs require electricity, evacuate early	List of mobility limited folks; exercise
	Heat exposure during power outage – pregnant mothers more vulnerable	Public education
Critical Facilities	Loss of power/no electricity/no water – pump stations, sewer lift stations, water treatment need good backup power sources and need to stay operating/up	Pre-identify critical facilities with utility and arrange for generator backup; upgrade, maintain, install new backup power infrastructure; redundant failure systems; well; solar/backup; elevate; secure rooms and procedures for pumps; emergency generators of pumps personnel
	Losing records	Emergency plan
	Protecting people housed in critical facilities	Emergency plan
	Cell towers down	Towers; mobile cell towers
	Access to law enforcement, hospitals, EMS, facilties; operations (pumps, elec. stn.); response from facility (police, fire)	Hardening of police, fire, and pump stations; contingency plans/sites; adopting more restrictive building regulations; elevate; "tall" trucks available for critical personnel delivery
	Loss of telecom, inability to communicate or do emergency dispatch	Satellite communications
	Town hall, civic center, schools, fire station, police, utility facilities, roads, bridges	
	Water damage; protection from water	Elevate
	Plan for mitigation	
Economy and Employers	Emergency contact list and evacuation plan	Emergency contact list
	Housing; need for temporary housing	

Category	Issue	Solutions?
	Obviously important but secondary to getting infrastructure up and running	Fortify businesses to eliminate/reduce effects of various hazards
	Loss of power	
	Incorporate key businesses to support recovery such as gas stations and grocery stores; slow return to business; allow/establish order of business based off importance to reopen	Include as a pre-identified subset of critical type facilities; rapid assistance to those commercial businesses (e.g., stores, gas) that are critical to brining population back
	Challenges with continuity of operations; teaching employees post event	Require/provide Emergency Plan with alternate contact lists
	Loss of business and tax revenue for local municipality; loss of income	Promote business continuity; adaptive reserve funding; contingency plans for long-term municipal ops after major disaster; use of pervious pavers; grants/loans
	Uninsured or underinsured small businesses – loss of jobs and business failure	Encourage insurance (business interruption); workshops for small business owners
	Closed for extended period; no employees due to evacuation; remote work plan	Houses in safe locations; bring in additional fuel along road to prevent breakdown
	Establish plan for business owners to assess damage	
	Ability to print/copy paper to perform every day or mundane tasks – email access, how to get checks	
	Hwy 1 needs to be elevated south of Port Fouchon	
	Price gouging	
Number/Type of Buildings	Properties in both Zone X and AE are at risk of flooding	Continue to educate people on flood protection measures and floodproofing
	Loss of power, water pressure/contamination, mold	Inventory building inspections; remediation plans
	Long-term inaccessibility	Contingency plans
	Rapid damage assessment	
	Super market	
	Flooding in high density areas	Lower density development; green infrastructure
	Incorporate code enforcements/planning records to determine building inventory	
	Use flood data to help determine appropriate zoning	
	Number of slab-on-grade homes is too prolific	Include pier and beam requirement for homes 1,500 sq ft and lower
	All buildings identified as “critical facilities”	
	Need for temporary housing and quick build housing	Prepare essential personnel housing (e.g., chemical plants, EMT and first responders)
Public Buildings	Pump stations, sewer treatment, water treatment, admin offices, EOC, etc.; no utilities	Pump stations have been storm proofed; generator; shelter of last resort; elevate
	Loss of services; critical equipment placement	Plan for backup services for servers; ensure equipment is elevated and housed in hardened facility
	Secure records id’s risks – off the ground, flooded paper, dislocation of filing system	Saving records in less flood-prone areas (e.g., buildings in high ground and not floor of 1st floor), off the ground, off site, out of state, electronic server
	Access to govt. services; provide critical services	Contingency site plans; need to maintain access
	Rebuilding/prioritize; provide a plan to rehab these buildings	Alternative building methods
	Mitigation – develop mitigation plan for future	Identify long-term mitigation initiatives
	Loss of schools and hospitals – social interruption, impact on mental health	Hardening/elevation of public buildings
	Town hall	
	All buildings identified as “critical facilities”	

4.3.6 Occurrences of the Flood Hazard

Table 26 below summarizes the 30 flood events occurring in Jefferson Parish in the last 10 years. These were all categorized as flash floods or coastal floods.

Table 26
Flood Events, Jefferson Parish, January 2008 – May 2018

Location or County	Date	Time	Type	Dth	Inj
MARRERO	04/26/2008	15:00	Flash Flood	0	0
JEFFERSON	06/15/2008	08:30	Flash Flood	0	0
WESTWEGO	03/27/2009	04:15	Flash Flood	0	0
METAIRIE	12/12/2009	16:45	Flash Flood	0	0
SOUTHPORT	12/14/2009	23:20	Flash Flood	0	0
BRIDGEDALE	04/23/2010	13:51	Flash Flood	0	0
METAIRIE	08/12/2010	04:30	Flash Flood	0	0
METAIRIE	08/30/2010	14:00	Flash Flood	0	0
METAIRIE	03/09/2011	07:50	Flash Flood	0	0
METAIRIE	03/29/2011	17:50	Flash Flood	0	0
HARVEY	03/29/2011	18:45	Flash Flood	0	0
GOULDSBORO	03/29/2011	18:55	Flash Flood	0	0
GOULDSBORO	07/18/2011	05:30	Flash Flood	0	0
METAIRIE	07/27/2011	14:45	Flash Flood	0	0
MOISANT ARPT	07/28/2011	13:33	Flash Flood	0	0
HARAHAN	04/04/2012	02:54	Flash Flood	0	0
TERRYTOWN	06/07/2012	09:25	Flash Flood	0	0
GRETNA	07/20/2012	12:57	Flash Flood	0	0
RIVER RIDGE	07/20/2012	14:45	Flash Flood	0	0

Location or County	Date	Time	Type	Dth	Inj
KENNER	05/01/2013	11:50	Flash Flood	0	0
(MSY)MOISANT FLD NEW	05/01/2013	11:55	Flash Flood	0	0
GRETNA	05/09/2014	N/A	Flash Flood	0	0
METAIRIE	05/09/2014	N/A	Flash Flood	0	0
KENNER	05/29/2013	N/A	Flash Flood	0	0
KENNER	06/01/2014	N/A	Flash Flood	0	0
HARAHAN	04/14/2015	10:25	Flash Flood	0	0
LOWER JEFFERSON (ZONE)	10/25/2015	18:00	Coastal Flood	0	0
KENNER	04/01/2016	10:30	Flash Flood	0	0
LOWER JEFFERSON (ZONE)	04/30/2017	10:15	Coastal Flood	0	0
METAIRIE	10/02/2017	11:30	Flash Flood	0	0

Significant events for unincorporated Jefferson Parish are summarized below:

- April 26, 2008 – Heavy rainfall amounts of up to 8 inches caused the flooding of numerous streets, several vehicles, and a few homes across sections of the West Bank including the Marrero, Harvey, and Terrytown areas.

- June 15, 2008 – Heavy rainfall of 4 to 6 inches from a thunderstorm resulted in widespread street flooding and the closing of some roadways. Numerous vehicles were flooded. At least 34 residences reported some damage from the flooding.

- December 12, 2009 – Heavy rainfall resulted in widespread and significant street flooding throughout northern Jefferson Parish and caused the flooding of some homes on the East Bank. Residents reported water as high as 2 feet in parts of Kenner and 12 inches in Metairie at West Napoleon and Causeway.[13]

- December 14, 2009 – Heavy rain resulted in widespread street flooding. Sections of Veterans Boulevard were covered by 12 inches of water while areas of Airline Highway were covered by 18 inches of water.

- April 23, 2010 – Significant street flooding on Transcontinental, David Drive, West Metairie and Clearview Roads was reported higher than 3 inches.[14]

- August 12, 2010 – Water intruded into the first floor of an apartment complex in southeast Metairie near Ochsner Medical Center. There were also several flooded streets in Bridge City with a total rainfall of 4.64 inches. Damage costs were estimated at $10,000.

- August 30, 2010 – Localized flash flooding damaged two businesses near Jefferson Highway and Metairie Road and caused approximately $20,000 in property damage. The rain gauge at this intersection indicated 4.20 inches of rainfall.

- March 9, 2011 – Thunderstorms in advance of a strong cold front produced numerous reports of flooding and severe weather in addition to water overflowing the banks of the canal between West Napoleon and Severn. Parish President John Young reported flood depths of 4-5 inches at Transcontinental Drive and Kawanee Avenue.[15]

- March 29, 2011 – In Metairie, a trained spotter reported water approaching homes on Roosevelt Avenue south of the West Metairie Canal and the street was not passable. There were 4.08 inches of rainfall captured at the nearby rain gauge. Widespread street flooding was also reported in the Airline Park subdivision. In Harvey, numerous streets were flooded along Manhattan and Lapalco Boulevards. Two to three feet of water was reported on Gretna Blvd. Water was approaching, but not moving into, homes in this area. In Gouldsboro, Jefferson Parish Emergency Management reported water in 25 apartments in the 1600 block of Carol Sue in Terrytown, resulting in approximately $25,000 in property damage.

- July 18, 2011 – Jefferson Parish officials confirmed through local newspaper that 4 homes were flooded on Holmes Boulevard in Terrytown after early morning down pour. Widespread flooding of streets occurred in west bank areas of Jefferson Parish including Terry Parkway, Carrollton Parkway, and several other roadways as deep as 7 inches.[16] [17]

- July 27, 2011 – Several reports of street flooding were received from the Metairie area, including parts of Airline Highway, Jefferson Highway, and some smaller residential streets. Jefferson Highway was nearly impassable at Clearview. Throughout the West Bank, Jefferson Parish Supervisory Control and Data Acquisition (SCADA) monitors recorded more than 7 inches of rain in several locations.

- June 7, 2012 – Heavy rain produced standing water, making roads impassable. Some locations included were the 2000 block of Woodmere Street, Armagh Street, the 1700 block of Destrehan Avenue, and the 1600 block of Long Bridge. The rain gauge near Woodmere collected 1.57 inches of rainfall, 3.12 inches near Armagh Street, 0.44 inches near Destrehan Avenue, and 1.55 inches at Long Bridge.

- July 20, 2012 – Numerous streets were impassable due to flash flooding in River Ridge, Harahan and Metairie.

- May 9, 2014 – Heavy rainfall resulted in flooded streets at North Laurel from Airline Drive to Market Street, Ute Drive in Harvey, and Wall Blvd between Mount Laurel Drive and Harvey Blvd. Flood waters were recorded as high as 2.63 inches at David and York drives in Metairie to 2.51 inches at Terry Parkway and Stumpf Boulevard.[18]

- October 25, 2015 – Tides of 2 to 4 feet above normal tide levels resulted in widespread flooding of low-lying terrain and roadways including in the Lafitte and Barataria communities.

- April 30, 2017 – Strong onshore flow caused tides to rise approximately 1.5 feet above normal resulting in impassible roads during high tide on Grand Isle.

- October 2, 2017 – Jefferson Parish Sheriff's Office reported there was flood water over Veterans Boulevard at the Causeway Boulevard Overpass. Several other streets were reported impassible in Metairie.

In addition to data collected from national reports, Jefferson Parish has also developed an online platform for recording historic hazard events that is updated regularly by Parish staff. **Table 27** below summarizes flood events captured through this platform in Jefferson Parish in the last 11 years.

Table 27
Flood Events, Jefferson Parish, 2007 – 2018

Location	Number of Events
Gretna	2
Harahan	9
Kenner	13
Westwego	0
Grand Isle	0
Jean Lafitte	0
Unincorporated Jefferson Parish	172
TOTAL	**196**

The history of flooding in Jefferson Parish and each of the municipalities indicates that flooding may occur during any season of the year. In the cooler months, the area is subject to heavy rainfalls resulting from frontal passages. In the summer months, heavy rainfalls result from convective thunderstorms. In the late summer, hurricanes accompanied by rainfall and super-elevated water-surface elevations pose the largest threat of flooding to the area.

The most common source of such information is the National Flood Insurance Program (NFIP), the predominant flood insurer in the U.S. The Program maintains a very large database of claims information for millions of policies nationwide. Because of the prevalence of flooding in Jefferson Parish, these NFIP records offer an excellent source of information about past flood losses and can contribute to the flood risk assessment.

FEMA and the NFIP categorize policies in several ways, as part of their effort to focus mitigation program resources on properties with the highest risk. One such category is *repetitive loss* properties, which are defined as those that have been paid at least two claims of $1,000 or more over a rolling ten-year period. In recent years, FEMA has focused considerable attention on these insured, repetitive loss properties. In Jefferson Parish, a total of 8,843 properties are currently identified as repetitive loss properties. Data related to RL properties in Jefferson Parish are shown in **Table 28**, **Table 29**, and **Table 30**.

As of September 30, 2018, there were 108,729 structures located within Jefferson Parish with flood insurance policies with the NFIP and annual premiums totaling approximately $72,914,009.00. The total coverage value of these policies is approximately $29.3 billion. Since 1978, NFIP policy holders within Jefferson Parish have filed insurance claims for a total loss value of approximately $19.0 billion.

Table 28
Repetitive Loss Flood Insurance Statistics for Jefferson Parish – ALL
(Source: National Flood Insurance Program, March 31, 2019)

Community Name	Building Payments	Contents Payments	Total Payments	Average Payment	Losses	Properties
Grand Isle	$28,339,117.84	$7,756,075.62	$36,095,193.46	$20,696.79	1,744	547
Gretna	$16,650,245.62	$6,370,265.97	$23,020,511.59	$11,775.20	1,955	495
Harahan	$6,349,840.19	$2,818,725.90	$9,168,566.09	$19,888.43	461	120
Jean Lafitte	$9,862,975.33	$3,536,991.81	$13,399,967.14	$37,960.25	353	135
Uninc. Jefferson Parish	$408,326,613.70	$151,916,391.65	$560,243,005.35	$23,650.92	23,688	6,738
Kenner	$49,374,951.19	$15,742,553.08	$65,117,504.27	$26,797.33	2,430	693
Westwego	$3,800,223.31	$1,482,214.50	$5,282,437.81	$11,533.71	458	115
Total	**$522,703,967.18**	**$189,623,218.53**	**$712,327,185.71**	**$152,302.63**	**31,089**	**8,843**

Table 29
Repetitive Loss Flood Insurance Statistics for Jefferson Parish – NON-MITIGATED
(Source: National Flood Insurance Program, March 31, 2019)

Community Name	Building Payments	Contents Payments	Total Payments	Average Payment	Losses	Properties
Grand Isle	$20,098,164.90	$5,086,264.16	$25,184,429.06	$21,360.84	1,179	385
Gretna	$10,221,431.13	$3,946,225.93	$14,167,657.06	$12,098.77	1,171	273
Harahan	$3,485,350.54	$1,462,177.39	$4,947,527.93	$17,796.86	278	83
Jean Lafitte	$4,886,307.54	$1,859,467.71	$6,745,775.25	$36,267.61	186	71
Uninc. Jefferson Parish	$257,660,718.97	$94,395,862.84	$352,056,581.81	$22,221.59	15,843	4,949
Kenner	$31,935,299.58	$9,532,049.55	$41,467,349.13	$28,637.67	1,448	469
Westwego	$2,718,861.43	$1,220,285.74	$3,939,147.17	$11,688.86	337	89
Total	**$331,006,134.09**	**$117,502,333.32**	**$448,508,467.41**	**$150,072.20**	**20,442**	**6,319**

Table 30
Repetitive Loss Flood Insurance Statistics for Jefferson Parish – MITIGATED
(Source: National Flood Insurance Program, March 31, 2019)

Community Name	Building Payments	Contents Payments	Total Payments	Average Payment	Losses	Properties
Grand Isle	$8,240,952.94	$2,669,811.46	$10,910,764.40	$19,311.09	565	162
Gretna	$6,428,814.49	$2,424,040.04	$8,852,854.53	$11,291.91	784	222
Harahan	$2,864,489.65	$1,356,548.51	$4,221,038.16	$23,065.78	183	37

Community Name	Building Payments	Contents Payments	Total Payments	Average Payment	Losses	Properties
Jean Lafitte	$4,976,667.79	$1,677,524.10	$6,654,191.89	$39,845.46	167	64
Uninc. Jefferson Parish	$150,665,894.73	$57,520,528.81	$208,186,423.54	$26,537.47	7,845	1,789
Kenner	$17,439,651.61	$6,210,503.53	$23,650,155.14	$24,083.66	982	224
Westwego	$1,081,361.88	$261,928.76	$1,343,290.64	$11,101.58	121	26
Total	**$191,697,833.09**	**$72,120,885.21**	**$263,818,718.30**	**$155,236.95**	**10,647**	**2,524**

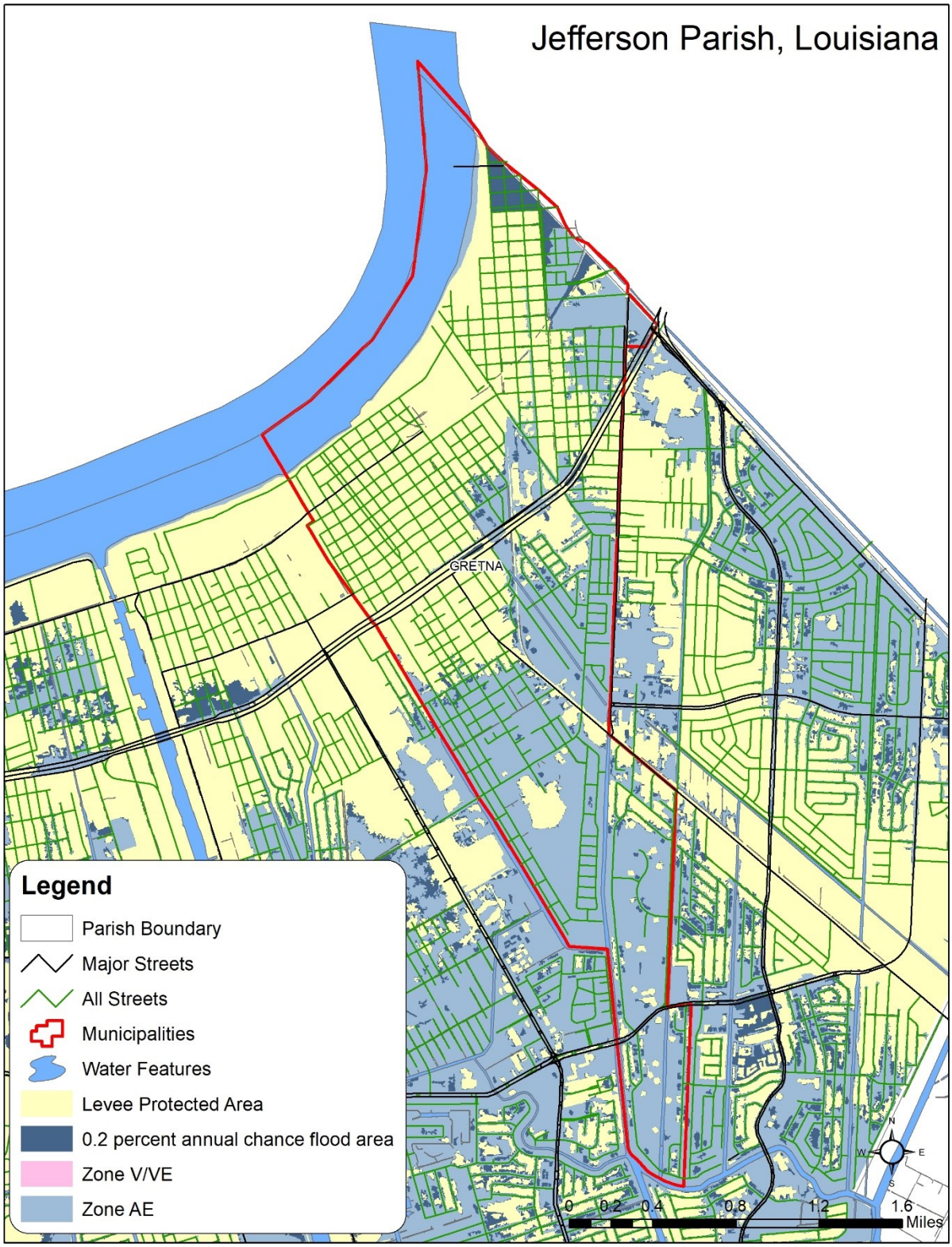
4.3.7 Municipality Flood Hazards

City of Gretna

Figure 25 below identifies the FEMA flood zones for the City of Gretna. The flood zones identified on the map include Zones AE and X. The map indicates that the majority of the City is located in Zone AE. The areas of Gretna located in Zone AE include the southern part of the City and a few areas north of the Westbank Expressway. Most of the area adjacent to the Mississippi River falls in the Levee Protected Area.

The principle sources of previous flooding in the City of Gretna include rainfall ponding, levee overtopping, and hurricane or tropical storm surges originating in the Gulf of Mexico that push water onshore and into the interior areas of Jefferson Parish. Based on a review of the City of Gretna Repetitive Loss Area Analysis Report, the most flood prone areas in the City of Gretna appear to be concentrated in the area bounded by Hancock Street, Virgil Street, L B Landry Avenue, and Westbank Expressway and the area bounded by Hancock Street, Anson Street, and the city's northeast border.

Figure 25
City of Gretna Flood Zones



Source: Federal Emergency Management Agency

In the last 10 years, 2 flood events were recorded in the City of Gretna. These events are summarized in **Table 31** below.

Table 31
Flood Events, City of Gretna, January 2008 – May 2018

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
Gretna	07/20/2012	12:57	Flash Flood	N/A	0	0	0.00K	0.00K
Gretna	05/09/2014	N/A	Flash Flood	N/A	0	0	0.00K	0.00K
Totals:					0	0	0.00K	0.00K

- July 20, 2012 – Officials closed Stumpf Blvd at Gretna Blvd due to high water. Lafayette Street from the West Bank Expressway to the Mississippi River levee was also closed due to flooding. Flooding occurred in the McDonoghville area of Gretna as well.

- May 9, 2014 – Flooding resulted in the closure of Lafayette Street at the West Bank Expressway in Gretna. Rain gauges recorded 2.63 inches of rain at the Emergency Operations Center in Gretna.[19]

Four flood events have been recorded since 1996. These events occurred over a period of 22 years which translates to a 18% annual probability of future flood occurrences in the City of Gretna.

Flood Protection Measures

The most densely populated areas of Gretna are protected from flooding by levees, drainage canals, and drainage pump stations. The City is protected from flooding by two levee systems. Along the Mississippi River the U.S. Army Corp. of Engineers (USACE) has constructed a levee system to protect the City from overbank flooding. The rest of the City is protected by levees that run along the Harvey and Algiers Canals (City of Gretna Flood Hazard Mitigation Plan). These levees are part of a hurricane protection system that partially protects the West Bank from storm surge from the Gulf of Mexico (Flood Insurance Study, Jefferson Parish, Louisiana and Incorporated Areas, Revised February 2, 2018).

Drainage of floodwaters in the City is accomplished by a system of structures and canals, which outflow to pumping stations. The City is served by the Hero and Planters pumping stations, which are located along Barataria. The major canal within Gretna is Verret Canal. Historically, these pumping stations have been inadequate in capacity to handle the volume of floodwaters reaching the stations and have operated at less than full capacity during floods. In addition, drainage structures through some man-made barriers, such as highway and railroad embankments, have proven inadequate during previous rainfall events.

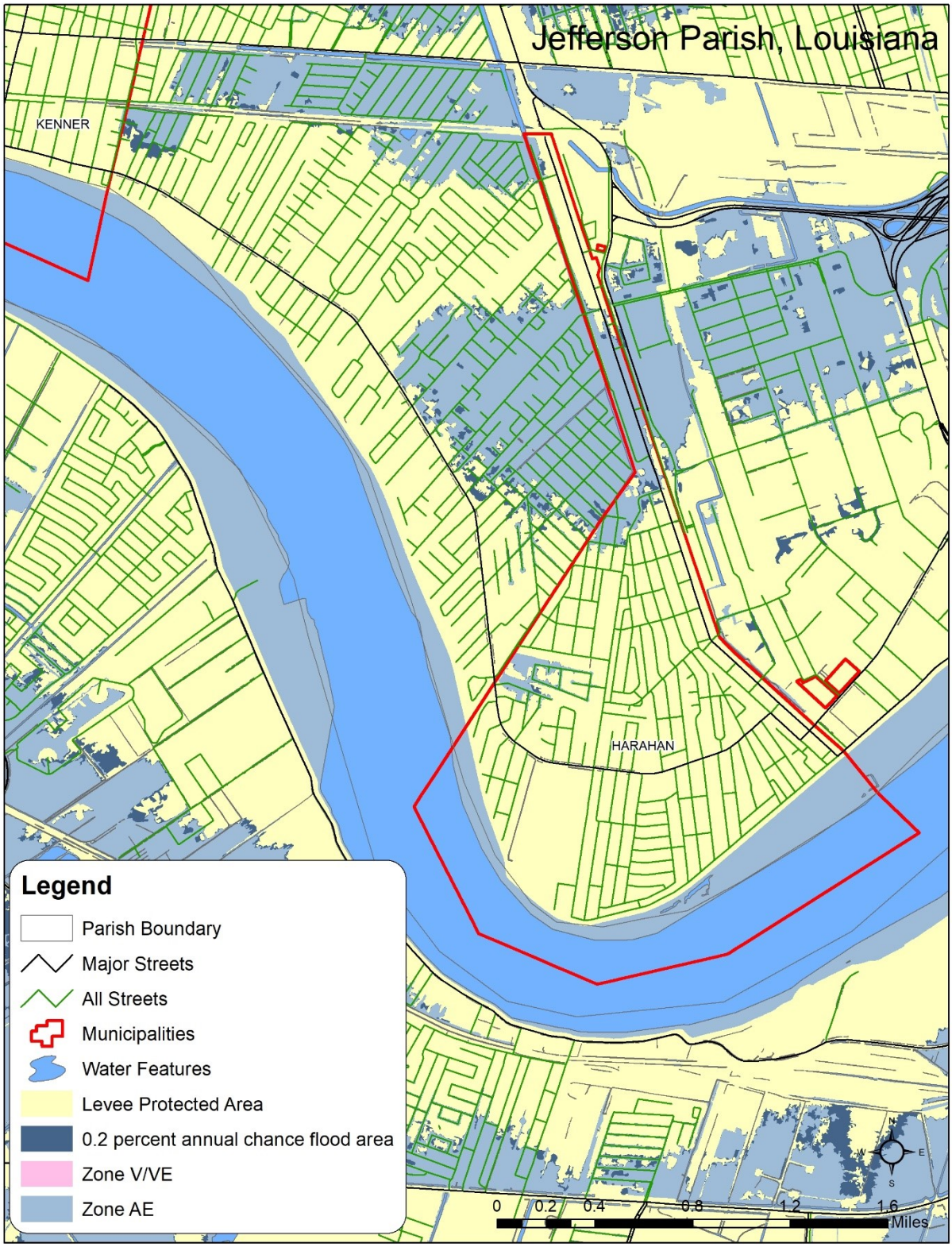
<u>City of Harahan</u>

Figure 26 below identifies the FEMA flood zones for the City of Harahan. The flood zones identified on the map include Zones AE and X. The map indicates that the majority of the City is located within the Levee Protected Area. A small area in the northern part of the city along Dickory Avenue is located in the AE zone.

The principle sources of flooding in the City of Harahan are sheet flow/ponding, levee overtopping, and hurricane or tropical storm surges originating in the Gulf of Mexico. Harahan is located on the East Bank of Jefferson Parish which has many flood problem areas. These problem areas are caused by land subsidence, inadequate capacity of canals and culverts, and inadequate capacity of pumping stations. Flooding from storm surge is covered in a later section.

Based on a review of FEMA NFIP repetitive loss and severe repetitive loss records, the most flood prone residential areas in Harahan appear to be concentrated along Generes Drive and Hickory Street. Flooding on non-residential areas has occurred in the past along Clearview Parkway and a portion of Elmwood Park Boulevard.

Figure 26
City of Harahan Flood Zones



Source: Federal Emergency Management Agency

Two flood events were reported in Harahan in the last ten years. These events are summarized in **Table 32** below.

Table 32
Flood Events, City of Harahan, January 2008 – May 2018

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
HARAHAN	04/04/2012	02:54	Flash Flood	N/A	0	0	5.00K	0.00K
HARAHAN	04/14/2015	10:25	Flash Flood	N/A	0	0	0.00K	0.00K
Totals:					0	0	5.00K	0.00K

- April 4, 2012 – Public reports water entering at least one building near Mark Lane and Citrus Drive causing $5,000 in property damage. The nearby rain gauge indicated rainfall amounts of 3.35 inches.

- April 14, 2015 – Widespread street flooding was reported in Harahan. Some roads were reported impassible.

Two flood events have been recorded since 1996. These events occurred over a period of 22 years which translates to a 9% annual probability of future flood occurrences in the City of Harahan.

Flood Protection Measures

Since most of Harahan's land mass is located below sea level, a levee and pump system is employed for drainage. The levees protect the City of Harahan from natural overbank flooding of surrounding water bodies, including the Mississippi River and Lake Pontchartrain. The major canal in the City of Harahan is the Soniat Canal. The City of Harahan is served by Pump Station #3 located along Elmwood Canal. Pumping is necessary to remove runoff from the drainage system over the levees into the outlying water bodies. (Flood Insurance Study, Jefferson Parish, Louisiana and Incorporated Areas, Revised February 2, 2018)

<u>City of Kenner</u>

Figure 27 below identifies the FEMA flood zones for the City of Kenner. The flood zones identified on the map include Zones AE, VE, and X. The map indicates that the majority of the city is located within Zone AE or the Levee Protected Area. A portion of the northern part of the City along the Lake Pontchartrain falls within Zone VE.

The principle sources of flooding in the City of Kenner are rainfall ponding, levee overtopping, and hurricane or tropical storm surges originating in the Gulf of Mexico from Lake Pontchartrain on the East Bank of the Mississippi River. As demonstrated by Hurricane Katrina, the northern and northwestern part of the City is particularly vulnerable to flooding from heavy rains that have the potential to overwhelm the City's drainage system.

Based on a review of the City of Kenner Repetitive Loss Area Analysis Report, the most flood prone areas in the City of Kenner appear to be concentrated in the area bounded by Phoenix Street, Canal Number 12, Canal Number 13, and Duncan Canal.

Figure 27
City of Kenner Flood Zones

Source: Federal Emergency Management Agency

Of the 6 flood events occurring in the City of Kenner in the last 10 years, 2 resulted in property damage in 2013. These events are summarized in **Table 33** below.

Table 33
Flood Events, City of Kenner, January 2008 – May 2018

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
MOISANT ARPT	07/28/2011	13:33	Flash Flood	N/A	0	0	0.00K	0.00K
KENNER	05/01/2013	11:50	Flash Flood	N/A	0	0	10.00K	0.00K
(MSY) MOISANT FLD NEW	05/01/2013	11:55	Flash Flood	N/A	0	0	10.00K	0.00K
Kenner	05/29/2013	N/A	Flash Flood	N/A	0	0	0.00K	0.00K
Kenner	06/01/2014	N/A	Flash Flood	N/A	0	0	0.00K	0.00K
KENNER	04/01/2016	10:30	Flash Flood	N/A	0	0	0.00K	0.00K
Totals:					0	0	20.00K	0.00K

- July 28, 2011 – Police reported street flooding of Loyola Drive and West Esplanade from slow movement of the thunderstorms. Hooper Drive at Loyola Drive was also reported flooded. Radar estimates of two to three inches were shown in some areas.[20]

- May 1, 2013 – In Kenner, numerous streets were reported flooded, especially around Audubon Subdivision. Near Moisant Field, the intersection of West Esplanade and East Loyola was impassable due to flash flooding. One vehicle was stalled due to the water. A total of 2.52 inches of rainfall was recorded at the nearby rain gauge.

- May 29, 2013 - Kenner has seen roughly five inches of rainfall in a one and a half hour timeframe. Neighborhoods, particularly off of Vintage Drive in north Kenner, are seeing high water as a result of the afternoon storm. High water has been reported in the following areas: Chateau at Vintage, 33rd and Maine, two right lanes 4100 - 4300 block of Williams, 3800 - 39th and Lake Trail, Joe Yenni near Platt - drainage canal beginning to overtop.

- June 1, 2014 – After a weekend of heavy rain fall, street flooding was reported in the 4400 block of Lake Trail, 4200 block of Connecticut, 4200 block of Alabama, Gelpi from Driftwood Blvd to Coronado, Power Blvd NB and SB Vintage to I-10, and Chateau and Vintage. The rain gauge indicated more than 4 inches of rainfall.

- April 1, 2016 – Numerous streets were reported impassible with several cars flooded in Metairie and Elmwood.

Six flood events have been recorded since 1996. These events occurred over a period of 22 years which translates to a 27% annual probability of future flood occurrences in the City of Kenner.

Flood Protection Measures

The most densely populated areas of the City of Kenner are protected from flooding by levees, drainage canals, and drainage pump stations. The major canals in the City of Kenner are Duncan Canal, Canal #1, Canal #2, and Canal #13. The City of Kenner is served by Pump Station #4, which is

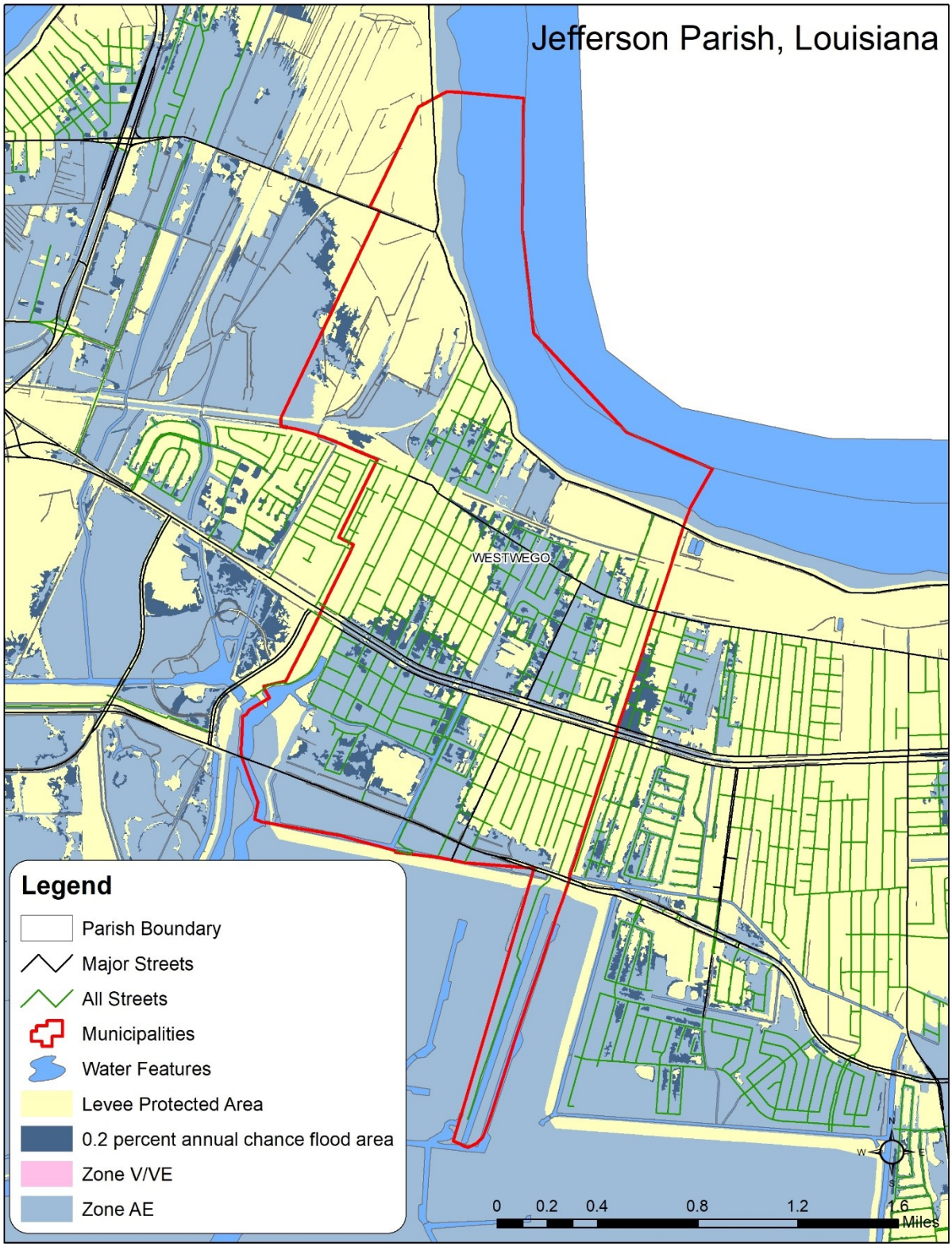
located in the City along Duncan Canal, Pump Station #3, and the Kenner Relief Pumping Station, which is located along the Parish Line Canal approximately 3.9 miles south of Lake Pontchartrain. In Kenner, Lake Pontchartrain and the hurricane protection levee prevents flooding by hurricane storm surge from the Lake up to approximately 17 feet (Flood Insurance Study, Jefferson Parish, Louisiana and Incorporated Areas, Revised February 2, 2018).

City of Westwego

Figure 28 below identifies the FEMA flood zones for Westwego. The flood zones identified on the map include Zones AE and X. The map indicates that the majority of the City is located within Zone AE or the Levee Protected Area. Some areas are located within Zone X throughout the City southwest.

The principle sources of flooding are rainfall ponding, levee overtopping, and hurricane or tropical storm surges originating in the Gulf of Mexico from Lake Pontchartrain on the East Bank and Lakes Salvador and Cataouatche on the West Bank. Drainage of floodwaters in the City of Westwego is accomplished by a system of structures and canals, which outflow to pumping stations. Based on a review of the City of Westwego Repetitive Loss Area Analysis Report, the most flood prone areas in the City of Westwego appear to be concentrated in the area bounded by Laroussini Street, Westbank Expressway, Tanglewood Drive, and Via A Pitre Drive.

Figure 28
City of Westwego Flood Zones



Source: Federal Emergency Management Agency

One flood event was recorded in the City of Westwego in the last ten years. These events are summarized in **Table 34** below.

Table 34
Flood Events, City of Westwego, January 2008 – May 2018

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
WESTWEGO	03/27/2009	04:15	Flash Flood	N/A	0	0	0.00K	0.00K
Totals:					0	0	0.00K	0.00K

- March 27, 2009 – Heavy rainfall flooded numerous roadways and some homes and vehicles on the West Bank of Jefferson Parish. The rain gauge at the #2 Pump Station in Westwego recorded 4.38 inches of rainfall.

One flood event has been recorded since 1996. This event occurred over a period of 22 years which translates to a 5% annual probability of future flood occurrences in the City of Westwego.

The principle sources of flooding are rainfall ponding, levee overtopping, and hurricane or tropical storm surges originating in the Gulf of Mexico from Lake Pontchartrain on the East Bank and Lakes Salvador and Cataouatche on the West Bank. Drainage of floodwaters in the City of Westwego is accomplished by a system of structures and canals, which outflow to pumping stations. Based on a review of the City of Westwego Repetitive Loss Area Analysis Report, the most flood prone areas in the City of Westwego appear to be concentrated in the area bounded by Laroussini Street, Westbank Expressway, Tanglewood Drive, and Via A Pitre Drive.

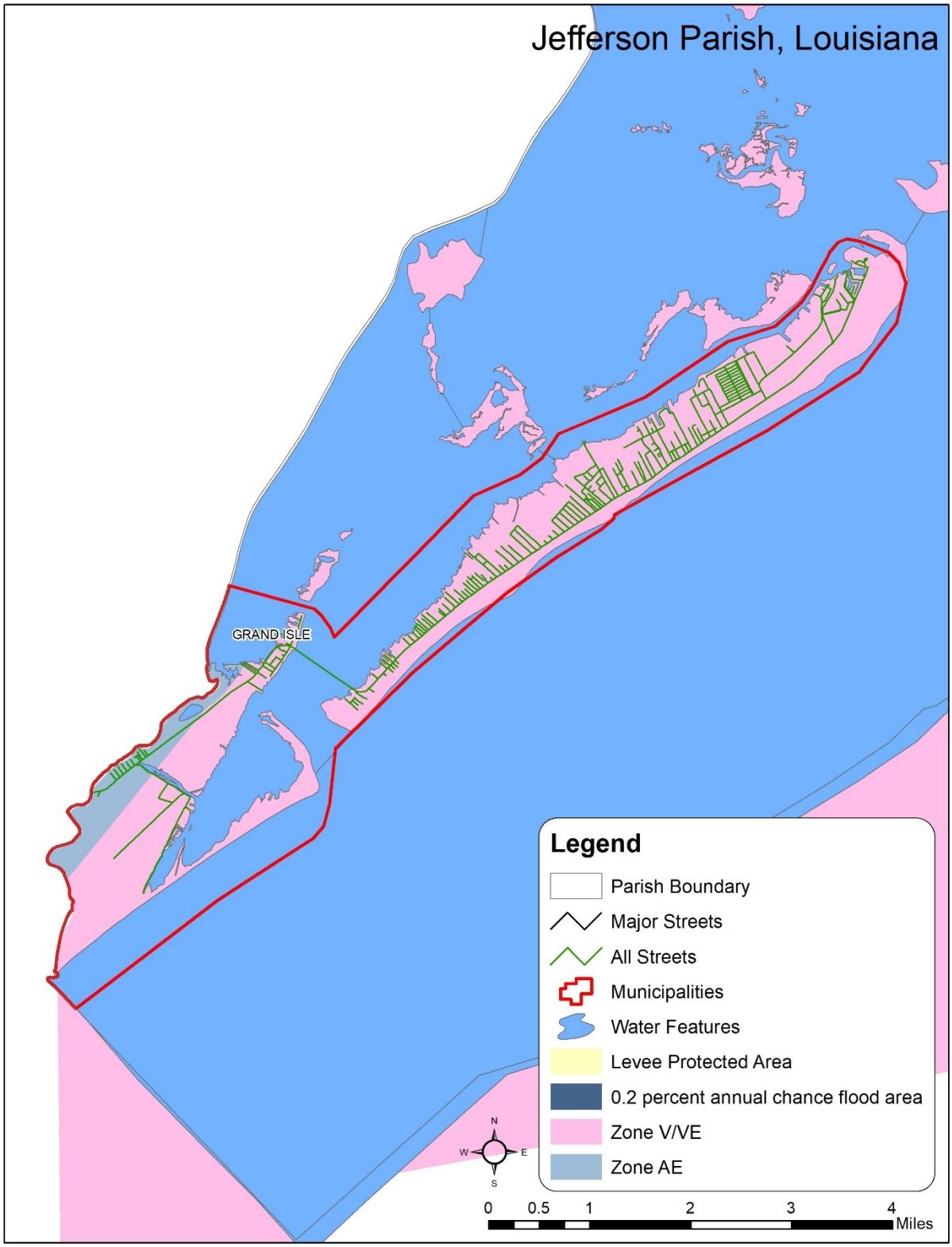
Flood Protection Measures

The most densely populated areas of the City of Westwego are protected from flooding by levees, drainage canals, and drainage pump stations. The City of Westwego is served by the Westwego and Bayou Segnette Pumping Stations, which are located in the southwestern portion of the City along Bayou Segnette. The City of Westwego is partially protected from hurricane surges from Lake Salvador and Lake Cataouatche by Parish-built levees (Flood Insurance Study, Jefferson Parish, Louisiana, and Incorporated Areas, Revised February 2, 2018).

Town of Grand Isle

The whole Town is susceptible to flooding due to its proximity to the Gulf of Mexico and low elevation. The Town is surrounded by levees but still considered the most flood prone community in all of Jefferson Parish. **Figure 29** below identifies the FEMA flood zones for Grand Isle. The map shows nearly the entire island is located within Zone VE, coastal areas within the 100-year floodplain with no additional hazards due to storm-induced velocity wave action.

Figure 29
Town of Grand Isle Flood Zones



Source: Federal Emergency Management Agency

There were no non-hurricane-related flood events reported in the Town of Grand Isle since 1996. With zero events occurring in the last 22 years, there is <1% annual probability of future flash flood occurrences in the Town of Grand Isle.

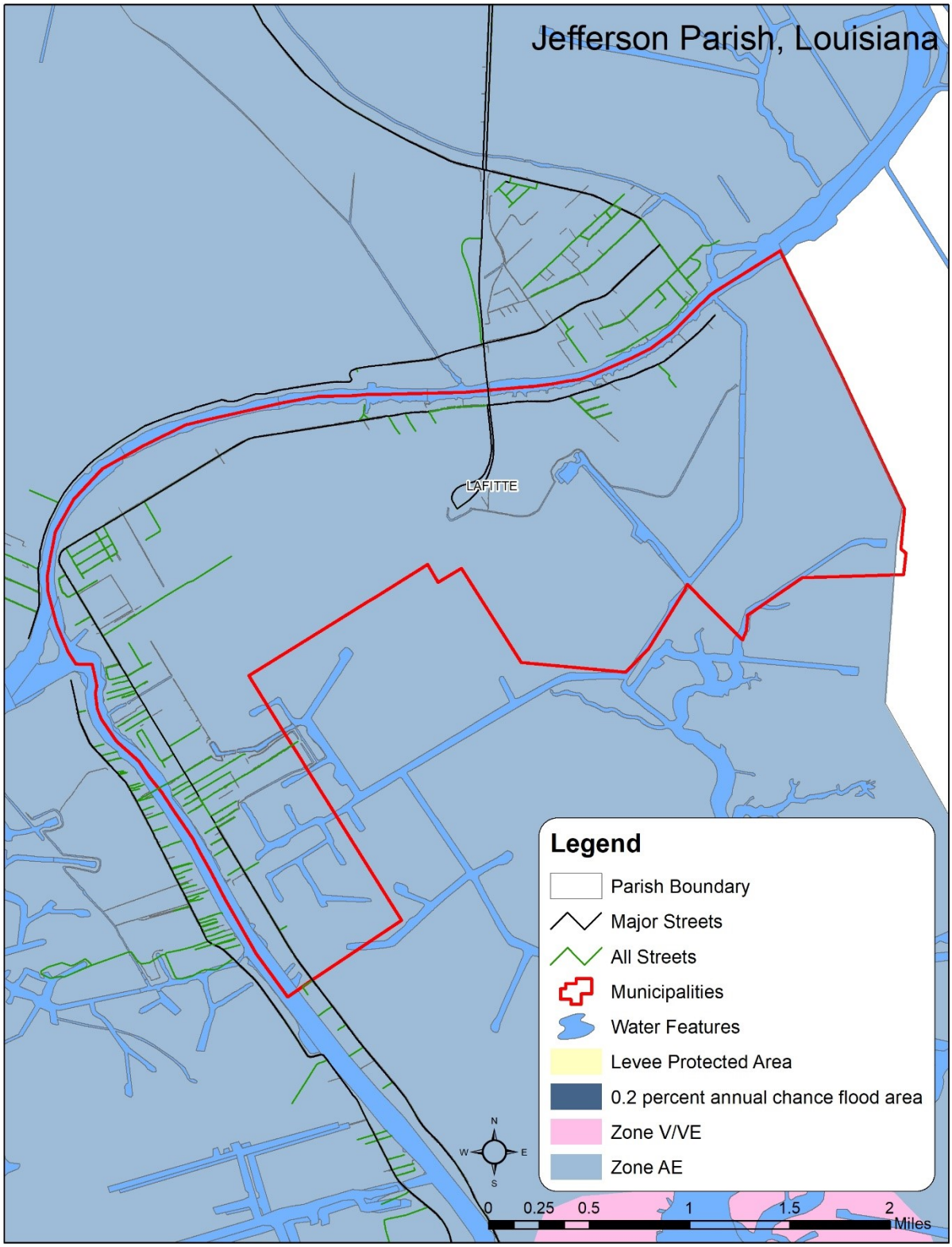
While floods are a significant threat to the Town of Grand Isle, almost all floods associated with this area are a result from strong hurricanes that produced large storms surges along the Louisiana coastline. The whole Town is susceptible to flooding due to its proximity to the Gulf of Mexico and low elevation. The Town is surrounded by levees but still considered the most flood prone community in all of Jefferson Parish. The Town is located on the barrier island of Grand Isle at the southernmost point of Jefferson Parish along the Gulf of Mexico and is at the mouth of Barataria Bay and bordered by the Gulf of Mexico to the south and inland wetlands and estuaries to the north. The elevation of the Island is at or near sea level and the Town is surrounded by a system of levees to protect it from flooding from storm surge events.

As demonstrated by Hurricane Katrina, and other past hurricanes with strong storm surges, the entire island is vulnerable to flooding. See Section 4.5 (Storm Surge) for flooding in Grand Isle related to storm surge. Based on a review of FEMA NFIP repetitive loss and severe repetitive loss records, the most flood prone areas in the Town of Grand Isle appear to be located along Santiny Lane and Grand Isle Parkway.

Town of Jean Lafitte

The Town is protected by a system of levees, which helps reduce flood losses, but is still prone to flooding due to its location near the Gulf of Mexico and its low elevation. **Figure 30** below identifies the FEMA flood zones for Jean Lafitte. The map identifies that the entire Town is located within Zone AE, areas within the 100-year floodplain where base flood elevations are provided.

Figure 30
Town of Lafitte Flood Zones



Source: Federal Emergency Management Agency

There were no non-hurricane-related flood events reported in the Town of Jean Lafitte since 1996. With zero events occurring in the last 22 years, there is <1% annual probability of future flash flood occurrences in the Town of Jean Lafitte.

Ponding and flash floods are infrequent in the Town of Jean Lafitte, yet floods are a significant threat to the Town. Almost all floods associated with this area are a result from strong hurricanes that produced large storms surges along the Louisiana coastline. The Town is protected by a system of levees, which helps reduce flood losses, but is still prone to flooding due to its location near the Gulf of Mexico and its low elevation. Past flood events were almost all associated with strong hurricanes that produced large storm surges along the Louisiana coastline. Based on a review of the Town of Jean Lafitte Repetitive Loss Area Analysis Report, the most flood prone areas in the Town of Jean Lafitte appear to be located all along Jean Lafitte Boulevard.

Flood Protection Measures

A portion of Jean Lafitte is currently protected from flooding by a system of levees. The levees are up to five feet in height and provide protection for only a portion of the Town. In July 2009, the Town of Jean Lafitte working in coordination with Jefferson Parish, the West Jefferson Levee District, and the US Army Corps of Engineers (USACE) completed phase one of the Fisher Basin tidal levee project. Phase one of the project included 4.7 miles of earthen levees along the southern edge of the Town that abuts marshland.[21] The earthen levee is the first of three phases of the Fisher Basin tidal levee project and will provide Jean Lafitte residents an increased level of flood protection. When fully completed, there will be a ring of levees around the town to protect the area from inundation from nearby marshes and Bayou Barataria. As part of the project, the USACE plans to raise the Town's current levee protection from roughly five feet to seven feet and construct seven-foot floodwalls in those areas that do not have levees (Jefferson Parish website – Jean Lafitte Groundbreaking, December 4, 2006). In September 2014, workers broke ground on a ring levee that will run along the western boundary of the Town tying in with an already-built back levee that runs along the eastern side, encircling the Town.[22] As of 2019, this project has been completed.

4.3.8 Flood Risk Assessment

All communities have completed multiple flood protection measures from 2008 to 2019 as seen in each community's flood profile. However, flood risk remains the highest-ranked risk for all communities in Jefferson Parish. In addition, risk might increase because Jefferson Parish is vulnerable to relative sea level rise and subsidence as described in the sea level rise section. While the Parish's population growth and building permit trends have been relatively slow to stable, there is some notable redevelopment in areas inside the levee system that may be susceptible to future flooding.

Private Structure Vulnerability

The flood risk assessment for private structures in Jefferson Parish is based on an analysis of National Flood Insurance Program (NFIP) data on both repetitive loss (RL) properties and all NFIP flood claims in Jefferson Parish. The Community Rating System has three different categories for communities with repetitive loss properties, each based on the severity of the repetitive loss problem. A Category A community is defined by having no unmitigated repetitive loss properties. A Category B community has anywhere from 1 to 49 unmitigated repetitive loss properties. Finally, a Category C community has 50 or more unmitigated repetitive loss properties. With a total of 4,949

unmitigated repetitive loss properties as of March 31, 2019, Jefferson Parish is designated a Category C repetitive loss community.

The NFIP defines repetitive loss properties as those that have received at least two NFIP insurance payments of more than $1,000 each in any rolling ten-year period. As of March 2019, Jefferson Parish had 6,913 such unmitigated properties, as shown in **Table 35,** based on data provided by FEMA's Region VI Mitigation Program's Floodplain Management and Insurance Branch Analyst.

Table 35
Repetitive Loss Flood Insurance Statistics for Jefferson Parish – NON-MITIGATED
Ordered by Number of Repetitive Loss Properties in each Community
(Source: National Flood Insurance Program, March 31, 2019)

Community Name	Building Payments	Contents Payments	Total Payments	Average Payment	Losses	Properties
Uninc. Jefferson Parish	$257,660,718.97	$94,395,862.84	$352,056,581.81	$22,221.59	15,843	4,949
Kenner	$31,935,299.58	$9,532,049.55	$41,467,349.13	$28,637.67	1,448	469
Grand Isle	$20,098,164.90	$5,086,264.16	$25,184,429.06	$21,360.84	1,179	385
Gretna	$10,221,431.13	$3,946,225.93	$14,167,657.06	$12,098.77	1,171	273
Westwego	$2,718,861.43	$1,220,285.74	$3,939,147.17	$11,688.86	337	89
Harahan	$3,485,350.54	$1,462,177.39	$4,947,527.93	$17,796.86	278	83
Jean Lafitte	$4,886,307.54	$1,859,467.71	$6,745,775.25	$36,267.61	186	71
Total	**$331,006,134.09**	**$117,502,333.32**	**$448,508,467.41**	**$150,072.20**	**20,442**	**6,319**

It should be noted that the number of claims or repetitive loss properties are not necessarily good indicators of risk, except on a community level. This is in part because communities with larger populations will normally have more insurance policies and more claims (holding constant the exposure to flood hazards). **Table 36** shows the same data sorted by the dollar amount of the average NFIP claim. Particularly when a statistically significant number of claims are included in the data set, the dollar amount of the average claim is a better indication of relative flood risk.

Table 36
Repetitive Loss Flood Insurance Statistics for Jefferson Parish – NON-MITIGATED
Ordered by Average of NFIP Insurance Claims in each Community
(Source: National Flood Insurance Program, March 31, 2019)

Community Name	Building Payments	Contents Payments	Total Payments	Average Payment	Losses	Properties
Jean Lafitte	$4,886,307.54	$1,859,467.71	$6,745,775.25	$36,267.61	186	71
Kenner	$31,935,299.58	$9,532,049.55	$41,467,349.13	$28,637.67	1,448	469
Uninc. Jefferson Parish	$257,660,718.97	$94,395,862.84	$352,056,581.81	$22,221.59	15,843	4,949
Grand Isle	$20,098,164.90	$5,086,264.16	$25,184,429.06	$21,360.84	1,179	385
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Gretna	$10,221,431.13	$3,946,225.93	$14,167,657.06	$12,098.77	1,171	273
Westwego	$2,718,861.43	$1,220,285.74	$3,939,147.17	$11,688.86	337	89
Total	**$331,006,134.09**	**$117,502,333.32**	**$448,508,467.41**	**$150,072.20**	**20,442**	**6,319**

Outside of those properties that appear on the NFIP repetitive loss list, there have been additional flood claims paid in Jefferson Parish since 1978. The total of those losses for the Parish, shown in **Table 37,** paint a very real picture of the impact to the Parish from flooding.

Table 37
NFIP Flood Losses in Jefferson Parish
(Source: Louisiana State NFIP Office 2019)

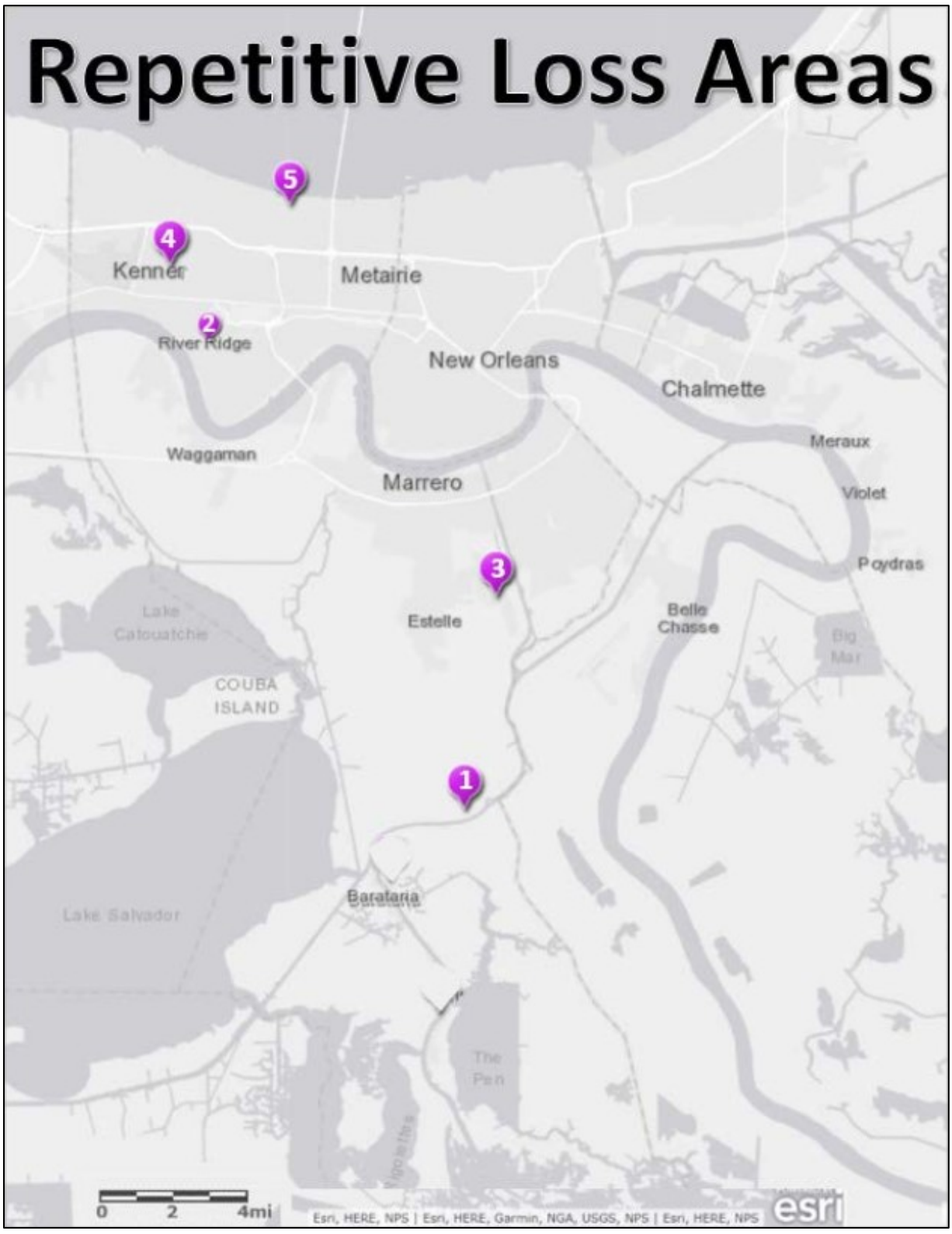
Jurisdiction	Total $ Claims 1978-2007	Total $ Claims 2008-2014	Total $ Claims 2015-2019	Total $ Claims
Jefferson Parish	$1,272,320,955.00	61,314,982.00	$13,763,600,571.00	$15,097,236,508.00
City of Kenner	$500,720,873.00	$3,462,010.00	$2,522,521,018.00	$3,026,703,901.00
City of Gretna	$39,294,737.00	$1,154,624.00	$202,432,010.00	$242,881,371.00
Town of Grand Isle	$49,956,518.00	$10,782,275.00	$304,370,664.00	$365,109,457.00
City of Harahan	$28,285,085.00	$1,208,252.00	$148,416,141.00	$177,909,478.00
City of Westwego	$8,867,760.00	$492,726.00	$46,831,976.00	$56,192,462.00
Town of Jean Lafitte	$2,741,544.00	$6,770,452.00	$48,784,474.00	$58,296,470.00
Grand Total	**$1,902,187,472.00**	**$85,185,321.00**	**$17,036,956,854.00**	**$19,024,329,647.00**

*Note: 2015-2017 data as of February; 2018-2019 data as of April.

The unincorporated Jefferson Parish Repetitive Loss Area Analysis (RLAA) identifies five repetitive flood loss subareas as shown in **Figure 31**. These areas consist of repetitive loss properties and the surrounding properties that experience the same or similar flooding conditions, whether or not the buildings on those surrounding properties have been damaged by flooding. The subareas were selected based on the following criteria: number of flood insurance claims post Hurricane Katrina, percentage of repetitive flood loss properties as compared to the structures between October 2005 and June 2017, and cluster of repetitive flood loss properties in the neighborhood. **Figure 32**, **Figure 33**, **Figure 34**, **Figure 35**, and **Figure 36** provide detailed maps of each subarea.

The RLAA provides an in-depth look at areas that have experienced multiple losses from flooding. During the analysis, detailed building information was collected through field visits to develop an understanding of the causes of repetitive flood damage at those sites. More details on the analysis and specific guidance on mitigation solutions for individual buildings or areas can be found in the complete report included as Appendix E. The RLAA report can be used by property owners to help reduce their risk of future flooding by providing an understanding of the flood risk, funding sources, and resources for mitigation. The RLAA reports for Gretna, Jean Lafitte, Kenner, and Westwego can also be found in Appendix E.

Figure 31
Unincorporated Jefferson Parish Repetitive Loss Areas

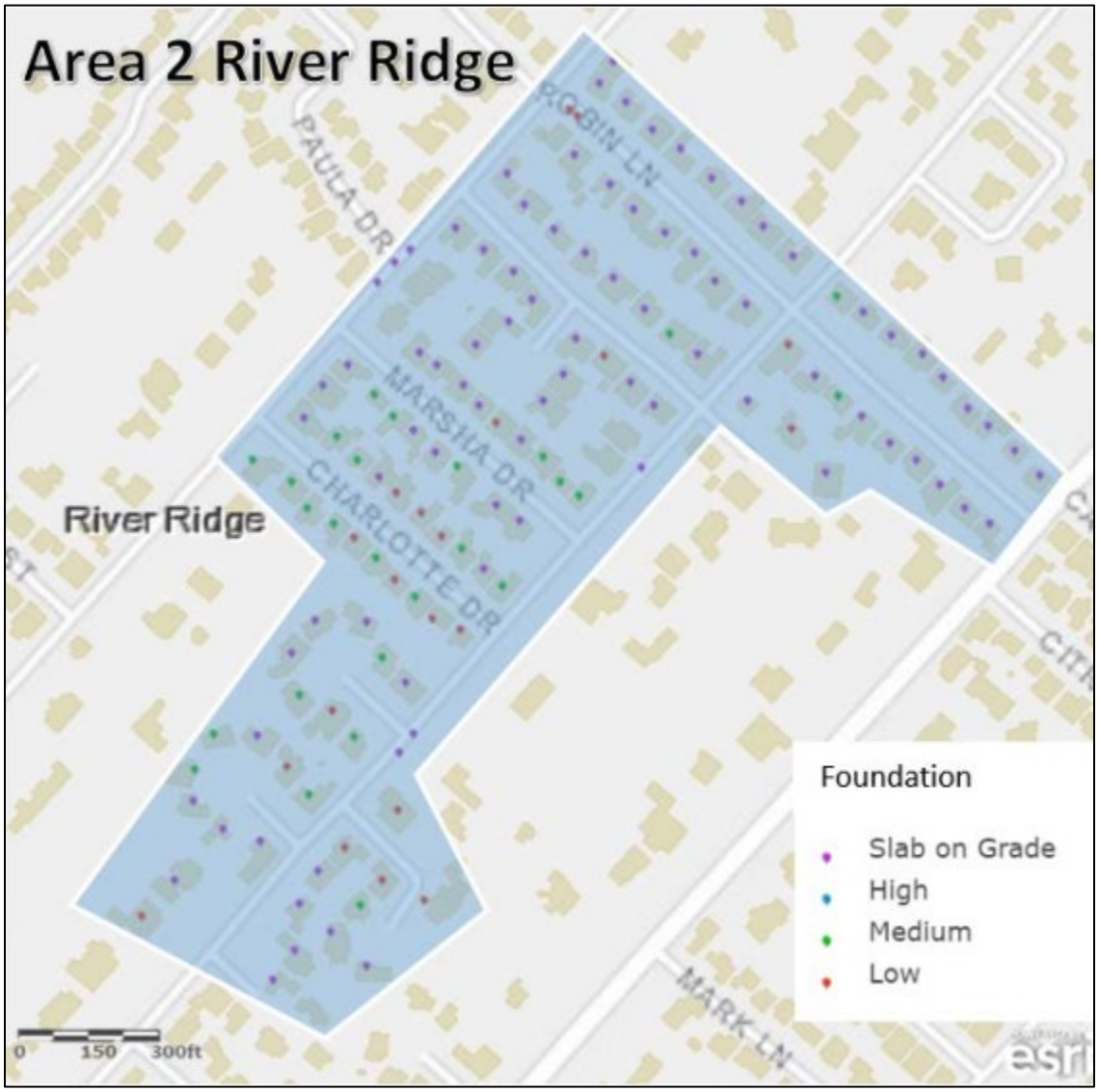


Source: Jefferson Parish Repetitive Loss Area Analysis

Figure 32
Repetitive Loss Subarea 1: Crown Point, Lafitte, Barataria

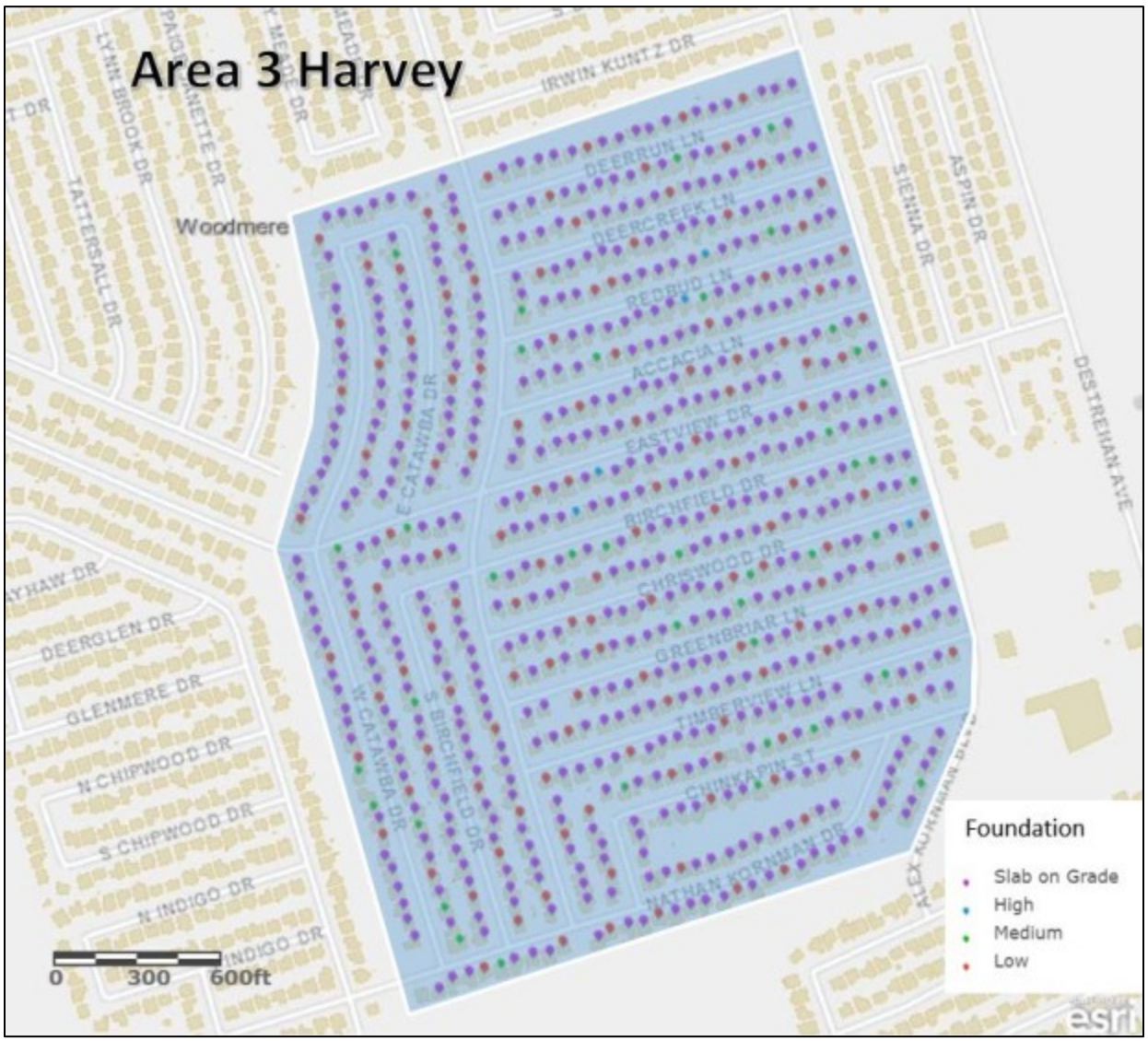
Source: Jefferson Parish Repetitive Loss Area Analysis

Figure 33
Repetitive Loss Subarea 2: River Ridge



Source: Jefferson Parish Repetitive Loss Area Analysis

Figure 34
Repetitive Loss Subarea 3: Harvey

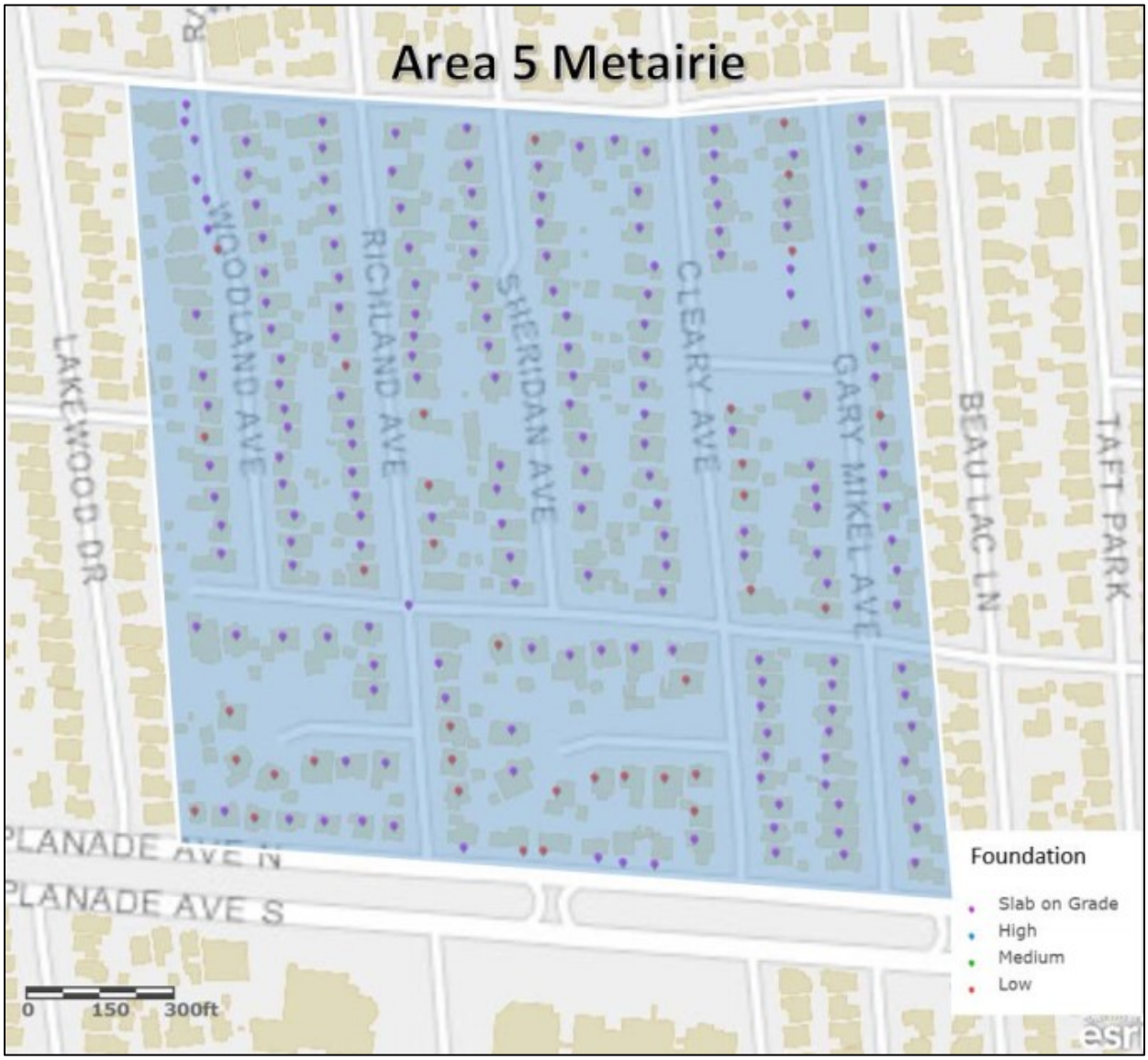


Source: Jefferson Parish Repetitive Loss Area Analysis

Figure 35
Repetitive Loss Subarea 4: Metairie Arcadia Place

Source: Jefferson Parish Repetitive Loss Area Analysis

Figure 36
Repetitive Loss Subarea 5: Metairie Manson Subdivision



Source: Jefferson Parish Repetitive Loss Area Analysis

The data that was obtained for NFIP flood loss is summarized in **Table 38** below.

Table 38
NFIP Flood Loss Statistics, Jefferson Parish;
By year from 2015-2019
(Source: Louisiana State NFIP Office 2019)

Jurisdiction	2016 Claims	2017 Claims	2018 Claims	2019 Claims
Jefferson Parish	$1,462,914.00	$1,732,978.00	$2,091,338.00	$924,195.00
City of Kenner	$216,510.00	$104,470.00	$209,769.00	$7,500.00

Jurisdiction	2016 Claims	2017 Claims	2018 Claims	2019 Claims
City of Gretna	$6,255.00	$0.00	$36,831.00	$33,073.00
Town of Grand Isle	$5,300.00	$23,922.00	$86,967.00	$162,954.00
City of Harahan	$2,331.00	$273,289.00	$60,120.00	$0.00
Town of Jean Lafitte	$190,000.00	$104,828.00	$60,000.00	$30,000.00
City of Westwego	$0.00	$0.00	$14,768.00	$0.00
Grant Total	**$1,883,310.00**	**$2,239,487.00**	**$2,559,793.00**	**$1,157,722.00**

*Note: 2015-2017 data as of February; 2018-2019 data as of April.

A second analysis of flood risk can be conducted by assessing the number of Pre- and Post-FIRM structure policies in Jefferson Parish and their respective flood claim totals. This data is summarized in **Table 39** and **Table 40** below.

Table 39
Pre-FIRM Structure Policies and Claims

Community	# of Policies	# of Paid Claims	$ of Claims
Jefferson Parish	48,119	52,797	$1,749,488,785.00
City of Gretna	2,303	2,729	$34,951,340.00
City of Harahan	1,605	1,233	$22,691,006.00
City of Kenner	6,414	6,459	$239,163,621.00
City of Westwego	878	850	$7,539,604.00
Town of Grand Isle	250	2,721	$50,455,695.72
Town of Jean Lafitte	78	220	$7,072,641.00
Totals	**59,647**	**67,009**	**$2,111,362,692.72**

**Pre-/Post-FIRM data is as of 3/31/2018 insurance data (updated data available May 2019).*

Table 40
Post-FIRM Structure Policies and Claims

Community	# of Policies	# of Paid Claims	$ of Claims
Jefferson Parish	38,755	19,583	$937,791,197.00
City of Gretna	812	229	$2,885,530.00
City of Harahan	972	273	$6,317,990.00
City of Kenner	9,612	4,750	$254,271,769.00
City of Westwego	394	84	$1,346,258.00
Town of Grand Isle	530	584	$6,513,656.27
Town of Jean Lafitte	193	114	$1,401,328.00
Totals	**51,268**	**25,617**	**$1,210,527,728.27**

**Pre-/Post-FIRM data is as of 3/31/2018 insurance data (updated data available May 2019).*

Pre-FIRM refers to houses that were built before the first Flood Insurance Rate Map (FIRM) was produced and issued. For Jefferson Parish, that means any home constructed prior to July 23, 1976 is considered a pre-FIRM home. These homes were built without any FEMA enforced regulations. **Table 41** below shows the percentage of pre-firm structures by community in Jefferson Parish. Post-FIRM dwellings are those constructed after July 23, 1976. The tables above illustrate that with more houses built before floodplain regulations were enforced, the more houses are at risk for flooding. The City of Kenner, Town of Grand Isle, and the Town of Jean Lafitte have more policies in force for post-FIRM houses. This could indicate that development increased in these three municipalities after 1976 or that once the FIRM went into effect, more of these properties were in the Special Flood Hazard Area, thereby requiring homeowners to purchase flood insurance policies. The Towns of Grand Isle and Jean Lafitte have substantially more pre-FIRM paid claims than they do policies which indicate a large number of repetitive loss properties in these municipalities. Post-FIRM dwellings have a significantly lower number of paid claims in all the municipalities except for the Town of Grand Isle; however, they only have 54 more claims than they do policies. Ultimately, pre-FIRM houses are at such greater risk, as demonstrated, that the claims payments have costs an entire billion dollars more than the post-FIRM homes. Floodplain management regulations have made an astounding impact to Jefferson Parish in the last 43 years.

Table 41
Percentage of Pre-FIRM Structures by Community

Community	Total # of Structures	Pre-FIRM Policies	% of Pre-FIRM
Jefferson Parish	109,921	48,119	44%
City of Gretna	6,013	2,303	38%
City of Harahan	3,754	1,605	43%
City of Kenner	19,877	6,414	32%
City of Westwego	2,800	878	31%
Town of Grand Isle	1,997	250	12%
Town of Jean Lafitte	1,522	78	5%

**Pre-/Post-FIRM data is as of 3/31/2018 insurance data (updated data available May 2019).*

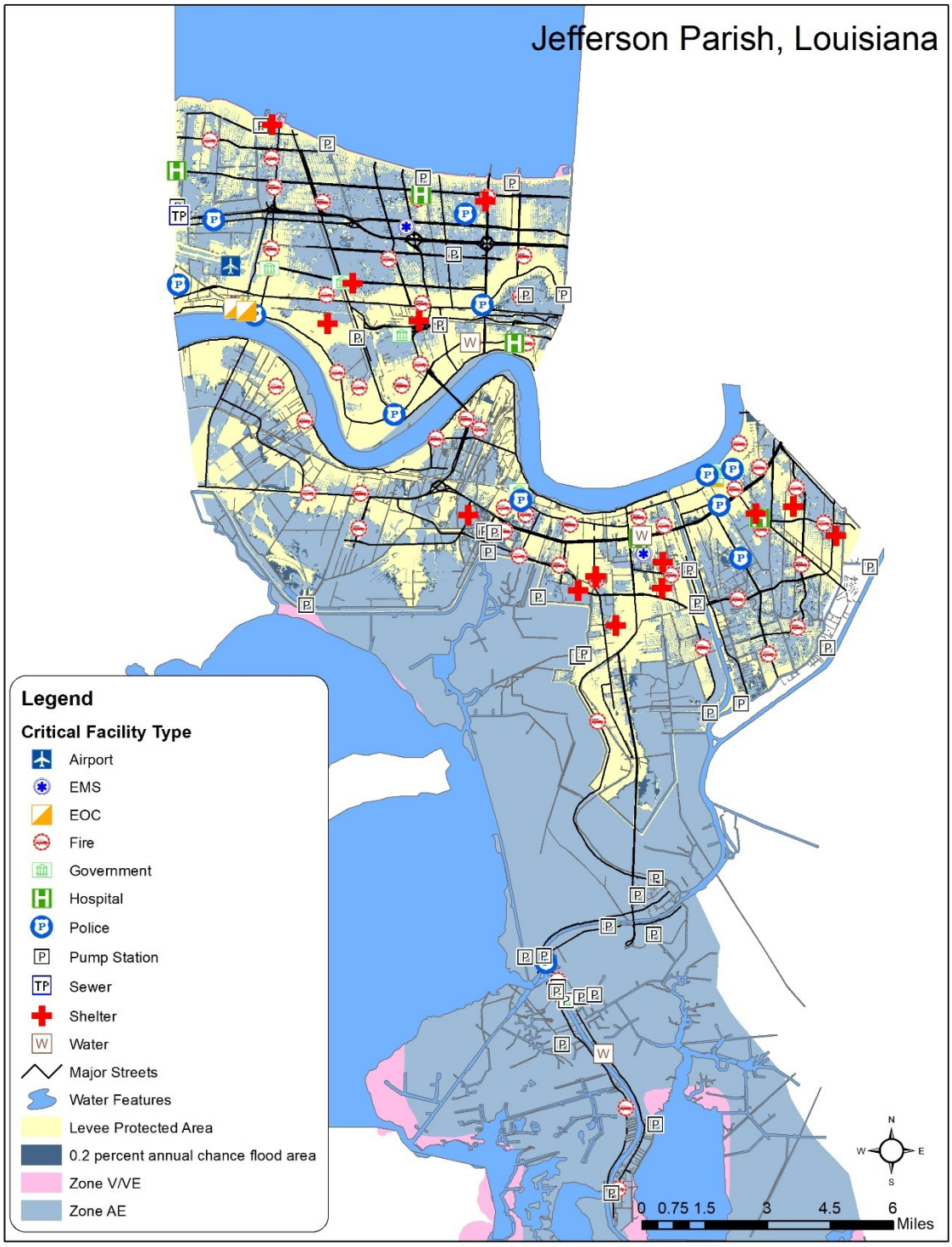
The results of this analysis substantiate the ranking position that is placed on the flood hazard, and also paint a monetarily cumbersome picture for Jefferson Parish from future flood events. Ways that the Parish plans to reduce this risk are discussed in detail in the Mitigation Strategy Section (Section 5).

Critical Facilities Vulnerability

Critical facility inventory data was used to analyze the vulnerability of the structures to flood events. A number of data points were collected as relate to flooding and these are included in the table below. The designated flood zone in which each facility lies is one of the most basic factors that describes the likelihood that flooding will occur at that location. In addition, depth grids were available and provided information on flood depths and the percent chance that flooding will occur on an annualized basis and within a 30-year period which is the typical length of a mortgage on a residential home. **Figure 37 and Figure 38** below display these Critical Facilities on a map with their respective

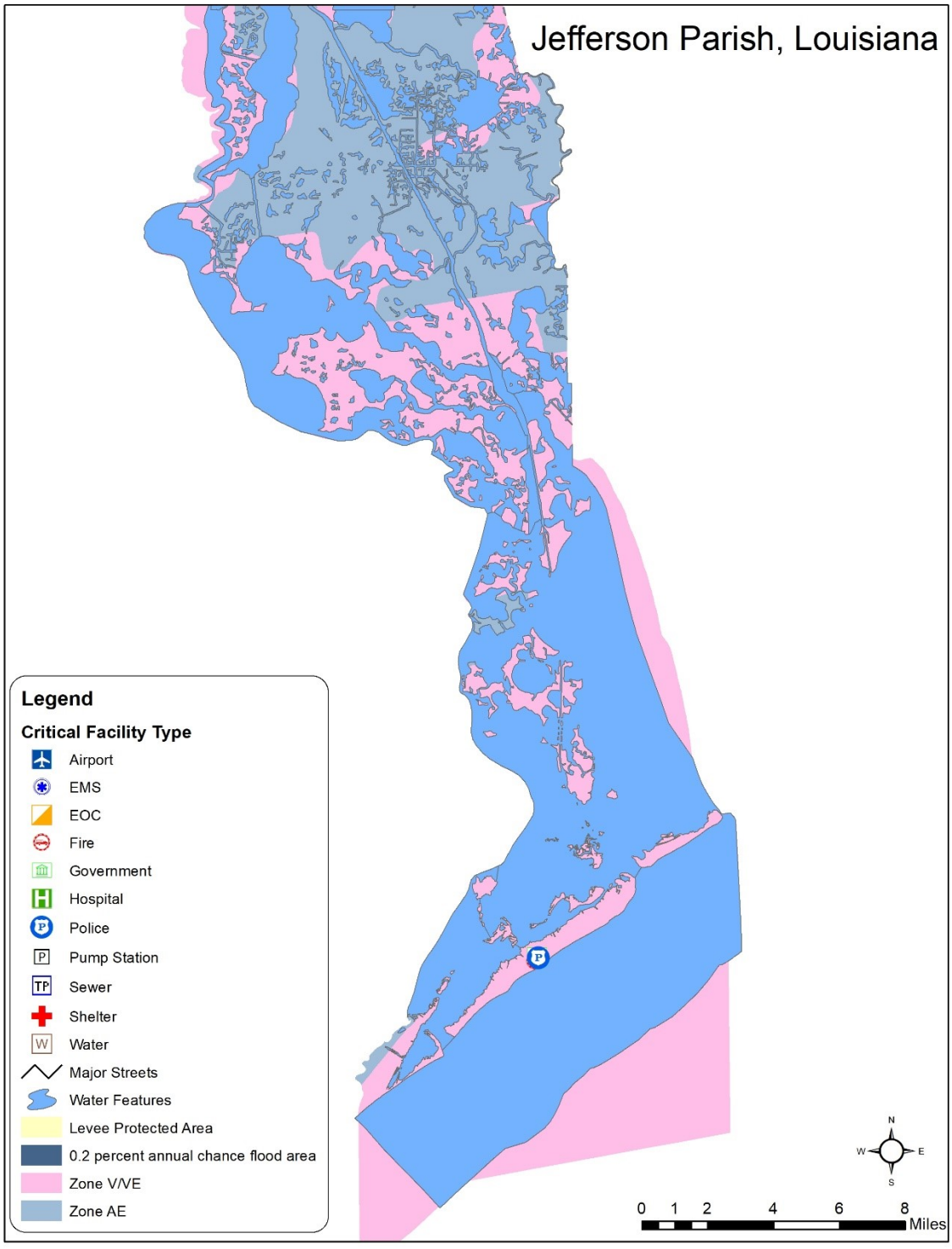
flood zone while **Table 42** summarizes the flood event vulnerability of critical facilities in the municipalities of Jefferson Parish, based on the factors described above. Additional information on asset risk can be found in Appendix F, Asset Inventory.

Figure 37
Jefferson Parish North Critical Facilities;
Flood Zones



Source: Federal Emergency Management Agency, Jefferson Parish GIS Department

Figure 38
Jefferson Parish South Critical Facilities;
Flood Zones



Source: Federal Emergency Management Agency, Jefferson Parish GIS Department

Table 42
Jefferson Parish Critical Facilities;
Flood Vulnerability Assessment

Facility	Address	Type	In Zone A/AE	In Zone V/VE	In Zone X	Annual Chance (%)	30yr Chance (%)	10 yr depth (ft)	50 yr depth (ft)	100 yr depth (ft)
Jefferson Parish										
East Jefferson EMS	3120 Lime St	EMS	Yes			10.00	95.76	1.10	1.60	1.90
West Jefferson EMS	1225 Avenue C	EMS	Yes			10.00	95.76	0.50	0.90	0.90
Avondale VFD (Main) Station 74	500 South Jamie Blvd	Fire	Yes			10.00	95.76	0.80	0.90	1.40
Avondale VFD Station 75	201 West Tish Dr	Fire	Yes			10.00	95.76	0.30	0.40	1.10
Bridge City VFD	2220 Bridge City Ave	Fire				0.00	0.00	0.00	0.00	0.00
Eastbank Consolidated FD Station 11	3525 Jefferson Hwy	Fire				0.00	0.00	0.00	0.00	0.00
Eastbank Consolidated FD Station 12	968 Jefferson Hwy	Fire				0.00	0.00	0.00	0.00	0.00
Eastbank Consolidated FD Station 13	4642 Calumet St	Fire				0.00	0.00	0.00	0.00	0.00
Eastbank Consolidated FD Station 14	1714 Edinburgh St	Fire	Yes			2.00	45.45	0.00	0.80	0.80
Eastbank Consolidated FD Station 15	402 Aurora Ave	Fire				0.00	0.00	0.00	0.00	0.00
Eastbank Consolidated FD Station 16	5200 Lafreniere St	Fire				0.00	0.00	0.00	0.00	0.00
Eastbank Consolidated FD Station 17	6616 Kawanee Ave	Fire	Yes			10.00	95.76	0.90	1.30	1.60
Eastbank Consolidated FD Station 18	3430 N. Causeway Blvd	Fire				0.00	0.00	0.00	0.00	0.00
Eastbank Consolidated FD Station 20	4110 Hudson St	Fire	Yes			10.00	95.76	0.40	0.50	1.00
Harvey #2 VFD Station 62	2200 Lapalco Blvd	Fire	Yes			10.00	95.76	0.20	0.60	1.30
Harvey #2 VFD Station 63	3824 Manhattan Blvd	Fire	Yes			1.00	26.03	0.00	0.00	0.80
Jeff Parish Fire Training Academy	200 East St	Fire				0.00	0.00	0.00	0.00	0.00

Facility	Address	Type	In Zone A/AE	In Zone V/VE	In Zone X	Annual Chance (%)	30yr Chance (%)	10 yr depth (ft)	50 yr depth (ft)	100 yr depth (ft)
Lafitte Barataria Crown Point VFD Station 41	4176 Privateer Blvd	Fire	Yes			0.00	0.00	0.00	0.00	5.70
Live Oak Manor VFD (Main) Station 72	404 Azalea Dr	Fire				0.00	0.00	0.00	0.00	0.00
Live Oak Manor VFD Station 73	160 Modern Farms Rd	Fire				0.00	0.00	0.00	0.00	0.00
Marrero Estelle VFD Station 83	4050 Barataria Blvd	Fire				0.00	0.00	0.00	0.00	0.00
Marrero Estelle VFD Station 84	3180 Destrehan Ave	Fire	Yes			10.00	95.76	0.90	1.30	2.10
Marrero Harvey VFD (Main) Station 80	531 Avenue C	Fire	Yes			2.00	45.45	0.00	0.10	0.70
Marrero Harvey VFD Station 81	808 McArthur Blvd	Fire	Yes			10.00	95.76	0.30	1.00	0.80
Marrero Harvey VFD Station 82	3649 Patriot St	Fire			Yes	0.20	5.83	0.00	0.00	0.00
Marrero Ragusa VFD (Main) Station 86	1400 Berger Rd	Fire				0.00	0.00	0.00	0.00	0.00
Marrero Ragusa VFD Station 87	455 St Ann St	Fire				0.00	0.00	0.00	0.00	0.00
Marrero Ragusa VFD Station 88	5725 Belle Terre Rd	Fire				0.00	0.00	0.00	0.00	0.00
Nine Mile Point	1024 Oak Ave	Fire	Yes			1.00	26.03	0.00	0.00	0.60
Terrytown VFD (Main) Sta. 51	341 Heritage Ave	Fire	Yes			10.00	95.76	0.40	0.60	1.20
Terrytown VFD Station 52	2201 Carol Sue Ave	Fire	Yes			10.00	95.76	0.90	1.20	1.70
Third District VFD Station 32	9421 Jefferson Hwy	Fire				0.00	0.00	0.00	0.00	0.00
Third District VFD Station 33	301 N Lester Ave	Fire	Yes			10.00	95.76	0.10	0.50	0.70
Wallace Memorial VFD Sta. 76	4040 Highway 90	Fire				0.00	0.00	0.00	0.00	0.00
First Parish Court	924 DAVID DRIVE	Government				0.00	0.00	0.00	0.00	0.00
Joe Yenni Bldg	1221 Elmwood Park Blvd.	Government	Yes			10.00	95.76	0.70	1.10	2.30

Facility	Address	Type	In Zone A/AE	In Zone V/VE	In Zone X	Annual Chance (%)	30yr Chance (%)	10 yr depth (ft)	50 yr depth (ft)	100 yr depth (ft)
East Jefferson Gen Hospital	4200 Houma Blvd	Hospital	Yes			10.00	95.76	0.20	0.30	0.80
Ochsner Foundation Hospital	1516 Jefferson Hwy	Hospital				0.00	0.00	0.00	0.00	0.00
West Jefferson Medical Center	1101 Medical Center Blvd	Hospital	Yes			10.00	95.76	0.40	0.70	1.40
Jefferson Parish Sheriffs Office First District Patrol Div	3620 Hessmer Avenue	Police				0.00	0.00	0.00	0.00	0.00
JPSO 2nd District	1901 Manhattan Blvd	Police	Yes			1.00	26.03	0.00	0.00	0.10
JPSO Admin Eastbank	3300 Metairie Rd	Police				0.00	0.00	0.00	0.00	0.00
JPSO Admin Westbank	1233 Westbank Expwy	Police				0.00	0.00	0.00	0.00	0.00
Ames Pump Station	5100 Rochester	Pump Station				0.00	0.00	0.00	0.00	0.00
BelMont Pump Station	2108 BELMONT PL	Pump Station	Yes			10.00	95.76	1.40	1.90	2.20
Bonnabel Pump Station	1500 Beverly Garden	Pump Station				0.00	0.00	0.00	0.00	0.00
Canal Street Pump Station	100 Canal St	Pump Station	Yes			0.00	0.00	0.00	0.00	13.30
Cousins Pump Station 1	Destrehan & Lapalco	Pump Station				0.00	0.00	0.00	0.00	0.00
Cousins Pump Station 2	Destrehan & Lapalco	Pump Station				0.00	0.00	0.00	0.00	0.00
Elmwood Canal Pump Station	ELMWOOD CANAL AT LAKE PONTCHART	Pump Station				0.00	0.00	0.00	0.00	0.00
Estelle Pump Station	3850 Destrahan Ave.	Pump Station				0.00	0.00	0.00	0.00	0.00
Harvey Pump Station	1600 Destrehan Ave.	Pump Station				0.00	0.00	0.00	0.00	0.00
Hero Pump Station	Peters Road	Pump Station				0.00	0.00	0.00	0.00	0.00
Lake Cataoutche Pump Station	3.5 Miles off of U.S. 90	Pump Station				0.00	0.00	0.00	0.00	0.00
Mount Kennedy Pump Station	3100 Mt Kennedy Dr	Pump Station				0.00	0.00	0.00	0.00	0.00
Planters Pump Station	268 Bypass Road	Pump Station				0.00	0.00	0.00	0.00	0.00
Pontiff Playground Pump Station	1521 Palm St	Pump Station	Yes			10.00	95.76	0.70	1.80	1.80
Suburban Canal Pump Station	SUBURBAN CANAL AT LAKE PONTCHAR	Pump Station				0.00	0.00	0.00	0.00	0.00
Upper Kraak Pump Station	911 KAYE ST	Pump Station				0.00	0.00	0.00	0.00	0.00

Facility	Address	Type	In Zone A/AE	In Zone V/VE	In Zone X	Annual Chance (%)	30yr Chance (%)	10 yr depth (ft)	50 yr depth (ft)	100 yr depth (ft)
Westminster Pump Station	2050 Watling	Pump Station	Yes			10.00	95.76	1.40	2.20	2.30
Whitney - Barataria Pump Station	1301 Engineers Road	Pump Station				0.00	0.00	0.00	0.00	0.00
Causeway Head Start	3420 N. Causeway Blvd	Shelter				0.00	0.00	0.00	0.00	0.00
JP Animal Shelter -West Bank	2701 Lapalco Blvd	Shelter	Yes			2.00	45.45	0.00	0.50	1.10
Jutland Head Start	1821 Jutland	Shelter				0.00	0.00	0.00	0.00	0.00
Kings Grant Playground	3805 15th Street	Shelter				0.00	0.00	0.00	0.00	0.00
Lapalco Head Start	2001 Lincolnshire Dr	Shelter				0.00	0.00	0.00	0.00	0.00
Little Farms Playground	10301 S Park St	Shelter				0.00	0.00	0.00	0.00	0.00
Miley Playground	6716 W Metairie	Shelter	Yes			10.00	95.76	0.60	0.80	1.40
Pard Playground	5185 Eighty Arpent Road	Shelter				0.00	0.00	0.00	0.00	0.00
Terrytown Gretna Head Start	2315 Park Place	Shelter				0.00	0.00	0.00	0.00	0.00
Terrytown Playground	641 Heritage Ave	Shelter				0.00	0.00	0.00	0.00	0.00
Eastbank Water Plant	3600 Jefferson Hwy	Water				0.00	0.00	0.00	0.00	0.00
Westbank Water Plant	4500 Westbank Exp.	Water	Yes			10.00	95.76	0.50	0.80	1.50
City of Gretna										
New EOC	910 3rd Street	EOC				0.00	0.00	0.00	0.00	0.00
David Crockett VFD (Mn) St 45	1136 Lafayette St	Fire				0.00	0.00	0.00	0.00	0.00
David Crockett VFD Station 46	323 Weidman St	Fire				0.00	0.00	0.00	0.00	0.00
David Crockett VFD Station 47	700 Gretna Blvd	Fire	Yes			10.00	95.76	0.40	0.90	1.10
David Crockett VFD Station 48	2000 Hancock St	Fire				0.00	0.00	0.00	0.00	0.00
Station 54	3301 WALL BLVD.	Fire	Yes			1.00	26.03	0.00	0.00	0.10
Terrytown VFD Station 53	200 Wall Blvd	Fire	Yes			1.00	26.03	0.00	0.00	1.60
Courthouse	200 Derbigny St	Government				0.00	0.00	0.00	0.00	0.00
Courthouse Annex	210 Derbigny St	Government				0.00	0.00	0.00	0.00	0.00

Facility	Address	Type	In Zone A/AE	In Zone V/VE	In Zone X	Annual Chance (%)	30yr Chance (%)	10 yr depth (ft)	50 yr depth (ft)	100 yr depth (ft)
EOC	910 3rd St	Government				0.00	0.00	0.00	0.00	0.00
General Government Building	200 Derbigny Street	Government				0.00	0.00	0.00	0.00	0.00
Gretna City Hall	740 2nd St	Government				0.00	0.00	0.00	0.00	0.00
Ochsner-Westbank Medical Center	2500 Belle Chase Hwy	Hospital				0.00	0.00	0.00	0.00	0.00
Gretna City Of Police Department Chief Of Police & A	200 5th St	Police				0.00	0.00	0.00	0.00	0.00
Jefferson Parish Sheriffs Office Correctional Center	100 Dolhonde St	Police				0.00	0.00	0.00	0.00	0.00
Mel Ott Multi Purpose Center	2301 Belle Chasse Hwy	Shelter	Yes			10.00	95.76	0.70	1.10	1.30
City of Harahan										
Eastbank Consolidated FD Fire Prevention/Arson Unit	834 S. Clearview Pkwy	Fire				0.00	0.00	0.00	0.00	0.00
Eastbank Consolidated FD Station 19	455 Edwards Ave	Fire				0.00	0.00	0.00	0.00	0.00
Harahan VFD Station 27	800 Randolph St	Fire				0.00	0.00	0.00	0.00	0.00
City Hall of Harahan	6425 Jefferson Hwy	Government				0.00	0.00	0.00	0.00	0.00
Harahan City Of Police Department Headquarters	6425 Jefferson Hwy	Police				0.00	0.00	0.00	0.00	0.00
Midway Pump Station	1 SHADY OAK LN	Pump Station	Yes			0.00	0.00	0.00	0.00	0.10
JP Animal Shelter - East Bank	1 Humane Way	Shelter				0.00	0.00	0.00	0.00	0.00
City of Kenner										
Louis Armstrong Airport	900 Airline Dr	Airport				0.00	0.00	0.00	0.00	0.00
Sourtheast Louisiana Flood Protection Authority-East EOC	1100 Reverend Richard Wilson Dr	EOC				0.00	0.00	0.00	0.00	0.00
City of Kenner EOC	1610 Reverend Richard Wilson Dr	EOC				0.00	0.00	0.00	0.00	0.00
Kenner FD Station 37	3928 Delaware Ave	Fire	Yes			10.00	95.76	0.50	0.50	0.50

Facility	Address	Type	In Zone A/AE	In Zone V/VE	In Zone X	Annual Chance (%)	30yr Chance (%)	10 yr depth (ft)	50 yr depth (ft)	100 yr depth (ft)
Kenner Fire Rescue Station 379	3343 Williams Blvd	Fire				0.00	0.00	0.00	0.00	0.00
Kenner FD HQ/Fire Alarm	2226 Williams Blvd	Fire				0.00	0.00	0.00	0.00	0.00
Kenner FD (Main) Station 35	1801 Williams Blvd	Fire				0.00	0.00	0.00	0.00	0.00
Kenner FD Station 36	315 Worth St	Fire				0.00	0.00	0.00	0.00	0.00
Kenner FD Station 39	401 Vintage Dr	Fire	Yes			1.00	26.03	0.00	0.00	0.10
Kenner City Hall	1801 Wiliams Blvd	Government				0.00	0.00	0.00	0.00	0.00
Ochsner-Kenner Medical Center	180 W Esplanade Ave	Hospital	Yes			2.00	45.45	0.00	0.40	0.40
East Jefferson Levee District Police Dept	1135 Lesan Dr	Police				0.00	0.00	0.00	0.00	0.00
Kenner Police HQ	500 Veterans Blvd	Police				0.00	0.00	0.00	0.00	0.00
Kenner Police Training Center	1939 Reverend Richard Wilson Dr	Police				0.00	0.00	0.00	0.00	0.00
Sourtheast Louisiana Flood Protection Authority-East Police Dept	1100 Reverend Richard Wilson Dr	Police				0.00	0.00	0.00	0.00	0.00
Duncan Canal Pump Station 4	DUNCAN CANAL AT LAKE PONTCHARTRA	Pump Station				0.00	0.00	0.00	0.00	0.00
Parish Line Pump Station	PARISH LINE & GRANDLAKE	Pump Station				0.00	0.00	0.00	0.00	0.00
Kenner Sewer Plant	1 West 30th Street	Sewer				0.00	0.00	0.00	0.00	0.00
Pontchartrain Center	4545 Williams Blvd	Shelter				0.00	0.00	0.00	0.00	0.00
City of Westwego										
Westwego EMS	918 6th St.	EMS				0.00	0.00	0.00	0.00	0.00
Westwego VFD Station 92	300 Columbus St	Fire	Yes			2.00	45.45	0.00	0.20	0.30
Westwego VFD Station 94	206 Louisiana St	Fire				0.00	0.00	0.00	0.00	0.00
Westwego VFD (Mn) Sta. 91	677 Avenue H	Fire				0.00	0.00	0.00	0.00	0.00
Westwego VFD Station 95	1164 Avenue C	Fire	Yes			10.00	95.76	0.10	0.50	0.50
Westwego VFD Station 93	1501 Central Ave	Fire	Yes			2.00	45.45	0.00	0.50	0.80

Facility	Address	Type	In Zone A/AE	In Zone V/VE	In Zone X	Annual Chance (%)	30yr Chance (%)	10 yr depth (ft)	50 yr depth (ft)	100 yr depth (ft)
Westwego City Hall	419 Avenue A	Government	Yes			10.00	95.76	0.50	1.10	1.20
Westwego City Of Police Department Police Chief	401 4th Street	Police				0.00	0.00	0.00	0.00	0.00
Bayou Segnette Pump Station	801 Louisiana Ave	Pump Station				0.00	0.00	0.00	0.00	0.00
Westwego Pump Station 1	100 Vic A. Pitre Drive	Pump Station	Yes			10.00	95.76	5.30	5.90	5.90
Westwego Pump Station 2	820 South Laroussine	Pump Station	Yes			0.00	0.00	0.00	0.00	2.60
Alario Center	2000 Segnette Blvd	Shelter			Yes	0.20	5.83	0.00	0.00	0.00
Town of Grand Isle										
Grand Isle Fire	100 Chighizola Lane	Fire		Yes		Not Available	Not Available	Not Available	Not Available	9.60
Grand Isle Town Hall	170 Ludwig Ln	Government		Yes		Not Available	Not Available	Not Available	Not Available	10.90
Grand Isle Town Of Police Dept	134 Ludwig Ln	Police		Yes		Not Available	Not Available	Not Available	Not Available	11.30
Town of Jean Lafitte										
Lafitte Barataria Crown Point VFD (Main) Station 40	2385 Jean Lafitte Blvd	Fire	Yes			Not Available	Not Available	Not Available	Not Available	5.00
Lafitte Barataria Crown Point VFD Station 43	5510 Jean Lafitte Blvd	Fire	Yes			Not Available	Not Available	Not Available	Not Available	6.60
Jean Lafitte Town Hall	2654 Jean Lafitte Blvd	Government	Yes			Not Available	Not Available	Not Available	Not Available	3.60
Jean Lafitte Police	2607 Jean Lafitte Blvd	Police	Yes			Not Available	Not Available	Not Available	Not Available	4.80
Crown Point Pump Station 2	OAK TRAILER PARK	Pump Station	Yes			Not Available	Not Available	Not Available	Not Available	5.80
Crown Point Pump Station 1		Pump Station	Yes			Not Available	Not Available	Not Available	Not Available	7.50
Rosethorn Pump Station		Pump Station	Yes			Not Available	Not Available	Not Available	Not Available	7.70
August Lane Pump Station		Pump Station	Yes			Not Available	Not Available	Not Available	Not Available	8.70
Highway 45 Pump Station	2013 Jean Lafitte Blvd	Pump Station	Yes			Not Available	Not Available	Not Available	Not Available	4.70

Facility	Address	Type	In Zone A/AE	In Zone V/VE	In Zone X	Annual Chance (%)	30yr Chance (%)	10 yr depth (ft)	50 yr depth (ft)	100 yr depth (ft)
Jones Point Pump Station	Dead end Carmelite St	Pump Station	Yes			Not Available	Not Available	Not Available	Not Available	1.10
Fleming Pump Station	DARDAR ST	Pump Station	Yes			Not Available	Not Available	Not Available	Not Available	7.70
Oak Dr Pump Station	OAK ST	Pump Station	Yes			Not Available	Not Available	Not Available	Not Available	5.80
Perkins Street Pump Station	End of Perkins St	Pump Station	Yes			Not Available	Not Available	Not Available	Not Available	5.70
Church Street Pump Station		Pump Station	Yes			Not Available	Not Available	Not Available	Not Available	7.00
Gloria Pump Station		Pump Station	Yes			Not Available	Not Available	Not Available	Not Available	2.70
Pailet Pump Station		Pump Station	Yes			Not Available	Not Available	Not Available	Not Available	5.00
Goose Bayou Pump Station	4875 DECAMP ST	Pump Station	Yes			Not Available	Not Available	Not Available	Not Available	3.30
Marrero St Pump Station	5117 2ND ST	Pump Station	Yes			Not Available	Not Available	Not Available	Not Available	7.20
Lafitte Water Tower	3448 JEAN LAFITTE BLVD	Water	Yes			Not Available	Not Available	Not Available	Not Available	6.00

4.3.9 Conclusion

Flood continues to be the most significant risk for Jefferson Parish as evidenced by the historic losses, repetitive loss properties, estimates of future damage from flood events. Critical facilities parish wide are also vulnerable to a future flood event with many having a high risk of incurring damage in multiple different return period events. Reduction of these risks will be addressed in greater detail in the Mitigation Strategy Section (Section 5).

4.4 Hurricanes and Tropical Storms

4.4.1 Description of the Hurricane and Tropical Storms Hazard

Hurricanes, tropical storms, and typhoons, collectively known as tropical cyclones, are among the most devastating naturally occurring hazards in the United States. They present flooding, storm surge, and high wind hazards to the communities that they impact.

A hurricane is defined as a low-pressure area of closed circulation winds that originates over tropical waters. A hurricane begins as a tropical depression with wind speeds below 39 mph. As it intensifies, it may develop into a tropical storm, with further development producing a hurricane. See Appendix D, General Descriptions of Natural Hazards, for a more detailed description and definition of the hurricane and tropical storm hazard.

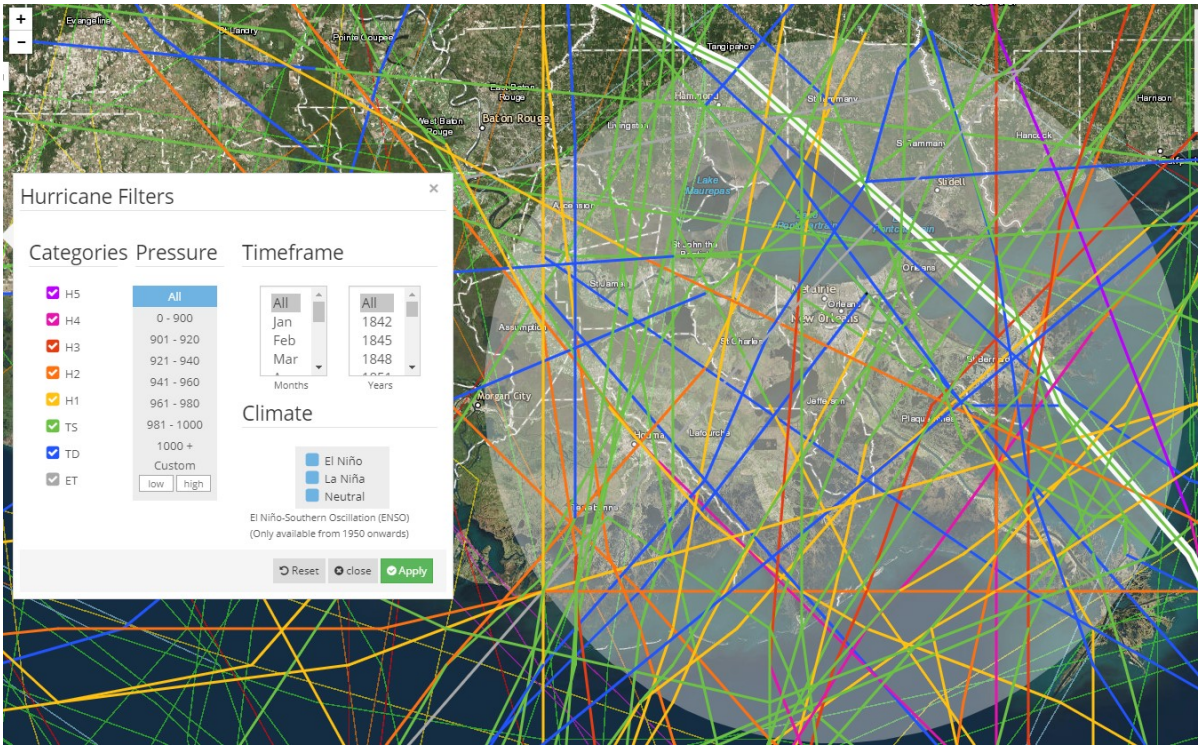
4.4.2 Location and Extent of the Hurricane and Tropical Storm Hazard

The hurricane risk in the United States extends along the entire east coast from Main to Florida, the Gulf Coast (including Florida, Alabama, Louisiana, and Texas), and Hawaii. The southeastern U.S. and Gulf Coast are at greatest risk based on historical storm tracks and the warmer waters of the Gulf of Mexico and Atlantic Ocean.

According to the NECI Storm Events Database, there have been 29 hurricanes and tropical storms recorded in Jefferson Parish between January 1996 and May 2018. Of those 29 events, 13 are classified as hurricanes, four of which were a Category 1, three a Category 2, five a Category 3, one a Category 4, and one a Category 5. Although the entire planning area is subject to the effects of hurricanes and tropical storms, the southern part (particularly the Island of Grand Isle) is considered most vulnerable. Grand Isle is situated along the Gulf of Mexico at the southern point of the Parish and is directly exposed to hurricanes that make landfall along the Gulf. Based on past records, the entire planning area can expect hurricanes as strong as Category 5 in future events.

Figure 39 shows all recorded, historical hurricanes that came within 65 nautical miles of Jefferson Parish from 1842 to 2017. The map was developed using NOAA's Historic Hurricane Tracks Tool.[23]

Figure 39
Historic Hurricanes Within 65 Nautical Miles of Jefferson Parish



Source: NOAA Coastal Service Center – Historic Hurricane Tracks database

4.4.3 Severity of the Hurricane and Tropical Storm Hazard

The severity of hurricanes and tropical storms is measured primarily by wind velocity, flooding, and storm surge. For the period 1886 – 1994, an average of five hurricanes per year has occurred in the North Atlantic basin. This region is particularly vulnerable because hurricanes occur frequently, the areas are prone to storm surge and coastal riverine flooding, and the population has climbed to an estimated 36 million people.

As shown in **Table 43**, the Saffir-Simpson Hurricane Scale is used to classify storms by numbered categories. Hurricanes are classified as Categories 1 through 5 based on central pressure, wind speed, storm surge height, and damage potential.

Table 43
Saffir-Simpson Hurricane Scale
(Source: NOAA[24])

Storm Category	Central Pressure	Sustained Winds	Storm Surge	Potential Damage
1	> 980 mbar	74 - 95 mph	4 – 5 ft	Minimal
2	965 – 979 mbar	96 - 110 mph	6 – 8 ft	Moderate
3	945 – 964 mbar	111 – 129 mph	9 – 12 ft	Extensive
4	920 – 944 mbar	130 – 156 mph	13 – 18 ft	Extreme
5	< 920 mbar	> 157 mph	> 18 ft	Catastrophic

4.4.4 Impact on Life and Property

Zero injuries and twenty-seven deaths are reported in the NCEI Storm Events Database for hurricanes and tropical storms for Jefferson Parish from January 1996 to May 2018. Property damage was estimated at $1.77 billion dollars. The dollar value associated with wind damage is seemingly small, but this is in part due to the difficulty in differentiating between damage caused by flood/surge and that actually caused by wind.

The wind associated with hurricanes turns loose objects into flying debris. This debris can cause injury to those out in the open or near unprotected windows. Flooding typically accompanies hurricanes as well. Floodwater may contain toxins such as bacteria, oil, pesticides, and sewage as well as sharp objects that may cause injury and lead to infection.

To help keep Jefferson Parish residents safe, it is vital to warn them when there are impending hazards. To do this, the Jefferson Parish Emergency Management (JPEM) has an Emergency Alert System called JPAlert that is used for flood warnings and evacuations. This system is capable of sending out automated and manual alerts by text, email, or voice phone calls providing flood-related warnings due to inclement weather. This system works in conjunction with watches and warnings issued by the National Weather Service; river gauge and other levee protection water heights, as well as real-time data from the Parish's Supervisory Control and Data Acquisition system (SCADA). As the user, Jefferson Parish, initiates warnings by sending out messages by city, zip codes, geographic drawn shapes, predesignated groups, individuals, or to all residents & businesses.

Just like with heavy floods, hurricanes sometimes warrant an evacuation. An evacuation notice will be issued when a hurricane is forecasted to present a danger to Jefferson Parish. The timing of this notice will depend on the probability of landfall in the area and the severity and forward speed of the storm.

The overall strategy for dealing with a catastrophic hurricane is to evacuate the at-risk population from the path of the storm. Evacuees would be relocated to a place of relative safety outside the projected storm surge flooding and hurricane force winds. In Jefferson Parish, no public shelters will be open for a slow-moving Cat 3 or a slow/fast moving Cat 4 or 5. Residents will be directed to evacuate to public shelters in other sectors of the State. In-Parish evacuation and sheltering can be used for the lower-category of hurricanes (Cat 1 & 2) when in-Parish procedures can meet the threat.

Traffic control devices, such as signs and barricades and special signalization, will be provided by Public Works Department/Traffic Engineering and Parish and State Police Officers.

4.4.4-1 Impact on Public Health

Hurricanes and tropical storms are wind hazards, but the floodwaters that follow wreak havoc on public health. If the water is unable to drain within a few days, mosquitoes begin to breed and spread infectious diseases. Animals living in nearby waterways such as alligators and snakes may become displaced, posing a serious threat to the public. Once the floodwater subsides, people can begin drying out their flooded homes. If they are not able to access their homes for an extended period of time, mold could begin growing. When there is no electricity to dry out a flooded home and the air is humid, mold spreads very quickly in the moist heat. Mold has been linked to respiratory conditions

including asthma and allergies. Additionally, displacement from one's home and/or community can affect mental health and often results in post-traumatic stress disorder (PTSD).

4.4.5 Occurrences of the Hurricane and Tropical Storm Hazard

While the NCEI Storm Events Database only lists hurricane and tropical storm events in Jefferson Parish between 1996 and 2018, FEMA's database of declared disasters indicates five additional hurricanes affected Jefferson Parish prior to 1996 for a total of 29 events since 1965. Jefferson Parish experiences hurricanes and tropical storms on average slightly less than once every two years. The 29 events have occurred over a period of 53 years which calculates to a 55% annual probability of future hurricane or tropical storm occurrences.

Table 44 below summarizes the hurricanes and tropical storms occurring in Unincorporated Jefferson Parish, City of Gretna, City of Harahan, City of Kenner, City of Westwego, Town of Grand Isle, and Town of Jean Lafitte in the last 10 years.

Table 44
Hurricane and Tropical Storm Events, Jefferson Parish Planning Area, January 2008 – May 2018
Lower Jefferson: Unincorporated Jefferson Parish, Town of Grand Isle, and Town of Jean Lafitte. Upper Jefferson: Unincorporated Jefferson Parish, City of Gretna, City of Harahan, City of Kenner, and City of Westwego
(Source: NOAA/NCEI[25])

	Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1.	LOWER JEFFERSON (ZONE)	08/03/2008	16:00	Tropical Storm	N/A	0	0	0.00K	0.00K
2.	LOWER JEFFERSON (ZONE)	09/01/2008	00:00	Hurricane (typhoon)	Cat 2	0	0	1.780M	0.00K
	UPPER JEFFERSON (ZONE)	09/01/2008	00:00	Hurricane (typhoon)	Cat 2	0	0	750.00K	0.00K
3.	UPPER JEFFERSON (ZONE)	09/11/2008	05:00	Hurricane (typhoon)	Cat 2	0	0	0.00K	0.00K
	LOWER JEFFERSON (ZONE)	09/11/2008	05:00	Hurricane (typhoon)	Cat 2	0	0	0.00K	0.00K
4.	LOWER JEFFERSON (ZONE)	11/09/2009	12:00	Tropical Storm	N/A	0	0	0.00K	0.00K
	UPPER JEFFERSON (ZONE)	11/09/2009	12:00	Tropical Storm	N/A	0	0	0.00K	0.00K
5.	UPPER JEFFERSON (ZONE)	09/02/2011	16:00	Tropical Storm	N/A	0	0	25.00K	0.00K
	LOWER JEFFERSON (ZONE)	09/02/2011	16:00	Tropical Storm	N/A	0	0	25.00K	0.00K
6.	UPPER JEFFERSON (ZONE)	08/28/2012	04:00	Hurricane (typhoon)	Cat 1	0	0	6.020M	0.00K
	LOWER JEFFERSON (ZONE)	08/28/2012	04:00	Hurricane (typhoon)	Cat 1	0	0	6.020M	0.00K

	Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
7.	LOWER JEFFERSON (ZONE)	06/20/2017	9:00	Tropical Storm	N/A	0	0	0.00K	0.00K
	UPPER JEFFERSON (ZONE)	06/20/2017	21:00	Tropical Storm	N/A	0	0	0.00K	0.00K

Significant events for Unincorporated Jefferson Parish, City of Gretna, City of Harahan, City of Kenner, City of Westwego, Town of Grand Isle, and Town of Jean Lafitte are summarized below:

- August 3, 2008 – Tropical Storm Edouard formed over the north central Gulf of Mexico on the afternoon of August 3rd. Edouard moved east northeast offshore the south Louisiana coastline before making landfall on the upper Texas Coast on Tuesday August 5th. The effects on the southeast Louisiana were minimal and confined to the coastal areas west of the Mississippi River. Tropical storm force winds, primarily in gusts, occurred along the coast. Tides were generally 1 to 3 feet above normal with a few low-lying roadways having minor flooding.

- September 1, 2008 – Hurricane Gustav emerged into the southeast Gulf of Mexico as a major category 3 hurricane on August 31st after developing in the Caribbean Sea and moving across western Cuba. Gustav tracked northwestward across the Gulf toward Louisiana and made landfall as a category 2 hurricane near Cocodrie, Louisiana during the morning of September 1st. The highest wind gust recorded was 117 mph at a USGS site at the Houma Navigational Canal and at the Pilot Station Est C-MAN at near the Southwest Pass of the Mississippi River. Rainfall varied considerably across southeast Louisiana ranging from around 4 inches to just over 11 inches. Storm surge around Lake Pontchartrain was generally 4 to 5 feet above normal. Storm surge affected many low-lying coastal areas as well as areas around Lake Pontchartrain, but federal levees protected most of the high-density population areas of greater New Orleans. However, some locally built levees were breached or overtopped. Hurricane Gustav affected over 100 homes in the lower portion of Jefferson Parish with 4 homes being destroyed, 41 receiving major damage, and around 40 minor damage. A number of businesses also received damage and several trees and utility poles were knocked down. Substantial damage from coastal flooding also occurred in lower Jefferson Parish, especially in Grand Isle where major beach erosion also occurred. In the upper portion of Jefferson Parish, Hurricane Gustav caused minor damage to several homes. Some businesses also received damage and several trees and utility poles were knocked down from the strong winds.

- September 11, 2008 – Hurricane Ike emerged into the southeast Gulf of Mexico as a category 1 hurricane on September 9th after earlier being a major hurricane as it moved across the Caribbean. Ike gradually intensified and developed an unusually large wind field as it tracked northwest across the Gulf over the next three days. Ike made landfall as a category 2 hurricane during the early morning hours on September 13th along the northern end of Galveston Island, Texas. The main effect of Ike on southeast Louisiana was the storm surge which inundated sections of the coast, especially Terrebonne and Lafourche Parish. The unusually high storm surge of approximately 5 feet above normal in Lake Pontchartrain generated by the distant hurricane affected many low-lying coastal areas as well as areas around Lake Pontchartrain, but federal levees protected most of the high-density population areas of greater New Orleans. In southern Jefferson Parish from Lafitte and Crown Point to Grand Isle, approximately 2,500 structures were flooded. Considerable storm surge flooding

was noted around Lakes Pontchartrain and Maurepas. The storm surge flooding took several weeks to fully drain from many low-lying areas of southeast Louisiana. Rainfall across the area was mainly less than one and a half inches.

- November 9, 2009 – Ida developed from a tropical wave moving over the southwestern Caribbean Sea that spawned an area of low pressure on November 2nd. This low pressure developed into a tropical depression on November 4th and then strengthened into a tropical storm a little later that same day. Ida then increased to hurricane strength on November 5th before shortly thereafter making landfall in Nicaragua. After weakening to a tropical depression while over land in Nicaragua and Honduras, Ida emerged back into the western Caribbean and strengthened into a hurricane once again late on November 7th as it tracked north toward the southern Gulf of Mexico. Ida continued north into the central Gulf of Mexico as a hurricane before weakening to a tropical storm early November 9th as moved into the northern Gulf. The storm briefly became a hurricane once again later that day south of the Mississippi River and then weakened to a tropical storm late on November 9th as it encountered increasing wind shear and cooler waters. Ida moved across the southeast Louisiana and Mississippi coastal waters as a tropical storm late on the 9th and early on the 10th of November. Ida became extratropical on the morning of November 10th and dissipated over the Florida panhandle on November 11th.

  Tropical Storm Ida's effects on coastal areas of southeast Louisiana were relatively minor as the storm weakened as it moved across the coastal waters east of the Mississippi River and only brushed the region. Moderate beach erosion did occur in lower Jefferson Parish where storm surge eroded 100 to 200 feet of beach and cut a new pass through Elmer's Island adjacent to Grand Isle. In addition, on Grand Isle in lower Jefferson Parish two or three homes were threatened when a 1,000-foot section of a local levee on the western side of the island collapsed as waters from Barataria Bay began to rise. The maximum sustained wind recorded in the vicinity of coastal southeast Louisiana was 52 knots at Pilots Station East near the mouth of the Mississippi River. The storm surge during the event generally ranged from around 2 to 6.5 feet along the southeast Louisiana coast. Rainfall totals were generally around 1 inch or less.

- September 2, 2011 - Tropical Storm Lee initially developed as Tropical Depression Thirteen in the middle Gulf of Mexico on Thursday evening September 1st. The depression moved slowly north and gradually strengthened, eventually reaching tropical storm strength just south of the Louisiana coast on Friday afternoon September 2nd. Tropical Storm Lee made only slow and haltingly northward progress over the next 24 hours eventually moving onshore the Louisiana coast Saturday night, September 3rd, with a maximum sustained wind estimated around 60 mph. As Tropical Depression Lee was moving northeast and taking on mid-latitude characteristics, strong northerly winds were experienced across the region, occasionally gusting to higher levels than experienced when Lee was characterized as a tropical storm.

  No fatalities or injuries were associated with any Tropical Storm Lee hazards. The main impacts associated with Tropical Storm Lee were associated with storm surge and rainfall. Both of these impacts were related to its slow forward speed as it crossed the region which allowed the circulation to linger over the area for several days. Storm surge associated with Lee caused tide values to be 3 to 5 feet above normal causing low land flooding. The four-day storm total rainfall ranged between 7 and 15 inches across the area. A maximum of 15.48 inches was recorded near Holden in Livingston Parish. Due to dry antecedent conditions,

river flooding was minimal for the amount of rainfall that occurred. Wind impacts were generally minimal due to only tropical storm strength winds recorded, resulting in tree limbs being blown down, and weak trees toppling causing power outages. All of the hazards associated with TS Lee resulted in an estimated $3.0 million in property damage. The majority of the damage, approximately $2 million, was associated with storm surge flooding impacts. Flash flooding resulted in an estimated $75,000 in damages.

- August 28, 2012 - Isaac entered the Gulf of Mexico as a tropical storm on August 26, moving northwest after crossing Haiti, Cuba and the Florida Straits. Isaac strengthened into a hurricane on the morning of the 28th when it was 75 miles south-southeast of the mouth of the Mississippi River. Isaac made landfall in Plaquemines Parish as a Category 1 Hurricane near Southwest Pass of the Mississippi River on the evening of the 28th. A second landfall occurred near Port Fourchon the following morning. The storm weakened to a tropical storm on the afternoon of the 29th about 50 miles west southwest of New Orleans and weakened further to a tropical depression on the afternoon of the 30th near Monroe, Louisiana.

  The highest wind gust recorded on land in Louisiana was 86 mph, measured by a portable weather station (Texas Tech University) near Buras on the evening at August 28. Due to Isaac's very large size, and slow forward speed, tropical storm force winds lasted in excess of 48 hours in many areas of coastal southeast Louisiana. Occasional hurricane gusts of 70 to 85 mph were recorded across southeast Louisiana during the night of the Aug 28th and early on the 29th, especially south of Lake Pontchartrain. Interior areas of southeast Louisiana such as around Baton Rouge and northward experienced tropical storm force winds. Widespread power outages occurred across the area. Local utility companies reported over 700,000 customers were without power at the peak of the storm in southeast Louisiana. Some of those outages lasted as long as seven days before being restored. Generally, most of the wind damage was limited to downed trees and power lines, and roof damage caused by wind and falling trees and tree limbs.

  Significant impact also occurred around Lakes Pontchartrain and Maurepas with a storm tide of 5 to 9 feet. Roadways and low-lying property were flooded. Local levees around Lafitte and Myrtle Grove were overtopped and/or breached resulting flooding of numerous houses and property in this area. Many areas of southeast Louisiana received 8 to 12 inches of rain with a few locations having 15 inches of rain or more. Maximum storm total rainfall was 20.66 inches at the New Orleans Carrollton gauge on the Mississippi River. Overall impacts of Isaac resulted in at least $600 million in damages in southeast Louisiana, 3 direct fatalities, and 2 indirect fatalities. Storm surge flooding accounted for the bulk of damage, estimated around $500 million and the three direct storm surge fatalities in Louisiana. Winds accounted for a much lesser amount of slightly more than a $100 million. As stated earlier, these are early damage estimates and will likely be adjusted upward due to later damage assessments.

  Localized damage also impacted Jefferson Parish as a result of the high wind, flood water, and surge: Sewerage bypass pumps and lift stations were flooded, water lines were damaged by the uprooting of trees, and transportation routes were blocked by debris which slowed recovery efforts. In an attempt to off-set these issues, temporary pumps and sand bags were utilized outside of the levee system.

  During the recovery process there were two indirect fatalities. On Sept 1, a 67-year-old man was electrocuted when attempting to restore power to his house in Abita Springs, St

Tammany Parish. On Sept 3, a 90-year-old man died of heat related impacts in his house in Marrero, Jefferson Parish, where power had not been restored.

- June 20, 2017 - Tropical Storm Cindy developed over the central Gulf of Mexico on June 20th and moved generally northwest for the next few days before making landfall in southwest Louisiana near the Louisiana and Texas state line.

  Cindy was an asymmetric system as it moved through the central Gulf toward southwest Louisiana, resulting in minor to moderate impacts across southeast Louisiana. The storm resulted in heavy rainfall, minor storm surge flooding, and isolated damage due to strong winds.

  The minimum sea level pressure of 1004.4 mb, along with the highest wind gust and highest sustained wind in southeast Louisiana were all measured by the New Orleans Lakefront Airport ASOS. The highest wind gust recorded was 43 knots, or 49 mph, and the maximum sustained wind in southeast Louisiana was 38 knots, or 44 mph. Tropical storm force winds were primarily experienced in gusts as squalls moved through the area. The winds did cause isolated minor damage to trees, roofs, and power lines. The only two known injuries in southeast Louisiana resulted from a tree falling on a mobile home in Houma.

  A storm tide of generally 4 to 6 feet occurred along the Gulf Coast of southeast Louisiana from St. Bernard Parish through Terrebonne Parish. The highest measured storm tide was 6.18 ft NAVD88 at a USGS gauge near Point a la Hache in Plaquemines Parish. The elevated tides resulted in minor to moderate flooding mainly of low-lying land and roadways outside the federal levee system.

  Around Lake Pontchartrain, storm tide was generally measured in the 2 to 4 ft range, with a maximum value of 4.29 ft NAVD88 at the USCOE gauge near Mandeville. Again, impacts were minor to moderate with flooding to low lying land and roadways outside of levees systems.

  Many areas of southeast Louisiana received 3 to 5 inches of rain with a few measurements in excess of 6 inches. Maximum storm total rainfall was 6.52 inches measured at a CoCoRaHS station in St. Bernard. The rainfall resulted in some minor river flooding across portions of the north shore of Lake Pontchartrain.

  Frequent tropical storm force gusts and a few instances of sustained tropical storm force winds affected the parish - especially at Grand Isle. A maximum wind gust of 43 kts, or 49 mph, was reported by the Grand Isle C-Man station (GISL1) at 6 pm CST on the 20th. The same station also reported maximum sustained winds of 34 kts, or 39 mph, at 5:42 pm CST on the 20th.

  Frequent tropical storm force wind gusts were reported at New Orleans International Airport (KMSY). The highest gust reported was 39 knots at 12:17 am CST on June 21. The strong winds downed a tree on Lakeshore Drive in Metairie.

In addition to data collected from national reports, Jefferson Parish has also developed an online platform for recording historic hazard events that is updated regularly by Parish staff. **Table 45** below summarizes hurricane and tropical storm events captured through this platform in Jefferson Parish in the last 11 years (note, additional hurricane and tropical storm events not listed here are captured under other hazards such as flood).

Table 45
Hurricane and Tropical Storm Events, Jefferson Parish, 2007 – 2018

Location	Number of Events
Gretna	0
Harahan	0
Kenner	0
Westwego	0
Grand Isle	1
Jean Lafitte	0
Unincorporated Jefferson Parish	1
TOTAL	**2**

4.4.6 Municipality Hurricane & Tropical Storm Hazards

Unincorporated Jefferson Parish

Hurricanes are also a significant threat to Unincorporated Jefferson Parish. All of the parish wide events listed in the table above also impacted the unincorporated areas of Jefferson Parish. Jefferson Parish is only approximately 30-50 miles from the Gulf Coast. Of these miles, approximately 39 miles are marsh wetlands. These wetlands act as a buffer and can significantly reduce wind speeds as a hurricane makes landfall. Even with this buffer, hurricane strength winds and gusts are often felt hundreds of miles inland. The high winds associated with a major hurricane could have a devastating impact on the Planning Area. The entire Parish is subject to the effects of future hurricanes and tropical storms.

City of Gretna

Hurricanes are also a significant threat to the City of Gretna. All of the parish wide events listed in the table above also impacted the City of Gretna. Gretna is only approximately 45 miles from the Gulf Coast. Of these 45 miles, approximately 39 miles are marsh wetlands. These wetlands act as a buffer and can significantly reduce wind speeds as a hurricane makes landfall. Even with this buffer, hurricane strength winds and gusts are often felt hundreds of miles inland. The high winds associated with a major hurricane could have a devastating impact on the City. The entire City is subject to the effects of future hurricanes and tropical storms.

City of Harahan

Hurricanes are also a significant threat to the City of Harahan. All of the parish wide events listed in the table above also impacted the City of Harahan. Harahan is approximately 45 miles from the Gulf Coast. These 45 miles are separated by large areas of marsh wetlands that extend inland from Grand Isle. These wetlands act as a buffer and can significantly reduce wind speeds as a hurricane makes landfall. Even with this buffer, hurricane strength winds and gusts are often felt hundreds of miles inland. The high winds associated with a major hurricane could have a devastating impact on the City. The entire City is subject to the effects of future hurricanes and tropical storms.

City of Kenner

Hurricanes are a significant threat to the City of Kenner. All of the parish wide events listed in the table above also impacted the City of Kenner. The City is located approximately 50 miles from the Gulf Coast, separated by large areas of marsh wetlands that extend inland from Grand Isle. These wetlands act as a buffer and can significantly reduce wind speeds as a hurricane makes landfall. Even with this buffer, hurricane strength winds and gusts are often felt hundreds of miles inland. The high winds associated with a major hurricane could have a devastating impact on the City. The entire City is subject to the effects of future hurricanes and tropical storms.

City of Westwego

Hurricanes are a significant threat to the City of Westwego. All of the parish wide events listed in the table above also impacted the City of Westwego. The City of Westwego is located approximately 45 miles from the Gulf Coast, separated by large areas of marsh wetlands that extend inland from Grand Isle. These wetlands act as a buffer and can significantly mitigate storm surge as a hurricane makes landfall. Even with this buffer, hurricane strength winds and gusts are often felt hundreds of miles inland. The entire City is subject to the effects of future hurricanes and tropical storms.

Town of Grand Isle

High winds from hurricanes are also a significant threat to the Town of Grand Isle. All of the parish wide events listed in the table above also impacted the Town of Grand Isle. The Island is located along the Louisiana coastline adjacent to the Gulf of Mexico. When future hurricane events impact Grand Isle, the high winds associated with a hurricane most likely would be devastating to the Town. The entire Town is subject to the effects of future hurricanes and tropical storms.

Town of Jean Lafitte

Hurricanes are a significant threat to the Town of Jean Lafitte. All of the parish wide events listed in the table above also impacted the Town of Jean Lafitte. Jean Lafitte is located approximately 30 miles from the Gulf Coast separated by large areas of marsh wetlands that extend inland from Grand Isle. These wetlands act as a buffer and can significantly reduce wind speeds as a hurricane makes landfall. Even with this buffer, hurricane strength winds and gusts are often felt hundreds of miles inland. The high winds associated with a major hurricane could have a devastating impact on the Town. The entire Town is subject to the effects of future hurricanes and tropical storms.

4.4.7 Hurricane & Tropical Storm Risk Assessment

Protection against hurricane and tropical storm wind damage is difficult to provide to a Parish as a whole. Existing individual structures must be hardened and/or secured in order to produce a wind-sustainable community. Due to the nature of wind events and the potential to have wide-ranging impacts across a community, wind risk was estimated by Census Block using various Hazus scenarios to determine potential damage.

Hazus Structural Damage Assessment

As part of the risk assessment for hurricane wind damage, Hazus 4.2 SP1 was used to model damages both in terms of building counts and total dollar losses (including structural, contents, inventory) that would potentially be incurred from a storm event. Hazus provides both tabular and visual data

that can be useful in projecting future damages. **Table 46** and **Table 47** show the estimated damages in terms of buildings, contents and inventory loss based on the wind scenarios that were run.

Table 46
Hazus Hurricane Katrina Modeled Scenario- Direct Economic Losses for Buildings

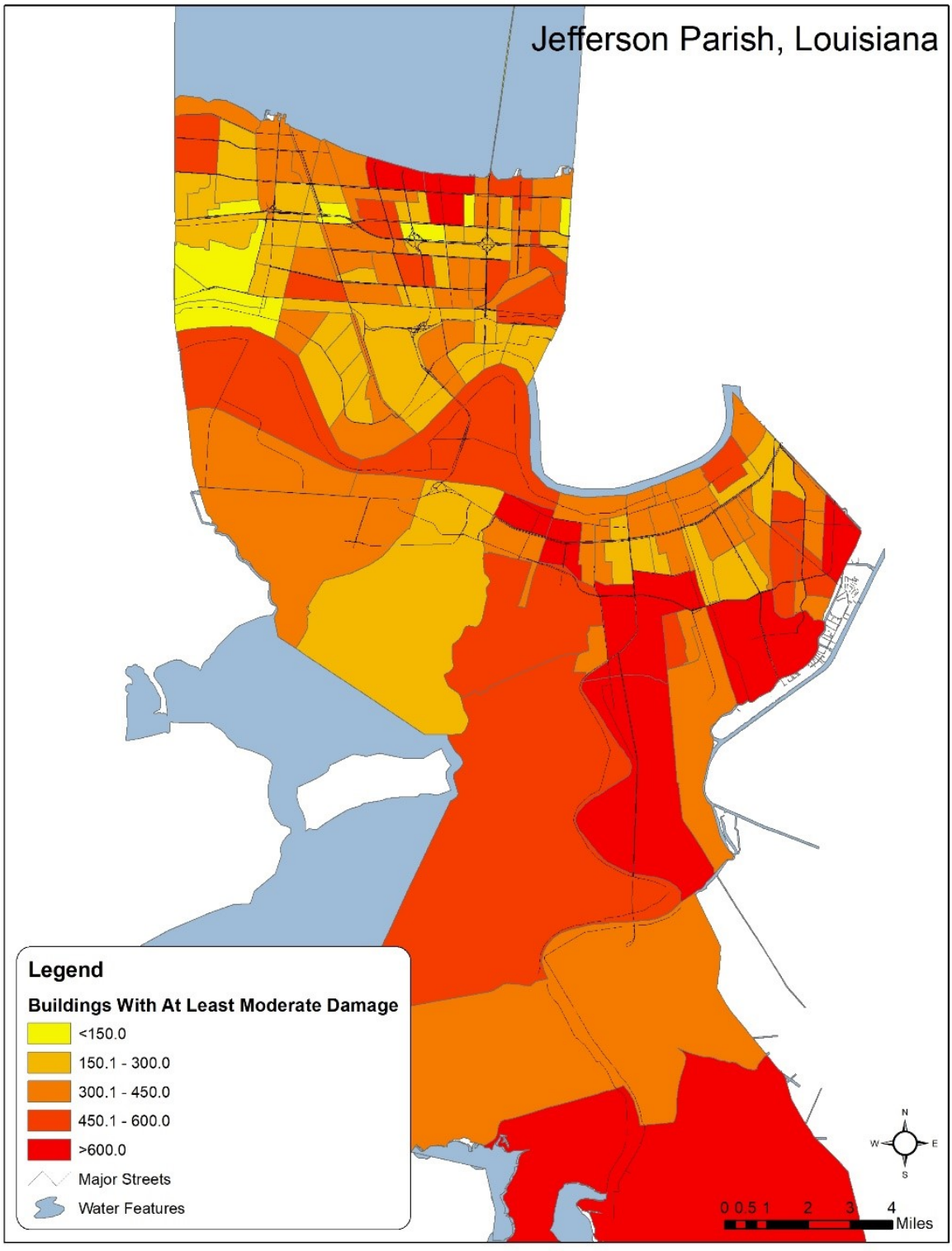
Community	Building Damage	Contents Damage	Inventory Loss	Total
Jefferson Parish	$986,380,000	$175,322,000	$1,665,000	$1,163,367,000

Table 47
Hazus Hurricane 100 Year Probabilistic Scenario- Annualized Losses for Buildings

Community	Building Damage	Contents Damage	Inventory Loss	Total
Jefferson Parish	$106,348,000	$32,869,000	$342,000	$139,559,000

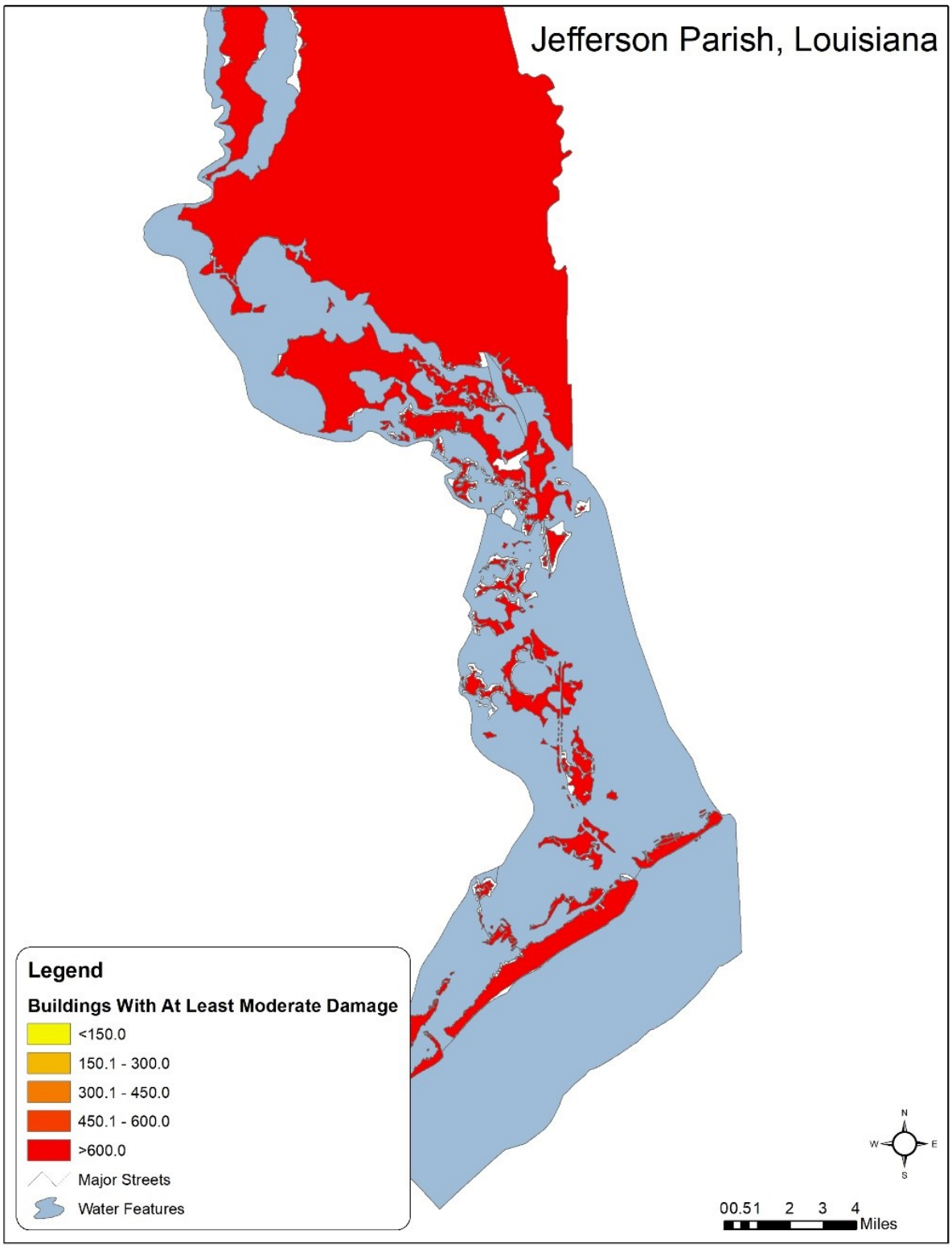
Figure 40, Figure 41, Figure 42 and **Figure 43** show the results of a Hurricane Katrina modeled scenario in which the path and strength of the storm in the model are equivalent to the true storm's attributes, but the scenario is run using updated Census Tract information to estimate building losses.

Figure 40
Hazus Hurricane Katrina Modeled Scenario North Parish- Count of Buildings with At Least Moderate Damage



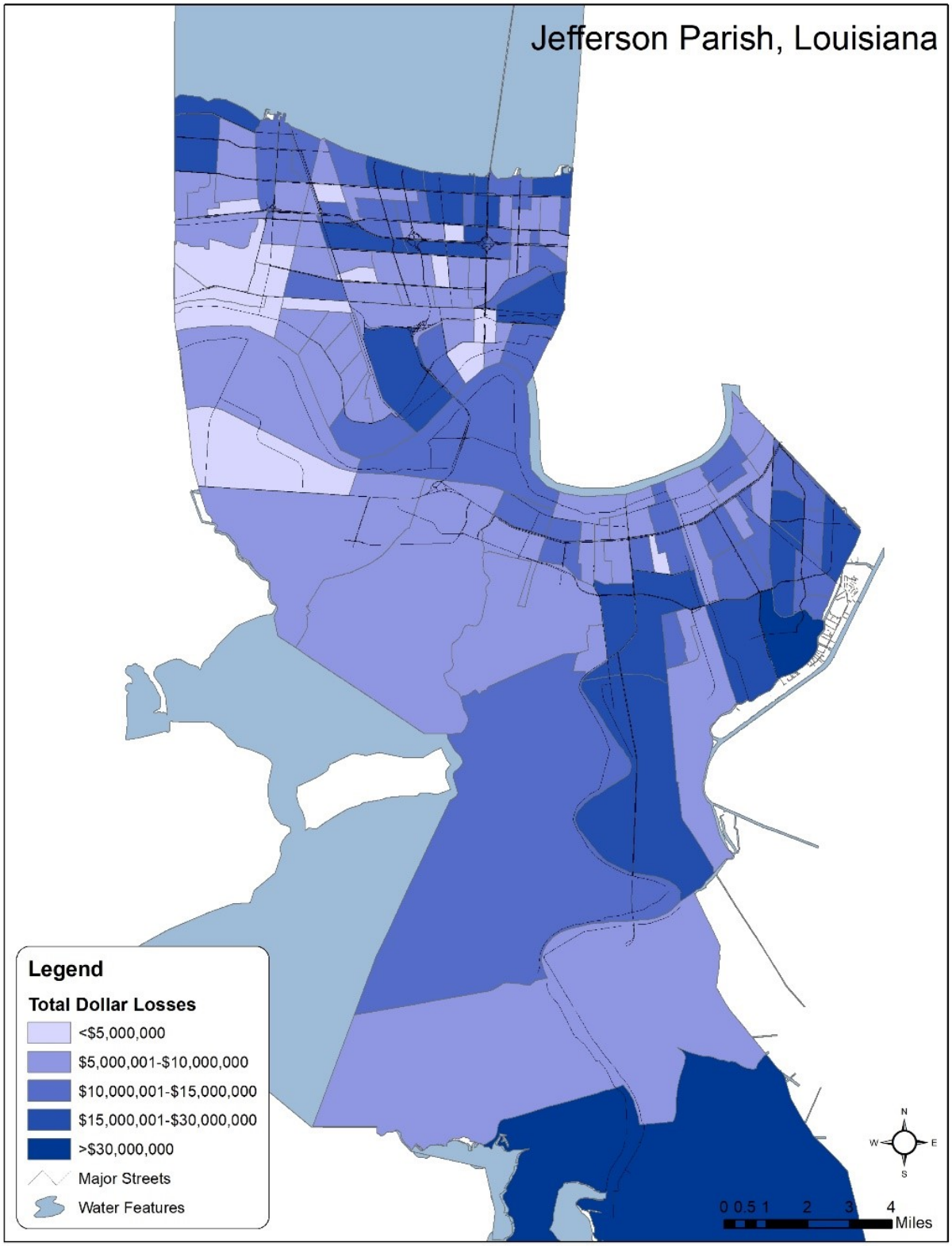
Source: Hazus-MH 4.2 SP1

Figure 41
Hazus Hurricane Katrina Modeled Scenario South Parish- Count of Buildings with At Least Moderate Damage



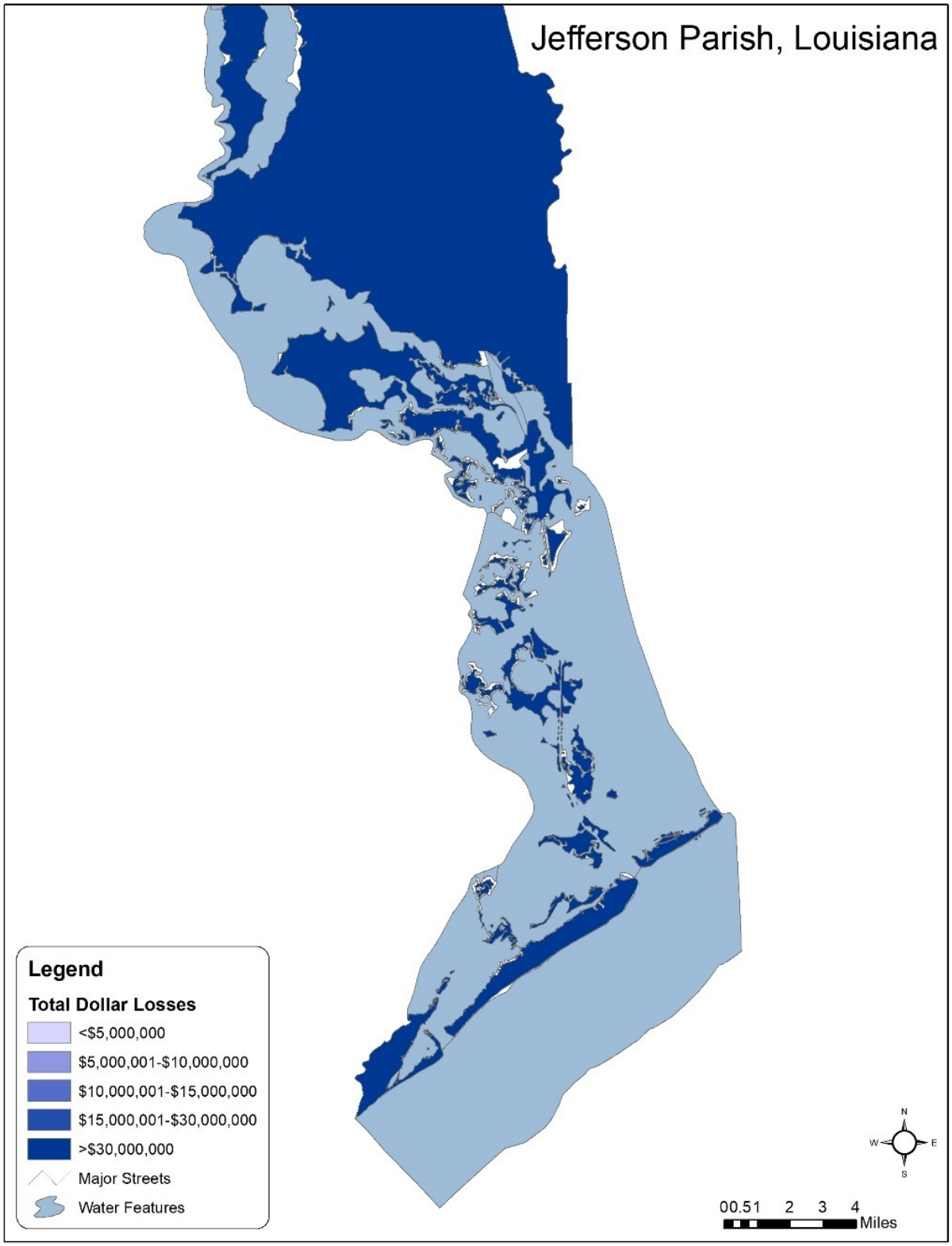
Source: Hazus-MH 4.2 SP1

Figure 42
Hazus Hurricane Katrina Modeled Scenario North Parish- Total Dollar Losses



Source: Hazus-MH 4.2 SP1

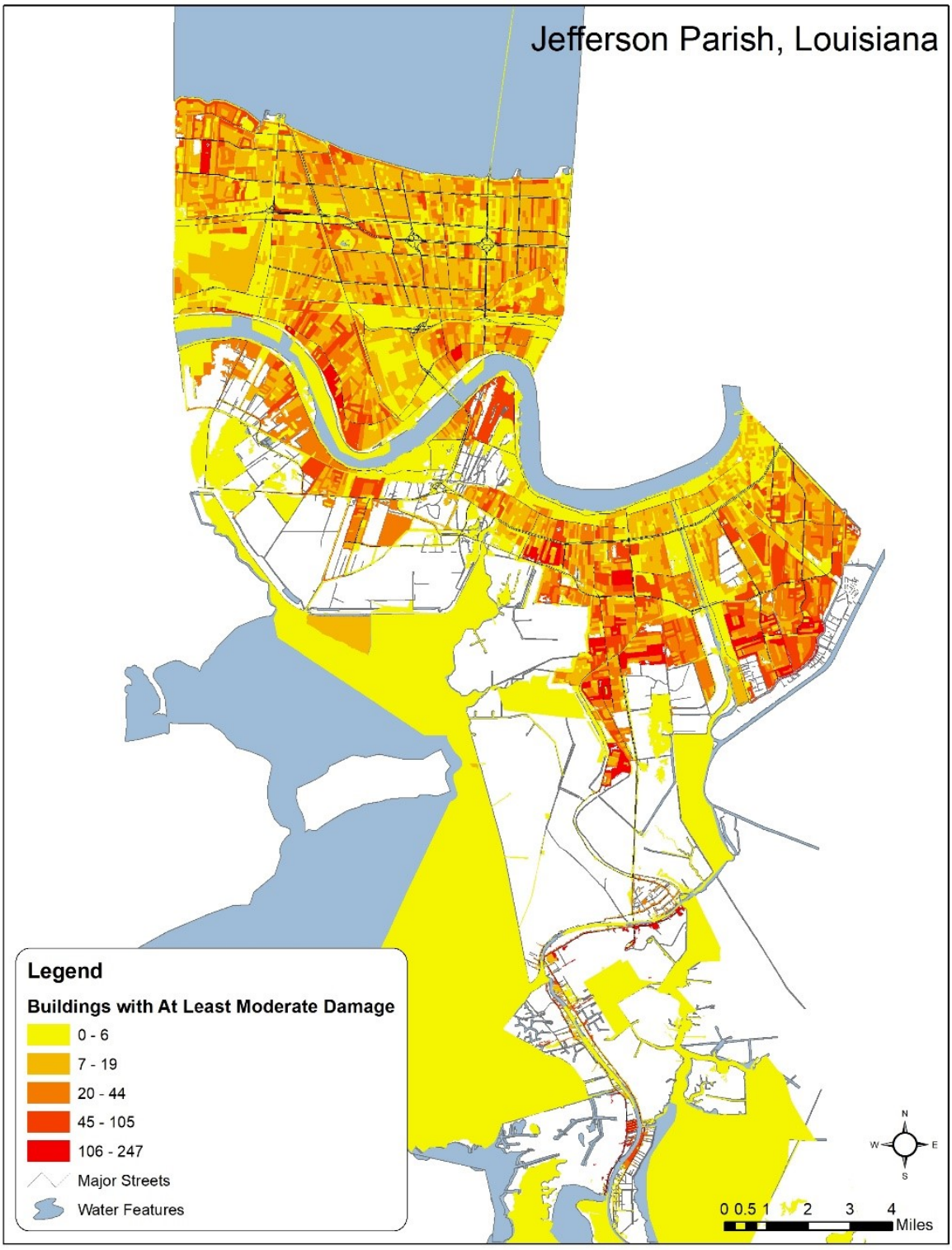
Figure 43
Hazus Hurricane Katrina Modeled Scenario North Parish- Total Dollar Losses



Source: Hazus-MH 4.2 SP1

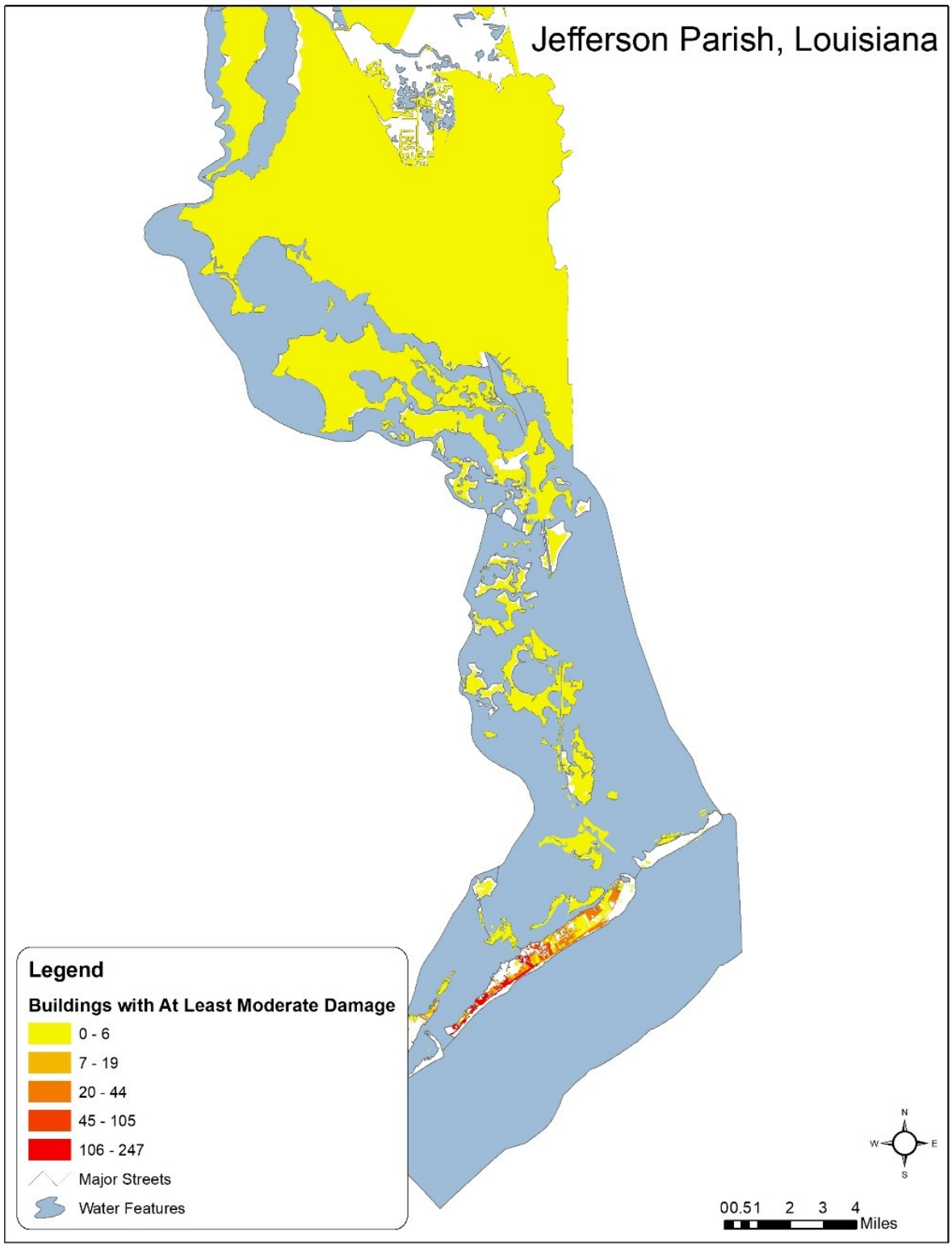
In addition to a Katrina model, Hazus also has the capability to run annualized loss scenarios that calculate loss based on return period event and results in an estimate for damage across many years. This information can be useful in demonstrating that, although in any given year there may not be a major storm event, there are potential costs of future storms that are significant and should be considered across time. **Figure 44, Figure 45, Figure 46** and **Figure 47** show the results of an annualized loss modeled scenario. In this scenario, Hazus uses dasymetric data that removes undeveloped areas (such as bodies of water, wetlands) from the Census blocks. The resulting mapped data appears incomplete but includes all relevant areas that contain population and development.

Figure 44
Hazus 100-year Return Period Annualized Loss Scenario North Parish- Count of Buildings with At Least Moderate Damage



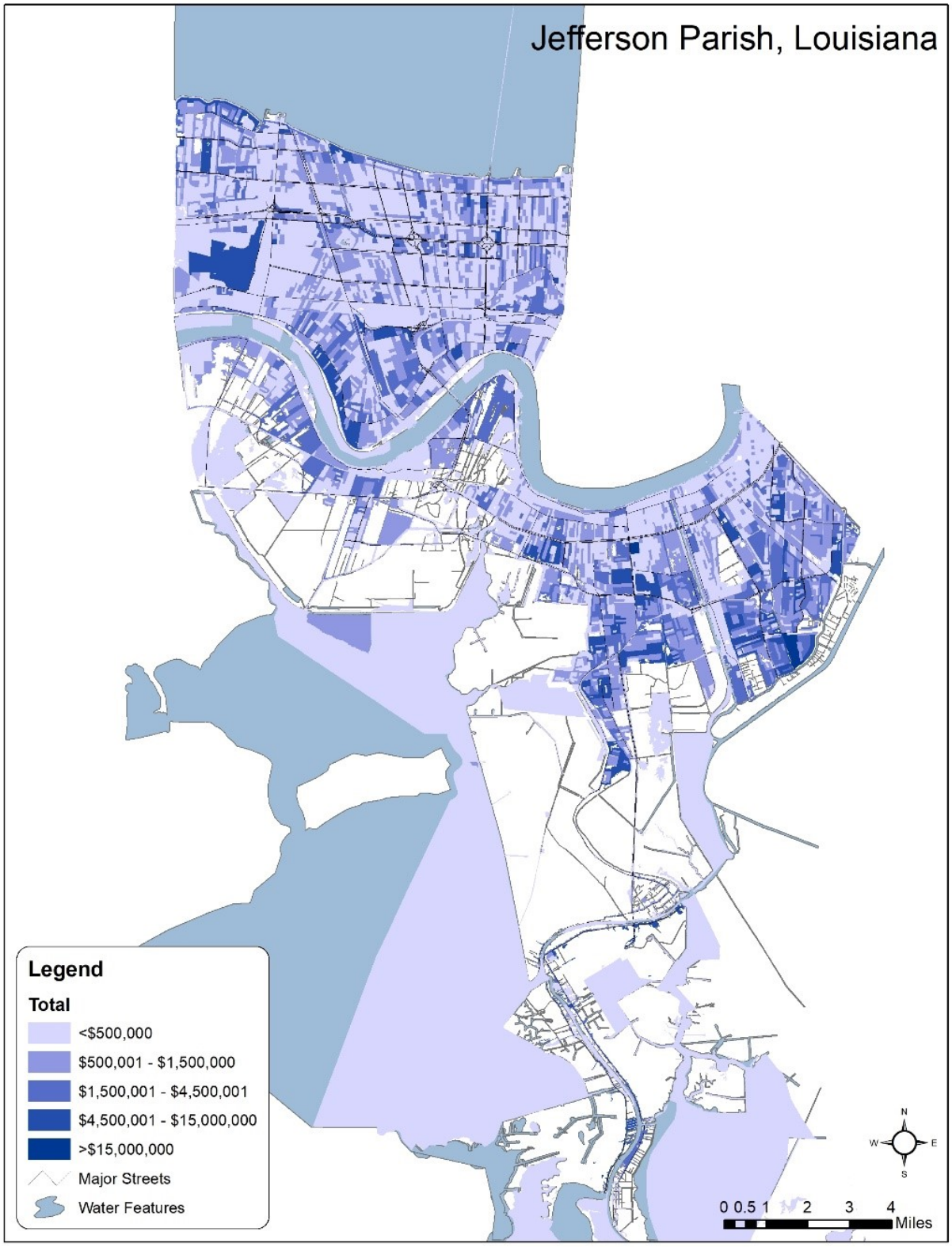
Source: Hazus-MH 4.2 SP1

Figure 45
Hazus 100-year Return Period Annualized Loss Scenario South Parish- Count of Buildings with At Least Moderate Damage



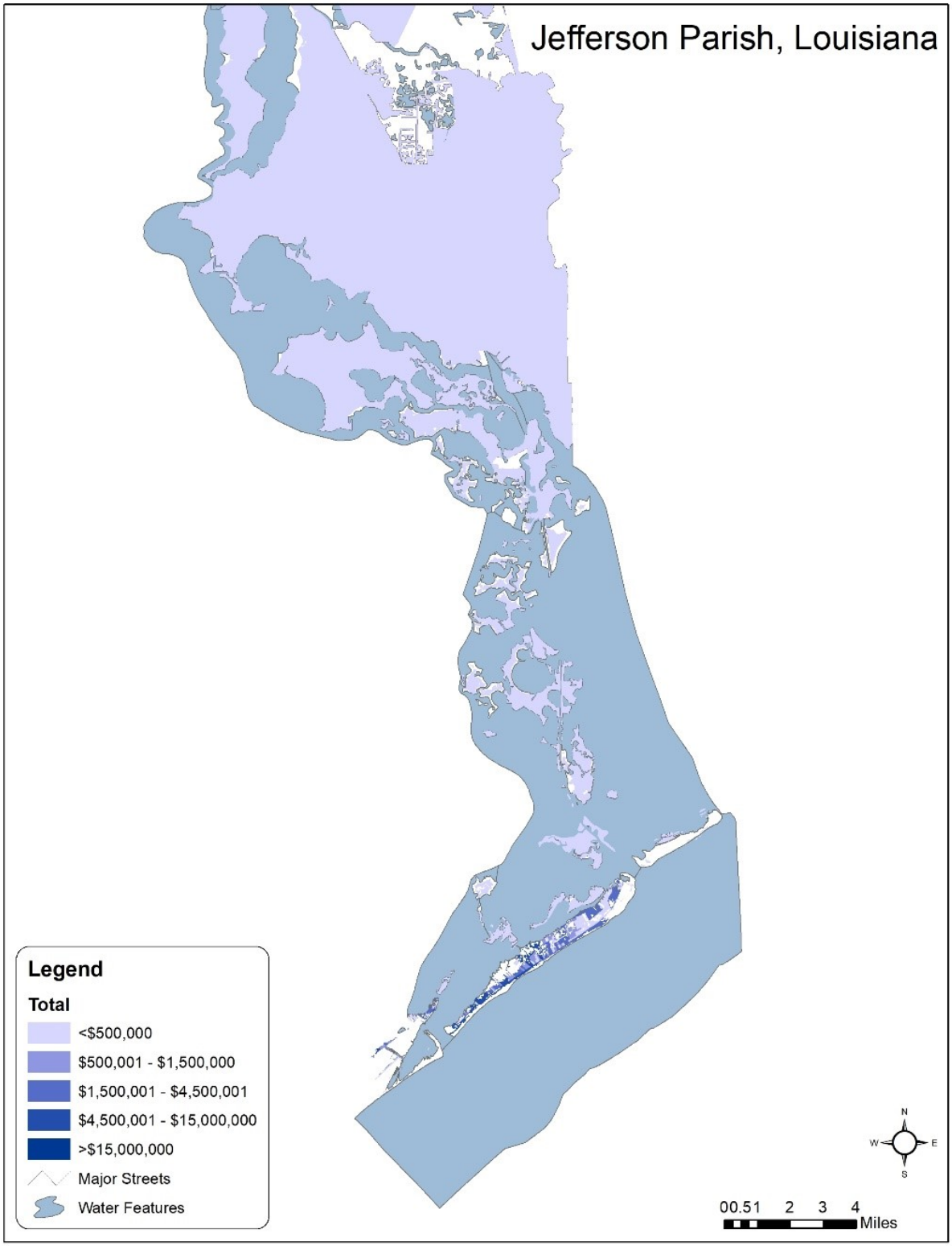
Source: Hazus-MH 4.2 SP1

Figure 46
Hazus 100-year Return Period Annualized Loss Scenario North Parish- Total Dollar Losses



Source: Hazus-MH 4.2 SP1

Figure 47
Hazus 100-year Return Period Annualized Loss Scenario South Parish - Total Dollar Losses

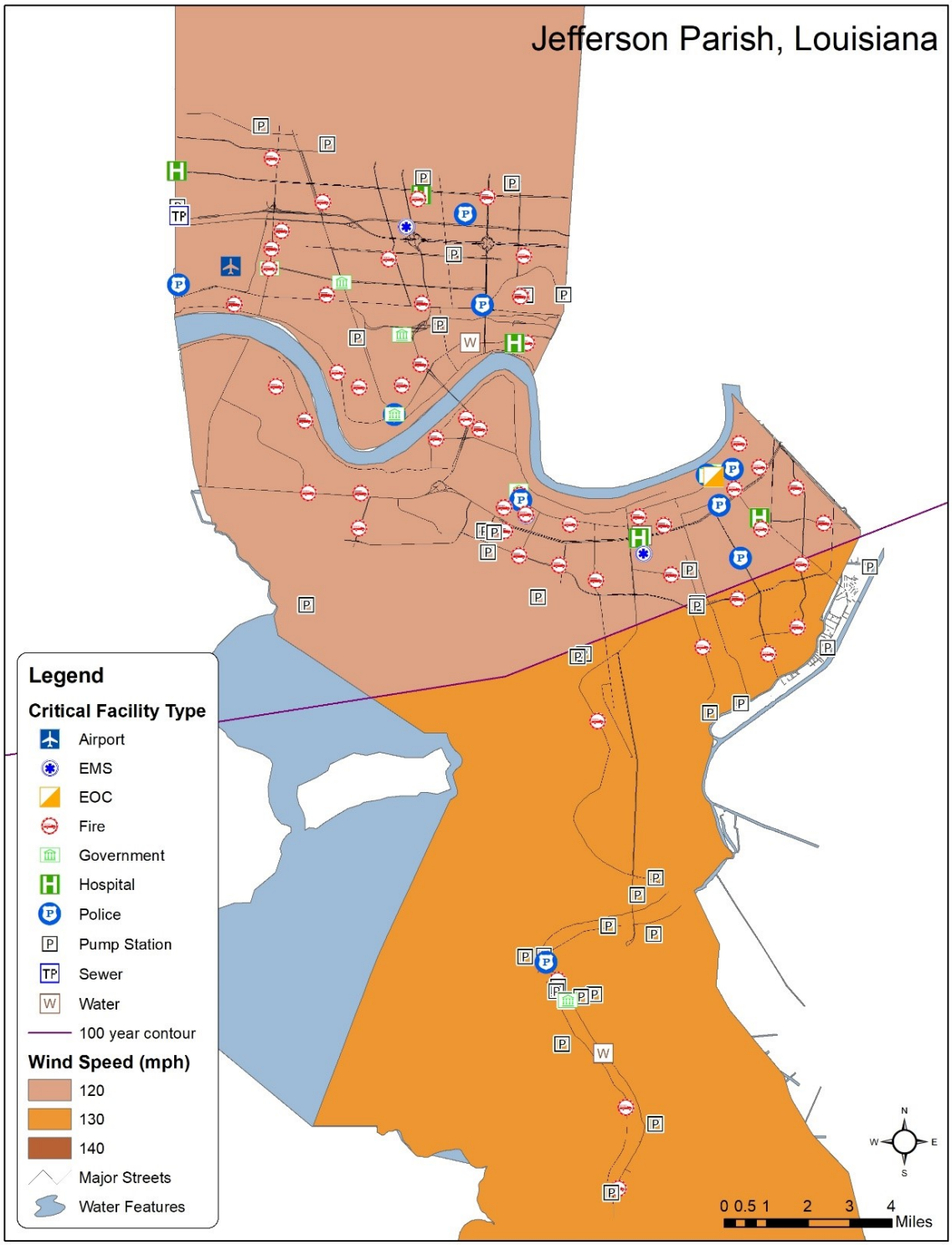


Source: Hazus-MH 4.2 SP1

Critical Facilities Vulnerability

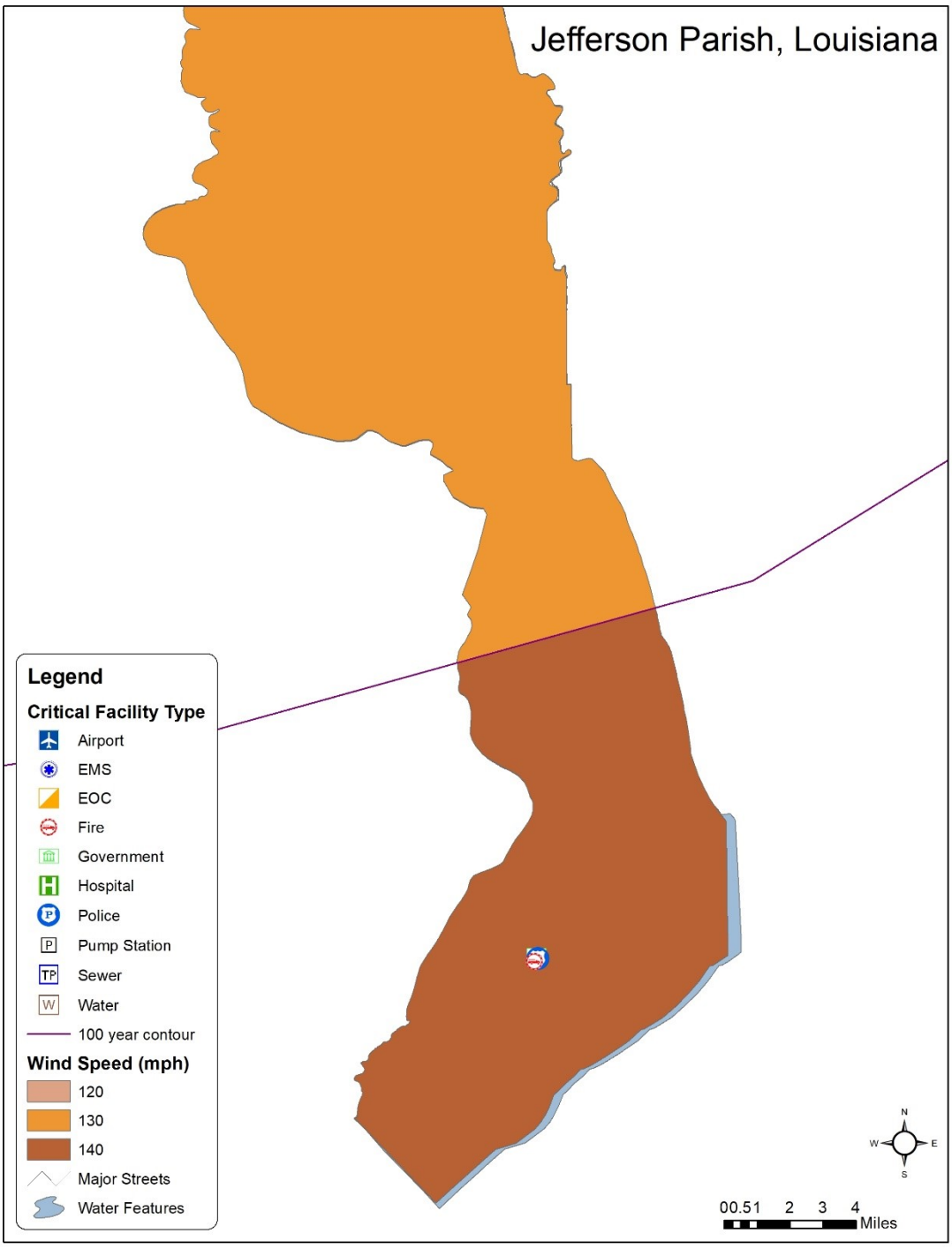
Critical facility inventory data was used to analyze the vulnerability of the structures to Hurricane and Thunderstorm wind events. **Figure 48** and **Figure 49** below show these Critical Facilities on a map with wind speed, while **Table 48** outlines the vulnerability of each critical facility to each storm category. ASCE 7-16 wind maps depicting the 100 year return period event were used to determine the probable wind speed in miles per hour at each facility. Additional information on asset risk can be found in Appendix F, Asset Inventory.

Figure 48
North Jefferson Parish Public Facilities;
100 year return Wind Speed



Source: American Society of Civil Engineers

Figure 49
South Jefferson Parish Public Facilities;
100 year return Wind Speed



Source: American Society of Civil Engineers

Table 48
Jefferson Parish Critical Facilities;
Hurricane Wind Vulnerability Assessment

Facility	Address	Type	100 year return wind speed (mph)
Jefferson Parish			
East Jefferson EMS	3120 Lime St	EMS	120
West Jefferson EMS	1225 Avenue C	EMS	120
Avondale VFD (Main) Station 74	500 South Jamie Blvd	Fire	120
Avondale VFD Station 75	201 West Tish Dr	Fire	120
Bridge City VFD	2220 Bridge City Ave	Fire	120
Eastbank Consolidated FD Station 11	3525 Jefferson Hwy	Fire	120
Eastbank Consolidated FD Station 12	968 Jefferson Hwy	Fire	120
Eastbank Consolidated FD Station 13	4642 Calumet St	Fire	120
Eastbank Consolidated FD Station 14	1714 Edinburgh St	Fire	120
Eastbank Consolidated FD Station 15	402 Aurora Ave	Fire	120
Eastbank Consolidated FD Station 16	5200 Lafreniere St	Fire	120
Eastbank Consolidated FD Station 17	6616 Kawanee Ave	Fire	120
Eastbank Consolidated FD Station 18	3430 N. Causeway Blvd	Fire	120
Eastbank Consolidated FD Station 20	4110 Hudson St	Fire	120
Harvey #2 VFD Station 62	2200 Lapalco Blvd	Fire	130
Harvey #2 VFD Station 63	3824 Manhattan Blvd	Fire	130
Jeff Parish Fire Training Academy	200 East St	Fire	120
Lafitte Barataria Crown Point VFD Station 41	4176 Privateer Blvd	Fire	130
Live Oak Manor VFD (Main) Station 72	404 Azalea Dr	Fire	120
Live Oak Manor VFD Station 73	160 Modern Farms Rd	Fire	120
Marrero Estelle VFD Station 83	4050 Barataria Blvd	Fire	130
Marrero Estelle VFD Station 84	3180 Destrehan Ave	Fire	130
Marrero Harvey VFD (Main) Station 80	531 Avenue C	Fire	120
Marrero Harvey VFD Station 81	808 McArthur Blvd	Fire	120
Marrero Harvey VFD Station 82	3649 Patriot St	Fire	120
Marrero Ragusa VFD (Main) Station 86	1400 Berger Rd	Fire	120
Marrero Ragusa VFD Station 87	455 St Ann St	Fire	120
Marrero Ragusa VFD Station 88	5725 Belle Terre Rd	Fire	120
Nine Mile Point	1024 Oak Ave	Fire	120
Terrytown VFD (Main) Sta. 51	341 Heritage Ave	Fire	120
Terrytown VFD Station 52	2201 Carol Sue Ave	Fire	120
Third District VFD Station 32	9421 Jefferson Hwy	Fire	120
Third District VFD Station 33	301 N Lester Ave	Fire	120

Facility	Address	Type	100 year return wind speed (mph)
Wallace Memorial VFD Sta. 76	4040 Highway 90	Fire	120
First Parish Court	924 DAVID DRIVE	Government	120
Joe Yenni Bldg	1221 Elmwood Park Blvd.	Government	120
East Jefferson Gen Hospital	4200 Houma Blvd	Hospital	120
Ochsner Foundation Hospital	1516 Jefferson Hwy	Hospital	120
West Jefferson Medical Center	1101 Medical Center Blvd	Hospital	120
Jefferson Parish Sheriffs Office First District Patrol Div	3620 Hessmer Avenue	Police	120
JPSO 2nd District	1901 Manhattan Blvd	Police	120
JPSO Admin Eastbank	3300 Metairie Rd	Police	120
JPSO Admin Westbank	1233 Westbank Expwy	Police	120
Ames Pump Station	5100 Rochester	Pump Station	130
BelMont Pump Station	2108 BELMONT PL	Pump Station	120
Bonnabel Pump Station	1500 Beverly Garden	Pump Station	120
Canal Street Pump Station	100 Canal St	Pump Station	120
Cousins Pump Station 1	Destrehan & Lapalco	Pump Station	130
Cousins Pump Station 2	Destrehan & Lapalco	Pump Station	130
Elmwood Canal Pump Station	ELMWOOD CANAL AT LAKE PONTCHART	Pump Station	120
Estelle Pump Station	3850 Destrahan Ave.	Pump Station	130
Harvey Pump Station	1600 Destrehan Ave.	Pump Station	120
Hero Pump Station	Peters Road	Pump Station	130
Lake Cataoutche Pump Station	3.5 Miles off of U.S. 90	Pump Station	120
Mount Kennedy Pump Station	3100 Mt Kennedy Dr	Pump Station	130
Planters Pump Station	268 Bypass Road	Pump Station	130
Pontiff Playground Pump Station	1521 Palm St	Pump Station	120
Suburban Canal Pump Station	SUBURBAN CANAL AT LAKE PONTCHAR	Pump Station	120
Upper Kraak Pump Station	911 KAYE ST	Pump Station	120
Westminster Pump Station	2050 Watling	Pump Station	120
Whitney - Barataria Pump Station	1301 Engineers Road	Pump Station	130
Causeway Head Start	3420 N. Causeway Blvd	Shelter	120
JP Animal Shelter -West Bank	2701 Lapalco Blvd	Shelter	120
Jutland Head Start	1821 Jutland	Shelter	120
Kings Grant Playground	3805 15th Street	Shelter	120
Lapalco Head Start	2001 Lincolnshire Dr	Shelter	120
Little Farms Playground	10301 S Park St	Shelter	120
Miley Playground	6716 W Metairie	Shelter	120
Pard Playground	5185 Eighty Arpent Road	Shelter	120
Terrytown Gretna Head Start	2315 Park Place	Shelter	120
Terrytown Playground	641 Heritage Ave	Shelter	120

Facility	Address	Type	100 year return wind speed (mph)
Eastbank Water Plant	3600 Jefferson Hwy	Water	120
Westbank Water Plant	4500 Westbank Exp.	Water	120
City of Gretna			
New EOC	910 3rd Street	EOC	120
David Crockett VFD Station 46	323 Weidman St	Fire	120
David Crockett VFD Station 48	2000 Hancock St	Fire	120
David Crockett VFD (Mn) St 45	1136 Lafayette St	Fire	120
David Crockett VFD Station 47	700 Gretna Blvd	Fire	120
Terrytown VFD Station 53	200 Wall Blvd	Fire	130
Station 54	3301 WALL BLVD.	Fire	130
Gretna City Hall	740 2nd St	Government	120
Courthouse	200 Derbigny St	Government	120
Courthouse Annex	210 Derbigny St	Government	120
EOC	910 3rd St	Government	120
General Government Building	200 Derbigny Street	Government	120
Ochsner-Westbank Medical Center	2500 Belle Chase Hwy	Hospital	120
Gretna City Of Police Department Chief Of Police & A	200 5th St	Police	120
Jefferson Parish Sheriffs Office Correctional Center	100 Dolhonde St	Police	120
Mel Ott Multi Purpose Center	2301 Belle Chasse Hwy	Shelter	120
City of Harahan			
Eastbank Consolidated FD Fire Prevention/Arson Unit	834 S. Clearview Pkwy	Fire	120
Eastbank Consolidated FD Station 19	455 Edwards Ave	Fire	120
Harahan VFD Station 27	800 Randolph St	Fire	120
City Hall of Harahan	6425 Jefferson Hwy	Government	120
Harahan City Of Police Department Headquarters	6425 Jefferson Hwy	Police	120
Midway Pump Station	1 SHADY OAK LN	Pump Station	120
JP Animal Shelter- East Bank	1 Humane Way	Shelter	120
City of Kenner			
Louis Armstrong Airport	900 Airline Dr	Airport	120
Sourtheast Louisiana Flood Protection Authority-East EOC	1100 Reverend Richard Wilson Dr	EOC	120
City of Kenner EOC	1610 Reverend Richard Wilson Dr	EOC	120
Kenner FD Station 37	3928 Delaware Ave	Fire	120
Kenner Fire Rescue Station 379	3343 Williams Blvd	Fire	120
Kenner FD HQ/Fire Alarm	2226 Williams Blvd	Fire	120
Kenner FD (Main) Station 35	1801 Williams Blvd	Fire	120
Kenner FD Station 36	315 Worth St	Fire	120
Kenner FD Station 39	401 Vintage Dr	Fire	120

Facility	Address	Type	100 year return wind speed (mph)
Kenner City Hall	1801 Wiliams Blvd	Government	120
Ochsner-Kenner Medical Center	180 W Esplanade Ave	Hospital	120
East Jefferson Levee District Police Dept	1135 Lesan Dr	Police	120
Kenner Police HQ	500 Veterans Blvd	Police	120
Kenner Police Training Center	1939 Reverend Richard Wilson Dr	Police	120
Sourtheast Louisiana Flood Protection Authority-East Police Dept	1100 Reverend Richard Wilson Dr	Police	120
Duncan Canal Pump Station 4	DUNCAN CANAL AT LAKE PONTCHARTRA	Pump Station	120
Parish Line Pump Station	PARISH LINE & GRANDLAKE	Pump Station	120
Kenner Sewer Plant	1 West 30th Street	Sewer	120
Pontchartrain Center	4545 Williams Blvd	Shelter	120
City of Westwego			
Westwego EMS	918 6th St.	EMS	120
Westwego VFD Station 92	300 Columbus St	Fire	120
Westwego VFD Station 94	206 Louisiana St	Fire	120
Westwego VFD (Mn) Sta. 91	677 Avenue H	Fire	120
Westwego VFD Station 95	1164 Avenue C	Fire	120
Westwego VFD Station 93	1501 Central Ave	Fire	120
Westwego City Hall	419 Avenue A	Government	120
Westwego City Of Police Department Police Chief	401 4th Street	Police	120
Bayou Segnette Pump Station	801 Louisiana Ave	Pump Station	120
Westwego Pump Station 1	100 Vic A. Pitre Drive	Pump Station	120
Westwego Pump Station 2	820 South Laroussine	Pump Station	120
Alario Center	2000 Segnette Blvd	Shelter	120
Town of Grand Isle			
Grand Isle Fire	100 Chighizola Lane	Fire	140
Grand Isle Town Hall	170 Ludwig Ln	Government	140
Grand Isle Town Of Police Dept	134 Ludwig Ln	Police	140
Town of Lafitte			
Lafitte Barataria Crown Point VFD (Main) Station 40	2385 Jean Lafitte Blvd	Fire	130
Lafitte Barataria Crown Point VFD Station 43	5510 Jean Lafitte Blvd	Fire	130
Jean Lafitte Town Hall	2654 Jean Lafitte Blvd	Government	130
Jean Lafitte Police	2607 Jean Lafitte Blvd	Police	130
Crown Point Pump Station 2	OAK TRAILER PARK	Pump Station	130
Crown Point Pump Station 1		Pump Station	130
Rosethorn Pump Station		Pump Station	130

Facility	Address	Type	100 year return wind speed (mph)
August Lane Pump Station		Pump Station	130
Highway 45 Pump Station	2013 Jean Lafitte Blvd	Pump Station	130
Jones Point Pump Station	Dead end Carmelite St	Pump Station	130
Fleming Pump Station	DARDAR ST	Pump Station	130
Oak Dr Pump Station	OAK ST	Pump Station	130
Perkins Street Pump Station	End of Perkins St	Pump Station	130
Church Street Pump Station		Pump Station	130
Gloria Pump Station		Pump Station	130
Pailet Pump Station		Pump Station	130
Goose Bayou Pump Station	4875 DECAMP ST	Pump Station	130
Marrero St Pump Station	5117 2ND ST	Pump Station	130
Lafitte Water Tower	3448 JEAN LAFITTE BLVD	Water	130

4.4.8 Conclusion

Risk of damage and loss from future Hurricane and Tropical Storm wind events to Jefferson Parish is not only probable, but monetarily substantial. Jefferson Parish has historically been impacted by numerous major storms, and as seen in the tables above, both private structures and public facilities are vulnerable to damage losses across all municipalities of the Parish. More information on how this risk is being addressed can be found in Section 5 (Mitigation Strategy).

4.5 Storm Surge

4.5.1 Description of the Storm Surge Hazard

Storm surges occur when the water level of a tidally influenced body of water increases above the normal high tide. Storm surges occur with coastal storms caused by massive low-pressure systems with cyclonic flows that are typical of hurricanes.

Storm surges are particularly damaging when they occur at the time of a high tide, combining the effects of the surge and the tide. This increases the difficulty of predicting the magnitude of a storm surge since it requires weather forecasts to be accurate to within a few hours. See Appendix D, General Descriptions of Natural Hazards, for a more detailed description and definition of the storm surge hazard.

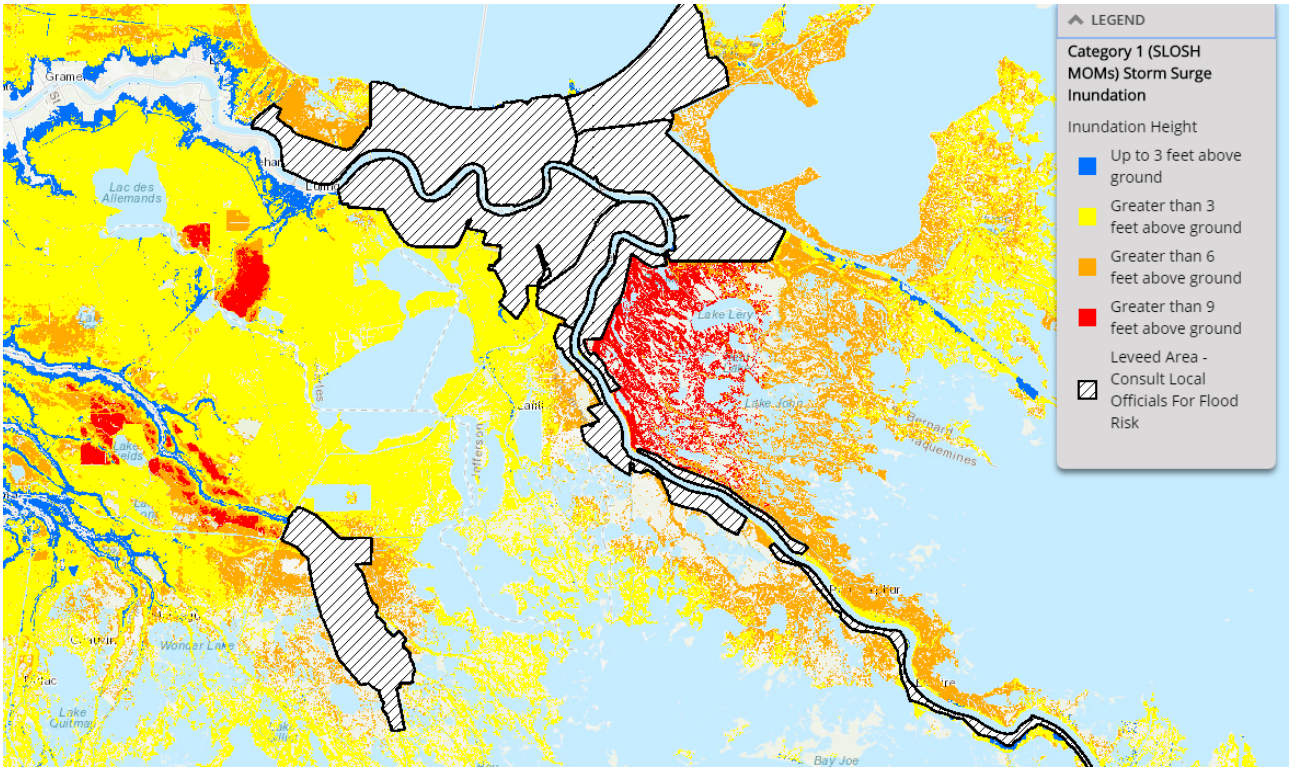
4.5.2 Location and Extent of the Storm Surge Hazard

The storm surge hazard associated with hurricanes and other severe storms are responsible for coastal flooding and erosion along the Louisiana Gulf Coast. In addition to flooding coastal areas, storm surge can also reach further inland impacting lakes and rivers. With more than 60% of Jefferson Parish residents living at or below sea level, residents are particularly vulnerable to flooding and storm surge.[26] Storm surge in Jefferson Parish is primarily the result of hurricanes that approach land from the Gulf of Mexico. Storm surge is most likely to occur in the southern part of the Parish, particularly along the island of Grand Isle. The northern part of the Parish, particularly the

City of Kenner and the area around Metairie, are vulnerable from storm surge from Lake Pontchartrain. The effects of storm surge can be felt in the Parish from hurricanes that make landfall as far away as Texas, Mississippi, or Alabama.

Figure 50, Figure 51, **Figure 52,** and **Figure 53** below show storm surge inundation levels in Jefferson Parish based on SLOSH modeling of the Maximum of Maximums (MOMs) for a Category 1 and Category 4 storm.[27]

Figure 50
Category 1 Storm Surge (SLOSH MOMs) Inundation

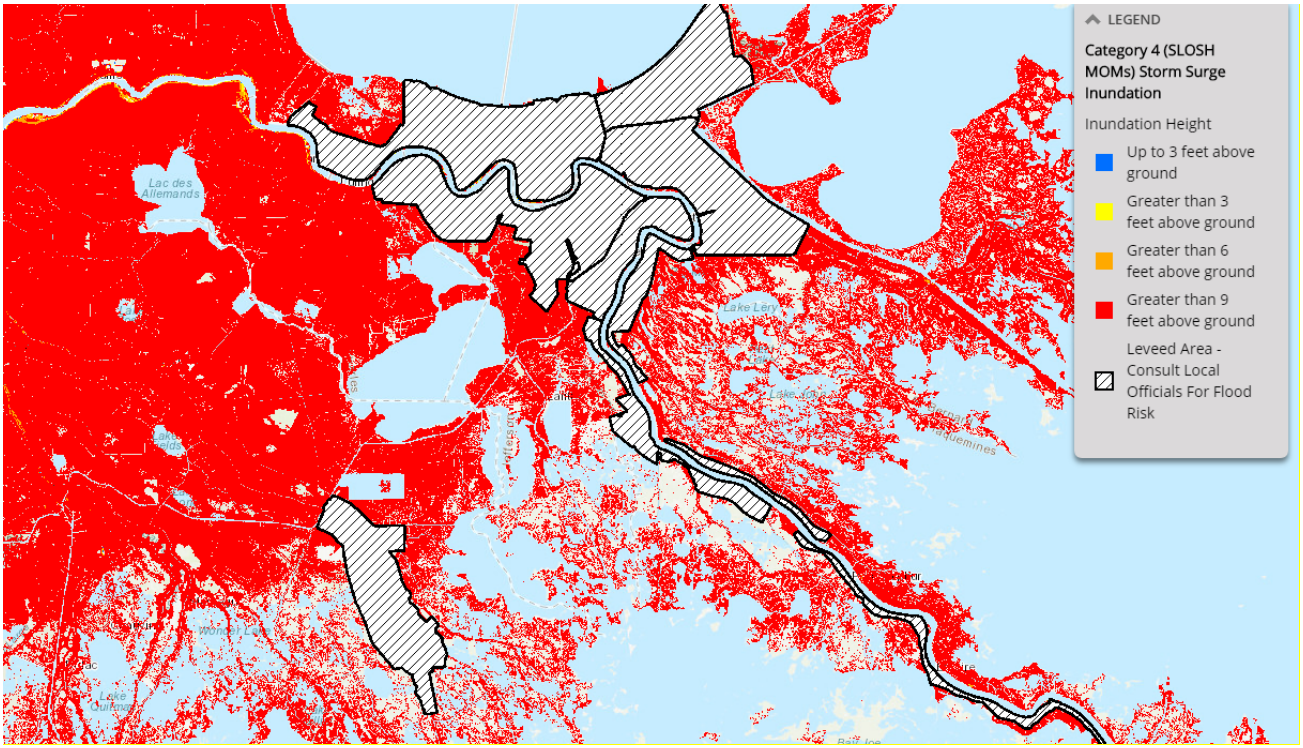


Source: National Oceanic and Atmospheric Administration

Figure 51
Category 1 Storm Surge (SLOSH MOMs) Inundation

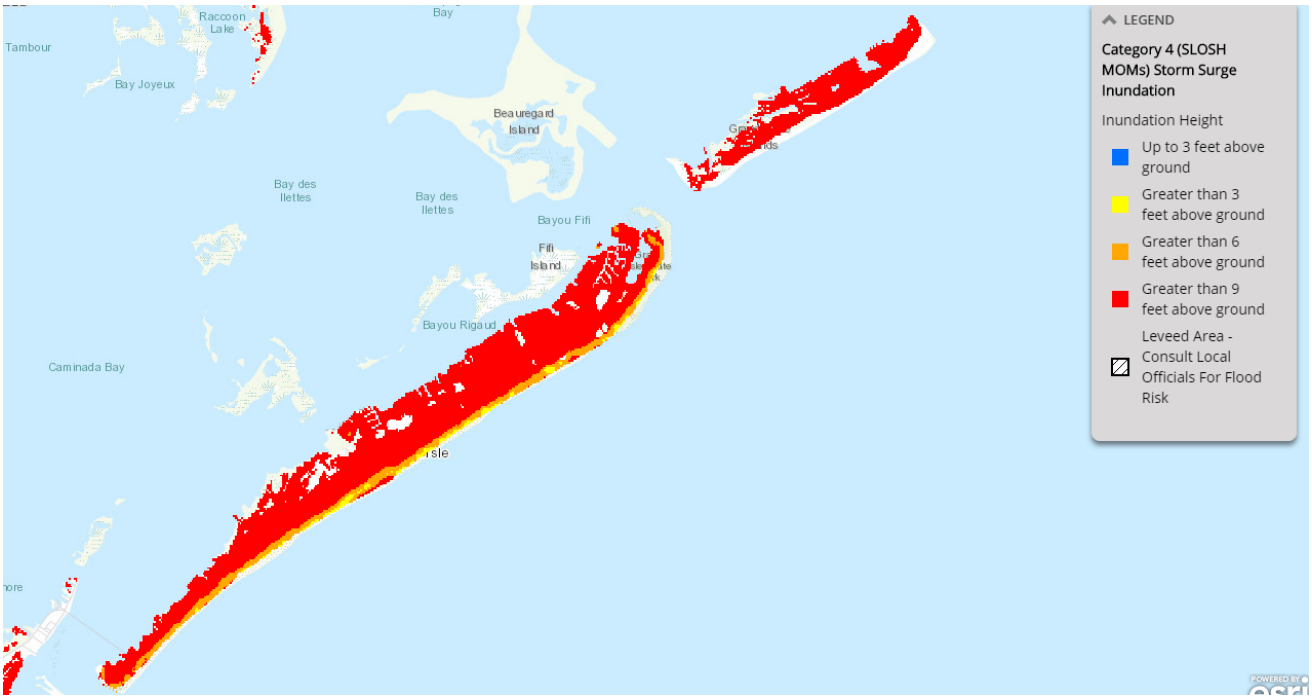
Source: National Oceanic and Atmospheric Administration

Figure 52
Category 4 Storm Surge (SLOSH MOMs) Inundation



Source: National Oceanic and Atmospheric Administration

Figure 53
Category 4 Storm Surge (SLOSH MOMs) Inundation



Source: National Oceanic and Atmospheric Administration

According to the NCEI Storm Events Database, there have been 26 instances of storm surge in Jefferson Parish between January 1996 and May 2018. Based on past records, the entire planning area can expect storm surge as high as 9 feet in future events.

4.5.3 Severity of the Storm Surge Hazard

Storm surges inundate coastal floodplains by tidal elevation rise in inland bays and ports and backwater flooding through coastal river mouths. Severe winds associated with low-pressure systems cause increase in tide levels and water surface elevations. Storm systems also generate large waves that run up and flood coastal areas. The combined effects create storm surges that affect the beach, marsh, and low-lying floodplains. Shallow offshore depths can cause storm driven waves and tides to pile up against the shoreline and inside bays. See **Table 49** for factors that can influence the severity of coastal storms.

Storm surges in Louisiana are deeper and travel further inland than in other Gulf Coast states according to experts. Storm surge is considered the next most dangerous part of a hurricane after severe winds and causes nine out of every ten hurricane-related deaths according to the National Weather Service.

The level of surge in a particular area is also determined by the slope of the continental shelf. A shallow slope off the coast, like what is found off the coast of Louisiana, will allow a greater surge to inundate coastal communities.

Table 49
Factors that Influence the Severity of Coastal Storms

Factor	Effect
Wind Velocity	The higher the wind velocity the greater the damage.
Storm Surge Height	The higher the storm surge the greater the damage.
Coastal Shape	Concave shoreline sections sustain more damage because the water is driven into a confined area by the advancing storm, thus increasing storm surge height and storm surge flooding.
Storm Center Velocity	Then slower the storm moves, the greater damage. The worst possible situation is a storm that stalls along a coast, through several high tides.
Nature of Coast	Damage is most severe on low-lying island barrier shorelines because they are easily over washed by wave action.
Previous Storm Damage	A coast weakened by even a minor previous storm will be subject to greater damage in a subsequent storm.
Human Activity	With increased development, property damage increases and more floating debris becomes available to knock down other structures.

4.5.4 Protection Measures

In February of 2014 FEMA declared the Hurricane Storm Damage Risk Reduction System (HSDRRS) as accredited, clearing the way for the improved storm surge protection to be incorporation into National Flood Insurance Program flood maps. The accreditation decision follows a formal certification process conducted by the Army Corps of Engineers, which had to prove to FEMA's satisfaction that the levee improvements will protect interior areas from the effects of surge caused by a hurricane with a one (1) percent chance of occurring in any year – a so-called 100-year storm.

The result is that the portions of new flood maps that include the levee system will show that areas behind the levees are protected, meaning they will be marked as a shaded Zone X. Zone X areas would see significantly lower flood insurance rates.

However, areas within the levee system that are still subject to flooding from other causes, such as poor drainage during rainfall events, would still be given an AE rating, with rates higher than those in a designated Zone X. Areas outside the levee system could still be rated at even higher risk levels, with corresponding insurance rates.

Figure 54 below shows a portion of the HSDRRS at the Seabrook Floodgate Complex. The complex is designed to keep storm surges, such as that of Hurricane Katrina (a 100-year storm), out of the canal.

Figure 54
Army Corps of Engineers Harvey Canal Floodwall

4.5.5 Impact on Life and Property

In Jefferson Parish there have been no deaths or injuries due to storm surge. Approximately $419 million has been reported in property damages related to storm surge.[28]

Even though no deaths have been reported for storm surge events, storm surge produces large waves that pose a significant threat for drowning.

To help keep Jefferson Parish residents safe, it is vital to warn them when there are impending hazards. To do this, the Jefferson Parish Emergency Management (JPEM) has an Emergency Alert System called JPAlert that is used for flood warnings and evacuations. This system is capable of sending out automated and manual alerts by text, email, or voice phone calls providing flood-related warnings due to inclement weather. This system works in conjunction with watches and warnings issued by the National Weather Service; river gauge and other levee protection water heights, as well as real-time data from the Parish's Supervisory Control and Data Acquisition system (SCADA). As the user, Jefferson Parish, initiates warnings by sending out messages by city, zip codes, geographic drawn shapes, predesignated groups, individuals, or to all residents & businesses.

Just like with heavy floods, storm surge from hurricanes sometimes warrant an evacuation. An evacuation notice will be issued when a hurricane is forecasted to present a danger to Jefferson Parish. The timing of this notice will depend on the probability of landfall in the area and the severity and forward speed of the storm.

The overall strategy for dealing with a catastrophic hurricane is to evacuate the at-risk population from the path of the storm. Evacuees would be relocated to a place of relative safety outside the projected storm surge flooding and hurricane force winds. In Jefferson Parish, no public shelters will be open for a slow-moving Cat 3 or a slow/fast-moving Cat 4 or 5. Residents will be directed to evacuate to public shelters in other sectors of the State. In-Parish evacuation and sheltering can be used for the lower-category of hurricanes (Cat 1 & 2) when in-Parish procedures can meet the threat.

Traffic control devices, such as signs and barricades and special signalization, will be provided by Public Works Department/Traffic Engineering and Parish and State Police Officers.

4.5.5-1 Impact on Public Health

Storm surge can be very powerful and, in some cases, carry large items such as cars a great distance. The items eventually settle with no consideration as to where and may be incredibly destructive to neighboring homes and the people who live in them. Additionally, if the water from storm surge is not able to drain quickly, mosquitoes begin to breed and spread infectious diseases. Animals living in nearby waterways such as alligators and snakes may become displaced, posing a serious threat to the public. Once the floodwater subsides, people can begin drying out their flooded homes. If they are not able to access their homes for an extended period of time, mold could begin growing. When there is no electricity to dry out a flooded home and the air is humid, mold spreads very quickly in the moist heat. Mold has been linked to respiratory conditions including asthma and allergies. Additionally, displacement from one's home and/or community can affect mental health and often results in post-traumatic stress disorder (PTSD).

4.5.6 Occurrences of the Storm Surge Hazard

There have been 6 storm surge events to impact Jefferson Parish between January 2008 and May 2018. Jefferson Parish experiences a storm surge event on average every other year. **Table 50** summarizes the major storm surge events that have impacted Jefferson Parish since from 2008 to 2018.

Table 50
Storm Surge Events, Jefferson Parish, January 2008 – May 2018
(Source: NOAA/NCEI[29])

	Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1.	LOWER JEFFERSON (ZONE)	08/03/2008	16:00	Storm Surge/tide	N/A	0	0	0.00K	0.00K
2.	UPPER JEFFERSON (ZONE)	09/01/2008	00:00	Storm Surge/tide	N/A	0	0	0.00K	0.00K
	LOWER JEFFERSON (ZONE)	09/01/2008	00:00	Storm Surge/tide		0	0	5.000M	0.00K
3.	LOWER JEFFERSON (ZONE)	09/11/2008	12:00	Storm Surge/tide		0	0	87.500M	0.00K
4.	UPPER JEFFERSON (ZONE)	09/02/2011	16:00	Storm Surge/tide	N/A	0	0	5.00K	0.00K
	LOWER JEFFERSON (ZONE)	09/02/2011	16:00	Storm Surge/tide	N/A	0	0	620.00K	0.00K
5.	UPPER JEFFERSON (ZONE)	08/28/2012	06:00	Storm Surge/tide	N/A	0	0	42.300M	0.00K
	LOWER JEFFERSON (ZONE)	08/28/2012	06:00	Storm Surge/tide	N/A	0	0	22.800M	0.00K
6.	LOWER JEFFERSON (ZONE)	06/21/2017	00:00	Storm Surge/tide	N/A	0	0	0.00K	0.00K
	Totals:					**0**	**0**	**158.23M**	**0.00K**

- August 3, 2008 – Storm surge of 1 to 3 feet above normal was experienced along the southeast Louisiana coast as Tropical Storm Edouard moved across the northern Gulf of Mexico. Minimal impact was felt along the coast with only minor flooding of a few coastal roadways. Maximum storm tide was 3.2 feet recorded at the LUMCON-Cocodrie facility.

- September 1, 2008 – Hurricane Gustav continued to move northwest across south Louisiana and weakened to a Category 1 storm over south central Louisiana. Storm surge around Lake Pontchartrain was generally 4 to 5 feet above normal. Storm surge affected many low-lying coastal areas as well as areas around Lake Pontchartrain, but federal levees protected most of the high-density population areas of greater New Orleans. However, some locally built levees were breached or overtopped. While numerous structures experienced flooding, especially in Grand Isle, only minor storm surge flooding occurred outside the levee system.

- September 11, 2008 - Storm surge flooding of 4 to 6 ft above normal from Hurricane Ike flooded low lying areas, roadways and property from Grand Isle through the Lafitte areas. Approximately 1500 structures were flooded in this area. The high water took several weeks to fully drain from some areas.

- September 2, 2011 – Tropical Storm Lee affected southeast Louisiana from late on September 2nd through September 4 with primarily onshore southeast and south wind flow. The slow

forward speed and broad circulation caused above normal tides along the southeast Louisiana and south Mississippi coast and tidal Lakes of Pontchartrain and Maurepas. Tides were generally 2 to 5 feet above normal. Gauge readings included 6.25 ft NAVD at the Seabrook Bridge at Lake Pontchartain. Storm surge flooding was primarily confined to areas near the coast and tidal lakes, and outside of hurricane protection levees. Low lying roadways were flooded in many areas. Jefferson Parish was among the areas with the greatest impact to houses and other structures with approximately 105 homes experiencing minor flooding in the Lafitte and Crown Point areas. Low lying property on the bay side flooded in the Grand Isle.

- August 28, 2012 – Due to Hurricane Isaac's very large size, and slow forward speed, tropical storm force winds lasted in excess of 48 hours in many areas of coastal southeast Louisiana. Local utility companies reported over 700,000 customers were without power at the peak of the storm in southeast Louisiana. Generally, most of the wind damage was limited to downed trees and power lines, and roof damage caused by wind and falling trees and tree limbs. Significant impact also occurred around Lakes Pontchartrain and Maurepas with a storm tide of 5 to 9 feet. Storm surge flooding also affected areas south and southwest of New Orleans with a storm tide of 4 to 7 feet. Roadways and low-lying property were flooded. Local levees around Lafitte and Myrtle Grove were overtopped and/or breached resulting flooding of numerous houses and property in this area. Overall impacts of Isaac resulted in at least $600 million in damages in southeast Louisiana, 3 direct fatalities, and 2 indirect fatalities. Storm surge flooding accounted for the bulk of damage, estimated around $500 million and the three direct storm surge fatalities in Louisiana. Winds accounted for a much lesser amount of slightly more than a $100 million. During the recovery process there was an indirect fatality in Jefferson Parish. On Sept 3, a 90-year-old man died of heat-related impacts in his house in Marrero, Jefferson Parish, where power had not been restored.

- June 21, 2017 – Tropical Storm Cindy was an asymmetric system as it moved through the central Gulf toward southwest Louisiana, resulting in minor to moderate impacts across southeast Louisiana. The storm resulted in heavy rainfall, minor storm surge flooding, and isolated damage due to strong winds.

  A storm tide of generally 4 to 6 feet occurred along the Gulf Coast of southeast Louisiana from St. Bernard Parish through Terrebonne Parish. The highest measured storm tide was 6.18 ft NAVD88 at a USGS gauge near Point a la Hache in Plaquemines Parish. The elevated tides resulted in minor to moderate flooding mainly of low lying land and roadways outside the federal levee system.

  Around Lake Pontchartrain, storm tide was generally measured in the 2 to 4 ft range, with a maximum value of 4.29 ft NAVD88 at the USCOE gauge near Mandeville. Again, impacts were minor to moderate with flooding to low lying land and roadways outside of levees systems.

  The USGS gauge at the Barataria Waterway south of Lafitte rose to a maximum of 3.15 ft NAVD88 at 9:15 am CST on June 22. Tides were at least 1.5 feet above normal from 6/20 through 6/22 at this gauge. The National Ocean Service gauge at Grand Isle reported a maximum water level of 1.94 ft MHHW, which was 1.8 ft above normal. The storm surge resulted in moderate impacts to the southern portions of the parish which are outside of the federal levee system. In Grand Isle, 30 ft of shoreline was eroded by the storm surge and wave runup. Flooding in the Lafitte area was limited to roads and low-lying property with an inundation depth of generally 1 to 2 feet.

The greatest recorded storm surge in the United States was generated by Hurricane Katrina, which produced a storm surge exceeding 27 feet along a 20-mile section of the Mississippi Gulf Coastline. The storm surge from Katrina caused an estimated $31.3 billion in damages to the Gulf Coast and $16.2 billion in damages to Louisiana[30] [31]. Hurricane Ike was a close second at $87.5 million for Jefferson Parish alone, mostly affecting the low-lying areas of Grand Isle and Lafitte with 4-6 feet of flooding.

Prior to Katrina, storm surge models (SLOSH) that were developed for the Louisiana coastline estimated storm surge flooding inland up to 18 feet above sea level. The damages caused by Hurricane Katrina demonstrate that storm surge-related flooding can reach depths of up to 30 feet above sea level, with ability to reach either the Northshore of Lake Pontchartrain, just north of New Orleans or the Southshore in Jefferson Parish. However, the highest recorded storm surge for Jefferson Parish in the NCEI Storm Events Database is 9 feet.

In addition to data collected from national reports, Jefferson Parish has also developed an online platform for recording historic hazard events that is updated regularly by Parish staff. However, no storm surge events were captured through this platform in Jefferson Parish in the last 11 years.

4.5.7 Municipality Storm Surge Hazards

City of Gretna

The City of Gretna is subject to storm surge from hurricanes or tropical storms in the Gulf of Mexico pushing water inland along the Mississippi River or Harvey Canal. The City has historically only experienced minimal impacts from storm surge. Zero storm surge events have been recorded since 1996. With zero events occurring in the last 22 years, there is <1% annual probability of future storm surge occurrences in the City of Gretna.

City of Harahan

The City of Harahan has no direct exposure to the Gulf, though clearly storm surge could impact Harahan via the Mississippi River. Zero storm surge events have been recorded since 1996. With zero events occurring in the last 22 years, there is <1% annual probability of future storm surge occurrences in the City of Harahan.

City of Kenner

Storm surge is most often a result of strong hurricane winds "pushing" water from either the Gulf of Mexico or another large body of water against the coastline causing flooding conditions. The City of Kenner is on the southern shore of Lake Pontchartrain and, therefore, could potentially be impacted by storm surge from the Lake. The East Bank of Jefferson Parish, including the City of Kenner, is protected from storm surge by a levee that runs along the southern shoreline of Lake Pontchartrain. Although the levee provides protection from storm surge, historically the City has been impacted to some degree by storm surge from hurricanes affecting the area. Zero storm surge events have been recorded since 1996. With zero events occurring in the last 22 years, there is <1% annual probability of future storm surge occurrences in the City of Kenner.

City of Westwego

Storm surge is most often a result of strong hurricane winds "pushing" water onto land. The City of Westwego is subject to storm surge from the Mississippi River, Lake Salvador, and Lake Cataouatche. Bayou Segnette, located just south of the City, empties into Lake Salvador and may also threaten the City of Westwego as hurricane force winds push water from the Lake up into the Bayou. Although the Mississippi River Levee and the earthen levee along Lake Cataouatche provide some protection from storm surge, the City has historically been impacted to some degree by storm surge from hurricanes affecting the area. It is likely that during a major hurricane event Westwego would experience storm surge from Lake Cataouatche, Lake Salvador, or the Mississippi River. Zero storm surge events have been recorded since 1996. With zero events occurring in the last 22 years, there is <1% annual probability of future storm surge occurrences in the City of Westwego.

Town of Grand Isle

The storm surge hazard is perhaps the greatest threat to the Town of Grand Isle. Storm surge along the Island is a result of strong hurricane winds "pushing" water from the Gulf of Mexico against the coastline causing flooding conditions. As the island is surrounded by water, storm surge can be severe. The Town has historically been impacted by storm surge from hurricanes.

Five storm surge occurrences have been recorded in the Town of Grand Isle in the past ten years. Summaries of these events follow:

- September 1, 2008 – Hurricane Gustav came ashore with 110 mph winds and storm surge as high as 10 feet in Grand Isle. The surge resulted in extensive impacts to the barrier island and battered the island shore line along the Gulf of Mexico. Eighty-Five percent of the then new (completed just 9 days prior to H. Gustav) 8,000 square foot levee system on the east end of the island was breached or completely destroyed.[32]

- September 11, 2008 – Storm surge for Hurricane Ike was reported to reach 9-12 feet on the Island according to Grand Isle Mayor David Camardelle.[33]

- September 2, 2011 – Tropical Storm Lee's storm surge was recorded at 2.4 feet in the Town of Grand Isle.[34]

- August 28, 2012 – One Grand Isle resident reported two to five feet of water from Hurricane Isaac's storm surge covered the Town the day after Isaac hit shore.[35]

- June 21, 2017 – The National Ocean Service gauge at Grand Isle reported a maximum water level of 1.94 ft MHHW, which was 1.8 ft above normal. The storm surge resulted in moderate impacts to the southern portions of the parish which are outside of the federal levee system. In Grand Isle, 30 ft of shoreline was eroded by the storm surge and wave runup.

Seven storm surge events have been recorded since 1996. With 7 events occurring in the last 22 years, there is a 32% annual probability of future flash flood occurrences in the Town of Grand Isle.

Town of Jean Lafitte

Storm surge along the coastal areas of southern Louisiana is most often a result of strong hurricane winds "pushing" water from the Gulf of Mexico against the coastline causing flooding conditions. The

Town of Jean Lafitte can experience storm surge from the Gulf of Mexico, Barataria Bay Waterway, and from Bayou Rigolettes. Although the levee system provides some protection from storm surge, the Town has historically been impacted to some degree by storm surge from hurricanes affecting the area.

Four storm surge occurrences have been recorded in the Town of Jean Lafitte in the past ten years. Summaries of these events follow:

- September 11, 2008 – Hurricane Ike's storm surge completely inundated residential areas just off Jean Lafitte Boulevard. Reports noted many of the houses and businesses that had been elevated after the 2005 hurricanes were flooded from Hurricane Ike (www.leanweb.org/our-work/community/hurricane-ike-damage-assessment). Another article stated many homes and businesses took several feet of water.[36]

- September 2, 2011 – Tropical Storm Lee's threat of flooding was so great that Mayor Tim Kerner called a mandatory evacuation for residents of Jean Lafitte, Crown Point, Barataria and areas outside the levee system because of rising surge and tides pushed into the area by southeast winds from the storm. While the storm did not reach hurricane strength, its surge was powerful. Approximately fifty homes were flooded in the Town of Jean Lafitte, Crown Point, and nearby communities according to the Mayor.[37] [38]

- August 28, 2012 – Hurricane Isaac's storm surge reached as high as six feet in some spots according to Mayor Kerner. This number varied slightly by resident to resident. One homeowner reported that the floodwaters exceeded the height of her roof, while another homeowner stated her home was inundated by 7 feet of water. Many homes in the area were severely flooded for Hurricane Isaac, even though some were elevated. Numerous homeowners lost all the contents of their homes and endured extensive structural damage as well. Widespread flooding prevented residents from returning home for days after the hurricane as roads were blocked until the water subsided.[39] [40] [41]

- June 21, 2017 – The USGS gauge at the Barataria Waterway south of Lafitte rose to a maximum of 3.15 ft NAVD88 at 9:15 am CST on June 22. Tides were at least 1.5 feet above normal from 6/20 through 6/22 at this gauge. Flooding in the Lafitte area was limited to roads and low-lying property with an inundation depth of generally 1 to 2 feet.

Four storm surge events have been recorded since 1996. With 4 events occurring in the last 22 years, there is a 18% annual probability of future flash flood occurrences in the Town of Jean Lafitte.

4.5.8 Storm Surge Risk Assessment

Structure Vulnerability

While the City of Gretna, City of Harahan, City of Kenner, City of Westwego, and some Unincorporated areas of Jefferson Parish are in proximity to the Mississippi River and/or Lake Pontchartrain, both of which are subject to storm surge, these areas are within the protection of Parish levee system and are not expected to experience major impacts from storm surge.

Therefore, an assessment of structures located in various ranges of storm surge depths was carried out primarily in the southern part of the parish. This analysis looked at which structures were located in these depth ranges based on two categories of storm as projected by NOAA: Category 1 and 4. The

results are presented in **Table 51** and **Table 52** and maps are presented in **Figure 55, Figure 56, Figure 57,** and **Figure 58.**

Table 51
Improved Property in Category 1 Storm Surge Zones in Jefferson Parish

Name	0 to 5 feet Count of Buildings	0 to 5 feet Estimated Replacement Value*	6 to 10 feet Count of Buildings	6 to 10 feet Estimated Replacement Value*	> 10 feet Count of Buildings	> 10 feet Estimated Replacement Value*
Jefferson Parish	1,617	$427,569,509	368	$77,636,707	0	$0
City of Gretna	0	$0	0	$0	0	$0
City of Harahan	0	$0	0	$0	0	$0
City of Kenner	0	$0	0	$0	0	$0
City of Westwego	0	$0	0	$0	0	$0
Town of Grand Isle	2,155	$508,034,602	0	$0	0	$0
Town of Jean Lafitte	712	$203,204,516	92	$24,171,087	0	$0
Grand Total	**4,484**	**$1,138,808,627**	**460**	**$101,807,794**	**0**	**$0**

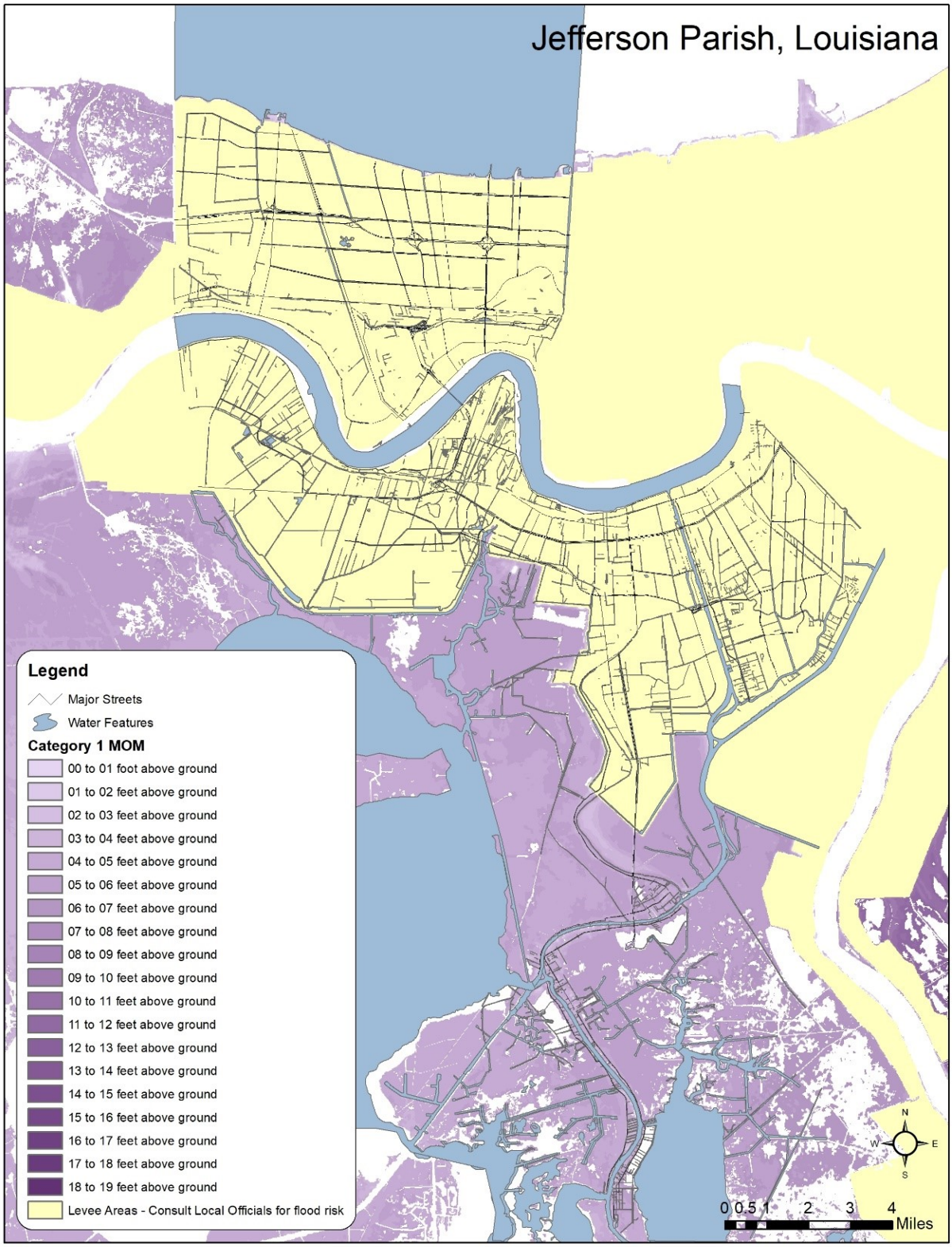
*As noted above, this value was estimated based on an average value of $125/sq ft and does not reflect a structure level assessment of each building's replacement value in the Parish

Table 52
Improved Property in Category 4 Storm Surge Zones in Jefferson Parish

Name	0 to 5 feet Count of Buildings	0 to 5 feet Estimated Replacement Value*	6 to 10 feet Count of Buildings	6 to 10 feet Estimated Replacement Value*	> 10 feet Count of Buildings	> 10 feet Estimated Replacement Value*
Jefferson Parish	8	$771,890	81	$21,294,694	2,024	$522,461,091
City of Gretna	0	$0	0	$0	0	$0
City of Harahan	0	$0	0	$0	0	$0
City of Kenner	0	$0	0	$0	0	$0
City of Westwego	0	$0	0	$0	0	$0
Town of Grand Isle	0	$0	365	$106,298,071	1,922	$437,320,464
Town of Jean Lafitte	0	$0	0	$0	814	$228,552,478
Grand Total	8	$771,890	**446**	**$127,592,765**	**4,760**	**$1,188,334,033**

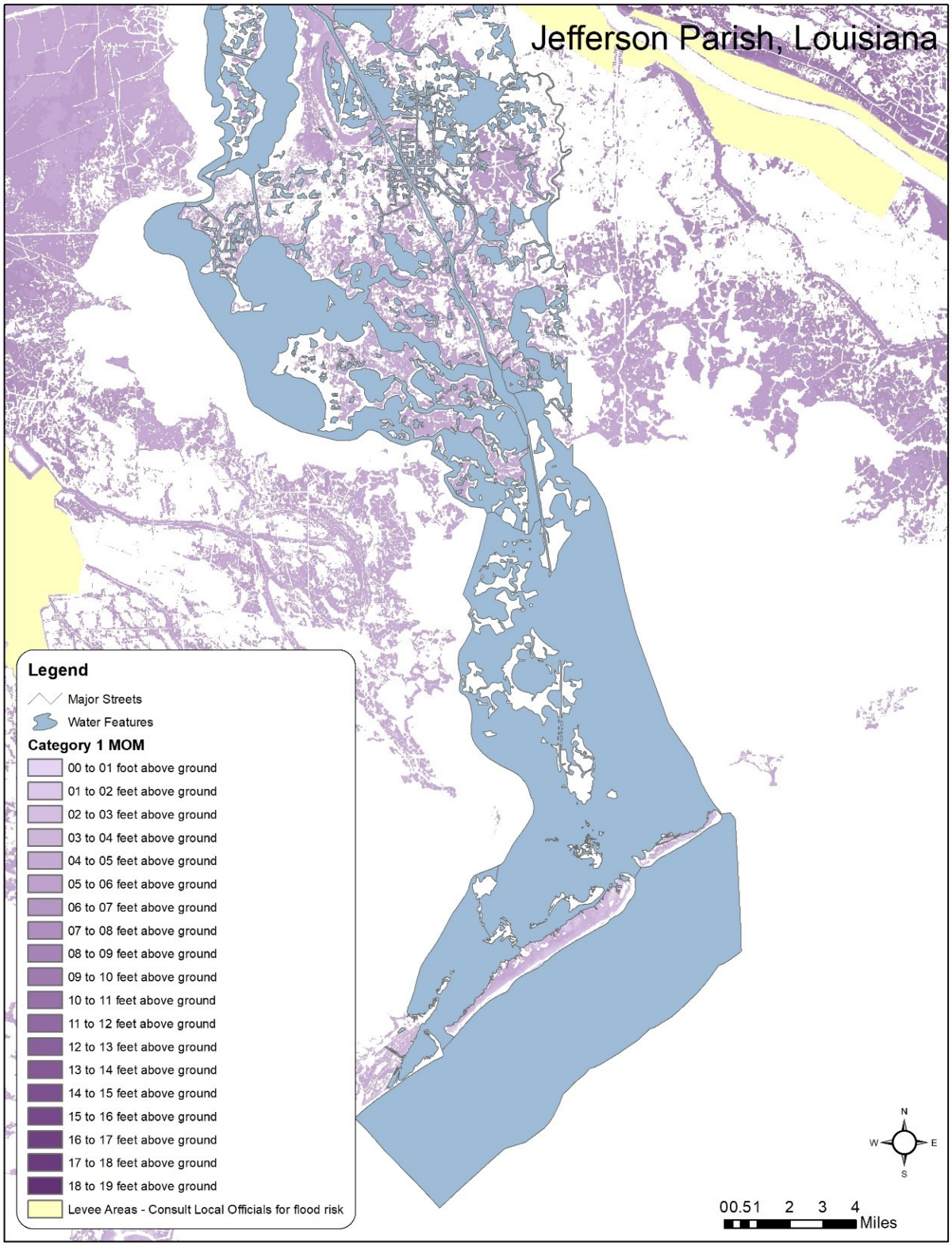
*As noted above, this value was estimated based on an average value of $125/sq ft and does not reflect a structure level assessment of each building's replacement value in the Parish

Figure 55
North Jefferson Category 1 Storm Surge



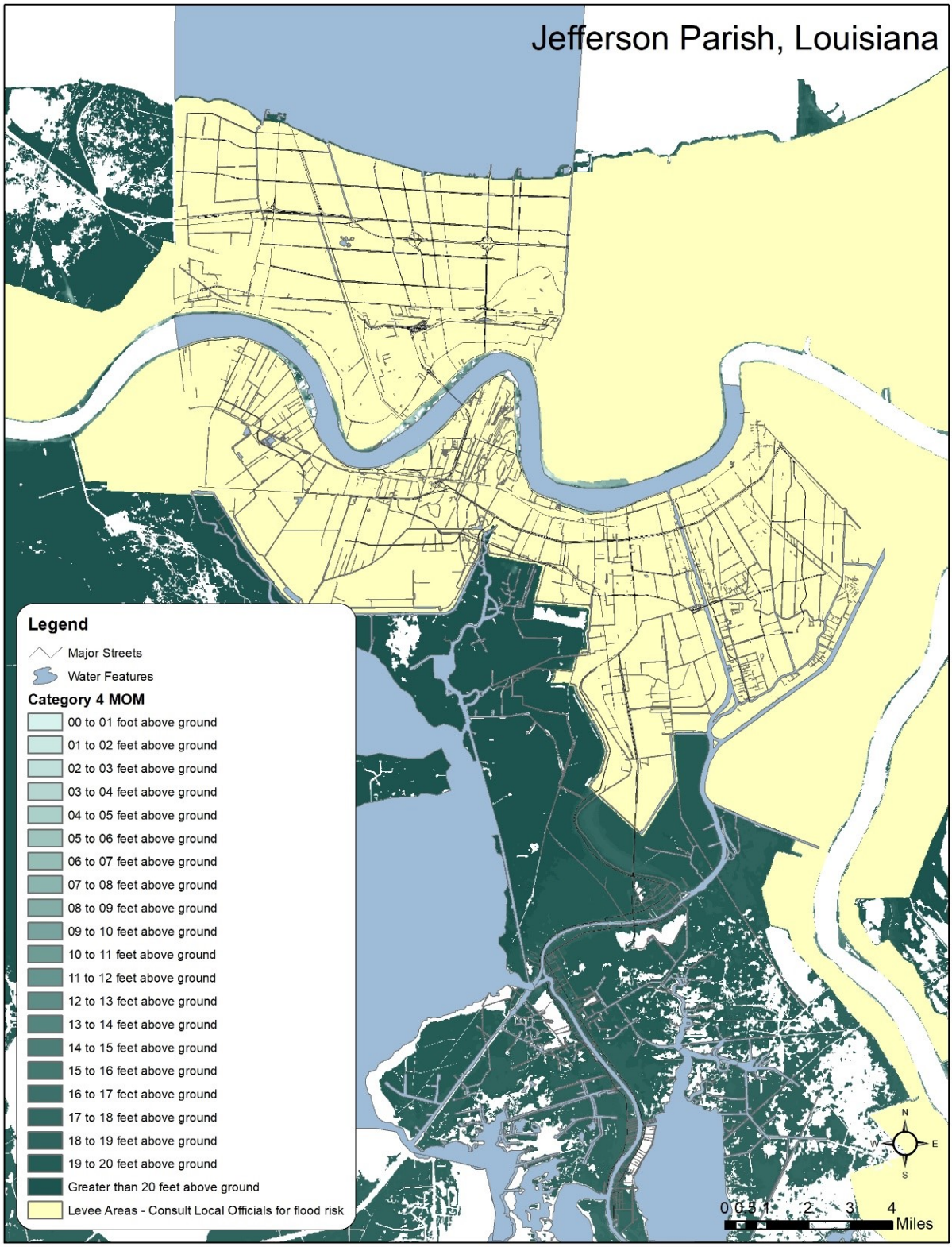
Source: National Oceanic and Atmospheric Administration

Figure 56
South Jefferson Category 1 Storm Surge



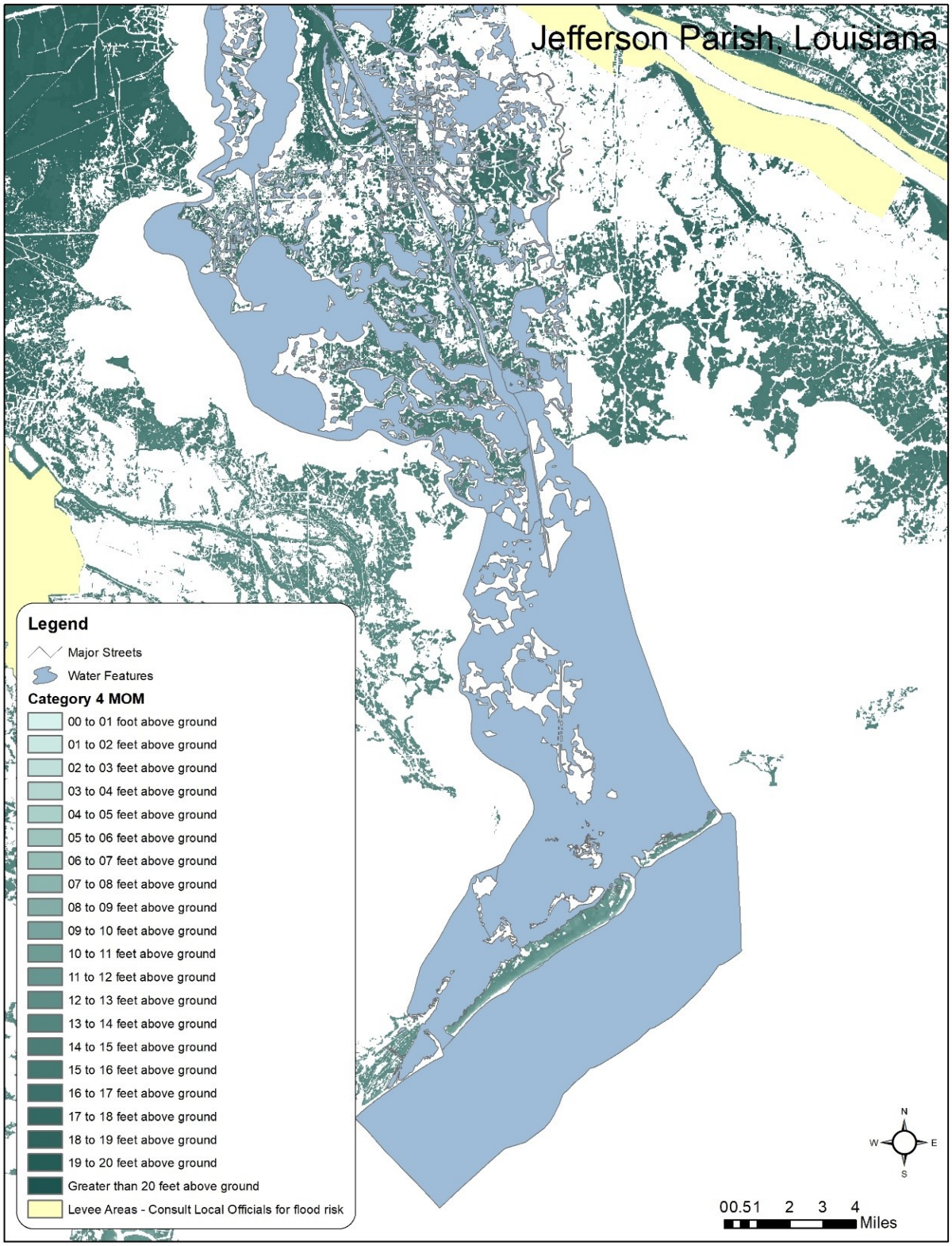
Source: National Oceanic and Atmospheric Administration

Figure 57
North Jefferson Category 4 Storm Surge



Source: National Oceanic and Atmospheric Administration

Figure 58
South Jefferson Category 4 Storm Surge



Source: National Oceanic and Atmospheric Administration

Critical Facilities Vulnerability

Critical facility inventory data was used to analyze the vulnerability of the structures to storm surge events. One of the major factors directly affecting a facility's susceptibility to damage and/or loss from storm surge is the building's location in relation to the levee system, also known as the Hurricane Storm Damage Risk Reduction System (HSDRRS). Critical facilities located within the protection of the HSDRRS have an added level of protection which reduces their vulnerability to a storm surge event. **Table 53** summarizes the storm surge vulnerability of critical facilities in the municipalities of Jefferson Parish based on depth of flooding predicted by SLOSH modeling for each hurricane category's associated storm surge. Additional information on asset risk can be found in Appendix F, Asset Inventory.

Table 53
Jefferson Parish Critical Facilities;
Storm Surge Vulnerability Assessment

Facility	Address	Type	Category 1 Surge (ft)	Category 2 Surge (ft)	Category 3 Surge (ft)	Category 4 Surge (ft)	Category 5 Surge (ft)
Jefferson Parish							
East Jefferson EMS	3120 Lime St	EMS	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
West Jefferson EMS	1225 Avenue C	EMS	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Avondale VFD (Main) Station 74	500 South Jamie Blvd	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Avondale VFD Station 75	201 West Tish Dr	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Bridge City VFD	2220 Bridge City Ave	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Eastbank Consolidated FD Station 11	3525 Jefferson Hwy	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Eastbank Consolidated FD Station 12	968 Jefferson Hwy	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Eastbank Consolidated FD Station 13	4642 Calumet St	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Eastbank Consolidated FD Station 14	1714 Edinburgh St	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Eastbank Consolidated FD Station 15	402 Aurora Ave	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Eastbank Consolidated FD Station 16	5200 Lafreniere St	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Eastbank Consolidated FD Station 17	6616 Kawanee Ave	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Eastbank Consolidated FD Station 18	3430 N. Causeway Blvd	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Eastbank Consolidated FD Station 20	4110 Hudson St	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Harvey #2 VFD Station 62	2200 Lapalco Blvd	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected

Facility	Address	Type	Category 1 Surge (ft)	Category 2 Surge (ft)	Category 3 Surge (ft)	Category 4 Surge (ft)	Category 5 Surge (ft)
Harvey #2 VFD Station 63	3824 Manhattan Blvd	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Jeff Parish Fire Training Academy	200 East St	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Lafitte Barataria Crown Point VFD Station 41	4176 Privateer Blvd	Fire	5	12	16	18	20
Live Oak Manor VFD (Main) Station 72	404 Azalea Dr	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Live Oak Manor VFD Station 73	160 Modern Farms Rd	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Marrero Estelle VFD Station 83	4050 Barataria Blvd	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Marrero Estelle VFD Station 84	3180 Destrehan Ave	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Marrero Harvey VFD (Main) Station 80	531 Avenue C	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Marrero Harvey VFD Station 81	808 McArthur Blvd	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Marrero Harvey VFD Station 82	3649 Patriot St	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Marrero Ragusa VFD (Main) Station 86	1400 Berger Rd	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Marrero Ragusa VFD Station 87	455 St Ann St	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Marrero Ragusa VFD Station 88	5725 Belle Terre Rd	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Nine Mile Point	1024 Oak Ave	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Terrytown VFD (Main) Sta. 51	341 Heritage Ave	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Terrytown VFD Station 52	2201 Carol Sue Ave	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Third District VFD Station 32	9421 Jefferson Hwy	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected

Facility	Address	Type	Category 1 Surge (ft)	Category 2 Surge (ft)	Category 3 Surge (ft)	Category 4 Surge (ft)	Category 5 Surge (ft)
Third District VFD Station 33	301 N Lester Ave	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Wallace Memorial VFD Sta. 76	4040 Highway 90	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
First Parish Court	924 DAVID DRIVE	Government	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Joe Yenni Bldg	1221 Elmwood Park Blvd.	Government	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
East Jefferson Gen Hospital	4200 Houma Blvd	Hospital	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Ochsner Foundation Hospital	1516 Jefferson Hwy	Hospital	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
West Jefferson Medical Center	1101 Medical Center Blvd	Hospital	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Jefferson Parish Sheriffs Office First District Patrol Div	3620 Hessmer Avenue	Police	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
JPSO 2nd District	1901 Manhattan Blvd	Police	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
JPSO Admin Eastbank	3300 Metairie Rd	Police	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
JPSO Admin Westbank	1233 Westbank Expwy	Police	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Ames Pump Station	5100 Rochester	Pump Station	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
BelMont Pump Station	2108 BELMONT PL	Pump Station	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Bonnabel Pump Station	1500 Beverly Garden	Pump Station	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Canal Street Pump Station	100 Canal St	Pump Station	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Cousins Pump Station 1	Destrehan & Lapalco	Pump Station	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Cousins Pump Station 2	Destrehan & Lapalco	Pump Station	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected

Facility	Address	Type	Category 1 Surge (ft)	Category 2 Surge (ft)	Category 3 Surge (ft)	Category 4 Surge (ft)	Category 5 Surge (ft)
Elmwood Canal Pump Station	ELMWOOD CANAL AT LAKE PONTCHART	Pump Station	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Estelle Pump Station	3850 Destrahan Ave.	Pump Station	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Harvey Pump Station	1600 Destrehan Ave.	Pump Station	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Hero Pump Station	Peters Road	Pump Station	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Lake Cataoutche Pump Station	3.5 Miles off of U.S. 90	Pump Station	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Mount Kennedy Pump Station	3100 Mt Kennedy Dr	Pump Station	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Planters Pump Station	268 Bypass Road	Pump Station	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Pontiff Playground Pump Station	1521 Palm St	Pump Station	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Suburban Canal Pump Station	SUBURBAN CANAL AT LAKE PONTCHAR	Pump Station	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Upper Kraak Pump Station	911 KAYE ST	Pump Station	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Westminster Pump Station	2050 Watling	Pump Station	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Whitney - Barataria Pump Station	1301 Engineers Road	Pump Station	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Causeway Head Start	3420 N. Causeway Blvd	Shelter	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
JP Animal Shelter -West Bank	2701 Lapalco Blvd	Shelter	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Jutland Head Start	1821 Jutland	Shelter	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Kings Grant Playground	3805 15th Street	Shelter	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected

Facility	Address	Type	Category 1 Surge (ft)	Category 2 Surge (ft)	Category 3 Surge (ft)	Category 4 Surge (ft)	Category 5 Surge (ft)
Lapalco Head Start	2001 Lincolnshire Dr	Shelter	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Little Farms Playground	10301 S Park St	Shelter	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Miley Playground	6716 W Metairie	Shelter	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Pard Playground	5185 Eighty Arpent Road	Shelter	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Terrytown Gretna Head Start	2315 Park Place	Shelter	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Terrytown Playground	641 Heritage Ave	Shelter	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Eastbank Water Plant	3600 Jefferson Hwy	Water	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Westbank Water Plant	4500 Westbank Exp.	Water	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
City of Gretna							
New EOC	910 3rd Street	EOC	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
David Crockett VFD Station 46	323 Weidman St	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
David Crockett VFD Station 48	2000 Hancock St	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
David Crockett VFD (Mn) St 45	1136 Lafayette St	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
David Crockett VFD Station 47	700 Gretna Blvd	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Terrytown VFD Station 53	200 Wall Blvd	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Station 54	3301 WALL BLVD.	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Gretna City Hall	740 2nd St	Government	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Courthouse	200 Derbigny St	Government	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected

Facility	Address	Type	Category 1 Surge (ft)	Category 2 Surge (ft)	Category 3 Surge (ft)	Category 4 Surge (ft)	Category 5 Surge (ft)
Courthouse Annex	210 Derbigny St	Government	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
EOC	910 3rd St	Government	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
General Government Building	200 Derbigny Street	Government	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Ochsner-Westbank Medical Center	2500 Belle Chase Hwy	Hospital	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Gretna City Of Police Department Chief Of Police & A	200 5th St	Police	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Jefferson Parish Sheriffs Office Correctional Center	100 Dolhonde St	Police	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Mel Ott Multi Purpose Center	2301 Belle Chasse Hwy	Shelter	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
City of Harahan							
Eastbank Consolidated FD Fire Prevention/Arson Unit	834 S. Clearview Pkwy	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Eastbank Consolidated FD Station 19	455 Edwards Ave	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Harahan VFD Station 27	800 Randolph St	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
City Hall of Harahan	6425 Jefferson Hwy	Government	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Harahan City Of Police Department Headquarters	6425 Jefferson Hwy	Police	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Midway Pump Station	1 SHADY OAK LN	Pump Station	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
JP Animal Shelter- East Bank	1 Humane Way	Shelter	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
City of Kenner							
Louis Armstrong Airport	900 Airline Dr	Airport	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected

Facility	Address	Type	Category 1 Surge (ft)	Category 2 Surge (ft)	Category 3 Surge (ft)	Category 4 Surge (ft)	Category 5 Surge (ft)
Sourtheast Louisiana Flood Protection Authority-East EOC	1100 Reverend Richard Wilson Dr	EOC	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
City of Kenner EOC	1610 Reverend Richard Wilson Dr	EOC	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Kenner FD Station 37	3928 Delaware Ave	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Kenner Fire Rescue Station 379	3343 Williams Blvd	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Kenner FD HQ/Fire Alarm	2226 Williams Blvd	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Kenner FD (Main) Station 35	1801 Williams Blvd	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Kenner FD Station 36	315 Worth St	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Kenner FD Station 39	401 Vintage Dr	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Kenner City Hall	1801 Wiliams Blvd	Government	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Ochsner-Kenner Medical Center	180 W Esplanade Ave	Hospital	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
East Jefferson Levee District Police Dept	1135 Lesan Dr	Police	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Kenner Police HQ	500 Veterans Blvd	Police	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Kenner Police Training Center	1939 Reverend Richard Wilson Dr	Police	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Sourtheast Louisiana Flood Protection Authority-East Police Dept	1100 Reverend Richard Wilson Dr	Police	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Duncan Canal Pump Station 4	DUNCAN CANAL AT LAKE PONTCHARTRA	Pump Station	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Parish Line Pump Station	PARISH LINE & GRANDLAKE	Pump Station	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected

Facility	Address	Type	Category 1 Surge (ft)	Category 2 Surge (ft)	Category 3 Surge (ft)	Category 4 Surge (ft)	Category 5 Surge (ft)
Kenner Sewer Plant	1 West 30th Street	Sewer	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Pontchartrain Center	4545 Williams Blvd	Shelter	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
City of Westwego							
Westwego EMS	918 6th St.	EMS	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Westwego VFD Station 92	300 Columbus St	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Westwego VFD Station 94	206 Louisiana St	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Westwego VFD (Mn) Sta. 91	677 Avenue H	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Westwego VFD Station 95	1164 Avenue C	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Westwego VFD Station 93	1501 Central Ave	Fire	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Westwego City Hall	419 Avenue A	Government	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Westwego City Of Police Department Police Chief	401 4th Street	Police	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Bayou Segnette Pump Station	801 Louisiana Ave	Pump Station	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Westwego Pump Station 1	100 Vic A. Pitre Drive	Pump Station	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Westwego Pump Station 2	820 South Laroussine	Pump Station	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Alario Center	2000 Segnette Blvd	Shelter	Levee Protected	Levee Protected	Levee Protected	Levee Protected	Levee Protected
Town of Grand Isle							
Grand Isle Fire	100 Chighizola Lane	Fire	3	6	8	11	14
Grand Isle Town Hall	170 Ludwig Ln	Government	4	7	9	12	15

Facility	Address	Type	Category 1 Surge (ft)	Category 2 Surge (ft)	Category 3 Surge (ft)	Category 4 Surge (ft)	Category 5 Surge (ft)
Grand Isle Town Of Police Dept	134 Ludwig Ln	Police	3	6	8	12	14
Town of Jean Lafitte							
Lafitte Barataria Crown Point VFD (Main) Station 40	2385 Jean Lafitte Blvd	Fire	4	11	16	18	20
Lafitte Barataria Crown Point VFD Station 43	5510 Jean Lafitte Blvd	Fire	5	12	16	18	20
Jean Lafitte Town Hall	2654 Jean Lafitte Blvd	Government	4	11	15	18	19
Jean Lafitte Police	2607 Jean Lafitte Blvd	Police	4	11	16	18	20
Crown Point Pump Station 2	OAK TRAILER PARK	Pump Station	6	13	17	20	21
Crown Point Pump Station 1		Pump Station	6	14	18	20	21
Rosethorn Pump Station		Pump Station	4	12	16	19	20
August Lane Pump Station		Pump Station	7	14	18	20	21
Highway 45 Pump Station	2013 Jean Lafitte Blvd	Pump Station	4	11	16	19	20
Jones Point Pump Station	Dead end Carmelite St	Pump Station	4	12	16	19	20
Fleming Pump Station	DARDAR ST	Pump Station	6	13	17	20	21
Oak Dr Pump Station	OAK ST	Pump Station	6	14	18	20	21
Perkins Street Pump Station	End of Perkins St	Pump Station	5	12	17	19	21
Church Street Pump Station		Pump Station	5	12	16	19	20
Gloria Pump Station		Pump Station	5	13	17	19	21
Pailet Pump Station		Pump Station	5	12	16	19	20
Goose Bayou Pump Station	4875 DECAMP ST	Pump Station	6	14	18	20	21
Marrero St Pump Station	5117 2ND ST	Pump Station	5	12	16	18	20

Facility	Address	Type	Category 1 Surge (ft)	Category 2 Surge (ft)	Category 3 Surge (ft)	Category 4 Surge (ft)	Category 5 Surge (ft)
Lafitte Water Tower	3448 JEAN LAFITTE BLVD	Water	5	12	16	19	20

4.5.9 Conclusion

The areas of Jefferson Parish that lie outside of levee protection are vulnerable to future damage from storm surge events. According to the SLOSH modeling, these areas have a very high potential risk of damages. Ways that the Parish plans to reduce this associated risk are addressed in Section 5, Mitigation Strategy.

4.6 Tornadoes

4.6.1 Description of the Tornado Hazard

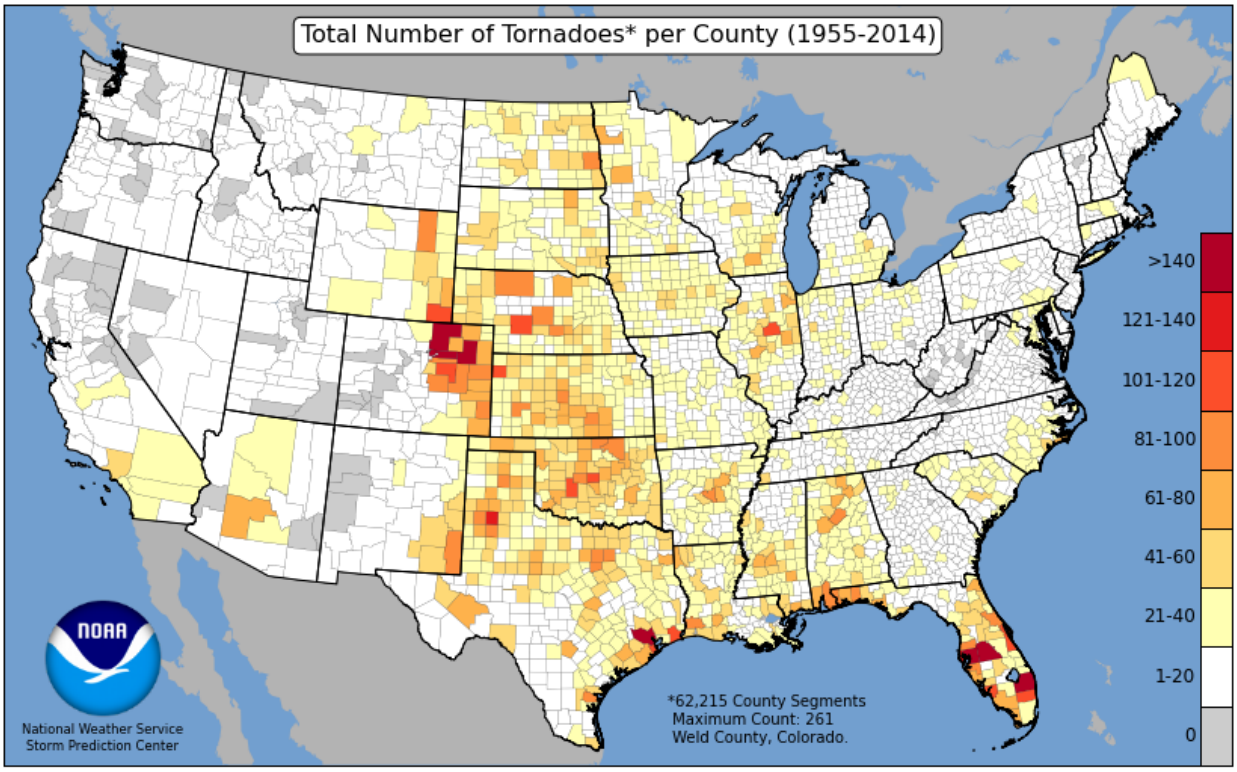
A tornado is a rapidly rotating vortex or funnel of air extending ground ward from a cumulonimbus cloud. Most of the time, vortices remain suspended in the atmosphere. When the lower tip of a vortex touches earth, the tornado becomes a force of destruction. Approximately 1,000 tornadoes are spawned by severe thunderstorms each year. See Appendix D, General Descriptions of Natural Hazards, for a more detailed description and definition of the tornado hazard.

4.6.2 Location and Extent of the Tornado Hazard

Tornadoes are random events and could occur in any of the jurisdictions. Therefore, all jurisdictions in Jefferson Parish have equal risk to the tornado hazard. The National Centers for Environmental Information reports that 60 tornadoes, including waterspouts, have occurred in Jefferson Parish between January 1950 and May 2018. Of those 60 tornadoes, 26 were an F0, 21 were an F1, 9 were an F2, and 4 were waterspouts.

In Louisiana, peak tornado occurrence is in March through May, and in November. **Figure 59** shows tornado activity in the United States. The map indicates NOAA's recorded tornadoes per county from 1955-2014, including Jefferson Parish.

Figure 59
Tornado Activity in the United States[42]



Source: National Oceanic and Atmospheric Administration

An area covering portions of Texas, Oklahoma, Arkansas, Missouri, and Kansas is known as Tornado Alley, where the average annual number of tornadoes is the highest in the United States. Cold air from the north collides with warm air from the Gulf of Mexico, creating a temperature differential on the order of 20 – 30 degrees C. Most tornadoes in this area occur in the spring.

People living in manufactured or mobile homes are most exposed to damage from tornadoes. Even if anchored, mobile homes do not withstand high wind speeds as well as permanent, site-built structures.

4.6.3 Severity of Tornado Hazard

Prior to February 1, 2007, tornado damage severity was measured by the Fujita Tornado Scale. The Fujita Scale assigns numerical values based on wind speeds and categorizes tornadoes from 0 to 5. The letter "F" often precedes the numerical value. Tornadoes are related to larger vortex formations and, therefore, often form in convective cells such as thunderstorms or in the right forward quadrant of a hurricane far from the hurricane eye. See **Table 54** for the Fujita Tornado Measurement Scale.

Table 54
Fujita Tornado Measurement Scale

Category	Wind Speed	Examples of Possible Damage	Number in Louisiana	% of LA Tornadoes
F0	Gale (40-72 mph)	Light damage. Some damage to chimneys; break branches of trees; push over shallow rooted trees; damage to sign boards.	321	22%
F1	Moderate (73-112 mph)	Moderate damage. Peel surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off roads.	698	48%
F2	Significant (113-157 mph)	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light-object missiles generated.	292	20%
F3	Severe (158-206 mph)	Severe damage. Roofs and some walls torn off well constructed houses; trains overturned; most trees in forest uprooted; cars lifted off ground and thrown.	132	9%
F4	Devastating (207-260 mph)	Devastating damage. Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.	18	1%
F5	Incredible (261-318 mph)	Incredible damage. Strong frame houses lifted off foundations and carried considerable distance to disintegrate; automobile sized missiles fly through air in excess of 100 yards; trees debarked; incredible phenomena will occur.	2	0%

An update to the original Fujita Tornado Scale by a team of meteorologists and wind engineers was implemented on February 1, 2007. This update is called the Enhanced Fujita Scale and is still a set of wind estimates (not measurements) based on damage. It uses three-second gusts estimated at the point of damage based on a judgement of 8 levels of damage to 28 damage indicators. See **Table 55** for the Fujita Tornado Measurement Scale.

Table 55
Enhanced Fujita Tornado Measurement Scale

Category	Intensity Phrase	3 Second Gust	Potential Damage
EF0	Gale	65-85 mph	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages to sign boards.
EF1	Moderate	86-110 mph	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
EF2	Significant	111-135 mph	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
EF3	Severe	136-165 mph	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
EF4	Devastating	166-200 mph	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
EF5	Incredible	Over 200 mph	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel re-enforced concrete structures badly damaged.

4.6.4 Impact on Life and Property

The tornadoes category is the one hazard recorded by the National Centers for Environmental Information since 1950. At that time, events were reported on a parish-wide basis. It was not until 1996 that recorded events included 48 different types of hazard events that were separated out by municipalities.

The National Centers for Environmental Information reports that 60 tornadoes, including waterspouts, have occurred in Jefferson Parish between January 1950 and May 2018. The tornadoes caused an estimated $63.7 million in property damage. For all 60 tornadoes, there were 4 deaths and 71 injuries. With a total of 60 tornadoes between 1950 and 2018, Jefferson Parish experiences a tornado event on average about once every 1.25 years. The 60 events have occurred over a period of 68 years which calculates to an 88% annual probability of future tornado occurrences.

Because tornadoes occur with such little warning, they do not warrant an evacuation; however, warnings are disseminated by public safety agencies such as firefighters driving around neighborhoods with their sirens on to warn the public that a tornado is coming. Additionally, displacement from one's home and/or community can affect mental health and often results in post-traumatic stress disorder (PTSD).

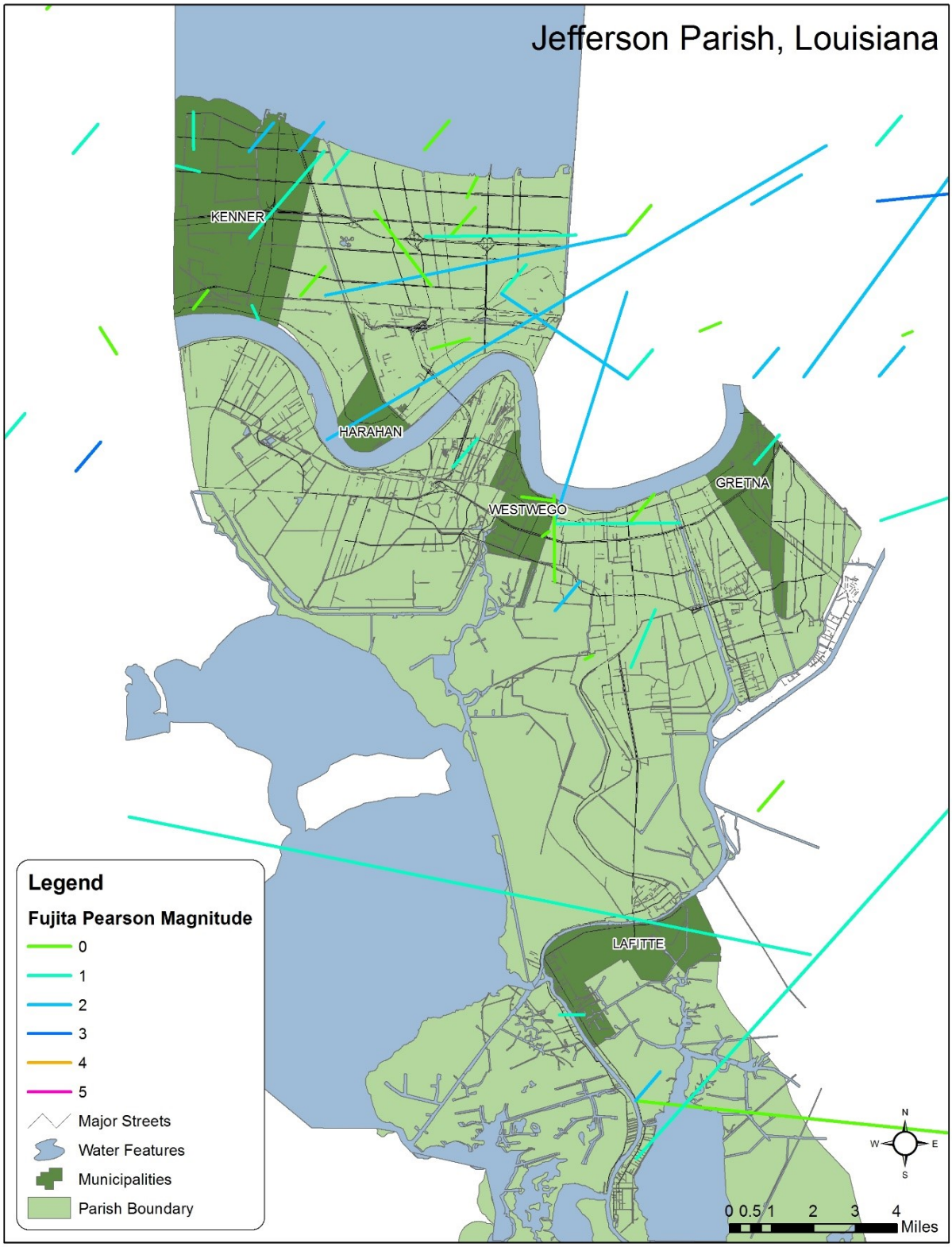
4.6.4-1 Impact on Public Health

Flying debris and building collapse are among the major culprits of injuries after tornadoes. The impact on public health is more severe in high-density areas. Tornadoes are destructive and non-discriminatory and may damage an entire community in a matter of minutes. If the hospitals and roads to transport people are also damaged, it may be a challenge for a community to provide the services needed to treat these injuries in a timely fashion meaning that victims may not recover.

4.6.5 Occurrences of the Tornado Hazard

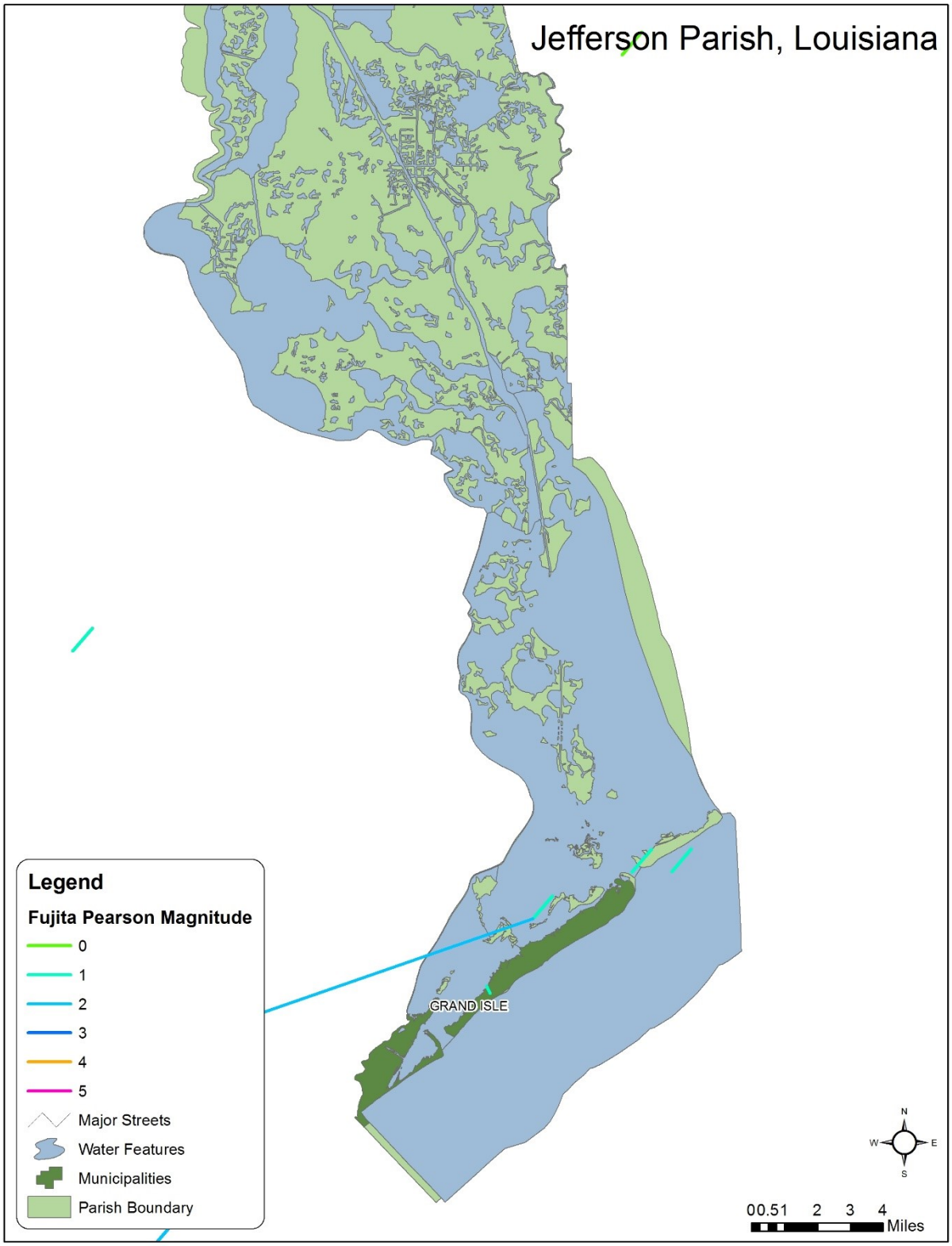
Table 56 summarizes the major tornado events that have impacted Jefferson Parish since from 2008 to 2018. Of the 60 tornadoes identified, 26 were an F0, 21 were an F1, 9 were an F2, and 4 were waterspouts. Therefore, the most common size tornadoes that could impact the Parish are either an F0 or an F1, although an F2 to F5 event is still possible. **Figure 60** and **Figure 61** show maps of tornadoes that have occurred in and around the parish between 1950-2017.

Figure 60
Tornado Events in North Jefferson Parish (1950-2017)



Source: National Oceanic and Atmospheric Administration

Figure 61
Tornado Events in South Jefferson Parish (1950-2017)



Source: National Oceanic and Atmospheric Administration

Table 56
Tornado Events, Jefferson Parish, January 2008 – May 2018
(Source: NOAA/NCEI[43])

	Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1.	ESTELLE	03/19/2008	03:00	Tornado	EF1	0	0	200.00K	0.00K
2.	WESTWEGO	09/02/2008	16:40	Tornado	EF1	0	0	1.700M	0.00K
3.	METAIRIE	05/16/2009	20:20	Tornado	EF0	0	0	15.00K	0.00K
4.	WESTWEGO	12/15/2009	05:20	Tornado	EF0	0	0	3.00K	0.00K
5.	MOISANT ARPT	03/09/2011	06:08	Tornado	EF0	0	0	5.00K	0.00K
6.	GRAND ISLE	05/13/2011	11:46	Tornado	EF0	0	0	10.00K	0.00K
7.	GRAND ISLE	05/09/2012	13:40	Tornado	EF1	0	0	100.00K	0.00K
8.	TERRYTOWN	12/25/2012	18:20	Tornado	EF0	0	0	10.00K	0.00K
9.	KENNER	04/24/2013	10:52	Tornado	EF0	0	2	100.00K	0.00K
10.	MOISANT ARPT	04/24/2013	10:48	Tornado	EF1	0	0	150.00K	0.00K
11.	GRAND ISLE	06/19/2013	14:45	Tornado	EF0	0	0	10.00K	0.00K
12.	MOISANT ARPT	04/27/2015	9:23	Tornado	EF1	0	0	0.00K	0.00K
13.	KENNER	05/26/2015	0:22	Tornado	EF1	0	0	0.00K	0.00K
14.	MOISANT ARPT	02/23/2016	11:11	Tornado	EF0	0	0	0.00K	0.00K
15.	WESTWEGO	11/30/2016	8:45	Tornado	EF0	0	0	0.00K	0.00K
16.	SOUTHPORT	02/07/2017	10:51	Tornado	EF0	0	0	0.00K	0.00K
17.	ESTELLE	05/12/2017	10:13	Tornado	EF0	0	0	0.00K	0.00K
	Totals:					0	2	2.303M	0.00K

Significant events for unincorporated Jefferson Parish are summarized below:

- March 19, 2008 – An EF1 tornado damaged 13 homes and snapped several large hardwood trees in half along an intermittent path. Some of the trees fell on roofs of houses and one car was crushed by a falling tree. One person was injured when hit by a section of a falling rafter.

- May 16, 2009 – A National Weather Service storm damage survey indicated that a waterspout moved onshore from Lake Pontchartrain as an EF0 tornado before dissipating. Intermittent property damage occurred to a few houses and businesses from near the lakefront and Severn Avenue to a few blocks south of West Esplanade and Hessemmer Avenue. Damage occurred to trees, fences, and a few roofs.

- December 25, 2012 – An EF0 tornado touched down in Marrero near the intersection of Barataria and LaPalco Blvd. A gas station sign was blown over and minor damage was done to a fast food restaurant drive-through canopy.

- February 7, 2017 – An EF0 tornado touched down near Elmwood on St. George Avenue. It moved east northeast causing intermittent tree and roof damage. It lifted near Jefferson Heights around the intersection of Sizeler Avenue and Lauricella Avenue. Maximum wind speeds are estimated around 80 mph.

- May 12, 2017 – Minor property damage was reported with two carports ripped off homes on Mt. Revarb Drive. Rear car windows were also blown out, with tree and power line damage as well. Tornado was rated EF0 with maximum winds of 65 to 70 mph and a path width of 20-30 yards.

In addition to data collected from national reports, Jefferson Parish has also developed an online platform for recording historic hazard events that is updated regularly by Parish staff. **Table 57** below summarizes tornado events captured through this platform in Jefferson Parish in the last 11 years.

Table 57
Tornado Events, Jefferson Parish, 2007 – 2018

Location	Number of Events
Gretna	0
Harahan	0
Kenner	1
Westwego	12
Grand Isle	0
Jean Lafitte	0
Unincorporated Jefferson Parish	3
TOTAL	**16**

4.6.6 Municipality Tornado Hazards

City of Gretna

No previous tornado occurrences have been recorded in the City of Gretna in the past 10 years.

City of Harahan

No previous tornado occurrences have been recorded in the City of Harahan in the past 10 years.

City of Kenner

Six tornadoes have been reported in the City Kenner in the past ten years. These events are summarized in **Table 58** below.

Table 58
Tornado Events, City of Kenner, January 2008 – May 2018

	Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1.	MOISANT ARPT	03/09/2011	06:08	Tornado	EF0	0	0	5.00K	0.00K
2.	KENNER	04/24/2013	10:52	Tornado	EF0	0	2	100.00K	0.00K
3.	MOISANT ARPT	04/24/2013	10:48	Tornado	EF1	0	0	150.00K	0.00K
4.	MOISANT ARPT	04/27/2015	09:23	Tornado	EF1	0	0	0.00K	0.00K
5.	KENNER	05/26/2015	00:22	Tornado	EF1	0	0	0.00K	0.00K
6.	MOISANT ARPT	02/23/2016	11:11	Tornado	EF0	0	0	0.00K	0.00K
		Totals:				0	2	255.00K	0.00K

- March 9, 2011 – An EF0 tornado blew down a couple of power poles. Minor fence damage was reported along Joe Yenni Boulevard. A few trees were uprooted and one tree fell onto the corner of a house on Platt Street. Traffic lights were twisted on Joe Yenni Boulevard. Maximum wind was estimated at 70 mph. The tornado moved into Lake Pontchartrain.

- April 24, 2013, two tornadoes were recorded—an EF0 tornado in Kenner near the Metairie line and an EF1 tornado near the airport. A weak tornado touched down near the intersection of Meadowdale Street and Kent Avenue in Metairie, where it downed a large, but rotting, tree onto a parked car. At the intersection of Transcontinental Drive and Veterans Boulevard, the tornado snapped several small trees and overturned a large truck, with the two occupants suffering minor injuries. The tornado continued to cause minor damage to trees and rooftops as it moved through the Pontchartrain Gardens subdivision. The tornado near the airport downed power lines, knocked over light poles, and ripped large limbs off of several large oak trees. A few of the limbs were upward of 18 inches in diameter. The tornado lifted shortly after crossing the intersection of West Loyola Drive and Vintage Drive. Sporadic straight line wind damage was also found in surrounding areas. Estimated peak wind speed was 90 mph.

- April 27, 2015 – A weak tornado, along the leading edge of a squall line, touched down at the levee of Duncan Canal north of West Esplanade Avenue. Two wooden power poles were bent near an apartment complex. The storm tracked to the east-southeast with mainly light tree damage, and one area of light roof damage on Grandlake Boulevard. The tornado then crossed Canal Number 17 and lifted the roof off of the back porch of a house on Tulane Drive. On the opposite side of Tulane Drive, another house had a small portion of its roof ripped off. The tornado continued to the east-southeast and crossed West Louisiana State Drive and bent over one wooden power pole and snapped a second one. The tornado then uprooted a hardwood tree in front of a house on West Loyola. The most significant damage occurred at the corner of Loyola and West Esplanade, where multiple wooden power poles and a few trees were snapped. The tornado then quickly lifted as it crossed West Esplanade. In addition to the tornado, sporadic light tree damage occurred south of the track. A large portion of the facade of a hotel on the corner of Loyola and the Interstate 10 Service Road was damaged due to straight line winds.

- May 26, 2015 – A tornado touched down on the east bank of the Mississippi River, damaging a pier at the foot of Williams Boulevard and snapping hardwood trees. The highest EF-1 damage occurred at the start of the tornado track from the Mississippi River to along

Reverend Richard Wilson Drive with structural damage reported to homes and a business. The tornado continued to track northwest to Kenner Avenue, where it caused part of a roof to peel back on a single family home. The tornado then weakened to EF-0 as it lifted on the north side of the railroad tracks. Estimated peak wind was 110 mph.

- February 23, 2016 – A tornado touched down in Kenner near the intersection of Audubon Ct and 3rd St. It moved toward the northeast causing damage to roofs and power poles. It lifted as it neared the intersection of James St. and Pollock Plaza.

City of Westwego

Three tornadoes have been recorded in the City of Westwego in the past ten years. These events are summarized in **Table 59** below.

Table 59
Tornado Events, City of Westwego, January 2008 – May 2018

	Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1.	WESTWEGO	09/02/2008	16:40	Tornado	EF1	0	0	1.700M	0.00K
2.	WESTWEGO	12/15/2009	05:20	Tornado	EF0	0	0	3.00K	0.00K
3.	WESTWEGO	11/30/2016	08:45	Tornado	EF0	0	0	0.00K	0.00K
		Totals:				0	0	1.703M	0.00K

- September 2, 2008 – An EF1 tornado damaged 35 to 40 structures with 15 being classified as total losses or destroyed.

- December 15, 2009 – An EF0 tornado briefly touched down near the intersection of West Bank Expressway and Victory Drive resulting in minor damage. The tornado snapped large tree limbs, broke off two power poles, and knocked down power lines along West Bank Expressway.

- November 30, 2016 – A weak tornado touched down near the intersection of Avenue C and Columbus Street in Westwego. It caused minor damage to the roofs of about 5 homes, tore the carport off of one home, bent a power pole, and snapped limbs on several trees. It moved eastward through an industrial area, causing damage to the roof and garage doors of a warehouse. It then lifted as it crossed River Road. Estimated maximum wind speed was 85 mph.

Town of Grand Isle

Three previous occurrences have been recorded in the Town of Grand Isle in the last ten years. These events are summarized in **Table 60** below.

Table 60
Tornado Events, Town of Grand Isle, January 2008 – May 2018

	Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1.	GRAND ISLE	05/13/2011	11:46	Tornado	EF0	0	0	10.00K	0.00K
2.	GRAND ISLE	05/09/2012	13:40	Tornado	EF1	0	0	100.00K	0.00K
3.	GRAND ISLE	06/19/2013	14:45	Tornado	EF0	0	0	10.00K	0.00K
		Totals:				0	0	120.00K	0.00K

- May 13, 2011 - A waterspout was observed crossing Grand Isle. The waterspout went ashore near the bridge, crossed the island and then moved north back over the water. Grand Isle police observed the waterspout for approximately 6 miles...mainly over the water. Power lines were downed near the bridge on Louisiana Highway 1. Part of a roof was taken off of a cabin at the Bridgeside Marina.

- May 9, 2012 – A waterspout over Barataria Bay, as described in an earlier entry, moved southward and onshore the west portion of Grand Isle. A National Weather Service storm survey determined EF-1 damage. There was a total loss of one manufactured home roof, and roof and siding damage to several other structures. A parked recreational travel trailer also suffered significant damage. Some roof debris was thrown 30 yards to the northeast. The path extended from just east of Raspberry Lane on the north side of the island to just west of Raspberry Street on the south side of the island.

- June 19, 2013 - A large waterspout over Barataria Bay moved south and onshore Grand Isle. A portion of a camp roof was blown off and several power lines snapped.

Town of Jean Lafitte

No previous tornado occurrences have been recorded in the Town of Jean Lafitte in the past 10 years.

4.6.7 Tornado Risk Assessment

Structure Vulnerability

Although tornado risk in Jefferson Parish is small relative to other parts of the nation, there remains enough exposure to the hazard to warrant a risk assessment to estimate potential future losses from this hazard.

Since the tornado wind impacts are similar to those from hurricane winds, one way to approach the potential damage from a tornado would be to use the hurricane winds vulnerability results. However, a tornado would likely have more localized and acute impacts than a hurricane, which would have widespread effects across the entire parish. As such, property loss results were derived based on the total damages reported by NCEI. This assessment, presented in **Table 61**, was based on an annualized assessment of tornado losses for the Parish and does not provide a breakdown by community, but instead is a parish-wide assessment of potential annualized losses.

Table 61
Annualized Building Loss Estimate from Tornadoes in Jefferson Parish

Name	Annualized Loss
Jefferson Parish	$936,644

Critical Facilities Vulnerability

Since the location of damage from a tornado event is unpredictable and may occur anywhere within the Parish, vulnerability of facilities to a tornado is relatively equal across the parish and so all facilities are considered at risk to damage from a tornado event. Additional information on asset risk can be found in Appendix F, Asset Inventory.

4.6.8 Conclusion

The total annualized risk to residential structures in Jefferson Parish from a tornado event could be potentially high depending on the strength of the tornado and the exact location impacted. The exact damage level will be based on these factors. It should also be noted that tornadoes have the capacity to have major impacts in some localized areas of a community, while causing little to no damage in other areas.

4.7 Coastal Erosion

4.7.1 Description of the Coastal Erosion Hazard

Coastal erosion is the wearing away of land or the removal of beach or dune sediments by wave action, tidal currents, wave currents, or drainage. The physical processes that cause barrier island erosion and wetland loss throughout the Louisiana delta plain are complex and varied (USGS – Coastal Erosion and Wetland Change in Louisiana). Coastal erosion along the Louisiana Gulf Coast is an ongoing process that continues to threaten the wetlands and barrier islands. The erosion process is only accelerated by strong storms and hurricanes which can erode large sections of coastline with a single event. See Appendix D, General Descriptions of Natural Hazards, for a more detailed description and definition of the coastal erosion hazard.

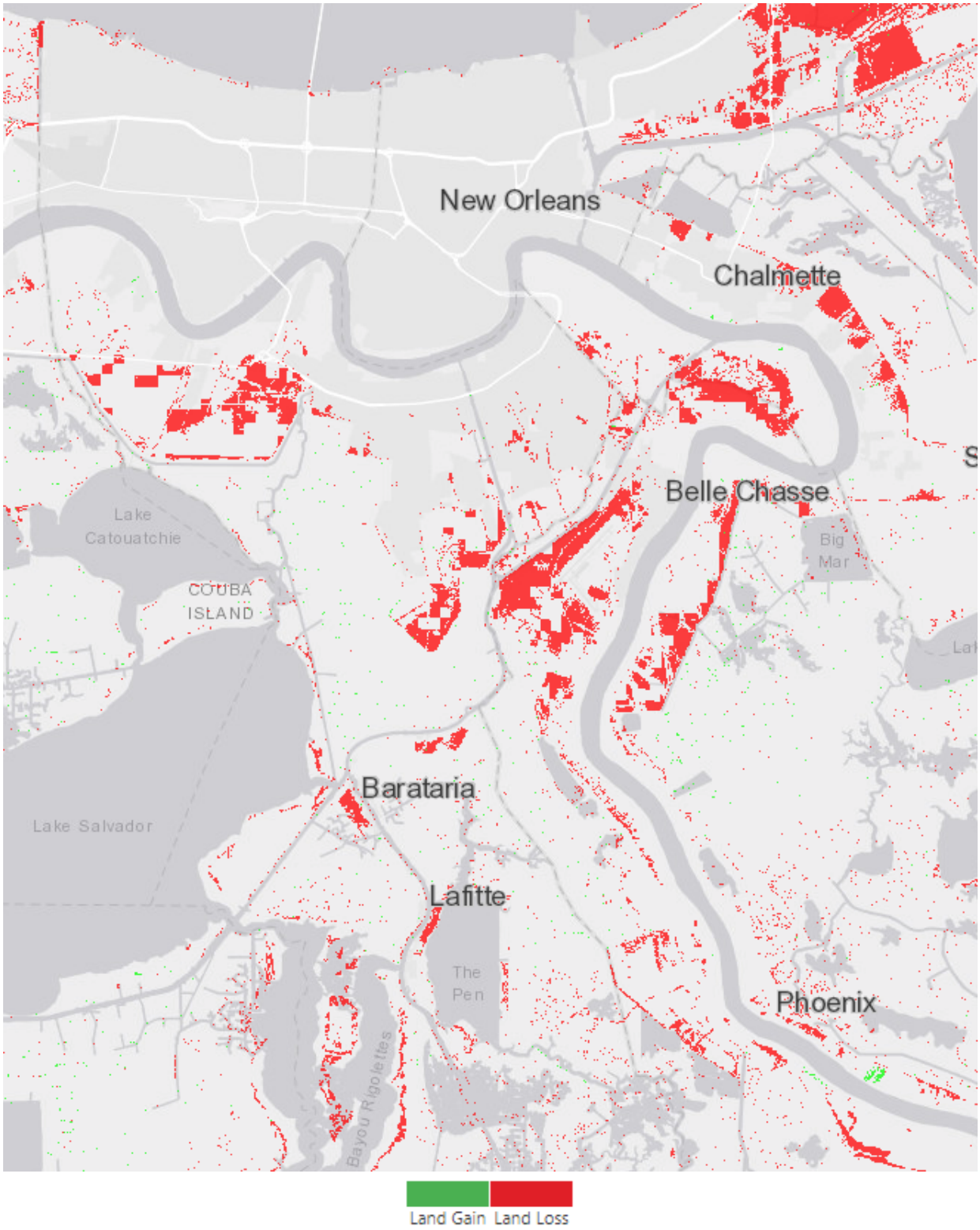
4.7.2 Location and Extent of Coastal Erosion

Coastal erosion is a significant problem along the entire Louisiana Gulf Coast. The barrier islands and marshes of Louisiana provide protection for inland development during hurricanes. These islands act as a buffer and help to reduce the intensity of hurricanes as they make landfall prior to reaching more densely populated areas such as Jefferson Parish. For example, Hurricane Lili went from a Category 4 to a Category 2 as it encountered Louisiana coastal waters. However, as more land is eroding, these barriers are far less effective.

Coastal erosion directly impacts the southern half of Jefferson Parish. One of the greatest areas of concern in the Parish is the Grand Isle barrier island. This is the only inhabited barrier island in the State of Louisiana. Coastal erosion threatens to shift or reduce the size of the island dramatically in coming years. **Figure 62, Figure 63, Figure 64,** and **Figure 65** below identify projected areas of coastal erosion for Jefferson Parish based on information from the CPRA Coastal Master Plan.[44] For

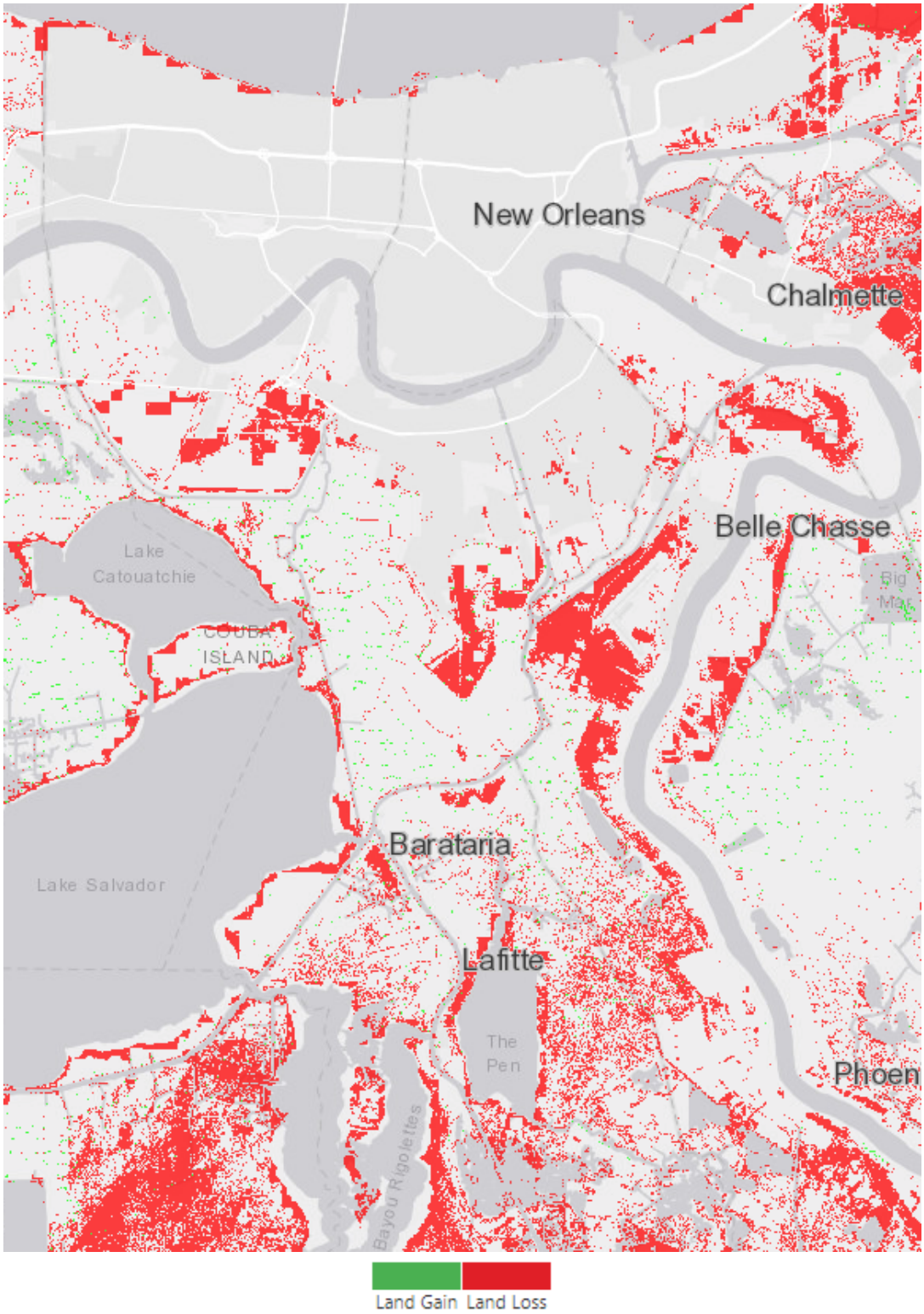
Jefferson Parish, the most land loss is projected in the Towns of Jean Lafitte and Grand Isle, but there is projected land loss throughout the parish in both the 10-year and 40-year medium loss scenario. This indicates that erosion and land loss will likely be a significant issue for Jefferson Parish going forward, especially in the southern part of the parish.

Figure 62
Projected Land Loss/Gains in North Jefferson Parish: 10-year Medium Scenario



Source: Louisiana Coastal Master Plan

Figure 63
Projected Land Loss/Gains in North Jefferson Parish: 40-year Medium Scenario

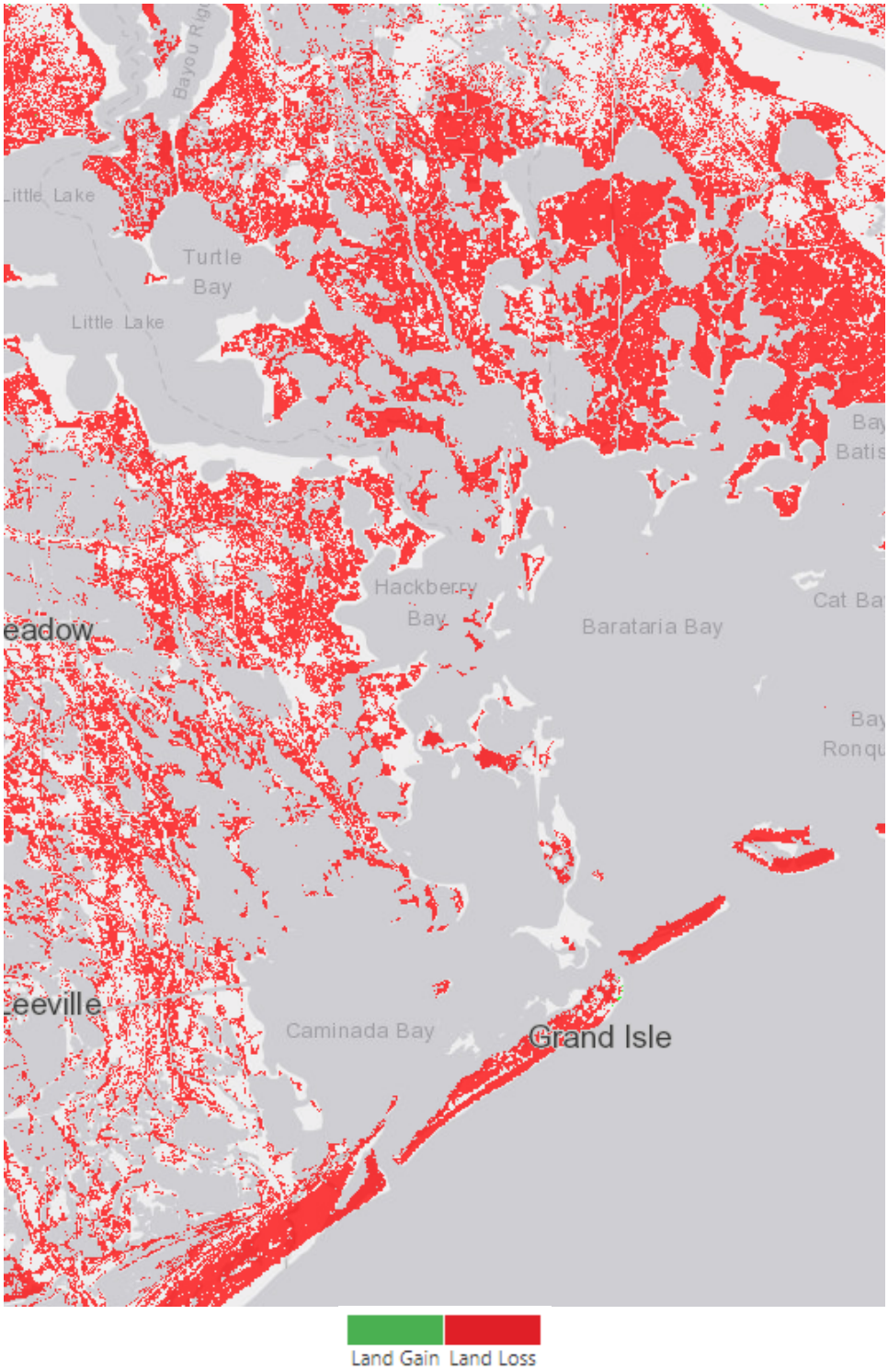


Source: Louisiana Coastal Master Plan

Figure 64
Projected Land Loss/Gains in South Jefferson Parish: 10-year Medium Scenario

Source: Louisiana Coastal Master Plan

Figure 65
Projected Land Loss/Gains in South Jefferson Parish: 40-year Medium Scenario



Source: Louisiana Coastal Master Plan

4.7.3 Severity of the Coastal Erosion Hazard

Tides and strong storms moving onshore from the Gulf of Mexico are eroding Louisiana's marshy coastline at an alarming rate. Erosion of several of the barrier islands, which lie offshore of the estuaries and wetlands that buffer and protect these important ecosystems from the open marine environment, exceeds 20 meters/year. The average rate of shoreline erosion is over 10 meters/year. Within the past 100 years, Louisiana's barrier islands have decreased in area by more than 40 percent, and some islands have lost more than 75 percent of their land area. If these loss rates continue, several of the barriers are expected to erode completely within the next three decades. Their disappearance will contribute to further loss and deterioration of wetlands and back-barrier estuaries and increase the risk to infrastructure.

Coastal wetlands in southern Louisiana are also being lost due to erosion. Louisiana has the highest rate of wetlands loss in the country with the state accounting for 80 percent of the nation's total wetland loss. The USGS estimates wetland loss in the Mississippi River Delta Plain to be 70 square kilometers per year the equivalent of a football field every 20 minutes. In total, the USGS estimates that Louisiana has lost approximately 1,900 square miles of its coast since 1932. At the current rate, the USGS projects that another 500 square miles will be lost by the year 2050 (Wetlands Conservation and Restoration Plan).

Coastlines in southern Jefferson Parish are sinking or eroding away with incoming water eating at the marshes and wetlands that buffer and drain the higher drier land. There are efforts being made to reduce coastal erosion such as the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA), Coast-2050, and the Louisiana Coastal Area (LCA) Plan of Restoration (USGS – Coastal Erosion and Wetland Change in Louisiana). Jefferson Parish is a member of the Parishes Against Coastal Erosion (PACE) formed in 1999 to encourage joint cooperation between the southern Louisiana parishes and communities to protect the coastline. The organization meets periodically to discuss issues and encourage policy that reduces coastal erosion.

4.7.4 Impact on Life and Property

There are no known deaths or injuries in Jefferson Parish due to coastal erosion. The slow movement and advancement of coastal erosion is typically not life threatening and does not warrant an evacuation but has the potential to cause substantial property damage and negative impacts to the Louisiana economy. If losses continue at the current rate it has the potential to have direct implications on the nation's energy supplies, seafood industry, economic security, and environmental integrity.[45]

4.7.4-1 Impact on Public Health

Coastal erosion may impact ecosystems and fisheries but generally has minimal impact on public health.

4.7.5 Occurrences of Coastal Erosion

As mentioned above, the rate at which Louisiana is losing coastline and wetlands is fastest than any place in the United States or perhaps even the world. It is estimated that since 1932 the state of Louisiana has lost an estimated 1,900 square miles of coastal land, an area the size of Delaware.[46]

Although there are specific cases of coastal erosion that can be identified, this is an ongoing process that impacts the entire coastal region of Louisiana. The NCEI Storm Events Database does not track occurrences of coastal erosion, but specific cases in southern Louisiana and the coastal region of Jefferson Parish are summarized below:

- **Chandeleur Islands** – This chain of barrier islands is located in St. Bernard Parish, Louisiana about 60 miles east of New Orleans and are part of the Breton National Wildlife Refuge. The USGS analyzed a section of the islands with aerial photographs taken two days after Hurricane Katrina. The photos were compared with those taken in 2001 prior to Hurricanes Lili and Ivan. **Figure 66** identifies the USGS study areas and sections photographed as part of the analysis. **Figure 67** and **Figure 68** compare location 2 of the study area in 2001 and 2005. The photo taken in 2001 shows low vegetation and marshes behind narrow sand beaches. In 2005, this section of the barrier island is almost submerged from erosion and wave action from Hurricane Katrina and other hurricanes.[47]

Figure 66
Chandeleur Islands Study Area

Figure 67
Location 2; Photo of barrier islands in 2001

Figure 68
Location 2; Photo of Barrier Islands in 2005

Source: United States Geological Survey[48]

As the process of coastal erosion has been reported for decades, there is a 100% probability that it will continue to affect Jefferson Parish as well as the entire Gulf Coast.

In addition to data collected from national reports, Jefferson Parish has also developed an online platform for recording historic hazard events that is updated regularly by Parish staff. However, no coastal erosion events were captured through this platform in Jefferson Parish in the last 11 years.

4.7.6 Municipality Coastal Erosion Hazards

City of Gretna

The City of Gretna is subject to erosion in a few areas that are mostly concentrated in the southern half of the city as illustrated above in the Figures above.

City of Harahan

The City of Harahan has no areas vulnerable to coastal erosion according to the Figures above.

City of Kenner

The City of Kenner is on the southern shore of Lake Pontchartrain and, therefore, is impacted by coastal erosion along the Lake as illustrated above in the Figures above.

City of Westwego

The City of Westwego is subject to erosion in a few areas that are mostly concentrated in the southern half of the city as illustrated above in the Figures above.

Town of Grand Isle

Grand Isle is a six square mile barrier island located in southern Jefferson Parish. The island lies between marshes on the inland side and the Gulf of Mexico. Saltwater intrusion has been a major source of coastal erosion around the area of Grand Isle. Construction of canals allows saltwater to infiltrate into the fresh and brackish marshes which weakens and kills many of the marsh grasses.

Nearly the entire town is vulnerable to coastal erosion as show in the Figures above.

Town of Jean Lafitte

The Town of Jean Lafitte is subject to erosion in areas predominately located in the northern portion of the town along Bayou Barataria as illustrated above in the Figures above.

4.7.7 Coastal Erosion Risk Assessment

Structure Vulnerability

Although coastal erosion risk is present in Jefferson Parish, the NCEI Storm Events Database does not track occurrences of coastal erosion, and there is no record of property loss for the Parish. Therefore, an annualized estimate of coastal erosion losses cannot be calculated (**Table 62**).

Table 62
Annualized Building Loss Estimate from Coastal Erosion in Jefferson Parish

Name	Annualized Loss
Jefferson Parish	n/a

Critical Facilities Vulnerability

Since the location of damage from coastal erosion is unpredictable and may occur anywhere within the Parish, vulnerability of facilities to coastal erosion is relatively equal across the parish and so all facilities are considered at risk to damage from coastal erosion. However, it should be noted that the critical facilities located in Jean Lafitte and Grand Isle will be more susceptible to the erosion that occurs as a direct impact from a major storm event. Additional information on asset risk can be found in Appendix F, Asset Inventory.

4.8 Subsidence

4.8.1 Description of the Subsidence Hazard

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. It is the motion of the Earth's surface as it shifts downward, relative to sea level. Land subsidence, the loss of surface elevation due to the removal of subsurface support, ranges from broad regional lowering of the land surface to localized collapse. Subsidence usually occurs gradually over a period of years or decades, but in some cases, subsidence can happen much faster. It can be highly localized or spread over large regions. See Appendix D, General Descriptions of Natural Hazards, for a more detailed description and definition of the subsidence hazard.

Subsidence and sea level rise impact Louisiana in a similar manner – making it difficult to separate impacts. Rising sea levels coupled with subsidence – known as relative sea level rise – can accelerate coastal erosion and wetland loss, exacerbate flooding, and increase the extent and frequency of storm impacts.

4.8.2 Location and Extent of the Subsidence Hazard

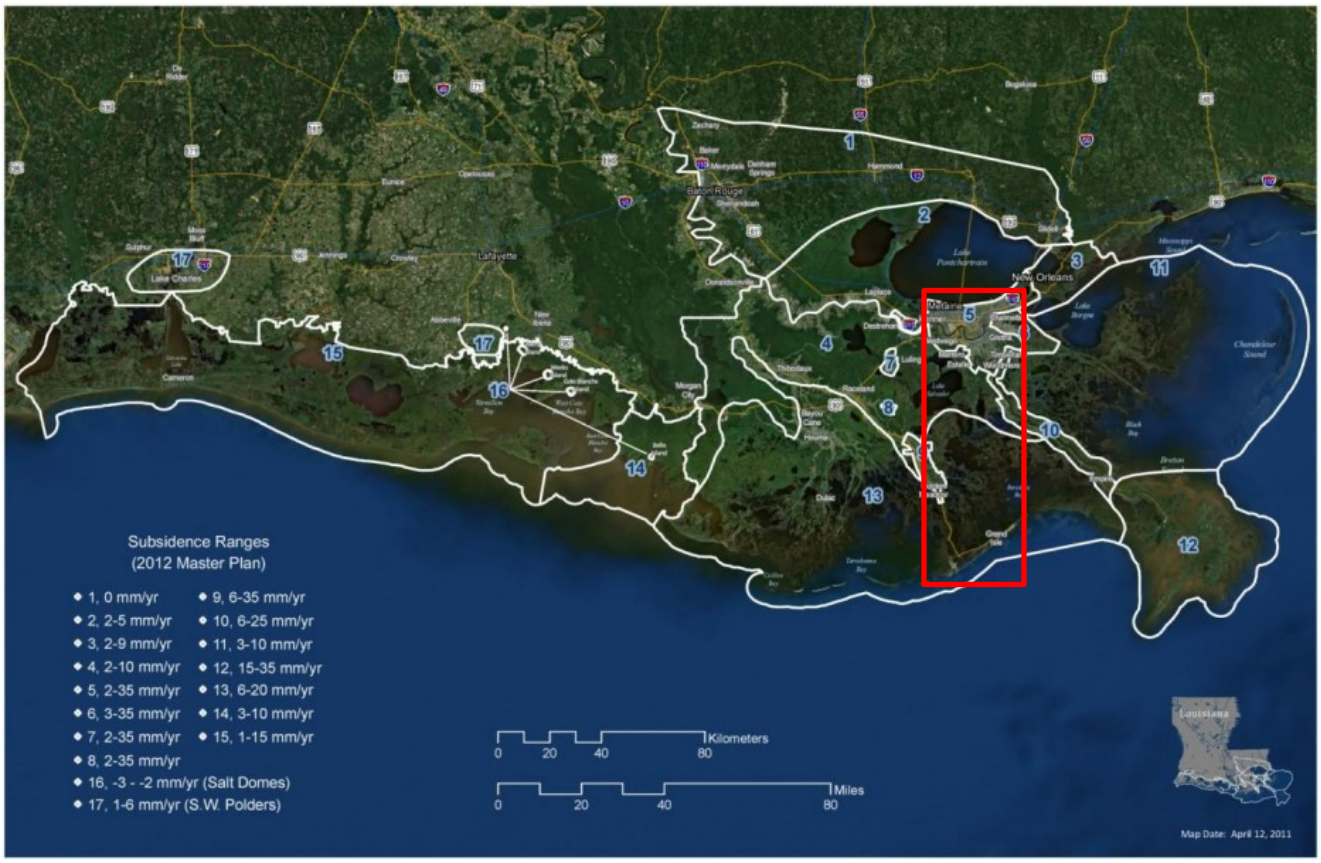
Subsidence is generally found in areas of very distinct geography, such as places where there is extensive gas or groundwater (that has been extracted), or in areas of karst topography or mines. All states with low-lying coasts are vulnerable to accelerated sea-level rise, but Louisiana's coast is much more so because of the subsidence of the Mississippi River delta. Until humans intervened, the surface elevation of the broad delta complex had kept pace with rising sea levels for several thousand years, largely because the river-built delta lobes and nourished wetland vegetation. The rates of natural subsidence and sea-level rise along the Louisiana coast have been exacerbated by human modifications, primarily levees which have isolated the Mississippi River from a delta complex that depends on an annual flooding cycle. These modifications cut off the delta-building process of the river.

The Mississippi River delta plain as a whole is losing land at an average rate of more than 60 square kilometers (23 square miles) per year. Moreover, NOAA data indicates that 1.32 inches of elevation have been lost in the Town of Grand Isle just from 2009 to 2014. That is approximately four times the subsidence rate than any other coastline. In addition, NOAA's data suggests that over the course of the next 100, sea levels could rise anywhere from 4 to 9 feet in Jefferson Parish, based on readings from the monitoring

station at Grand Isle. This combination of relative sea level rise will certainly affect the future of Jefferson Parish.[49] [50] [51]

While the entire Parish is at risk from subsidence, different jurisdictions are losing land at different rates. The Louisiana Coastal Master Plan includes information on subsidence rates across Louisiana's coast. According to **Figure 69**, Jefferson Parish falls approximately in to three different zones that were identified by the study in which potential subsidence rates in range from 2 millimeters per year to 35 millimeters per year.

Figure 69
Subsidence Rates for Jefferson Parish from Louisiana Coastal Master Plan



Source: Louisiana Coastal Master Plan

4.8.3 Severity of Subsidence

The severity of subsidence has no generally established measure, except that it can be described in terms of change in ground elevation relative to sea level. Subsidence is generally permanent, although it can be abated with proper management methods. Subsidence occurs slowly and continuously over time or on abrupt occasions, as in the case of sudden formation of sinkholes. Procedures for determining the probability or frequency of land subsidence have not been recommended.

Louisiana's coastal system, specifically Jefferson Parish, has also been heavily impacted by channels dug for navigation and mineral extraction, which have allowed high-salinity Gulf waters to migrate inland. Over

a million acres of coastal land have been lost since the 1930s, and between 25 and 35 square miles continue to be lost each year. Louisiana's coastal ecosystems are threatened with systemic collapse.

4.8.4 Impact on Life and Property

In Jefferson Parish there are no known deaths or injuries due to subsidence. Subsidence happens slowly over time and is does not warrant evacuations. Also, specific data regarding the degree of property damage and costs associated with that damage is currently not available. As relative sea level rise (subsidence and sea level rise together) increases, impacts from floods and small hurricanes (Category 1) will increase dramatically; thus, causing property damage to grow cumulatively over the next few decades.

Exposure of people and property is a function of the type and duration of subsidence as well as the extent of the area affected.

- Collapse into Voids – Collapse of surficial materials into underground voids is most commonly associated with coal mining. Coal is found in 37 states and mined underground in 22 states.[52]

- Sediment Compaction – Sediment compaction subsidence is caused by pumping groundwater and petroleum. More than 30 areas in seven states have experienced land subsidence of this type. Groundwater withdrawal in Houston, TX, caused some coastal areas to subside more than 6 feet.[53]

- Drainage of Organic Soils – Approximately 3,600 miles^2 of land underlain by organic soil has subsided because of drainage of organic soils. An even larger area is susceptible to subsidence. Approximately 39,000 mi^2 of the conterminous United States are covered by peat and muck soils and more than 10,000 mi^2 of organic wetlands are in Standard Metropolitan Statistical Areas.[54]

Subsidence can also cause the following impacts:

- Accelerate the effects of saltwater intrusion and other factors that contribute to land loss.

- In many cases, make structures more vulnerable to flooding.

- Call in to question the accuracy of surveying benchmarks which can contribute to additional flooding problems if construction occurs at lower elevations than anticipated or planned.

4.8.4-1 Impact on Public Health

Subsidence can affect infrastructure including the shifting of building foundations and roads, making communities more flood prone. Floodwaters wreak havoc on public health. If the water is unable to drain within a few days, mosquitoes begin to breed and spread infectious diseases. Animals living in nearby waterways such as alligators and snakes may become displaced, posing a serious threat to the public. Once the floodwater subsides, people can begin drying out their flooded homes. If they are not able to access their homes for an extended period of time, mold could begin growing. When there is no electricity to dry out a flooded home and the air is humid, mold spreads very quickly in the moist heat. Mold has been linked to respiratory conditions including asthma and allergies. Additionally, in extreme flooding situations, displacement from one's home and/or community can affect mental health and often results in post-traumatic stress disorder (PTSD).

4.8.5 Occurrences of Subsidence

The average annual damage from all types of subsidence is estimated conservatively to be at least $125 million. Cities where cumulative damage from subsidence exceeds $100 million include Long Beach, CA, Houston, TX; and New Orleans, LA.[55]

- Collapse into Voids – The cumulative costs of damage from subsidence caused by underground mining are most significant in Pennsylvania and Washington, not as much in Louisiana.

- Sediment Compaction – Losses from natural compaction, particularly in the Mississippi River Delta, are difficult to estimate because of the uncertain value of coastal wetlands. Increased flooding potential is the principal impact because affected areas commonly are low lying and naturally subject to flooding. Annual revenue losses are possibly on the order of millions of dollars. Even areas with humid climates have incurred significant costs. For example, collapsible soils added more than $2.5 million in mitigation costs to interstate highway construction in Louisiana. The states with the highest damage caused from land subsidence are California and Louisiana.

- Drainage of Organic Soils – Costs associated with structural damage due to differential subsidence caused by drainage of organic soils appear to be high. Approximately $30 million was spent in New Orleans and Jefferson Parish to repair damage and maintain property. Increased flooding is the most serious problem associated with organic soil subsidence. The cumulative damage caused by drainage of organic soils exceeds $100 million in California, Louisiana, and Florida.

- Several benchmarks in Jefferson Parish have been found to be lower than what they are marked. Louisiana Highway 1 is a foot lower than what it is marked. Satellite imagery was used to confirm this.

Any of these types of land subsidence – collapse into voids, sediment compaction, and drainage of organic soils – can potentially undermine the integrity of the levee system leading to levee failure. In Jefferson Parish, land subsidence has caused extensive damage to roads and drainage systems which can cause increased flooding. Due to continued heavy rains one would expect to see ongoing problems from subsidence in the future.

Because subsidence and sea level rise occur as a gradual process, there are no single occurrences to report. As this process has been reported for decades, there is a 100% probability that subsidence will continue to affect Jefferson Parish, all of its municipalities, as well as the entire Gulf Coast.

In addition to data collected from national reports, Jefferson Parish has also developed an online platform for recording historic hazard events that is updated regularly by Parish staff. **Table 63** below summarizes subsidence events captured through this platform in Jefferson Parish in the last 11 years.

Table 63
Subsidence Events, Jefferson Parish, 2007 – 2018

Location	Number of Events
Gretna	0
Harahan	0
Kenner	0
Westwego	0
Grand Isle	1

Location	Number of Events
Jean Lafitte	0
Unincorporated Jefferson Parish	0
TOTAL	**1**

4.8.6 Municipality Subsidence Hazards

City of Gretna

The City of Gretna is located in an area with potential subsidence rates ranging from 2 millimeters per year to 35 millimeters per year.

City of Harahan

The City of Harahan is located in an area with potential subsidence rates ranging from 2 millimeters per year to 35 millimeters per year.

City of Kenner

The City of Kenner is located in an area with potential subsidence rates ranging from 2 millimeters per year to 35 millimeters per year.

City of Westwego

The City of Westwego is located in an area with potential subsidence rates ranging from 2 millimeters per year to 35 millimeters per year.

Town of Grand Isle

The Town of Grand Isle is located in an area with potential subsidence rates ranging from 6 millimeters per year to 20 millimeters per year.

Town of Jean Lafitte

The Town of Jean Lafitte is located in an area with potential subsidence rates ranging from 2 millimeters per year to 35 millimeters per year.

4.8.7 Subsidence Risk Assessment

Structure Vulnerability

Although subsidence risk is present in Jefferson Parish, the NCEI Storm Events Database does not track occurrences of subsidence, and there is no record of property loss for the Parish. Therefore, an annualized estimate of subsidence losses cannot be calculated (**Table 64**).

Table 64
Annualized Building Loss Estimate from Subsidence in Jefferson Parish

Name	Annualized Loss
Jefferson Parish	n/a

Critical Facilities Vulnerability

Since the location of damage from subsidence is unpredictable and may occur anywhere within the Parish, vulnerability of facilities to subsidence is relatively equal across the parish and so all facilities are considered at risk to damage from subsidence. However, it should be noted that the critical facilities located in Jean Lafitte and Grand Isle will be more susceptible to the erosion that occurs as a direct impact from a major storm event. Additional information on asset risk can be found in Appendix F, Asset Inventory.

4.9 Hailstorms

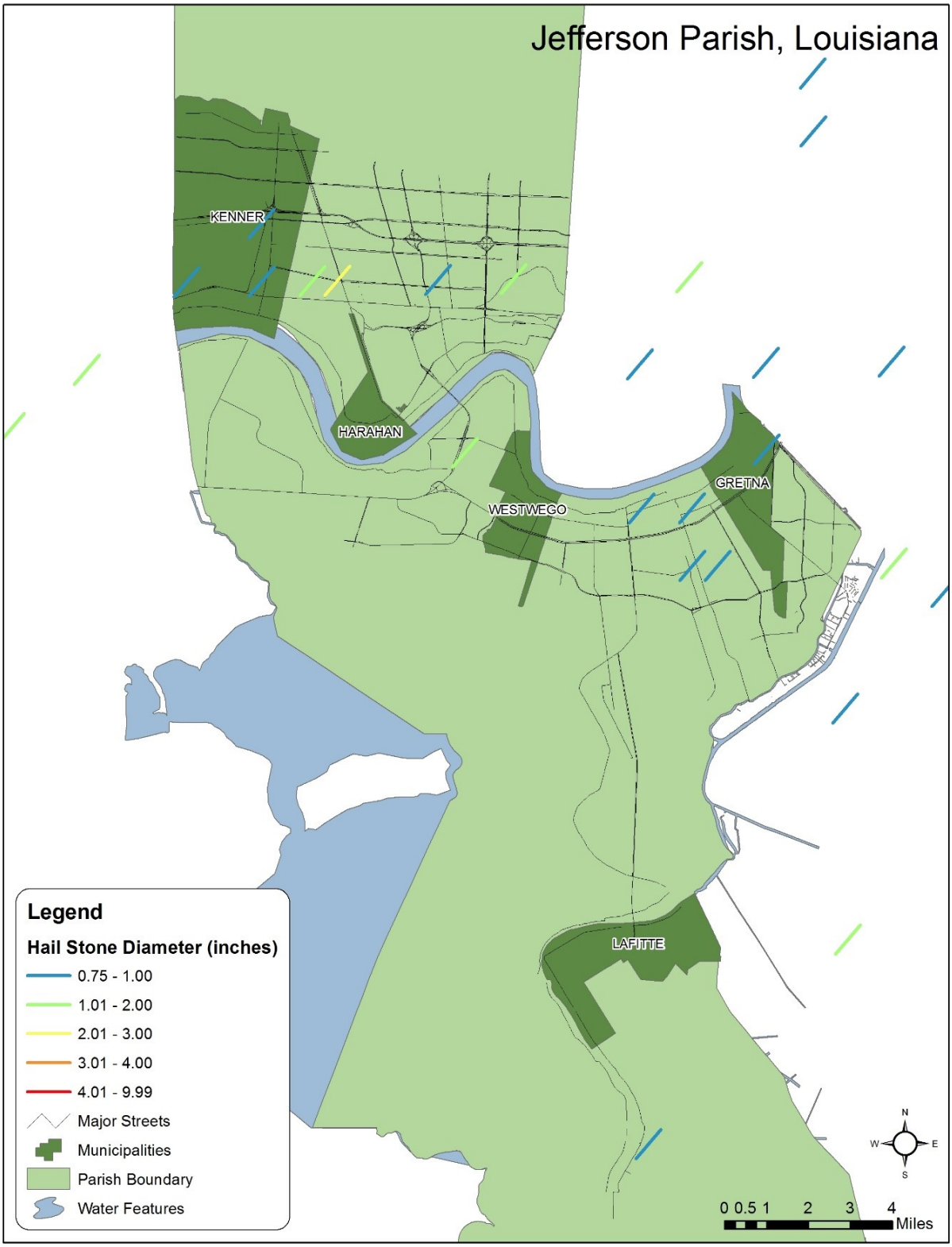
4.9.1 Description of the Hailstorm Hazard

Hail is a form of precipitation comprised of spherical lumps of ice. Known as hailstones, these ice balls typically range from 5 millimeters to 50 millimeters in diameter on average, with much larger hailstones forming in severe thunderstorms. The size of hailstones is a direct function of the severity and size of the storm. See Appendix D, General Descriptions of Natural Hazards, for a more detailed description and definition of the hailstorm hazard.

4.9.2 Location and Extent of the Hail Hazard

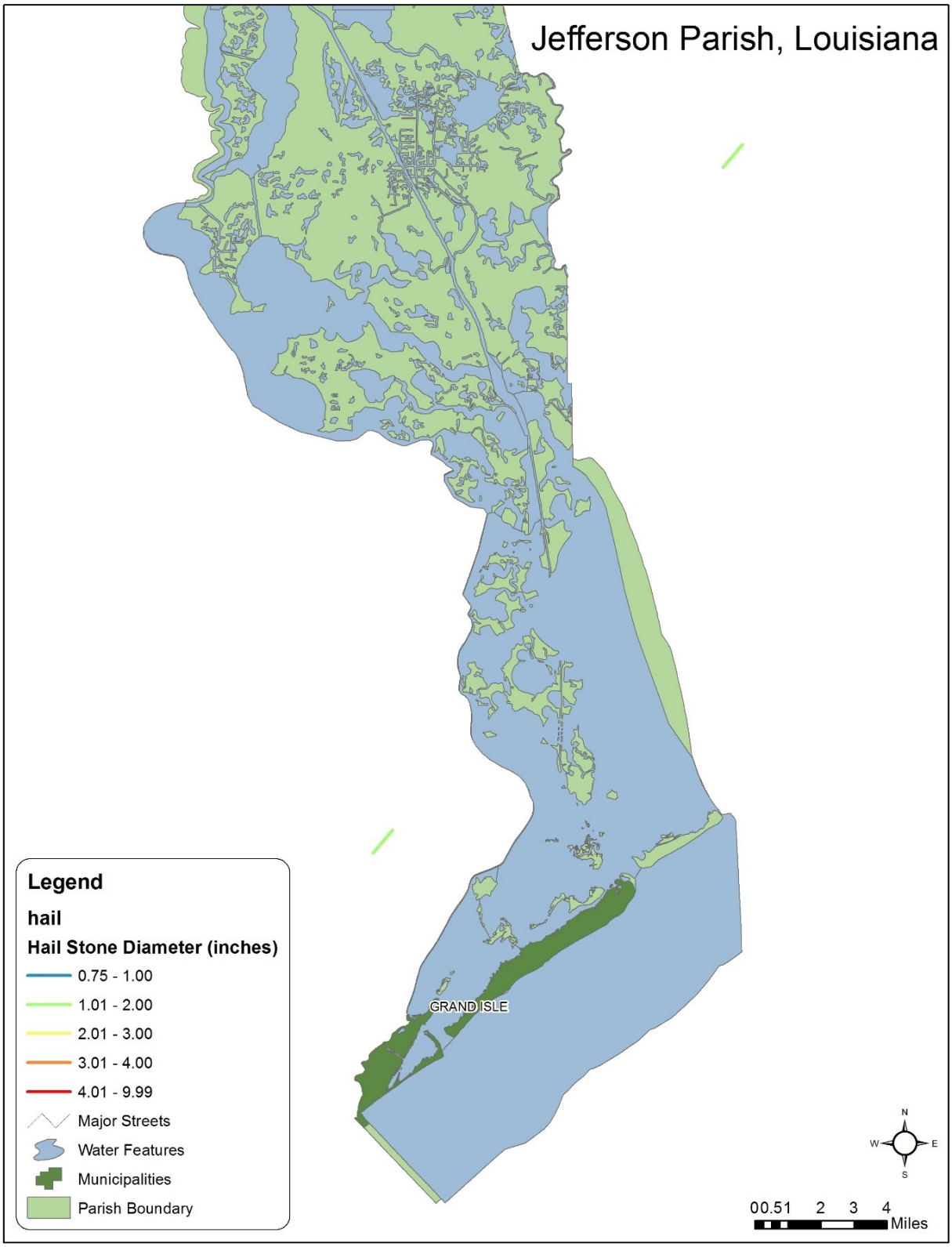
The entire Parish has been affected by hail events at one time or another. Hailstorms affect Jefferson Parish and each of the municipalities equally and uniformly. The NCEI Storm Events Database indicates that there have been 65 hailstorms in Jefferson Parish between January 1955 and May 2018. The largest size hail recorded is 3 inches, but the most common size hail the Parish has experienced is 1.00 inch. Based on past records, the entire planning area can expect hail sizes as large as 3 inches in future events. **Figure 70** and **Figure 71** show maps of tornadoes that have occurred in and around the parish between 1955-2017.

Figure 70
Tornado Events in North Jefferson Parish (1955-2017)



Source: National Oceanic and Atmospheric Administration

Figure 71
Tornado Events in South Jefferson Parish (1955-2017)



Source: National Oceanic and Atmospheric Administration

Hailstorms occur more frequently during the late spring and early summer when the jet stream migrates northward across the Great Plains. This period has extreme temperature changes from the ground surface upward into the jet stream, which produces the strong updraft winds needed for hail formation.

Peak periods for hailstorms, late spring and early summer, coincide with the Midwest's peak agricultural seasons for crops such as wheat, corn, barley, oats, rye, tobacco, and fruit trees. Long-stemmed vegetation is particularly vulnerable to damage by hail impacts and winds. The land area affected by individual hail events is not much smaller than that of a parent thunderstorm, an average of 15 miles in diameter around the center of a storm.

4.9.3 Severity of the Hail Hazard

The severity of hailstorms is measured by duration, size of the hail itself, and geographic extent. All of these factors are directly related to the weather phenomena that create the hail, thunderstorms. There is wide potential variation in these severity components. **Table 65** shows the TORRO Hailstorm Intensity Scale which is a way of measuring hail severity.

Table 65: **TORRO Hailstorm Intensity Scale**

	Intensity Category	Typical Hail Diameter (mm)*	Probable Kinetic Energy, J-m^2	mm to inch conversion (inches)	Typical Damage Impacts
H0	Hard Hail	5	0-20	0 - 0.2	No damage
H1	Potentially Damaging	5-**15**	>20	0.2 - 0.6	Slight general damage to plants, crops
H2	Significant	10-**20**	>100	0.4 - 0.8	Significant damage to fruit, crops, vegetation
H3	Severe	20-**30**	>300	0.8 - 1.2	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	25-**40**	>500	1.0 - 1.6	Widespread glass damage, vehicle bodywork damage
H5	Destructive	30-**50**	>800	1.2 - 2.0	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	40-**60**		1.6 - 2.4	Bodywork of grounded aircraft dented, brick walls pitted
H7	Destructive	50-**75**		2.0 - 3.0	Severe roof damage, risk of serious injuries

	Intensity Category	Typical Hail Diameter (mm)*	Probable Kinetic Energy, J-m²	mm to inch conversion (inches)	Typical Damage Impacts
H8	Destructive	60-**90**		1.6 - 3.5	(Severest recorded in the British Isles) Severe damage to aircraft bodywork
H9	Super Hailstorms	75-**100**		3.0 - 3.9	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	>100			Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

Source: http://www.torro.org.uk/site/hscale.php

Figure 72 shows an example of large hailstones.

Figure 72
Large Hailstones

Data on the probability and frequency of occurrence of hailstorms is limited, with little recent research. What data that is available shows that only a localized area along the border of northern Colorado and southern Wyoming experiences hailstorms 8 or more days each year. Outside of the coastal regions, most of the United States experiences hailstorms at least 2 or more days each year.

4.9.4 Impact on Life and Property

Hail events have been recorded by the National Centers for Environmental Information since 1955. At that time, events were reported on a parish-wide basis. It was not until 1996 that recorded events were separated out by municipalities.

There are no known instances of injuries or death from hail events in Jefferson Parish. Although typically not life threatening, severe hailstorms have the potential to cause significant property damage particularly to automobiles and some building types. The development of hailstorms from thunderstorm events causes nearly $1.6 billion in property damage each year.[56] One hail event occurred in January of 2000 that caused property damage totaling $65 million dollars in Jefferson Parish. Hail storms do not warrant evacuations.

An intense thunderstorm produced a long swath of destructive hail extending from Metairie in northern Jefferson Parish southeast across much of New Orleans in Orleans Parish to Chalmette in St. Bernard Parish. The hail ranged in size from pennies (0.75") to golf balls (1.75") and covered the ground in many locations. The rare hailstorm caused widespread damage to roofs, windows, and vehicles resulting in nearly 25,000 auto and home insurance claims that were estimated to cost $65 million.[57]

4.9.4-1 Impact on Public Health

Hailstorms pose a serious threat to those who cannot seek shelter. Drivers caught on the road amidst a hailstorm are at risk as hail can shatter windshields and cause injury and potential auto accidents. Pedestrians caught in a hailstorm are at risk to head trauma that may result in severe injury and even death. Hailstorms do not typically result in rising floodwater but can cause roof damage to homes and buildings allowing water to enter from the top. This may result in a flooded building, making it prone to mold growth. Mold has been linked to respiratory conditions including asthma and allergies. Additionally, crops can be devastated by hailstorms due to impact and mold growth within the crop.

4.9.5 Occurrences of the Hail Hazard

There have been 65 hailstorms recorded in Jefferson Parish between January 1955 and May 2018. Jefferson Parish experiences a significant hailstorm event on average approximately every year. The 65 events have occurred over a period of 63 years which calculates to a 100% annual probability of future hailstorm occurrences. **Table 66** below summarizes the 25 hailstorm events that have been documented in the past 10 years in the Jefferson Parish planning area.

Table 66
Hailstorm Events, Jefferson Parish, January 2008 – May 2018[58] [59] [60]

	Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1.	METAIRIE	06/29/2008	15:52	Hail	0.88 in.	0	0	0.00K	0.00K
2.	METAIRIE	03/25/2009	22:50	Hail	1.00 in.	0	0	0.00K	0.00K
3.	METAIRIE	05/16/2009	20:55	Hail	1.25 in.	0	0	0.00K	0.00K
4.	SOUTHPORT	02/21/2010	18:05	Hail	0.75 in.	0	0	0.00K	0.00K
5.	(MSY)MOISANT FLD NEW	03/29/2011	17:35	Hail	1.00 in.	0	0	0.00K	0.00K
6.	HARVEY	03/29/2011	18:15	Hail	1.00 in.	0	0	0.00K	0.00K
7.	MARRERO	03/29/2011	18:15	Hail	1.25 in.	0	0	0.00K	0.00K
8.	TERRYTOWN	03/29/2011	18:20	Hail	1.00 in.	0	0	0.00K	0.00K
9.	LAFITTE	05/26/2011	19:10	Hail	1.00 in.	0	0	0.00K	0.00K
10.	KENNER	04/02/2012	15:51	Hail	1.00 in.	0	0	0.00K	0.00K
11.	KENNER	04/02/2012	16:00	Hail	1.00 in.	0	0	0.00K	0.00K
12.	METAIRIE	04/03/2012	21:23	Hail	1.00 in.	0	0	0.00K	0.00K
13.	MARRERO	02/24/2013	21:15	Hail	2.50 in.	0	0	0.00K	0.00K

	Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
14.	WESTWEGO ARPT	02/24/2013	21:15	Hail	1.75 in.	0	0	0.00K	0.00K
15.	TERRYTOWN	02/24/2013	21:15	Hail	1.50 in.	0	0	0.00K	0.00K
16.	Metairie*	04/29/2013	17:41	Hail	Not reported	0	0	0.00K	0.00K
17.	MARRERO	06/06/2013	16:10	Hail	1.00 in.	0	0	0.00K	0.00K
18.	Lafitte**	07/12/2013	Not reported	Hail	1.75 in.	0	0	0.00K	0.00K
19.	KENNER	04/08/2014	13:57	Hail	0.75 in.	0	0	0.00K	0.00K
20.	KENNER	04/08/2014	13:57	Hail	0.88 in.	0	0	0.00K	0.00K
21.	KENNER	04/15/2015	15:30	Hail	2.75 in.	0	0	0.00K	0.00K
22.	SOUTHPORT	04/15/2015	15:42	Hail	1.75 in.	0	0	0.00K	0.00K
23.	(MSY)MOISANT FLD NEW	02/07/2017	10:45	Hail	1.50 in.	0	0	0.00K	0.00K
24.	GRAND ISLE	05/03/2017	08:50	Hail	1.00 in.	0	0	0.00K	0.00K
25.	METAIRIE	05/18/2018	15:29	Hail	1.00 in.	0	0	0.00K	0.00K
	Totals:					**0**	**0**	**0.00K**	**0.00K**

The hail sizes for Jefferson Parish hail events between 1955 and 2018 are summarized in **Table 67** below. The most common size hail the Parish has experienced is between .75 inches and 1.75 inches, with 1.00 inch being the most frequent size hail.

Table 67
Hail Size Summary for Jefferson Parish between January 1955 and May 2018

Size of Hail	Number of Events
0.75 inches	14
0.88 inches	4
0.90 inches	1
1.00 inches	21
1.25 inches	3
1.50 inches	3
1.75 inches	13
2.00 inches	2
2.50 inches	2
2.75 inches	1
3.00 inches	1

Significant events for unincorporated Jefferson Parish are summarized below:

- June 29, 2008 – Several reports of nickel size hail were received from the Metairie area on WWL News.[61]

- March 25, 2009 – One-inch size hail was reported in Metairie.

- May 16, 2009 – Scattered strong to severe thunderstorms developed in a moist and very unstable airmass and hail measuring at 1.25 inches was reported in the Metairie area.

- February 21, 2010 – Pea to penny size hail was reported at Kenner and Metairie.

- March 29, 2011 – In Harvey, Jefferson Parish Emergency Manager reported quarter size hail at the intersection of Manhattan Blvd and the Westbank Expressway. A trained spotter reported half dollar size hail in Marrero and the Cooperative Observer in Terrytown reported quarter size hail covering his yard.

- April 3, 2012 – A storm spotter reported dime to quarter size hail occurring in Metairie between Causeway Boulevard and Bonnabel Boulevard.

- February 24, 2013 – A photo posted on social media indicated oblong shaped hailstone in a person's hand with a size of about 2.25 to 2.50 inches in Marrero and a NWS Cooperative Observer reported ping-pong ball size hail in Terrytown.

- April 29, 2013 – Hail was reported in Old Metairie and in the Edenborn and West Metairie Neighborhood. The size of hail was not indicated.

- June 6, 2013 – Quarter size hail was reported in Marrero.

- April 15, 2015 – Golf ball size hail reported in Kenner and Metairie by Jefferson Parish Sheriff's Office.

- May 18, 2018 – A report of quarter size hail was received via social media from the Metairie area.

No Presidentially-declared disasters from hail have occurred in Jefferson Parish.

In addition to data collected from national reports, Jefferson Parish has also developed an online platform for recording historic hazard events that is updated regularly by Parish staff. **Table 68** below summarizes hailstorm events captured through this platform in Jefferson Parish in the last 11 years.

Table 68
Hailstorm Events, Jefferson Parish, 2007 – 2018

Location	Number of Events
Gretna	0
Harahan	0
Kenner	1
Westwego	0
Grand Isle	0
Jean Lafitte	0
Unincorporated Jefferson Parish	0
TOTAL	**1**

4.9.6 Municipality Hailstorm Hazards

City of Gretna

No previous hail occurrences have been recorded in the City of Gretna in the past 10 years.

City of Harahan

No previous hail occurrences have been recorded in the City of Harahan in the past 10 years.

City of Kenner

Seven hail events have been reported in City of Kenner in the past ten years. These events are summarized in **Table 69** below.

Table 69
Hail Events, City of Kenner, January 2008 – May 2018

	Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1.	(MSY)MOISANT FLD NEW	03/29/2011	17:35	Hail	1.00 in.	0	0	0.00K	0.00K
2.	KENNER	04/02/2012	15:51	Hail	1.00 in.	0	0	0.00K	0.00K
3.	KENNER	04/02/2012	16:00	Hail	1.00 in.	0	0	0.00K	0.00K
4.	KENNER	04/08/2014	13:57	Hail	0.75 in.	0	0	0.00K	0.00K
5.	KENNER	04/08/2014	13:57	Hail	0.88 in.	0	0	0.00K	0.00K
6.	KENNER	04/15/2015	15:30	Hail	2.75 in.	0	0	0.00K	0.00K
7.	(MSY)MOISANT FLD NEW	02/07/2017	10:45	Hail	1.50 in.	0	0	0.00K	0.00K
	Totals:					**0**	**0**	**0.00K**	**0.00K**

- March 29, 2011 – A trained spotter reported quarter size hail just east of New Orleans International Airport.

- April 2, 2012 – At 3:51 PM, quarter size hail was reported near Roosevelt Boulevard and West Metairie Avenue. Nine minutes later at 4:00 PM, quarter size hail was reported near Sam's Club in Kenner.

- April 8, 2014 – Kenner experienced 0.75 and 0.88 in hail when a cold upper level low pressure system passed through.

- April 15, 2015 – Photo of baseball size hail was sent to TV station through social media from Kenner. Event time was based on radar.

- February 7, 2017 – Relative of NWS employee reported ping pong ball sized hail.

City of Westwego

There has been one hail event recorded in the City of Westwego in the past ten years. This event is summarized in **Table 70** below.

Table 70
Hail Events, City of Westwego, January 2008 – May 2018

	Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1.	WESTWEGO ARPT	02/24/2013	21:15	Hail	1.75 in.	0	0	0.00K	0.00K
	Totals:					**0**	**0**	**0.00K**	**0.00K**

- February 24, 2013 – Fire Station 86 near LaPalco Blvd and Westwood Drive reported golf ball size hail.

Town of Grand Isle

There has been one hail event recorded in the Town of Grand Isle in the past ten years. This event is summarized in **Table 71** below.

Table 71
Hail Events, Town of Grand Isle, January 2008 – May 2018

	Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1.	GRAND ISLE	05/03/2017	08:50	Hail	1.00 in.	0	0	0.00K	0.00K
	Totals:					**0**	**0**	**0.00K**	**0.00K**

- May 3, 2017 – Quarter size hail was reported in Grand Isle.

Town of Jean Lafitte

Two hail events have been recorded in the Town of Jean Lafitte in the past ten years.[62] These events are summarized in **Table 72** below.

Table 72
Hail Events, Town of Jean Lafitte, January 2008 – May 2018

	Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1.	LAFITTE	05/26/2011	19:10	Hail	1.00 in.	0	0	0.00K	0.00K

2.	LAFITTE*	07/12/2013	Not reported	Hail	1.75 in.	0	0	0.00K	0.00K
	Totals:					**0**	**0**	**0.00K**	**0.00K**

- May 26, 2011 – Hail the size of quarters was reported in the Marrero-Lafitte-Larose Highway area near Lafitte.

- July 12, 2013 – Near Lafitte, along Highway 45 between Jean Lafitte and Marrero, 1.75-inch hail was reported.[63]

4.9.7 Hailstorm Risk Assessment

Structure Vulnerability

Although hailstorm risk in Jefferson Parish is only moderate, there remains enough exposure to the hazard to warrant a risk assessment to estimate potential future losses from this hazard.

Hailstorms have the potential to impact the entire parish. As such, property loss results were derived based on the total damages reported by NCEI. This assessment, presented in **Table 73**, was based on an annualized assessment of hailstorm losses for the Parish and does not provide a breakdown by community, but instead is a parish-wide assessment of potential annualized losses.

Table 73
Annualized Building Loss Estimate from Hailstorms in Jefferson Parish

Name	Annualized Loss
Jefferson Parish	$1,181,909

Critical Facilities Vulnerability

Since the location of damage from a hailstorm event is unpredictable and may occur anywhere within the Parish, vulnerability of facilities to a hailstorm is relatively equal across the parish and so all facilities are considered at risk to damage from a hailstorm event. Additional information on asset risk can be found in Appendix F, Asset Inventory.

4.10 Winter Storms

4.10.1 Description of the Winter Storm Hazard

Winter storms typically form along a front generally following the meandering path of the jet stream. These storms, called mid-latitude cyclones or extra-tropical cyclones, differ from hurricanes in that they move from west to east as opposed to east to west. These weather patterns carry cold air from Canada and the Rockies into the southern U.S. The origins of the weather patterns that cause winter storms in Louisiana are affected by differences in temperature and pressure, moisture availability, and wind direction as well as weather systems in the Atlantic Ocean and Gulf of Mexico. See Appendix D, General Descriptions of Natural Hazards, for a more detailed description and definition of the winter storm hazard.

4.10.2 Location and Extent of the Winter Storm Hazard

Nearly the entire United States is considered at risk for severe winter storms. When these storms occur in the South, unprotected pipes are especially vulnerable. Disruption in water service and decreases in water pressure cause a cascading problem for emergency responders. Heavily populated areas are particularly impacted when severe winter storms disrupt communication and power due to downed lines from high winds and icing. Debris associated with heavy icing may impact utility systems and transportation routes.

According to the NCEI Storm Events Database, there has been a total of five winter weather events reported between January 1996 and May 2018 in Jefferson Parish. Winter weather/storms have affected the entire planning area. All people and assets are considered to have the same degree of exposure. All jurisdictions in the entire planning area could expect to see 2-day closures of government offices, schools/institutions, and elevated roadways and bridges. Temperatures below freezing combined with precipitation could bring ice accumulation of 0.10-0.25 inches.

4.10.3 Severity of Winter Storms

Because severe winter storms are relatively rare in Louisiana, occurrences tend to be very disruptive to transportation and commerce. Trees, cars, roads, bridges, and other surfaces develop a coating or glaze of ice making even small accumulations of ice an extreme hazard to motorists and pedestrians. Roadways are often shut down during severe winter storms.

Many winter depressions give rise to exceptionally heavy rain and widespread flooding. Conditions worsen as the temperature drops, rain turns to ice, and accumulation of ice begins to occur. Winter storms are known to spawn other natural hazards, such as coastal flooding and erosion, severe thunderstorms, tornadoes, high winds, and severe ice.

4.10.4 Impact on Life and Property

The previous Hazard Mitigation Plan notes two injuries and 15 deaths from winter storms from 1950 through 2007 in Jefferson Parish. Property damage from two previous events totaled $11.8 million dollars. Zero injuries and deaths have been reported from winter storms in Jefferson Parish since 2007. Winter storms do not warrant evacuations but rather encourage sheltering in place.

4.10.4-1 Impact on Public Health

Staying warm is one of the biggest challenges during winter storms, particularly when there have been prolonged power outages. Exposure to freezing temperatures over an extended period of time could result in frostbite, hypothermia, and even death. Infants and the elderly are most vulnerable when it comes to winter storms as they lose body heat more easily than teenagers and adults. Heating homes can also pose a threat of fire and/or carbon monoxide poisoning if fireplaces, heaters, and generators are not properly ventilated. Mold growth is prohibited in freezing temperatures and does not pose a threat in winter storms.

4.10.5 Occurrences of the Winter Storm Hazard

Since 1996 (the year NCEI starting tracking winter storms), five winter storms occurred in Jefferson Parish. One was on Christmas Day 2004. **Table 74** below summarizes the winter storm events that have been documented in the past 10 years in the Jefferson Parish planning area.

Table 74
Winter Storm Events, Jefferson Parish, January 2008 – May 2018
(Source: NOAA/NCEI[64])

	Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1.	UPPER JEFFERSON (ZONE)	12/11/2008	07:00	Heavy Snow	N/A	0	0	0.00K	0.00K
2.	UPPER JEFFERSON (ZONE)	01/24/2014	17:00	Winter Weather	N/A	0	0	0.00K	0.00K
3.	UPPER JEFFERSON (ZONE)	01/28/2014	12:00	Winter Weather	N/A	0	0	0.00K	0.00K
4.	UPPER JEFFERSON (ZONE)	01/17/2018	09:30	Winter Weather	N/A	0	0	0.00K	0.00K
	Totals:					0	0	0.00K	0.00K

The significant events occurring within the last 10 years are summarized below:

- December 11, 2008 – A rare and widespread snowfall occurred across much of southeast and east central Louisiana, beginning early in the morning of December 11th and continuing until around the noon hour, as an unusually strong and cold upper level storm system moved across the region. The snow, which was occasionally heavy, affected all but some of the immediate coastal areas. The heaviest snow occurred over the Florida parishes of east central and southeast Louisiana from east of Baton Rouge to the Pearl River, and along and to the north of Interstate 12. Snowfall amounts of 2 to 6 inches were common in this area with 6 to 8 inch totals occurring in sections of Tangipahoa Parish. The weight of the snow resulted in widespread power outages and tree damage in areas that received the heavier snowfall amounts. Snowfall totals of 1 to 2 inches were common across areas to the south and southwest of Lake Pontchartrain including the New Orleans metropolitan area.

- January 24, 2014 – Winter weather caused by a cold front moving through southern Mississippi and southeast Louisiana brought sub-freezing temperatures to the area. A combination of frozen precipitation including freezing rain, sleet and snow produced hazardous road conditions, forcing much of the area to shut down for 3 days. Bridges and overpasses were not safe, and sections of interstate and the Lake Pontchartrain Causeway closed during this period, highly affecting travel. A local resident reported heavy sleet in Metairie with overpasses beginning to ice.

- January 28, 2014 – A bitterly cold air mass descended on southern Mississippi and southeast Louisiana during the night of the 26th and during the day on the 27th. A strong upper level jet disturbance moved across the area on the 28th, producing a large area of sleet and freezing rain. Temperatures remained at or below the freezing mark during much or all of the precipitation event on the 28th, even south of Lake Pontchartrain in the New Orleans metropolitan area. Travel was significantly impacted on bridges, overpasses and other elevated roadways. Portions of every Interstate in southeast Louisiana, plus the Lake Pontchartrain Causeway were closed at times on the 28th into the morning of the 29th.

- January 17, 2018 - A strong arctic cold front moved through southern Mississippi and southeast Louisiana during the afternoon hours of the 16th. The cold air behind the front changed the

precipitation from rain to freezing rain and snow across portions of the area to the north of Interstate 10. After the precipitation ended, roads remained icy across much of the area through the day on the 17th and roadways were not fully cleared of ice until the afternoon of Jan 18th when temperatures warmed into the upper 30s and lower 40s. The Arctic airmass that spread into the region behind the front brought some of the coldest temperatures to the region in the past 10 years. Low temperatures on the morning of the 17th ranged from the mid-teens in interior parts of southeast Louisiana to low and mid 20s along in coastal area. Record low temperatures on the Jan 17th included 20 degrees at New Orleans International Airport and 14 degrees at Baton Rouge Airport. High temperatures only went above freezing for a few hours on the afternoon of the 17th. Due to unusually cold temperatures and bursting of water pipes occurred in many locations in coastal parishes, especially elevated houses. Bursting of pipes and residents running water to prevent pipe freezing caused low water pressure in many areas resulting in boil water advisories in several coastal parishes including the City of New Orleans. Many schools and businesses, especially in coastal parishes were closed from the Jan 16th -18th due to either icy roadways or lack of water pressure.

With a total of five winter weather events reported between 1996 and 2018, Jefferson Parish experiences winter weather/storms on average once every 4 years. The 5 events have occurred over a period of 22 years which calculates to a 23% annual probability of future winter storm occurrences.

In addition to data collected from national reports, Jefferson Parish has also developed an online platform for recording historic hazard events that is updated regularly by Parish staff. **Table 75** below summarizes winter storm events captured through this platform in Jefferson Parish in the last 11 years.

Table 75
Winter Storm Events, Jefferson Parish, 2007 – 2018

Location	Number of Events
Gretna	0
Harahan	2
Kenner	0
Westwego	2
Grand Isle	0
Jean Lafitte	0
Unincorporated Jefferson Parish	17
TOTAL	**21**

4.10.6 Municipality Winter Storm Hazards

City of Gretna

No previous occurrences of winter storms have been recorded in the City of Gretna in the past 10 years.

City of Harahan

No previous occurrences of winter storms have been recorded in the City of Harahan in the past 10 years.

City of Kenner

No previous occurrences of winter storms have been recorded in the City of Kenner in the past 10 years.

City of Westwego

No previous occurrences of winter storms have been recorded in the City of Westwego in the past 10 years.

Town of Grand Isle

No previous occurrences of winter storms have been recorded in the Town of Grand Isle in the past 10 years.

Town of Jean Lafitte

No previous occurrences of winter storms have been recorded in the Town of Jean Lafitte in the past 10 years.

4.10.7 Winter Storm Risk Assessment

Structure Vulnerability

Although winter storm risk in Jefferson Parish is low, there remains enough exposure to the hazard to warrant a risk assessment to estimate potential future losses from this hazard.

Winter storms have the potential to impact the entire parish. As such, property loss results were derived based on the total damages reported by NCEI. This assessment, presented in **Table 76**, as based on an annualized assessment of winter storm losses for the Parish and does not provide a breakdown by community, but instead is a parish-wide assessment of potential annualized losses.

Table 76
Annualized Building Loss Estimate from Winter Storms in Jefferson Parish

Name	Annualized Loss
Jefferson Parish	$0

Critical Facilities Vulnerability

Since the location of damage from a winter storm event is unpredictable and may occur anywhere within the Parish, vulnerability of facilities to a winter storm is relatively equal across the parish and so all facilities are considered at risk to damage from a winter storm event. Additional information on asset risk can be found in Appendix F, Asset Inventory.

4.11 Lightning

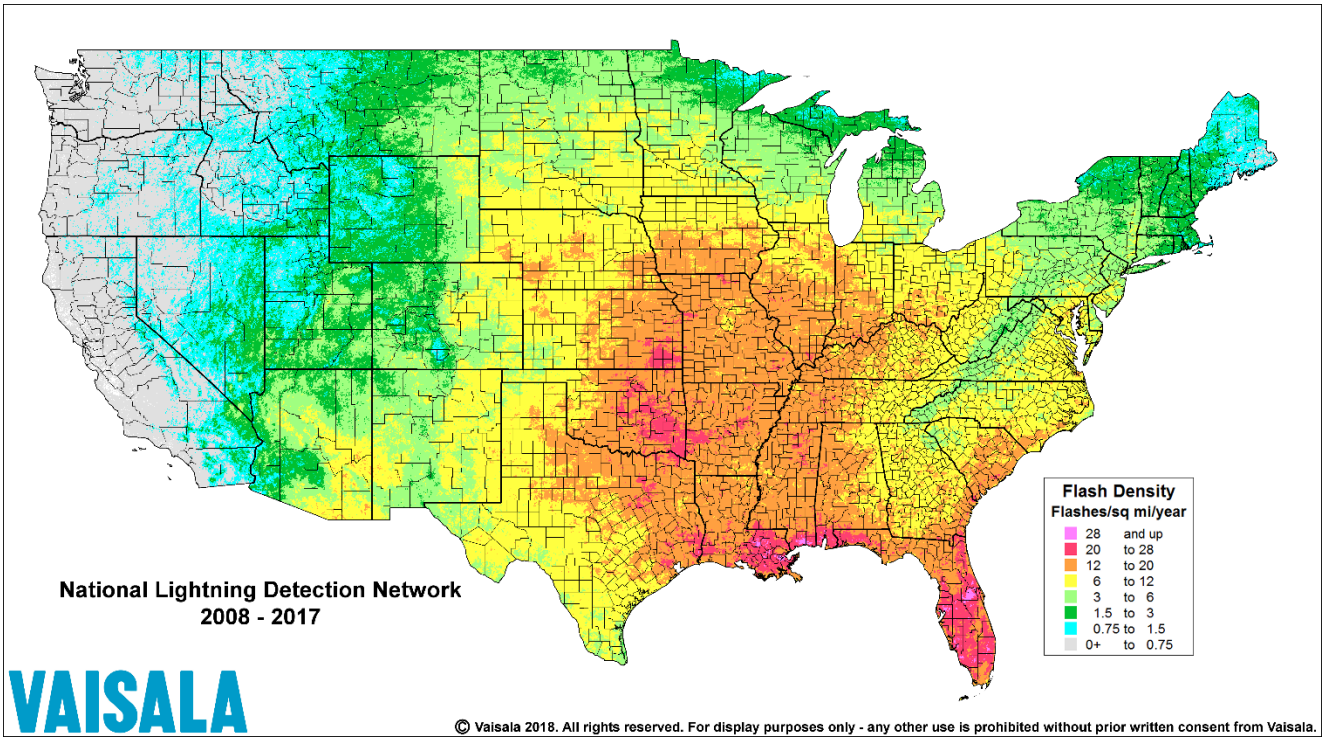
4.11.1 Description of the Lightning Hazard

Lightning events are generated by atmospheric imbalance and turbulence due to a combination of conditions. Lightning, which occurs during all thunderstorms, can strike anywhere. Generated by the buildup of charged ions in a thundercloud, the discharge of a lightning bolt interacts with the best conducting object or surface on the ground. The air in the channel of a lightning strike reaches temperatures higher than 50,000 degrees Fahrenheit. See Appendix D, General Descriptions of Natural Hazards, for a more detailed description and definition of the lightning hazard.

4.11.2 Location and Extent of the Lightning Hazard

Individual lightning strikes typically affect a relatively small geographical area. Lightning strikes are random events and could occur in any of the jurisdictions. Therefore, all jurisdictions in Jefferson Parish have equal risk to the lightning hazard, particularly during the warmer months of the year. Based on the lightning flash density map in **Figure 73** below, the entire planning area can expect 12 to 28 and up flashes per square mile per year.

Figure 73
Lighting Flash Density Map[65]



Source: Vaisala National Lightning Detection Network

4.11.3 Severity of the hazard

Severe lightning events can occur anywhere in the planning area. Even during common events, the lightning current can branch off to strike a person from a tree, fence, pole, or other tall object. In addition, electrical current may be conducted through the ground to a person after lightning strikes a nearby tree, antenna, or other tall object. The current also may travel through power lines, telephone lines, or plumbing pipes to a person who is in contact with an electric appliance, telephone, or plumbing fixture. Lightning may use similar processes to damage property or cause fires.

4.11.4 Impact on Life and Property

People and property in virtually the entire United States are exposed to damage, injury, and loss of life from lightning. According to NOAA, from 1963 to 1993, the average loss of life in the U.S. due to lightning was 89 per year, with an additional 300 persons injured each year. In the year 2000, lightning was responsible for 3 deaths (two while playing golf and one was from an unknown cause) in Louisiana. Most lightning-related deaths and injuries occurred when people were outdoors during summer afternoons and evenings. Lightning does not warrant evacuations.

Between January 1996 and May 2018 three deaths and one injury resulting from lightning strikes have been identified in Jefferson Parish. There have been no reported deaths or injuries since 2005. Total property damage reported in Jefferson Parish from lightning strikes since 1996 is estimated at $370,750 dollars.

4.11.4-1 Impact on Public Health

Lightning strikes can cause fires, serious injury, or even death. Mold growth is not likely to result from lightning.

4.11.5 Occurrences of the Lightning Hazard

Fifteen lightning events have been identified in Jefferson Parish between January 1996 and May 2018. Jefferson Parish experiences a significant lightning event on average approximately once every year. The 15 events have occurred over a period of 22 years which calculates to a 68% annual probability of future lightning occurrences. **Table 77** below summarizes the lighting events for Jefferson Parish in the last 10 years.

Table 77
Lightning Events, Jefferson Parish, January 2008 – May 2018
(Source: NOAA/NCEI[66])

	Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1.	SOUTHPORT	04/04/2012	02:00	Lightning	N/A	0	0	20.00K	0.00K
2.	METAIRIE	06/24/2014	16:45	Lightning	N/A	0	0	20.00K	0.00K
	Totals:					**0**	**0**	**40.00K**	**0.00K**

The significant events for unincorporated Jefferson Parish are summarized below:

- April 4, 2012 - Lightning struck a house near Morris Place and Carol Drive in Old Jefferson, causing a fire.

- June 24, 2014 – A local TV station relayed pictures of a fire triggered by a lightning strike at a home in the 3700 block of Rockford Heights. Time estimated.

Lightning strikes occur regularly in Jefferson Parish, but no damage has been documented beyond the June 24, 2014 event.

In addition to data collected from national reports, Jefferson Parish has also developed an online platform for recording historic hazard events that is updated regularly by Parish staff. However, no lightning events were captured through this platform in Jefferson Parish in the last 11 years.

4.11.6 Municipality Lightning Hazards

City of Gretna

There have been no previous lightning occurrences recorded in the City of Gretna in the past 10 years.

City of Harahan

There have been no previous lightning occurrences recorded in the City of Harahan in the past 10 years.

City of Kenner

There have been no previous lightning occurrences recorded in the City of Kenner in the past 10 years.

City of Westwego

There have been no previous lightning occurrences recorded in the City of Westwego in the past 10 years.

Town of Grand Isle

There have been no previous lightning occurrences recorded in the City of Grand Isle in the past 10 years.

Town of Jean Lafitte

There have been no previous lightning occurrences recorded in the City of Jean Lafitte in the past 10 years.

While occurrences are frequent, the damage associated with these events is rare. Even when damages occur it is usually localized to individual properties and not reported to news or other weather information sources; therefore, no further assessment will be conducted for this hazard.

4.11.7 Lightning Risk Assessment

Structure Vulnerability

Although lightning risk in Jefferson Parish is only moderate, there remains enough exposure to the hazard to warrant a risk assessment to estimate potential future losses from this hazard.

Lightning has the potential to impact the entire parish. As such, property loss results were derived based on the total damages reported by NCEI. This assessment, presented in **Table 78**, was based on an annualized assessment of lightning losses for the Parish and does not provide a breakdown by community, but instead is a parish-wide assessment of potential annualized losses.

Table 78
Annualized Building Loss Estimate from Lightning in Jefferson Parish

Name	Annualized Loss
Jefferson Parish	$17,655

Critical Facilities Vulnerability

Since the location of damage from a lightning event is unpredictable and may occur anywhere within the Parish, vulnerability of facilities to lightning is relatively equal across the parish and so all facilities are considered at risk to damage from a lightning event. Additional information on asset risk can be found in Appendix F, Asset Inventory.

4.12 Drought

4.12.1 Description of the Drought Hazard

A drought is an extended dry climate condition when there is not enough water to support urban, agricultural, human, or environmental water needs. It usually refers to a period of below-normal rainfall but can also be caused by drying bores or lakes or anything that reduces the amount of liquid water available. Drought is a recurring feature of nearly all the world's climatic regions. See Appendix D, General Descriptions of Natural Hazards, for a more detailed description and definition of the drought hazard.

4.12.2 Location and Extent of the Drought Hazard

Droughts may occur anywhere in the United States. Effects seen in different regions vary depending on normal meteorological conditions, such as precipitation and temperature, as well as geological conditions, such as soil type and subsurface water levels.

According to the NCEI Storm Events Database, there were nine recorded droughts in Jefferson Parish from January 1996 to May 2018, four of which occurred in 1998. Drought events affect Jefferson Parish and each of the municipalities equally and uniformly.

4.12.3 Severity of the Drought Hazard

A drought's severity depends on numerous factors, including duration, intensity, and geographic extent as well as regional water supply demands by humans and vegetation. The severity of drought can be aggravated by other climatic factors, such as prolonged high winds and low relative humidity (FEMA, 1997). Due to its multi-dimensional nature, drought is difficult to define in exact terms and also poses difficulties in terms of comprehensive risk assessments.

Figure 74 below shows drought classifications according to the U.S. Drought Monitor.[67] **Figure 75** below shows the highest level of drought reached within the parish each year according to the U.S. Drought Monitor.

Figure 74
Highest Level of Drought in Jefferson Parish (2000-2018)

Category	Description	Possible Impacts	Palmer Drought Severity Index (PDSI)	CPC Soil Moisture Model (Percentiles)
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures Coming out of drought: some lingering water deficits pastures or crops not fully recovered	-1.0 to -1.9	21 to 30
D1	Moderate Drought	Some damage to crops, pastures Streams, reservoirs, or wells low, some water shortages developing or imminent Voluntary water-use restrictions requested	-2.0 to -2.9	11 to 20
D2	Severe Drought	Crop or pasture losses likely Water shortages common Water restrictions imposed	-3.0 to -3.9	6 to 10
D3	Extreme Drought	Major crop/pasture losses Widespread water shortages or restrictions	-4.0 to -4.9	3 to 5
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses Shortages of water in reservoirs, streams, and wells creating water emergencies	-5.0 or less	0 to 2

Source: United States Drought Monitor

Figure 75
Highest Level of Drought in Jefferson Parish (2000-2018)

Year	Level
2000	EXCEPTIONAL
2001	SEVERE
2002	SEVERE
2003	MODERATE
2004	ABNORMAL
2005	ABNORMAL
2006	EXTREME
2007	ABNORMAL
2008	ABNORMAL
2009	MODERATE
2010	MODERATE

Year	Level
2011	EXCEPTIONAL
2012	EXTREME
2013	ABNORMAL
2014	SEVERE
2015	SEVERE
2016	SEVERE
2017	ABNORMAL
2018	ABNORMAL

Source: United States Drought Monitor

Drought can cause extensive damage to commercial and residential structures' foundations, framing, and walls; agricultural crops; roads; bridges; pipelines; utilities; and railroads.

4.12.4 Impact on Life and Property

There are no known deaths or injuries from droughts in Jefferson Parish. Crop damage from three previous events totaled $385 million dollars. Droughts do not warrant evacuations.

4.12.4-1 Impact on Public Health

Droughts pose serious threats to public health. Severe droughts can dry up small bodies of water, affecting water supplies as well as fish and other aquatic life. Dry conditions increase the chance of wildfires and marsh fires which then impact air quality. Airborne particles like dust, smoke, pollen, and others can cause increase asthma and respiratory infections like bronchitis. Under drought conditions, crops will suffer from lack of irrigation and become more prone to disease infestation which can lead to starvation and malnutrition. Despite these devastating conditions, floodwater and mold growth are not likely to occur during a drought.

4.12.5 Occurrences of the Drought Hazard

There were nine recorded droughts in Jefferson Parish from January 1996 to May 2018. Despite the fact that 4 of these events were in the same year, looking at the total number of droughts reported in that 22-year time span, Jefferson Parish on average experiences a drought event once every 2 years. The 9 events have occurred over a period of 22 years which calculates to a 41% annual probability of future drought occurrences.

In the spring and summer of 1998, Jefferson Parish experienced severe drought conditions. In May, June, and July total precipitation was only 2.29 inches. Only the fall of 1924 (1.39 inches) and the summer of 1934 (2.09 inches) were drier. Area rivers and lakes fell to well below normal levels with water users urged to conserve. August was one of the hottest months in the history of the area.

- May 31, 1998 - Drought conditions were in full force by mid-May across the Parish. Most places saw less half an inch of rain, dating back to the last half of April. The most significant impact in May was the drying up of shallow wells, with many farmers resorting to deeper wells for irrigation purposes. Some crops were beginning to see the effects of the drought, but any significant loses will be attributed to the month of June. The other major story during May's drought, though not directly attributed to it, was the smoke and haze from Mexican and Central

American forest fires. Many places had visibilities of three miles or less for over a week (May 12-20th), and people with respiratory ailments, as well as the elderly and young, were confined to their homes during this period.

- June 30, 1998 - A mild to moderate drought continued across southeastern Louisiana through the month of June. This drought began in mid-May. There were only two opportunities for rain in June, on the 5th and the 26th.

- July 31, 1998 - A mild to severe drought continued for the third straight month across southeast Louisiana. The Parish saw only one to two inches of rain the entire month of July.

- August 31, 1998 - The drought of 1998 continued in the month of August across southeast Louisiana. Between four and five inches of rain fell in the entire month of August, which was actually the most in a month since April 1998. Crop damages were reported to be approximately $215.4 million across Southeast Louisiana.

- December 31, 2000 – The drought of 2000 was devastating to the agricultural communities. Lack of rain fall caused $169.6 million in crop damages across Southeast Louisiana.

There have been no previous drought occurrences recorded in Jefferson Parish in the last 10 years. Also, no Presidentially-declared disasters from drought have occurred in the Parish.

In addition to data collected from national reports, Jefferson Parish has also developed an online platform for recording historic hazard events that is updated regularly by Parish staff. However, no drought events were captured through this platform in Jefferson Parish in the last 11 years.

4.12.6 Municipality Drought Hazards

City of Gretna

There have been no previous drought occurrences recorded in the City of Gretna in the last 10 years.

City of Harahan

There have been no previous drought occurrences recorded in the City of Harahan in the last 10 years.

City of Kenner

There have been no previous drought occurrences recorded in the City of Kenner in the last 10 years.

City of Westwego

There have been no previous drought occurrences recorded in City of Westwego in the last 10 years.

Town of Grand Isle

There have been no previous drought occurrences recorded in Town of Grand Isle in the last 10 years.

Town of Jean Lafitte

There have been no previous drought occurrences recorded in Town of Jean Lafitte in the last 10 years.

4.12.7 Drought Risk Assessment

Structure Vulnerability

Although drought risk is present in Jefferson Parish, the NCEI Storm Events Database does not track occurrences of drought, and there is no record of property loss for the Parish. Therefore, an annualized estimate of drought losses cannot be calculated (**Table 79**).

Table 79
Annualized Building Loss Estimate from Drought in Jefferson Parish

Name	Annualized Loss
Jefferson Parish	n/a

Critical Facilities Vulnerability

Since the location of damage from a drought event is unpredictable and may occur anywhere within the Parish, vulnerability of facilities to a drought is relatively equal across the parish and so all facilities are considered at risk to damage from a drought event. Additional information on asset risk can be found in Appendix F, Asset Inventory.

4.13 Wildfires

4.13.1 Description of the Wildfire Hazard

Wildfires are uncontrolled fires often occurring in wildland areas, which can consume houses or agricultural resources if not contained. Wildfires/urban interface is defined as the area where structures and other human development blend with undeveloped wildland. See Appendix D, General Descriptions of Natural Hazards, for a more detailed description and definition of the wildfire hazard.

4.13.2 Location and Extent of the Wildfire Hazard

The potential for wildfires varies for all of the jurisdictions in Jefferson Parish. Upper Unincorporated Jefferson Parish, City of Gretna, City of Harahan, City of Kenner, City of Westwego, and Town of Grand Isle are dense urban areas without vegetation and do not have a chance of wildfire. The vegetative areas of Lower Unincorporated Jefferson Parish and Jean Lafitte are surrounded by water and vegetation that comprises of approximately 15.25 square miles of land area. While no wildfires have been reported in Jefferson Parish since 1996, one marsh fire has been reported within the last 10 years. Another marsh fire was reported in New Orleans, but its smoke directly affected Jefferson Parish. These marsh fires lasted for several days.

4.13.3 Severity of the Wildfire Hazard

The frequency and severity of wildfires is dependent on weather and on human activity. In a worst-case scenario event, all 15.25 square miles of the wildfire-prone areas in Lower Unincorporated Jefferson Parish and Jean Lafitte would burn. While wildfires have not been reported, two marsh fire events have, but the data is not readily available as to determine the damage incurred or acres burned.

4.13.4 Impact on Life and Property

There are no records of deaths or injuries and no recorded loss of property from wildfires/urban interface fires in the Parish. There is an impact on air quality, however, from the marsh fires as the DEQ advised the smoke from the marsh fire could cause respiratory irritation in children, adults, the elderly, and people who suffer with respiratory sensitivity or diseases such as asthma. These marsh fires occur where there are no occupied structures and therefore do not warrant evacuations.

If wildfire was to occur in the at-risk areas of Lower Unincorporated Jefferson Parish and Jean Lafitte, several vulnerable assets could be impacted. These assets include Jean Lafitte's Town Hall (Administration Building), its Multi-Purpose Complex (Recreational Center), and the Rosethorn Waste Water Treatment Plant (Infrastructure Component).

4.13.4-1 Impact on Public Health

Wildfires and marsh fires impact air quality. These fires produce dust, smoke, and chemical reactions from burning vegetation that can irritate eyes and increase asthma and respiratory infections like bronchitis. They can also wipe out crops which can lead to malnutrition. Mold growth is not likely to result from wildfires.

4.13.5 Occurrences of Wildfires

There have not been any reported wildfires in Jefferson Parish since 1996. With zero events occurring in the last 22 years, there is <1% annual probability of future wildfire occurrences. Several marsh fires have occurred in the past in Jefferson Parish, but there are significant data limitations in determining exact numbers of fires. These incidents of fires in the marshes were from lightning strikes and/or arson.

Significant marsh fire events are summarized below:

- August 30, 2011 – A large marsh fire impacting Jefferson Parish is expected to burn for several more days in the Bayou Sauvage National Wildlife Refuge in eastern New Orleans near Interstate 10 and Interstate 510. The National Weather Service reports east to east southeast winds are expected to continue throughout the day in the Greater New Orleans area and other areas South and Southwest of Lake Pontchartrain. The marsh fire is not expected to spread toward any populated areas. However, because of its location, it is inaccessible to firefighting equipment. Recent reports from the Department of Environmental Quality indicate the smoke is resulting in "Unhealthy for Sensitive Groups Air Quality Index" levels in parts of the New Orleans metropolitan area, including Jefferson Parish.

- June 20, 2012 – Strong winds blew lots of smoke from a marsh fire on the West Bank Wednesday evening towards East Bank neighborhoods in Jefferson and Orleans Parishes. The Kenner Fire Department first reported that there was lots of smoke in the air near Armstrong International

Airport just before 7:00 p.m. The Jefferson Parish Fire Department says the cause of the smoke is a marsh fire that was burning near Waggaman on the West Bank and that the fire is out now.

In addition to data collected from national reports, Jefferson Parish has also developed an online platform for recording historic hazard events that is updated regularly by Parish staff. However, no wildfire events were captured through this platform in Jefferson Parish in the last 11 years.

4.13.6 Municipality Wildfire Hazards

City of Gretna

No previous wildfire occurrences have been recorded in City of Gretna in the last 10 years.

City of Harahan

No previous wildfire occurrences have been recorded in City of Harahan in the last 10 years.

City of Kenner

No previous wildfire occurrences have been recorded in City of Kenner in the last 10 years.

City of Westwego

No previous wildfire occurrences have been recorded in City of Westwego in the last 10 years.

Town of Grand Isle

No previous wildfire occurrences have been recorded in Town of Grand Isle in the last 10 years.

Town of Jean Lafitte

No previous wildfire occurrences have been recorded in Town of Jean Lafitte in the last 10 years.

4.13.7 Wildfire Risk Assessment

Structure Vulnerability

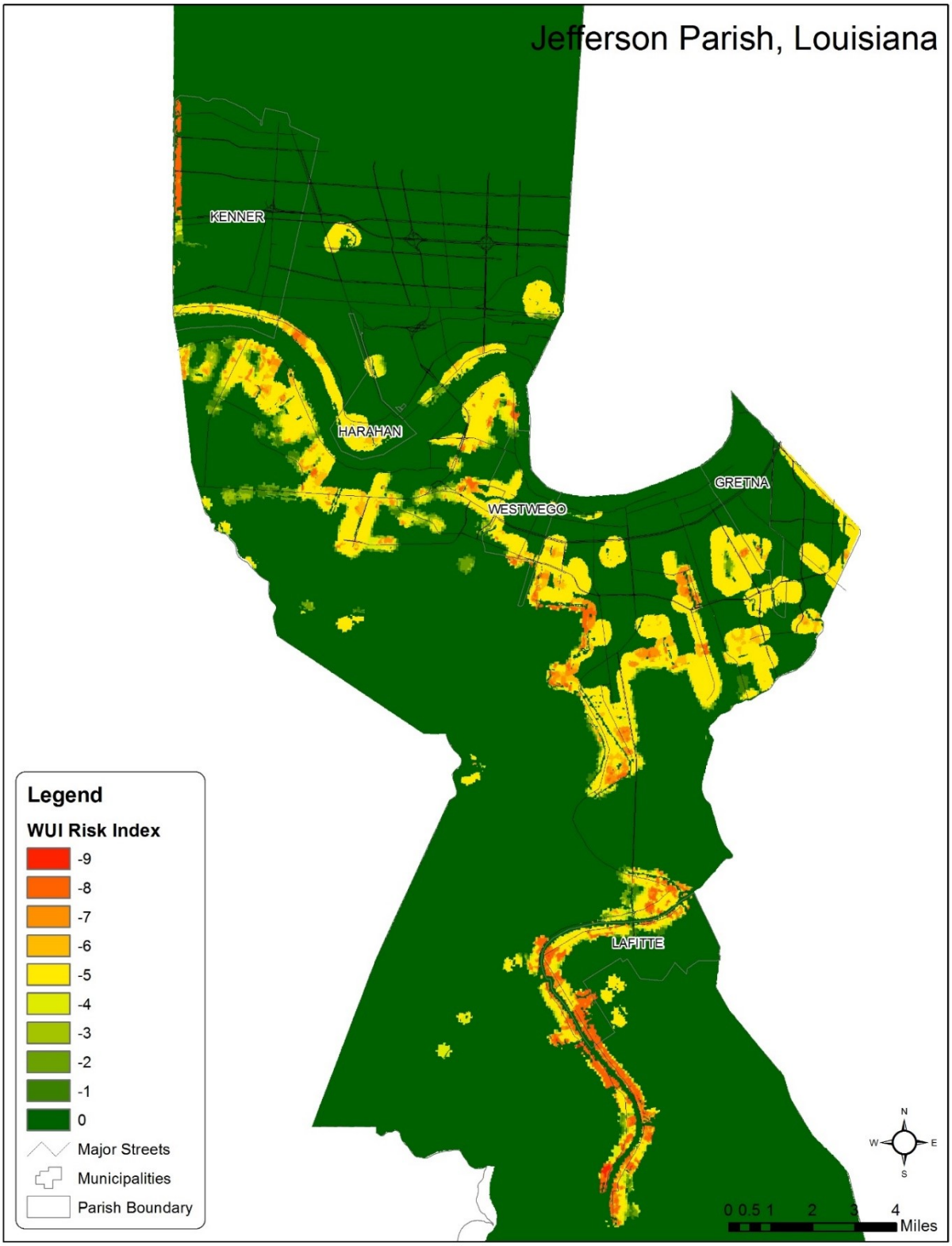
Figure 76 and **Figure 77** below show the Wildland Urban Interface Risk Index developed by the Southern Wildfire Risk Assessment, which is a data layer that shows a rating of the potential impact of a wildfire on people and their homes.[68] The key input, Wildland Urban Interface (WUI), reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the WUI and rural areas is key information for defining potential wildfire impacts to people and homes. Initially provided as raster data, it was converted to a polygon to allow for analysis. The Wildland Urban Interface Risk Index data ranges from 0 to -9 with lower values being most severe (as noted previously, this is only a measure of relative risk). **Table 80** shows the structures that are located in areas classified between -7 and -9, the highest risk wildfire zones in the Parish**.**

Table 80
Improved Property in Wildland Urban Interface Risk Index -7 to -9 Zones in Jefferson Parish

Name	Count of Buildings	Estimated Replacement Value*
Jefferson Parish	4,019	$1,302,136,932
City of Gretna	1	$64,125
City of Harahan	0	$0
City of Kenner	863	$255,670,940
City of Westwego	26	$6,630,518
Town of Grand Isle	1,491	$348,672,683
Town of Jean Lafitte	436	$106,682,130
Grand Total	**6,836**	**$2,019,857,329**

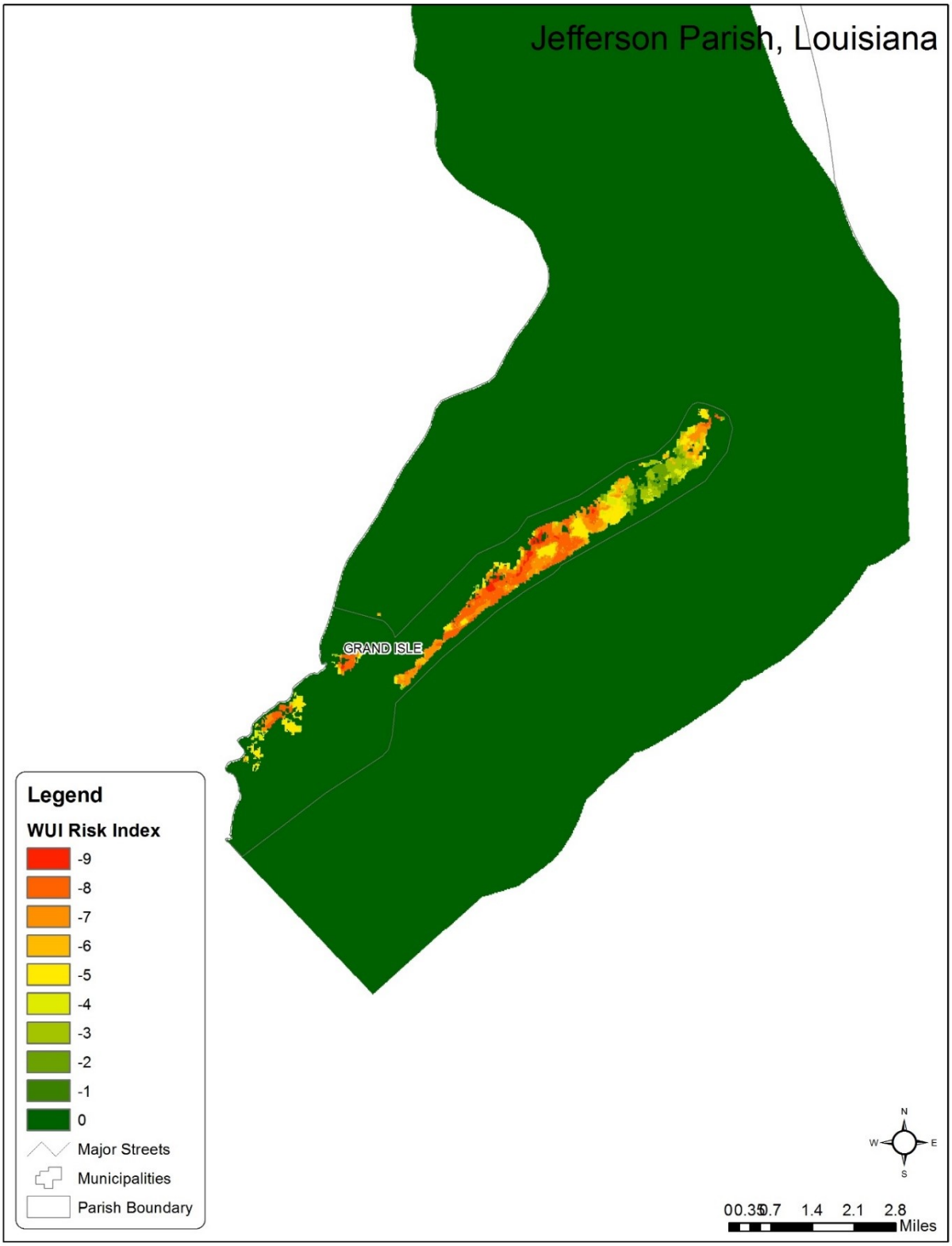
*As noted above, this value was estimated based on an average value of $125/sq ft and does not reflect a structure level assessment of each building's replacement value in the Parish

Figure 76
North Jefferson Parish Wildland Urban Interface Risk Index



Source: Southern Wildfire Risk Assessment

Figure 77
South Jefferson Parish Wildland Urban Interface Risk Index



Source: Southern Wildfire Risk Assessment

Critical Facilities Vulnerability

Since the location of damage from a wildfire event is unpredictable and may occur anywhere within the Parish, vulnerability of facilities to a wildfire is relatively equal across the parish and so all facilities are considered at risk to damage from a wildfire event. It should be noted that areas with higher concentration of development tend not to have fuel loads capable of producing a wildfire, and so are generally at lower risk. Additional information on asset risk can be found in Appendix F, Asset Inventory.

4.14 Earthquakes

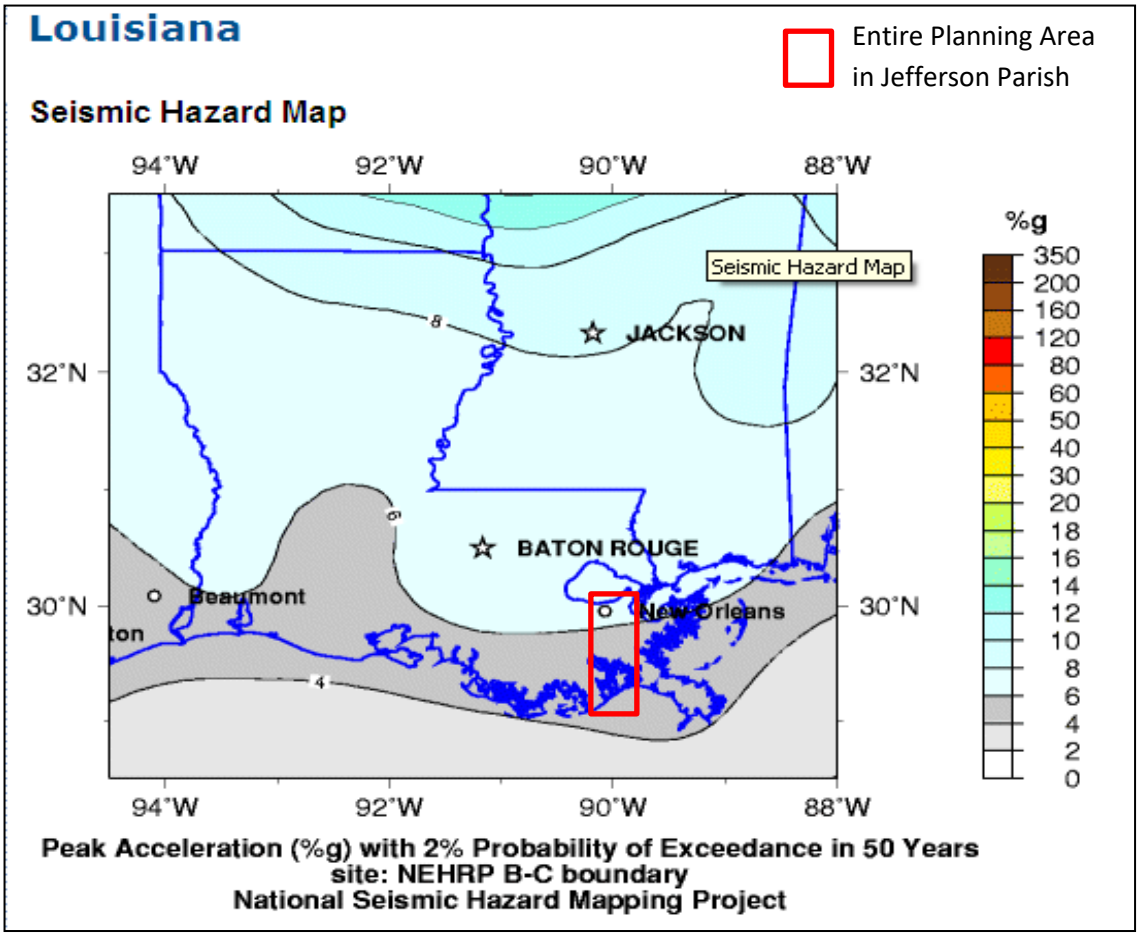
4.14.1 Description of the Earthquake Hazard

An earthquake is a sudden release of energy from the earth's crust that creates seismic waves. Tectonic plates become stuck, putting a strain on the ground. When the strain becomes so great that rocks give way, fault lines occur. At the Earth's surface, earthquakes may manifest themselves by a shaking or displacement of the ground, which may lead to loss of life and destruction of property. The size of an earthquake is expressed quantitatively as magnitude and local strength of shaking as intensity. The inherent size of an earthquake is commonly expressed using a magnitude. See Appendix D, General Descriptions of Natural Hazards, for a more detailed description and definition of the earthquake hazard.

4.14.2 Location and Extent of the Earthquake Hazard

As shown in **Figure 78**, the entire Parish and its municipalities are considered minimally susceptible to the effects of earthquakes with peak ground acceleration ranging from 2 to 8%g.

Figure 78
Louisiana Seismic Hazard Map, showing Peak Ground Acceleration in Percent of *G*, with two percent exceedance in 50 years.

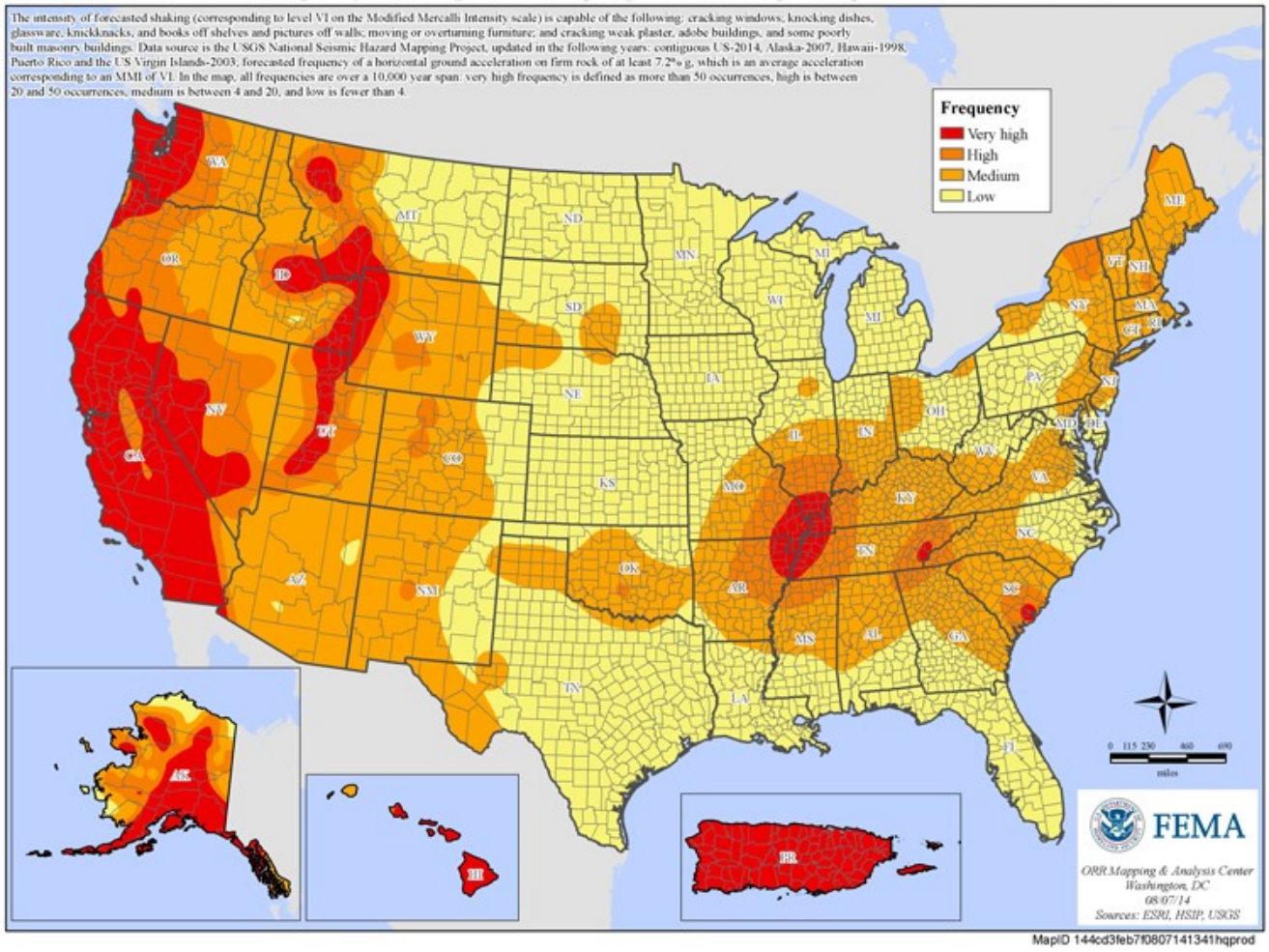


Source: United States Geological Survey[69]

4.14.3 Severity of Earthquake Hazard

As shown in the figure above, the probability of any severe earthquake in the area is minimal. The severity of earthquakes is influenced by several factors, including the depth of the quake, the geology in the area, and the soils. FEMA forecasts the frequency of earthquake shaking capable of causing damage across the United States, and southern Louisiana is classified as a low risk area as **Figure 79** shows.

Figure 79
Forecasted Frequency of Earthquake Shaking Capable of Causing Damage within the U.S.



Source: Federal Emergency Management Agency

4.14.4 Impact on Life and Property

There are no known deaths, injuries, or property damage from earthquakes in Jefferson Parish. The effects on life and property in the area would be minimal if a large earthquake were to occur, with very little damage to the built infrastructure. At most, a few small objects and/or hanging photos may fall off the wall. Because this hazard would have minimal effects, earthquakes in Jefferson Parish do not warrant evacuations.

4.14.4-1 Impact on Public Health

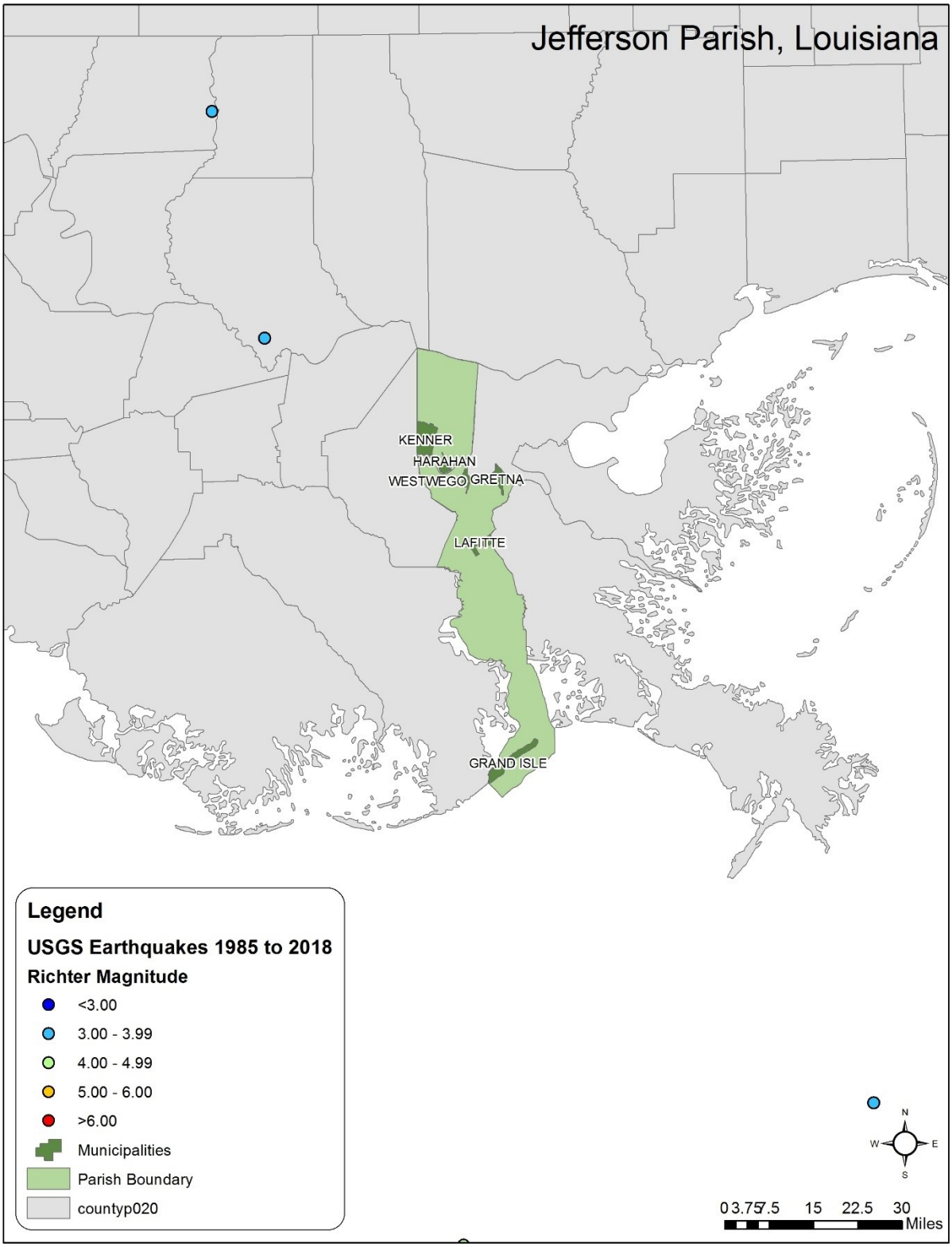
Building collapse is the major culprit of injuries after earthquakes. The impact on public health is more severe in high-density areas. Earthquakes are destructive and non-discriminatory and may damage an entire community in a matter of minutes. If the hospitals and roads to transport people are also damaged, it may be a challenge for a community to provide the services needed to treat these injuries in a timely fashion meaning that victims may not recover. Because earthquakes are not water-related, floodwater and mold growth are not likely to occur as a result of an earthquake.

4.14.5 Occurrences of Earthquakes

There have been no previous earthquake occurrences recorded in Jefferson Parish in the last 10 years.

Historical data reveals that areas near Jefferson Parish have experienced few and minor earthquakes of low magnitude and intensity over the past 75-plus years. A map showing earthquakes that have occurred in the areas around Jefferson Parish from 1985 to 2018 can be found in **Figure 80** below.

Figure 80
Historic Earthquakes Around Jefferson Parish 1985-2018



Source: United States Geological Survey

In October of 1930, a small earthquake centered about 60 miles west of New Orleans was felt throughout southern Louisiana. In some areas small objects were overturned and trees were shaken, but no injuries or deaths were reported.

On November 19, 1958, a local earthquake in the Baton Rouge area shook houses and rattled windows. Residents telephoned the Weather Bureau, Civil Defense, police and radio stations. The shock was also felt at Baker and Denham (USGS).

On May 6, 2018, a rare 4.6-magnitude earthquake occurred in the Gulf of Mexico about 120 miles southeast of Grand Isle. Dozens of people reported feeling vibrations across southern Louisiana, but the impact was small because it happened in the ocean, reducing the potential for injuries and damage to buildings.[70]

Based on historical records, there is <1% annual probability of future earthquake occurrences in Jefferson Parish.

In addition to data collected from national reports, Jefferson Parish has also developed an online platform for recording historic hazard events that is updated regularly by Parish staff. However, no earthquake events were captured through this platform in Jefferson Parish in the last 11 years.

4.14.6 Municipality Earthquake Hazards

City of Gretna

There have been no previous earthquake occurrences recorded in City of Gretna in the last 10 years.

City of Harahan

There have been no previous earthquake occurrences recorded in City of Harahan in the last 10 years.

City of Kenner

There have been no previous earthquake occurrences recorded in City of Kenner in the last 10 years.

City of Westwego

There have been no previous earthquake occurrences recorded in City of Westwego in the last 10 years.

Town of Grand Isle

There have been no previous earthquake occurrences recorded in Town of Grand Isle in the last 10 years.

Town of Jean Lafitte

There have been no previous earthquake occurrences recorded in Town of Jean Lafitte in the last 10 years.

4.14.7 Earthquake Risk Assessment

Damage from an earthquake in Jefferson Parish is generally expected to be low as the Parish's location is fairly distant from any major fault zones. There have been some cases of earthquakes occurring near the Parish, but those have been of small magnitude and generally only caused minor damage. Although there

is some chance of minor damage to buildings from a mild or moderate earthquake, the greatest risk to the Parish related to the earthquake hazard is non-structural damage.

Hazus Structural Damage Assessment

As the Hazus-MH model suggests below, and historical occurrences confirm, any earthquake activity in the area is likely to inflict only minor to moderate damage to the planning area. Hazus-MH 4.2 SP1 estimates a total annualized loss of $129,000 which includes buildings, contents, and inventory throughout the planning area.

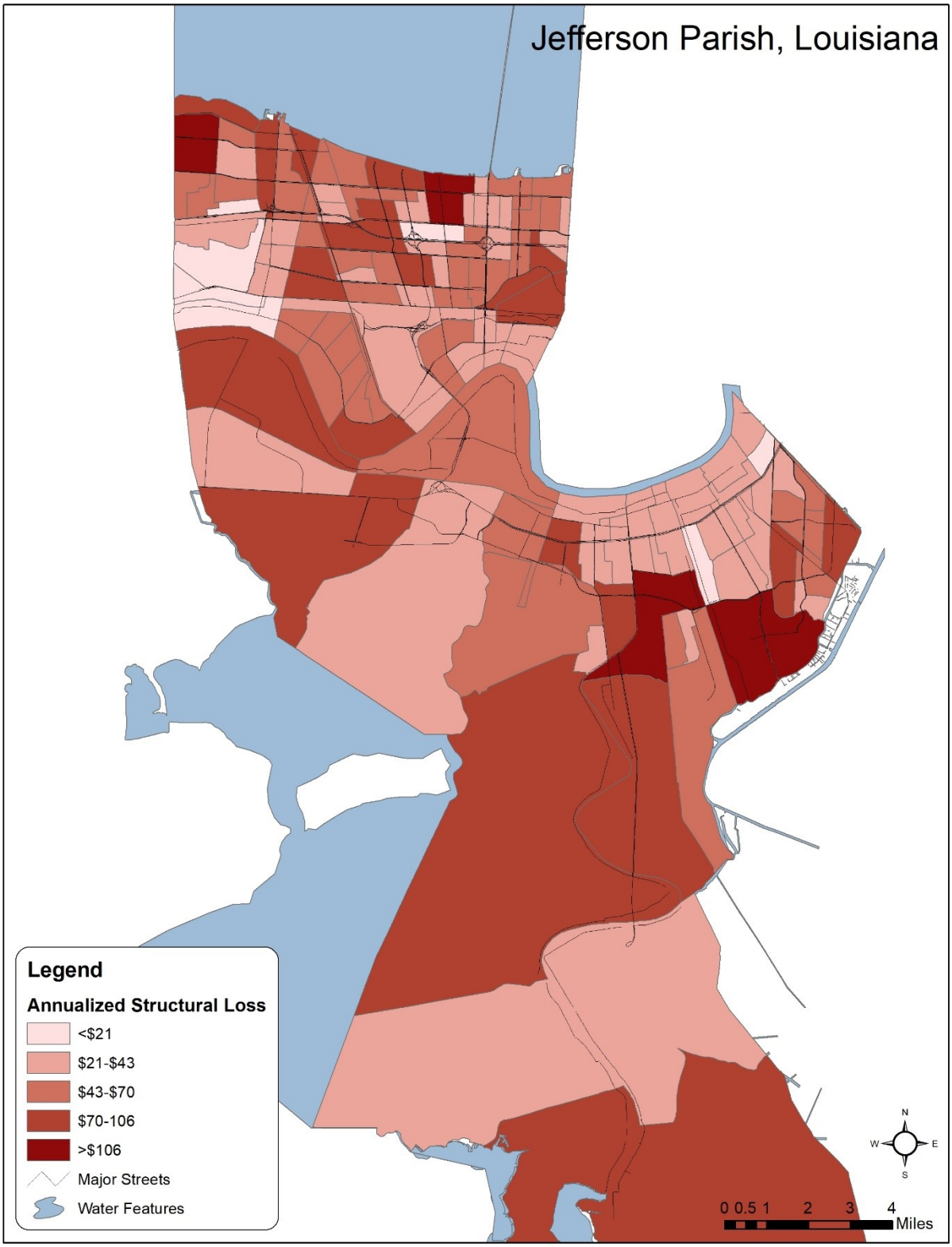
For the earthquake hazard vulnerability assessment, a probabilistic scenario was created to estimate the average annualized loss on a parish-wide basis. Since the scenario is annualized, no building counts are provided. Losses reported included losses due to structure failure, building loss, contents damage, and inventory loss. They do not include losses to business interruption, lost income, or relocation. **Table 81** shows the estimated damages in terms of structural, non-structural, contents and inventory loss based on the earthquake scenario that was run.

Table 81
Hazus Earthquake Probabilistic Scenario- Annualized Losses for Buildings

Community	Structural Damage	Non-Structural Damage	Contents Damage	Inventory Loss	Total
Jefferson Parish	$40,000	$86,000	$23,000	$0	$129,000

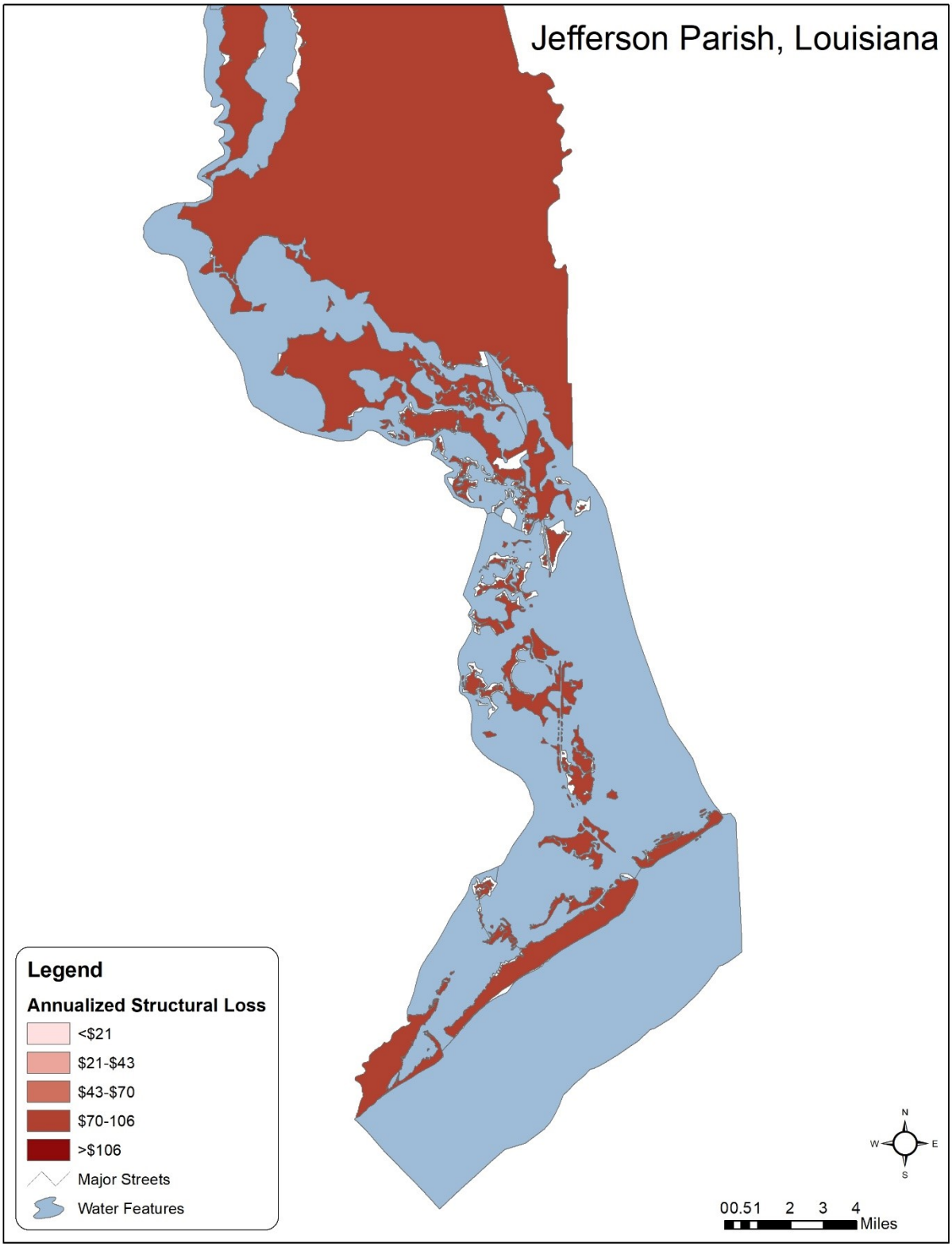
Figure 81 and **Figure 82** show the results of the probabilistic modeled scenario using Census Tract information to estimate building losses.

Figure 81
Hazus Earthquake Probabilistic Scenario North Parish- Structural Damage in Dollars



Source: Hazus MH 4.2 SP1

Figure 82
Hazus Earthquake Probabilistic Scenario South Parish- Structural Damage in Dollars



Source: Hazus MH 4.2 SP1

4.15 Sea Level Rise

4.15.1 Description of the Sea Level Rise Hazard

Sea Level Rise is defined as the mean rise in sea level. It is caused by two factors: 1) as the ocean warms, sea water expands in volume and 2) continental ice shelves melt, increasing the amount of water in the oceans. This leads to a greater area of land being inundated by sea water.

Rising sea level contributes to the loss of coastal wetlands (which provide protective buffers from flood events), beach erosion, impacts on population and property in low areas, and disruption of coastal habitats and species. Further, flooding and hurricane events are more severe and affect a greater area.

Given that 600 million people live in an area that is less than 10 meters, or 33 feet, above sea level and the coastal population has doubled in the last 50 years, sea level rise is a formidable threat.

See Appendix D, General Descriptions of Natural Hazards, for a more detailed description and definition of the sea level rise hazard.

4.15.2 Location and Extent of the Sea Level Rise Hazard

Sea level rise is occurring at a global scale. However, it does not affect areas uniformly and will be more severe in some places. Most assessments carried out across the globe have concluded that climate change is a phenomenon that will impact our planet in the foreseeable future. Among others, the National Climate Assessment, International Panel on Climate Change, and National Oceanic and Atmospheric Administration all project that climate change will impact the United States and will have a major impact on coastal communities due to the effects of sea level rise. As such, projections concerning sea level rise are important to incorporate into planning efforts in order to identify people and property that may be impacted.

4.15.3 Severity of Sea Level Rise Hazard

Sea level rise projections vary based on the local situation, but many studies estimate rises in the range of 1 to 6 feet over the next century. The National Climate Assessment states that, over the past century, global sea level rise has averaged approximately 8 inches and that this rate is expected to accelerate through the next century.[71] Rises in sea level can have drastic effects on personal property as well as the economy as roads may be shut down more frequently and saltwater intrusion may impact water supplies.

4.15.4 Impact on Life and Property

In much of the north parish, the HSDRRS protects people and property from rising flood waters and storm surge. This levee system will provide similar protection against sea level rise in terms of flood consequences. However, sea level rise will occur in conjunction with subsidence and land loss hazards to effectively lower the elevation of land within this area, resulting in an increasingly low-lying land area in the north that sinks below sea level and is at increasing risk to flooding.

In the southern part of the Parish, including Jean Lafitte and Grand Isle, sea level rise poses and increasingly great threat. Similar to the north, it the south of Jefferson Parish will be impacted by coinciding sea level rise and subsidence, which will create more low-lying areas that are susceptible to flooding and eventually complete land loss. Rising sea levels will also cause create an environment that is more susceptible to flooding and storm surge as smaller storms that might not previously have impacted these communities

will have increasing impacts on people and property. As the maps above illustrate, even 1 foot of sea level rise will have a major impact on both Jean Lafitte and Grand Isle and 3 feet or more many have the effect of completely inundating most of these communities.

4.15.4-1 Impact on Public Health

According to the National Climate Assessment,[72] sea level rise can have major impacts on public health as it is likely to cause more severe flooding and storm surge, which can in turn cause wider-ranging damage to healthcare infrastructure and reduce the ability of medical services to treat patients. These events can also contribute to viral and bacterial contamination from sewage overflows and lack of access to potable drinking water supplies. Sea level rise can infiltrate traditionally potable water supplies, thereby exacerbating many public health issues.

4.15.5 Occurrences of Sea Level Rise

Sea level rise is a slow-onset hazard and specific events/occurrences are not possible to determine. However, it is estimated that over the past century, global sea level rise has averaged approximately 8 inches. Because sea level rise occurs as a gradual process and this process has been reported for decades, there is a 100% probability that sea level rise will continue to affect Jefferson Parish, all of its municipalities, as well as the entire Gulf Coast.

4.15.6 Municipality Sea Level Rise Hazards

City of Gretna

Sea level rise is a slow-onset hazard and specific events/occurrences are not possible to determine. However, it is estimated that over the past century, global sea level rise has averaged approximately 8 inches.

City of Harahan

Sea level rise is a slow-onset hazard and specific events/occurrences are not possible to determine. However, it is estimated that over the past century, global sea level rise has averaged approximately 8 inches.

City of Kenner

Sea level rise is a slow-onset hazard and specific events/occurrences are not possible to determine. However, it is estimated that over the past century, global sea level rise has averaged approximately 8 inches.

City of Westwego

Sea level rise is a slow-onset hazard and specific events/occurrences are not possible to determine. However, it is estimated that over the past century, global sea level rise has averaged approximately 8 inches.

Town of Grand Isle

Sea level rise is a slow-onset hazard and specific events/occurrences are not possible to determine. However, it is estimated that over the past century, global sea level rise has averaged approximately 8 inches.

Town of Jean Lafitte

Sea level rise is a slow-onset hazard and specific events/occurrences are not possible to determine. However, it is estimated that over the past century, global sea level rise has averaged approximately 8 inches.

4.15.7 Sea Level Rise Risk Assessment

Structure Vulnerability

In order to assess sea level rise risk, a GIS-based analysis was used to estimate exposure to future projections of sea level rise using data produced by the National Oceanic and Atmospheric Administration. The determination of value at-risk (exposure) was calculated using GIS analysis by summing the values for improved properties that were located within the inundation zone that would be created in the event of 1 foot, 3 feet, and 6 feet of sea level rise. A number of different sea level rise scenarios were available via NOAA (from 1 foot to 6 feet, at 1-foot intervals), however these three scenarios were selected to demonstrate a range of potential sea level rise scenarios from low to moderate to high projections.

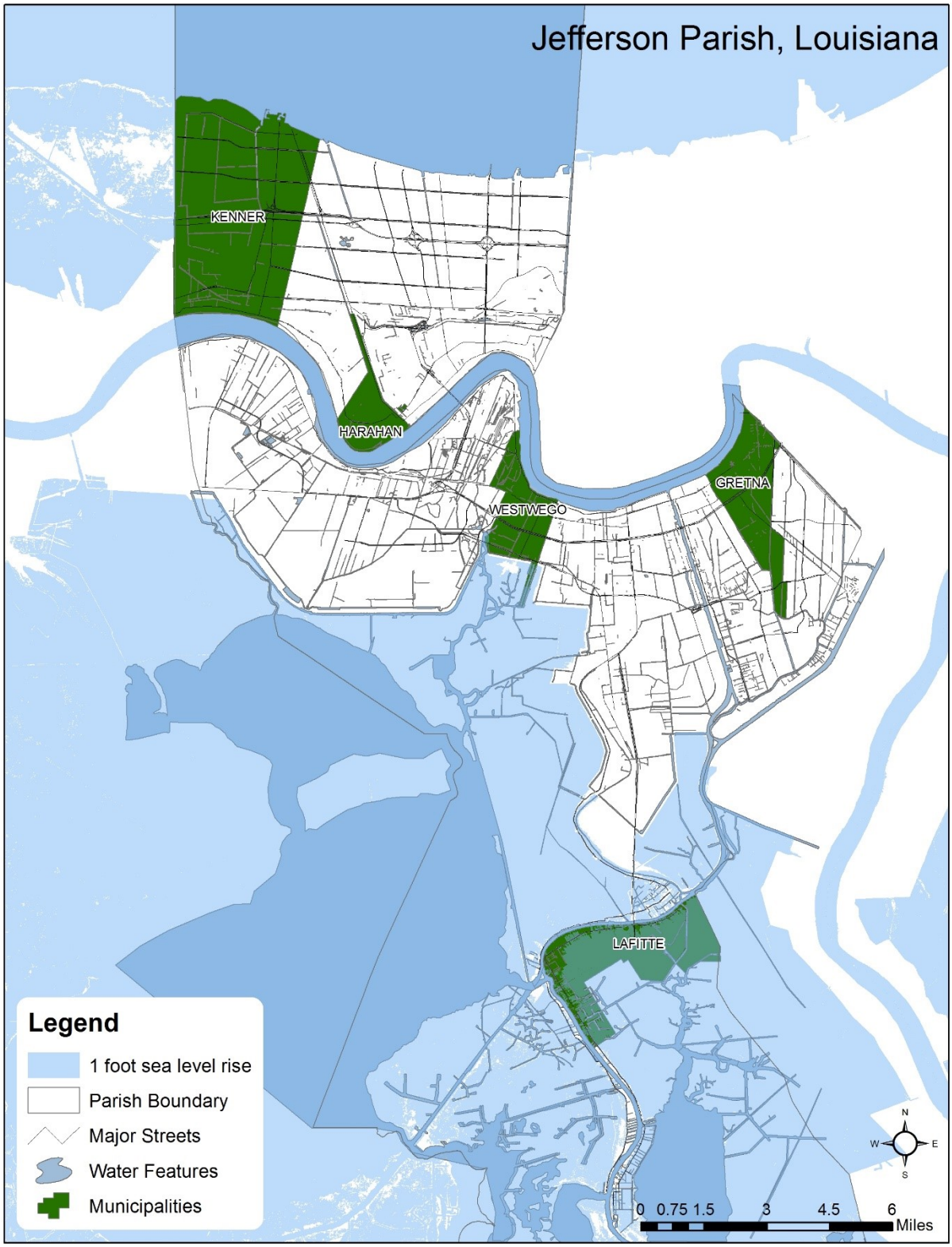
Figure 83, **Figure 84**, **Figure 85**, **Figure 86**, **Figure 87**, and **Figure 88** below show each of the aforementioned scenarios and **Table 82** shows the number of buildings and estimated dollar value of properties located in each inundation zone. Areas located within the HSDRRS, were not considered as part of this analysis due to protection from the levee system. However, there will certainly be impacts from sea level rise within the HSDRRS, particularly in terms of relative sea level rise that results in conjunction with subsidence and land loss.

Table 82
Improved Property in Various Sea Level Rise Inundation Scenarios

Name	1 foot SLR Count of Buildings	1 foot SLR Estimated Replacement Value*	3 feet SLR Count of Buildings	3 feet SLR Estimated Replacement Value*	6 feet SLR Count of Buildings	6 feet SLR Estimated Replacement Value*
Jefferson Parish	1,229	$303,224,385	2,029	$503,305,580	2,169	$542,663,026
City of Gretna	0	$0	0	$0	0	$0
City of Harahan	0	$0	0	$0	0	$0
City of Kenner	0	$0	0	$0	0	$0
City of Westwego	0	$0	0	$0	0	$0
Town of Grand Isle	1,225	$265,145,716	2,516	$577,145,873	2,610	$605,627,472
Town of Jean Lafitte	396	$98,133,136	765	$211,557,025	814	$228,552,478
Grand Total	**2,850**	$666,503,237	**5,310**	**$1,292,008,478**	**5,593**	**$1,376,842,976**

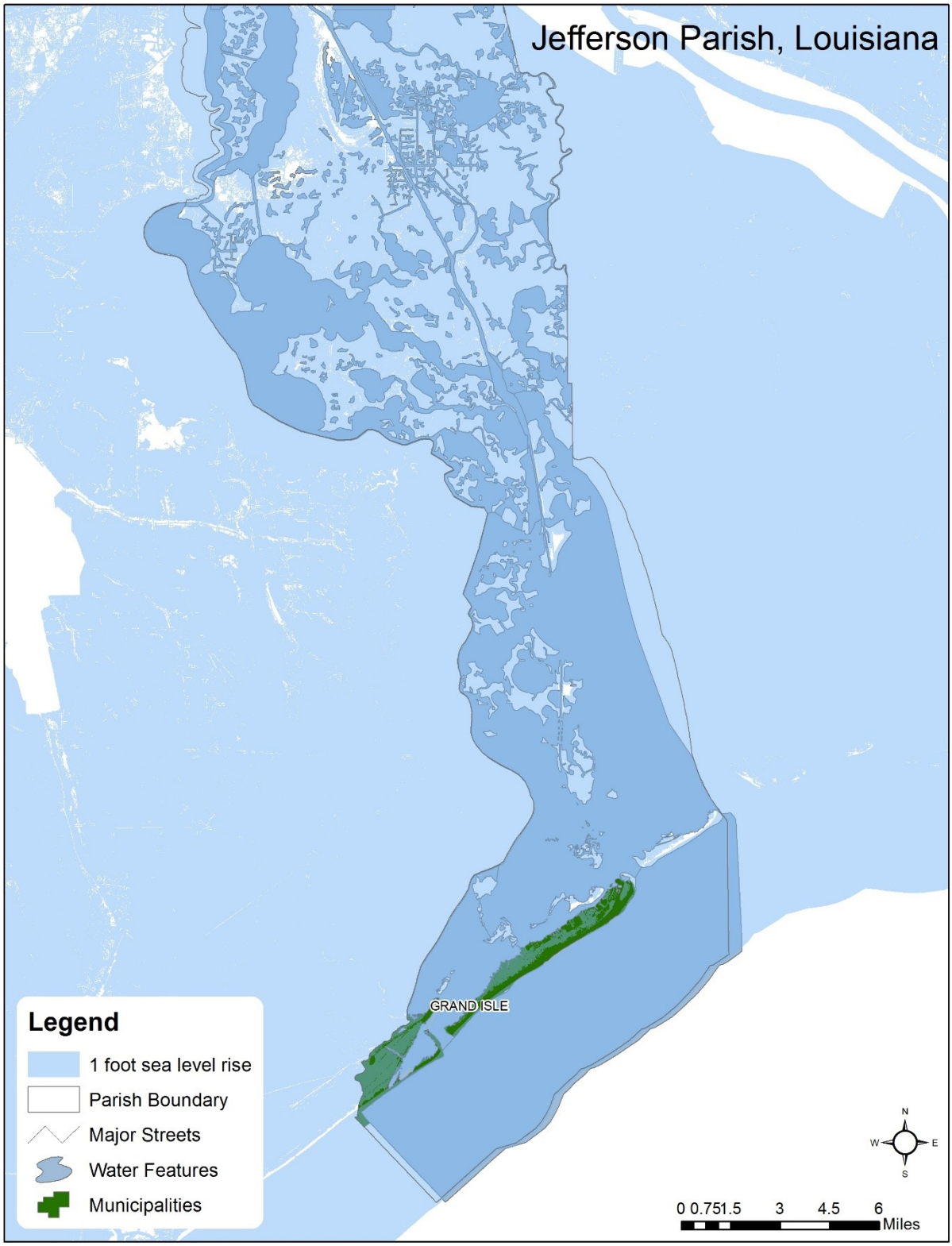
*As noted above, this value was estimated based on an average value of $125/sq ft and does not reflect a structure level assessment of each building's replacement value in the Parish

Figure 83
North Parish Areas Inundated by 1 foot of Sea Level Rise



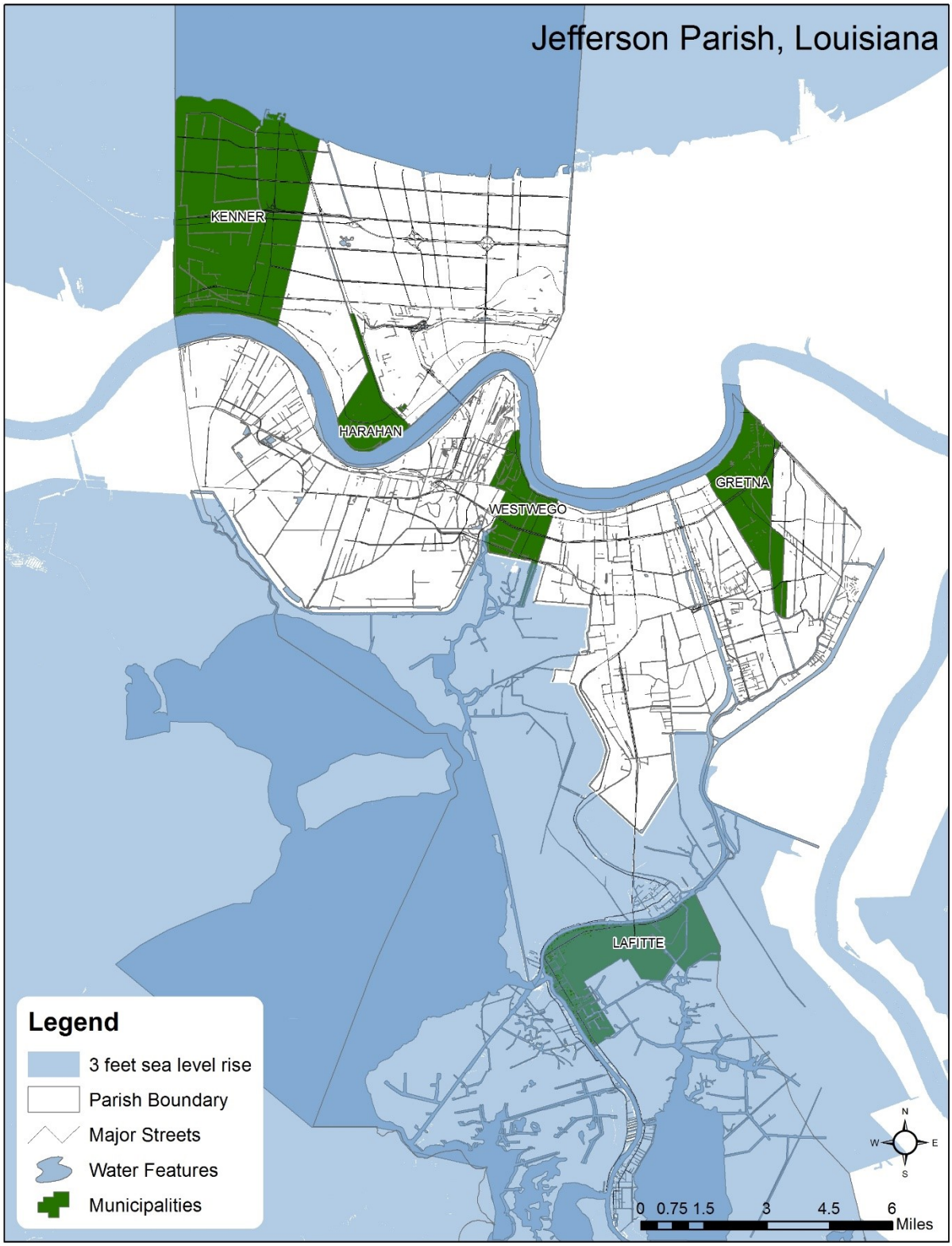
Source: National Oceanic and Atmospheric Administration

Figure 84
South Parish Areas Inundated by 1 foot of Sea Level Rise



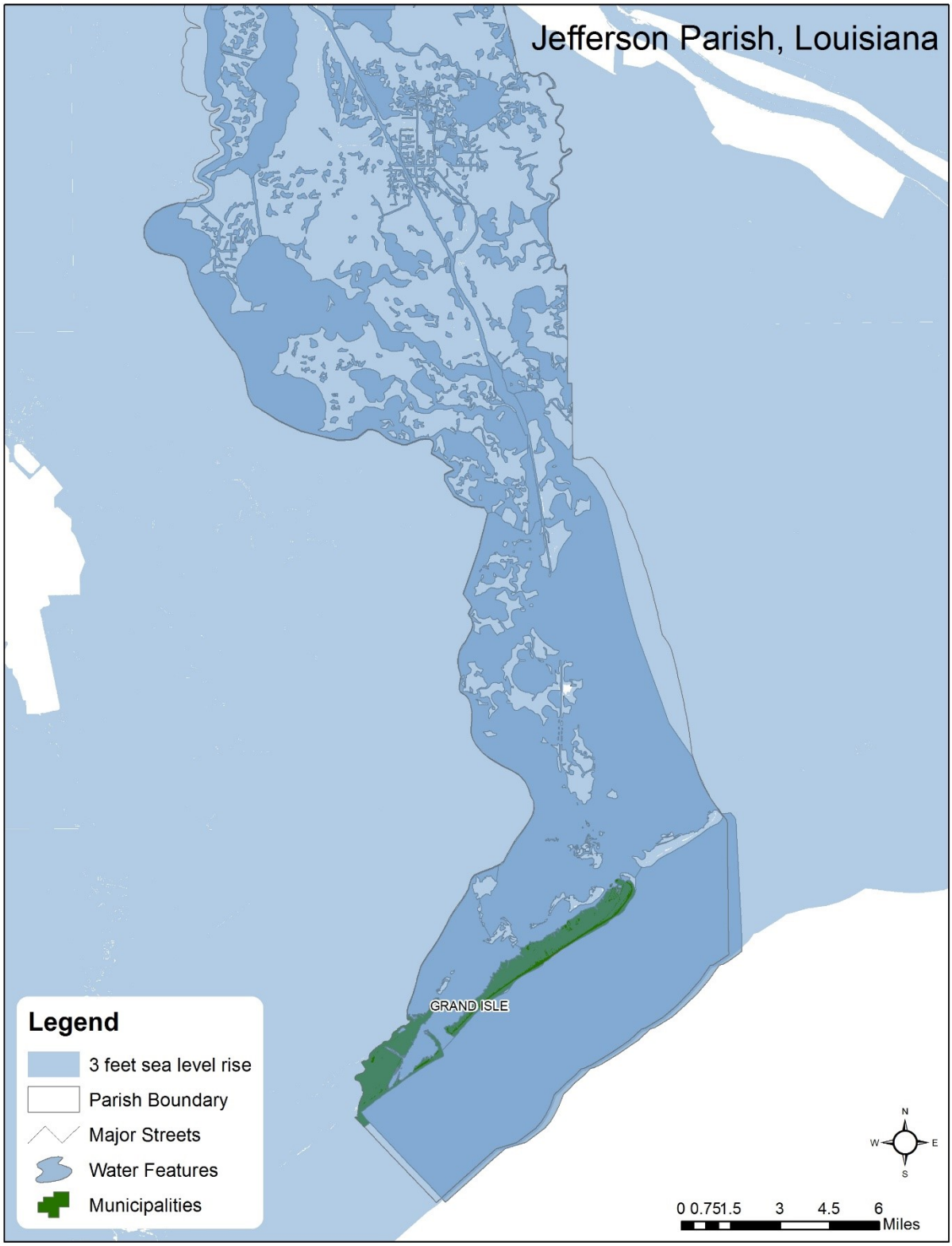
Source: National Oceanic and Atmospheric Administration

Figure 85
North Parish Areas Inundated by 3 feet of Sea Level Rise



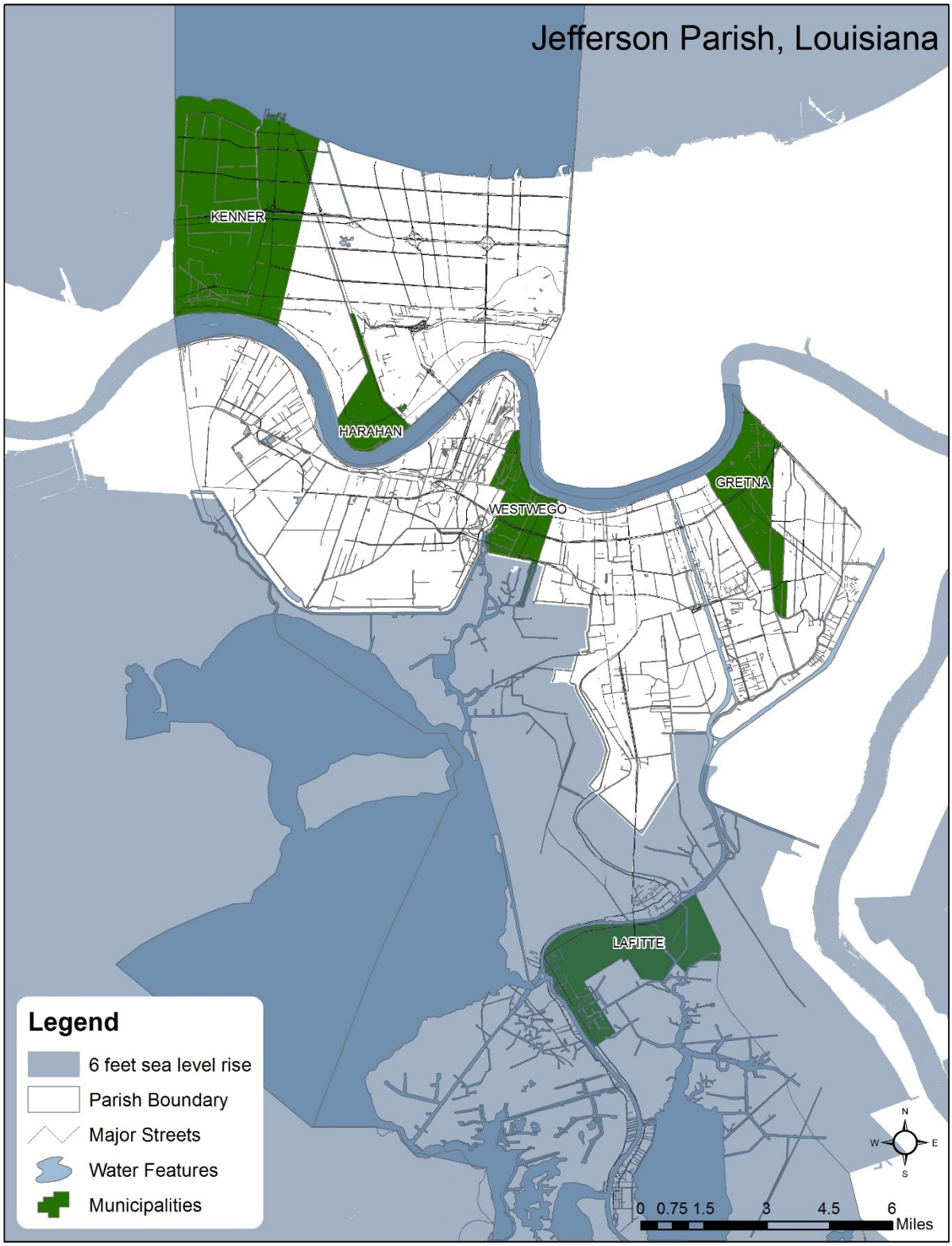
Source: National Oceanic and Atmospheric Administration

Figure 86
South Parish Areas Inundated by 3 feet of Sea Level Rise



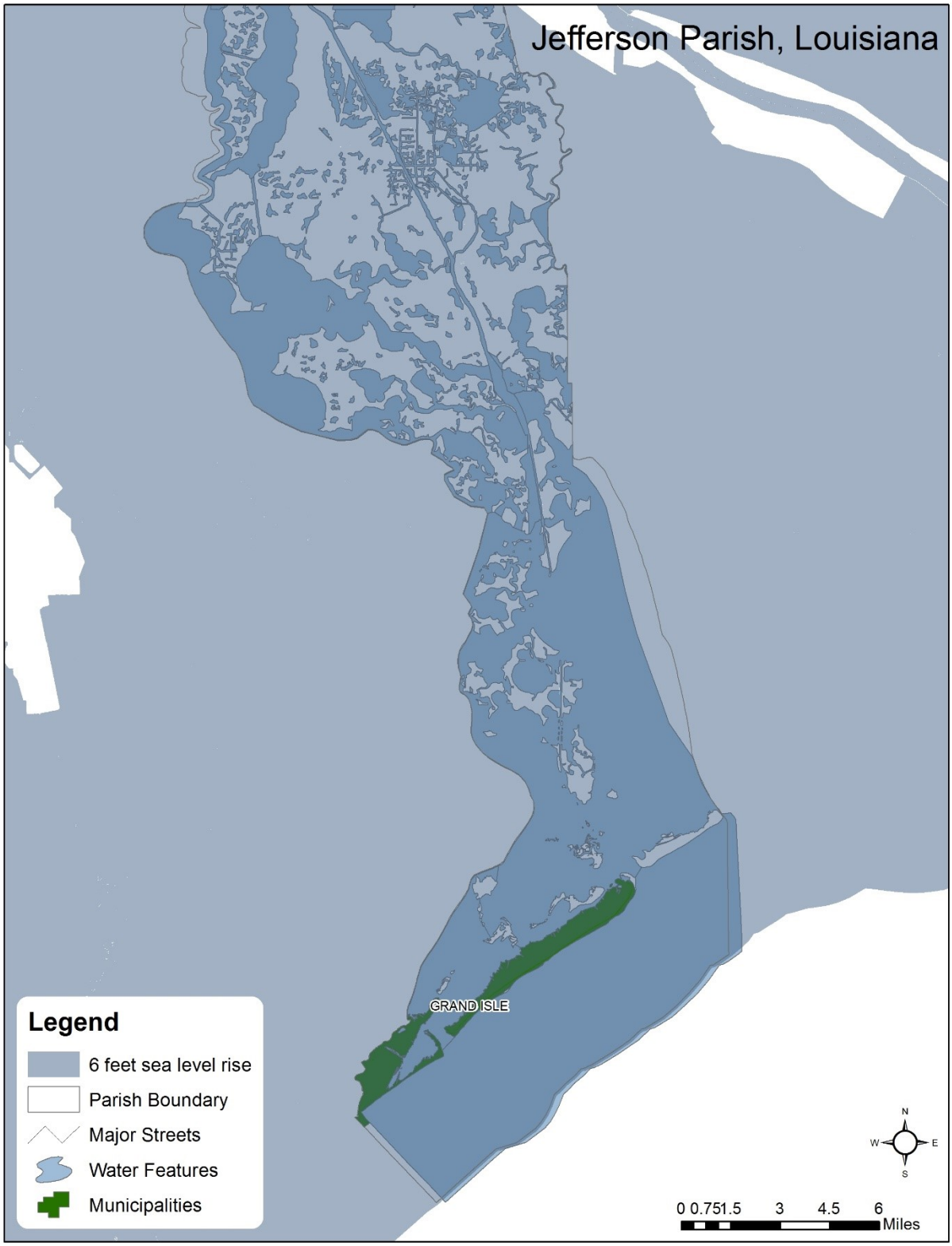
Source: National Oceanic and Atmospheric Administration

Figure 87
North Parish Areas Inundated by 6 feet of Sea Level Rise



Source: National Oceanic and Atmospheric Administration

Figure 88
South Parish Areas Inundated by 6 feet of Sea Level Rise



Source: National Oceanic and Atmospheric Administration

Critical Facilities Vulnerability

Critical facility inventory data collected by the HMPAC was used to analyze the vulnerability of the structures to future sea level rise. Areas that would be inundated at various depths of sea level rise were compared to the locations of critical facilities to determine if there may be impacts from sea level rise to these facilities, and **Table 83** identifies the vulnerable critical facilities. Although this does not account for depth of water, it does give some indication of critical facilities that are more susceptible to sea level rise. Additional information on asset risk can be found in Appendix F, Asset Inventory.

Table 83
Jefferson Parish Critical Facilities;
Sea Level Rise Vulnerability Assessment

Facility	Address	Type	1 ft SLR	3 ft SLR	6 ft SLR
Jefferson Parish					
East Jefferson EMS	3120 Lime St	EMS			
West Jefferson EMS	1225 Avenue C	EMS			
Avondale VFD (Main) Station 74	500 South Jamie Blvd	Fire			
Avondale VFD Station 75	201 West Tish Dr	Fire			
Bridge City VFD	2220 Bridge City Ave	Fire			
Eastbank Consolidated FD Station 11	3525 Jefferson Hwy	Fire			
Eastbank Consolidated FD Station 12	968 Jefferson Hwy	Fire			
Eastbank Consolidated FD Station 13	4642 Calumet St	Fire			
Eastbank Consolidated FD Station 14	1714 Edinburgh St	Fire			
Eastbank Consolidated FD Station 15	402 Aurora Ave	Fire			
Eastbank Consolidated FD Station 16	5200 Lafreniere St	Fire			
Eastbank Consolidated FD Station 17	6616 Kawanee Ave	Fire			
Eastbank Consolidated FD Station 18	3430 N. Causeway Blvd	Fire			
Eastbank Consolidated FD Station 20	4110 Hudson St	Fire			
Harvey #2 VFD Station 62	2200 Lapalco Blvd	Fire			
Harvey #2 VFD Station 63	3824 Manhattan Blvd	Fire			
Jeff Parish Fire Training Academy	200 East St	Fire			
Lafitte Barataria Crown Point VFD Station 41	4176 Privateer Blvd	Fire		Yes	Yes
Live Oak Manor VFD (Main) Station 72	404 Azalea Dr	Fire			
Live Oak Manor VFD Station 73	160 Modern Farms Rd	Fire			

Facility	Address	Type	1 ft SLR	3 ft SLR	6 ft SLR
Marrero Estelle VFD Station 83	4050 Barataria Blvd	Fire			
Marrero Estelle VFD Station 84	3180 Destrehan Ave	Fire			
Marrero Harvey VFD (Main) Station 80	531 Avenue C	Fire			
Marrero Harvey VFD Station 81	808 McArthur Blvd	Fire			
Marrero Harvey VFD Station 82	3649 Patriot St	Fire			
Marrero Ragusa VFD (Main) Station 86	1400 Berger Rd	Fire			
Marrero Ragusa VFD Station 87	455 St Ann St	Fire			
Marrero Ragusa VFD Station 88	5725 Belle Terre Rd	Fire			
Nine Mile Point	1024 Oak Ave	Fire			
Terrytown VFD (Main) Sta. 51	341 Heritage Ave	Fire			
Terrytown VFD Station 52	2201 Carol Sue Ave	Fire			
Third District VFD Station 32	9421 Jefferson Hwy	Fire			
Third District VFD Station 33	301 N Lester Ave	Fire			
Wallace Memorial VFD Sta. 76	4040 Highway 90	Fire			
First Parish Court	924 DAVID DRIVE	Government			
Joe Yenni Bldg	1221 Elmwood Park Blvd.	Government			
East Jefferson Gen Hospital	4200 Houma Blvd	Hospital			
Ochsner Foundation Hospital	1516 Jefferson Hwy	Hospital			
West Jefferson Medical Center	1101 Medical Center Blvd	Hospital			
Jefferson Parish Sheriffs Office First District Patrol Div	3620 Hessmer Avenue	Police			
JPSO 2nd District	1901 Manhattan Blvd	Police			
JPSO Admin Eastbank	3300 Metairie Rd	Police			
JPSO Admin Westbank	1233 Westbank Expwy	Police			
Ames Pump Station	5100 Rochester	Pump Station			
BelMont Pump Station	2108 BELMONT PL	Pump Station			
Bonnabel Pump Station	1500 Beverly Garden	Pump Station			
Canal Street Pump Station	100 Canal St	Pump Station			

Facility	Address	Type	1 ft SLR	3 ft SLR	6 ft SLR
Cousins Pump Station 1	Destrehan & Lapalco	Pump Station			
Cousins Pump Station 2	Destrehan & Lapalco	Pump Station			
Elmwood Canal Pump Station	ELMWOOD CANAL AT LAKE PONTCHART	Pump Station			
Estelle Pump Station	3850 Destrahan Ave.	Pump Station			
Harvey Pump Station	1600 Destrehan Ave.	Pump Station			
Hero Pump Station	Peters Road	Pump Station			
Lake Cataoutche Pump Station	3.5 Miles off of U.S. 90	Pump Station			
Mount Kennedy Pump Station	3100 Mt Kennedy Dr	Pump Station			
Planters Pump Station	268 Bypass Road	Pump Station			
Pontiff Playground Pump Station	1521 Palm St	Pump Station			
Suburban Canal Pump Station	SUBURBAN CANAL AT LAKE PONTCHAR	Pump Station			
Upper Kraak Pump Station	911 KAYE ST	Pump Station			
Westminster Pump Station	2050 Watling	Pump Station			
Whitney - Barataria Pump Station	1301 Engineers Road	Pump Station			
Causeway Head Start	3420 N. Causeway Blvd	Shelter			
JP Animal Shelter -West Bank	2701 Lapalco Blvd	Shelter			
Jutland Head Start	1821 Jutland	Shelter			
Kings Grant Playground	3805 15th Street	Shelter			
Lapalco Head Start	2001 Lincolnshire Dr	Shelter			
Little Farms Playground	10301 S Park St	Shelter			
Miley Playground	6716 W Metairie	Shelter			
Pard Playground	5185 Eighty Arpent Road	Shelter			
Terrytown Gretna Head Start	2315 Park Place	Shelter			
Terrytown Playground	641 Heritage Ave	Shelter			
Eastbank Water Plant	3600 Jefferson Hwy	Water			
Westbank Water Plant	4500 Westbank Exp.	Water			
City of Gretna					
New EOC	910 3rd Street	EOC			
David Crockett VFD Station 46	323 Weidman St	Fire			

Facility	Address	Type	1 ft SLR	3 ft SLR	6 ft SLR
David Crockett VFD Station 48	2000 Hancock St	Fire			
David Crockett VFD (Mn) St 45	1136 Lafayette St	Fire			
David Crockett VFD Station 47	700 Gretna Blvd	Fire			
Terrytown VFD Station 53	200 Wall Blvd	Fire			
Station 54	3301 WALL BLVD.	Fire			
Gretna City Hall	740 2nd St	Government			
Courthouse	200 Derbigny St	Government			
Courthouse Annex	210 Derbigny St	Government			
EOC	910 3rd St	Government			
General Government Building	200 Derbigny Street	Government			
Ochsner-Westbank Medical Center	2500 Belle Chase Hwy	Hospital			
Gretna City Of Police Department Chief Of Police & A	200 5th St	Police			
Mel Ott Multi Purpose Center	2301 Bell Chasse Hwy	Shelter			
City of Harahan					
Jefferson Parish Sheriffs Office Correctional Center	100 Dolhonde St	Police			
Eastbank Consolidated FD Fire Prevention/Arson Unit	834 S. Clearview Pkwy	Fire			
Eastbank Consolidated FD Station 19	455 Edwards Ave	Fire			
Harahan VFD Station 27	800 Randolph St	Fire			
City Hall of Harahan	6425 Jefferson Hwy	Government			
Harahan City Of Police Department Headquarters	6425 Jefferson Hwy	Police			
Midway Pump Station	1 SHADY OAK LN	Pump Station			
JP Animal Shelter- East Bank	1 Humane Way	Shelter			
City of Kenner					
Louis Armstrong Airport	900 Airline Dr	Airport			
Sourtheast Louisiana Flood Protection Authority-East EOC	1100 Reverend Richard Wilson Dr	EOC			
City of Kenner EOC	1610 Reverend Richard Wilson Dr	EOC			
Kenner FD Station 37	3928 Delaware Ave	Fire			

Facility	Address	Type	1 ft SLR	3 ft SLR	6 ft SLR
Kenner Fire Rescue Station 379	3343 Williams Blvd	Fire			
Kenner FD HQ/Fire Alarm	2226 Williams Blvd	Fire			
Kenner FD (Main) Station 35	1801 Williams Blvd	Fire			
Kenner FD Station 36	315 Worth St	Fire			
Kenner FD Station 39	401 Vintage Dr	Fire			
Kenner City Hall	1801 Wiliams Blvd	Government			
Ochsner-Kenner Medical Center	180 W Esplanade Ave	Hospital			
East Jefferson Levee District Police Dept	1135 Lesan Dr	Police			
Kenner Police HQ	500 Veterans Blvd	Police			
Kenner Police Training Center	1939 Reverend Richard Wilson Dr	Police			
Sourtheast Louisiana Flood Protection Authority-East Police Dept	1100 Reverend Richard Wilson Dr	Police			
Duncan Canal Pump Station 4	DUNCAN CANAL AT LAKE PONTCHARTRA	Pump Station			
Parish Line Pump Station	PARISH LINE & GRANDLAKE	Pump Station			
Kenner Sewer Plant	1 West 30th Street	Sewer			
Pontchartrain Center	4545 Williams Blvd	Shelter			
City of Westwego					
Westwego EMS	918 6th St.	EMS			
Westwego VFD Station 92	300 Columbus St	Fire			
Westwego VFD Station 94	206 Louisiana St	Fire			
Westwego VFD (Mn) Sta. 91	677 Avenue H	Fire			
Westwego VFD Station 95	1164 Avenue C	Fire			
Westwego VFD Station 93	1501 Central Ave	Fire			
Westwego City Hall	419 Avenue A	Government			
Westwego City Of Police Department Police Chief	401 4th Street	Police			
Bayou Segnette Pump Station	801 Louisiana Ave	Pump Station			
Westwego Pump Station 1	100 Vic A. Pitre Drive	Pump Station			
Westwego Pump Station 2	820 South Laroussine	Pump Station			
Alario Center	2000 Segnette Blvd	Shelter			

Facility	Address	Type	1 ft SLR	3 ft SLR	6 ft SLR
Town of Grand Isle					
Grand Isle Fire	100 Chighizola Lane	Fire		Yes	Yes
Grand Isle Town Hall	170 Ludwig Ln	Government	Yes	Yes	Yes
Grand Isle Town Of Police Dept	134 Ludwig Ln	Police		Yes	Yes
Town of Lafitte					
Lafitte Barataria Crown Point VFD (Main) Station 40	2385 Jean Lafitte Blvd	Fire		Yes	Yes
Lafitte Barataria Crown Point VFD Station 43	5510 Jean Lafitte Blvd	Fire		Yes	Yes
Jean Lafitte Town Hall	2654 Jean Lafitte Blvd	Government		Yes	Yes
Jean Lafitte Police	2607 Jean Lafitte Blvd	Police		Yes	Yes
Crown Point Pump Station 2	OAK TRAILER PARK	Pump Station	Yes	Yes	Yes
Crown Point Pump Station 1		Pump Station		Yes	Yes
Rosethorn Pump Station		Pump Station	Yes	Yes	Yes
August Lane Pump Station		Pump Station	Yes	Yes	Yes
Highway 45 Pump Station	2013 Jean Lafitte Blvd	Pump Station		Yes	Yes
Jones Point Pump Station	Dead end Carmelite St	Pump Station		Yes	Yes
Fleming Pump Station	DARDAR ST	Pump Station	Yes	Yes	Yes
Oak Dr Pump Station	OAK ST	Pump Station	Yes	Yes	Yes
Perkins Street Pump Station	End of Perkins St	Pump Station	Yes	Yes	Yes
Church Street Pump Station		Pump Station	Yes	Yes	Yes
Gloria Pump Station		Pump Station			Yes
Pailet Pump Station		Pump Station	Yes	Yes	Yes
Goose Bayou Pump Station	4875 DECAMP ST	Pump Station			Yes
Marrero St Pump Station	5117 2ND ST	Pump Station	Yes	Yes	Yes
Lafitte Water Tower	3448 JEAN LAFITTE BLVD	Water		Yes	Yes

4.16 Extreme Heat

4.16.1 Description of the Extreme Heat Hazard

Extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and that last for an extended period of time. A heat wave may occur when temperatures hover 10 degrees or more above the average high temperature for the region and last for a

prolonged number of days or several weeks. Humid conditions may also add to the discomfort of high temperatures.

While extreme heat does not typically affect buildings, the impact to the population can have grave effects. Health risks from extreme heat include heat cramps, heat fainting, heat exhaustion and heat stroke. According to the National Weather Service (which compiles data from the National Climatic Data Center), heat is the leading weather-related killer in the United States. During the ten-year period between 2000 and 2009 heat events killed 162 people - more people than lightning, tornado, flood, cold, winter storm, wind and hurricane hazards. However, most deaths are attributed to prolonged heat waves in large cities that rarely experience hot weather. The elderly and the ill are most at-risk, along with those who exercise outdoors in hot, humid weather.

See Appendix D, General Descriptions of Natural Hazards, for a more detailed description and definition of the extreme heat hazard.

4.16.2 Location and Extent of the Extreme Heat Hazard

Heat waves typically impact a large area and cannot be confined to any geographic or political boundaries. The entire parish is susceptible to extreme heat conditions.

4.16.3 Severity of Extreme Heat Hazard

According to the National Oceanic and Atmospheric Administration, heat is the number one weather-related killer among natural hazards, followed by frigid winter temperatures. The National Weather Service devised the Heat Index as a mechanism to better inform the public of heat dangers. The Heat Index Chart, shown in **Figure 89**, uses air temperature and humidity to determine the heat index or apparent temperature.

Figure 89
Heat Index Chart

Air Temp (in F) \ Relative Humidity (in percent)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
140	125																				
135	120	128																			
130	117	122	131																		
125	111	116	123	131	141																
120	107	111	116	123	130	139	148														
115	103	107	111	115	120	127	135	143	151												
110	99	102	105	108	112	117	123	130	137	143	150										
105	95	97	100	102	105	109	113	118	123	129	135	142	149								
100	91	93	95	97	99	101	104	107	110	115	120	126	132	138	144						
95	87	88	90	91	93	94	96	98	101	104	107	110	114	119	124	130	136				
90	83	84	85	86	87	88	90	91	93	95	96	98	100	102	106	109	113	117	122		
85	78	79	80	81	82	83	84	85	86	87	88	89	90	91	93	95	97	99	102	105	108
80	73	74	75	76	77	77	78	79	79	80	81	81	82	83	85	86	86	87	88	89	91
75	69	69	70	71	72	72	73	73	74	74	75	75	76	76	77	77	78	78	79	79	80
70	64	64	65	65	66	66	67	67	68	68	69	69	70	70	70	70	71	71	71	71	72

Source: National Oceanic and Atmospheric Administration

During an extreme heat event, temperatures can reach up to 100 to 102°F in Jefferson Parish; however, it is possible that future extreme heat events will exceed this temperature.

4.16.4 Impact on Life and Property

Extreme heat, like drought, poses little risk to property. However, extreme heat can have devastating effects on health. Extreme heat is often referred to as a "heat wave." Heat waves are typically accompanied by humidity but may also be very dry. These conditions can pose serious health threats causing an average of more than 600 deaths each summer in the United States.[73]

4.16.4-1 Impact on Public Health

Table 84 shows the dangers associated with different heat index temperatures. Some populations, such as the elderly and young, are more susceptible to heat danger than other segments of the population.

Table 84
Heat Disorders Associated with Heat Index Temperature

Heat Index Temperature (Fahrenheit)	Description of Risks
80°- 90°	Fatigue possible with prolonged exposure and/or physical activity
90°- 105°	Sunstroke, heat cramps, and heat exhaustion possible with prolonged exposure and/or physical activity
105°- 130°	Sunstroke, heat cramps, and heat exhaustion likely, and heatstroke possible with prolonged exposure and/or physical activity
130° or higher	Heatstroke or sunstroke is highly likely with continued exposure

Source: National Oceanic and Atmospheric Administration

In addition, the National Weather Service issues a number of heat-related cautions in order to better inform and warn the public of heat dangers. These are outlined below in **Table 85.**

Table 85
National Weather Service Heat-Related Alerts

Alert Type	Description of Alert
Excessive Heat Warning	An Excessive Heat Warning is issued within 12 hours of the onset of extremely dangerous heat conditions. The general rule of thumb for this Warning is when the maximum heat index temperature is expected to be 105°F or higher for at least 2 days and night time air temperatures will not drop below 75°F.
Excessive Heat Watch	Heat watches are issued when conditions are favorable for an excessive heat event in the next 24 to 72 hours. A Watch is used when the risk of a heat wave has increased but its occurrence and timing is still uncertain.

Heat Advisory	A Heat Advisory is issued within 12 hours of the onset of extremely dangerous heat conditions. The general rule of thumb for this Advisory is when the maximum heat index temperature is expected to be 100°F or higher for at least 2 days, and night time air temperatures will not drop below 75°F.
Excessive Heat Outlook	Excessive Heat Outlooks are issued when the potential exists for an excessive heat event in the next 3-7 days. An Outlook provides information to those who need considerable lead-time to prepare for the event.

Source: National Oceanic and Atmospheric Administration

People living in urban areas are often most vulnerable to heat events because stagnant atmospheric conditions trap pollutants, thus adding unhealthy air to excessively hot temperatures. In addition, the "urban heat island effect" can produce significantly higher nighttime temperatures because asphalt and concrete (which store heat longer) gradually release heat at night. Finally, it should be noted that elderly and aging populations—one of the fastest growing age demographics nationally—are highly vulnerable to heat-related illnesses.

4.16.5 Occurrences of Extreme Heat

Two extreme heat events have been identified in Jefferson Parish between January 1996 and May 2018. **Table 86** below summarizes the extreme heat events for Jefferson Parish in the last 10 years.

Table 86
Extreme Heat Events, Jefferson Parish, January 2008 – May 2018
(Source: NOAA/NCEI[74])

	Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1.	UPPER JEFFERSON (ZONE)	08/01/2010	11:00	Excessive Heat	N/A	0	0	90.00K	0.00K
2.	UPPER JEFFERSON (ZONE)	09/03/2012	10:20	Heat	N/A	1	1	0.00K	0.00K
	Totals:					**0**	**0**	**90.00K**	**0.00K**

The significant events for unincorporated Jefferson Parish are summarized below:

- August 1, 2010 – Hot and humid weather produced high temperatures near 100 degrees and heat index values near 110 degrees in portions of southeast Louisiana. Seven roads in Jefferson Parish buckled due to heat.

- September 3, 2012 – Temperatures in the mid 90s were common across southeast Louisiana. During a widespread power outage in the wake of Hurricane Isaac, combined with the hot temperatures, several reports of heat exhaustion were reported, including one fatality from heat stroke.

With a total of two extreme heat events reported between 1996 and 2018, Jefferson Parish experiences extreme heat on average once every 11 years. The 2 events have occurred over a period of 22 years which calculates to a 9% annual probability of future extreme heat occurrences.

4.16.6 Municipality Extreme Heat Hazards

City of Gretna

No previous occurrences of extreme heat have been recorded in the City of Gretna in the past 10 years.

City of Harahan

No previous occurrences of extreme heat have been recorded in the City of Harahan in the past 10 years.

City of Kenner

No previous occurrences of extreme heat have been recorded in the City of Kenner in the past 10 years.

City of Westwego

No previous occurrences of extreme heat have been recorded in the City of Westwego in the past 10 years.

Town of Grand Isle

No previous occurrences of extreme heat have been recorded in the Town of Grand Isle in the past 10 years.

Town of Jean Lafitte

No previous occurrences of extreme heat have been recorded in the Town of Jean Lafitte in the past 10 years.

4.16.7 Extreme Heat Risk Assessment

Structure Vulnerability

Although extreme heat risk in Jefferson Parish is only moderate, there remains enough exposure to the hazard to warrant a risk assessment to estimate potential future losses from this hazard.

Extreme heat has the potential to impact the entire parish. As such, property loss results were derived based on the total damages reported by NCEI. This assessment, presented in **Table 87**, was based on an annualized assessment of extreme heat losses for the Parish and does not provide a breakdown by community, but instead is a parish-wide assessment of potential annualized losses.

Table 87
Annualized Building Loss Estimate from Extreme Heat in Jefferson Parish

Name	Annualized Loss
Jefferson Parish	$11,250

Critical Facilities Vulnerability

Since the location of damage from an extreme heat event is unpredictable and may occur anywhere within the Parish, vulnerability of facilities to extreme heat is relatively equal across the parish and so all facilities are considered at risk to damage from an extreme heat event. Additional information on asset risk can be found in Appendix F, Asset Inventory.

Section 5 Mitigation Strategy

As mentioned elsewhere, during the 2020 Plan Update, portions of the original HMP were preserved, including some of the terms and language. This section includes various elements from the original 2005 version of the Plan. In the earlier versions of the Plan, the Mitigation Action Plan was a separate Microsoft Excel document. This section is now integrated into the present Mitigation Strategy as Section 5.6 (Prioritized Mitigation Actions and Projects). The same Section (5.6) also includes detailed descriptions and cost estimates for each project that have been scoped as part of this Plan Update. The Update also includes discussion about progress on the goals, strategies, and actions from the previous versions of the HMP. This information is found in Section 5.3 (Mitigation Goals). Additional details about specific changes and updates from the previous versions of the Plan can be found in Appendix B, Summary of Changes.

5.1 44 CFR Requirements for Mitigation Strategy

44 CFR §201.6(c)(3): *[The plan shall include the following:] A mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs, and resources, and its ability to expand on and improve these existing tools.*

44 CFR §201.6(c)(3)(i): *[The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.*

44 CFR §201.6(c)(3)(ii): *[The hazard mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.*

44 CFR §201.6(c)(3)(iii): *[The hazard mitigation strategy section shall include an] action plan, describing how the actions identified in paragraph (c)(3)(ii) of this section will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.*

5.2 Capability Assessment

Jefferson Parish Adoption of Freeboard

To minimize the flood impacts of future events after Katrina and Rita, FEMA provided advisory information concerning coastal flood elevations and interior levee ponding elevations that can be used to guide recovery efforts. The document titled, *FEMA Flood Recovery Guidance,* was published by FEMA on April 12, 2006 and included new floodplain guidance for substantially damaged structures and new construction inside and outside of the levee protected areas in Jefferson Parish.

For structures located inside the levee areas in the northern part of the Parish, FEMA recommends elevating to the Base Flood Elevation (BFE) shown on the current effective Flood Insurance Rate Map (FIRM).

For areas of Jefferson Parish outside of the levee protected areas, FEMA encourages freeboard above the BFEs shown on the FIRM. Jefferson Parish revised its Flood Damage Prevention Ordinance in November 2017. The ordinance requires that all new structures and substantial improvement in Zone AE must be

elevated above -3.5 feet. Depending on base flood elevation, freeboard is either 2.5, 1.5, or 0.5 feet. For all outside-levee areas in Jefferson Parish, 2 foot of freeboard is required. That is, structures should be elevated at least 2 feet above the current BFE shown on the effective FIRM for the building site. In Zone X, residential structures must be 18 inches above the centerline of the street and non-residential structures must be 6 inches above the centerline of the street. It is anticipated that a stricter standard may be adopted for freeboard going forward.

Digital Flood Insurance Rate Maps (FIRMs)

As a provision of the Flood Insurance Reform Act of 2004, all updated FIRMs are now available in digital format on FEMA's Map Service Center Website (Adoption of Flood Insurance Rate Maps by Participating Communities, FEMA 495/September 2012). This enhances the community official's ability to locate properties simply by typing in an address and can increase accuracy in determining a property's Flood Zone and Base Flood Elevation (BFE). Jefferson Parish's current map is official as of February 2, 2018 (the historic FIRM maps for the Parish are dated July 9, 1976 and March 23, 1995).

Building Code Effectiveness Grading Schedule (BCEGS)

The Building Code Effectiveness Grading Scale is a program run by the Insurance Services Office (ISO) to evaluate a community's effective building code and grade how that community enforces the codes. The rating ranges from 1-10 with 1 being the best. Jefferson Parish currently has a BCEGS rating of 4.

Planning Resources and Capabilities

Jefferson Parish has local authorities, policies, and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. These tools and their capabilities can vary by jurisdiction and are outlined in **Table 88** below. Each of these local plans, ordinances, and programs should be considered available mechanisms for incorporating the requirements of the Jefferson Parish Hazard Mitigation Plan.

Table 88
Jefferson Parish Capability Assessment

	UJP	Gretna	Harahan	Kenner	Westwego	Grand Isle	Jean Lafitte
Plans	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
Comprehensive / Master Plan	Y	N	Y	N	Y	N	Y
Capital Improvements Plan	Y	Y	N	Y	Y	Y	Y
Economic Development Plan	Y	Y	Y	Y	Y	Y	Y
Local Emergency Operations Plan	Y	Y	Y	Y	Y	N	N
Continuity of Operations Plan	Y	N	N	N	N	N	N
Transportation Plan	Y	N	N	N	N	N	N
Stormwater Management Plan	Y	Y	Y	Y	Y	N	N
Community Wildfire Protection Plan	N	N	N	N	N	N	N
Other plans (redevelopment, recovery, coastal zone management)							
Building Code, Permitting, and Inspections	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
Building Code	Y	Y	Y	Y	Y	Y	Y
Building Code Effectiveness Grading Schedule (BCEGS) score	Y	N	N	Y	N	N	N
Fire Department ISO rating	Y	Y	Y	Y	Y	Y	Y
Site plan review requirements	Y	Y	Y	Y	Y	Y	
Land Use Planning and Ordinances	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N

	UJP	Gretna	Harahan	Kenner	Westwego	Grand Isle	Jean Lafitte
Zoning Ordinance	Y	Y	Y	Y	Y	Y	Y
Subdivision Ordinance	Y	Y	Y	Y	Y	Y	Y
Floodplain Ordinance	Y	Y	Y	Y	Y	Y	Y
Natural Hazard Specific Ordinance (stormwater, steep slope, wildfire)	N	N	N	Y	N	N	N
Flood Insurance Rate Maps	Y	Y	Y	Y	Y	Y	Y
Acquisition of land for open space and public recreation uses	Y	Y	Y	Y	Y	Y	Y
Other							
Administration	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
Planning Commission	Y	Y	Y	Y	Y	Y	Y
Mitigation Planning Committee	Y	Y	Y	Y	Y	Y	Y
Maintenance programs to reduce risk (tree trimming, clearing drainage systems)	Y	Y	Y	Y	Y	Y	Y
Staff	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
Chief Building Official	Y	Y	Y	Y	Y	Y	N
Floodplain Administrator	Y	Y	Y	Y	Y	Y	Y
Emergency Manager	Y	Y	Y	Y	Y	Y	Y
Community Planner	Y	Y	Y	Y	Y	N	N
Civil Engineer	Y	Y	Y	Y	N	Y	Y
GIS Coordinator	Y	Y	N	Y	N	N	N
Grant Writer	Y	Y	N	Y	N	N	N
Other		Y					
Technical	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
Warning Systems / Service (Reverse 911, outdoor warning signals)	Y	Y	Y	Y	Y	Y	N
Hazard Data & Information	Y	Y	Y	Y	N	N	N
Grant Writing	Y	Y	Y	Y	N	N	N
Hazus Analysis	N	N	N	N	N	N	N
Other							
Funding Resource	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
Capital Improvements project funding	Y	Y	Y	Y	Y	Y	Y
Authority to levy taxes for specific purposes	Y	Y	Y	N	Y	Y	N
Fees for water, sewer, gas, or electric services	Y	Y	Y	N	Y	Y	N
Impact fees for new development	Y	Y	Y	N	N	N	N
Stormwater Utility Fee	N	N	N	N	N	N	N
Community Development Block Grant (CDBG)	Y	Y	Y	Y	Y	Y	Y
Other Funding Programs	HMGP	HMGP		HMGP, PDM			
Program / Organization	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
Local citizen group or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Y	Y	Y	Y	Y	Y	Y

	UJP	Gretna	Harahan	Kenner	Westwego	Grand Isle	Jean Lafitte
Ongoing public education or information program (responsible water use, fire safety, household preparedness, environmental education)	Y	Y	Y	Y	Y	Y	Y
Natural Disaster or safety-related school program	Y	Y	N	N	Y	Y	N
Storm Ready certification	Y	Y	Y	Y	Y	Y	Y
Firewise Communities certification	N	N	N	N	N	N	N
Public/Private partnership initiatives addressing disaster-related issues.	Y	N	N	Y	Y	N	N
Other							

Unincorporated Jefferson Parish

Unincorporated Jefferson Parish will continue to add to its current plans as well as work to create new plans that will address a long-term recovery and resiliency framework. The Parish will work to improve coordination with the community planner to ensure that Parish plans do include the comprehensive plan, incorporate elements of the hazard mitigation plan to ensure that future development does not occur in special flood hazard areas and other areas at risk from hazards identified in this plan. The Parish will also work to identify existing local funding sources that can be used to implement hazard mitigation activities.

City of Gretna

The City of Gretna will explore opportunities to create new plans that will address a long-term recovery and resiliency framework as City resources allow. The City will work to improve coordination with the community planner to ensure that City plans incorporate elements of the hazard mitigation plan to ensure that future development does not occur in hazard areas. The City will also work to identify existing local funding sources that can be used to implement hazard mitigation activities.

City of Harahan

The City of Harahan will explore opportunities to create new plans that will address a long-term recovery and resiliency framework as City resources allow. The City will work to improve coordination with the community planner to ensure that City plans incorporate elements of the hazard mitigation plan to ensure that future development does not occur in hazard areas. The City will also work to identify existing local funding sources that can be used to implement hazard mitigation activities.

City of Kenner

The City of Kenner will explore opportunities to create new plans that will address a long-term recovery and resiliency framework as City resources allow. The City will work to improve coordination with the community planner to ensure that City plans incorporate elements of the hazard mitigation plan to ensure that future development does not occur in hazard areas. The City will also work to identify existing local funding sources that can be used to implement hazard mitigation activities.

City of Westwego

The City of Westwego will explore opportunities to create new plans that will address a long-term recovery and resiliency framework as City resources allow. The City will work to improve coordination with the community planner to ensure that City plans incorporate elements of the hazard mitigation plan to ensure that future development does not occur in hazard areas. The City will also work to identify existing local funding sources that can be used to implement hazard mitigation activities.

Town of Grand Isle

The Town of Grand Isle will explore opportunities to create new plans that will address a long-term recovery and resiliency framework as Town resources allow. The Town will consider hiring a community planner to improve local planning and help ensure that future development does not occur in potential hazard areas. The Town will also work to identify existing local funding sources that can be used to implement hazard mitigation activities.

Town of Jean Lafitte

The Town of Jean Lafitte will explore opportunities to create new plans that will address a long-term recovery and resiliency framework as Town resources allow. The Town will consider hiring a community planner to improve local planning and help ensure that future development does not occur in hazard areas. The Town will also work to identify existing local funding sources that can be used to implement hazard mitigation activities.

5.3 Mitigation Goals

Goals are general descriptions of desired long-term outcomes. State and federal guidance and regulations pertaining to mitigation planning require the development of mitigation goals to reduce or avoid long-term vulnerabilities to identified hazards. Mitigation goals have been established by FEMA, the State of Louisiana, and Jefferson Parish.

The primary goal of all local governments is to promote the public health, safety, and welfare of its citizens. In keeping with this standard, Jefferson Parish and the participating municipalities have developed five goal statements for local hazard mitigation planning in the Parish. In developing these goals, the HMPAC reviewed the existing goals from the 2015 Plan and found that, generally, they seemed to be in line with the Parish's current vision for mitigation. The existing mitigation goals from the previous Plan include:

1. Identify and pursue preventive measures that will reduce future damages from hazards.
2. Enhance public awareness and understanding of disaster preparedness risks through education programs.
3. Identify and pursue protective measures that will benefit natural systems from hazards.
4. Facilitate sound development in the Parish through local plans and regulations to reduce or eliminate the potential impact of hazards.

After considering the existing goals, the HMPAC proposed one new goal and accepted the four existing goals (after making several minor word choice modifications). The five goals were reviewed, voted on, and accepted by the HMPAC at the Goals Meeting held on October 23, 2018. Each goal, purposefully broad in nature, serves to establish parameters that were used in developing mitigation actions. Consistent implementation of the actions over time will ensure that the mitigation goals are achieved. The final five mitigation goals developed by the Parish are as follows:

1. Identify and pursue preventive measures that will reduce future damages from hazards.
2. Enhance public awareness and understanding of preparedness and risks through education and notification programs.
3. Identify and pursue protective measures that will benefit the built environment and natural systems.
4. Facilitate sound development in the Parish through local plans and regulations to reduce or eliminate the potential impact of hazards.
5. Invest in structural and green infrastructure projects to manage future risk.

5.4 Mitigation Objectives and Strategies

5.4.1 Objectives

Objectives are well-defined intermediate points in the process of achieving goals. Jefferson Parish mitigation planning objectives include:

1. Reduce the exposure of residential areas to flooding and storm surge from the Mississippi River, Lake Pontchartrain, and the Gulf of Mexico.
2. Mitigate properties listed on the Jefferson Parish repetitive loss list and severe repetitive loss (SRL) list, and properties that meet substantial damage.
3. Ensure that Parish critical facilities remain functional during natural hazard events.
4. Find and develop opportunities to work with other agencies to leverage mitigation funds, and to share information about the risks of natural hazards.
5. Improve the early warning and Public Alert System for hazards such as flash floods and tornadoes to save lives and reduce damages to property.
6. Promote partnerships among Federal, State, Parish, Interstate Commissions, and Local Governments to identify, prioritize and implement mitigation actions.
7. Improve the Parish's CRS rating through the NFIP to allow citizens to purchase flood insurance at a discounted price.
8. Maintain continuity of operations and economic productivity of Jefferson Parish businesses by preventing damages from hazards.
9. Ensure that the Parish maximizes its opportunities for access to Federal and State grants and other kinds of assistance.
10. Reduce wind damages to residential and commercial buildings through hazard mitigation and effective implementation of building codes.
11. Provide effective implementation of existing floodplain regulations and building codes.
12. Ensure that the Parish continues to be represented in the determination of region-wide mitigation actions.
13. Stay involved with citizen and technical groups concerning measures related to hazard mitigation.

5.4.2 Strategies

Strategies are specific courses of action to achieve the objectives. Jefferson Parish mitigation planning strategies include:

1. Maintain awareness of the potential effects of natural hazards on Jefferson Parish assets. Use new information from damaging events to increase local knowledge of risks.
2. Undertake vulnerability and risk studies to better understand the potential for future damages.

3. Ensure the Parish Emergency Operations Plan is maintained and updated and enhance Public Alert System.
4. Implement cost-effective projects and actions to reduce risk from natural hazards, both for Parish assets and operations, as well as for residents and businesses in the planning area.
5. Elevate, reconstruct, or acquire qualifying residential structures from the Jefferson Parish repetitive loss list and severe repetitive loss list.
6. Install emergency backup generators at all critical facilities.
7. Distribute information to the public concerning the hazards associated with flooding. Include with the material opportunities about mitigation measures that can reduce flooding.
8. Monitor mitigation measures to ensure they are functioning efficiently.
9. Promote the purchase of flood insurance.
10. Continuously monitor this Plan Update to ensure that it remains current with regard to risks, strategies, priorities and mitigation actions.
11. Promote public understanding, support and demand for hazard mitigation.
12. Pursue drainage projects that will reduce local flooding in the Parish.
13. Seek Federal and State grants to fund mitigation activities.
14. Upgrade the local shelters to allow more people access during hazardous events.
15. Encourage and facilitate the development or updating of General Plans, Drainage Plans, Land and Zoning, Building Construction, Fire Protection and Floodplain Management Ordinances to limit development in hazard areas.
16. Implement elements of the Plan and monitor results.

5.5 Summary of Mitigation Activities Considered

Mitigation activities for consideration were evaluated by the HMPAC at the Possible Activities Meeting. These included preventive activities, floodplain management activities, property protection activities, activities to protect the natural and beneficial functions of the floodplain, structural projects, emergency services activities, and public information activities. For each activity considered, the status (new or update), pros and cons, appropriateness for the community and its flood problems, as well as an explanation of why or why not the activity is appropriate were identified by the HMPAC and are listed in **Table 89** below.

Table 89
Mitigation Activities for Consideration

Mitigation Activities for Consideration					
Activity	New or Update	Pros	Cons	Appropriate for the Community and its Flood Problems (Y/N)	Explanation of why or why not appropriate
Preventive Activities					
Comprehensive or Land Use Plan	Update	• Reviewing zoning requirements to better zone the community	• Detrimental to pre-existing buildings • Non-conforming uses • Checkerboard effect	Y	The zoning reflects the land use and informs more strategic development to make it more appropriate for that area.

Mitigation Activities for Consideration					
Activity	New or Update	Pros	Cons	Appropriate for the Community and its Flood Problems (Y/N)	Explanation of why or why not appropriate
Zoning Ordinance	Recently updated	• To guide appropriate development	• People like to do what I want to do • May not be politically favorable	Y	For the safety and welfare of the public.
Stormwater Management Regulations	Update (in process)	• Manages runoff, storage, pervious pavement • Reduce flooding and subsidence	• Can be expensive • Not everyone is open to it • Commit that portion of your property to no-productive use	Y	To manage stormwater and reduce flooding and the demand on the drainage systems.
Building Codes	Recently updated	• Guide development • Help to promote best practices	• Applicants seek variances to code requirements	Y	Provides a safe structure for everyone.
Subdivision Ordinance	Exists	• Creates safe and compliant subdivisions	• Cookie cutter • Upsetting the public and developers • Increase cost of development	Y	Creates safer development.
Open Space Preservation	Update	• Allows water to flow naturally • Protects natural floodplain functions • Increase recreational opportunities	• Take land out of commerce	Y	Water needs to flow somewhere, people want more green space, and continues to reduce pervious areas. Increases value of surrounding areas.
Drainage system maintenance	Update	• Reduces flooding quickly • Keep everything running efficiently	• Expensive • Lose CRS points if not properly maintained • Could back up	Y	An efficient drainage system reduces flooding, protects properties, and costs less in the long run.
Capital improvements program	Update	• Quickly reduces flooding which protects • Keeping the plan in line with evolving needs	• Expensive • Maintaining funding	Y	An efficient drainage system reduces flooding, protects properties, and costs less over time.
Floodplain Management Activities					
Floodplain mapping	Update, continue to update	• Keep information accurate	• Costly! • Slow and technical • Not always accurate	Y	It is appropriate because it impacts everyone, helps to rate insurance, and provides level of risk.
Future conditions mapping	Continue to update	• Can help inform decisions • Maps make it real	• Determent for development • Catastrophic feel	Y	To better inform decisions.

Mitigation Activities for Consideration					
Activity	New or Update	Pros	Cons	Appropriate for the Community and its Flood Problems (Y/N)	Explanation of why or why not appropriate
Freeboard requirements	Update	• Better protected property and people • Protects investments • Significant savings on flood insurance	• Discourage developers • Politically feasible? opposition	Y	It protects communities and reduces exposure. Come back more quickly.
Setbacks	N/A	•	•		Not legally and administrability feasible.
No-rise ordinance	Update	• Not increasing runoff	• Cost more to implement	Y	To reduce flooding while allowing development.
Prohibit fill in floodplain	New	• Place for water to go • Reduce slab on grade buildings	• Changing development mentality	Y	To less the flooding on existing homes (or on slab).
Compensatory storage requirement for new construction	Update	• No net impact	• Increase cost • Finding space to do it	Y	So that new development does not impact existing development or built environment.
Regulate development in upland areas	N/A				
Require drainage study with new development	Update	• Modeling existing risks and impacts of new development	• Money • Time • Slows development	Y	To model current and future impacts on built environment.
Program to incentivize rain gardens	New	• Incentives • Look nice • Reduces impermeable areas • Reduce rates of subsidence	• Maintenance • Management	Y	Adds beautification, recharges water table, and reduces risk of flooding.
Permeable surface requirements for new construction	New	• Incentives • Look nice • Reduces impermeable areas • Reduce rates of subsidence	• Maintenance • Management	Y	Adds beautification, recharges water table, and reduces risk of flooding.
Limit/prevent construction in floodplain	N/A				Not feasible.
Property Protection Activities					
Acquisition	New	• Create storage capacity	• Lose tax base	Y	May not be feasible in areas with high tax bases. Needs to be balanced and vetted between benefits and loss of revenue.

Mitigation Activities for Consideration					
Activity	New or Update	Pros	Cons	Appropriate for the Community and its Flood Problems (Y/N)	Explanation of why or why not appropriate
Retrofitting	Update	• Continuity of operations • Government buildings			Need to see insurance benefits.
Flood Insurance	Update			Y	Create education programs for new flood maps and extreme weather events.
Elevation	Update	• Less flood risk	• Elderly population climb stairs	Y	
Relocation	New	• Historic structures can be saved	• Moving old flooded homes may not be feasible	Maybe	
Sewer backup protection	Update	• Less damages	• Cost exceed benefits	Y	Non-clogging pumps, backflow prevention, alternative power supply for lift stations, line the sewer lines, water tight manhole covers.
Safe rooms Insurance	Update	• Protect life • Operate pumps		Y	
Activities to Protect the Natural and Beneficial Functions of the Floodplain					
Wetlands Protection	Unknown, there are studies	• First level of protection • Environmentally feasible	• Economic feasibility	Y	It would help in the protection of more population areas. Connected to erosion and sediment control and costal barrier protection.
Erosion and sediment control	Unknown, there are studies	• First level of protection	• Economic feasibility	Y	Connected to wetlands protection and coastal barrier protection.
Natural area restoration	Unknown if there are studies	• First level of protection • Filtration • Retention	• Legal feasibility • Economic feasibility • Political feasibility	Y/N	No – for people affected within immediate area. Yes – for people affected outside immediate area.
Water quality improvement	Unknown if there are studies	• Deliver cleaner water to our lakes • Enhancing recreational activities	• Environmental feasibility	Y – community N – flood	Yes – enhancing quality of life. No – unsure of impact of flooding.
Coastal barrier protection	Unknown, there are studies	• First level protection	• Economic feasibility	Y	It would help in the protection of more populated area. Connected to wetlands protection and erosion and sediment control.
Environmental corridors	Unknown, there are studies	• Unknown	• Lack of an available urban corridor	N/A	

Mitigation Activities for Consideration					
Activity	New or Update	Pros	Cons	Appropriate for the Community and its Flood Problems (Y/N)	Explanation of why or why not appropriate
Emergency Services Activities					
Hazard warning systems	Updating (annually)	• Public stays informed	• Cost implementation • Educating public	Y	To increase public safety.
Evacuation planning and management	Updated (annually)	• Promotes situation awareness	• N/A	Y	Public safety, enhance efficiency of emergency response.
Shelter operations planning	Updated EDE, public (annually)	• Provides safe haven for public	• Cost • Manpower • Safety • Special needs	Y – flood victims	Public safety.
Emergency response training and exercises	Updated (annually)	• More prepared • ID gaps and needs	• Cost • Time/scheduling	Y	Emergency Management responses more efficient.
Sandbagging	Updated (annually)	• Keeps	• Cost • Manpower • Storage • Transportation	Y	Outside of Levee District considerable ground level housing.
Structural Projects					
Levees	Update	• Lifts of levees scheduled	• Water overtopping	Y	We rely heavily upon levee protection.
Reservoirs	N/A				We have water storage tanks as opposed to reservoirs.
Channel Modifications	Update	• Canal stabilization • Water flow improvement	• Extremely costly	Y	Canal stabilization needed for infrastructure (streets) and protection of property.
Detention/ retention basins	Update	• Holding water • Less strains on drainage system	• Extremely costly	Y	Less strain on the drainage system.
Stormwater diversions	N/A				We have no place to send the water.
Dams	N/A	•	•		
Floodwalls	Update	• Another layer of protection	• Costly	Y	Necessary for our environment.
Storm drain improvements	Update	• Improving infrastructure – pipes put in the 1980s and prior were too small	• Costly	Y	Improvements are necessary for quality of life.
Public Information Activities					
Outreach Projects	Update New	• Keep public better informed • Keep public better educated	• Tech maintenance • Tech education	Y	Safety awareness.
Environmental Education Programs	Education for all levels	• Early education = greater information retention	• Time	Y	Geared to every age group.

Mitigation Activities for Consideration					
Activity	New or Update	Pros	Cons	Appropriate for the Community and its Flood Problems (Y/N)	Explanation of why or why not appropriate
Map information Real estate disclosure Public postings/ displays (e.g. at library) School education program Speaker series Hazard expositions	Recently updated by FEMA Reading material at public buildings Outreach	• Sit aware of current flood insurance		Y	Assist with floodplain/ insurance.

5.6 Prioritized Mitigation Actions and Projects

As mentioned earlier in this section, a Mitigation Action Plan was prepared to develop specific actions to achieve the five goals discussed in Section 5.3, Mitigation Goals. The Action Plan identifies an appropriate lead person for each action, a schedule for completion and suggested funding sources. The method that the HMPAC chose to help them consider potential action items in a systematic way was the **S**ocial, **T**echnical, **A**dministrative, **P**olitical, **L**egal, **E**conomic, and **E**nvironmental (STAPLEE) Method. This method helped the HMPAC to weigh the pros and cons of different alternative actions for each of the identified objectives and strategies. **Table 90** provides an explanation of the criteria used for the STAPLEE methodology.

Table 90
STAPLEE Methodology

STAPLEE	Criteria Explanation
S – Social	Mitigation actions are acceptable to the community if they do not adversely affect a particular segment of the population, do not cause relocation of lower income people, and if they are compatible with the community's social and cultural values.
T – Technical	Mitigation actions are technically most effective if they provide long- term reduction of losses and have minimal secondary adverse impacts.
A – Administrative	Mitigation actions are easier to implement if the jurisdiction has the necessary staffing and funding.
P – Political	Mitigation actions can truly be successful if all stakeholders have been offered an opportunity to participate in the planning process and if there is public support for the action.
L – Legal	It is critical that the jurisdiction or implementing agency have the legal authority to implement and enforce a mitigation action.
E – Economic	Budget constraints can significantly deter the implementation of mitigation actions. Hence, it is important to evaluate whether an action is cost-effective, as determined by a cost benefit review, and possible to fund.

STAPLEE	Criteria Explanation
E - Environmental	Sustainable mitigation actions that do not have an adverse effect on the environment, that comply with Federal, State, and local environmental regulations, and that are consistent with the community's environmental goals, have mitigation benefits while being environmentally sound.

For the Plan Update, the HMPAC members developed and prioritized the actions using the STAPLEE criteria. The Action Plan from the 2015 version was distributed to the HMPAC, and members were requested to update and provide comments. The updates and comments received were integrated into the Action Plan for the 2020 Plan. HMPAC members were also asked to identify new actions to include in the Action Plan. The new and existing action items were then prioritized based on the STAPLEE criteria and their potential to reduce risk to the Parish, including its citizens, operations, and physical assets. The highest priority actions are those that are most effective in reducing risks to multiple assets simultaneously.

The HMPAC defined High, Medium, and Low priorities in the Action Plan as follows:

- High: Meets 7 STAPLEE criteria
- Medium: Meets 5-6 STAPLEE criteria
- Low: Meets 1-4 STAPLEE criteria

As discussed in Section 4 (Hazard Identification, Ranking, and Risk Assessment), a key criterion in Jefferson Parish's prioritization of actions is the cost-effectiveness of actions and projects. High-priority actions and projects are subjected to feasibility assessments and benefit-cost analyses to determine if they are good candidates for mitigation actions. Cost effectiveness will continue to be central to the Parish's decision-making processes in identifying and funding mitigation actions.

Table 91 (Jefferson Parish), **Table 92** (City of Gretna), **Table 93** (City of Harahan), **Table 94** (City of Kenner), **Table 95** (City of Westwego), **Table 96** (Town of Grand Isle), and **Table 97** (Town of Jean Lafitte), on the following pages, outline mitigation actions that have been identified by the HMPAC and include the existing actions from previous plan updates. The actions are prioritized using the STAPLEE ranking method referenced above and give implementation information including: responsible coordinating entity, potential funding agency, benefit-cost and technical feasibility, cost, anticipated year of completion, and 2020 implementation status update. This information further identifies how Jefferson Parish could potentially implement these actions should funding become available.

Overall, there have been no changes in local priorities since the local hazard mitigation was previously approved. This can be attributed to the same prioritization method being used to prioritize mitigation actions as well as no changes in outside influences such as political or financial conditions.

Table 91
Summary of Mitigation Actions – Jefferson Parish

Jefferson Parish										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
Preventative										
P-1	F-5, SS-7 G4	Adopt freeboard	Flood, Storm Surge	7-High	JP FPHM	n/a	Provides a margin of safety against unknown flood depths while taking into account sea level rise and subsidence. Can ultimately reduce the amount of flooding a home would experience, lower flood insurance premiums, and provide the community with CRS points which in turn also lowers flood insurance premiums.		2025	New ordinance adopted in Nov. 2017. All new structures and substantial improvement in AE must be elevated above -3.5 ft. Depending on BFE, FRB is either 2.5 ft, 1.5 ft, or 0.5 ft. Outside levee must be +2 ft. In Zone X, must be 18 inches above centerline of the street for residential structures and 6 inches for non-residential structures. It is anticipated that a stricter standard may be adopted for freeboard going forward, so this action will remain in place.
P-2	F-9, H&TS-4, SS-6 G4	Issue fewer permits for building in vulnerable areas and/or adopt stronger bldg codes "study"	Flood, Hurricane and Tropical Storms, Storm Surge	6-Medium	JP Planning, JP Code	n/a	Reduce the localized flooding problems that would occur with new development, keep neighborhoods safe from disasters, and fortify structures to better withstand flood and wind. Reduce the number of buildings susceptible to storm surge, thereby, keeping communities safe and damage cost low.		2025	The parish has made efforts to reduce the number of building permits issued in vulnerable areas and to try to ensure any construction that takes place in those areas is safe and minimizes risk. In general, permit issuance has trended downwards over the past several years (ex. 1,164 commercial permits in 2015 vs. 1,019 in 2018). However, efforts will need to continue going forward, so this action will remain in place.

Jefferson Parish										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
P-3	SS-2 G1	Maintain 100 Year levee protection to ensure continued protection	Storm Surge	7-High	SELFPA-E/W, USACE	n/a	Reduce surge damage and cost to homeowner, government, and NFIP.		2025	Ongoing. All of the gates and structures in the hurricane system are exercised by the local levee districts multiple times a year.
P-4		Update Comprehensive Plan	All Hazards	7-High	JP Planning	CDBG	Good planning is a key preventative measure and helps reduce the likelihood that new construction will be built in high risk areas without mitigative measures.		2020	New Action
P-5		Increase Open Space Areas	Flood	7-High	JP Planning	n/a	Open spaces such as parks can help provide additional pervious surface areas to allow for infiltration and reduce flooding		2025	New Action
P-6		Perform Regular Maintenance of Drainage System	Flood	6-Medium	JP Drainage	JP Drainage	Ensuring drainage systems are maintained can have major impacts as this allows water to be managed in a way that minimizes flooding.		2025	New Action
P-7		Update Capital Improvements Plan	All Hazards	7-High	JP Capital Projects	JP Capital Projects	A capital improvements plan can help direct funding to the highest priority projects and ensure that projects that reduce risk are being identified		2025	New Action

Jefferson Parish										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
P-8		Update the Repetitive Loss Area Analysis (RLAA) annually	Flood	7-High	JP FPHM	JP FPHM	RLAAs generate specific guidance on mitigation solutions for individual buildings or areas and help property owners reduce their risk of future flooding by providing an understanding of flood risk, flooding sources, and resources for mitigation.		2025	New Action
P-9		Develop a local tree inventory and maintenance schedule for trees located in rights-of way	Hurricane and Tropical Storms, Tornadoes, Winter Storms	3-Low	JP Planning	JP Planning	If trees located within municipality owned rights-of-way fail and damage personal property or cause personal injury or death, there has been a legal trend that courts have placed a reasonable responsibility on the owner of the tree to maintain it.		2025	New Action
Floodplain Management										
FP-1		Evaluate efficacy of future conditions mapping	Flood	5-Medium	JP FPHM, JP GIS	FEMA	Future conditions mapping identifies areas of future risk that may not be suitable for development and therefore can reduce future losses		2025	New Action

Jefferson Parish										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
FP-2		Update Stormwater Management Regulations (ex. compensatory storage for new construction, drainage study with new development, program for rain garden/green infrastructure incentives, permeable surface requirements, sewer backup/overflow protection program)	Flood	5-Medium	JP Environmental, JP Code, JP Engineering, JP Public Works, JP FPHM, JP Sewerage, JP Planning	FEMA, CWSRLF	Stormwater management regulations can be extremely cost-effective and help manage water in a way that reduces localized flooding which is a major issue in many areas of the parish		2025	New Action
FP-3		Develop a Watershed Master Plan (WMP)	Flood	5-Medium	JP Environmental, JP Code, JP Engineering, JP Public Works, JP FPHM, JP Sewerage, JP Planning	FEMA, CWSRLF	The objective of watershed master planning is to provide the communities within a watershed with a tool they can use to make decisions that will reduce the increased flooding from development on a watershed-wide basis. A WMP is more comprehensive than a stormwater runoff plan and while creating a WMP may be difficult, the benefits are great.		2025	New Action

Jefferson Parish										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
Property Protection										
PP-1	F-1, SS-3 G1	Elevate, Acquire, Reconstruct, Relocate or Floodproof private and public structures and infrastructure in flood-prone and surge-prone areas	Flood, Storm Surge	7-High	JP FPHM	FEMA, HUD, CPRA, DNR, DEQ	By removing structures from the floodplain and raising structures above the BFE, homeowners suffer less mental and physical stress, displacement days, and flood damage. Also, the drain on the NFIP is reduced by a decrease in flood claims.	$1.5 B	2020	Ongoing. 498 elevation/recon properties and Rep Loss structures approved since 2015. Pending approval for elevation/recon/floodproof/and onsite green infrastructure for 154 properties.
PP-2	H&TS-1, T-3 G1	Fortify critical infrastructure, including lift stations, with storm shutters, upgraded roofs, and generators	Hurricane and Tropical Storms, Tornadoes	6-Medium	JP Gen Services, Dept. Heads, JP Risk Mngt, JP FPHM	FEMA, HUD	Provide extra protection to critical infrastructure from potential wind damage, thus allowing operations to continue during hurricanes and tropical storms and improving the chance a community can thrive after a tornado.	$100 M	2025	Ongoing. West Jeff Medical Center wind retrofit completed construction Aug 2015. Additional wind retrofit projects were approved Sept 2015 for multiple sites for JP, Gretna and Harahan: the Fire Station, General Government Building, Kenner Jail, and Town of Lafitte Town Hall. Applied for wind retrofit grant for City Hall in Kenner - Buildings A, B, and C in 2016. Created risk profiles for parish facilities as part of new plan update.

Jefferson Parish										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
PP-3	T-1 G2	Construct Safe Rooms	Tornadoes	3-Low	JP FPHM JUMP	PDM, HMGP	Provides security and peace of mind, protects residents from tornadoes, and has the potential to increase the value of one's home.		2025	Few safe rooms have been constructed due to feasibility as these would often need to be built in high risk flood zones. However, the parish will continue to evaluate options to build safe rooms and further enhance structural integrity of buildings, especially residences, to reduce wind damage risk.
PP-4	T-2 G4	Harden structures for wind impact	Tornadoes	6-Medium	JP FPHM	PDM, HMGP	Better protect homes from strong winds that could speed recovery after a tornado.		2025	Some structures have been hardened as they have been refurbished in accordance with the building code, ICC and IBC, which currently require 150 mph loads. However, there is still a need for building hardening of additional structures, so this action will remain in place and addressed as needed/feasible.
Natural Resource Protection										
NRP-1	SS-4 G1, G3	Increase coastal protection	Storm Surge	7-High	JP Coastal	CPRA, RESTORE Act, USACE	Better coastal protection could help to prolong the presence of the coastline and continue to provide protection against storms as well as economic gain from tourist destinations.	$2 B	2025	Ongoing. Land Bridge in Lafitte is underway. Funding approved for Phase 2 design and permit is pending. Lower Lafitte Shoreline Stabilization complete in 2017.

Jefferson Parish										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
NRP-2	SS-5 G1, G3	Build back marsh	Storm Surge	7-High	JP Coastal	CPRA	Replenish the first lines of defense against hurricanes and surge. This will protect homes from catastrophic levels of damage.	$2 B	2025	Ongoing. Land Bridge in Lafitte is underway. Funding approved for Phase 2 design and permit is pending. Lower Lafitte Shoreline Stabilization complete in 2017.
NRP-3	SS-8 G3	Fund more erosion mitigation projects (research alternative materials)	Storm Surge	7-High	JP Coastal	CPRA, GOMESA	Erosion projects will help establish a stronger coastline that protects people and property and reduces or prevents devastating damage from storm surge	$2 B	2025	Ongoing. Fifi Island Restoration Rock Breakwater Extension has been completed. Plan for protective barrier known as the Gulfside and Bayside Shoreline Breakwaters in Grand Isle is in comment period. A study of Bucktown including Marsh creation in Lake Pontchartrain is underway.
NRP-4		Improve water quality	Flood, Storm Surge	5-Medium	JP Water, JP Environmental		Improving water quality has many beneficial consequences including better drinking water and ecosystem conservation as well as impacts to public health and well-being and recreational use		2025	New Action

Jefferson Parish										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
Structural Projects										
SP-1	F-2 G3	Increase storm water protection management including retention and detention basins	Flood	6-Medium	JP Drainage, JP Environ	FEMA, HUD, CAP OUTLAY, USACE, private entities	By improving drainage in flood prone areas, residents will suffer fewer flooded structures and therefore, less mental and physical stress, displacement days, and flood damage. Also, the drain on the NFIP is reduced by a decrease in flood claims.	$20 M	2020	Ongoing. Manson Ditch Retention Pond-Phase 1 approved April 2015. Parish has established a Stormwater Mngt Committee to review applicable codes for potential amendment. In 2017, created implementation plan for stormwater mngt on residential lots and passed legislation approving the use of permeable surfaces for off street parking. Installation of grass guard in Grand Isle. Approximately 194 properties were approved to install green infrastructure for storm water detention modifications and applied for an additional 79 sites in FMA 2018.

Jefferson Parish										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
SP-2	F-4 G1	Implement drainage improvement projects in flood-prone areas	Flood	7-High	JP Drainage	FEMA, HUD, MILLAGE, CAP OUTLAY	By improving drainage in flood prone areas, residents will suffer fewer flooded structures and therefore, less mental and physical stress, displacement days, and flood damage. Also, the drain on the NFIP is reduced by a decrease in flood claims.	$500 M	2020	Ongoing. **Completed Projects:** B&C Canal and Orleans Village (Marrero); Mazoue Ditch Ph 6 (River Ridge); Bonnabel Canal Ph 1, Canal St Canal, and Taft Pump Station (Metairie); Upper Kraak Pump Station Upgrade (Jefferson); Terry Pkwy Ph 3 (Terrytown); Mt. Kennedy (Marrero); Waggaman (Waggaman). **Drainage Improvements Under Construction:** Manson Ditch Project Phase 1; Rivertown Drainage Project (Kenner); Ave D Ph 6 and Maplewood/Pailet (Harvey); Terry Pkwy Ph 4 (Terrytown); W. Metairie at Lester Culvert (Metairie); Westgate Pump Stations; Parish Line Pump Station Pump Addition; 17th street canal widening; Sena Drive Phase 3; Bonnabel Canal Improvements; Pump to Rive for Old Metairie.

Jefferson Parish										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
SP-3	F-7 G1	Install increased permanent pumps to alleviate flooding	Flood	5-Medium	JP Drainage	F, H, M, CAP, USACE	By improving drainage in flood prone areas, residents will suffer fewer flooded structures and therefore, less mental and physical stress, displacement days, and flood damage. Also, the drain on the NFIP is reduced by a decrease in flood claims.	$100 M	2020	Ongoing. **Completed projects:** Capital Outlay pumps at the airport; Taft/Turnbull; Pump to the River project. **Approved projects:** Manson Ditch, Clearview, Maplewood, and Mounes.
SP-4	F-10 G1	Implement failover systems as well as study and implement diversion projects for the Miss River	Flood	4-Low	JP Coastal	F, H, CPRA, CAPITAL	Failover systems and diversions can help direct water in ways that prevent large volumes of water that cause flooding to build in certain areas.	$200 M	2025	Ongoing. Land Bridge in Lafitte is underway. Funding approved for Phase 2 design and permit is pending. Lower Lafitte Shoreline Stabilization complete in 2017.
SP-5		Install reservoirs/storage tanks	Flood	5-Medium	JP Drainage	F, H, M, CAP	Reservoirs and storage tanks can provide a means of controlling water flow and volumes to reduce flood risk.		2025	New Action
SP-6		Channel modifications	Flood	5-Medium	JP Drainage	F, H, M, CAP	Channel modifications can help to control the flow and volume of water and reduce flooding in certain areas		2025	New Action

Jefferson Parish										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
Emergency Services										
ES-1	H&TS-5 G1	Widen the bridges to expedite evacuation	Hurricane and Tropical Storms	5-Medium	JP Streets, Cap. Projects	DOTD, capital outlay	Allows for more efficient traffic flow during evacuation.	$500 M	2025	Ongoing. Goose Bayou Bridge widening project is approximately 50% complete. Proposed intersection improvements are under review for the intersection of Clearview Parkway and Airline Highway (US 61) to help alleviate the congestion and facilitate transportation to various areas.
ES-2		Install hazard warning systems	All Hazards	7-High	JP Emergency Management	JP EM	Hazard warning systems can save lives and can be installed for reasonable fees		2025	New Action
ES-3		Carry out shelter operations planning	All Hazards	7-High	JP Emergency Management	JP EM	Shelters provide citizens with safe refuge before, during, and after hazard events and are critical to protecting life and safety		2025	New Action
ES-4		Implement emergency response training and exercises	All Hazards	7-High	JP Emergency Management	JP EM	Training and exercises help ensure responders are prepared and can take action to reduce loss of life and injury during a disaster.		2025	New Action

Jefferson Parish										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
Public Education and Awareness										
PEA-1	F-3, H&TS-3 G2	Encourage and educate public regarding small-scale flood mitigation projects and small-scale wind mitigation projects homeowners can employ	Flood, Hurricane and Tropical Storms	5-Medium	JP FPHM, JUMP	FEMA, HUD, PRIV. FUNDS, CPRA	Homeowners will be empowered to protect themselves with low-cost, DIY projects and suffer less flood and wind damage.	$10 M	2025	Ongoing. Conducted numerous site visits from 2015 to 2018 and provided homeowner with flood proofing options and will continue doing so. Three of these visits resulted in recommendations for small scale mitigation options (2 in 2017 and 1 in 2018). Created residential stormwater handouts that were provided to 100 property owners participating in FMA in 2017.
PEA-2	F-6 G2	Encourage the purchase of flood insurance	Flood	7-High	JP FPHM, JUMP	n/a	Enables homeowners to financially recover from the devastating effects of flooding as quickly as possible. Serves to educate area residents that any homeowner, regardless of location, can purchase flood insurance.		2025	Ongoing. Created specific flood insurance promotion outreach projects as part of the PPI; one of which is the creation of a video by Parish President Yenni. Presented before council in 2017 and 2018 and created a PSA with the State Insurance Commissioner's Office. Need to work towards more brochures and bilingual literature.
PEA-3	F-8 G2, G4	Educate public on not dumping and cleaning catch basins; enforce penalties for dumping	Flood	7-High	JP FPHM, JP Environ, JP Drainage	n/a	An informed public is better able to respond to and protect themselves from flooding.		2025	Ongoing. Labeled storm drains with "No Dumping" Markers at various locations and events including the Bunche Village on the WB; Terrytown (WB); and the Beach Sweep (EB) each year from 2015 to 2018. Updated drain marker to include 2nd message.

Jefferson Parish										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
PEA-4	H&TS-2, SS-1 G2	Educate public on risks, preparedness measures, evacuation procedures, and generator safety	Hurricane and Tropical Storms, Storm Surge	6-Medium	JP EM, JP Fire, JP FPHM, JUMP	n/a	An informed public is better able to respond to and protect themselves from hurricanes and storm surge.		2025	Ongoing. Applied for EPA Education Grant Sept 2015. Implementing projects identified in the PPI including PrepareAthon Day. Added *Be Storm Ready* bus shelters and newsletter graphics in 2018.
PEA-5		Implement school-based education program combined with environmental education program	All Hazards	5-Medium	JP FPHM, JP School Board	n/a	Beginning education programs at a young age will help build an informed populace that better understands how to mitigate risks		2025	New Action
PEA-6		Develop public postings/displays and put on hazard expositions	All Hazards	5-Medium	JP FPHM, JP Coastal	n/a	Public displays can help push out key messages about what the public can do to reduce risk		2025	New Action

Table 92
Summary of Mitigation Actions – City of Gretna

City of Gretna										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
Preventative										
P-1	F-5 G4	Adopt freeboard	Flood	6-Medium	JP FPHM	n/a	Provides a margin of safety against unknown flood depths while taking into account sea level rise and subsidence. Can ultimately reduce the amount of flooding a home would experience, lower flood insurance premiums, and provide the community with CRS points which in turn also lowers flood insurance premiums.		2025	Maintained Higher Regulatory Standard Base Flood Elevations (36 inches above Centerline of the Street) as the higher regulatory standard for new construction. It is anticipated that a stricter standard may be adopted for freeboard going forward, so this action will remain in place.
P-2	F-9 G1	Technology redundancy	Flood	7-High	Gretna IT Manager	GCH Gretna	Backing up technology at multiple locations can reduce disruption in productivity and operations.		2025	Ongoing. Implemented server virtualization for faster recovery capabilities, relocated critical application servers to new hardened facility that is elevated and equipped with redundant/failover power and internet access. Maintain disaster recovery redundancy with primary financial software vendor. Servers have officially been moved.

City of Gretna										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
P-3	SS-2 G1	Maintain 100 Year levee protection to ensure continued protection	Storm Surge	7-High	SELFPA-E/W, USACE	n/a	Reduce surge damage and cost to homeowner, government, and NFIP.		2025	Ongoing. All of the gates and structures in the hurricane system are exercised by the local levee districts multiple times a year.
P-4		Update Comprehensive Plan	All Hazards	7-High	JP Planning	CDBG	Good planning is a key preventative measure and helps reduce the likelihood that new construction will be built in high risk areas without mitigative measures.		2020	New Action
P-5		Increase Open Space Areas	Flood	7-High	JP Planning	n/a	Open spaces such as parks can help provide additional pervious surface areas to allow for infiltration and reduce flooding		2025	New Action
P-6		Perform Regular Maintenance of Drainage System	Flood	6-Medium	JP Drainage	JP Drainage	Ensuring drainage systems are maintained can have major impacts as this allows water to be managed in a way that minimizes flooding.		2025	New Action
P-7		Update Capital Improvements Plan	All Hazards	7-High	JP Capital Projects	JP Capital Projects	A capital improvements plan can help direct funding to the highest priority projects and ensure that projects that reduce risk are being identified		2025	New Action

City of Gretna										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
Floodplain Management										
FP-1		Evaluate efficacy of future conditions mapping	Flood	5-Medium	JP FPHM, JP GIS	FEMA	Future conditions mapping identifies areas of future risk that may not be suitable for development and therefore can reduce future losses		2025	New Action
FP-2		Update Stormwater Management Regulations (ex. compensatory storage for new construction, drainage study with new development, program for rain garden/green infrastructure incentives, permeable surface requirements, sewer backup/overflow protection program)	Flood	5-Medium	JP Environmental, JP Code, JP Engineering, JP Public Works, JP FPHM, JP Sewerage, JP Planning	FEMA, CWSRLF	Stormwater management regulations can be extremely cost-effective and help manage water in a way that reduces localized flooding which is a major issue in many areas of the parish		2025	New Action

City of Gretna										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
Property Protection										
PP-1	F-1 G1	Elevate, Acquire, Reconstruct, Relocate or Flood proof private and public structures and infrastructure in flood-prone areas	Flood	7-High	JP FPHM	FEMA, HUD, CPRA, DNR, DEQ	By removing structures from the floodplain, homeowners suffer less mental and physical stress, displacement days, and flood damage. Also, the drain on the NFIP is reduced by a decrease in flood claims.	$1 B	2020	Ongoing. 498 elevation/recon properties and Rep Loss structures approved since 2015. Pending approval for elevation/recon/floodproof/and onsite green infrastructure for 154 properties.
PP-2	H&TS-1 G1	Fortify critical infrastructure with storm shutters, upgraded roofs, and generators	Hurricane and Tropical Storms	6-Medium	JP Gen Services, JP Risk Mngt, JP FPHM	FEMA, HUD	Provide extra protection to critical infrastructure from potential wind damage, thus allowing operations to continue during hurricanes and tropical storms.	$50 M	2025	Ongoing. The General Government Building wind retrofit project in Gretna was approved Sept 2015. New Police Department building has been completed designed to withstand wind and flood hazards and with backup generators. Mel Ott Multipurpose Center (a designated emergency operation location) has been retrofitted with backup power generation. FEMA, SHPO, and City of Gretna working through checklist for funds to harden City Hall for window retrofit grants. Police Department Project Phase 1 completed. Phase 2 includes upgrades to the old police department by raising floor to ABFE, lifting all electric and plumbing and applying flood resistant materials to building at grade and is near completion.

City of Gretna										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
PP-3	T-1 G2	Construct Safe Rooms	Tornadoes	4-Low	JP FPHM JUMP	n/a	Provides security and peace of mind, protects residents from tornadoes, and has the potential to increase the value of one's home.		2025	Several buildings in Gretna have been built to act as safe rooms including the EOC, JP Government Building, and Gretna Police Department. The city will continue to evaluate the need for further safe rooms.
PP-4	T-2 G4	Harden structures for wind impact	Tornadoes	6-Medium	JP Planning	n/a	Better protect homes from strong winds that could speed recovery after a tornado.		2025	Many structures have been constructed in compliance with the current building codes and the city will continue to make sure that this takes place going forward.
Natural Resource Protection										
NRP-1	SS-3 G1, G3	Coastal erosion projects	Storm Surge	6-Medium			Increased coastal protection could help to prolong the presence of the coastline and continue to provide protection against storms as well as economic gain from tourist destinations.		Deleted	Gretna is not coastal area, so this action will be deleted.
NRP-2	SS-4 G1, G3	Revitalize wetlands to protect City from surge	Storm Surge	6-Medium			Replenish the first lines of defense against hurricanes and surge. This will protect homes from catastrophic levels of damage.		Deleted	Gretna is not coastal area, so this action will be deleted.

City of Gretna										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
NRP-3		Improve water quality	Flood, Storm Surge	5-Medium	JP Water, JP Environmental		Improving water quality has many beneficial consequences including better drinking water and ecosystem conservation as well as impacts to public health and well-being and recreational use		2025	New Action
Structural Projects										
SP-1	F-2 G3	Increase storm water protection management including retention and detention basins	Flood	7-High	JP Drainage	FEMA, HUD, CAP OUTLAY, USACE	By improving drainage in flood prone areas, residents will suffer fewer flooded structures and therefore, less mental and physical stress, displacement days, and flood damage. Also, the drain on the NFIP is reduced by a decrease in flood claims.	$20 M	2020	Ongoing. Completed Racetrack detention pond project in 2016. Hancock Canal Project enclosing canal and increasing drainage capacity completed in 2017. 4th Street Extension project, including new drainage infrastructure, is underway. Improvement at the Virgil/Hancock intersection, drainage to Virgil Retention Pond, improvement on Hancock and Franklin Streets. Downtown Drainage Project – 1. Gretna City Park project – implementation of GI, habitat preservation; 2. 5th Street Improvement project to include GI and drainage. Incorporating stormwater/GI BMPs in all major public infrastructure projects; updating codes to incentivize and mandate stormwater/GI BMPs for private development. 2019 Q2 construction start on first major GI

City of Gretna										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
										demonstration that includes public plaza upgrades alongside GI in downtown. 25th Street Resilience District (Gretna City Park and 25th Street Canal) - structural and nonstructural interventions to address concentrations of RL/SRL props (57 acre feet of storage). Developing partnership with USACE for more detailed flood vulnerability analysis.
SP-2	F-4 G1	Implement drainage improvement projects in flood-prone areas	Flood	6-Medium	JP Drainage	FEMA, HUD, MILLAGE, CAP OUTLAY	By improving drainage in flood prone areas, residents will suffer fewer flooded structures and therefore, less mental and physical stress, displacement days, and flood damage. Also, the drain on the NFIP is reduced by a decrease in flood claims.	$500 M	2020	Ongoing. Projects detailed in SP-1 above also impact flood prone areas and are equally applicable here.
SP-3	F-7 G1	Install increased permanent pumps to alleviate flooding	Flood	6-Medium	JP Drainage	F, H, M, CAP	By improving drainage in flood prone areas, residents will suffer fewer flooded structures and therefore, less mental and physical stress, displacement days, and flood damage. Also, the drain on the NFIP is reduced by a decrease in flood claims.	$100 M	2020	Ongoing. In design, submitted for FMA 2017 but wasn't funded. Submitted again in FMA 2018. Pending approval.

City of Gretna										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
SP-4		Install reservoirs/storage tanks	Flood	5-Medium	JP Drainage	F, H, M, CAP	Reservoirs and storage tanks can provide a means of controlling water flow and volumes to reduce flood risk.		2025	New Action
SP-5		Channel modifications	Flood	5-Medium	JP Drainage	F, H, M, CAP	Channel modifications can help to control the flow and volume of water and reduce flooding in certain areas		2025	New Action
Emergency Services										
ES-1		Install hazard warning systems	All Hazards	7-High	JP Emergency Management	JP EM	Hazard warning systems can save lives and can be installed for reasonable fees		2025	New Action
ES-2		Carry out shelter operations planning	All Hazards	7-High	JP Emergency Management	JP EM	Shelters provide citizens with safe refuge before, during, and after hazard events and are critical to protecting life and safety		2025	New Action
ES-3		Implement emergency response training and exercises	All Hazards	7-High	JP Emergency Management	JP EM	Training and exercises help ensure responders are prepared and can take action to reduce loss of life and injury during a disaster.		2025	New Action

City of Gretna										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
Public Education and Awareness										
PEA-1	F-3, H&TS-3 G2	Encourage and educate public regarding small-scale flood mitigation projects and small-scale wind mitigation projects homeowners can employ	Flood, Hurricane and Tropical Storms	6-Medium	JP FPHM, JUMP	FEMA, HUD, PRIV. FUNDS, CPRA	Homeowners will be empowered to protect themselves with low-cost, DIY projects and suffer less flood and wind damage.	$10 M	2025	Ongoing. City adopted generator safety ordinance in building codes in 2016. City enforces wind load regulations on all new construction. Ongoing outreach as part of PPI.
PEA-2	F-6 G2	Encourage the purchase of flood insurance	Flood	7-High	JP FPHM, JUMP	n/a	Enables homeowners to financially recover from the devastating effects of flooding as quickly as possible. Serves to educate area residents that any homeowner, regardless of location, can purchase flood insurance.		2025	Ongoing. Created specific flood insurance promotion outreach projects as part of the PPI. Implementing the PPI. Video produced featuring Mayor Constant to promote purchase of flood insurance published on web, social media, and shown at public meetings.
PEA-3	F-8 G2	Educate public on not dumping and cleaning catch basins; enforce penalties for dumping	Flood	6-Medium	JP FPHM, JP Environ, JP Drainage	n/a	An informed public is better able to respond to and protect themselves from flooding.		2025	Ongoing. Hosted several MS4 workshops targeted at contractors, builders, and building inspectors in 2016. Labeled storm drains with "No Dumping" Markers at various locations and events including the Spring Sweep in 2017 and 2018; updated drain marker to include 2nd message.

City of Gretna										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
PEA-4	H&TS-2, SS-1 G2	Educate public on risks, preparedness measures, evacuation procedures, and generator safety	Hurricane and Tropical Storms, Storm Surge	6-Medium	JP EM, JP Fire, JP FPHM, JUMP	n/a	An informed public is better able to respond to and protect themselves from hurricanes and storm surge.		2025	Ongoing. Applied for EPA Education Grant Sept 2015. Implementing projects identified in the PPI. City also pre-registers at-risk populations for evacuation assistance.
PEA-5		Implement school-based education program combined with environmental education program	All Hazards	5-Medium	JP FPHM, JP School Board	n/a	Beginning education programs at a young age will help build an informed populace that better understands how to mitigate risks		2025	New Action
PEA-6		Develop public postings/displays and put on hazard expositions	All Hazards	5-Medium	JP FPHM, JP Coastal	n/a	Public displays can help push out key messages about what the public can do to reduce risk		2025	New Action

Table 93
Summary of Mitigation Actions – City of Harahan

City of Harahan										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
Preventative										
P-1	F-5 G4	Adopt freeboard	Flood	7-High	JP FPHM	n/a	Provides a margin of safety against unknown flood depths while taking into account sea level rise and subsidence. Can ultimately reduce the amount of flooding a home would experience, lower flood insurance premiums, and provide the community with CRS points which in turn also lowers flood insurance premiums.		2025	Ongoing. Most of the city is located in a zone X and the building code has feet above the CLS.
P-2	H&TS-4 G4	Issue fewer permits for building in vulnerable areas	Hurricane and Tropical Storms	6-Medium	JP Planning	n/a	Reduce the localized flooding and roofing problems that would occur with new development		2025	The city has been working to reduce the number of permits issued in vulnerable areas and will continue to do so with the new administration.
P-3	SS-2 G1	Maintain 100 Year levee protection to ensure continued protection	Storm Surge	6-Medium	SELFPA-E/W, USACE	n/a	Reduce surge damage and cost to homeowner, government, and NFIP.		2025	Ongoing. All of the gates and structures in the hurricane system are exercised by the local levee districts multiple times a year. The pump to the river has been completed and the levee lift at the river.

City of Harahan										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
P-4		Update Comprehensive Plan	All Hazards	7-High	JP Planning	CDBG	Good planning is a key preventative measure and helps reduce the likelihood that new construction will be built in high risk areas without mitigative measures.		2020	New Action
P-5		Increase Open Space Areas	Flood	7-High	JP Planning	n/a	Open spaces such as parks can help provide additional pervious surface areas to allow for infiltration and reduce flooding		2025	New Action
P-6		Perform Regular Maintenance of Drainage System	Flood	6-Medium	JP Drainage	JP Drainage	Ensuring drainage systems are maintained can have major impacts as this allows water to be managed in a way that minimizes flooding.		2025	New Action
P-7		Update Capital Improvements Plan	All Hazards	7-High	JP Capital Projects	JP Capital Projects	A capital improvements plan can help direct funding to the highest priority projects and ensure that projects that reduce risk are being identified		2025	New Action

City of Harahan										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
Floodplain Management										
FP-1		Evaluate efficacy of future conditions mapping	Flood	5-Medium	JP FPHM, JP GIS	FEMA	Future conditions mapping identifies areas of future risk that may not be suitable for development and therefore can reduce future losses		2025	New Action
FP-2		Update Stormwater Management Regulations (ex. compensatory storage for new construction, drainage study with new development, program for rain garden/green infrastructure incentives, permeable surface requirements, sewer backup/overflow protection program)	Flood	5-Medium	JP Environmental, JP Code, JP Engineering, JP Public Works, JP FPHM, JP Sewerage, JP Planning	FEMA, CWSRLF	Stormwater management regulations can be extremely cost-effective and help manage water in a way that reduces localized flooding which is a major issue in many areas of the parish		2025	New Action

City of Harahan										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
Property Protection										
PP-1	F-1 G1	Elevate, Acquire, Reconstruct, Relocate or Flood proof private and public structures and infrastructure in flood-prone areas	Flood	7-High	JP FPHM	FEMA, HUD, CPRA, DNR, DEQ	By removing structures from the floodplain, homeowners suffer less mental and physical stress, displacement days, and flood damage. Also, the drain on the NFIP is reduced by a decrease in flood claims.	$1 B	2020	Ongoing. 498 elevation/recon properties and Rep Loss structures approved since 2015. Pending approval for elevation/recon/floodproof/and onsite green infrastructure for 154 properties.
PP-2	H&TS-1 G1	Fortify critical infrastructure with storm shutters, upgraded roofs, and generators	Hurricane and Tropical Storms	6-Medium	JP Gen Services, JP Risk Mngt, JP FPHM	FEMA, HUD	Provide extra protection to critical infrastructure from potential wind damage, thus allowing operations to continue during hurricanes and tropical storms.	$50 M	2025	Ongoing. Awaiting approval of wind retrofit projects for sites in Harahan. Developed risk profiles for city facilities as part of new plan update.
PP-3	T-1 G2	Encourage the construction of safe rooms	Tornadoes	5-Medium	JP FPHM JUMP	n/a	Provides security and peace of mind, protects residents from tornadoes, and has the potential to increase the value of one's home.		2025	This process is still in progress as the city attempts to tie into hurricane protection initiatives and needs to do more outreach to encourage safe rooms.
PP-4	T-2 G4	Harden structures for wind impact	Tornadoes	6-Medium	JP Planning	n/a	Better protect homes from strong winds that could speed recovery after a tornado.		2025	The city has been encouraging high wind protection in new construction and will continue to evaluate ways to ensure buildings are built to a high level of wind resistance.

City of Harahan										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
Natural Resource Protection										
NRP-1		Improve water quality	Flood, Storm Surge	5-Medium	JP Water, JP Environmental		Improving water quality has many beneficial consequences including better drinking water and ecosystem conservation as well as impacts to public health and well-being and recreational use		2025	New Action
Structural Projects										
SP-1	F-2 G3	Increase storm water protection management including retention and detention basins	Flood	7-High	JP Drainage	FEMA, HUD, CAP OUTLAY, USACE	By improving drainage in flood prone areas, residents will suffer fewer flooded structures and therefore, less mental and physical stress, displacement days, and flood damage. Also, the drain on the NFIP is reduced by a decrease in flood claims.	$20 M	2020	The city has implemented some of these measures through regulatory means and encouraging detention for commercial development. Additional measures will be evaluated and implemented accordingly going forward.
SP-2	F-4 G1	Implement drainage improvement projects in flood-prone areas	Flood	6-Medium	JP Drainage	FEMA, HUD, MILLAGE, CAP OUTLAY	By improving drainage in flood prone areas, residents will suffer fewer flooded structures and therefore, less mental and physical stress, displacement days, and flood damage. Also, the drain on the NFIP is reduced by a decrease in flood claims.	$500 M	2025	Ongoing. Pump to the River is now online. A LOMR application is under review to potentially amend several map panels reflecting the project, additional needed. There is also a need for drainage under Jefferson Highway.

City of Harahan										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
SP-3		Install reservoirs/storage tanks	Flood	5-Medium	JP Drainage	F, H, M, CAP	Reservoirs and storage tanks can provide a means of controlling water flow and volumes to reduce flood risk.		2025	New Action
SP-4		Channel modifications	Flood	5-Medium	JP Drainage	F, H, M, CAP	Channel modifications can help to control the flow and volume of water and reduce flooding in certain areas		2025	New Action
Emergency Services										
ES-1		Install hazard warning systems	All Hazards	7-High	JP Emergency Management	JP EM	Hazard warning systems can save lives and can be installed for reasonable fees		2025	New Action
ES-2		Carry out shelter operations planning	All Hazards	7-High	JP Emergency Management	JP EM	Shelters provide citizens with safe refuge before, during, and after hazard events and are critical to protecting life and safety		2025	New Action
ES-3		Implement emergency response training and exercises	All Hazards	7-High	JP Emergency Management	JP EM	Training and exercises help ensure responders are prepared and can take action to reduce loss of life and injury during a disaster.		2025	New Action

City of Harahan										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
Public Education and Awareness										
PEA-1	F-3, H&TS-3 G2	Encourage and educate public regarding small-scale flood mitigation projects and small-scale wind mitigation projects homeowners can employ	Flood, Hurricane and Tropical Storms	5-Medium	JP FPHM, JUMP	FEMA, HUD, PRIV. FUNDS, CPRA	Homeowners will be empowered to protect themselves with low-cost, DIY projects and suffer less flood and wind damage.	$10 M	2025	Ongoing. Outreach takes place through PPI outreach. The city has developed a tie-in for outreach with its MS4 initiative and is developing additional materials to align with this.
PEA-2	F-6 G2	Encourage the purchase of flood insurance	Flood	7-High	JP FPHM, JUMP	n/a	Enables homeowners to financially recover from the devastating effects of flooding as quickly as possible. Serves to educate area residents that any homeowner, regardless of location, can purchase flood insurance.		2025	Ongoing. Created specific flood insurance promotion outreach projects as part of the PPI; one of which is the creation of a video by Mayor Miceli.
PEA-3	F-7 G2	Educate public on not dumping and cleaning catch basins	Flood	6-Medium	JP FPHM, JP Environ, JP Drainage	n/a	An informed public is better able to respond to and protect themselves from flooding.		2025	Ongoing. Created new drain markers to include 2nd message.
PEA-4	H&TS-2, SS-1 G2	Educate public on risks, preparedness measures, evacuation procedures, and generator safety	Hurricane and Tropical Storms, Storm Surge	6-Medium	JP EM, JP Fire, JP FPHM, JUMP	n/a	An informed public is better able to respond to and protect themselves from hurricanes and storm surge.		2025	Ongoing. Applied for EPA Education Grant Sept 2015. Implementing projects identified in the PPI.

City of Harahan										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
PEA-5		Implement school-based education program combined with environmental education program	All Hazards	5-Medium	JP FPHM, JP School Board	n/a	Beginning education programs at a young age will help build an informed populace that better understands how to mitigate risks		2025	New Action
PEA-6		Develop public postings/displays and put on hazard expositions	All Hazards	5-Medium	JP FPHM, JP Coastal	n/a	Public displays can help push out key messages about what the public can do to reduce risk		2025	New Action

Table 94
Summary of Mitigation Actions – City of Kenner

City of Kenner										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
Preventative										
P-1	F-5 G4	Adopt freeboard	Flood	7-High	JP FPHM	n/a	Provides a margin of safety against unknown flood depths while taking into account sea level rise and subsidence. Can ultimately reduce the amount of flooding a home would experience, lower flood insurance premiums, and provide the community with CRS points which in turn also lowers flood insurance premiums.		2025	Complete. New ordinance adopted in Dec. 2017. All new structures and substantial improvement in AE must be elevated above -3.5. Depending on BFE, FRB is either 2.5 ft, 1.5 ft, or 0.5 ft. It is anticipated that a stricter standard may be adopted for freeboard going forward, so this action will remain in place.
P-2	H&TS-4 G4	Adopt and Enforce Strict and uniform bldg codes	Hurricane and Tropical Storms	6-Medium	JP Code, Kenner Code	n/a	Fortify structures to better withstand flood and wind.		2025	Ongoing. The city has adopted uniform building codes but will keep this action in place as updates may be required in the future.
P-3	SS-2 G1	Maintain 100 Year levee protection to ensure continued protection	Storm Surge	6-Medium	SELFPA-E/W, USACE	n/a	Reduce surge damage and cost to homeowner, government, and NFIP.		2025	Ongoing. All of the gates and structures in the hurricane system are exercised by the local levee districts multiple times a year.

City of Kenner										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
P-4		Update Comprehensive Plan	All Hazards	7-High	JP Planning	CDBG	Good planning is a key preventative measure and helps reduce the likelihood that new construction will be built in high risk areas without mitigative measures.		2020	New Action
P-5		Increase Open Space Areas	Flood	7-High	JP Planning	n/a	Open spaces such as parks can help provide additional pervious surface areas to allow for infiltration and reduce flooding		2025	New Action
P-6		Perform Regular Maintenance of Drainage System	Flood	6-Medium	JP Drainage	JP Drainage	Ensuring drainage systems are maintained can have major impacts as this allows water to be managed in a way that minimizes flooding.		2025	New Action
P-7		Update Capital Improvements Plan	All Hazards	7-High	JP Capital Projects	JP Capital Projects	A capital improvements plan can help direct funding to the highest priority projects and ensure that projects that reduce risk are being identified		2025	New Action

City of Kenner										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
Floodplain Management										
FP-1		Evaluate efficacy of future conditions mapping	Flood	5-Medium	JP FPHM, JP GIS	FEMA	Future conditions mapping identifies areas of future risk that may not be suitable for development and therefore can reduce future losses		2025	New Action
FP-2		Update Stormwater Management Regulations (ex. compensatory storage for new construction, drainage study with new development, program for rain garden/green infrastructure incentives, permeable surface requirements, sewer backup/overflow protection program)	Flood	5-Medium	JP Environmental, JP Code, JP Engineering, JP Public Works, JP FPHM, JP Sewerage, JP Planning	FEMA, CWSRLF	Stormwater management regulations can be extremely cost-effective and help manage water in a way that reduces localized flooding which is a major issue in many areas of the parish		2025	New Action

City of Kenner										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
Property Protection										
PP-1	F-1 G1	Elevate, Acquire, Reconstruct, Relocate or Flood proof private and public structures and infrastructure in flood-prone areas	Flood	7-High	JP FPHM	FEMA, HUD, CPRA, DNR, DEQ	By removing structures from the floodplain, homeowners suffer less mental and physical stress, displacement days, and flood damage. Also, the drain on the NFIP is reduced by a decrease in flood claims.	$1 B	2020	Ongoing. 498 elevation/recon properties and Rep Loss structures approved since 2015. Pending approval for elevation/recon/floodproof/and onsite green infrastructure for 154 properties.
PP-2	H&TS-1 G1	Fortify critical infrastructure with storm shutters, upgraded roofs, and generators	Hurricane and Tropical Storms	6-Medium	JP Gen Services, JP Risk Mngt, JP FPHM	FEMA, HUD	Provide extra protection to critical infrastructure from potential wind damage, thus allowing operations to continue during hurricanes and tropical storms.	$50 M	2025	Ongoing. Kenner Jail wind retrofit project was approved Sept 2015. Storm shutters added to police complex and public works complex in 2016. Looking to add storm shutters to the city hall building as well. Created risk profiles for city facilities as part of new plan update.
PP-3	T-1 G2	Construct Safe Rooms	Tornadoes	5-Medium	JP FPHM JUMP	n/a	Provides security and peace of mind, protects residents from tornadoes, and has the potential to increase the value of one's home.		2025	Few safe rooms have been constructed due to feasibility as these would often need to be built in high risk flood zones. However, the parish will continue to evaluate options to build safe rooms and further enhance structural integrity of buildings, especially residences, to reduce wind damage risk.

City of Kenner										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
PP-4	T-2 G4	Harden structures for wind impact	Tornadoes	6-Medium	JP Planning	n/a	Better protect homes from strong winds that could speed recovery after a tornado.		2025	Some structures have been hardened as they have been refurbished in accordance with the building code, ICC and IBC, which currently require 150 mph loads. However, there is still a need for building hardening of additional structures, so this action will remain in place and addressed as needed/feasible.
Natural Resource Protection										
NRP-1		Improve water quality	Flood, Storm Surge	5-Medium	JP Water, JP Environmental		Improving water quality has many beneficial consequences including better drinking water and ecosystem conservation as well as impacts to public health and well-being and recreational use		2025	New Action

City of Kenner										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
Structural Projects										
SP-1	F-2 G3	Increase storm water protection management including retention and detention basins	Flood	7-High	JP Drainage	FEMA, HUD, CAP OUTLAY, USACE	By improving drainage in flood prone areas, residents will suffer fewer flooded structures and therefore, less mental and physical stress, displacement days, and flood damage. Also, the drain on the NFIP is reduced by a decrease in flood claims.	$20 M	2020	Ongoing. Manson Ditch Retention Pond-Phase 1 approved April 2015. Parish has established a Stormwater Mngt Committee to review applicable codes for potential amendment. In 2017, created implementation plan for stormwater mngt on residential lots and passed legislation approving the use of permeable surfaces for off street parking. Installation of grass guard in Grand Isle. Approximately 194 properties were approved to install green infrastructure for storm water detention modifications and applied for an additional 79 sites in FMA 2018.
SP-2	F-4 G1	Implement drainage improvement projects in flood-prone areas	Flood	6-Medium	JP Drainage	FEMA, HUD, MILLAGE, CAP OUTLAY	By improving drainage in flood prone areas, residents will suffer fewer flooded structures and therefore, less mental and physical stress, displacement days, and flood damage. Also, the drain on the NFIP is reduced by a decrease in flood claims.	$500 M	2020	Ongoing. Rivertown Drainage Project completed in 2018.

City of Kenner										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
SP-3	F-7 G1	Install increased permanent pumps to alleviate flooding	Flood	4-Low	JP Drainage	F, H, M, CAP	By improving drainage in flood prone areas, residents will suffer fewer flooded structures and therefore, less mental and physical stress, displacement days, and flood damage. Also, the drain on the NFIP is reduced by a decrease in flood claims.	$100 M	2020	Ongoing. Massive pumping station at new airport expansion facility completed in 2018.
SP-5		Install reservoirs/storage tanks	Flood	5-Medium	JP Drainage	F, H, M, CAP	Reservoirs and storage tanks can provide a means of controlling water flow and volumes to reduce flood risk.		2025	New Action
SP-6		Channel modifications	Flood	5-Medium	JP Drainage	F, H, M, CAP	Channel modifications can help to control the flow and volume of water and reduce flooding in certain areas		2025	New Action
Emergency Services										
ES-1		Install hazard warning systems	All Hazards	7-High	JP Emergency Management	JP EM	Hazard warning systems can save lives and can be installed for reasonable fees		2025	New Action
ES-2		Carry out shelter operations planning	All Hazards	7-High	JP Emergency Management	JP EM	Shelters provide citizens with safe refuge before, during, and after hazard events and are critical to protecting life and safety		2025	New Action

City of Kenner										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
ES-3		Implement emergency response training and exercises	All Hazards	7-High	JP Emergency Management	JP EM	Training and exercises help ensure responders are prepared and can take action to reduce loss of life and injury during a disaster.		2025	New Action
Public Education and Awareness										
PEA-1	F-3, H&TS-3 G2	Encourage and educate public regarding small-scale flood mitigation projects and small-scale wind mitigation projects homeowners can employ	Flood, Hurricane and Tropical Storms	5-Medium	JP FPHM, JUMP	FEMA, HUD, PRIV. FUNDS, CPRA	Homeowners will be empowered to protect themselves with low-cost, DIY projects and suffer less flood and wind damage.	$10 M	2025	Ongoing. Conducted numerous site visits from 2015 to 2018 and provided homeowner with flood proofing options and will continue doing so. Three of these visits resulted in recommendations for small scale mitigation options (2 in 2017 and 1 in 2018). Created residential stormwater handouts that were provided to 100 property owners participating in FMA in 2017.
PEA-2	F-6 G2	Encourage the purchase of flood insurance	Flood	7-High	JP FPHM, JUMP	n/a	Enables homeowners to financially recover from the devastating effects of flooding as quickly as possible. Serves to educate area residents that any homeowner, regardless of location, can purchase flood insurance.		2025	Ongoing. Created specific flood insurance promotion outreach projects as part of the PPI; one of which is the creation of a video by the newly elected Mayor - Ben Zahn. Kenner updated CRS webpage

City of Kenner										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
PEA-3	F-8 G2	Educate public on not dumping and cleaning catch basins	Flood	6-Medium	JP FPHM, JP Environ, JP Drainage	n/a	An informed public is better able to respond to and protect themselves from flooding.		2025	Ongoing. Labeled storm drains with "No Dumping" Markers at the Beach Sweep (EB) in 2015 and 2016. Created new drain markers to include 2nd message. Continual messaging during storm events to clean drains through social media and website.
PEA-4	H&TS-2, SS-1 G2	Educate public on risks, preparedness measures, evacuation procedures, and generator safety	Hurricane and Tropical Storms, Storm Surge	6-Medium	JP EM, JP Fire, JP FPHM, JUMP	n/a	An informed public is better able to respond to and protect themselves from hurricanes and storm surge.		2025	Ongoing. Applied for EPA Education Grant Sept 2015. Implementing projects identified in the PPI.
PEA-5	SS-3 G2	Awareness of climate change and environmental impacts	Storm Surge	6-Medium	JP FPHM	n/a	An informed public is better able to respond to and protect themselves from climate change and disasters resulting from climate change.		2025	Ongoing. Requested funding through the NDRC Competition to create an educational component around environmental impacts. Beach Sweep twice a year – participated in Beach Sweep along Lake Pontchartrain. Participated in several outreach events including the NOLA Home and Garden Show to help raise public awareness.
PEA-6		Implement school-based education program combined with environmental education program	All Hazards	5-Medium	JP FPHM, JP School Board	n/a	Beginning education programs at a young age will help build an informed populace that better understands how to mitigate risks		2025	New Action

City of Kenner										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
PEA-7		Develop public postings/displays and put on hazard expositions	All Hazards	5-Medium	JP FPHM, JP Coastal	n/a	Public displays can help push out key messages about what the public can do to reduce risk		2025	New Action

Table 95
Summary of Mitigation Actions – City of Westwego

City of Westwego										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
Preventative										
P-1	F-5 G4	Adopt freeboard	Flood	7-High	JP FPHM	n/a	Provides a margin of safety against unknown flood depths while taking into account sea level rise and subsidence. Can ultimately reduce the amount of flooding a home would experience, lower flood insurance premiums, and provide the community with CRS points which in turn also lowers flood insurance premiums.		2025	Ongoing. Not yet adopted. Still under consideration.
P-2	H&TS-4, SS-3 G4	Issue fewer permits for building in vulnerable areas	Hurricane and Tropical Storms, Storm Surge	6-Medium	JP Planning	n/a	Reduce the localized flooding and roofing problems that would occur with new development. Reduce the number of buildings susceptible to storm surge, thereby, keeping communities safe and damage cost low.		2025	The city has made efforts to reduce the number of building permits issued in vulnerable areas and to try to ensure any construction that takes place in those areas is safe and minimizes risk. However, these efforts will need to continue going forward, so this action will remain in place.
P-3	SS-2 G1	Maintain 100 Year levee protection to ensure continued protection	Storm Surge	6-Medium	SELFPA-E/W, USACE	n/a	Reduce surge damage and cost to homeowner, government, and NFIP.		2025	Ongoing. All of the gates and structures in the hurricane system are exercised by the local levee districts multiple times a year.

City of Westwego										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
P-4		Update Comprehensive Plan	All Hazards	7-High	JP Planning	CDBG	Good planning is a key preventative measure and helps reduce the likelihood that new construction will be built in high risk areas without mitigative measures.		2020	New Action
P-5		Increase Open Space Areas	Flood	7-High	JP Planning	n/a	Open spaces such as parks can help provide additional pervious surface areas to allow for infiltration and reduce flooding		2025	New Action
P-6		Perform Regular Maintenance of Drainage System	Flood	6-Medium	JP Drainage	JP Drainage	Ensuring drainage systems are maintained can have major impacts as this allows water to be managed in a way that minimizes flooding.		2025	New Action
P-7		Update Capital Improvements Plan	All Hazards	7-High	JP Capital Projects	JP Capital Projects	A capital improvements plan can help direct funding to the highest priority projects and ensure that projects that reduce risk are being identified		2025	New Action

City of Westwego										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
Floodplain Management										
FP-1		Evaluate efficacy of future conditions mapping	Flood	5-Medium	JP FPHM, JP GIS	FEMA	Future conditions mapping identifies areas of future risk that may not be suitable for development and therefore can reduce future losses		2025	New Action
FP-2		Update Stormwater Management Regulations (ex. compensatory storage for new construction, drainage study with new development, program for rain garden/green infrastructure incentives, permeable surface requirements, sewer backup/overflow protection program)	Flood	5-Medium	JP Environmental, JP Code, JP Engineering, JP Public Works, JP FPHM, JP Sewerage, JP Planning	FEMA, CWSRLF	Stormwater management regulations can be extremely cost-effective and help manage water in a way that reduces localized flooding which is a major issue in many areas of the parish		2025	New Action

City of Westwego										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
Property Protection										
PP-1	F-1 G1	Elevate, Acquire, Reconstruct, Relocate or Flood proof private and public structures and infrastructure in flood-prone areas	Flood	7-High	JP FPHM	FEMA, HUD, CPRA, DNR, DEQ	By removing structures from the floodplain, homeowners suffer less mental and physical stress, displacement days, and flood damage. Also, the drain on the NFIP is reduced by a decrease in flood claims.	$1 B	2020	Ongoing. 498 elevation/recon properties and Rep Loss structures approved since 2015. Pending approval for elevation/recon/floodproof/and onsite green infrastructure for 154 properties.
PP-2	H&TS-1 G1	Fortify critical infrastructure with storm shutters, upgraded roofs, and generators	Hurricane and Tropical Storms	6-Medium	JP Gen Services, JP Risk Mngt, JP FPHM	FEMA, HUD	Provide extra protection to critical infrastructure from potential wind damage, thus allowing operations to continue during hurricanes and tropical storms.	$50 M	2025	Ongoing. Created risk profiles for city facilities as part of new plan update.
PP-3	T-1 G2	Construct Safe Rooms	Tornadoes	5-Medium	JP FPHM JUMP	n/a	Provides security and peace of mind, protects residents from tornadoes, and has the potential to increase the value of one's home.		2025	Few safe rooms have been constructed due to feasibility as these would often need to be built in high risk flood zones. However, the parish will continue to evaluate options to build safe rooms and further enhance structural integrity of buildings, especially residences, to reduce wind damage risk.

City of Westwego										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
PP-4	T-2 G4	Harden structures for wind impact	Tornadoes	6-Medium	JP Planning	n/a	Better protect homes from strong winds that could speed recovery after a tornado.		2025	Some structures have been hardened as they have been refurbished in accordance with the building code, ICC and IBC, which currently require 150 mph loads. However, there is still a need for building hardening of additional structures, so this action will remain in place and addressed as needed/feasible.
Natural Resource Protection										
NRP-1		Improve water quality	Flood, Storm Surge	5-Medium	JP Water, JP Environmental		Improving water quality has many beneficial consequences including better drinking water and ecosystem conservation as well as impacts to public health and well-being and recreational use		2025	New Action

City of Westwego										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
Structural Projects										
SP-1	F-2 G3	Increase storm water protection management including retention and detention basins	Flood	7-High	JP Drainage	FEMA, HUD, CAP OUTLAY, USACE	By improving drainage in flood prone areas, residents will suffer fewer flooded structures and therefore, less mental and physical stress, displacement days, and flood damage. Also, the drain on the NFIP is reduced by a decrease in flood claims.	$20 M	2020	Ongoing. Manson Ditch Retention Pond-Phase 1 approved April 2015. Parish has established a Stormwater Mngt Committee to review applicable codes for potential amendment. In 2017, created implementation plan for stormwater mngt on residential lots and passed legislation approving the use of permeable surfaces for off street parking. Installation of grass guard in Grand Isle. Approximately 194 properties were approved to install green infrastructure for storm water detention modifications and applied for an additional 79 sites in FMA 2018.

City of Westwego										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
SP-2	F-4 G1	Implement drainage improvement projects in flood-prone areas	Flood	6-Medium	JP Drainage	FEMA, HUD, MILLAGE, CAP OUTLAY	By improving drainage in flood prone areas, residents will suffer fewer flooded structures and therefore, less mental and physical stress, displacement days, and flood damage. Also, the drain on the NFIP is reduced by a decrease in flood claims.	$500 M	2020	Ongoing. **Completed Projects:** B&C Canal and Orleans Village (Marrero); Mazoue Ditch Ph 6 (River Ridge); Bonnabel Canal Ph 1, Canal St Canal, and Taft Pump Station (Metairie); Upper Kraak Pump Station Upgrade (Jefferson); Terry Pkwy Ph 3 (Terrytown); Mt. Kennedy (Marrero); Waggaman (Waggaman). **Drainage Improvements Under Construction:** Manson Ditch Project Phase 1; Rivertown Drainage Project (Kenner); Ave D Ph 6 and Maplewood/Pailet (Harvey); Terry Pkwy Ph 4 (Terrytown); W. Metairie at Lester Culvert (Metairie); Westgate Pump Stations; Parish Line Pump Station Pump Addition; 17th street canal widening; Sena Drive Phase 3; Bonnabel Canal Improvements; Pump to Rive for Old Metairie.

City of Westwego										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
SP-3	F-7 G1	Install increased permanent pumps to alleviate flooding	Flood	4-Low	JP Drainage	F, H, M, CAP	By improving drainage in flood prone areas, residents will suffer fewer flooded structures and therefore, less mental and physical stress, displacement days, and flood damage. Also, the drain on the NFIP is reduced by a decrease in flood claims.	$100 M	2020	Ongoing. **Completed projects:** Capital Outlay pumps at the airport; Taft/Turnbull; Pump to the River project. **Approved projects:** Manson Ditch, Clearview, Maplewood, and Mounes.
SP-4		Install reservoirs/storage tanks	Flood	5-Medium	JP Drainage	F, H, M, CAP	Reservoirs and storage tanks can provide a means of controlling water flow and volumes to reduce flood risk.		2025	New Action
SP-5		Channel modifications	Flood	5-Medium	JP Drainage	F, H, M, CAP	Channel modifications can help to control the flow and volume of water and reduce flooding in certain areas		2025	New Action
Emergency Services										
ES-1		Install hazard warning systems	All Hazards	7-High	JP Emergency Management	JP EM	Hazard warning systems can save lives and can be installed for reasonable fees		2025	New Action
ES-2		Carry out shelter operations planning	All Hazards	7-High	JP Emergency Management	JP EM	Shelters provide citizens with safe refuge before, during, and after hazard events and are critical to protecting life and safety		2025	New Action

City of Westwego										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
ES-3		Implement emergency response training and exercises	All Hazards	7-High	JP Emergency Management	JP EM	Training and exercises help ensure responders are prepared and can take action to reduce loss of life and injury during a disaster.		2025	New Action
Public Education and Awareness										
PEA-1	F-3, H&TS-3 G2	Encourage and educate public regarding small-scale flood mitigation projects and small-scale wind mitigation projects homeowners can employ	Flood, Hurricane and Tropical Storms	5-Medium	JP FPHM, JUMP	FEMA, HUD, PRIV. FUNDS, CPRA	Homeowners will be empowered to protect themselves with low-cost, DIY projects and suffer less flood and wind damage.	$10 M	2025	Ongoing. Conducted numerous site visits from 2015 to 2018 and provided homeowner with flood proofing options and will continue doing so. Three of these visits resulted in recommendations for small scale mitigation options (2 in 2017 and 1 in 2018). Created residential stormwater handouts that were provided to 100 property owners participating in FMA in 2017.
PEA-2	F-6 G2	Encourage the purchase of flood insurance	Flood	7-High	JP FPHM, JUMP	n/a	Enables homeowners to financially recover from the devastating effects of flooding as quickly as possible. Serves to educate area residents that any homeowner, regardless of location, can purchase flood insurance.		2025	Ongoing. Created specific flood insurance promotion outreach projects as part of the PPI; one of which is the creation of a video by Mayor Shaddinger.
PEA-3	F-8 G2	Educate public on not dumping and cleaning catch basins	Flood	6-Medium	JP FPHM, JP Environ, JP Drainage	n/a	An informed public is better able to respond to and protect themselves from flooding.		2025	Ongoing. Ongoing through PPI projects.

City of Westwego										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
PEA-4	H&TS-2, SS-1 G2	Educate public on risks, preparedness measures, evacuation procedures, and generator safety	Hurricane and Tropical Storms, Storm Surge	6-Medium	JP EM, JP Fire, JP FPHM, JUMP	n/a	An informed public is better able to respond to and protect themselves from hurricanes and storm surge.		2025	Ongoing. Applied for EPA Education Grant Sept 2015. Implementing projects identified in PPI.
PEA-5		Implement school-based education program combined with environmental education program	All Hazards	5-Medium	JP FPHM, JP School Board	n/a	Beginning education programs at a young age will help build an informed populace that better understands how to mitigate risks		2025	New Action
PEA-6		Develop public postings/displays and put on hazard expositions	All Hazards	5-Medium	JP FPHM, JP Coastal	n/a	Public displays can help push out key messages about what the public can do to reduce risk		2025	New Action

Table 96
Summary of Mitigation Actions – Town of Grand Isle

Town of Grand Isle										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
Preventative										
P-1	F-5 G4	Adopt freeboard	Flood	7-High	JP FPHM	n/a	Provides a margin of safety against unknown flood depths while taking into account sea level rise and subsidence. Can ultimately reduce the amount of flooding a home would experience, lower flood insurance premiums, and provide the community with CRS points which in turn also lowers flood insurance premiums.		2025	Ongoing. The city has adopted freeboard, but may look into including a minimum bottom slab elevation for elevated residences to reduce damage to personal property that may be stored below the lowest floor of structure.
P-2		Update Comprehensive Plan	All Hazards	7-High	JP Planning	CDBG	Good planning is a key preventative measure and helps reduce the likelihood that new construction will be built in high risk areas without mitigative measures.		2020	New Action
P-3		Increase Open Space Areas	Flood	7-High	JP Planning	n/a	Open spaces such as parks can help provide additional pervious surface areas to allow for infiltration and reduce flooding		2025	New Action

Town of Grand Isle										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
P-4		Perform Regular Maintenance of Drainage System	Flood	6-Medium	JP Drainage	JP Drainage	Ensuring drainage systems are maintained can have major impacts as this allows water to be managed in a way that minimizes flooding.		2025	New Action
P-5		Update Capital Improvements Plan	All Hazards	7-High	JP Capital Projects	JP Capital Projects	A capital improvements plan can help direct funding to the highest priority projects and ensure that projects that reduce risk are being identified		2025	New Action
Floodplain Management										
FP-1		Evaluate efficacy of future conditions mapping	Flood	5-Medium	JP FPHM, JP GIS	FEMA	Future conditions mapping identifies areas of future risk that may not be suitable for development and therefore can reduce future losses		2025	New Action

Town of Grand Isle										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
FP-2		Update Stormwater Management Regulations (ex. compensatory storage for new construction, drainage study with new development, program for rain garden/green infrastructure incentives, permeable surface requirements, sewer backup/overflow protection program)	Flood	5-Medium	JP Environmental, JP Code, JP Engineering, JP Public Works, JP FPHM, JP Sewerage, JP Planning	FEMA, CWSRLF	Stormwater management regulations can be extremely cost-effective and help manage water in a way that reduces localized flooding which is a major issue in many areas of the parish		2025	New Action
Property Protection										
PP-1	F-1, SS-3 G1	Elevate, Acquire, Reconstruct, Relocate or Floodproof private and public structures and infrastructure in flood-prone and surge-prone areas	Flood, Storm Surge	7-High	JP FPHM	FEMA, HUD, CPRA, DNR, DEQ	By removing structures from the floodplain and raising structures above the BFE, homeowners suffer less mental and physical stress, displacement days, and flood damage. Also, the drain on the NFIP is reduced by a decrease in flood claims.	$1 B	2025	Ongoing. 498 elevation/recon properties and Rep Loss structures approved since 2015. Pending approval for elevation/recon/floodproof/and onsite green infrastructure for 154 properties.

Town of Grand Isle										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
PP-2	H&TS-1 G1	Fortify critical infrastructure with storm shutters, upgraded roofs, and generators	Hurricane and Tropical Storm	6-Medium	JP Gen Services, JP Risk Mngt, JP FPHM	FEMA, HUD	Provide extra protection to critical infrastructure from potential wind damage, thus allowing operations to continue during hurricanes and tropical storms.	$50 M	2025	Ongoing. Created risk profiles for town facilities as part of new plan update.
PP-3	H&TS-5 G1	Upgrade and lower water lines to 20 ft below the water surface	Hurricane and Tropical Storm	5-Medium	JP Water	FEMA, HUD	This would allow uninterrupted water service for residents living in the Town.		2025	Ongoing. Requested funding to continue it through the NDRC Competition but NDRC did not get funded. Trying to secure funding.
PP-4	T-1 G2	Construct Safe Rooms	Tornadoes	5-Medium	JP FPHM JUMP	n/a	Provides security and peace of mind, protects residents from tornadoes, and has the potential to increase the value of one's home.		2025	Few safe rooms have been constructed due to feasibility as these would often need to be built in high risk flood zones. However, the parish will continue to evaluate options to build safe rooms and further enhance structural integrity of buildings, especially residences, to reduce wind damage risk.
PP-5	T-2 G4	Harden structures for wind impact	Tornadoes	6-Medium	JP Planning	n/a	Better protect homes from strong winds that could speed recovery after a tornado.		2025	Some structures have been hardened as they have been refurbished in accordance with the building code, ICC and IBC, which currently require 150 mph loads. However, there is still a need for building hardening of additional structures, so this action will remain in place and addressed as needed/feasible.

Town of Grand Isle										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
Natural Resource Protection										
NRP-1	H&TS-4 G3	Use debris (fallen trees) after a strong hurricane for coastal restoration (like Christmas tree project)	Hurricane and Tropical Storm	6-Medium	JP Coastal	CPRA, JP	Better coastal protection could help to prolong the presence of the coastline and continue to provide protection against storms as well as economic gain from tourist destinations.		2025	Ongoing. No hurricanes between 2015 to 2018 for debris.
NRP-2	SS-2 G1, G3	Increase coastal protection	Storm Surge	7-High	GIILD	CPRA, GOMESA RESTORE	Better coastal protection could help to prolong the presence of the coastline and continue to provide protection against storms as well as economic gain from tourist destinations.		2025	Ongoing. Fifi Island Restoration Rock Breakwater Extension has been 60% completed. An additional $10M is required to complete the project. Plan for protective barrier known as the Gulfside (50% funded at $30M) and Bayside Shoreline Breakwaters ($6.5M allocated from CPRA and the balance by GOMESA Bonds) in Grand Isle is in comment period. Caminada Marsh Creation Increment 2 completed. The Bayside Segmented Breakwater project is underway. Following the approval of the JP Multiyear Plan by the Dept. of Treasury, JP will apply for the first 2 rounds of RESTORE dollars and build 8 of the 16 breakwaters.

Town of Grand Isle										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
NRP-3	SS-4 G1, G3	Natural Shoreline/ Dune Restoration	Storm Surge	7-High	GIILD	CPRA, GOMESA RESTORE	Better coastal protection could help to prolong the presence of the coastline and continue to provide protection against storms as well as economic gain from tourist destinations.		2025	Ongoing. Fifi Island Restoration Rock Breakwater Extension has been 60% completed. An additional $10M is required to complete the project. Plan for protective barrier known as the Gulfside (50% funded at $30M) and Bayside Shoreline Breakwaters ($6.5M allocated from CPRA and the balance by GOMESA Bonds) in Grand Isle is in comment period. Caminada Marsh Creation Increment 2 completed. The Bayside Segmented Breakwater project is underway. Following the approval of the JP Multiyear Plan by the Dept. of Treasury, JP will apply for the first 2 rounds of RESTORE dollars and build 8 of the 16 breakwaters.
NRP-4		Improve water quality	Flood, Storm Surge	5-Medium	JP Water, JP Environmental		Improving water quality has many beneficial consequences including better drinking water and ecosystem conservation as well as impacts to public health and well-being and recreational use		2025	New Action

Town of Grand Isle										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
Structural Projects										
SP-1	F-2 G3	Increase storm water protection management including retention and detention basins	Flood	7-High	JP Drainage	FEMA, HUD, CAP OUTLAY, USACE	By improving drainage in flood prone areas, residents will suffer fewer flooded structures and therefore, less mental and physical stress, displacement days, and flood damage. Also, the drain on the NFIP is reduced by a decrease in flood claims.	$20 M	2020	The town has taken several measures to protect against stormwater flooding. However, there is still action to take including the Queen Bess subdivision to Walnut pump station and adding a new pump station along the back side of the island.
SP-2	F-4 G1	Implement drainage improvement projects in flood-prone areas	Flood	6-Medium	JP Drainage	FEMA, HUD, MILLAGE, CAP OUTLAY	By improving drainage in flood prone areas, residents will suffer fewer flooded structures and therefore, less mental and physical stress, displacement days, and flood damage. Also, the drain on the NFIP is reduced by a decrease in flood claims.	$500 M	2020	The town has taken several measures to protect against stormwater flooding. However, there is still action to take including the Queen Bess subdivision to Walnut pump station and adding a new pump station along the back side of the island.
SP-3		Install reservoirs/storage tanks	Flood	5-Medium	JP Drainage	F, H, M, CAP	Reservoirs and storage tanks can provide a means of controlling water flow and volumes to reduce flood risk.		2025	New Action
SP-4		Channel modifications	Flood	5-Medium	JP Drainage	F, H, M, CAP	Channel modifications can help to control the flow and volume of water and reduce flooding in certain areas		2025	New Action

Town of Grand Isle										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
Emergency Services										
ES-1		Install hazard warning systems	All Hazards	7-High	JP Emergency Management	JP EM	Hazard warning systems can save lives and can be installed for reasonable fees		2025	New Action
ES-2		Carry out shelter operations planning	All Hazards	7-High	JP Emergency Management	JP EM	Shelters provide citizens with safe refuge before, during, and after hazard events and are critical to protecting life and safety		2025	New Action
ES-3		Implement emergency response training and exercises	All Hazards	7-High	JP Emergency Management	JP EM	Training and exercises help ensure responders are prepared and can take action to reduce loss of life and injury during a disaster.		2025	New Action
Public Education and Awareness										
PEA-1	F-3, H&TS-3 G2	Encourage and educate public regarding small-scale flood mitigation projects and small-scale wind mitigation projects homeowners can employ	Flood, Hurricane and Tropical Storm	5-Medium	JP FPHM, JUMP	FEMA, HUD, PRIV. FUNDS, CPRA	Homeowners will be empowered to protect themselves with low-cost, DIY projects and suffer less flood and wind damage.	$10 M	2025	Ongoing. Conducted numerous site visits from 2015 to 2018 and provided homeowner with flood proofing options and will continue doing so. Three of these visits resulted in recommendations for small scale mitigation options (2 in 2017 and 1 in 2018). Created residential stormwater handouts that were provided to 100 property owners participating in FMA in 2017.

Town of Grand Isle										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
PEA-2	F-6 G2	Encourage the purchase of flood insurance	Flood	7-High	JP FPHM, JUMP	n/a	Enables homeowners to financially recover from the devastating effects of flooding as quickly as possible. Serves to educate area residents that any homeowner, regardless of location, can purchase flood insurance.		2025	Ongoing. Created specific flood insurance promotion outreach projects as part of the PPI.
PEA-3	H&TS-2, SS-1 G2	Educate public on risks, preparedness measures, evacuation procedures, and generator safety	Hurricane and Tropical Storm, Storm Surge	6-Medium	JP EM, JP Fire, JP FPHM, JUMP	n/a	An informed public is better able to respond to and protect themselves from hurricanes and storm surge.		2025	Ongoing. Projects have been identified in the PPI. Applied for EPA Education Grant Sept 2015.
PEA-4		Implement school-based education program combined with environmental education program	All Hazards	5-Medium	JP FPHM, JP School Board	n/a	Beginning education programs at a young age will help build an informed populace that better understands how to mitigate risks		2025	New Action
PEA-5		Develop public postings/displays and put on hazard expositions	All Hazards	5-Medium	JP FPHM, JP Coastal	n/a	Public displays can help push out key messages about what the public can do to reduce risk		2025	New Action

Table 97
Summary of Mitigation Actions – Town of Jean Lafitte

Town of Jean Lafitte										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
Preventative										
P-1	F-5 G4	Adopt freeboard	Flood	7-High	JP FPHM	n/a	Provides a margin of safety against unknown flood depths while taking into account sea level rise and subsidence. Can ultimately reduce the amount of flooding a home would experience, lower flood insurance premiums, and provide the community with CRS points which in turn also lowers flood insurance premiums.		2025	Complete. Adopted 2 ft freeboard. It is anticipated that a stricter standard may be adopted for freeboard going forward, so this action will remain in place.
P-2		Update Comprehensive Plan	All Hazards	7-High	JP Planning	CDBG	Good planning is a key preventative measure and helps reduce the likelihood that new construction will be built in high risk areas without mitigative measures.		2020	New Action
P-3		Increase Open Space Areas	Flood	7-High	JP Planning	n/a	Open spaces such as parks can help provide additional pervious surface areas to allow for infiltration and reduce flooding		2025	New Action

Town of Jean Lafitte										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
P-4		Perform Regular Maintenance of Drainage System	Flood	6-Medium	JP Drainage	JP Drainage	Ensuring drainage systems are maintained can have major impacts as this allows water to be managed in a way that minimizes flooding.		2025	New Action
P-5		Update Capital Improvements Plan	All Hazards	7-High	JP Capital Projects	JP Capital Projects	A capital improvements plan can help direct funding to the highest priority projects and ensure that projects that reduce risk are being identified		2025	New Action
Floodplain Management										
FP-1		Evaluate efficacy of future conditions mapping	Flood	5-Medium	JP FPHM, JP GIS	FEMA	Future conditions mapping identifies areas of future risk that may not be suitable for development and therefore can reduce future losses		2025	New Action

Town of Jean Lafitte										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
FP-2		Update Stormwater Management Regulations (ex. compensatory storage for new construction, drainage study with new development, program for rain garden/green infrastructure incentives, permeable surface requirements, sewer backup/overflow protection program)	Flood	5-Medium	JP Environmental, JP Code, JP Engineering, JP Public Works, JP FPHM, JP Sewerage, JP Planning	FEMA, CWSRLF	Stormwater management regulations can be extremely cost-effective and help manage water in a way that reduces localized flooding which is a major issue in many areas of the parish		2025	New Action
Property Protection										
PP-1	F-1, SS-3 G1	Elevate, Acquire, Reconstruct, Relocate or Floodproof private and public structures and infrastructure in flood-prone and surge-prone areas	Flood, Storm Surge	7-High	JP FPHM	FEMA, HUD, CPRA, DNR, DEQ	By removing structures from the floodplain and raising structures above the BFE, homeowners suffer less mental and physical stress, displacement days, and flood damage. Also, the drain on the NFIP is reduced by a decrease in flood claims.	$1 B	2025	Ongoing. 498 elevation/recon properties and Rep Loss structures approved since 2015. Pending approval for elevation/recon/floodproof/and onsite green infrastructure for 154 properties.

Town of Jean Lafitte										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
PP-2	H&TS-1 G1	Fortify critical infrastructure with storm shutters, upgraded roofs, and generators	Hurricane and Tropical Storms	6-Medium	JP Gen Services, JP Risk Mngt, JP FPHM	FEMA, HUD	Provide extra protection to critical infrastructure from potential wind damage, thus allowing operations to continue during hurricanes and tropical storms.	$50 M	2025	Ongoing. Town of Lafitte Town Hall wind retrofit project was approved Sept 2015 and is underway. Created risk profiles for town facilities as part of new plan update.
PP-3	H&TS-6 G1	Emergency generators at sewer treatment plants and lift stations	Hurricane and Tropical Storms	5-Medium	JP Gen Services, JP Risk Mngt, JP FPHM	FEMA, HUD	Provide continuous source of power during power outages to keep homes protected from flood waters and sewer backup.		2025	Ongoing. Rosethorn Sewer Project proposed in NDRC Competition, but NDRC did not get funded. Seeking other funds.
PP-4	T-1 G2	Construct Safe Rooms	Tornadoes	5-Medium	JP FPHM JUMP	n/a	Provides security and peace of mind, protects residents from tornadoes, and has the potential to increase the value of one's home.		2025	Few safe rooms have been constructed due to feasibility as these would often need to be built in high risk flood zones. However, the parish will continue to evaluate options to build safe rooms and further enhance structural integrity of buildings, especially residences, to reduce wind damage risk.
PP-5	T-2 G4	Harden structures for wind impact	Tornadoes	6-Medium	JP Planning	n/a	Better protect homes from strong winds that could speed recovery after a tornado.		2025	Some structures have been hardened as they have been refurbished in accordance with the building code, ICC and IBC, which currently require 150 mph loads. However, there is still a need for building hardening of additional structures, so this action will remain in place and addressed as needed/feasible.

Town of Jean Lafitte										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
Natural Resource Protection										
NRP-1	H&TS-4 G1	Barrier construction along bayous to prevent erosion	Hurricane and Tropical Storms	4-Low	JP FPHM, USACE	USACE	Better coastal protection could help to prolong the presence of the coastline and continue to provide protection against storms as well as economic gain from tourist destinations.		2025	Ongoing. Implementing 7 to 8 foot of tidal surge levees – 10 total levees. Fisher Basin Phase I is complete and Phase II will go out for bids in Fall 2018. Rosethorne Basin will go out for bids early 2019. The other 8 tidal surge levees are all under design. Design will be complete on some in early 2019 and construction will follow.
NRP-2	SS-2 G1, G3	Build back marsh	Storm Surge	6-Medium	JP Coastal, JP FPHM	FHWA, FWS	Replenish the first lines of defense against hurricanes and surge. This will protect homes from catastrophic levels of damage.		2025	Ongoing. Land Bridge in Lafitte is underway. Funding approved for Phase 2 design and permit is pending. Lower Lafitte Shoreline Stabilization complete in 2017.
NRP-3		Improve water quality	Flood, Storm Surge	5-Medium	JP Water, JP Environmental		Improving water quality has many beneficial consequences including better drinking water and ecosystem conservation as well as impacts to public health and well-being and recreational use		2025	New Action

Town of Jean Lafitte										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
Structural Projects										
SP-1	F-2 G3	Increase storm water protection management including retention and detention basins	Flood	7-High	JP Drainage	FEMA, HUD, CAP OUTLAY, USACE	By improving drainage in flood prone areas, residents will suffer fewer flooded structures and therefore, less mental and physical stress, displacement days, and flood damage. Also, the drain on the NFIP is reduced by a decrease in flood claims.	$20 M	2025	Ongoing. Implementing 7 to 8 foot of tidal surge levees – 10 total levees. Fisher Basin Phase I is complete and Phase II will go out for bids in Fall 2018. Rosethorne Basin will go out for bids early 2019. The other 8 tidal surge levees are all under design. Design will be complete on some in early 2019 and construction will follow.
SP-2	F-4 G1	Implement drainage improvement projects in flood-prone areas	Flood	6-Medium	JP Drainage	FEMA, HUD, MILLAGE, CAP OUTLAY	By improving drainage in flood prone areas, residents will suffer fewer flooded structures and therefore, less mental and physical stress, displacement days, and flood damage. Also, the drain on the NFIP is reduced by a decrease in flood claims.	$500 M	2020	Ongoing. The Town implemented over 7 million dollars in 2015. The Town implemented $3 million of additional drainage projects during 2017. An additional $2.5 million will be implemented in 2018.

Town of Jean Lafitte										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
SP-3	F-7 G1	Install increased permanent pumps to alleviate flooding	Flood	4-Low	JP Drainage	F, H, M, CAP	By improving drainage in flood prone areas, residents will suffer fewer flooded structures and therefore, less mental and physical stress, displacement days, and flood damage. Also, the drain on the NFIP is reduced by a decrease in flood claims.	$100 M	2020	Ongoing. **Completed projects:** Capital Outlay pumps at the airport; Taft/Turnbull; Pump to the River project. **Approved projects:** Manson Ditch, Clearview, Maplewood, and Mounes.
SP-4		Install reservoirs/storage tanks	Flood	5-Medium	JP Drainage	F, H, M, CAP	Reservoirs and storage tanks can provide a means of controlling water flow and volumes to reduce flood risk.		2025	New Action
SP-5		Channel modifications	Flood	5-Medium	JP Drainage	F, H, M, CAP	Channel modifications can help to control the flow and volume of water and reduce flooding in certain areas		2025	New Action
Emergency Services										
ES-1	H&TS-5 G1	Elevate evacuation routes	Hurricane and Tropical Storms	5-Medium	JP Emergency Management	DOTD	Alleviates the need to close evacuation routes due to road flooding and helps homeowners seek safety quicker.		2025	Ongoing. Plans are being discussed.
ES-2		Install hazard warning systems	All Hazards	7-High	JP Emergency Management	JP EM	Hazard warning systems can save lives and can be installed for reasonable fees		2025	New Action

Town of Jean Lafitte										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
ES-3		Carry out shelter operations planning	All Hazards	7-High	JP Emergency Management	JP EM	Shelters provide citizens with safe refuge before, during, and after hazard events and are critical to protecting life and safety		2025	New Action
ES-4		Implement emergency response training and exercises	All Hazards	7-High	JP Emergency Management	JP EM	Training and exercises help ensure responders are prepared and can take action to reduce loss of life and injury during a disaster.		2025	New Action
Public Education and Awareness										
PEA-1	F-3, H&TS-3 G2	Encourage and educate public regarding small-scale flood mitigation projects and small-scale wind mitigation projects homeowners can employ	Flood, Hurricane and Tropical Storms	5-Medium	JP FPHM, JUMP	FEMA, HUD, PRIV. FUNDS, CPRA	Homeowners will be empowered to protect themselves with low-cost, DIY projects and suffer less flood and wind damage.	$10 M	2025	Ongoing. Presented enviroscape program to 3rd grade classes in Lafitte on 9/18/15.
PEA-2	F-6 G2	Encourage the purchase of flood insurance	Flood	7-High	JP FPHM, JUMP	n/a	Enables homeowners to financially recover from the devastating effects of flooding as quickly as possible. Serves to educate area residents that any homeowner, regardless of location, can purchase flood insurance.		2025	Ongoing. Created specific flood insurance promotion outreach projects as part of the PPI; one of which is the creation of a video by Mayor Kerner.

Town of Jean Lafitte										
Action ID	Old Action ID and Goals	Description	Hazard(s) Addressed	Priority	Responsible Coordinating Entity	Potential Funding Agency	(B/C) Benefit-Costs (TF) Technical Feasibility	Cost	Anticipated Year of Completion	Implementation Status Update 2020
PEA-3	H&TS-2, SS-1 G2	Educate public on risks, preparedness measures, evacuation procedures, and generator safety	Hurricane and Tropical Storms, storm Surge	6-Medium	JP EM, JP Fire, JP FPHM, JUMP	n/a	An informed public is better able to respond to and protect themselves from hurricanes and storm surge.		2025	Ongoing. Applied for EPA Education Grant Sept 2015. Implementing projects identified in PPI.
PEA-4		Implement school-based education program combined with environmental education program	All Hazards	5-Medium	JP FPHM, JP School Board	n/a	Beginning education programs at a young age will help build an informed populace that better understands how to mitigate risks		2025	New Action
PEA-5		Develop public postings/displays and put on hazard expositions	All Hazards	5-Medium	JP FPHM, JP Coastal	n/a	Public displays can help push out key messages about what the public can do to reduce risk		2025	New Action

5.6.1 Post-Disaster Mitigation Policies and Procedures

In the event of a Federally declared disaster, Jefferson Parish, in coordination with its Multi-Jurisdictional Program for Public Information developed by Jefferson United Mitigation Professionals (JUMP), Jefferson Parish's Community Rating System Users Group, has chosen public information projects to be implemented specifically after a flood. These Flood Response Preparation Procedures will go into effect when a disaster that results in flooding is declared for Jefferson Parish. Information will be circulated to the affected areas as soon as local officials are allowed in the area. This should happen within two weeks of the declared event depending on the scale of the event.

JUMP has identified six projects to be distributed to flooded areas.

- FRP#1 – Hang On Door Hanger (AgCenter)
- FRP#2 – ICC Trifold Brochure
- FRP#3 – Handout on Grant Opportunities (HMGP)
- FRP#4 – Brochure Panel on Permit Requirements
- FRP#5 – Plastic Bag
- FRP#6 – ICC News Release

These projects have been prepared and printed so that they are ready for distribution. After a declared flood event occurs, members of JUMP will work in tandem with the various departments that assess damage in their jurisdictions to disseminate the projects. Each jurisdiction has 200 copies of each publication ready to go. If the damaged area has more than 200 structures, each jurisdiction will pool their copies to go to the areas in need. If the damaged structures exceed the number of printed items, additional printing will be requested. JUMP has engaged Vistaprint (an online printing company) and provided them with the digital files so that orders can be repeated as quickly as necessary and shipped wherever accessible post event. FRP#1-4 will be packaged in the plastic bag (FRP#5) to be hung on doors. FRP#6 will be distributed to various news media by the Jefferson Parish Public Information Office.

Disseminating these projects will provide homeowners with information regarding what to do after a flood, potential grant opportunities, as well as the different requirements for new construction, substantial improvements, and substantially damaged structures. If a structure located in the floodplain is determined to have received damages for which the cost of all repair equals or exceeds 50% of the building's fair market value (substantial damage), the structure must be brought into compliance with the local floodplain management regulations, and it must meet the same finished flood elevation requirements as a new building. Increased Cost of Compliance (ICC) coverage up to $30,000 may be available for homeowners to help defray the cost of bringing the structure into compliance if a FEMA flood insurance policy was in place at the time of the disaster.

Section 6 Plan Monitoring and Maintenance

6.1 44 CFR Requirements for Plan Monitoring and Maintenance

44 CFR §201.6(c)(4)(i): *[The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.*

44 CFR §201.6(c)(4)(ii): *[The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.*

44 CFR §201.6(c)(4)(iii): *[The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.*

6.2 Method for Monitoring the Plan

This Plan will be monitored by the Jefferson Parish Department of Floodplain Management and Hazard Mitigation for several related purposes:

1. Maintain the currency of hazard and risk information.
2. Ensure that mitigation projects and actions reflect the priorities of Jefferson Parish and the HMPAC.
3. To comply with FEMA and State of Louisiana requirements for Plan maintenance and maintain Jefferson Parish's eligibility for federal disaster assistance and mitigation grants.

The Parish Floodplain Manager is responsible for monitoring and maintaining this Plan and will continuously monitor the Plan for the purposes noted above, and with respect to the update triggers noted in Section 6.4 below.

Periodic revisions and updates of the Plan are required to ensure that the goals of the Plan are kept current, taking into account potential changes in hazard vulnerability and mitigation priorities. In addition, revisions may be necessary to ensure that the Plan is in full compliance with applicable federal and state regulations. Periodic evaluation of the Plan will also ensure that specific mitigation actions are being reviewed and carried out according to the Mitigation Action Plan.

Each of the six municipalities that are included in this plan will have a representative on the HMPAC. Although the individuals filling the positions may change from year to year, the future HMPAC will continue to be comprised of the same job functions or titles. However, the decision of specific job duties will be left to the Parish Floodplain Manager to be assigned as deemed appropriate.

Progress on the mitigation action items will be monitored and evaluated by the Parish Floodplain Manager. The Department of Floodplain Management and Hazard Mitigation will coordinate the completion of an Annual Progress Report with the HMPAC. This Progress Report will be designed to monitor the state of the projects and evaluate the success of each mitigation item. The report will list each action item and answer several very important questions, such as has the project begun? If not, why not? The status of project; is it complete? If so, did it eliminate the problem? Are there changes needed to better implement the mitigation actions? These questions will serve to address the progress being made on each of the mitigation actions items.

The HMPAC shall meet twice a year and discuss progress of the hazard mitigation actions and prepare the Annual Progress Report for mitigation actions that have been achieved throughout each year. The committee shall also discuss feasibility and monetary needs for the actions described in the plan. The HMPAC shall meet at a minimum once every year to evaluate the progress attained and to revise, where needed, the activities set forth in the Plan. This meeting shall be held in the month upon which final plan approval is attained, however, it may be necessary to schedule in the month prior or after in any given year, depending on the schedules of local officials. The findings and recommendations of the HMPAC will be documented in the Annual Progress Report that can be shared with interested municipalities, the parish, and other stakeholders. The HMPAC will also meet following any disaster events warranting a reexamination of the mitigation actions being implemented or proposed for future implementation. This will ensure that the Plan is continuously updated to reflect changing conditions and needs within Jefferson Parish. The Jefferson Parish Floodplain Manager will be responsible for reconvening the HMPAC for these reviews.

6.3 Method and Schedule for Updating the Plan

Jefferson Parish has a system to ensure that a regular review and update of the Hazard Mitigation Plan occurs. This will be the responsibility of the HMPAC. The committee consists of representatives from governmental organizations, local businesses, and private citizens, who will be involved in the process of monitoring, evaluating, and updating the plan. All municipalities participating in this plan will remain active in the HMPAC.

Comprehensive review and revisions to this Hazard Mitigation Plan will be undertaken on the required five-year cycle. This Plan Update has been re-adopted in 2020 and, thus, must undergo a formal FEMA-compliant update again by 2025. If a disaster occurs or as action items are completed, the plan will be reviewed, revised, and updated sooner than the required five years using the process outlined in this section.

As mentioned above in Section 6.2, an Annual Progress Report will be completed to monitor and evaluate the mitigation action items. The Parish Floodplain Manager will consult with the Responsible Coordinating Entity for details involving each mitigation item. Copies of the Annual Progress Reports will also be sent to the Parish Council and the Mayors of each municipality, distributed to the local media, and made available to the public. If during this process of reviewing the Annual Progress Report the Parish Floodplain Manager determines that the HMPAC should be reconvened for discussion, he/she has the option of doing so. He/she will use the following criteria to determine if a meeting needs to be held:

- Are there any changes in mitigation plan requirements for funding programs?
- Are any changes or revision required to the Mitigation Action Items? (i.e. Have any action items been completed? Are there any new specific mitigation action items? Are there any changes to the mitigation plan requirements? Have any new specific mitigation action items been identified?)
- Does a review of the Progress Reports indicate any changes are necessary?
- Are there any changes within the HMPAC?

The Parish Floodplain Manager is responsible for contacting committee members, organizing the meeting, and providing notification for the meeting to solicit public input and provide an opportunity for public involvement.

The HMPAC will be reconvened approximately one year before the five-year deadline described above and begin evaluating the Hazard Mitigation Plan to initiate the update planning process. The above criteria and the following key topics and questions below will be addressed at the meeting.

- ID Hazard – Are there new hazards that may affect the community? Has a disaster occurred?
- Profile Hazard Events – Are additional maps or new hazard studies available? Have chances of future events changed? Have the nature or magnitude of risks changed? Have recent and future development in the community been checked for their effect on hazard areas?
- Inventory Assets – Have inventories of existing structures in hazard areas been updated? Are there any new special high-risk populations? Is future land development accounted for in the inventories?
- Estimate Losses – Have losses been updated to account for recent changes?
- Current and Expected Conditions – Do the goals need to be updated to address current and expected conditions?
- Resources – Does plan implementation require more resources than currently available?
- Implementation – Have technical, political, legal, or coordination issues with other agencies been identified during plan implementation?
- Outcomes – Are the plan outcomes not as expected?
- Participation – Did Parish departments not participate in the plan implementation process as assigned?

If the answer to any of the above questions is a "Yes", then the HMP will be updated accordingly.

The HMP review and update will be accomplished by reviewing each goal and action item to determine its relevance to changing situations in the Parish and in each municipality, as well as changes to State or Federal policy, and to ensure that they are addressing current and expected conditions. The HMPAC will also review the risk assessment portion and determine if this information should be updated or modified. New development in identified hazard areas, an increased exposure to hazards, an increase or decrease in capability to address hazards, and changes to federal or state legislation are examples of factors that may affect the necessary content of the Plan. Disaster events within the state or significant national events may also warrant the need for additional update to the plan to address potential risks. The HMP may also need to be revised in conjunction with other parish wide plan updates the plan should align with such as a new comprehensive plan for the area. If no changes are necessary, the State Hazard Mitigation Officer will be given a justification for this determination.

The HMPAC will work together as a team, with each member sharing responsibility for completing the evaluation and updates. Each member of the HMPAC is an equal member of the process. It will be the responsibility of the representatives from each community to ensure that their section of this plan is updated to meet the required deadline.

The Parish Floodplain Manager is responsible for incorporating changes into the HMP. All necessary revisions will be completed at least three months prior to the end of the five-year period to allow the HMPAC time to review the updated plan. After each HMPAC meeting, the Parish Floodplain Manager will send a status report (meeting minutes) to the Parish Council and Mayors of the municipalities. Any required revisions will be implemented into existing plans, as applicable, within six months following the review process. This process will be repeated for each five-year review of the plan.

After the Update is completed, the final Plan will be submitted to GOHSEP for review and comment. After any GOHSEP revisions are completed, the plan will be forwarded to FEMA for review and eventual approval.

6.4 Circumstances that will Initiate Plan Review and Updates

This section identifies the circumstances or conditions under which Jefferson Parish will initiate Plan reviews and updates.

1. On the recommendation of the Parish Floodplain Manager or on its own initiative, the Jefferson Parish Council may initiate a Plan review at any time.
2. At approximately the one-year anniversary of the Plan's re-adoption and every year thereafter.
3. After natural hazard events that appear to significantly change the apparent risk to Jefferson Parish assets, operations, and/or citizens (including the six municipalities).
4. When activities of Jefferson Parish, its municipalities, or the State significantly alter the potential effects of natural hazards on Jefferson Parish assets, operations, and/or citizens. Examples include completed mitigation projects that reduce risk or actions or circumstances that increase risk.
5. When new mitigation opportunities or sources of funding are identified.

6.5 Incorporation into Existing Planning Documents

The Jefferson Parish HMPAC intends to make available to all of Jefferson Parish and its municipalities a process by which the requirements of this hazard mitigation plan will be incorporated into other plans. During the planning process for new and updated local planning documents, such as a comprehensive plan, capital improvements plan, or emergency operations plan as examples, the Jefferson Parish Floodplain Manager will provide a copy of the hazard mitigation plan to the advisory committee of each relevant planning document. The Jefferson Parish Floodplain Manager will advise the advisory committee members to ensure that all goals and strategies of new and updated local planning documents are consistent with the hazard mitigation plan and will not increase the risk of hazards or vulnerability of the municipalities. This process will be carried out for each of the planning documents described in the Capability Assessment of this document (Section 5.2). It should also be noted that most municipalities within the parish are participants in the parish-level version of each type of plan and do not have stand-alone municipal plans of their own. Therefore, when the Floodplain Manager shares and advises on the hazard mitigation plan, he or she is acting on behalf of the municipalities. It should be further noted that municipal representatives of the HMPAC are often the same person who participates in the update of comprehensive plans, zoning ordinances, and other planning documents. As such, much of the engrained knowledge these officials have gained from participating in the hazard mitigation planning process is transferred to these processes. Therefore, each municipality's process for integrating the hazard mitigation plan into other planning mechanisms is the same as the parish level process because these planning mechanisms are carried out as parish wide plans or ordinances and each community's stake in each process is intricately linked.

Since the previous plan was adopted, each municipality has worked to integrate the hazard mitigation plan into other planning mechanisms where applicable/feasible. Examples of how this integration has occurred have been documented in the Implementation Status discussion provided for each of the mitigation actions found in Section 5. Specific examples of how integration has occurred include:

- Integrating the mitigation plan into reviews and updates of floodplain management ordinances and regulations;
- Integrating the mitigation plan into reviews and updates of emergency operations plans;
- Integrating information in the mitigation plan into parish Geographic Information Systems; and
- Integrating the mitigation plan into the local reserve fund through identification of mitigation actions that require local funding

Opportunities to further integrate the requirements of this Plan into other local planning mechanisms shall continue to be identified through future meetings of the HMPAC and the review process described herein. Although it is recognized that there are many possible benefits to integrating components of this Plan into other local planning mechanisms, the development and maintenance of this stand-alone Multi-jurisdictional Hazard Mitigation Plan is deemed by the HMPAC to be the most effective and appropriate method to implement local hazard mitigation actions at this time.

6.6 Continued Public Involvement

As noted above, this Plan will be evaluated and updated on approximately an annual basis and when certain triggering events occur. Regardless of the reason for the evaluation and update, Jefferson Parish will observe its mandated public notification processes by advertising all public meetings in which the Plan or elements of the Plan are to be discussed at least two weeks in advance. Additionally, when Plan Updates or other revisions are being contemplated, Jefferson Parish will provide paper and electronic copies of these revisions for public review at least two weeks prior to any hearings or meetings at which the Plan or revisions will be discussed. All municipalities will be invited to participate in the process by notifying the HMPAC. A public notice will be displayed in prominent locations within the main governmental buildings in Jefferson Parish and in the City Halls and government buildings of all participating municipalities. Those who opt to participate in this process will have an opportunity to express their concerns, opinions, or ideas about the Plan.

Electronic copies of the Plan will be made available via PDF download from the Parish website. Jefferson Parish representatives will be available to discuss aspects of the Plan with the public or interested groups. Any public comments will be tracked by the Jefferson Parish Floodplain Manager. All public comments will be reviewed and incorporated in the HMP at the five-year update if appropriate. When meetings of the HMPAC are held, public comments will also be reviewed and incorporated at that time if appropriate.

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Appendix A
Meeting and Outreach Documentation, Public Notices, and Public Participation Survey

The Hazard Mitigation Plan Advisory Committee (HMPAC) met a total five times during the plan update process. This appendix describes the dates of the meetings, agendas, meeting minutes, and attendees as indicated by the sign-in sheets. The proceedings will be described in chronological order.

As part of the Update, all of the participating communities have dedicated representatives to the planning committee to ensure that their community's interests are addressed and that they are fully engaged in the mitigation planning process. The committee is also composed of members of the public to ensure that citizen input in integrated into the plan. The following individuals comprise the HMPAC, which was formally created by Jefferson Parish's governing board as per the resolution below the table:

Jefferson Parish Hazard Mitigation Plan, Hazard Mitigation Plan Advisory Committee

Committee Member	Community	Department/ Organization	Representation	Member of Public (Y/N)
Aimee Vallot	Jefferson Parish	Dept. of Inspection and Code Enforcement	Preventive Measures	N
Anatola Thompson	Jefferson Parish	Solutient	Preventive Measures	Y
Antwan Harris	Jefferson Parish	Public Information Office	Public Information	N
Bruce Layburn	Jefferson Parish	Private	Property Protection	Y
Cody Muller	Westwego	Muller's Auto Supply	Emergency Services	Y
Danika Gorrondona	Gretna	Dept. of Building & Regulatory Inspections	Property Protection	N
Dena Frickey	Jean Lafitte	Levee Board	Structural Flood Control Projects	Y
Doug Dodt	Kenner	Office of Emergency Management	Emergency Services	N
Edwin Lauricella	Harahan	Dept. of Maintenance	Preventive Measures	N
Haley Delery	Gretna		Preventive Measures	Y
Joe Valiente	Jefferson Parish	Dept. of Emergency Management	Emergency Services	N
John Young	Metairie		Natural Resource Protection	Y
Kazem Alikhani	Jefferson Parish	ECM Consultants, Inc.	Structural Flood Control Projects	Y
Kevin Guffey	Kenner	Guffey Insurance	Public Information	Y
Lisa Tapia	Westwego	City Clerk	Public Information	N
Maggie Talley	Jefferson Parish	Dept. of Floodplain Management and Hazard Mitigation	Property Protection	N
Michael Wesley	Gretna		Member of the Public	Y
Michelle Gonzales	Harahan	Rostan	Property Protection	Y

Committee Member	Community	Department/ Organization	Representation	Member of Public (Y/N)
Mike Lockwood	Jefferson Parish	Dept. of Environmental Affairs	Natural Resource Protection	N
Mike Stewart	Jefferson Parish	Bryant Hammett & Associates	Property Protection	Y
Mitch Theriot	Jefferson Parish	Dept. of Drainage	Structural Flood Control Projects	N
Nicole Cooper	Jean Lafitte	Capital Projects	Natural Resource Protection	N
Nora Combel	Grand Isle	Building Dept.	Preventive Measures	N
Oneil Malbrough	Grand Isle	GIS Engineering, LLC	Natural Resource Protection	Y
Patrick Hamby	Jefferson Parish	Entergy	Emergency Services	Y
Ryan Daul	Jefferson Parish	Daul Insurance	Public Information	Y
Scott Eustis	Jefferson Parish	Gulf Restoration Network	Natural Resource Protection	Y
Shane Yokum	Jefferson Parish		Member of the Public	Y
Stephen Romig	Jefferson Parish		Community Land Use and Comprehensive Planning	Y
Terri Wilkinson	Jefferson Parish	Dept. of Planning and Zoning	Community Land Use and Comprehensive Planning	N
Walter Baudier	Metairie		Structural Flood Control Projects	Y

Jefferson Parish Hazard Mitigation Plan, Hazard Mitigation Plan Advisory Committee

On motion of **Mr. Roberts**, seconded by **Ms. Lee-Sheng,** the following resolution was offered:

RESOLUTION NO. 131948

A resolution appointing members to the Hazard Mitigation Plan Advisory Committee and to provide for related matters. (Parishwide)

WHEREAS, pursuant to Resolution No. 131719, adopted June 27, 2018, the Jefferson Parish Council established the Hazard Mitigation Plan Advisory Committee; and

WHEREAS, said Committee is composed of 29 members.

NOW, THEREFORE, BE IT RESOLVED by the Jefferson Parish Council, the governing authority of said Parish:

SECTION 1. That the following individuals are confirmed as members of the committee for the respective positions as follows:

a) Fifteen (15) members shall represent unincorporated Jefferson Parish as follows:
   1) The Jefferson Parish Director of the Department of Inspection and Code Enforcement, or their designee;
   2) The Jefferson Parish Director of the Floodplain Management and Hazard Mitigation Department, or their designee;
   3) The Jefferson Parish Director of the Department of Environmental Affairs, or their designee;
   4) The Jefferson Parish Director of the Department of Emergency Management or Public Safety Grants and Administration, or their designee;
   5) The Jefferson Parish Director of Drainage, or their designee;
   6) The Jefferson Parish Public Information Officer, or their designee;
   7) The Jefferson Parish Director of the Department of Planning and Zoning, or their designee;
   8) Eight "members of the public" as defined by the CRS to be appointed by the Jefferson Parish Council including:
      A) A planning professional specializing in use and development of flood-prone areas including planning and zoning, open space preservation, or erosion setbacks - **Anatola Thompson**, 330 N Carrollton Avenue, New Orleans, LA 7019;
      B) A design or construction professional specializing in design, construction, or mitigation of single family and/or multi-family residential developments - **Mike Stewart**, 1104 Dealers Avenue, Suite A, Harahan, LA 70123;
      C) A design or construction professional specializing in design, construction, or mitigation of commercial developments - **Bruce Layburn**, 3621 Lake Catherine Drive, Harvey, LA 70058;
      D) A member of parks, recreation, or conservation agency specializing in activities to preserve or restore natural areas or the natural function of floodplain and watershed areas – **Scott Eustis**, 1010 Common Street, Suite 902, New Orleans, LA 70112;
      E) An owner or operator of a critical facility responsible for measures taken during an emergency to minimize the event's impact - **Patrick Hamby**, 4809 Jefferson Highway, Mail Unit L-JEF-367, Jefferson, LA 70121;
      F) An engineer specializing in keeping flood water away from an area with levee, reservoir, or other flood control measure - **Kazem Alikhani**, 4409 Utica Street, Metairie, LA 70006;
      G) A realtor or insurance agent specializing in informing the public of natural hazard risk - **Ryan Daul**, PO Box

278, Gretna, LA 70054;

H) A member of a planning advisory organization – **Stephen G. Romig**, 109 Hollywood Drive, Metairie, LA 70005.

b) Two members shall represent the City of Gretna;
   a. Government – Danika Gorrondona or her designee, PO Box 404, Gretna, LA 70054;
   b. Non-Government – Haley M. Delery, 731 Hancock Street, Gretna, LA 70053;

c) Two members shall represent the City of Harahan;
   a. Government – Edwin Lauricella, 6437 Jefferson Highway, Harahan, LA 70123;
   b. Non-Government – Michelle Gonzales, 3850 N Causeway Boulevard, Suite 990, Metairie, LA 70002;

d) Two members shall represent the City of Kenner;
   a. Government – Doug Dodt, 1610 Reverend Richard Wilson Drive, Kenner, LA 70062;
   b. Non-Government – Kevin Guffy, 3409 Williams Boulevard, Suite 9, Kenner, LA 70062;

e) Two members shall represent the City of Westwego;
   a. Government – Lisa Tapia, 1100 Fourth Street, Westwego, LA 70094;
   b. Non-Government – Cody Muller, 450 Avenue D, Westwego, LA 70094;

f) Two members shall represent the Town of Grand Isle
   a. Government – Nora Combel, PO Box 200, Grand Isle, LA 70358;
   b. Non-Government – Oneil Malbrough, 197 Elysian Drive, Houma, LA 70363;

g) Two members shall represent the Town of Jean Lafitte;
   a. Government – Nicole Cooper, 2654 Jean Lafitte Boulevard, Lafitte, LA 70067;
   b. Non-Government – Dena Frickey, 5696 Jean Lafitte Boulevard, Lafitte, LA 70067;

h) Two members shall represent the CDP of Metairie
   a. Non-Government – John F. Young, Jr., 3408 6th Street, Metairie, LA 70002;
   b. Non-Government – Walter Baudier, 3330 W Esplanade Avenue, #205, Metairie, LA 70002.

SECTION 2. That a copy of this resolution be mailed to each individual at their respective addresses listed in Section 1 above.

The foregoing resolution having been submitted to a vote, the vote thereon was as follows:

YEAS: **6** **NAYS**: **None** **ABSENT**: **None**

The resolution was declared to be adopted on this **8th day of August, 2018.**

THE FOREGOING IS CERTIFIED
TO BE A TRUE & CORRECT COPY

Eula A. Lopez

EULA A. LOPEZ
PARISH CLERK
JEFFERSON PARISH COUNCIL

City of Gretna Hazard Mitigation Plan Advisory Committee Nomination Resolution

On motion by **Councilman Rau** and seconded by **Councilman Crosby,** the following ordinance was introduced:

RESOLUTION NO. 2018-048

A resolution of the City of Gretna's appointments to the Jefferson Parish Hazard Mitigation Plan Advisory Committee to represent the City of Gretna, Louisiana, designating the composition and duties of the committee, and providing for related matters.

WHEREAS, the current Jefferson Parish Multi-Jurisdictional Hazard Mitigation Plan 2015 will expire in June of 2020; and

WHEREAS, a current Hazard Mitigation Plan is needed to receive funding from FEMA for Hazard Mitigation Assistance projects and credit under section 510 of the Community Rating System (CRS); and

WHEREAS, the City of Gretna is vulnerable to flooding and other natural hazards that can cause loss of life and damages to public and private property; and

WHEREAS, Jefferson Parish received funding under the Pre-Disaster Mitigation (PDM) and Flood Mitigation Assistance (FMA) grant programs to update the Multi-Jurisdictional Hazard Mitigation Plan with a focus on CRS requirements; and

WHEREAS, the development and implementation of a multi-jurisdictional hazard mitigation plan that addresses the criteria outlined in Activity 510 of the Community Rating System can result in actions that reduce the long-term risk to life and property from flooding; and

WHEREAS, it is the intent of the City of Gretna, Jefferson Parish, and other Parish municipalities to work collaboratively to protect its citizens and property from the effects of flooding and other natural hazards by preparing and maintaining a local multi-jurisdictional hazard mitigation plan that addresses the criteria in CRS Activity 510 including Table 510-4 Categories for Floodplain Management activities; and

WHEREAS, it is required by Title 44 of the Federal Code of Regulations Part 201.6 that a Mitigation Planning Team be identified and play an active role in the update of this Multi-Jurisdictional Hazard Mitigation Plan; and

WHEREAS, at least fifty (50) percent of the committee membership shall be comprised of individuals outside local government; and

WHEREAS, the estimated completion date of the Hazard Mitigation Plan Update is December 2019; and

WHEREAS, the City of Gretna desires to participate in the Hazard Mitigation Plan Advisory Committee to meet the requirement set forth by FEMA and the Insurance Service Office.

NOW, THEREFORE, BE IT RESOLVED, by the City Council, acting as legislative authority for the City of Gretna, Louisiana that:

Haley M. Delery, Danika Gorrondona and Michael Wesley are hereby appointed to the Hazard Mitigation Plan Advisory Committee, which term shall run concurrently with the existence of the committee.

The foregoing resolution having been submitted to a vote, the vote thereon was as follows:

Yeas: **Councilmen Rau, Crosby, Hinyub, Miller and Berthelot**

Nays: None

Absent: None

Abstain: None

ADOPTED: JULY 11, 2018

/S/ NORMA J. CRUZ, CMC
CITY CLERK
CITY OF GRETNA
STATE OF LOUISIANA

/S/ BELINDA C. CONSTANT
MAYOR
CITY OF GRETNA
STATE OF LOUISIANA

A TRUE COPY:

CITY CLERK
CITY OF GRETNA
STATE OF LOUISIANA

City of Harahan Hazard Mitigation Plan Advisory Committee Nomination Resolution

The following Resolution was offered unanimously by the Harahan City Council:

RESOLUTION NO. 2018 – 592

A resolution appointing Michelle Gonzales to the Jefferson Parish **Hazard Mitigation Plan Advisory Committee to represent the City of Harahan,** designating the composition and duties of the committee, and providing for related matters.

WHEREAS, the current Jefferson Parish Multi-Jurisdictional Hazard Mitigation Plan 2015 will expire in June of 2020; and

WHEREAS, a current Hazard Mitigation Plan is needed to receive funding from FEMA for Hazard Mitigation Assistance projects and credit under section 510 of the Community Rating System (CRS); and

WHEREAS, the City of Harahan is vulnerable to flooding and other natural hazards that can cause loss of life and damages to public and private property; and

WHEREAS, Jefferson Parish received funding under the Pre-Disaster Mitigation (PDM) and Flood Mitigation Assistance (FMA) grant programs to update the Multi-jurisdictional Hazard Mitigation Plan with a focus on CRS requirements; and

WHEREAS, the development and implementation of a multi-jurisdictional hazard mitigation plan that addresses the criteria outlined in Activity 510 of the Community Rating System can result in actions that reduce the long-term risk to life and property from flooding; and

WHEREAS, it is the intent of the City of Harahan, Jefferson Parish, and other Parish municipalities to work collaboratively to protect its citizens and property from the effects of flooding and other natural hazards by preparing and maintaining a local multi-jurisdictional hazard mitigation plan that addresses the criteria in CRS Activity 510 including Table 510-4 Categories for Floodplain Management activities; and

WHEREAS, it is required by Title 44 of the Federal Code of Regulations Part 201.6 that a Mitigation Planning Team be identified and play an active role in the update of this Multi-Jurisdictional Hazard Mitigation Plan; and

WHEREAS, at least fifty (50) percent of the committee membership shall be comprised of individuals outside local government; and

WHEREAS, the estimated completion date of the Hazard Mitigation Plan Update is December 2019; and

WHEREAS, the City of Harahan desires to participate in the Hazard Mitigation Plan Advisory Committee to meet the requirement set forth by FEMA and the Insurance Service Office.

NOW, THEREFORE, BE IT RESOLVED, by the Harahan City Council, acting as governing authority of said City that:

SECTION 1. Michelle Gonzales is appointed to the Hazard Mitigation Plan Advisory Committee which term shall run concurrently with the existence of the committee.

The resolution having been submitted to a vote, the vote thereon was as follows:

YEAS: Baudier, Huete, Johnston, Wheeler
NAYS: None
ABSENT: Benton
ABSTENTION: None

The resolution was declared to be adopted this the **19th day of July, 2018.**

Nicole Lee
City Clerk

City of Kenner Hazard Mitigation Plan Advisory Committee Nomination Resolution

On motion of Councilmember McKinney, seconded by Councilmember Branigan, the following resolution was offered:

RESOLUTION NO. B-16924

A RESOLUTION APPOINTING KEVIN GUFFEY TO THE JEFFERSON PARISH HAZARD MITIGATION PLAN ADVISORY COMMITTEE TO REPRESENT THE CITY OF KENNER

WHEREAS, the current Jefferson Parish Multi-Jurisdictional Hazard Mitigation Plan 2015 will expire in June 2020; and,

WHEREAS, a current Hazard Mitigation Plan is needed to receive funding from FEMA for Hazard Mitigation Assistance projects and credit under section 510 of the Community Rating System(CRS); and,

WHEREAS, the City of Kenner is vulnerable to flooding and other natural hazards that can cause loss of life and damages to public and private property; and,

WHEREAS, Jefferson Parish received funding under the Pre-Disaster Mitigation (PDM) and Flood Mitigation Assistance (FMA) grant programs to update the Multi-jurisdictional Hazard Mitigation Plan with a focus on CRS requirements; and,

WHEREAS, the development and implementation of a multi-jurisdictional plan that addresses the criteria outlined in Activity 510 of the Community Rating System can result in actions that reduce the long-term risk to life and property from flooding; and,

WHEREAS, it is the intent of the City of Kenner, Jefferson Parish, and other Parish municipalities to work collaboratively to protect its citizens and property from the effects of flooding and other natural hazards by preparing and maintaining a local multi-jurisdictional hazard mitigation plan that addresses the criteria in CRS Activity 510 including Table 510-4 Categories for Floodplain Management activities; and,

WHEREAS, it is required by Title 44 of the Federal Code of Regulations Part 201.6 that a Mitigation Planning Team be identified and plan an active role in the update of this Multi-Jurisdictional Hazard Mitigation Plan; and,

WHEREAS, at least fifty (50) percent of the committee membership shall be comprised of individuals outside local government; and,

WHEREAS, the estimated completion date of the Hazard Mitigation Plan Update is December 2019; and,

WHEREAS, the City of Kenner desires to participate in the Hazard Mitigation Plan Advisory Committee to meet the requirement set forth by FEMA and the Insurance Service Office.

THE COUNCIL FOR THE CITY OF KENNER HEREBY RESOLVES:

SECTION ONE: That Kevin Guffey is appointed to the Jefferson Parish Hazard Mitigation Plan Advisory Committee which term shall run Concurrently with the existence of the committee.

This resolution having been submitted to a vote, the vote thereon was as follows:

YEAS: 7
NAYS: 0
ABSENT: 0
ABSTAINED: 0

This resolution was declared adopted on this, the 26th day of July, 2018.

Natalie Hall
CLERK OF THE COUNCIL

PRESIDENT OF THE COUNCIL

E. Ben Zahn
MAYOR

DESIGNATED AREA: Citywide
SUBMITTED BY: Councilmember Kristi McKinney, Division A

On motion of Councilmember Brennan, seconded by Councilmember Hayes, the following resolution was offered:

RESOLUTION NO. B-16919

A RESOLUTION APPOINTING DOUG DODT TO THE JEFFERSON PARISH HAZARD MITIGATION PLAN ADVISORY COMMITTEE TO REPRESENT THE CITY OF KENNER

WHEREAS, the current Jefferson Parish Multi-Jurisdictional Hazard Mitigation Plan 2015 will expire in June 2020; and,

WHEREAS, a current Hazard Mitigation Plan is needed to receive funding from FEMA for Hazard Mitigation Assistance projects and credit under section 510 of the Community Rating System(CRS); and,

WHEREAS, the City of Kenner is vulnerable to flooding and other natural hazards that can cause loss of life and damages to public and private property; and,

WHEREAS, Jefferson Parish received funding under the Pre-Disaster Mitigation (PDM) and Flood Mitigation Assistance (FMA) grant programs to update the Multi-jurisdictional Hazard Mitigation Plan with a focus on CRS requirements; and,

WHEREAS, the development and implementation of a multi-jurisdictional plan that addresses the criteria outlined in Activity 510 of the Community Rating System can result in actions that reduce the long-term risk to life and property from flooding; and,

WHEREAS, it is the intent of the City of Kenner, Jefferson Parish, and other Parish municipalities to work collaboratively to protect its citizens and property from the effects of flooding and other natural hazards by preparing and maintaining a local multi-jurisdictional hazard mitigation plan that addresses the criteria in CRS Activity 510 including Table 510-4 Categories for Floodplain Management activities; and,

WHEREAS, it is required by Title 44 of the Federal Code of Regulations Part 201.6 that a Mitigation Planning Team be identified and plan an active role in the update of this Multi-Jurisdictional Hazard Mitigation Plan; and,

WHEREAS, at least fifty (50) percent of the committee membership shall be comprised of individuals outside local government; and,

WHEREAS, the estimated completion date of the Hazard Mitigation Plan Update is December 2019; and,

WHEREAS, the City of Kenner desires to participate in the Hazard Mitigation Plan Advisory Committee to meet the requirement set forth by FEMA and the Insurance Service Office.

THE COUNCIL FOR THE CITY OF KENNER HEREBY RESOLVES:

SECTION ONE: That Doug Dodt is appointed to the Jefferson Parish Hazard Mitigation Plan Advisory Committee which term shall run concurrently with the existence of the committee.

This resolution having been submitted to a vote, the vote thereon was as follows:

YEAS: 7
NAYS: 0
ABSENT: 0
ABSTAINED: 0

This resolution was declared adopted on this, the 12th day of July, 2018.

Natalie Hall
CLERK OF THE COUNCIL

PRESIDENT OF THE COUNCIL

E. Ben Zahn
MAYOR

DESIGNATED AREA: Citywide

Town of Grand Isle Hazard Mitigation Plan Advisory Committee Nomination Resolution

RESOLUTION NO. 2757

A resolution appointing Nora Combel to the Jefferson Parish **Hazard Mitigation Plan Advisory Committee to represent** the Town of Grand Isle, designating the composition and duties of the committee, and providing for related matters.

WHEREAS, the current Jefferson Parish Multi-Jurisdictional Hazard Mitigation Plan 2015 will expire in June of 2020; and

WHEREAS, a current Hazard Mitigation Plan is needed to receive funding from FEMA for Hazard Mitigation Assistance projects and credit under section 510 of the Community Rating System (CRS); and

WHEREAS, the Town of Grand Isle is vulnerable to flooding and other natural hazards that can cause loss of life and damages to public and private property; and

WHEREAS, Jefferson Parish received funding under the Pre-Disaster Mitigation (PDM) and Flood Mitigation Assistance (FMA) grant programs to update the Multi-jurisdictional Hazard Mitigation Plan with a focus on CRS requirements; and

WHEREAS, the development and implementation of a multi-jurisdictional hazard mitigation plan that addresses the criteria outlined in Activity 510 of the Community Rating System can result in actions that reduce the long-term risk to life and property from flooding; and

WHEREAS, it is the intent of the Town of Grand Isle, Jefferson Parish, and other Parish municipalities to work collaboratively to protect its citizens and property from the effects of flooding and other natural hazards by preparing and maintaining a local multi-jurisdictional hazard mitigation plan that addresses the criteria in CRS Activity 510 including Table 510-4 Categories for Floodplain Management activities; and

WHEREAS, it is required by Title 44 of the Federal Code of Regulations Part 201.6 that a Mitigation Planning Team be identified and play an active role in the update of this Multi-Jurisdictional Hazard Mitigation Plan; and

WHEREAS, at least fifty (50) percent of the committee membership shall be comprised of individuals outside local government; and

WHEREAS, the estimated completion date of the Hazard Mitigation Plan Update is December 2019; and

WHEREAS, the Town of Grand Isle desires to participate in the Hazard Mitigation Plan Advisory Committee to meet the requirement set forth by FEMA and the Insurance Service Office.

NOW, THEREFORE, BE IT RESOLVED that Nora Combel is appointed to the Hazard Mitigation Plan Advisory Committee which term shall run concurrently with the existence of the committee.

This resolution was offered jointly by the Town Council.

Vote thereon as follows:

YEAS: Ray Santiny, Kelly Besson, Jr., Mona Santiny, Brian Barthelemy
Leoda Bladsacker

NAYS: 0

ABSENT: 0

The resolution was declared to be adopted this the 10th day of July, 2018.

David J. Camardelle, Mayor
Town of Grand Isle

ATTESTED:

Ray A. Santiny, Town Clerk
Town of Grand Isle

RESOLUTION NO. 2757

Town of Jean Lafitte Hazard Mitigation Plan Advisory Committee Nomination Resolution

RESOLUTION #2083

On a motion by Councilman Smith and seconded by Councilman Creppel the following resolution was adopted:

A resolution appointing Nicole Cooper and Dena Frickey to the Jefferson Parish **Hazard Mitigation Plan Advisory Committee to represent the Town of Jean Lafitte,** designating the composition and duties of the committee, and providing for related matters.

WHEREAS, the current Jefferson Parish Multi-Jurisdictional Hazard Mitigation Plan 2015 will expire in June of 2020; and

WHEREAS, a current Hazard Mitigation Plan is needed to receive funding from FEMA for Hazard Mitigation Assistance projects and credit under section 510 of the Community Rating System (CRS); and

WHEREAS, Town of Jean Lafitte is vulnerable to flooding and other natural hazards that can cause loss of life and damages to public and private property; and

WHEREAS, Jefferson Parish received funding under the Pre-Disaster Mitigation (PDM) and Flood Mitigation Assistance (FMA) grant programs to update the Multi-jurisdictional Hazard Mitigation Plan with a focus on CRS requirements; and

WHEREAS, the development and implementation of a multi-jurisdictional hazard mitigation plan that addresses the criteria outlined in Activity 510 of the Community Rating System can result in actions that reduce the long-term risk to life and property from flooding; and

WHEREAS, it is the intent of the Town of Jean Lafitte, Jefferson Parish, and other Parish municipalities to work collaboratively to protect its citizens and property from the effects of flooding and other natural hazards by preparing and maintaining a local multi-jurisdictional hazard mitigation plan that addresses the criteria in CRS Activity 510 including Table 510-4 Categories for Floodplain Management activities; and

WHEREAS, it is required by Title 44 of the Federal Code of Regulations Part 201.6 that a Mitigation Planning Team be identified and play an active role in the update of this Multi-Jurisdictional Hazard Mitigation Plan; and

WHEREAS, at least fifty (50) percent of the committee membership shall be compromised of individuals outside local government; and

WHEREAS, the estimated completion date of the Hazard Mitigation Plan Update is December 2019; and

WHEREAS, the Town of Jean Lafitte desires to participate in the Hazard Mitigation Plan Advisory Committee to meet the requirement set forth by FEMA and the Insurance Service Office.

NOW, THEREFORE, BE IT RESOLVED, Nicole Cooper and Dena Frickey are appointed to the Hazard Mitigation Plan Advisory Committee which term shall run concurrently with the existence of the committee.

The resolution was submitted to a vote, the vote thereon was as follows:

YEAS: 4
Councilman Creppel
Councilman Guillie
Councilman LeBeau
Councilman Smith

NAYS: 0

ABSENT: 1
Councilman Bartholomew

This resolution was hereby adopted on this 11th day of July 2018.

Mayor

Town Clerk

Outside Stakeholder Agencies/Organizations

Early in the update process the Parish determined that a group of knowledgeable participants, neighboring communities, businesses, academia, and other organizations and individuals with an interest in the Jefferson Parish Plan Update and Project Scoping should be identified. These Outside Stakeholder Agencies/Organizations were contacted to ask for input on the planning process and to contribute important information and data from their respective fields. This stakeholder group was identified by the HMPAC and, when possible, were contacted through either in-person communication or phone calls.

As drafts of the updated Plan were prepared, the Parish used email to distribute them to Outside Stakeholders and requested that they provide comments. Outside Stakeholders were requested to provide feedback through email or by telephoning the Jefferson Parish POC or a member of the consultant team. The consultant was responsible for archiving the comments and including them in edited versions of the Plan.

Jefferson Parish Hazard Mitigation Plan, Outside Stakeholder Agencies/Organizations

Coordinating Agencies					
Agency	**Contacted by Email**	**Meeting/ Phone**	**Date**	**Points**	**Topic**
City of New Orleans		Yes	2/26/2019	2	Call about hazard mitigation plan update and request for input
CPRA		Yes	3/6/2019	2	Call about hazard mitigation plan update and request for input
LPBF		Yes	2/12/2019	2	Call about hazard mitigation plan update and request for input
NOAA		Yes	2/20/2019	2	Call about hazard mitigation plan update and request for input
USDA/NRCA		Yes	2/28/2019	2	Call about hazard mitigation plan update and request for input
OCD		Yes	2/26/2019	2	Call about hazard mitigation plan update and request for input
Wright National Flood Insurance Services, LLC		Yes	2/27/2019	2	Call about hazard mitigation plan update and request for input
NORPC	Yes		10/19/2019	1	Request for relevant RPC plans for incorporation
Greater New Orleans Foundation		Yes	3/7/2019	2	Call about hazard mitigation plan update and request for input
Water Collaborative of Greater New Orleans		Yes	2/28/2019	2	Call about hazard mitigation plan update and request for input
Water Institute of the Gulf		Yes	2/25/2019	2	Call about hazard mitigation plan update and request for input
SLFPA – Flood Protection Authority		Yes	2/8/2019	2	Call about hazard mitigation plan update and request for input
Flood Protection Authority - East	Yes	Yes	3/6/2019	2	Call about hazard mitigation plan update and request for input
Lafourche Parish Government Floodplain Department		Yes	3/18/2019	2	Call about hazard mitigation plan update and request for input
UNO-CHART		Yes	3/18/2019	2	Call about hazard mitigation plan update and request for input
LSU Bert S. Turner	Yes		3/14/2019	1	Request for relevant data for risk

Coordinating Agencies					
Agency	**Contacted by Email**	**Meeting/ Phone**	**Date**	**Points**	**Topic**
Department of Construction Management					assessment analysis
			Total Points	**30**	

*supporting documentation is included in Appendix A

Other Stakeholder Outreach Documentation

City of New Orleans

Stakeholder Outreach Form

Jefferson Parish Staff Member: Maggie Talley

Date: 2/26/19

Time: 1:00 PM

Organization Contacted: City of New Orleans

Name of Contact: Austin Feldbaum

Title of Contact: Senior Hazard Mitigation Specialist

Phone Number: 504-658-8792

Email Address: afeldbaum@nola.gov

Introduction: We're currently working to update our local hazard mitigation plan which includes a review of our existing risk to flooding and other natural hazards. We are trying to collect information from many different key stakeholder groups and wanted to reach out to your organization to see if you would like to provide input on the plan update. We have a few questions we're asking if you have some time to answer them.

Question #1: Do you have any data or information related to flooding or other hazards that may be useful as we assess risk to hazards through this planning process?

Been in the planning process ourselves in the last year with our HM Plan Update. Leaning on FEMA's data on RL properties and NFIP flood claims. Working on bringing on other data sources. Conducting a RLAA; we defined our RL area as the entire parish. Gathering data for every parcel in the parish. We're also working on updating our data management system and creating a database to help search our data easily so we can prioritize the greatest at-risk properties. Another data source is the Road Home properties from the State Office of Community Development. The City is also working on a project that provides us with a continuous log of rainfall and water level gauges that will help to redirect traffic in real-time.

Question #2: Is there anything that your organization is doing that might affect flooding (increase/decrease) or properties in flood-prone areas within the community?

Nothing that comes to mind that would increase flooding in JP. What comes to mind for decreasing it is retention projects. The City Park/Lakeview HMGP project is in design. This is to redirect rain water to lagoons and other areas in park to hold water. SELA projects are mostly complete Uptown and the Broadmoor project both are retention/detention that can help with reducing rising waters that may affect Jefferson Parish.

Question #3: Would you be interested in being more involved in the planning effort? For example, being sent the draft plan for review when ready.

Yes, because of our proximity and shared Hurricane Protection System, it would be good for both of us to keep each other in the loop.

Other Information:

No

CPRA

Stakeholder Outreach Form

Jefferson Parish Staff Member: Melissa James

Date: 3/6/19

Time: 2:00 pm

Organization Contacted: Coastal Protection and Restoration Authority

Name of Contact: Krista Jankowski

Title of Contact: Coastal Resources Scientist Supervisor

Phone Number: 225-342-4642

Email Address: Krista.jankowski@la.gov

Introduction: We're currently working to update our local hazard mitigation plan which includes a review of our existing risk to flooding and other natural hazards. We are trying to collect information from many different key stakeholder groups and wanted to reach out to your organization to see if you would like to provide input on the plan update. We have a few questions we're asking if you have some time to answer them.

Question #1: Do you have any data or information related to flooding or other hazards that may be useful as we assess risk to hazards through this planning process?

Yes, we definitely have data from the 2017 Master Plan process that gives flood depths and flood risks for our current year and moving forward in the future. Google Master Plan Data Viewer and you can access a lot of this data on here. When you look at the flood damage section that shows you the estimate of cost of flood damage in millions, for example. You can play around on the site and even download the data for your Parish's GIS. I want to note it's definitely not about a specific address, but more of a general area and that's the decision making levels for trends in that area. There's also a section for social vulnerability which uses census data to distinguish demographic data.

Question #2: Is there anything that your organization is doing that might affect flooding (increase/decrease) or properties in flood-prone areas within the community?

Yes, under the Data Viewer – select the 2017 Coastal Master Plan – and you see three tabs. Structural project, Non-structural project, and Restoration project. You can view any of the planned projects in a particular area. You can access fact sheets based on what color coded area you select. For the green area, that's marshland, Under the structural project, you can see where federal and local levees are, as well as where proposed levees are going up.

Question #3: Would you be interested in being more involved in the planning effort? For example, being sent the draft plan for review when ready.

Sure, I would be happy to review a draft plan.

Other Information:

I want to point out that under the non-structural project tab on the Master Plan Data Vierwer, it's hard to get structure level data that's not the case in Jefferson Parish. So for that reason, the data for this specific tab is just estimates because the data is not as good as what Jefferson Parish would have collected.

LPBF

Stakeholder Outreach Form

Jefferson Parish Staff Member: John McCandless

Date: 2/12/2019

Time: 1:00pm

Organization Contacted: Lake Pontchartrain Basin Foundation

Name of Contact: Kristin Ransom & John Lopez

Title of Contact: Executive Director & Director of Coast and Community Program

Phone Number: (504) 352-8805

Email Address: kristi@saveourlake.org & jlopez@saveourlake.org

Introduction: We're currently working to update our local hazard mitigation plan which includes a review of our existing risk to flooding and other natural hazards. We are trying to collect information from many different key stakeholder groups and wanted to reach out to your organization to see if you would like to provide input on the plan update. We have a few questions we're asking if you have some time to answer them.

Question #1: Do you have any data or information related to flooding or other hazards that may be useful as we assess risk to hazards through this planning process?

I would say yes. Very recently, we have been in contact with UNO to do surge modeling in Lake Maurapas. We looked at the base case for surge under current conditions and looked at the new levee and how it affects storm surge. Basically, with an Isaac track, we think it would raise ½ foot along the levee. We also observed the West Shore Levee which is the levee west of Bonnet Carree Spillway. One thing is that b/c of the closure, we're seeing the salinity of Lake Pontchartrain go down and the we think a lot of that wetland is now suitable for restoration. Even though it's outside of Jefferson Parish, we think it's still helpful.

Question #2: Is there anything that your organization is doing that might affect flooding (increase/decrease) or properties in flood-prone areas within the community?

The tree planting on Maurapas land bridge which we think helps those areas west of the lake and also raises land areas along Lake Pontchartrain and the surrounding areas.

Question #3: Would you be interested in being more involved in the planning effort? For example, being sent the draft plan for review when ready.

Yes of course. We would love if you all could send the information.

Other Information:

Yes, we are involved in Bucktown marsh project in Jefferson parish. We believe that Jefferson Parish continues to improve resiliency because of such projects. We definitely support what you all are doing and we hope that we can always be of help.

NOAA

Stakeholder Outreach Form

Jefferson Parish Staff Member: Maggie Talley

Date: 2/20/19

Time: 10:00 AM

Organization Contacted: NOAA

Name of Contact: Kristin Ransom

Title of Contact: Coastal Management Specialist

Phone Number: 361-946-6824

Email Address: kristin.ransom@noaa.gov

Introduction: We're currently working to update our local hazard mitigation plan which includes a review of our existing risk to flooding and other natural hazards. We are trying to collect information from many different key stakeholder groups and wanted to reach out to your organization to see if you would like to provide input on the plan update. We have a few questions we're asking if you have some time to answer them.

Question #1: Do you have any data or information related to flooding or other hazards that may be useful as we assess risk to hazards through this planning process?

Yes, we have quite a few. Lots of tools in Digital Coast (coast.noaa.gov/digitalcoast). Some highlights-SLR data layer viewer; a visualization tool called flood mapper – this may useful in our assessment process. It brings in different types of flooding layers such as chronic layers, nuisance flooding, storm surge (using SLOSH models), and many others. It has the ability to zoom in, though not down to the parcel level. Let's you view multiple flood layers at one time to get a good sense of your level of risk. The mapper also brings in other social index layers including critical facilities, age (elderly), socioeconomic factors for class (poor, middle class, high class), and many others. It also shows ecosystem flood risk (areas of development vs areas or marsh land or open space). The tool was originally developed as a workshop to help people with their HM Plans, and based on feedback, we made it a digital viewer.

Question #2: Is there anything that your organization is doing that might affect flooding (increase/decrease) or properties in flood-prone areas within the community?

Not that I'm aware. Our office deals more with planning and not implementation. NOAA is funding other agencies on things like Green infrastructure and tree planting.

Question #3: Would you be interested in being more involved in the planning effort? For example, being sent the draft plan for review when ready.

Would love to review the draft when it's ready.

Other Information:

Happy to share any data/resources they have that may be helpful to you. The Coastal Program is doing a lot of work with providing additional information around CRS scores. Definitely encourage you to speak with the coastal zone manager.

USDA/NRCA

Stakeholder Outreach Form

Jefferson Parish Staff Member: Melissa James

Date: 2/28/19

Time: 10:00am

Organization Contacted: USDA/NRCA

Name of Contact: Alton James, Jr.

Title of Contact: Natural Resources Specialist

Phone Number: 985-331-9084 ext. 3349

Email Address: alton.james@la.usda.gov

Introduction: We're currently working to update our local hazard mitigation plan which includes a review of our existing risk to flooding and other natural hazards. We are trying to collect information from many different key stakeholder groups and wanted to reach out to your organization to see if you would like to provide input on the plan update. We have a few questions we're asking if you have some time to answer them.

Question #1: Do you have any data or information related to flooding or other hazards that may be useful as we assess risk to hazards through this planning process?

No

Question #2: Is there anything that your organization is doing that might affect flooding (increase/decrease) or properties in flood-prone areas within the community?

No

Question #3: Would you be interested in being more involved in the planning effort? For example, being sent the draft plan for review when ready.

Yes

Other Information:

Their department runs the Emergency Watershed Protection program – it only activates following a hurricane or major flood event that the state had declared a disaster. They clean out drainage canals following a state declared disaster. That's one way they get involved after a storm, but they don't collect data on flooding.

OCD

Stakeholder Outreach Form

Jefferson Parish Staff Member: Maggie Talley

Date: 2/26/19

Time: 4:00 PM

Organization Contacted: Office of Community Development, DRU

Name of Contact: Evelyn Campo

Title of Contact: Resilience Planning Analyst (focusing on the LA Watershed Initiative)

Phone Number: 504-556-9733

Email Address: evelyn.campo@la.gov

Introduction: We're currently working to update our local hazard mitigation plan which includes a review of our existing risk to flooding and other natural hazards. We are trying to collect information from many different key stakeholder groups and wanted to reach out to your organization to see if you would like to provide input on the plan update. We have a few questions we're asking if you have some time to answer them.

Question #1: Do you have any data or information related to flooding or other hazards that may be useful as we assess risk to hazards through this planning process?

- Assessment of other initiatives-we have blurbs we can share with you. Data-wise, we don't have much data yet as we are in the early stages of the Watershed Initiative, but LiDAR data can be very helpful in determining real flood risk, particularly if an EC was not available. I was recently working on grid analysis. Much of the flood hazard modeling efforts that are anticipated as part of the Louisiana Watershed Initiative are pending the Federal Register Notice regarding the use of funds allocated in Public Law 115-123 ($ 1.2 billion), but we can anticipate the production of high-quality predictive flood risk models once this part of the Initiative is completed. I will keep you posted on development regarding this part of the Initiative. The State of LA Hazard Mitigation Plan is always a good resource for hazard data.

Question #2: Is there anything that your organization is doing that might affect flooding (increase/decrease) or properties in flood-prone areas within the community?

- Yes, the initiative should definitely be doing some activities that should benefit Jefferson Parish. One of the main driving forces is to have projects that don't negatively impact areas (no regret projects). Currently in the early phases, but we are working towards policy development and collective decision-making that will benefit the State of Louisiana. The LWI is undertaking a large modeling effort can help Louisiana citizens and local, regional, and state leaders make informed decisions about flood protection and flood control efforts.

The Louisiana Watershed Initiative has also taken a number of immediate steps to work toward a reduction in flood risk, enabled by regional coordination in the state including:

- Formulation of the Council on Watershed Management, with assistance from Technical Advisory Groups – find vision document here
- A Phase I investigation regarding comprehensive watershed based floodplain management – please find report available for download here
- An 8-stop listening tour with over 500 stakeholders participating – please find report available for download here
- Hosting a Best Practices Summit to gain insight from local and national experts on regional watershed management – please find more info on event here

We will have further updates on funding for projects and technical assistance once the Federal Register Notice is issued regarding the usage of the federal funding referenced above for mitigation purposes.

Question #3: Would you be interested in being more involved in the planning effort? For example, being sent the draft plan for review when ready.

Yes, that will great. I'd love to review the draft plan and hope to attend the public meeting. Please keep me and LWI in mind as you move forward with the process! I will also make sure to forward information to you as it is appropriate to your area.

Other Information:

We have a working group of five state agencies who are in the same room pretty regularly. If you want have the various agencies to review the draft as well, that would be easy for us to facilitate.

Wright National Flood Insurance Services, LLC

Stakeholder Outreach Form

Jefferson Parish Staff Member: Melissa James

Date: 2/27/19

Time: 3:00 pm

Organization Contacted: Wright National Flood Insurance Services, LLC

Name of Contact: Dwayne LeBlanc

Title of Contact: Vice President of Business Development

Phone Number: 727-249-5364

Email Address: Dwayne.LeBlanc@weareflood.com

Introduction: We're currently working to update our local hazard mitigation plan which includes a review of our existing risk to flooding and other natural hazards. We are trying to collect information from many different key stakeholder groups and wanted to reach out to your organization to see if you would like to provide input on the plan update. We have a few questions we're asking if you have some time to answer them.

Question #1: Do you have any data or information related to flooding or other hazards that may be useful as we assess risk to hazards through this planning process?

We have tools available through FEMA & NFIP, but not sure if we can share. We have specific lost data but the request has to come through the government.

Question #2: Is there anything that your organization is doing that might affect flooding (increase/decrease) or properties in flood-prone areas within the community?

Specifically physical? No. We focus our efforts on education agents and customers consistently. We are largest insurance company providing federal program – both on the writer side and private side. Next year we hope to introduce as an additional choice by partnering with a major carrier on the provider side and offer insurance through them It will be regulated by the insurance commissioner and backed by the guaranteed fund of the state of Louisiana. We hope to give people more choices and make flood insurance more affordable. We are seeing people dropping their flood insurance when it's not required. Lack of interest in buying we wonder what will happen with affordability when FEMA changes the rate model later this year. But as of now, on the front side we focus on marketing and selling to retail producers and being good stewards (pre and post disaster), and promoters of stakeholders – like the Jefferson Parish Floodplain and Hazard Mitigation Department.

Question #3: Would you be interested in being more involved in the planning effort? For example, being sent the draft plan for review when ready.

Unfortunately, I can't actively be involved due to my travel schedule for work. Ryan Dall, a agent in Gretna may be a good resource.

Other Information:

_____
_____
_____

Seremak, Sara R

From: Tom Haysley <thaysley@norpc.org>
Sent: Tuesday, October 30, 2018 9:33 AM
To: Maggie Talley
Subject: RE: RPC Plans?

Hey Maggie,

I'd go ahead and download the documents now since that site was set up for our resilience project and we'll likely clear things off of it as we reach the end of this phase of the project. You should be able to share the documents with your consultant since they're all public and the final product will be owned by Jefferson Parish. Let me know if you need anything else.

Thanks,
Tom

From: Maggie Talley [mailto:MTalley@jeffparish.net]
Sent: Monday, October 29, 2018 5:06 PM
To: Nathan Lipson <nathanlipson@tmgconsulting.net>
Cc: Tom Haysley <thaysley@norpc.org>
Subject: RE: RPC Plans?

This is great! Thank you, Nathan. Is it okay for me to share this with our consulting firm assisting us with the plan update? For how long are the links good?

Maggie Olivier Talley, CFM
Director - Floodplain Management & Hazard Mitigation
Jefferson Parish
504-736-6541
mtalley@jeffparish.net

From: Nathan Lipson [mailto:nathanlipson@tmgconsulting.net]
Sent: Monday, October 29, 2018 1:53 PM
To: Maggie Talley <MTalley@jeffparish.net>
Cc: thaysley@norpc.org
Subject: RE: RPC Plans?

Maggie,

Some of the documents requested are quite large; you can download them from our sharefile at each of the links below:

- LA DOT Coastal Flood Risk and Resilience Report – this is just a summary document not a full report
- SE LA Hurricane Evacuation Study Transportation Analysis and Report
- Jean Lafitte Tomorrow- Town Resiliency Plan
- Jefferson Parish Coastal Zone Management Program
- Jefferson Parish Department of Community Development: Resilience and Vulnerability of the Region's Transportation System

Hope that helps!

Nathan

From: Tom Haysley <thaysley@norpc.org>
Sent: Monday, October 29, 2018 1:40 PM
To: Nathan Lipson <nathanlipson@tmgconsulting.net>
Subject: FW: RPC Plans?

Nathan,

Jefferson Parish is updating its Hazard Mitigation Plan and asked for some of the plans on our review list. Can you send them to Maggie?

Thanks,
Tom

From: Maggie Talley [mailto:MTalley@jeffparish.net]
Sent: Friday, October 26, 2018 10:34 AM
To: Tom Haysley <thaysley@norpc.org>
Cc: Chris Laborde <claborde@norpc.org>
Subject: RE: RPC Plans?

Morning, Tom,

I shared your list with the project team, and they would like to review the following to see if they are relevant:

- LA DOT Coastal Flood Risk and Resilience Report
- SE LA Hurricane Evacuation Study Transportation Analysis and Report
- Jean Lafitte Tomorrow- Town Resiliency Plan
- Jefferson Parish Coastal Zone Management Program
- Jefferson Parish Department of Community Development: Resilience and Vulnerability of the Region's Transportation System

If you have links to any of these, that would be the easiest way for us to get them. If not, do you have a FTP site to share if they are too large to email?

Thanks again for your assistance,

Maggie Olivier Talley, CFM
Director - Floodplain Management & Hazard Mitigation
Jefferson Parish
504-736-6541
mtalley@jeffparish.net

From: Tom Haysley [mailto:thaysley@norpc.org]
Sent: Thursday, October 25, 2018 8:08 AM
To: Maggie Talley <MTalley@jeffparish.net>
Cc: Chris Laborde <claborde@norpc.org>
Subject: RE: RPC Plans?

Hi Maggie,

Sorry for not getting back to you. We have surprisingly few relevant plans and they are fairly old. The only one directly related to Jefferson that I've found is from 1996 and is titled "Hurricane Incident Transportation Planning: Infrastructure Improvements for Regional Evacuation." Does this sound useful? If so I can send you a copy. I've also attached a copy of our master list of plans currently under review for the resilience study. The vast majority of these are not RPC work but have been collected by us for review. If there's anything on there that you don't have but would like please let me know and I'll get it to you.

You may also want to speak to Chris Laborde here at the RPC. Much of Chris's work is related to security, incident and emergency management. I'm not sure if there's any planning documents he can share but there may be ongoing work that's relevant to your hazard mitigation plan. I've copied him on this email.

Thanks,
Tom

From: Maggie Talley [mailto:MTalley@jeffparish.net]
Sent: Wednesday, October 24, 2018 6:50 PM
To: Tom Haysley <thaysley@norpc.org>
Subject: RE: RPC Plans?

Hi Tom,

Wanted to follow up on this request. Do you have anything that can be shared?

Maggie Olivier Talley, CFM
Director - Floodplain Management & Hazard Mitigation
Jefferson Parish
504-736-6541
mtalley@jeffparish.net

From: Maggie Talley
Sent: Friday, October 19, 2018 1:29 PM
To: 'thaysley@norpc.org' <thaysley@norpc.org>
Subject: RPC Plans?

Hey Tom,

We're in the process of updating our Hazard Mitigation Plan and part of that process is reviewing other plans that may be related to mitigation in some way. Does the RPC have any plans that involve Jefferson Parish? If so, can you share them or are they available online?

Thanks,

Maggie Olivier Talley, CFM
Director - Floodplain Management & Hazard Mitigation
Jefferson Parish
504-736-6541
mtalley@jeffparish.net

Please be advised any information provided to Jefferson Parish Government may be subject to disclosure under the Louisiana Public Records Law. Information contained in any correspondence, regardless of its source, may be a public record subject to public inspection and reproduction in accordance with the Louisiana Public Records Law, La. Rev. Stat. 44:1 et seq.

Please be advised any information provided to Jefferson Parish Government may be subject to disclosure under the Louisiana Public Records Law. Information contained in any correspondence, regardless of its source, may be a public record subject to public inspection and reproduction in accordance with the Louisiana Public Records Law, La. Rev. Stat. 44:1 et seq.

Greater New Orleans Foundation

Stakeholder Outreach Form

Jefferson Parish Staff Member: Jamelyn Trucks (Atkins)

Date: 3/7/2019

Time: 9am

Organization Contacted: Greater New Orleans Foundation

Name of Contact: Ella Delio

Title of Contact: Director of Environmental Programs

Phone Number: 504- 598-46663 /617-230-6877

Email Address: ella@gnof.org

Introduction: We're currently working to update our local hazard mitigation plan which includes a review of our existing risk to flooding and other natural hazards. We are trying to collect information from many different key stakeholder groups and wanted to reach out to your organization to see if you would like to provide input on the plan update. We have a few questions we're asking if you have some time to answer them.

Question #1: Do you have any data or information related to flooding or other hazards that may be useful as we assess risk to hazards through this planning process?

Reach out to Iseechange - future funding for Jefferson Parish - reach out to see what they have

Question #2: Is there anything that your organization is doing that might affect flooding (increase/decrease) or properties in flood-prone areas within the community?

n/a - Fund Water Collaborative executive director
- Greenlight - Rain barrells -

Question #3: Would you be interested in being more involved in the planning effort? For example, being sent the draft plan for review when ready.

yes- please send draft when ready for review

Other Information:

Julia @ iseechange - DataPoints... integrate w/ Hazard Event Data

Water Collaborative of Greater New Orleans

Stakeholder Outreach Form

Jefferson Parish Staff Member: Jamelyn Trucks (Atkins)

Date: 2/28/2019

Time: 2pm

Organization Contacted: Water Collaborative of Greater New Orleans

Name of Contact: Atianna Cordova

Title of Contact: Interim Executive Director

Phone Number: 504-931-8821

Email Address: waterblockllc@gmail.com

Introduction: We're currently working to update our local hazard mitigation plan which includes a review of our existing risk to flooding and other natural hazards. We are trying to collect information from many different key stakeholder groups and wanted to reach out to your organization to see if you would like to provide input on the plan update. We have a few questions we're asking if you have some time to answer them.

Question #1: Do you have any data or information related to flooding or other hazards that may be useful as we assess risk to hazards through this planning process?

n/a - will provide information on agencies programs & projects related to flood mitigation/education/outreach

Question #2: Is there anything that your organization is doing that might affect flooding (increase/decrease) or properties in flood-prone areas within the community?

n/a

Question #3: Would you be interested in being more involved in the planning effort? For example, being sent the draft plan for review when ready.

yes - interested in reviewing

Other Information:

Water Institute of the Gulf

Stakeholder Outreach Form

Jefferson Parish Staff Member: Jamelyn Trucks (Atkins)

Date: 2/25/2019

Time: 2:30pm

Organization Contacted: Water Institute of the Gulf

Name of Contact: Colleen mcHugh

Title of Contact: Senior Adaptation Planner

Phone Number: 504-475-2165(o) 415-640-5750 (c

Email Address: cmchugh@thewaterinstitute.org

Introduction: We're currently working to update our local hazard mitigation plan which includes a review of our existing risk to flooding and other natural hazards. We are trying to collect information from many different key stakeholder groups and wanted to reach out to your organization to see if you would like to provide input on the plan update. We have a few questions we're asking if you have some time to answer them.

Question #1: Do you have any data or information related to flooding or other hazards that may be useful as we assess risk to hazards through this planning process?

(Coastal master Plan) - watershed Initiative - Scott Hemerling

Social Vunerability Analysis - will send information to connect

Question #2: Is there anything that your organization is doing that might affect flooding (increase/decrease) or properties in flood-prone areas within the community?

n/a

Question #3: Would you be interested in being more involved in the planning effort? For example, being sent the draft plan for review when ready.

Yes - would be happy to do so!

Other Information:

SLFPA – Flood Protection Agency

Stakeholder Outreach Form

Jefferson Parish Staff Member: Jamelyn Trucks (Atkins)

Date: 2/8/2019

Time: 11:07am CST

Organization Contacted: SLFPA - Flood Protection Authority

Name of Contact: Derek Boese

Title of Contact: CAO

Phone Number: 504-919-5879

Email Address: dboese@yahoo.com
dbdboese@floodauthority.org

Introduction: We're currently working to update our local hazard mitigation plan which includes a review of our existing risk to flooding and other natural hazards. We are trying to collect information from many different key stakeholder groups and wanted to reach out to your organization to see if you would like to provide input on the plan update. We have a few questions we're asking if you have some time to answer them.

Question #1: Do you have any data or information related to flooding or other hazards that may be useful as we assess risk to hazards through this planning process?

levee lifting - completed in last 5 years
Permanent Pump Stations - took over last April
April/May last yr (17th street) 100% Jefferson PCCP

outfall walls / stations take over perfect

Question #2: Is there anything that your organization is doing that might affect flooding (increase/decrease) or properties in flood-prone areas within the community?

Question #3: Would you be interested in being more involved in the planning effort? For example, being sent the draft plan for review when ready.

get to Derek when - quick look

Other Information:

Flood Protection Agency – East

Stakeholder Outreach Form

Jefferson Parish Staff Member: Jamelyn Trucks (Atkins)

Date: 3/6/2019

Time: 2:00pm

Organization Contacted: Flood Protection Authority-East

Name of Contact: Stevan Spencer P.E.

Title of Contact: Chief Engineer

Phone Number: 504-782-8641

Email Address: sspencer@floodauthority.org

Introduction: We're currently working to update our local hazard mitigation plan which includes a review of our existing risk to flooding and other natural hazards. We are trying to collect information from many different key stakeholder groups and wanted to reach out to your organization to see if you would like to provide input on the plan update. We have a few questions we're asking if you have some time to answer them.

Question #1: Do you have any data or information related to flooding or other hazards that may be useful as we assess risk to hazards through this planning process?

see email list provided

Question #2: Is there anything that your organization is doing that might affect flooding (increase/decrease) or properties in flood-prone areas within the community?

see email list provided

Question #3: Would you be interested in being more involved in the planning effort? For example, being sent the draft plan for review when ready.

Yes, please send draft for review

Other Information: when available

Trucks, Jamelyn A

From: Stevan Spencer <sspencer@floodauthority.org>
Sent: Wednesday, March 6, 2019 2:36 PM
To: Trucks, Jamelyn A
Cc: Derek Boese
Subject: Jefferson Parish Hazard Mitigation Plan Update

Please see below:

1. EJLD raised all of the lakefront levees in Jefferson Parish, and the Corps recently armored them for resiliency.
2. The Corps recently raised the entire length of the Miss River Levee in Jefferson Parish.
3. The PCCP station on the 17th street canal is up and running to stop storm surge from the lake.
4. We have a communications plan to raise public awareness/safety related to tropical events.
5. A new emergency operations center is being opened within the next month in Jefferson Parish, near the River.

Stevan G. Spencer, P.E.
Chief Engineer
Flood Protection Authority - East
6920 Franklin Ave., Suite 107
New Orleans, LA 70122
504-286-3118 (Office) 504-782-8641 (Cell)

From: Trucks, Jamelyn A [mailto:Jamelyn.Trucks@atkinsglobal.com]
Sent: Wednesday, March 06, 2019 2:19 PM
To: Stevan Spencer <sspencer@floodauthority.org>
Cc: McAlister, James A <James.McAlister@atkinsglobal.com>
Subject: RE: Jefferson Parish Hazard Mitigation Plan Update

Hi Mr. Spencer,

Lafourche Parish Government Floodplain Department

Stakeholder Outreach Form

Jefferson Parish Staff Member: Melissa James

Date: 3/18/19

Time: 11:00AM

Organization Contacted: Lafourche Parish Government Floodplain Dept.

Name of Contact: Darla Duet

Title of Contact: Floodplain Manager

Phone Number: 985-537-7603 ext. 6906

Email Address: DuetDA@lafourchegov.org

Introduction: We're currently working to update our local hazard mitigation plan which includes a review of our existing risk to flooding and other natural hazards. We are trying to collect information from many different key stakeholder groups and wanted to reach out to your organization to see if you would like to provide input on the plan update. We have a few questions we're asking if you have some time to answer them.

Question #1: Do you have any data or information related to flooding or other hazards that may be useful as we assess risk to hazards through this planning process?

The Parish has a master drainage place on our website that you could review to see if that help assist you in any way. I can email Maggie our HM plan to see if there's anything you could pull from that to that could possibly help. Lafourche Parish doesn't have a huge flooding issue. We have 400 RL properties, some haven't flooded since Hurricane Juan. Unlike Jefferson Parish that was impacted by storms like Hurricane Isaac because it traveled up the mouth of the Mississippi River. We were on the good side of the storm.

Question #2: Is there anything that your organization is doing that might affect flooding (increase/decrease) or properties in flood-prone areas within the community?

We are still doing elevation projects, there are not many buyouts. We have been renovating pump stations and putting new pump stations in as well.

Question #3: Would you be interested in being more involved in the planning effort? For example, being sent the draft plan for review when ready.

Sure that would be fine.

Other Information:

N/A

UNO-CHART

Stakeholder Outreach Form

Jefferson Parish Staff Member: Maggie Talley

Date: 3/18/19

Time: 8:40 AM

Organization Contacted: UNO-CHART

Name of Contact: Monica Farris

Title of Contact: Director and Associate Professor of Research

Phone Number: 504-280-4016

Email Address: mateets@uno.edu

Introduction: We're currently working to update our local hazard mitigation plan which includes a review of our existing risk to flooding and other natural hazards. We are trying to collect information from many different key stakeholder groups and wanted to reach out to your organization to see if you would like to provide input on the plan update. We have a few questions we're asking if you have some time to answer them.

Question #1: Do you have any data or information related to flooding or other hazards that may be useful as we assess risk to hazards through this planning process?

Yes, we have the Rep Loss portal but it is not up-to-date. We do not have any data the parish would not have.

Question #2: Is there anything that your organization is doing that might affect flooding (increase/decrease) or properties in flood-prone areas within the community?

UNO-CHART focuses on education and outreach to residents, informing them in what they can do to protect their property and encouraging them on the importance of flood insurance. We recently submitted a Rep Loss Strategy and CRS strategy for the state as part of the State's Hazard Mitigation Plan Update.

Question #3: Would you be interested in being more involved in the planning effort? For example, being sent the draft plan for review when ready.

Sure, I would be happy to review the draft report.

Other Information:

No additional info.

Seremak, Sara R

From: Maggie Talley <MTalley@jeffparish.net>
Sent: Wednesday, May 8, 2019 10:48 AM
To: Wiedenman, Ryan E; Seremak, Sara R
Cc: Trucks, Jamelyn A
Subject: FW: JP Hazard Mitigation Plan - info request

See below. Also, please add this in as an email response for the stakeholder outreach. This should get us to the 30 points for CRS.

Thanks,

Maggie Olivier Talley, CFM
Director - Floodplain Management & Hazard Mitigation
Jefferson Parish
504-736-6541
mtalley@jeffparish.net

From: Carol J Friedland <friedland@lsu.edu>
Sent: Wednesday, May 8, 2019 7:40 AM
To: Maggie Talley <MTalley@jeffparish.net>
Subject: RE: JP Hazard Mitigation Plan - info request

HI Maggie,

All of the risk assessment analysis files from the state plan can be downloaded from https://drive.google.com/drive/folders/1XYh3ipzz_Qv8B1kuIx8t4A4wYqEAGIBC. The map packages are self-extracting and contain all the shapefiles for the individual maps. You can just zoom into Jefferson parish if you wish.

I asked Rubay to run hazus for each of the return period maps you gave me to get the census block losses. We will play around with this to see if we can get AALs – this is similar to the method we used for the wind loss analysis. Don't hold anything up for this, but this one direction we want to go anyway and it may be useful for your plan based on timeliness. Having AALs (average annual losses) is so much better than just the 100 year flood losses.

I'll get back with you when that's finished!

Also – we received very good comments on our LOI for the SeaGrant proposal, so will be developing the full proposal for submission at the end of the month. I'm excited about this – hopefully this funding will come through and we can really dive into the data!!

Thank you,
Carol

From: Maggie Talley <MTalley@jeffparish.net>
Sent: Tuesday, May 07, 2019 5:20 PM
To: Carol J Friedland <friedland@lsu.edu>
Subject: RE: JP Hazard Mitigation Plan - info request

Carol,

Thank you so much. Yes, if you can provide the GIS files as offered for our review and evaluation that would be AMAZING!

For the second item, this seems to be a more involved analysis process that likely would not be in line with our timing to move forward with submission of the plan for review. I would definitely like to continue to work with you towards getting something like this off the ground.

No worries on the timing. I get crazy behind at times too so I understand that all too well.

Thanks!

Maggie Olivier Talley, CFM
Director - Floodplain Management & Hazard Mitigation
Jefferson Parish
504-736-6541
mtalley@jeffparish.net

From: Carol J Friedland <friedland@lsu.edu>
Sent: Friday, May 3, 2019 7:03 AM
To: Maggie Talley <MTalley@jeffparish.net>
Subject: RE: JP Hazard Mitigation Plan - info request

Maggie,

I am so sorry for my lack of reply. I had missed your first email and things have been crazy here with spring break leading right into finals week. I have a final this afternoon but am going to think about this more. Right now, these are my thoughts:

1. Of course, I can share all of the state risk assessment GIS files from the state plan. I am very excited about this because we did everything at the block level this time and used much higher resolution boundaries, etc. to make the state-level work more useful to parishes. I've attached a zoom of the predicted 100-year flood property losses for Jefferson Parish to give you an example. I have all of the hazard maps and loss assessments in map packages for easy use by parishes.
2. I would be interested in trying to work with the multiple return period depth grids I had gotten from you to create flood loss estimates that are an equivalent basis to the other hazards (return-period based vs. 100 year). This is part of what we've been trying to get funding for from multiple sources. However, to just get the losses, we can run each of the depth grids, get the losses in Hazus, then use the return period-loss relationship to estimate average annual loss. This is similar to the methodology we used for wind in the state plan but we had a lot more return periods to consider for that. This would only be applicable within the leveed areas, as I believe that is the only area you have the multiple return period depth grids for. This should not be too difficult or time consuming and we could create a product similar to the attached map.

Please let me know if either of these are helpful to you and if there are any other ways we can help with the process. Again, I am so sorry for my lack of reply. I see you had originally emailed me almost 1.5 months ago and am embarrassed that I missed that email.

Thank you,
Carol

From: Maggie Talley <MTalley@jeffparish.net>
Sent: Monday, April 22, 2019 2:10 PM
To: Carol J Friedland <friedland@lsu.edu>
Subject: RE: JP Hazard Mitigation Plan - info request

Hi Carol,

I wanted to follow up to see if you had any insight on data sources that might be helpful for us.

Thanks,

Maggie Olivier Talley, CFM
Director - Floodplain Management & Hazard Mitigation
Jefferson Parish
504-736-6541
mtalley@jeffparish.net

From: Maggie Talley
Sent: Thursday, March 14, 2019 5:13 PM
To: 'Carol J Friedland' <friedland@lsu.edu>
Subject: JP Hazard Mitigation Plan - info request

Hi Carol,

Jefferson Parish is currently working to update its Hazard Mitigation Plan which includes a review of our existing risk to flooding and other natural hazards. We are trying to collect information from different key stakeholder groups and wanted to reach out to you to see if you have any information to share that could be useful to our planning process such as relevant data sources. Additionally, is there anything that the LSU Bert S. Turner Department of Construction Management is doing that might affect flooding (increase/decrease) or properties in flood-prone areas within Jefferson Parish?

Thanks,

Maggie Olivier Talley, CFM
Director - Floodplain Management & Hazard Mitigation
Jefferson Parish
504-736-6541
mtalley@jeffparish.net

Please be advised any information provided to Jefferson Parish Government may be subject to disclosure under the Louisiana Public Records Law. Information contained in any correspondence, regardless of its source, may be a public record subject to public inspection and reproduction in accordance with the Louisiana Public Records Law, La. Rev. Stat. 44:1 et seq.

Please be advised any information provided to Jefferson Parish Government may be subject to disclosure under the Louisiana Public Records Law. Information contained in any correspondence, regardless of its source, may be a public record subject to public inspection and reproduction in accordance with the Louisiana Public Records Law, La. Rev. Stat. 44:1 et seq.

Committee Meeting #1 (Kickoff and Hazards)

The first HMPAC meeting was held on August 21, 2018 at the JEDCO Conference Center in Westwego beginning at 1:00 PM.

Committee Meeting #1 Agenda

AGENDA

Jefferson Parish Multijurisdictional
Hazard Mitigation Plan Update
Committee Meeting #1 (Kickoff and Hazards)
August 21, 2018
1:00 PM

1) Introductions
2) Overview of Mitigation Planning
3) Project Overview
   i) Planning Process
   ii) Hazard Mitigation Planning Committee
   iii) Project Schedule
   iv) Data Request: Hazard Risk Information, Related Plans/Studies/Reports
4) Identify Existing and Future Flood-Related Hazards
   i) Sources and Causes of Flooding
   ii) Location of Flooding
   iii) Frequency of Flooding
   iv) Extent of Flooding
   v) Dams and Levees that Could Cause Flooding if Failure
   vi) Areas where Flooding is Likely to Get Worse Due to Floodplain Development, Watershed Development, Sea Level Rise
5) Roles and Responsibilities
6) Next Steps
7) Questions/Concerns

Committee Meeting #1 Meeting Minutes

Jefferson Parish Hazard Mitigation Plan 2020 Update Meeting Minutes
Hazard Mitigation Committee Meeting #1: Kickoff and Hazards
August 21, 1:00PM to 3:00PM
JEDCO Conference Center
701A Churchill Pkwy, Westwego, LA 70094

Maggie Talley, Director of Floodplain Management and Hazard Mitigation, opened the meeting by introducing herself and the consulting team. She outlined the overall project and turned the meeting over to Ryan Wiedenman, lead planner, with Atkins.

Mr. Wiedenman led the meeting and began by providing an overview of the agenda items and briefly reviewed each of the handouts that were distributed in the meeting packets. He then asked each of the meeting attendees to introduce themselves. Following introductions, he provided a brief overview of mitigation and the stages of the mitigation planning process that would be addressed through this plan.

Mr. Wiedenman emphasized that mitigation refers to actions (projects, policies, plans) to reduce the impacts of future hazard events. The hazard mitigation planning process looks at hazards, capability to conduct mitigation, and specific activities to reduce impacts of hazards. He explained how Federal legislation requires local governments to have a hazard mitigation plan in place to remain eligible for federal mitigation grants such as the Pre-Disaster Mitigation Grant Program, Hazard Mitigation Grant Program, and Flood Mitigation Assistance Program so there is funding to implement some of the actions that this plan may identify. Mr. Wiedenman then laid out all of the major steps of the mitigation plan update, including the planning process, the risk assessment, the capability assessment, and the mitigation strategy. He further explained at a high level what tasks would be carried out to complete each major step.

The discussion on the risk assessment was opened with a reminder of the hazards that are addressed in the current version of the Parish's hazard mitigation plan. Attendees were asked to review the list of existing hazards and ensure that all of the hazards were still applicable and to be sure that none had been missed that should be included in the current update of the plan. Mr. Wiedenman suggested that two hazards that the committee may want to include are dam/levee failure and sea level rise. Generally, all committee members agreed that sea level rise should be included. There was some discussion on dam/levee failure and it was decided that dam failures should not be included, but that levee failures should be included. There was also discussion on whether to include levee failure as a standalone hazard or as a sub-hazard under flooding. This discussion was tabled temporarily and the consulting team said they would analyze the issue further after the meeting. Several other hazards that were discussed, but ultimately the committee decided not to include these because they were either included as part of an existing hazard (e.g. marsh fires were discussed, but are addressed under the wildfire hazard) or were man-made/technological hazards and were determined to be outside the scope of this planning effort (e.g. nuclear power plant incident, oil spill).

During the review of the capability assessment, the group carried out an activity to review the plans, policies, and other resources that each community currently has in place. Tables from the current version of the plan were reviewed by each community and, working in small groups, updates were made within the tables to ensure information was complete and accurate.

Mr. Wiedenman then explained how public comment and participation are a required part of this process. A public survey was developed that the Parish has been placed on the hazard mitigation plan update 2020 website. The link can be shared electronically, and the attendees were asked to post the link and encourage participation. There are also a number of other ways that the public can be involved in the plan, all of which are available on the plan update website.

Mr. Wiedenman then spent some time explaining the CRS program and the benefits of it for a community as well as the ways to capitalize on points to gain a better class for the community thereby reducing flood insurance premiums for citizens. He explained that this plan will be developed with a focus on the CRS program and the process will be built around trying to gain as many points as possible within the program through the plan.

The committee was then asked to break down into small groups for a map activity which involved identifying locations of existing and future flooding. Attendees were asked to review a street map of the Parish within their small groups and use the markers provided to mark up the map by identifying locations where flooding has been an issue or may become an issue in the future. Upon marking a location, the attendees were also asked to answer a number of questions about the flooding issue at that location including:

- Has the area experienced past flooding or is it an area of future risk or is it both?
- How often does it flood?
- How severe is the flooding?
- What is the source?
- What is the cause?
- Is it an area where flooding is likely to get worse due to floodplain development, watershed development, or sea level rise?
- Are there dams/levees in the community that would cause flooding if they failed?
- Are there existing studies or other information available on these problem areas?

Upon completing the activity, attendees were asked to turn in their maps and tables so that the information provided could be aggregated and included in the plan.

Finally, Mr. Wiedenman discussed the roles and responsibilities of all the parties involved as well as the next steps for the process. He identified the date of the next meeting and asked the attendees to push out information on public involvement to the public.

Mr. Wiedenman then adjourned the meeting.

Committee Meeting #1 Photos

Committee Meeting #1 Sign-In Sheets

ATKINS

Committee Meeting #1 (Hazards) – August 21, 2018
Jefferson Parish Multijurisdictional Hazard Mitigation Plan Update

Name	✓ if Designee	Community	Dept/Org?	Representation	Member of Public? (Y/N)	Phone Number	Email Address	Signature
Aimee Vallot	✓	Jefferson Parish	Department of Inspection and Code Enforcement	Preventive Measures	N	504-736-4949	AVallot@jeffparish.net	
Anatola Thompson		Jefferson Parish	Solutient	Preventive Measures	Y	504 304.2000	athompson@solutient.com	
Antwan Harris		Jefferson Parish	Public Information Officer	Public Information	N		aharris@jeffparish.net	
Bruce Layburn		Jefferson Parish	PRIVATE	Property Protection	Y	504-362-9920		
Cody Muller		Westwego		Emergency Services	Y			
Danika Gorrondona		Gretna		Property Protection	N	504.202.0538	dgorrondona@gretnab.com	
Dena Frickey		Jean Lafitte		Structural Flood Control Projects	Y	504 583-4510	hamidalizadeh@atkins.com	
Doug Dodt		Kenner		Emergency Services	N	504 471-2100	ddodt@kennerla.us	
Edwin Lauricella		Harahan		Preventive Measures	N	504 737-5[illegible]		

Committee Meeting #1 (Hazards) – August 21, 2018

Jefferson Parish Multijurisdictional Hazard Mitigation Plan Update

ATKINS

Name	✓ if Designee	Community	Dept/Org?	Representation	Member of Public? (Y/N)	Phone Number	Email Address	Signature
Haley Delery		Gretna		Preventive Measures	Y	6386760	hdelery1@gmail.com	
Joe Valiente		Jefferson Parish	Department of Emergency Management	Emergency Services	N	504-655 2987	JVALIENTE @JEFFPARISH.NET	
John Young		Metairie		Natural Resource Protection	Y	504 352 6855	JohnQ JohnYoungOC.com	
Kazem Alikhani		Jefferson Parish		Structural Flood Control Projects	Y	504 352-8531	Kazem@ fcmconsultants.com	
Kevin Guffy GUFFEY		Kenner		Public Information	Y	504 338.2504	Kevinguffey insurance.net	
Lisa Tapia		Westwego		Public Information	N	341-3424	~~ltapia~~ lisatapia@ cityofwestwego.com	
Maggie Talley		Jefferson Parish	Department of Floodplain Management and Hazard Mitigation	Property Protection	N	736-6541	MTalley@jeffparish.Net	Maggie Talley
Michelle Gonzales		Harahan		Property Protection	Y	225 223 2719	Michelle.gonzales@arcadis.com	
Mike Lockwood		Jefferson Parish	Department of Environmental Affairs	Natural Resource Protection	N			

Committee Meeting #1 (Hazards) – August 21, 2018
Jefferson Parish Multijurisdictional Hazard Mitigation Plan Update

ATKINS

Name	✓ if Designee	Community	Dept/Org?	Representation	Member of Public? (Y/N)	Phone Number	Email Address	Signature
Mike Stewart		Jefferson Parish		Property Protection	Y	504 234-9839	mstewart@ blue-engineers.com	
Mitch Theriot		Jefferson Parish	Department of Drainage	Structural Flood Control Projects	N	504 736-6753	mtheriot@jeffparish.net	
Nicole Cooper		Jean Lafitte		Natural Resource Protection	N	(504) 233-1109	NCOOPER@TOWNOFJEANLAFITTE.COM	
Nora Combel		Grand Isle		Preventive Measures	N			called in by phone
Oneil Malbrough		Grand Isle		Natural Resource Protection	Y	985 856-1575	oneilm@gisy.com	
Patrick Hamby		Jefferson Parish		Emergency Services	Y	985 249 4134	phamby@entergy.com	
Ryan Daul		Jefferson Parish		Public Information	Y	504-782 1566	ryan@daulinsurance.com	
Scott Eustis		Jefferson Parish		Natural Resource Protection	Y	504237 0323	Scott@healthygulf.org	
Stephen Romig		Jefferson Parish		Community Land Use and Comprehensive Planning	Y			

Committee Meeting #1 (Hazards) – August 21, 2018

Jefferson Parish Multijurisdictional Hazard Mitigation Plan Update

ATKINS

Name	✓ if Designee	Community	Dept/Org?	Representation	Member of Public? (Y/N)	Phone Number	Email Address	Signature
Terri Wilkinson Rich Gillen	✓	Jefferson Parish	Department of Planning and Zoning	Community Land Use and Comprehensive Planning	N	504 736 6320	richyg3@aol.com rgillen@jeffparish.net	
Walter Baudier		Metairie		Structural Flood Control Projects	Y			
Kathy Russo for Mike Lockwood	✓	Jeff. Parish	Dept. of Environmental Affairs	Environment	N	736-6440	krusso@jeffparish.net	Kathy K. Russo
MICHAEL WESLEY		GRETNA	GIS/IT	GOVT	N	504-363-1567	mwesley@gretnala.com	

Committee Meeting #2 (Problems/Risk)

The second HMPAC meeting was held on September 18, 2018 at the JEDCO Conference Center in Westwego. The meeting began at 10:00 AM.

Committee Meeting #2 Agenda

AGENDA

Jefferson Parish Multijurisdictional
Hazard Mitigation Plan Update
Committee Meeting #2 (Problems/Risk Assessment)
September 18, 2018
10:00 AM

1) Introductions
2) Overview of Project so Far
3) Risk Assessment Results
   i) Hazard Profiles
   ii) Critical Facilities
   iii) Vulnerability of People and Property
   iv) Repetitive Loss Properties and Areas
4) Impacts from Flooding on:
   i) Life Safety/Need for Warning and Evacuation
   ii) Public Health (ex. Mold)
   iii) Critical Facilities and Infrastructure
   iv) Economy and Employers
   v) Number and Type of Buildings
   vi) Public Buildings Owned by Community
5) Activity: Develop Problem Statements. What are the Major Flooding Problems Facing Community?
6) Areas in Floodplain that Provide Natural Function
7) Next Steps
8) Questions/Concerns

Committee Meeting #2 Meeting Minutes

Jefferson Parish Hazard Mitigation Plan 2020 Update Meeting Minutes
Hazard Mitigation Committee Meeting #2: Risk Assessment
September 18, 10:00AM to 12:00PM
JEDCO Conference Center
701A Churchill Pkwy, Westwego, LA 70094

Ryan Wiedenman, lead planner with Atkins, opened the meeting by introducing himself and the consulting team. He reviewed the overall project progress and the major points that had been discussed at the last committee meeting and the first public meeting.

Mr. Wiedenman then reviewed the Risk Assessment information that had been developed to compare hazards and determine which should be the focus of mitigation efforts going forward. He presented the scoring system that was modified slightly since the last update of the hazard mitigation plan and explained that each hazard would be assessed based on seven different criteria including: History, Future Probability, Spatial Extent/Location, Potential for Mitigation, Presence of Susceptible Areas, Data Availability, Disaster Declarations.

Mr. Wiedenman presented information on each of the hazards and concluded by showing the group the scoring for each evaluation criterion for all of the hazards. Based on those scores, the hazards were tiered into three groups of relative risk: High, Moderate, and Low. The results of the initial scoring are presented below:

High: Flood, Hurricanes and Tropical Storms, Storm Surge

Moderate: Sea Level Rise, Tornadoes, Coastal Erosion, Subsidence, Hailstorms

Low: Lightning, Winter Storms, Drought, Wildfires, Earthquakes

The committee was then asked to evaluate these tiers and the scoring and provide any comments or ask any questions. Several comments were made and the committee determined that the following changes should be made to the scoring based on local knowledge and other information available to committee members who had significant expertise in certain hazards.

- Address Extreme Heat as a separate hazard and would likely be a Moderate risk
- Coastal Erosion and Subsidence should be viewed as High risk
- Erosion is a problem in other areas besides the direct coastline; the Bay areas around Grand Isle and Jean Lafitte are a bigger issue than the ocean-facing coast. Need to pull in additional information on the risks there.
- Lighting should be moved up to a Moderate risk
- When evaluating risk, it may be useful to differentiate between areas that are inside the HSSDRS and outside the HSSDRS- especially when it comes to flooding, risk is seen very differently based on whether you are in or out, so separate analyses/scoring may be warranted

Mr. Wiedenman then went on to discuss Critical Facilities that would be included in the plan and explained that critical facilities provide services and functions essential to a community, especially during and after a disaster. He also explained that the list of critical facilities being developed

included hospitals, police, fire, EMS, energy, water, and government administration. He then asked the committee if there were other suggestions as to what to include in the list and the following ideas were suggested:

- Schools
- Airport
- Public Works facilities
- Roads, especially those leading to and from the airport
- Shelters

Mr. Wiedenman said that these suggestions would be considered as the critical facility list was developed and that the list would be sent out to the committee for review once a further evaluation was carried out as creating a list that was too large could make it difficult to focus efforts on protecting the highest priority facilities.

Next, Mr. Wiedenman briefly reviewed how the vulnerability of people and property would be evaluated. He explained that building data as well as Census block data would be used to identify people and property that were located in the high-hazard areas discussed previously. He also went on to show the efforts that had been made prior to the planning process by the Parish to develop ArcGIS online tools to improve risk data collection and aggregation. He showed the group the Parish's Hazard Event Capture tool and Asset Inventory tool which provide a platform for data collection related to hazards.

Mr. Wiedenman then asked the group to participate in a small group activity designed to identify the potential impacts from flooding. In the activity, participants were asked to list specific impacts from flooding that might occur to Life Safety, Public Health, Critical Facilities, Economy/Employers, Number/Type of Buildings, and Public Buildings Owned by the Community. Each group was given a table to fill out that included a space to list the issue and any possible solutions to the issue.

When this activity was completed, committee members were asked to stay in their small groups and participate in a second activity. This activity was designed to develop Problem Statements related to flooding and was based on the areas that were identified as flood-prone areas in the activity from the first committee meeting. Each group was given a map showing the problem areas that had been identified by the committee and to write a problem statement about each area.

After both activities had been completed, Mr. Wiedenman reviewed some of the areas that had been identified as providing a natural function within the floodplain. The National Wetlands Database was the primary resource that had been used, but Mr. Wiedenman asked if any committee members could provide other sources of data that could be used. Some suggestions were made and committee members were asked to send the additional information to Mr. Wiedenman so that it could be included.

Mr. Wiedenman then explained the next steps which were to continue pushing out the public survey and for committee members to prepare for the next meeting which would be focused on Goals. He also announced that a second public meeting would be held on October 9th at 6:30pm.

Mr. Wiedenman then adjourned the meeting.

Committee Meeting #2 Photos

Committee Meeting #2 Sign-In Sheets

Committee Meeting #2 (Problems/Risk Assessment) – September 18, 2018
Jefferson Parish Multijurisdictional Hazard Mitigation Plan Update

Name	✓ if Designee	Community	Dept/Org?	Representation	Member of Public? (Y/N)	Phone Number	Email Address	Signature
Aimee Vallot		Jefferson Parish	Dept of Inspection and Code Enforcement	Preventive Measures	N	736-6949	avallot@jeffparish.net	
Anatola Thompson		Jefferson Parish	Solutient	Preventive Measures	Y	304-2000	athompson@solutient.com	
Antwan Harris		Jefferson Parish	Public Information Office	Public Information	N		aharris@jeffparish.net	
Bruce Layburn		Jefferson Parish	Private	Property Protection	Y	362-9920	bruce.layburn@gmail.com	
Cody Muller		Westwego	Muller's Auto Supply	Emergency Services	Y	341-3111		
Danika Gorrondona Michael Wesley	✓	Gretna	Dept of Building & Regulatory Inspections	Property Protection	N	202-0538	dgorrondona@gretnala.com	
Dena Frickey Hamid Alizadeh	✓	Jean Lafitte	Levee Board	Structural Flood Control Projects	Y	383-4510	hamid.alizadeh@aptim.com	
Doug Dodt		Kenner	Office of Emergency Management	Emergency Services	N	471-2100	ddodt@kenner.la.us	
Edwin Lauricella		Harahan	Dept of Maintenance	Preventive Measures	N	737-5823		

Committee Meeting #2 (Problems/Risk Assessment) – September 18, 2018

Jefferson Parish Multijurisdictional Hazard Mitigation Plan Update

Name	✓ if Designee	Community	Dept/Org?	Representation	Member of Public? (Y/N)	Phone Number	Email Address	Signature
Haley Delery		Gretna		Preventive Measures	Y	638-6760	hdeler1@gmail.com	
Joe Valiente		Jefferson Parish	Department of Emergency Management	Emergency Services	N	655-2987	jvaliente@jeffparish.net	
John Young		Metairie		Natural Resource Protection	Y	352-8855	John@JohnYoungLA.com	
Kazem Alikhani		Jefferson Parish	ECM Consultants, Inc.	Structural Flood Control Projects	Y	352-8531	kazem@ecmconsultants.com	
Kevin Guffey		Kenner	Guffey Insurance	Public Information	Y	338-2504	kevin@guffeyinsurance.net	
Lisa Tapia		Westwego	City Clerk	Public Information	N	341-3424	lisatapia@cityofwestwego.com	
Maggie Talley		Jefferson Parish	Department of Floodplain Management and Hazard Mitigation	Property Protection	N	736-6541	mtalley@jeffparish.net	
Michelle Gonzales		Harahan	Arcadis	Property Protection	Y	225-223-2719	michelle.gonzales@arcadis.com	
~~Mike Lockwood~~ Kathy Russo	✓	Jefferson Parish	Department of Environmental Affairs	Natural Resource Protection	N		mlockwood@jeffparish.net	KR

Committee Meeting #2 (Problems/Risk Assessment) – September 18, 2018

Jefferson Parish Multijurisdictional Hazard Mitigation Plan Update

Name	✓ if Designee	Community	Dept/Org?	Representation	Member of Public? (Y/N)	Phone Number	Email Address	Signature
Mike Stewart		Jefferson Parish	Bryant Hammett & Associates	Property Protection	Y	234-9839	mstewart@bha-engineers.com	
Mitch Theriot		Jefferson Parish	Department of Drainage	Structural Flood Control Projects	N	736-6753	mtheriot@jeffparish.net	
Nicole Cooper		Jean Lafitte	Capital Projects	Natural Resource Protection	N	233-1109	ncooper@townofjeanlafitte.com	NC
Nora Combel		Grand Isle	Building Dept	Preventive Measures	N		nc.togi@viscom.net	Via Phone
Oneil Malbrough		Grand Isle	GIS Engineering, LLC	Natural Resource Protection	Y	985-856-1575	oneilm@gisy.com	
Patrick Hamby		Jefferson Parish	Entergy	Emergency Services	Y	985-249-4134	phamby@entergy.com	
Ryan Daul		Jefferson Parish	Daul Insurance	Public Information	Y	782-1566	ryan@daulinsurance.com	
Scott Eustis		Jefferson Parish	Gulf Restoration Network	Natural Resource Protection	Y	237-0323	scott@healthygulf.org	
Stephen Romig		Jefferson Parish		Community Land Use and Comprehensive Planning	Y		Sromig1117@gmail.com	

Committee Meeting #2 (Problems/Risk Assessment) – September 18, 2018

Jefferson Parish Multijurisdictional Hazard Mitigation Plan Update

Name	✓ if Designee	Community	Dept/Org?	Representation	Member of Public? (Y/N)	Phone Number	Email Address	Signature
Terri Wilkinson Rich Gillen Shane Yokum	✓ ✓	Jefferson Parish	Department of Planning and Zoning	Community Land Use and Comprehensive Planning	N	736-6320	rgillen@jeffparish.net	RG SY
Walter Baudier John Karlin	✓	Metairie		Structural Flood Control Projects	Y	836-2155	WBaudier@dei-engr.com jKarlin@dei-engr.com	John Karlin
Michael Wesley	For Danika Gorrondona	Gretna	IT GIS	Prop. Prot.		9363-1567		
MITCH THERIOT		J.P. DRAIN	DRAINAGE			736-6753	mtheriot@jeffparish.net	
Shane Yokum		[illegible]			Y			

Committee Meeting #3 (Goals)

The third HMPAC meeting was held on October 23, 2018 in Room 405 of the Joseph S. Yenni Building in Jefferson. The meeting began at 10:00 AM.

Committee Meeting #3 Agenda

AGENDA

Jefferson Parish Multijurisdictional
Hazard Mitigation Plan Update
Committee Meeting #3 (Goals)
October 23, 2018
10:00 AM

1) Introductions
2) Overview of Project so Far
3) Future Development and Population Growth in Community
4) Future Flooding Conditions
5) Discussion of Overall Community Vision
6) Other Community Goals and Goals from Other Plans
7) Define Goals for HMP; Address all Problem Statements
8) Brainstorm Activity: Actions to Meet these Goals. What Category do They Fall Under?
    i) Preventive Measures
    ii) Property Protection
    iii) Natural Resource Protection
    iv) Emergency Services
    v) Structural Flood Control Projects
    vi) Public Information
9) Next Steps
10) Questions/Concerns

Committee Meeting #3 Meeting Minutes

Jefferson Parish Hazard Mitigation Plan 2020 Update Meeting Minutes
Hazard Mitigation Committee Meeting #3: Goals
October 23, 2018 10:00AM to 12:00PM
Joseph S. Yenni Building, Room 405
1221 Elmwood Park Boulevard, Jefferson, LA 70123

Jamelyn Austin Trucks, project manager with Atkins, opened the meeting by introducing herself and the topic of the meeting for the day. She reviewed the overall project progress and the major points that had been discussed at the last committee meeting and the second public meeting. She also reminded the group that this was the last chance to get the public survey out as it will be closing on November 15.

Ms. Trucks then reviewed some population and housing unit construction information that had been collected from the U.S. Census and American Community Survey to look at trends in growth in the communities that should be considered when thinking about hazard risk, especially flooding. During the discussion, committee members pointed out that some of the housing information may be incorrect since these were estimates from the federal level and that local information was likely available that more accurately portrayed the development within the parish. This was especially notable related to unincorporated Jefferson Parish.

This led to a discussion among group members about how to grow without increasing risk. Ms. Trucks used the example of Repurposing of Avondale to demonstrate a way that this is happening currently. There was also a comment from the group that there is a need to address areas of redevelopment, not just new construction. When areas are redeveloped, steps can be taken to try to reduce risk as well. For example, the Kmart in Elmwood is adding green features and detention areas below ground.

There was a note from Grand Isle that it appears on maps that Elmer's Island is being included as part of Grand Isle incorporated area which is not the case.

Ms. Trucks went on to discuss some of the plans that were being reviewed for integration with the hazard mitigation plan during the update. She asked the committee if there were any other plans that should be reviewed as part of this process. The Emergency Operations Plan was updated in 2017 and was suggested. The JEDCO plan will be public in about 3 months and should also be looked at. A committee member also suggested that it was relevant to keep the Urban Growth Limit Line in mind. At the end of the discussion on plans, the committee asked if they could see a list of the plans that were being reviewed and it was agreed that this list would be sent out in a follow-up email.

Ms. Trucks then began a discussion on Goals of the plan by showing the committee the goals that are currently in place in the 2015 adopted version of the plan. The committee was asked to review these goals and match up goals to each of the problem statements that they had developed in the last committee meeting and also note if the current issue that was identified in the problem statement was likely to get worse due to development, sea level rise, or both. A number of comments came out of this discussion and the activity. They are as follows:

- Goal 2 – expand "disaster preparedness" to a broader term "preparedness." Also include "…through education 'and notification' programs."

- There was a suggestion that it might make sense to combine Goals 1 and 3, but then it was decided that prevention and protection are two different things. However, there is a need to specifically include the built environment as part of the goals, possibly under Goal 3
- A question was asked about where green infrastructure falls within the Goals as there seems to be a gap on what structural projects fit under. These projects don't really fall under Goal 1 or Goal 3. Need to add something to one of the goals or develop a new goal?
- During the activity it was noted that some of the goals are hard to separate from one another. In order to fund some of these projects, education for the public is needed to demonstrate why they are important or why there is a need to increase a millage. Almost all of the goals could be applied to each of the problem statements.
- Maybe the language of the goals should be refined. For example: people could be in Zone X and still be below sea level, but don't have to build substantially higher, which has to do with floodplain regulations
- Overall, there was a feeling that there was a gap for structural projects in the goals. The price tag to increase drainage capacities is much higher than to maintain what's there and the current goals don't address this.

Ms. Trucks then went on to describe mitigation techniques/categories that are considered during the mitigation planning process to develop actions and projects for risk reduction. She walked through an outline that included various examples of each technique (Prevention, Property Protection, Natural Resource Protection, Structural Projects, Emergency Services, and Public Education and Awareness) and began a discussion of projects that the communities might pursue. Following this discussion, Ms. Trucks led a mitigation actions exercise.

Committee members were given an equal amount of fictitious money ($38 each) and asked to spend it in the various mitigation categories. The money could be thought of as grant money that communities received towards mitigation projects or areas that they felt were a higher priority. The purpose of the exercise helps pinpoint areas of mitigation that the community may want to focus on when developing mitigation grants or projects.

The results were:

- Structural = $264
- Emergency = $27
- Education = $50
- Natural Resource Protection = $111
- Property Protection = $130
- Prevention = $112

After the activity, a discussion took place on the results and one point was made that some people may have voted on what they thought was important and what cost the most. For instance, structural cost the most, so they put more $ in structural, even though they may have thought protection was a more important activity.

Ms. Trucks then explained the next steps which were to continue pushing out the public survey and for committee members to prepare for the next meeting which would be focused on Possible Activities. She also explained that if any additional plans were identified for review, to please send them in.

Ms. Trucks then adjourned the meeting.

Committee Meeting #3 Photos

Committee Meeting #3 Sign-In Sheets

Committee Meeting #3 (Goals) – October 23, 2018
Jefferson Parish Multijurisdictional Hazard Mitigation Plan Update

Name	✓ if Designee	Community	Dept/Org?	Representation	Member of Public? (Y/N)	Phone Number	Email Address	Signature
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Bruce Layburn		Jefferson Parish	Private	Property Protection	Y	362-9920	bruce.layburn@gmail.com	
Cody Muller		Westwego	Muller's Auto Supply	Emergency Services	Y	341-3111	Cody.muller@yahoo.com	
Danika Gorrondona		Gretna	Dept of Building & Regulatory Inspections	Property Protection	N	202-0538	dgorrondona@gretnala.com	
Dena Frickey Hamid Alizadeh	✓	Jean Lafitte	Levee Board	Structural Flood Control Projects	Y	383-4510	hamid.alizadeh@aptim.com	
Doug Dodt		Kenner	Office of Emergency Management	Emergency Services	N	471-2100	ddodt@kenner.la.us	
Edwin Lauricella		Harahan	Dept of Maintenance	Preventive Measures	N	737-5823	Edwin.lauricella@ci.harahan.la.us	

Committee Meeting #3 (Goals) – October 23, 2018

Jefferson Parish Multijurisdictional Hazard Mitigation Plan Update

Name	✓ if Designee	Community	Dept/Org?	Representation	Member of Public? (Y/N)	Phone Number	Email Address	Signature
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John Young		Metairie		Natural Resource Protection	Y	352-8855	John@JohnYoungLA.com	
Kazem Alikhani		Jefferson Parish	ECM Consultants, Inc.	Structural Flood Control Projects	Y	352-8531	kazem@ecmconsultants.com	
Kevin Guffey		Kenner	Guffey Insurance	Public Information	Y	338-2504	kevin@guffeyinsurance.net	
Lisa Tapia		Westwego	City Clerk	Public Information	N	341-3424	lisatapia@cityofwestwego.com	
Maggie Talley		Jefferson Parish	Department of Floodplain Management and Hazard Mitigation	Property Protection	N	736-6541	mtalley@jeffparish.net	MT
Michelle Gonzales		Harahan	Arcadis	Property Protection	Y	225-223-2719	michelle.gonzales@arcadis.com	
Mike Lockwood Kathy Russo	✓	Jefferson Parish	Department of Environmental Affairs	Natural Resource Protection	N	504 736-6424	mlockwood@jeffparish.net krusso@jeffparish.net	KKR

Committee Meeting #3 (Goals) – October 23, 2018

Jefferson Parish Multijurisdictional Hazard Mitigation Plan Update

Name	✓ if Designee	Community	Dept/Org?	Representation	Member of Public? (Y/N)	Phone Number	Email Address	Signature
Mike Stewart		Jefferson Parish	Bryant Hammett & Associates	Property Protection	Y	234-9839	mstewart@bha-engineers.com	
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Nicole Cooper		Jean Lafitte	Capital Projects	Natural Resource Protection	N	233-1109	ncooper@townofjeanlafitte.com	
Nora Combel		Grand Isle	Building Dept	Preventive Measures	N		nc.togi@viscom.net	
Oneil Malbrough		Grand Isle	GIS Engineering, LLC	Natural Resource Protection	Y	985-856-1575	oneilm@gisy.com	
Patrick Hamby		Jefferson Parish	Entergy	Emergency Services	Y	985-249-4134	phamby@entergy.com	
Ryan Daul		Jefferson Parish	Daul Insurance	Public Information	Y	782-1566	ryan@daulinsurance.com	
Scott Eustis		Jefferson Parish	Gulf Restoration Network	Natural Resource Protection	Y	237-0323	scott@healthygulf.org	
Stephen Romig		Jefferson Parish		Community Land Use and Comprehensive Planning	Y		Sromig1117@gmail.com	

Committee Meeting #3 (Goals) – October 23, 2018

Jefferson Parish Multijurisdictional Hazard Mitigation Plan Update

Name	✓ if Designee	Community	Dept/Org?	Representation	Member of Public? (Y/N)	Phone Number	Email Address	Signature
Terri Wilkinson Richard Gillen	✓	Jefferson Parish	Department of Planning and Zoning	Community Land Use and Comprehensive Planning	N	736-6320	rgillen@jeffparish.net	RG
Walter Baudier John Karlin	✓	Metairie		Structural Flood Control Projects	Y		WBaudier@dei-engr.com jKarlin@dei-engr.com	John Karlin
Shane Yokum				Public	Y	7366323	SYokum@jeffparish.net	SY Yokum

Committee Meeting #4 (Possible Activities)

The fourth HMPAC meeting was held on December 4, 2018 at the JEDCO Conference Center in Westwego. The meeting began at 10:00 AM.

Committee Meeting #4 Agenda

AGENDA

Jefferson Parish Multijurisdictional
Hazard Mitigation Plan Update
Committee Meeting #4 (Possible Activities)
December 4, 2018
10:00 AM

1) Introductions
2) Overview of Project so Far
3) Public Survey Results
4) Review Categories of Possible Activities
5) Discuss Highest Priority Activities to Ensure Inclusion in Plan
6) Small Group Activity: Discuss Pros/Cons of Each Activity within Each Community and Why Appropriate vs. Not Appropriate
7) Small Group Activity: Update Actions from Existing Plan
8) Activity: Ideas for New Actions
9) Next Steps
10) Questions/Concerns

Committee Meeting #4 Meeting Minutes

Jefferson Parish Hazard Mitigation Plan 2020 Update Meeting Minutes
Hazard Mitigation Committee Meeting #4: Possible Activities
December 4, 2018 10:00AM to 12:00PM
JEDCO Conference Center
701A Churchill Pkwy, Westwego, LA 70094

Ryan Wiedenman, lead planner with Atkins, opened the meeting by introducing himself and the consulting team. He reviewed the overall project progress and the major points that had been discussed at the last committee meeting.

Mr. Wiedenman then reviewed the updated goals based on feedback received during the last meeting, including the addition of a fifth goal related to structural and green infrastructure projects.

Next, Mr. Wiedenman shared the results of the public participation survey that had been available for the public since the start of the project. The survey was closed on November 15th and there were more than 150 participants who took the survey. Mr. Wiedenman explained that although the results provide some useful insights, the results should not necessarily be taken as a survey sample of the entire parish population.

Some of the major takeaways from the survey included:

- The top hazards of greatest concern identified by the public in the survey matched those identified by the planning committee and the risk assessment analysis (Flood, Hurricane/Tropical Storm, and Storm Surge)
- More than 85% of respondents are at least moderately concerned about being impacted by a disaster
- More than 90% of respondents are interested in making their homes safer from hazards and almost 60% have already taken some action to make their homes safer
- The mitigation action types of highest importance identified by survey respondents were emergency services, structural projects, and prevention.

Mr. Wiedenman then gave the group copies of the problem statements that had been developed through the first 3 meetings. He asked them to take a few minutes to review those and to keep them fresh in their minds as the committee began discussing the possible mitigation actions to include in the plan. Mr. Wiedenman also reviewed the categories of mitigation action to remind the committee of the potential universe of activities that could be implemented to reduce risk. Finally, Mr. Wiedenman reviewed the mitigation action type rankings from the last committee meeting and from the first two public meetings. These were compared against the survey results as well to try to identify common threads among the priorities of mitigation action types.

Mr. Wiedenman introduced the next activity which included reviewing a number of different possible activities that might be implemented in the community to reduce risk. He explained that not all activities identified would be appropriate for Jefferson Parish and that part of the idea of this activity was to weed out those particular activities so that the committee could focus on including appropriate activities in the plan. He passed out tables with the possible activities and had the committee divide into small groups based on the 7 categories of mitigation activity (Prevention, Floodplain Management, Property Protection, Natural Resource Protection, Structural, Emergency

Services, and Public Education and Awareness). Each group then took time to fill out the tables for their particular activity type, explaining the pros/cons of each activity and determining if it was or was not appropriate for implementation.

After this activity wrapped up, Mr. Wiedenman went on to explain how to update existing actions from the current plan and how the committee could update the plan with status reports on each existing action and could also add new actions to the plan, if desired. He asked committee members to follow up in between this meeting and the next with other members of their department and community to help begin updating the plan actions, which would be the focus of the next committee meeting.

Mr. Wiedenman then explained the next steps which were to review existing actions and determine if new actions should be included.

Mr. Wiedenman then adjourned the meeting.

Committee Meeting #4 Sign-In Sheets

Committee Meeting #4 (Possible Activities) – December 4, 2018
Jefferson Parish Multijurisdictional Hazard Mitigation Plan Update

Name	✓ if Designee	Community	Dept/Org?	Representation	Member of Public? (Y/N)	Phone Number	Email Address	Signature
Aimee Vallot		Jefferson Parish	Dept of Inspection and Code Enforcement	Preventive Measures	N	736-6949	avallot@jeffparish.net	
Anatola Thompson		Jefferson Parish	Solutient	Preventive Measures	Y	304-2000	athompson@solutient.com	
Antwan Harris		Jefferson Parish	Public Information Office	Public Information	N		aharris@jeffparish.net	
Bruce Layburn	✓	Jefferson Parish	Private	Property Protection	Y	362-9920	bruce.layburn@gmail.com	
Cody Muller		Westwego	Muller's Auto Supply	Emergency Services	Y	341-3111	Cody.muller@yahoo.com	
Danika Gorrondona Michael Wesley	✓	Gretna	Dept of Building & Regulatory Inspections	Property Protection	N	202-0538	dgorrondona@gretnala.com	
Dena Frickey		Jean Lafitte	Levee Board	Structural Flood Control Projects	Y	383-4510	hamid.alizadeh@aptim.com	
Doug Dodt		Kenner	Office of Emergency Management	Emergency Services	N	471-2100	ddodt@kenner.la.us	
Edwin Lauricella		Harahan	Dept of Maintenance	Preventive Measures	N	737-5823	Edwin.lauricella@ci.harahan.la.us	

Committee Meeting #4 (Possible Activities) – December 4, 2018

Jefferson Parish Multijurisdictional Hazard Mitigation Plan Update

Name	✓ if Designee	Community	Dept/Org?	Representation	Member of Public? (Y/N)	Phone Number	Email Address	Signature
Haley Delery		Gretna		Preventive Measures	Y	638-6760	hdeler1@gmail.com	
Joe Valiente		Jefferson Parish	Department of Emergency Management	Emergency Services	N	655-2987	jvaliente@jeffparish.net	
John Young		Metairie		Natural Resource Protection	Y	352-8855	John@JohnYoungLA.com	
Kazem Alikhani		Jefferson Parish	ECM Consultants, Inc.	Structural Flood Control Projects	Y	352-8531	kazem@ecmconsultants.com	
Kevin Guffey		Kenner	Guffey Insurance	Public Information	Y	338-2504	kevin@guffeyinsurance.net	
Lisa Tapia		Westwego	City Clerk	Public Information	N	341-3424	lisatapia@cityofwestwego.com	
Maggie Talley		Jefferson Parish	Department of Floodplain Management and Hazard Mitigation	Property Protection	N	736-6541	mtalley@jeffparish.net	
Michelle Gonzales		Harahan	Arcadis	Property Protection	Y	225-223-2719	michelle.gonzales@arcadis.com	
Mike Lockwood Kathy Rose	✓	Jefferson Parish	Department of Environmental Affairs	Natural Resource Protection	N	504-736-6440	mlockwood@jeffparish.net krusco@jeffparish.net	KR

Committee Meeting #4 (Possible Activities) – December 4, 2018

Jefferson Parish Multijurisdictional Hazard Mitigation Plan Update

Name	✓ if Designee	Community	Dept/Org?	Representation	Member of Public? (Y/N)	Phone Number	Email Address	Signature
Mike Stewart		Jefferson Parish	Bryant Hammett & Associates	Property Protection	Y	234-9839	mstewart@bha-engineers.com	
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Nicole Cooper		Jean Lafitte	Capital Projects	Natural Resource Protection	N	233-1109	ncooper@townofjeanlafitte.com	
Nora Combel		Grand Isle	Building Dept	Preventive Measures	N		nc.togi@viscom.net	Via Conference Call
Oneil Malbrough		Grand Isle	GIS Engineering, LLC	Natural Resource Protection	Y	985-856-1575	oneilm@gisy.com	
Patrick Hamby		Jefferson Parish	Entergy	Emergency Services	Y	985-249-4134	phamby@entergy.com	
Ryan Daul		Jefferson Parish	Daul Insurance	Public Information	Y	782-1566	ryan@daulinsurance.com	
Scott Eustis		Jefferson Parish	Gulf Restoration Network	Natural Resource Protection	Y	237-0323	scott@healthygulf.org	
Stephen Romig		Jefferson Parish		Community Land Use and Comprehensive Planning	Y		Sromig1117@gmail.com	

Committee Meeting #4 (Possible Activities) – December 4, 2018

Jefferson Parish Multijurisdictional Hazard Mitigation Plan Update

Name	✓ if Designee	Community	Dept/Org?	Representation	Member of Public? (Y/N)	Phone Number	Email Address	Signature
Terri Wilkinson Rich Gillen	✓	Jefferson Parish	Department of Planning and Zoning	Community Land Use and Comprehensive Planning	N	736-6320	rgillen@jeffparish.net	
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John McCandless		Jefferson Parish	Floodplain Management & Hazard Mitigation		Y	736 6732	jmccandless@jeffparish.net	

Committee Meeting #5 (Actions)

The fifth HMPAC meeting was held on January 15, 2019 at the JEDCO Conference Center in Westwego. The meeting began at 10:00 AM.

Committee Meeting #5 Agenda

AGENDA

Jefferson Parish Multijurisdictional
Hazard Mitigation Plan Update
Committee Meeting #5 (Actions)
January 15, 2019
10:00 AM

1) Overview of Project so Far
2) Post-Disaster Redevelopment Policies/Procedures
3) Small Group Activity: Provide Updates for Existing Actions for Each Community
4) Prioritize Actions, Consider Financial Feasibility
5) Review Possible Activities from Last Meeting
6) For Selected Actions, Identify Who Will Be Responsible, Timeframe to Complete, Funding Sources, Priority
7) Develop New Actions
8) Next Steps
9) Questions/Concerns

Committee Meeting #5 Meeting Minutes

Jefferson Parish Hazard Mitigation Plan 2020 Update Meeting Minutes
Hazard Mitigation Committee Meeting #5: Actions
January 15, 2019 10:00AM to 12:00PM
JEDCO Conference Center
701A Churchill Pkwy, Westwego, LA 70094

Ryan Wiedenman, lead planner with Atkins, opened the meeting by reviewing the overall project progress and the major points that had been discussed at the last committee meeting.

Mr. Wiedenman then discussed post-disaster redevelopment policies and procedures with the group, asking the committee what plans were in place for substantial damage and if there would be any areas that would not be allowed to redevelop if they were substantially damaged. The committee noted that currently there are no areas that have been identified as such because the parish is built out in a way that it doesn't allow for areas to disallow development. The committee also noted that current procedures in place have been successful after past events, so there is little need to make major revisions.

Next, Mr. Wiedenman transitioned to discussing the main topic of the meeting which was to gather information on the mitigation actions in the plan. The rest of the meeting was structured to review existing actions, further develop actions that were identified as possible activities from the previous meeting, and identify any new actions to include in the plan.

For the first part of the meeting, committee members were broken into small groups based on their community to review existing actions in the 2015 version of the plan. Committee members were given a table that included all of their community's actions and asked to provide an updated status on progress made to achieve that action. Members could also review whether each action was completed, needed to be deleted/removed from the plan, or was in need of further work to accomplish it. For actions that were in need of further work, members were asked to provide a new estimated completion date. Finally, committee members were asked to generally review all of the other elements of each action including the responsible party, funding sources, and prioritization to ensure that the information that was currently in the table reflected up to date information.

For the second part of the meeting, committee members were asked to remain in their small groups and Mr. Wiedenman provided tables that included all of the possible activities that the committee had identified in the previous meeting as those that should be included in the plan update as actions. Because these activities were to be transitioned into new actions, standard information such as responsible party, funding sources, timeframe for completion, and prioritization would need to be identified for each. Mr. Wiedenman asked the committee members to work in their small groups to provide this information and to especially focus on actions that would fall under their particular purview and for which they would be identified as the responsible party.

For the third part of the meeting, Mr. Wiedenman explained that now that the teams had reviewed all existing actions and the possible activities from the previous meeting, the committee should now have a good sense of all the actions that will be included in the plan. He explained that, given that list of actions, now the committee should consider if there were any actions that should be included in the plan that had not been discussed. He provided blank mitigation action tables that included spaces to provide all of the pertinent information required for adding a new action to the plan and gave members time to develop any new actions that may have been overlooked.

Mr. Wiedenman then explained the next steps which were to develop a draft version of the plan based on the information collected through all of these meetings and through other sources outside of the meetings with a goal of having that draft ready in the spring. He asked committee members to be ready to provide information as needed if they were contacted and thanked them for their commitment to the process.

Mr. Wiedenman then adjourned the meeting.

Committee Meeting #5 Photos

Committee Meeting #5 Sign-In Sheets

Committee Meeting #5 (Actions) – January 15, 2019
Jefferson Parish Multijurisdictional Hazard Mitigation Plan Update

Name	✓ if Designee	Community	Dept/Org?	Representation	Member of Public? (Y/N)	Phone Number	Email Address	Signature
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Antwan Harris		Jefferson Parish	Public Information Office	Public Information	N		aharris@jeffparish.net	
Bruce Layburn	✓	Jefferson Parish	Private	Property Protection	Y	362-9920	bruce.layburn@gmail.com	
Cody Muller		Westwego	Muller's Auto Supply	Emergency Services	Y	341-3111	Cody.muller@yahoo.com	
Danika Gorrondona		Gretna	Dept of Building & Regulatory Inspections	Property Protection	N	202-0538	dgorrondona@gretnala.com	
Dena Frickey		Jean Lafitte	Levee Board	Structural Flood Control Projects	Y	383-4510	hamid.alizadeh@aptim.com	
Doug Dodt		Kenner	Office of Emergency Management	Emergency Services	N	471-2100	ddodt@kenner.la.us	
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Committee Meeting #5 (Actions) – January 15, 2019

Jefferson Parish Multijurisdictional Hazard Mitigation Plan Update

Name	✓ if Designee	Community	Dept/Org?	Representation	Member of Public? (Y/N)	Phone Number	Email Address	Signature
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Joe Valiente		Jefferson Parish	Department of Emergency Management	Emergency Services	N	655-2987	jvaliente@jeffparish.net	
John Young		Metairie		Natural Resource Protection	Y	352-8855	John@JohnYoungLA.com	
Kazem Alikhani		Jefferson Parish	ECM Consultants, Inc.	Structural Flood Control Projects	Y	352-8531	kazem@ecmconsultants.com	
Kevin Guffey		Kenner	Guffey Insurance	Public Information	Y	338-2504	kevin@guffeyinsurance.net	
Lisa Tapia		Westwego	City Clerk	Public Information	N	341-3424	lisatapia@cityofwestwego.com	
Maggie Talley		Jefferson Parish	Department of Floodplain Management and Hazard Mitigation	Property Protection	N	736-6541	mtalley@jeffparish.net	Maggie Talley
Michelle Gonzales		Harahan	Arcadis	Property Protection	Y	225-223-2719	~~michelle.gonzales@arcadis.com~~ mgonzales@trustar.com	
Mike Lockwood Kathy Russo	✓	Jefferson Parish	Department of Environmental Affairs	Natural Resource Protection	N		mlockwood@jeffparish.net	Kathy Russo

Committee Meeting #5 (Actions) – January 15, 2019

Jefferson Parish Multijurisdictional Hazard Mitigation Plan Update

Name	✓ if Designee	Community	Dept/Org?	Representation	Member of Public? (Y/N)	Phone Number	Email Address	Signature
Mike Stewart		Jefferson Parish	Bryant Hammett & Associates	Property Protection	Y	234-9839	mstewart@bha-engineers.com	
~~Mitch Theriot~~ Clinton Hotard	✓	Jefferson Parish	Department of Drainage	Structural Flood Control Projects	N	736-6753	mtheriot@jeffparish.net	CH
Nicole Cooper		Jean Lafitte	Capital Projects	Natural Resource Protection	N	233-1109	ncooper@townofjeanlafitte.com	
Nora Combel		Grand Isle	Building Dept	Preventive Measures	N		nc.togi@viscom.net	On conference call
Oneil Malbrough		Grand Isle	GIS Engineering, LLC	Natural Resource Protection	Y	985-856-1575	oneilm@gisy.com	
Patrick Hamby		Jefferson Parish	Entergy	Emergency Services	Y	985-249-4134	phamby@entergy.com	
Ryan Daul		Jefferson Parish	Daul Insurance	Public Information	Y	782-1566	ryan@daulinsurance.com	
Scott Eustis		Jefferson Parish	Gulf Restoration Network	Natural Resource Protection	Y	237-0323	scott@healthygulf.org	
Stephen Romig		Jefferson Parish		Community Land Use and Comprehensive Planning	Y		Sromig1117@gmail.com	

Committee Meeting #5 (Actions) – January 15, 2019

Jefferson Parish Multijurisdictional Hazard Mitigation Plan Update

Name	✓ if Designee	Community	Dept/Org?	Representation	Member of Public? (Y/N)	Phone Number	Email Address	Signature
Terri Wilkinson	✓	Jefferson Parish	Department of Planning and Zoning	Community Land Use and Comprehensive Planning	N	736-6320	rgillen@jeffparish.net	
Walter Baudier	✓	Metairie		Structural Flood Control Projects	Y		WBaudier@dei-engr.com	
John McCandless		Jefferson Parish	~~Floodplain Management & Hazard Mitigation~~ Community member	Resident	Y	504 736 6732	JMcCandless@jeffparish.net	

Public Meetings

During the 2020 Plan Update, the public was involved by requesting their attendance and participation in three public presentations/meetings. In accordance with legal requirements, the Parish published public notice about the meeting on the Parish website and in the public library branches at least two weeks before each meeting. The municipalities also posted the public meeting notices in each of their respective locations. The flyers explained the purpose of the meeting and provided the date, time, and location of the meeting place. The first public meeting was held at the East Bank Regional Library in August 2018. The second public meeting was held at the West Bank Regional Library in October of 2018. The third public meeting was held in April 2020, and due to the unique situation in the Parish at the time related to COVID-19, this meeting was held virtually and broadcast on JPTV and Facebook Live.

- Public meeting 1 (East Bank) August 22, 2018
- Public meeting 2 (West Bank) October 9, 2018
- Public meeting 3 (Virtual) April 16, 2020

Public notices, agendas, meeting minutes, and sign-in sheets can be found below.

In addition to public meetings, several other public information activities were implemented as the plan was being developed to explain the planning process to the public and encourage input. These activities are also documented below and include:

1. A website explaining the planning process that includes the time and location of public meetings, meeting agendas, status reports, and the draft plan.
2. A survey/questionnaire asking for feedback from the public which asks questions about the hazards that are the greatest threat to the community and what the best measures are to reduce risk and damage from future events.
3. Social media postings that both explain the process and identify where more information on the plan can be found and input can be contributed.
4. News reports on television and online explaining that the planning process is taking place and where the public can attend meetings to learn more information about the plan.
5. Documentation of expositions/symposiums on flood risk, the planning process, and ways that the public can get involved in mitigation, such as through the Parish's Adopt a Catch Basin program.
6. A brochure/mailer that was sent to residents within the Parish describing the planning process and directing residents to the HMP update website for more information.
7. Flyers posted in public locations such as at Parish government offices and public libraries that describe the plan and identify public meeting locations and times.
8. Official news release emails sent out to the public email list informing residents of the planning process and the website address where more information can be found.

Public Meeting #1

The first public meeting was held on August 22, 2018 at the East Bank Regional Library in Metairie. The meeting began at 10:00 AM. Notices were published for all municipalities. An example of the notice for Jefferson Parish and a photo from the meeting can be found below.

Public Meeting #1 Public Notices and Advertisements

AUGUST 22, 2018

PUBLIC MEETING

Hazard Mitigation Plan Update

Date: 08/22/18

Time: 10:00 AM-noon

Location:

East Bank Regional Library
4747 West Napoleon Ave.
Metairie, LA 70001

CONTACT

Jefferson Parish
Department of Floodplain Management and Hazard Mitigation

Phone:
(504) 736-6540

E-mail:
JPfloodplain@jeffparish.net

The Jefferson Parish Hazard Mitigation Plan is being updated through a collaborative effort with unincorporated Jefferson Parish, the cities of Gretna, Harahan, Kenner, Westwego, and the towns of Grand Isle and Jean Lafitte. A public meeting to discuss the Plan Update is scheduled for Wednesday, August 22, 2018 at the East Bank Regional Library in Metairie at 10:00 AM.

The public is invited to help identify community assets, describe natural hazards concerns, and assist in prioritizing proposed mitigation actions. For information on the HMP update process, visit our website at jeffparish.net/HMP.

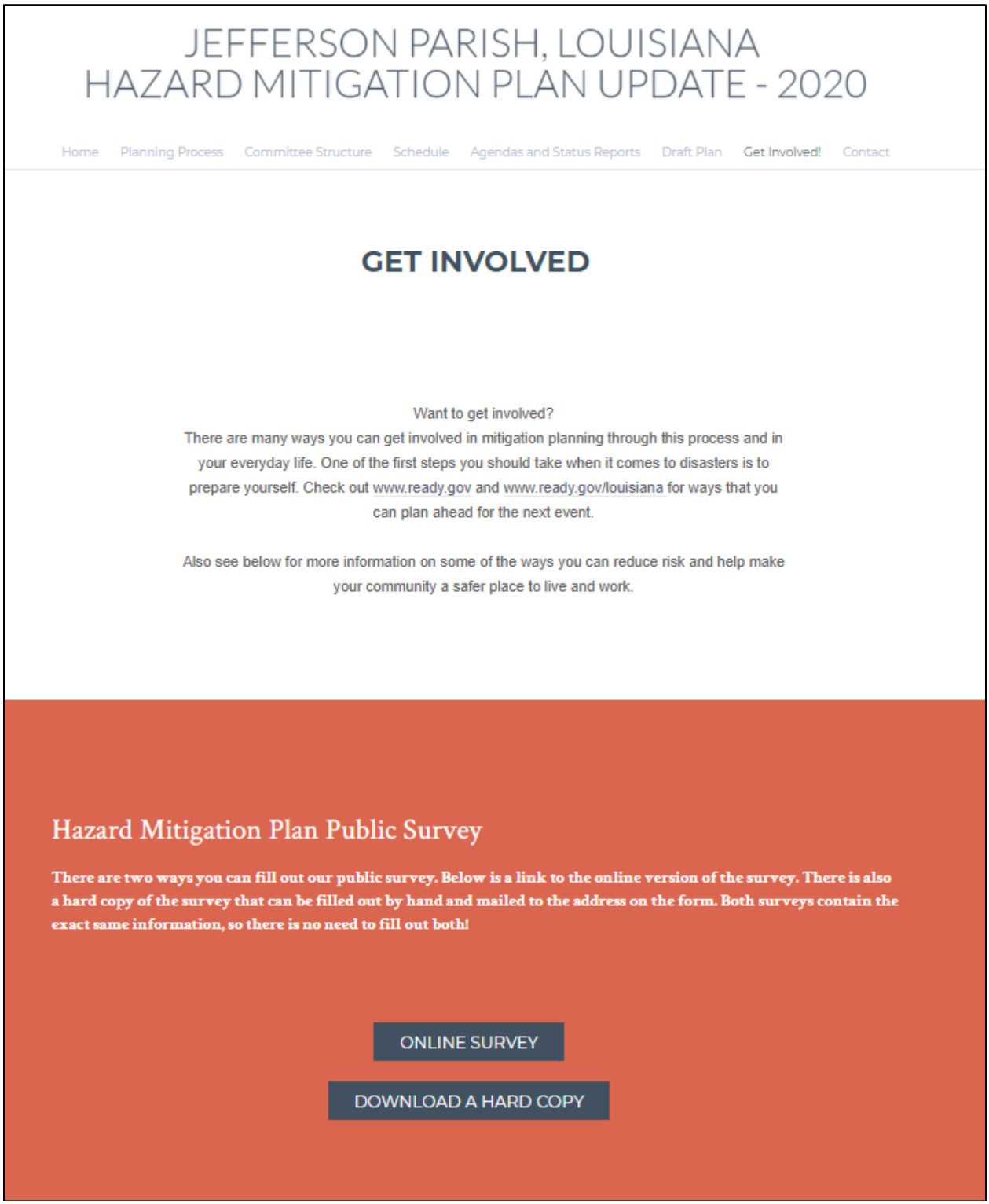
An approved plan will allow the Parish and participating municipalities to apply for federal funds for projects prioritized in the plan. The plan is also designed to support GOHSEP's statewide Hazard Mitigation Plan and enhance coordination efforts between local, state, and federal agencies during times of disaster.

In accordance with provisions of the American with Disabilities Act Amendments Act of 2008, as amended, Jefferson Parish shall not discriminate against individuals with disabilities on the basis of disability in its services, programs or activities. If you require auxiliary aids or devices, or other reasonable accommodation under the ADA Amendments Act, please submit your request to the ADA Coordinator at least forty-eight (48) hours in advance or as soon as practical. A seventy-two (72) hour advanced notice is required to request Certified ASL interpreters.

ADA Coordinator/Office of Citizens with Disabilities
1221 Elmwood Park Blvd., Suite 210, Jefferson, LA 70123
(504) 736-6086, ADA@jeffparish.net

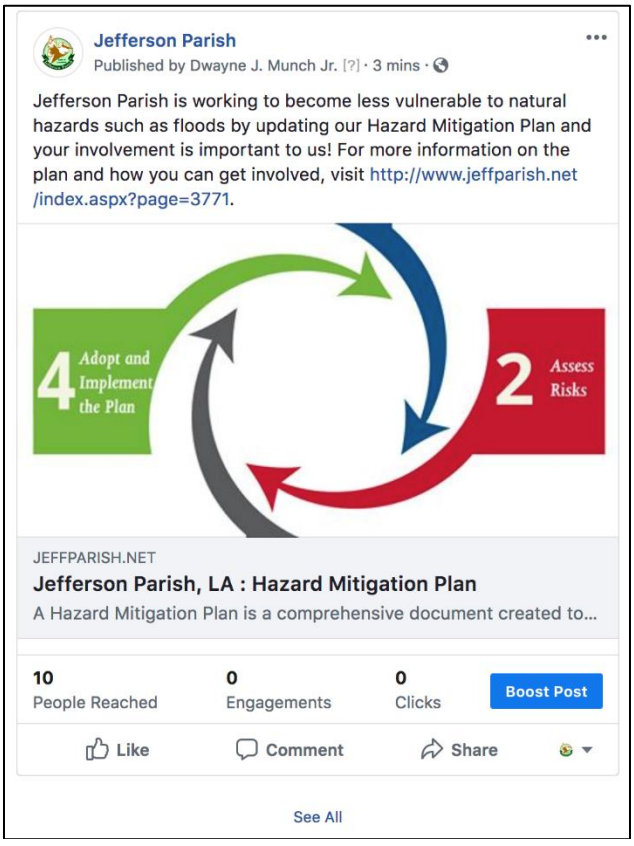
Public Meeting #1 Photo

Jefferson Parish Hazard Mitigation Plan Website



Example of Posting on City of Gretna's Website

Example of Postings on Social Media



Public Meeting #1 Agenda

AGENDA

Jefferson Parish Multijurisdictional
Hazard Mitigation Plan Update
Public Meeting #1
August 22, 2018
10:00 AM

1) Introductions

2) Overview of Mitigation Planning

3) Project Overview
   i) Planning Process
   ii) Hazard Mitigation Planning Committee
   iii) Project Schedule

4) Identify Hazards

5) Discuss Problems Associated with Hazards and Possible Solutions

6) Next Steps

7) Questions/Concerns

Public Meeting #1 Meeting Minutes

Jefferson Parish Hazard Mitigation Plan 2020 Update Meeting Minutes
Public Meeting #1
August 22, 10:00AM to 12:00PM
East Bank Regional Library
4747 W. Napoleon Ave, Metairie, LA 70001

Ryan Wiedenman, lead planner with Atkins, led the meeting and began by providing an overview of the agenda items and briefly reviewed each of the handouts that were distributed in the meeting packets. He then asked each of the meeting attendees to introduce themselves. Following introductions, he provided a brief overview of mitigation and the stages of the mitigation planning process that would be addressed through this plan.

Mr. Wiedenman emphasized that mitigation refers to actions (projects, policies, plans) to reduce the impacts of future hazard events. The hazard mitigation planning process looks at hazards, capability to conduct mitigation, and specific activities to reduce impacts of hazards. He explained how Federal legislation requires local governments to have a hazard mitigation plan in place to remain eligible for federal mitigation grants such as the Pre-Disaster Mitigation Grant Program, Hazard Mitigation Grant Program, and Flood Mitigation Assistance Program so there is funding to implement some of the actions that this plan may identify. Mr. Wiedenman then laid out all of the major steps of the mitigation plan update, including the planning process, the risk assessment, the capability assessment, and the mitigation strategy. He further explained at a high level what tasks would be carried out to complete each major step.

The discussion on the risk assessment was opened with an explanation of the hazards that are addressed in the current version of the Parish's hazard mitigation plan. Attendees were asked to review the list of existing hazards and if they had any comments on the hazards that were included. They were also asked if there are problems associated with these hazards that they see in their community and if there are specific geographic areas where the hazards pose a threat. Finally, they were asked to suggest any potential solutions to these issues that they'd like to see implemented.
During the discussion that followed, there was some dialogue on how the dam/levee failure hazard was the responsibility of the Army Corps of Engineers and how there have been some studies that showed that if a Hurricane Harvey level event were to impact the New Orleans area, there would be 28 billion gallons of water that needed to be pumped out, but that 15 billion of that could not be pumped out. Therefore, there is significant risk associated with managing a storm of this size. It appears that, going forward, many of the storms that have the greatest impacts may be rainfall events rather than wind events. We are very focused on wind speed in determining the severity of a storm (i.e. Saffir Simpson scale), but the big threat is from slow moving system that drops a lot of rain. This is a risk that we should look at further.

There was also a mention that there is a new push from the state that the state wants the Parish to be more self-reliant in terms of sheltering. There are currently 4 primary shelters in the Parish, 2 on each bank. They can shelter around 700 people total. There are also 24 parks/rec facilities that could be converted to shelters, but engineering reports for shelters need to occur to ensure they are protected. A potential mitigation action that was identified is the hardening of shelter locations and the addition of transfer switches and generators.

Other potential mitigation actions that were identified are looking at whether it would be possible to harden water and sewage plants as well. There was some debate about including swift water rescue training as part of this plan, but it was decided that that really falls more under operations/response planning than mitigation planning.

At the conclusion of the risk discussion, attendees were given an equal amount of fictitious money ($20 each) and asked to spend it in the various mitigation categories. Money could be considered grant money that communities received towards mitigation. Ideally, the exercise will help pinpoint areas of mitigation that the community may want to focus on when developing mitigation grants. Mr. Wiedenman explained that the results would be presented at the next Hazard Mitigation Planning Committee meeting.

The results were:

- Emergency Services - $15
- Prevention - $21
- Public Education and Awareness - $9
- Property Protection - $39
- Structural Projects - $12
- Natural Resource Protection - $4

Finally, Mr. Wiedenman discussed the plan update 2020 website and public survey and encouraged all attendees to take the survey and share with anyone they could. He also discussed the next steps for the process and identified the date of the next public meeting and meeting of the planning committee.

Mr. Wiedenman then adjourned the meeting.

Public Meeting #1 Sign-In Sheet

Public Meeting #1 – August 22, 2018
Jefferson Parish Multijurisdictional Hazard Mitigation Plan Update

ATKINS

Signature	Name	Community	Phone Number	Email Address
	James Hufft	JPPSS	504-349-7614	james.hufft@jppss.k12.la.us
	Doug Dodt	Kenner	504-471-2100	ddodt@kennerla.us
	Joe Valiente	JPEM	504-835-2487	JVALIENTE@JEFFPARISH.NET
Maggie Oliver Talley	Maggie O. Talley	JP Floodplain	504-736-6541	mtalley@jeffparish.net
	Craig Comeaux	Metairie	504-466-1472	cccomeaux@bellsouth.net

Public Meeting #2

The second public meeting was held on October 9, 2018 at the West Bank Regional Library in Harvey. The meeting began at 6:00 PM.

Public Meeting #2 Public Notices and Advertisements

Example of Postings in Public Locations

News Release Email

From: Rhonda Collins <RCollins@jeffparish.net>
Sent: Tuesday, September 25, 2018 12:13 PM
Subject: HAZARD EVENTS ON COMMUNITIES PUBLIC MEETING

NEWS RELEASE
JEFFERSON PARISH, LOUISIANA

September 25, 2018
FOR IMMEDIATE RELEASE

PUBLIC MEETING

HELPING TO REDUCE THE IMPACT OF HAZARD EVENTS ON COMMUNITIES

Jefferson Parish and its incorporated municipalities of Grand Isle, Gretna, Harahan, Jean Lafitte, Kenner and Westwego are working together to update the Parish's multi-jurisdictional Hazard Mitigation Plan required by FEMA every five years. The purpose of the plan is to provide a framework for community officials to use for reducing vulnerability to natural hazards such as flooding, hurricanes and tornadoes.

A second public meeting to discuss the Plan Update will be on Tuesday, October 9, 2018 at the West Bank Regional Library, 2751 Manhattan Boulevard in Harvey at 6:00PM. The public is invited to get an overview of how the planning process works, help identify natural hazards in Jefferson Parish and assess our risks and possible actions we can take to reduce those risks.

We also encourage members of the public to complete our Public Participation Survey. This survey is an opportunity for you to share your opinions and participate in the mitigation planning process. The information you provide will help us better understand your concerns so the Parish can implement mitigation projects that help reduce the severity of these natural hazard events.

To learn more and to complete the online Public Participation Survey, visit the website at jeffparish.net/HMP, the deadline for Survey responses is November 15, 2018.

###

Rhonda P. Collins, Public Information Office
10th Floor, Suite 1002
1221 Elmwood Park Boulevard
Jefferson, Louisiana 70123
RCollins@Jeffparish.net

504-736-6410, (F) 504-736-6413

Local Media Coverage

SHOW TRANSCRIPT

NEW ORLEANS — Jefferson Parish leaders updated the public Tuesday on their hazard mitigation plan.

The plan provides a framework to use for reducing vulnerability to natural hazards including tornadoes, flooding and hurricanes.

Parish President Mike Yenni says the plan includes Jefferson Parish's incorporated municipalities of Grand Isle, Gretna, Harahan, Jean Lafitte, Kenner and Westwego.

The Federal Emergency Management Agency requires the hazard mitigation plan to be updated every five years and Yenni said he relies heavily on the community's feedback to make the proper changes.

"It certainly opens our eyes to issues that we may not know about. Any issues where somebody says, you know, my streets always floods or this always happens, those are the kinds of things that are nice to hear," Yenni said.

Parish residents have until Nov. 15 to complete a survey and voice concerns about specific neighborhoods.

Click here for the survey.

Keep up with local news, weather and current events with the WDSU app here. Sign up for our email newsletters to get breaking news right in your inbox. Click here to sign up!

AlertMe

https://www.wdsu.com/article/jefferson-parish-leaders-update-public-on-hazard-mitigation-plan/23695975
https://www.youtube.com/watch?v=Fg1jGtqxTXU

Public Meeting #2 Agenda

AGENDA

Jefferson Parish Multijurisdictional
Hazard Mitigation Plan Update
Public Meeting #2
October 9, 2018
6:00 PM

1) Introductions

2) Overview of Mitigation Planning

3) Project Overview
   i) Planning Process
   ii) Hazard Mitigation Planning Committee
   iii) Project Schedule

4) Identify Hazards

5) Discuss Problems Associated with Hazards and Possible Solutions

6) Next Steps

7) Questions/Concerns

Public Meeting #2 Meeting Minutes

Jefferson Parish Hazard Mitigation Plan 2020 Update Meeting Minutes
Public Meeting #2
October 9, 2018 6:00PM to 7:30PM
West Bank Regional Library
2751 Manhattan Blvd, Harvey, LA 70058

Jamelyn Trucks, project manager with Atkins, led the meeting and began by providing an overview of the agenda items and briefly reviewed each of the handouts that were distributed in the meeting packets. She then asked each of the meeting attendees to introduce themselves. Following introductions, she provided a brief overview of mitigation and the stages of the mitigation planning process that would be addressed through this plan.

Ms. Trucks emphasized that mitigation refers to actions (projects, policies, plans) to reduce the impacts of future hazard events. The hazard mitigation planning process looks at hazards, capability to conduct mitigation, and specific activities to reduce impacts of hazards. She explained how Federal legislation requires local governments to have a hazard mitigation plan in place to remain eligible for federal mitigation grants such as the Pre-Disaster Mitigation Grant Program, Hazard Mitigation Grant Program, and Flood Mitigation Assistance Program so there is funding to implement some of the actions that this plan may identify. Ms. Trucks then laid out all of the major steps of the mitigation plan update, including the planning process, the risk assessment, the capability assessment, and the mitigation strategy. She further explained at a high level what tasks would be carried out to complete each major step.

The discussion on the risk assessment was opened with an explanation of the hazards that are addressed in the current version of the Parish's hazard mitigation plan. Attendees were asked to review the list of existing hazards and if they had any comments on the hazards that were included. They were also asked if there are problems associated with these hazards that they see in their community and if there are specific geographic areas where the hazards pose a threat. Finally, they were asked to suggest any potential solutions to these issues that they'd like to see implemented.
During the discussion that followed, there was discussion on several issues. Members of the audience shared how water goes down about 15 minutes after the rain stops. Parts of Manhattan Blvd (3500/3600 blocks) where it meets Lapalco (near the Village Green neighborhood) flood so much that people cannot pass in their vehicles until the water goes down. There is also street flooding at Wall Blvd by Oak Dale Park and Timberlane. It's a hindrance for drivers, but does not get high enough for house flooding.

In addition, there was a request that the Parish put out more information about the drainage improvements and pump stations and one concern about sewerage that comes out of the manhole during/after heavy rain events. The citizen understands that there used to be a pump in her area, but it was moved at some point. She doesn't know why and wants help from the Parish. For both of these concerns, Maggie Talley from Jefferson Parish agreed to put them in touch with the correct department within the Parish to discuss the concerns.

At the conclusion of the risk discussion, attendees were given an equal amount of fictitious money ($38 each) and asked to spend it in the various mitigation categories. Money could be considered grant money that communities received towards mitigation. Ideally, the exercise will help pinpoint areas of mitigation that the community may want to focus on when developing mitigation grants.

Ms. Trucks explained that the results would be presented at the next Hazard Mitigation Planning Committee meeting.

The results were:

- Emergency Services - $16
- Prevention - $80
- Public Education and Awareness - $25
- Property Protection - $20
- Structural Projects - $12
- Natural Resource Protection - $37

Finally, Ms. Trucks discussed the plan update 2020 website and public survey and encouraged all attendees to take the survey and share with anyone they could. She also discussed the next steps for the process and identified the date of the next public meeting and meeting of the planning committee.

Ms. Trucks then adjourned the meeting.

Public Meeting #2 Sign-In Sheet

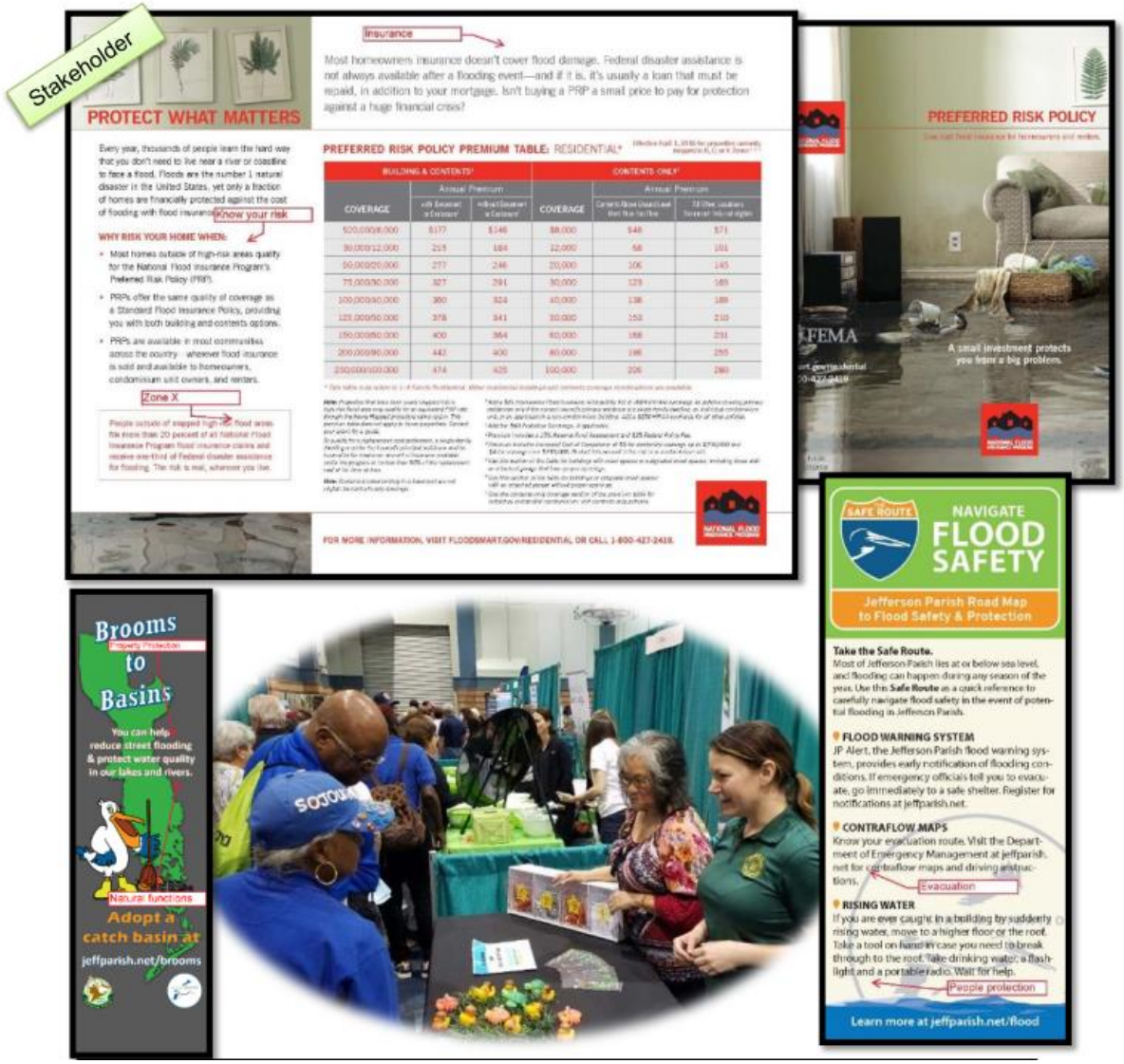
Public Meeting #2 – October 9, 2018

Jefferson Parish Multijurisdictional Hazard Mitigation Plan Update

Signature	Name	Community	Phone Number	Email Address
[illegible]	JOHN HECKER		504 509 1819	
Hal Helmker	HAL Helmker		504 235 8495	CoJACK1@Cox.NeT
Bertha Harris	Birtha Harris		(504)365-0865	
Cynthia Lee	Cynthia Lee		504-400-4848	
Lisa Synigal	LISA Synigal		504-393-2445	lisa@robertwolfeinc.com
Marc [illegible]	[illegible]		504-415-6669	
David DaJon	[illegible]		504-701-2981	DCE, INC, 944-2008 magic makeover
David Johnson	David Johnson		504-331-2719	insulationnation365@gmail.com
Karen Rapp	Karen Rapp		504-912-9830	Karenrapp@gmail.com
WilFred LaCaz			504 367 5566	None
Troy Porter	Troy Porter		504-239-6800	porterdvlpunltd@aol.com
[illegible]	A. Nieto		504-609 6095	365-Electric
Maggie Talley	Maggie Talley	JP Floodplain	504-736-6541	mtalley@jeffparish.net

Exposition/Symposium Public Outreach Events

An annual table event is held at the Jefferson Parish Senior Citizen Expo and the hazard mitigation planning process was referenced through the Brooms to Basins program and development of this publicly available site. The items provided annually are displayed below and include the STK - FEMA PRP brochure, Jeff Parish Flood Safety Brochure, and Brooms to Basins Bookmark.



Mailer/Flyer to Residents

Emergency Management

By
Ava Bougere

Happy New Year to all as we embrace 2019 and work toward another successful year in Jefferson Parish.

Congratulations go out to **Charles Hudson**, Coordinator III, on his new journey with the Kenner Fire Department. Over the years Charles has worn many hats and was a valuable asset to our department. We are sorry to see him go, but we commend and support him on following his dreams. He will be missed. Best wishes and continue to soar.

On December 18, 2018, Jefferson Parish Emergency Operations and Communications Center (EOCC) held the Region I Emergency Management Christmas luncheon. It was a great success. Thank you, Juvenile Services, for your delightful cooks. As always they are eager to come prepare and serve with great hospitality.

Thank you to our Coordinators for their participation in the weekly weather conference call with the National Weather Service. This information is shared with the Parish officials on the expected weather to keep our citizens abreast.

Gwen Bridgewater and Denita Hunter, of Juvenile Services, served up a wonderful Christmas luncheon

A Bittersweet moment. Farewell to **Williestein Burroughs**, aka T-Will, on her retirement. She was presented her Proclamation for 23 years of service with the Parish in President Mike Yenni's office. Mrs. Burroughs was accompanied by her co-workers to witness this wonderful accomplishment. She will be remembered for her hard work, enthusiasm, and loving and caring spirit. T-Will will most definitely be missed by many. Enjoy your retirement!

Williesteen Burroughs with Emergency Management Director Joe Valiente and President Yenni

Floodplain Management

By
Maggie Toliver

Floodplain Management and Hazard Mitigation welcomes its newest member: **John McCandless**! John is the new Floodplain/CRS Specialist for Jefferson Parish. Welcome, John.

Jefferson Parish and the municipalities within the parish are working together to update the Parish's multi-jurisdictional hazard mitigation plan, required by FEMA every five years. The plan provides a framework for community officials to reduce vulnerability to natural hazards. Representatives from each local government and other parish organizations have been reviewing the existing plan and meeting to complete the update to reflect community goals for mitigation. More information on this plan update can be found at www.jeffparish.net/HMP.

Don't wait until Mother Nature strikes. Soar above your flood risk. With new FEMA flood maps now in effect, you can easily find out if your risk has changed.

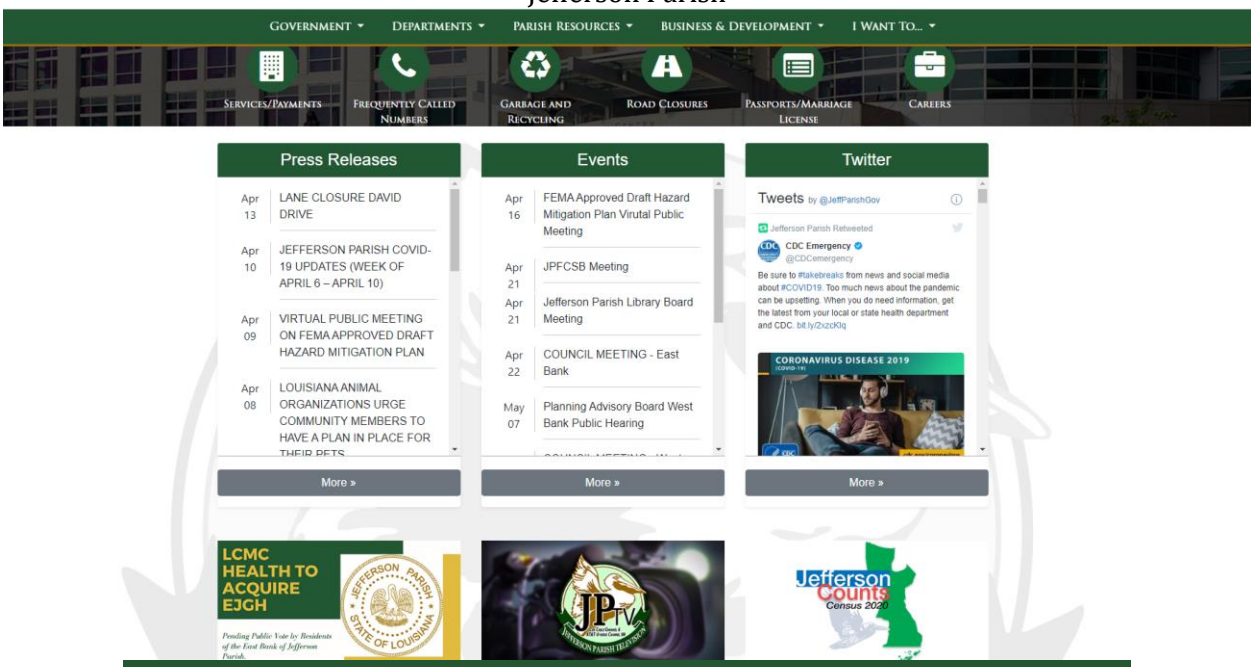
Visit www.jeffparish.net/flood to view your flood zone and/or request a Flood Zone Determination Letter. Whether you're in an X or an AE zone, flooding knows no boundaries. Protect yourself and your property by purchasing flood insurance.

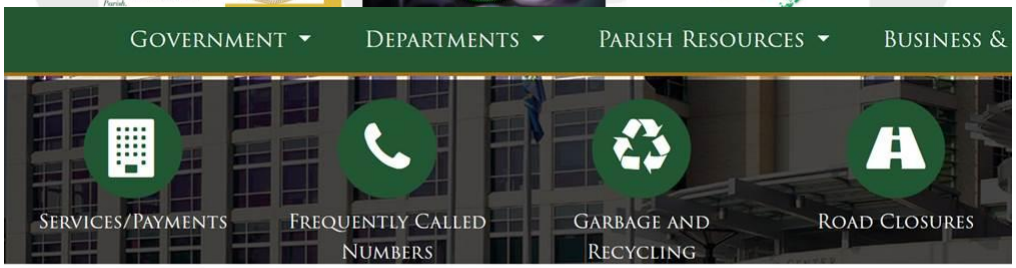
Public Meeting #3

The third public meeting was held virtually on April 16, 2020. The meeting began at 6:00 PM on JPTV and Facebook Live.

Advertisements on Local Government Websites

Jefferson Parish



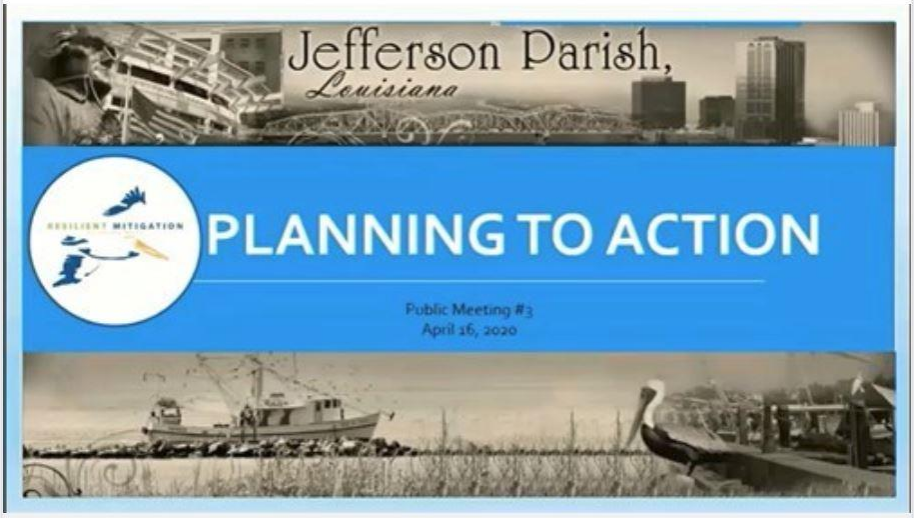


Jefferson Parish plans to premiere a video.
Yesterday at 9:24 AM ·

Public comments and participant sign-in will be accepted via this Google Form link https://forms.gle/NsMpR6WFRyMRtcY68 and on the Facebook comment thread. The team will respond to all questions within 48 hours.

To learn more and view a copy of the approved draft multi-jurisdictional Hazard Mitigation Plan 2020 Update and meeting agenda, visit jeffparish.net/HMP.

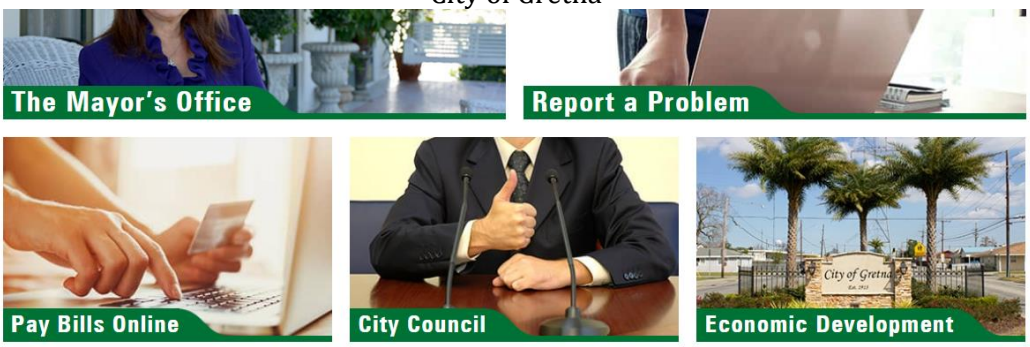
Jefferson Parish and its incorporated municipalities (Grand Isle, Gretna, Harahan, Jean Lafitte, Kenner and Westwego) have worked together to update the Parish's multi-jurisdictional Hazard Mitigation Plan which is required by FEMA every five years. The purpose of the plan is to provide a framework for community officials to use for reducing vulnerability to natural hazards such as flooding, hurricanes, and tornadoes.



TODAY AT 6:00 PM
DRAFT HAZARD MITIGATION PL...
Get Reminder
Tune in to watch live

5 11 Shares

City of Gretna



LATEST NEWS

Town of Jean Lafitte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City of Kenner Government
2 hrs
VIRTUAL PUBLIC MEETING ON FEMA APPROVED DRAFT HAZARD MITIGATION PLAN; MEETING WILL BE VIEWABLE ON JPTV AND JEFFERSON PARISH FACEBOOK
The City of Kenner improved to a Class 6 Flood Rating from the Federal Emergency Management Association (FEMA) Community Rating System (CRS) this spring. One of the components of the city floodplain program is to have a Hazard Mitigation Plan.
Jefferson Parish and its incorporated municipalities (Grand Isle, Gretna, Harahan, Jean Lafitte, Kenner and Westwego) have worked together to update this multi-jurisdictional Hazard Mitigation Plan, which is required by FEMA every five years. The purpose of the plan is to provide a framework for community officials to use for reducing vulnerability to natural hazards such as flooding, hurricanes, and tornadoes.
Due to COVID-19, this public meeting will be held virtually on Thursday, April 16, 2020 at 6 p.m. and should last approximately 45 minutes. The public is invited to attend the virtual meeting to view the Plan Update presentation prior to official adoption to get an overview of the plan document and its highlights. Participants will also be given the opportunity to submit public comment and/or questions.
On Thursday, April 16 at 6 p.m., the virtual meeting will be viewable on JPTV (Channel 6 on Cox and Channel 99 on AT&T Uverse), as well as the Jefferson Parish Facebook page at www.facebook.com/JeffersonParishGov/
Public comments and participant sign-in will be accepted via this Google Form link https://forms.gle/NsMpR6WFRyMRtcY68 and on the Facebook comment thread. The team will respond to all questions within 48 hours.
To learn more and to view a copy of the approved draft of the multi-jurisdictional Hazard Mitigation Plan 2020 Update and meeting agenda, visit jeffparish.net/HMP
DEPARTMENT
Community
See All
Invite your friends to like this Page
7,389 people like this
7,787 people follow this
Gary Gros likes this or has checked in
452 check-ins
About
See All
(504) 468-7200
Typically replies within a day
Send Message
www.kenner.la.us
Government Organization · Public & Government Service
Hours 8:30 AM - 4:30 PM
Open Now
Suggest Edits
Page Transparency
See More
Facebook is showing information to help you better understand the purpose of a Page. See actions taken by the people who manage and post content.
Page created - August 4, 2011
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Facebook © 2020

Press Release

NEWS RELEASE

JEFFERSON PARISH, LOUISIANA

April 9, 2020

FOR IMMEDIATE RELEASE

VIRTUAL PUBLIC MEETING ON FEMA APPROVED DRAFT HAZARD MITIGATION PLAN

The virtual meeting will be viewable on JPTV and Jefferson Parish Facebook

JEFFERSON, LA – Jefferson Parish and its incorporated municipalities (Grand Isle, Gretna, Harahan, Jean Lafitte, Kenner and Westwego) have worked together to update the Parish's multi-jurisdictional Hazard Mitigation Plan which is required by FEMA every five years. The purpose of the plan is to provide a framework for community officials to use for reducing vulnerability to natural hazards such as flooding, hurricanes, and tornadoes.

Due to COVID-19, this public meeting will be held virtually on Thursday, April 16, 2020 at 6 p.m. and should last approximately 45 minutes. The public is invited to attend the virtual meeting to view the Plan Update presentation prior to official adoption to get an overview of the plan document and its highlights. Participants will also be given the opportunity to submit public comment and/or questions.

On Thursday, April 16 at 6 p.m., the virtual meeting will be viewable on JPTV (Channel 6 on Cox and Channel 99 on AT&T Uverse), as well as the Jefferson Parish Facebook page at www.facebook.com/JeffersonParishGov/

Public comments and participant sign-in will be accepted via this Google Form link https://forms.gle/NsMpR6WFRyMRtcY68 and on the Facebook comment thread. The team will respond to all questions within 48 hours.

To learn more and view a copy of the approved draft multi-jurisdictional Hazard Mitigation Plan 2020 Update and meeting agenda, visit jeffparish.net/HMP.

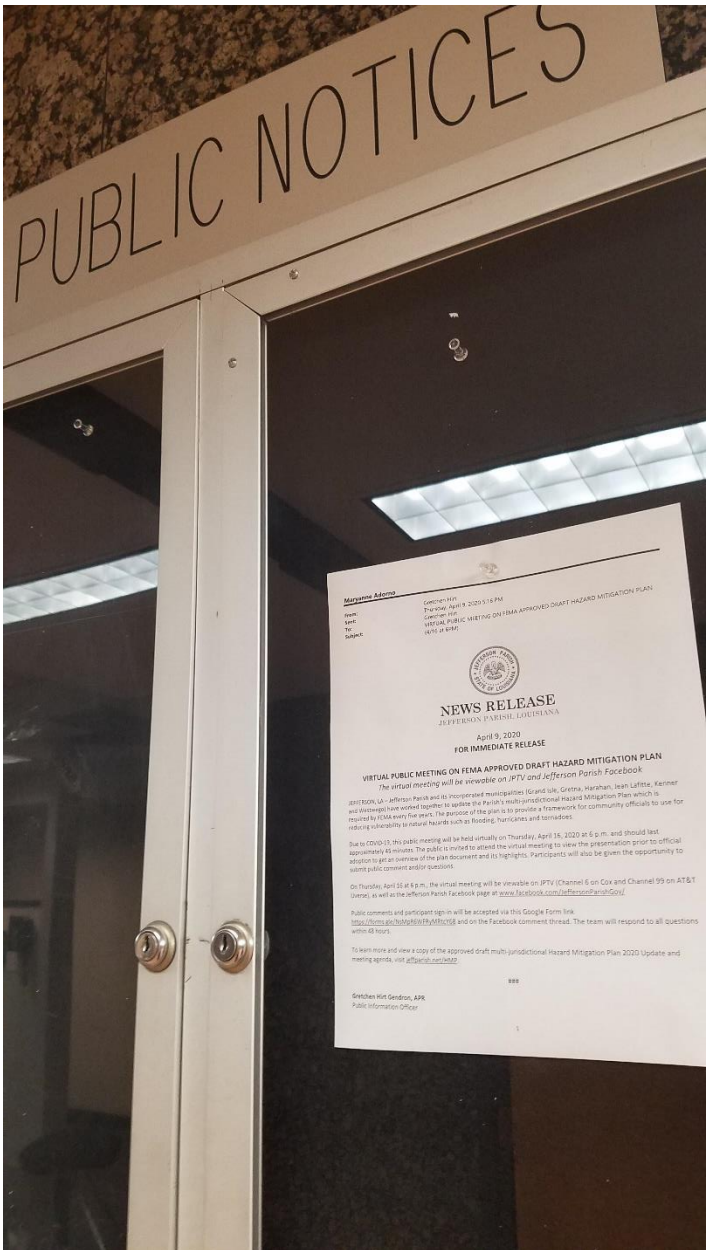
###

Jefferson Parish Public Information Office
1221 Elmwood Park Boulevard, Suite 1002
Jefferson, LA 70123

Gretchen Hirt Gendron, PIO
Office: 504-736-6412

JPALERT – SIGN UP TO RECEIVE EMERGENCY ALERTS

Posting on Public Notice Board



Public Meeting #3 Agenda

AGENDA

Jefferson Parish Multijurisdictional
Hazard Mitigation Plan Update
Public Meeting #3
April 16, 2020
6:00 PM

1) Introductions

2) Overview of Mitigation Planning

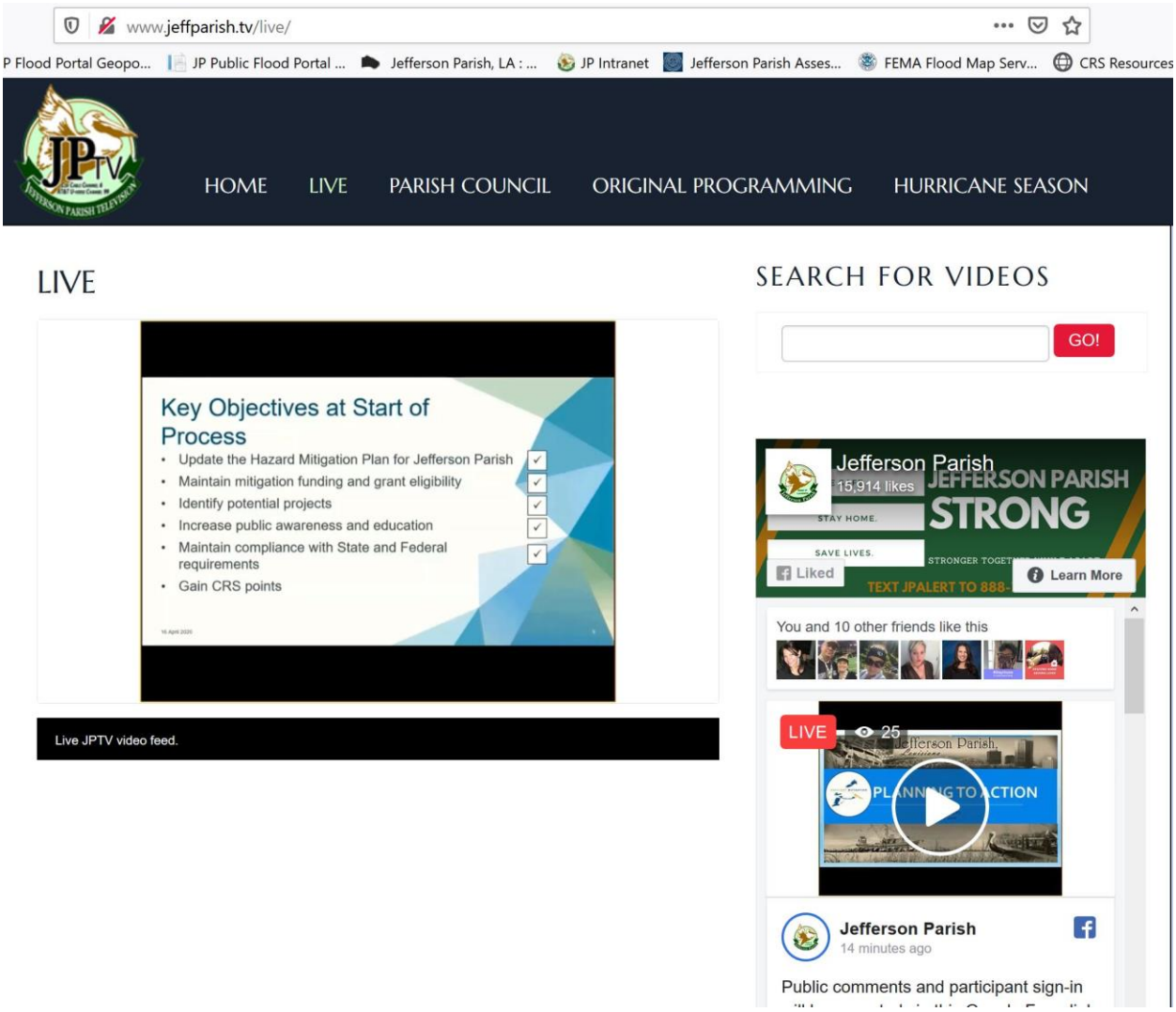
3) Project Overview
   i) Planning Process
   ii) Hazard Mitigation Planning Committee
   iii) Sections of Plan

4) Plan Highlights
   i) Community Rating System Credit
   ii) Online Asset Inventory

5) Next Steps

6) Questions/Concerns

JPTV Feed Screenshot



Facebook Live Screenshot

Public Meeting #3 Meeting Minutes

Jefferson Parish Hazard Mitigation Plan 2020 Update Meeting Minutes
Public Meeting #3
August 22, 2020 6:00PM to 7:00PM
Virtual Public Meeting Broadcast on JPTV and Facebook Live

Ryan Wiedenman, lead planner with Atkins, led the meeting and began by providing an overview of the agenda items and briefly discussed the unique circumstances under which this meeting was being held due to COVID-19. He then asked each of the meeting attendees to sign in to the meeting using the Google form link provided and explained that any questions or comments could also be included in the appropriate section of the Google form as well as the comments thread in Facebook Live.

Following the initial housekeeping items, Mr. Wiedenman provided a brief overview of mitigation and the stages of the mitigation planning process that would be addressed through this plan. He emphasized that mitigation refers to actions (projects, policies, plans) to reduce the impacts of future hazard events. The hazard mitigation planning process looks at hazards, capability to conduct mitigation, and specific activities to reduce impacts of hazards. He explained how Federal legislation requires local governments to have a hazard mitigation plan in place to remain eligible for federal mitigation grants such as the Pre-Disaster Mitigation Grant Program, Hazard Mitigation Grant Program, and Flood Mitigation Assistance Program so there is funding to implement some of the actions that this plan may identify. Mr. Wiedenman then laid out all of the key objectives for this update of the mitigation plan, explaining how each had been accomplished throughout the process.

Mr. Wiedenman then described in additional detail each of the major steps of the planning process and explained some of the highlights of each section of the plan. The discussion on the risk assessment was opened with an explanation of the hazards that were identified and analyzed through the risk analysis process. He showed several of the risk maps that were produced as well as problem statements that were developed and how the repetitive loss area analysis was carried out. He also provided a brief synopsis of the critical facility analysis and what types of critical facilities were included in this analysis.

Next, he went on to explain how the results of the risk assessment and capability assessment helped drive the development of the mitigation strategy section of the plan. In this section, he described some examples of the goals and actions that had been included in the plan and laid out some of the processes through which these decisions were made by the planning team. He also explained how the public had been involved in the process overall and the extensive efforts that were undertaken by the planning team provide opportunities for public involvement.

Finally, Mr. Wiedenman explained how the plan had been developed in accordance with the plan development guidance of the Community Rating System which allowed the Parish to earn points that can lead to a reduction in flood insurance premiums for citizens. He explained that during this update cycle, the planning team was anticipating receiving around 320 points for the hazard mitigation plan which is a great accomplishment.

He then concluded the meeting by explaining the final steps that would be taking place in the next few weeks wherein the plan would be officially adopted by local governing councils and then the implementation of the plan would take place with annual updates until the next 5-year update. The meeting was then ended.

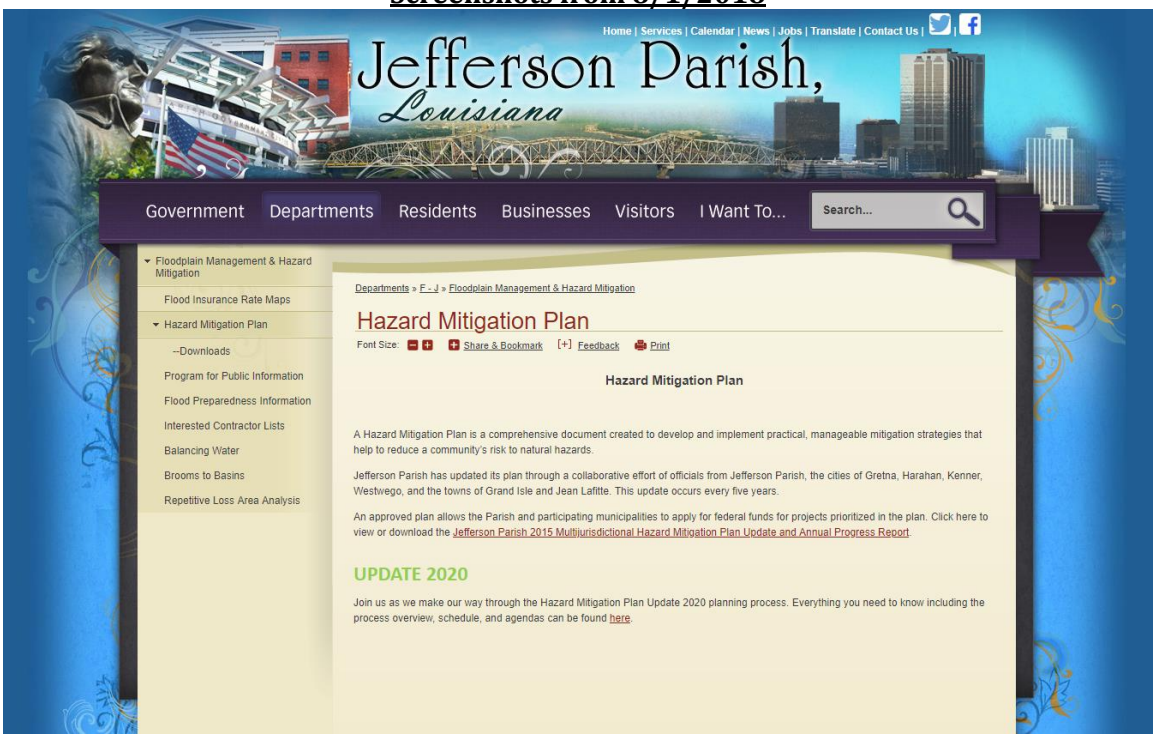
Public Meeting #3 Sign In

Timestamp	Name	Email	Phone number	Address
2020/04/09 7:45:41 PM AST	Nora Combel	nora_combel@yahoo.com	5043821705	P.O. Box 676
2020/04/15 9:47:49 PM AST	Maurizio Francescon	mdfrancescon@gmail.com	5044607578	239 West Ave Harahan 70123
2020/04/16 6:28:33 PM AST	Michelle Gonzales	mgonzales@jeffparish.net	2252232719	129 Ravan Ave Harahan LA 70123
2020/04/16 6:55:53 PM AST	Bruce W Layburn	bruce.layburn@gmail.com	5048841685	3621 Lake Catherine Drive
2020/04/16 7:00:29 PM AST	Erica Bustillo	eac413@yahoo.com	5043887962	50 Beauregard Drive Gretna, LA 70053
2020/04/16 7:02:19 PM AST	Maggie Talley	mtalley@jeffparish.net	504-736-6541	
2020/04/16 7:04:47 PM AST	Michael Wesley	mwesley@gretnala.com	504-363-1567	708 Hesper Ave, Metairie, LA
2020/04/16 7:04:51 PM AST	Richard Gillen	rgillen@jeffparish.net	504-736-6320	125 Ridgewood Drive, Metairie, LA 70005
2020/04/16 7:05:12 PM AST	Seamus Riley	SMRiley@JeffParish.net	504.736.6441	
2020/04/16 7:07:39 PM AST	Jason Smith	jasmmvp@cox.net	5048871765	4932 Hastings St., Metairie, LA 70006
2020/04/16 7:18:15 PM AST	Doug Dodt	ddodt@kenner.la.us	504-471-2100	1610 Rev. Richard Wilson Drive Kenner LA 70062
2020/04/16 7:43:47 PM AST	Kenner Office of Emergency Management	OEM@kenner.la.us		
2020/04/16 7:44:08 PM AST	Misty Camardelle	mcamardelle@jeffparish.net	504-736-6719	1221 Elmwood Park Blvd., Suite 310, Harahan, LA 70123

HMP 2020 Update Website

During the 2020 update, the Parish developed a website to encourage public involvement in the planning process and help push out information that was relevant to the process for the public. Below are a number of screenshots that demonstrate that the website was updated frequently throughout the process, including with agendas, status reports, and information on the schedule for public meetings. The website address (www.jeffparish was also referenced in other public outreach activities as a source of information on the plan and update process.

Screenshots from 8/1/2018



JEFFERSON PARISH, LOUISIANA
HAZARD MITIGATION PLAN UPDATE - 2020

PLANNING PROCESS

The typical mitigation planning process usually involves 3 major components:

- Risk Assessment (what are the hazard risks/problems our community faces?)
- Capability Assessment (what could we do about them?)
- Mitigation Actions (what will we do about them?)

Through this process, we will be re-evaluating our risks and trying to determine what the best solutions are that we can implement to address those risks. Often a good place to start when addressing risk is with repetitive loss areas (those that have experienced multiple losses from flooding). Jefferson Parish has carried out an in-depth Repetitive Loss Area Analysis in five of these repetitive loss areas. The final report is available here:

RLAA Reports

JEFFERSON PARISH, LOUISIANA
HAZARD MITIGATION PLAN UPDATE - 2020

COMMITTEE STRUCTURE

All of the communities that are participating in this plan update have dedicated representatives to the planning committee to ensure that their communities interests are addressed and that they are fully engaged in the mitigation planning process. This committee will act as the primary conduit for plan updates and development and will make determinations on items such as actions that each community should adopt to try to reduce risk. The committee is also composed of members of the public to ensure that citizen input is integrated into the plan. The committee membership can be found below.

Resolution Naming Committee

Resolution Naming Committee
Download File

JEFFERSON PARISH, LOUISIANA
HAZARD MITIGATION PLAN UPDATE - 2020

SCHEDULE

The schedule for updating this plan will take place over roughly a year. Our planned meeting schedule can be found below as well as specific locations and times for committee meetings and public meetings. Please note that we will do everything in our power to maintain this schedule and the meeting locations, but this schedule is subject to change if circumstances warrant. We will attempt to provide as much advance notice on this website as possible if changes do occur.

Meeting Locations and Times

Committee Meetings

Committee Meeting #1 (Hazards)
August 21, 1:00PM to 3:00PM
JEDCO Conference Center
701A Churchill Pkwy, Westwego, LA 70094

Committee Meeting #2 (Problems/Risk)
September 18, 10:00AM to 12:00PM
JEDCO Conference Center
701A Churchill Pkwy, Westwego, LA 70094

Committee Meeting #3 (Goals)
October 23, 10:00AM to 12:00PM
Joseph S. Yenni Building, Room 405
1221 Elmwood Pk. Blvd., Jefferson, LA 70181

Committee Meeting #4 (Possible Activities)
December 4, 10:00AM to 12:00PM
JEDCO Conference Center
701A Churchill Pkwy, Westwego, LA 70094

Committee Meeting #5 (Actions)
January 15, 10:00AM to 12:00PM
JEDCO Conference Center
701A Churchill Pkwy, Westwego, LA 70094

Public Meetings

Public Meeting #1
August 22, 10:00AM to 12:00PM
East Bank Regional Library
4747 W Napoleon Ave, Metairie, LA 70001

Public Meeting #2
Estimated for August 2019
Date/Time and Location Pending

JEFFERSON PARISH, LOUISIANA
HAZARD MITIGATION PLAN UPDATE - 2020

Home | Planning Process | Committee Structure | Schedule | Agendas and Status Reports | Draft Plan | Get Involved! | Contact

AGENDAS AND STATUS REPORTS

All meeting agendas and status reports from these meetings will be posted here on the website as they are produced.

Agendas

Committee Meeting #1 Agenda: August 21, 2018
Download File

Public Meeting #1 Agenda: August 22, 2018
Download File

Status Reports

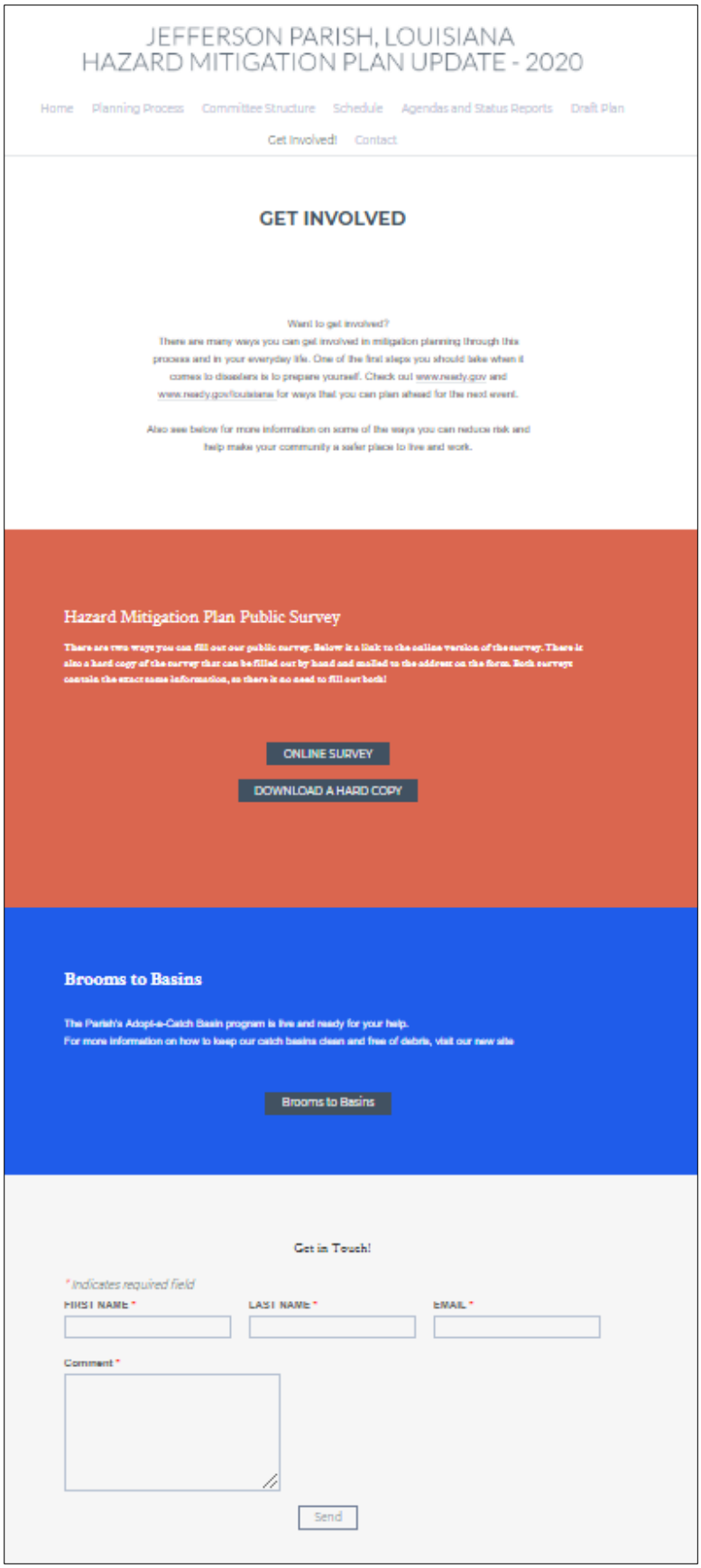
Committee Meeting #1 Status Report: August 21, 2018
Download File

Public Meeting #1 Status Report: August 22, 2018
Download File

JEFFERSON PARISH, LOUISIANA
HAZARD MITIGATION PLAN UPDATE - 2020

DRAFT PLAN

The draft plan is currently not available as we are in the process of developing it.
Please check back again soon as we will have an open public comment period when the final draft plan is ready.


JEFFERSON PARISH, LOUISIANA
HAZARD MITIGATION PLAN UPDATE - 2020
Home
Planning Process
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GET INVOLVED
Want to get involved?
There are many ways you can get involved in mitigation planning through this process and in your everyday life. One of the first steps you should take when it comes to disasters is to prepare yourself. Check out www.ready.gov and www.ready.gov/louisiana for ways that you can plan ahead for the next event.
Also see below for more information on some of the ways you can reduce risk and help make your community a safer place to live and work.
Hazard Mitigation Plan Public Survey
There are two ways you can fill out our public survey. Below is a link to the online version of the survey. There is also a hard copy of the survey that can be filled out by hand and mailed to the address on the form. Both surveys contain the exact same information, so there is no need to fill out both!
ONLINE SURVEY
DOWNLOAD A HARD COPY
Brooms to Basins
The Parish's Adopt-a-Catch Basin program is live and ready for your help.
For more information on how to keep our catch basins clean and free of debris, visit our new site
Brooms to Basins
Get in Touch!
* Indicates required field
FIRST NAME *
LAST NAME *
EMAIL *
Comment *
Send

JEFFERSON PARISH, LOUISIANA
HAZARD MITIGATION PLAN UPDATE - 2020

CONTACT

Get in Touch!

If you have questions or comments about this process, please feel free to fill out the form below and let us know what is on your mind.

You may also contact your local community officials using the contact information provided on their respective websites:

Jefferson Parish: http://www.jeffparish.net/
Town of Grand Isle: https://www.townofgrandisle.com/
City of Gretna: https://www.gretnala.com/
City of Harahan: http://www.cityofharahan.com/
Town of Jean Lafitte: https://www.townofjeanlafitte.com/
City of Kenner: http://www.kenner.la.us/
City of Westwego: http://www.visitwestwego.com/

** Indicates required field*

Name *

First Last

Email *

Comment *

Submit

Screenshots from 9/17/18

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1221 Elmwood Pk. Blvd., Jefferson, LA 70123

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Committee Meeting #5 (Actions)
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701A Churchill Pkwy, Westwego, LA 70094

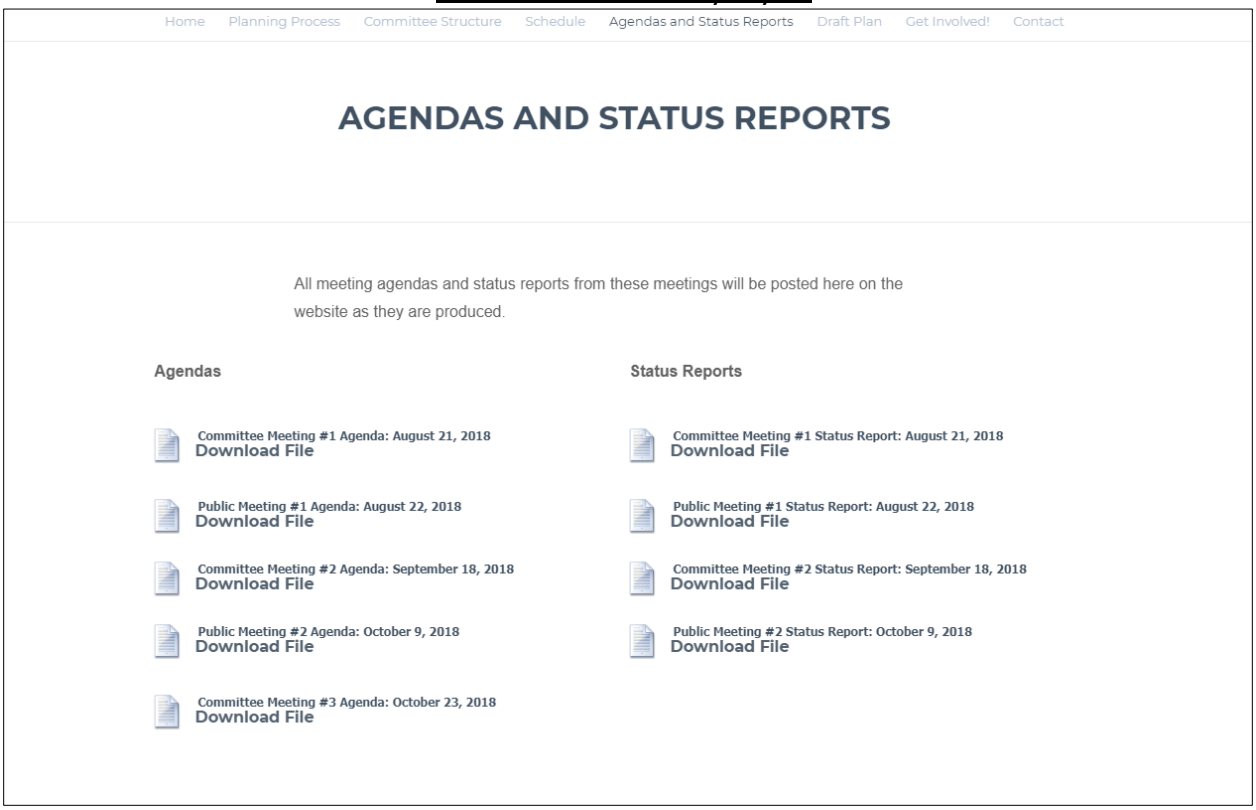
Public Meetings

Public Meeting #1
August 22, 2018 10:00AM to 12:00PM
East Bank Regional Library
4747 W Napoleon Ave, Metairie, LA 70001

Public Meeting #2
October 9, 2018 6:00PM to 7:30PM
West Bank Regional Library
2751 Manhattan Blvd, Harvey, LA 70058

Public Meeting #3
Estimated for August 2019
Date/Time and Location Pending

Screenshots from 10/11/18



Screenshots from 1/21/19

JEFFERSON PARISH, LOUISIANA
HAZARD MITIGATION PLAN UPDATE - 2020

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Public Meeting #2 Agenda: October 9, 2018
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Committee Meeting #3 Agenda: October 23, 2018
Download File

Committee Meeting #4 Agenda: December 4, 2018
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Committee Meeting #5 Agenda: January 15, 2019
Download File

Status Reports

Committee Meeting #1 Status Report: August 21, 2018
Download File

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Public Meeting #2 Status Report: October 9, 2018
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Committee Meeting #3 Status Report: October 23, 2018
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Committee Meeting #4 Status Report: December 4, 2018
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Committee Meeting #5 Status Report: January 15, 2019
Download File

Screenshots from 4/9/20

Meeting Locations and Times

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Public Meeting #1
August 22, 2018 10:00AM to 12:00PM
East Bank Regional Library
4747 W Napoleon Ave, Metairie, LA 70001

Public Meeting #2
October 9, 2018 6:00PM to 7:30PM
West Bank Regional Library
2751 Manhattan Blvd, Harvey, LA 70058

Public Meeting #3
April 16, 2020 6:00PM to 7:00PM
Virtual Public Meeting
Available on JPTV and Facebook Live

JEFFERSON PARISH, LOUISIANA
HAZARD MITIGATION PLAN UPDATE - 2020

DRAFT PLAN

The draft plan is now available!

It can be downloaded by clicking the link below or copying and pasting the url into your browser address bar. Then a PDF of the plan can be downloaded by clicking the "Download" button in the top right corner of the browser.

https://atkins.box.com/s/1jz21bdstvd4ej7lra5846a4whbc7tvl

Public Participation Survey

Additional public involvement was sought using a public survey instrument that was made available as both a hard copy and web-based survey. A copy of the survey and a detailed summary of the survey results are provided below.

PUBLIC PARTICIPATION SURVEY
FOR HAZARD MITIGATION PLAN UPDATE

We need your help! Please take a few minutes to complete this survey.

Jefferson Parish is working to become less vulnerable to natural hazards, such as floods, tornadoes, and severe storms, by updating our Hazard Mitigation Plan and your participation is important to us!

The parish, along with local jurisdictions and other partners, is working to prepare a multi-jurisdictional *Hazard Mitigation Plan Update*. This Plan will identify and assess our community's hazard risks and determine how to best mitigate, or minimize and manage, those risks.

This survey is an opportunity for you to share your opinions and participate in the mitigation planning process. The information you provide will help us better understand your hazard concerns and can lead to mitigation activities that should help reduce the impacts of future hazard events.

Please help us by completing this survey by November 15, 2018 and returning it to:

Ryan Wiedenman, Atkins
1616 E Millbrook Road, Suite 160
Raleigh, NC 27609

Surveys can also be faxed to: (919) 876-6848 c/o Ryan Wiedenman or scanned and emailed to: ryan.wiedenman@atkinsglobal.com.

If you have any questions regarding this survey or would like to learn about more ways you can participate in the development of the *Jefferson Parish Hazard Mitigation Plan Update*, please contact Atkins, the planning consultant for the project. You may reach Ryan Wiedenman (Atkins) at (919) 431-5295 or by email at ryan.wiedenman@atkinsglobal.com.

1. Where do you live?

- ❑ Jefferson Parish
- ❑ City of Gretna
- ❑ City of Harahan
- ❑ City of Kenner
- ❑ City of Westwego
- ❑ Town of Grand Isle
- ❑ Town of Jean Lafitte
- ❑ Other: _____

2. Is your home located in a floodplain?

- ❑ Yes
- ❑ No
- ❑ I don't know

3. **Do you have flood insurance for your home/personal property?**

- ❑ Yes
- ❑ No
- ❑ I don't know

a. If "No," why not?

- ❑ Not located in floodplain
- ❑ Too expensive
- ❑ Not necessary because it never floods
- ❑ Not necessary because my property is elevated or otherwise protected
- ❑ Never really considered it
- ❑ Other (please explain): _____

4. **Have you ever experienced or been impacted by a natural disaster?**

- ❑ Yes
- ❑ No

a. If "Yes," please explain:

5. **On a scale of 1 to 5, how concerned are you about the possibility of your community being impacted by a natural disaster?**

- ❑ 1 – Not at all
- ❑ 2 – Slightly
- ❑ 3 – Moderately
- ❑ 4 – Very
- ❑ 5 – Extremely

6. **Please select the <u>three</u> hazards you think pose the *greatest concern* to your community:**

- ❑ Flood
- ❑ Hurricane and Tropical Storm
- ❑ Storm Surge
- ❑ Tornado
- ❑ Coastal Erosion
- ❑ Subsidence
- ❑ Hailstorm
- ❑ Winter Storm
- ❑ Lightning
- ❑ Drought
- ❑ Wildfire
- ❑ Earthquake
- ❑ Sea Level Rise

7. **Is there another hazard not listed above that you think is a wide-scale threat to your community?**

   ❑ Yes (please explain): _____
   ❑ No

8. **On a scale of 1 to 5, how prepared do you feel if a natural disaster were to occur?**

   ❑ 1 – Not at all
   ❑ 2 – Slightly
   ❑ 3 – Moderately
   ❑ 4 – Very
   ❑ 5 – Extremely

9. **Have you taken any actions to make your home, neighborhood, or family safer from hazards?**

   ❑ Yes
   ❑ No

   a. **If "Yes," please explain:**

10. **Are you interested in making your home, neighborhood, or family safer from hazards?**

    ❑ Yes
    ❑ No

11. **On a scale of 1 to 5, how informed do you feel about the risks and potential impacts of natural disasters?**

    ❑ 1 – Not at all
    ❑ 2 – Slightly
    ❑ 3 – Moderately
    ❑ 4 – Very
    ❑ 5 – Extremely

12. Do you know which government department or agency to contact regarding your risks from hazards in your area?

- ❑ Yes
- ❑ No

13. Please select the way(s) you prefer to receive information about how to make your home, neighborhood, or family safer from hazards:

- ❑ Newspaper
- ❑ Television
- ❑ Radio
- ❑ Internet
- ❑ Social media
- ❑ Email
- ❑ Mail
- ❑ Public workshops/meetings
- ❑ School meetings
- ❑ Other (please explain): _____

14. Please select the way(s) you prefer to receive alerts or warnings about impending hazard events or dangerous conditions:

- ❑ Television
- ❑ Radio
- ❑ Landline phone
- ❑ Cell phone
- ❑ Text message
- ❑ Facebook
- ❑ Twitter
- ❑ Other (please explain): _____

15. In your opinion, what are some steps your local government could take to reduce the risk of future hazard damages in your community?

16. **A number of community-wide activities can reduce vulnerability to hazards. In general, these activities fall into one of the following six broad categories. Please tell us how important you think each category is for your community to consider.**

Category	Very Important	Somewhat Important	Not Important
1. Prevention Administrative or regulatory actions that influence the way land is developed and buildings are built. Examples include planning and zoning, building codes, open space preservation, and floodplain regulations.	❑	❑	❑
2. Property Protection Actions that involve modification of existing buildings to protect them from a hazard or removal from the hazard area. Examples include acquisition, relocation, elevation, structural retrofits, and storm shutters.	❑	❑	❑
3. Natural Resource Protection Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. Examples include floodplain protection, habitat preservation, slope stabilization, riparian buffers, and forest management.	❑	❑	❑
4. Structural Projects Actions intended to lessen the impact of a hazard by modifying the natural progression of the hazard. Examples include dams, levees, detention/retention basins, channel modification, retaining walls, and storm sewers.	❑	❑	❑
5. Emergency Services Actions that protect people and property during and immediately after a hazard event. Examples include warning systems, evacuation planning, emergency response training, and protection of critical emergency facilities or systems.	❑	❑	❑
6. Public Education and Awareness Actions to inform citizens about hazards and the techniques they can use to protect themselves and their property. Examples include outreach projects, school education programs, library materials, and demonstration events.	❑	❑	❑

THANK YOU FOR YOUR PARTICIPATION!

ATKINS

Jefferson Parish

Hazard Mitigation Plan
Public Participation Survey Results

Public Participation Survey

ATKINS

- Provides an opportunity for the public to share opinions and participate in the planning process
- Link to survey posted on county and municipal websites and social media
- 167 completed surveys received

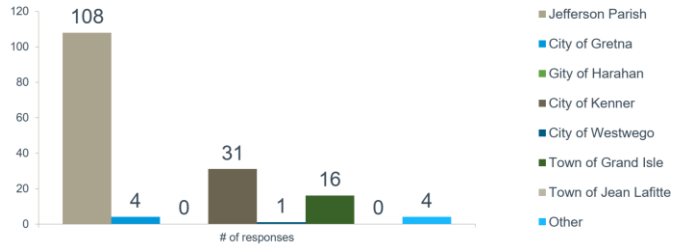
Public Participation Survey Highlights

ATKINS

- 91% of respondents are interested in making their homes safer from hazards
- 59% have already taken action to make their homes safer from hazards
- 41% do not know who to contact regarding risks from hazards

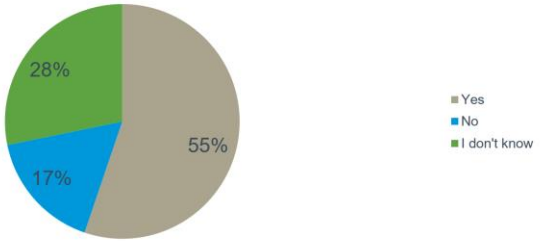
1. Where do you live?

ATKINS



2. Is your home in a floodplain?

ATKINS



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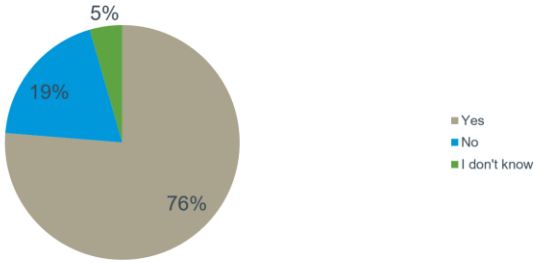
3. Do you have flood insurance?

ATKINS



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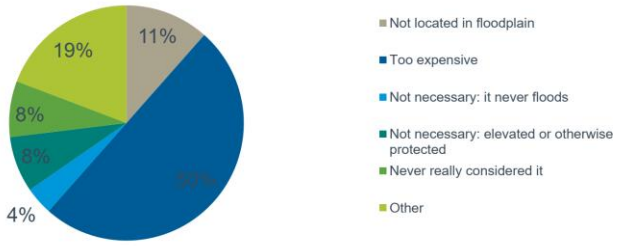
3a. Why no flood insurance?

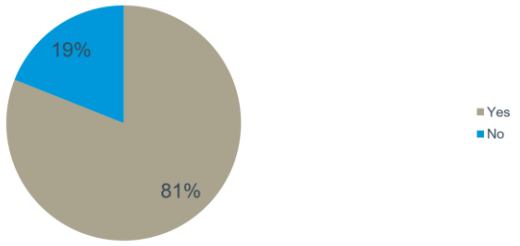
ATKINS



7

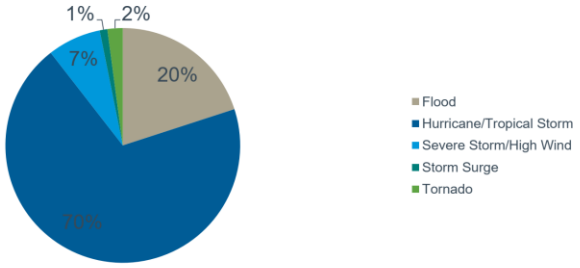
4. Have you experienced a disaster?

ATKINS



8

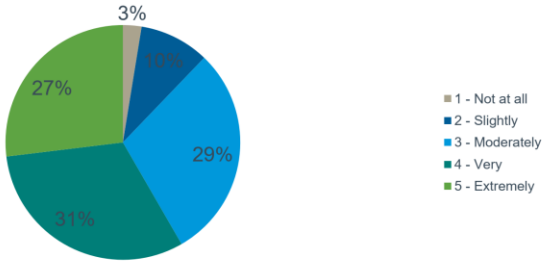
4a. Examples of disasters experienced



ATKINS

9

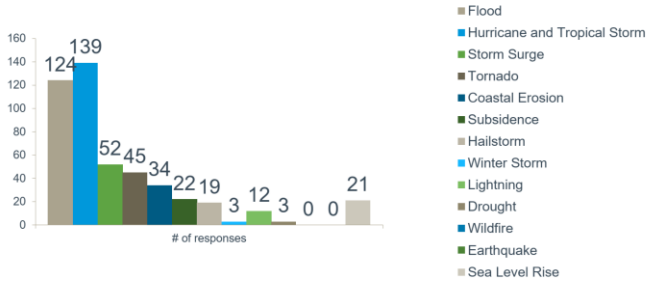
5. How concerned about possibility of being impacted by disaster?



ATKINS

10

6. Hazards of greatest concern?



ATKINS

11

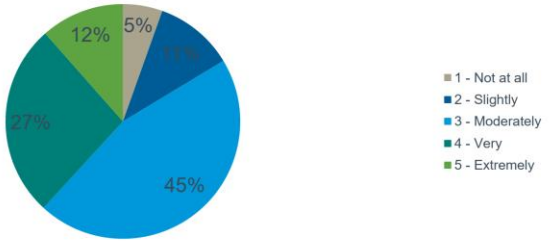
7. Other hazards not listed?

- Maritime traffic
- Hazardous materials transport/incident
- Electromagnetic pulse
- Man-made/human error
- Chemicals from refineries/chemical explosion
- Transportation (rail) incident
- Insufficient drainage/drainage breakdown/mechanical failure of flood protection system/not manning canals
- Water pollution/contamination
- Violence
- Climate change
- Traffic-related accidents
- Terrorism
- Termites
- Misquotes
- Medical problems

ATKINS

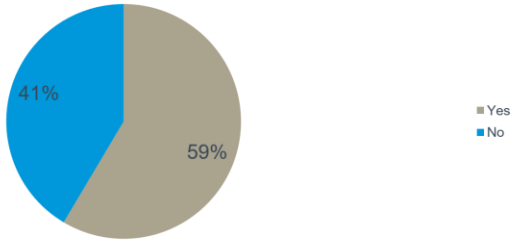
12

8. How prepared if disaster occurs?



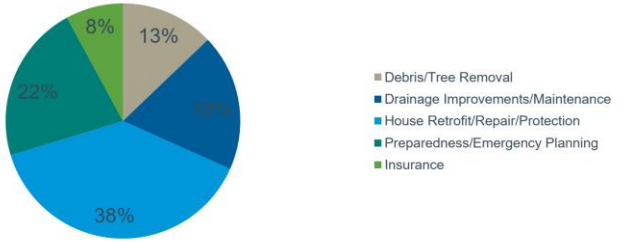
13

9. Taken action to be safer from hazards?



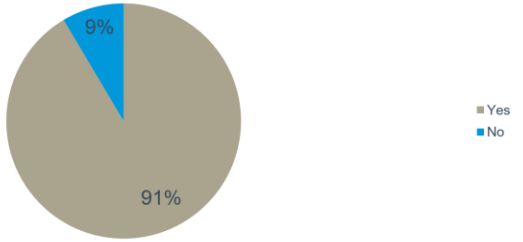
14

9a. Examples of actions taken



15

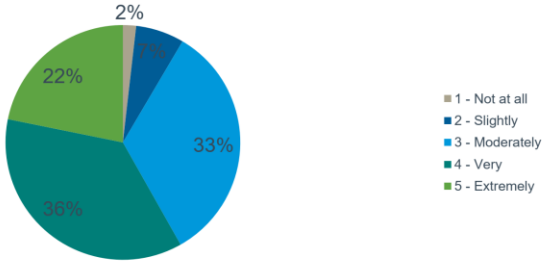
10. Interested in being safer from hazards?



16

11. How informed about risks and impacts of disasters?

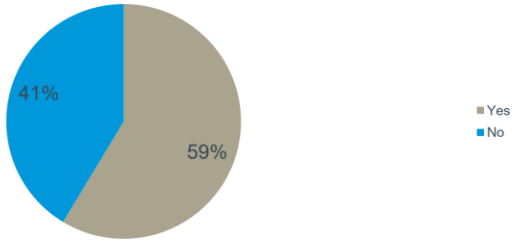
ATKINS



17

12. Know who to contact regarding risks from hazards?

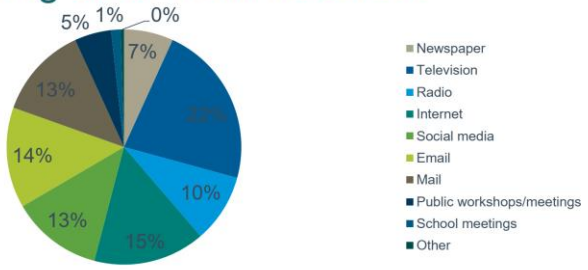
ATKINS



18

13. Preferred way to receive info. about being safer from hazards?

ATKINS



19

13. Other ways to receive information

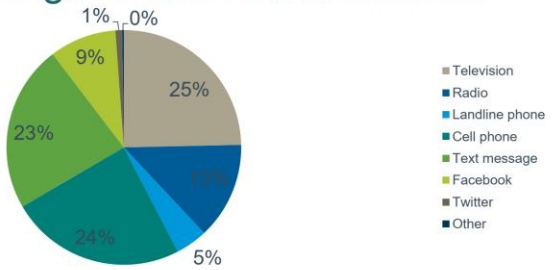
ATKINS

- Text messages

20

14. Preferred way to receive alerts/warnings about hazard events?

ATKINS



21

14. Other ways to receive alerts/warnings

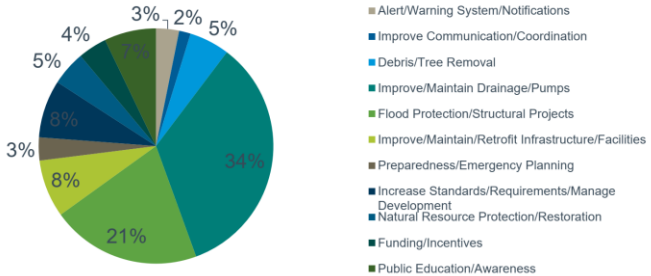
ATKINS

- Email

22

15. Steps local gov't could take to reduce risk

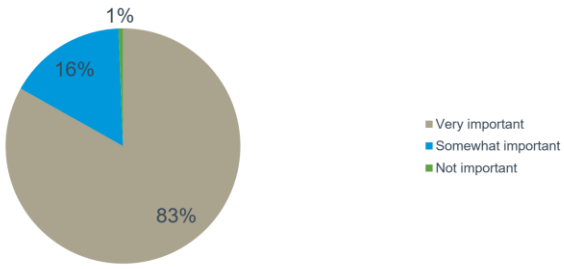
ATKINS



23

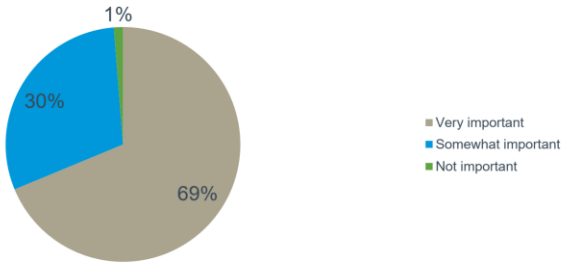
16. Mitigation Actions: Prevention

ATKINS



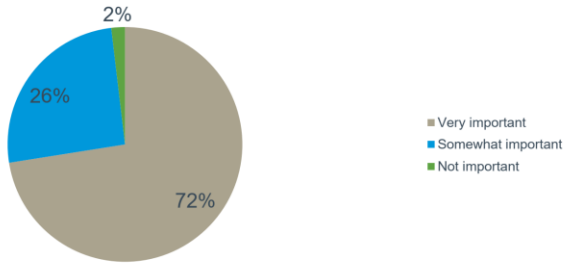
24

16. Mitigation Actions: Property Protection



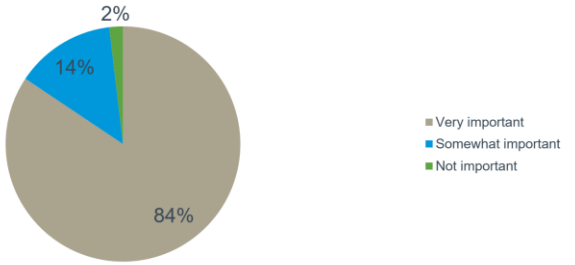
25

16. Mitigation Actions: Natural Resource Protection



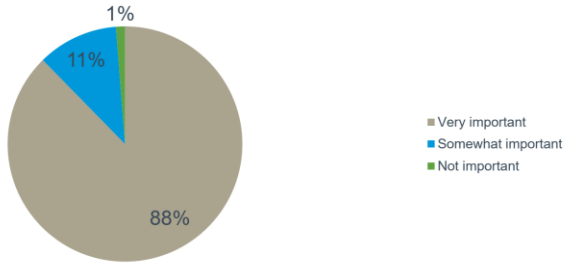
26

16. Mitigation Actions: Structural Projects



27

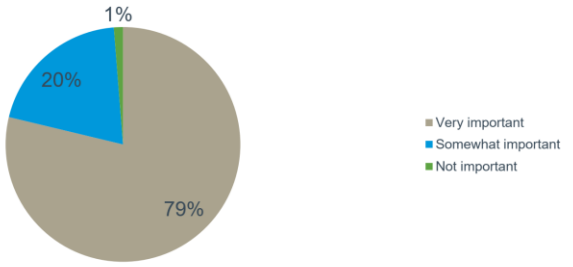
16. Mitigation Actions: Emergency Services



28

16. Mitigation Actions: Public Education and Awareness

ATKINS



29

16. Mitigation Actions: Summary

ATKINS

- Highest importance
- Emergency Services
- Structural Projects
- Prevention
- Moderate importance
- Public Education and Awareness
- Lowest importance
- Natural Resource Protection
- Property Protection

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Appendix B
Summary of Changes

As part of the Jefferson Parish 2020 Hazard Mitigation Plan (HMP) Update Process, the previously identified hazards, risk assessment, mitigation goals, strategies, and mitigation priorities were re-evaluated, and updates were made based on an analysis of hazard events, population changes, and other factors that have impacted risk. All sections of the Plan were re-assessed to identify changes and updates that may have occurred since the 2015 version or as a result of any disaster declarations since that time.

The general design of the plan has not been modified during this update. Any irrelevant or outdated information has been either updated or removed. There was a particular focus on incorporating new hazard information, updating the Parish risk assessment, and describing meetings and presentations held as part of this Plan update.

Plans Reviewed:

- City of Gretna Repetitive Loss Area Analysis
- City of Kenner Repetitive Loss Area Analysis
- City of Westwego Repetitive Loss Area Analysis
- FIRMs
- Flood Insurance Study, Jefferson Parish, LA, Incorporated and Unincorporated Areas, February 2, 2018
- Floodplain Ordinances
- Greater New Orleans Urban Water Plan
- Jean Lafitte Tomorrow Town Resiliency Plan
- Jefferson Parish Comprehensive Drainage Master Plans
- Jefferson Parish Comprehensive Plan
- Jefferson Parish Economic Development Strategic Plan
- Jefferson Parish Emergency Operations Plan
- Jefferson Parish Housing Stock Enhancement Strategic Plan
- Jefferson Parish Repetitive Loss Area Analysis
- Jefferson Parish Stormwater Management Plan
- LA SAFE
- Louisiana Coastal Master Plan
- Louisiana State Hazard Mitigation Plan 2019
- RESTORE Plan
- Sea Lake and Overland Surges from Hurricanes (SLOSH) Model
- Southeast Louisiana Hurricane Evacuation Study Transportation Analysis Report
- State of Louisiana Wetlands Conservation and Restoration Plan
- Town of Jean Lafitte Repetitive Loss Area Analysis

Governor's Office of Homeland Security
and Emergency Preparedness
State of Louisiana

JOHN BEL EDWARDS
GOVERNOR

JAMES B. WASKOM
DIRECTOR

June 9, 2020

GOHSEP-AFO-BR

Maggie Talley
Director
Jefferson Parish
1221 Elmwood Park Boulevard
Suite 310
Jefferson, Louisiana 70123

SUBJECT: Hazard Mitigation Plan Approval
Jefferson Parish Hazard Mitigation Plan Update – Multi Jurisdiction HM Plan
Funding Source:

Dear Ms. Talley:

Congratulations! I am pleased to inform you that the Jefferson Parish HM Plan Update was reviewed by the Governor's Office of Homeland Security (GOHSEP) and the Federal Emergency Management Agency's (FEMA). Per this review, the submission of the adoption resolutions, and the one electronic copy of the Jefferson Parish HM Plan Update, the plan has been officially approved. The plan was approved on June 2, 2020 and expires on June 2, 2025.

The approved participating jurisdictions:

- Jefferson Parish
- City of Gretna
- City of Harahan
- City of Kenner
- City of Westwego
- Town of Grand Isle
- Town of Jean Lafitte

are hereby considered eligible applicants for the following Hazard Mitigation Assistance Grants administered by FEMA

- Hazard Mitigation Grant Program (HMGP), our post-disaster-funding program
- Pre-Disaster Mitigation (PDM), a nationally competitive program for mitigation projects and planning grants
- Flood Mitigation Assistance (FMA), a nationally competitive program for Flood Mitigation projects

All jurisdiction should coordinate with Jefferson Parish on application submittals to the State. We strongly encourage Jefferson Parish community to perform an annual review and assessment of the effectiveness of their Hazard Mitigation Plan; however, a formal plan update is required at least every five years.

We commend the participants in the Jefferson Parish HM Plan for the development of a solid, workable plan that will guide Hazard Mitigation activities over the coming years. If you have any questions, please contact your Project Officer, Marion Pearson at 225.267.2522 or at marion.pearson@la.gov.

Sincerely,

Jeffrey Giering
State Hazard Mitigation Officer (SHMO)
Disaster Recovery Division

JG:mp

Enclosures: 1) FEMA Approval Letter Dated June 3, 2020
2) Jefferson Parish – Final Plan Review Tool

U.S. Department of Homeland Security
FEMA Region 6
800 N. Loop 288
Denton, TX 76209

FEMA

June 3,
2020

Jeffrey Giering, State Hazard Mitigation
Officer Louisiana Office of Homeland
Security
and Emergency
Preparedness 1500 North
Main Street Baton Rouge,
LA 70802

RE: Approval of the Jefferson Parish, Louisiana Multi-Jurisdiction Hazard Mitigation Plan

Dear Mr. Giering:

This office has concluded its review of the referenced plan and we are pleased to provide our approval of this plan in meeting the criteria set forth by 44 CFR § 201.6. By receiving this approval, eligibility for the Hazard Mitigation Assistance Grants will be ensured for five years from the date of this letter, expiring on June 2, 2025.

This approval does not demonstrate approval of projects contained in the plan. This office has provided the enclosed Local Hazard Mitigation Planning Tool with reviewer's comments, to further assist the community in refining the plan going forward. Please advise the referenced community of this approval.

If you have any questions, please contact Doray Hill, HM Community Planner, at (940) 383-7223.

Sincerely,

Ronald C. Wanhanen
Chief, Risk Analysis Branch

Enclosures

Enclosure A

Attached is the list of approved participating governments included in the June 3, 2020 review of the referenced Hazard Mitigation plan.

Community Name
1) Grand Isle
2) Gretna
3) Harahan
4) Jean Lafitte
5) Jefferson Parish
6) Kenner
7) Westwego

LOCAL MITIGATION PLAN REVIEW TOOL

The *Local Mitigation Plan Review Tool* demonstrates how the Local Mitigation Plan meets the regulation in 44 CFR §201.6 and offers States and FEMA Mitigation Planners an opportunity to provide feedback to the community.

- The Regulation Checklist provides a summary of FEMA's evaluation of whether the Plan has addressed all requirements.
- The Plan Assessment identifies the plan's strengths as well as documents areas for future improvement.
- The Multi-jurisdiction Summary Sheet is an optional worksheet that can be used to document how each jurisdiction met the requirements of the each Element of the Plan (Planning Process; Hazard Identification and Risk Assessment; Mitigation Strategy; Plan Review, Evaluation, and Implementation; and Plan Adoption).

The FEMA Mitigation Planner must reference this *Local Mitigation Plan Review Guide* when completing the *Local Mitigation Plan Review Tool.*

<table>
<tr><td>Jurisdiction:
Jefferson Parish</td><td>Title of Plan:
2020 Multijurisdictional Hazard Mitigation Plan Update</td><td>Date of Plan:
June 2020</td></tr>
<tr><td>Local Point of Contact:
Maggie Talley</td><td colspan="2" rowspan="3">Address:
1221 Elmwood Park Boulevard, Suite 310
Jefferson, Louisiana 70123</td></tr>
<tr><td>Title:
Director</td></tr>
<tr><td>Agency:
Jefferson Parish Director of Floodplain Management & Hazard Mitigation</td></tr>
<tr><td>Phone Number:
504.736.6540</td><td colspan="2">E-Mail:
mtalley@jeffparish.net</td></tr>
</table>

State Reviewer:	**Title:**	**Date:**
Marion Pearson	Project Resolution Officer	June 2, 2020

FEMA Reviewer:	**Title:**	**Date:**
Shanene Thomas	Mitigation Planner	12/17/2019
Date Received in FEMA Region 6	June 2, 2020	
Plan Not Approved		
Plan Approvable Pending Adoption		
Plan Approved	June 3, 2020	

LOCAL MITIGATION PLAN REVIEW TOOL

SECTION 1:
REGULATION CHECKLIST

INSTRUCTIONS: The Regulation Checklist must be completed by FEMA. The purpose of the Checklist is to identify the location of relevant or applicable content in the Plan by Element/sub-element and to determine if each requirement has been 'Met' or 'Not Met.' The 'Required Revisions' summary at the bottom of each Element must be completed by FEMA to provide a clear explanation of the revisions that are required for plan approval. Required revisions must be explained for each plan sub-element that is 'Not Met.' Sub-elements should be referenced in each summary by using the appropriate numbers (A1, B3, etc.), where applicable. Requirements for each Element and sub-element are described in detail in this *Plan Review Guide* in Section 4, Regulation Checklist.

1. REGULATION CHECKLIST Regulation (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
ELEMENT A. PLANNING PROCESS			
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))	*All page numbers shown are those of the PDF* Pgs. 11, 13, 42-51, App. A, App. B	X	
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))	Pgs. 43-45, App. A	X	
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))	Pgs. 46-47, App. A	X	
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))	Pgs. 38, 49-51, 343-345, App. B	X	
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))	Pgs. 342-343	X	
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))	Pgs. 12, 340-342	X	
ELEMENT A: REQUIRED REVISIONS			

1. REGULATION CHECKLIST Regulation (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT			
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))	Pgs. 7-8, 57-101, 123-132, 150-165, 176, 187-193, 197-202, 202, 210-212, 216, 219-221, 223-228, 229-230, 238-245, 252, App. D; App. E	X	
B2. Does the Plan include information on previous occurrences of	Pgs. 52-55, 60-102,	X	

hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))	122-131, 153-160, 179-184, 194-196, 197-201, 205-211, 212-215, 217-218, 220-222, 223-225, 232-234, 255-526		
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))	Pgs. 63, 79-82, 113-122, 125-126, 132-149, 154-155, 166-175, 177-180, 188, 194-197, 199-202, 211-215, 216-219, 220-223, 224-229, 213-237, 238-240, 247-252, 252-256	X	
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))	Pg. 87, 103-112, App. E	X	
ELEMENT B: REQUIRED REVISIONS			

1. REGULATION CHECKLIST Regulation (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
ELEMENT C. MITIGATION STRATEGY			
C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))	Pgs. 257-259	X	
C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))	Pgs. 48-49, 77-79, 258-259; App. E		
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	Pgs. 9-10, 261-262	X	
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))	Pgs. 10-11, 270-338	X	
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))	Pgs. 267-338	X	
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))	Pgs. 48-49	X	
ELEMENT C: REQUIRED REVISIONS			

LOCAL MITIGATION PLAN REVIEW TOOL

1. REGULATION CHECKLIST Regulation (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION (applicable to plan updates only)			
D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))	Pgs. 27-29, 33-38, 58,	X	
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))	Pgs. 267-338	X	
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	Section 5.3, 5.4, and 5.6; App. B	X	
ELEMENT D: REQUIRED REVISIONS			
ELEMENT E. PLAN ADOPTION			
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))	Pgs. 12, App. C	X	
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))	Pgs. 12, App. C	X	
ELEMENT E: REQUIRED REVISIONS All participants adopted			
ELEMENT F. ADDITIONAL STATE REQUIREMENTS (optional for State reviewers only; not to be completed by FEMA)			
F1.			
F2.			
ELEMENT F: REQUIRED REVISION			

LOCAL MITIGATION PLAN REVIEW TOOL

SECTION 2:
PLAN ASSESSMENT

INSTRUCTIONS: The purpose of the Plan Assessment is to offer the local community more comprehensive feedback to the community on the quality and utility of the plan in a narrative format. The audience for the Plan Assessment is not only the plan developer/local community planner, but also elected officials, local departments and agencies, and others involved in implementing the Local Mitigation Plan. The Plan Assessment must be completed by FEMA. The Assessment is an opportunity for FEMA to provide feedback and information to the community on: 1) suggested improvements to the Plan; 2) specific sections in the Plan where the community has gone above and beyond minimum requirements; 3) recommendations for plan implementation; and 4) ongoing partnership(s) and information on other FEMA programs, specifically RiskMAP and Hazard Mitigation Assistance programs. The Plan Assessment is divided into two sections:

1. Plan Strengths and Opportunities for Improvement
2. Resources for Implementing Your Approved Plan

Plan Strengths and Opportunities for Improvement is organized according to the plan Elements listed in the Regulation Checklist. Each Element includes a series of italicized bulleted items that are suggested topics for consideration while evaluating plans, but it is not intended to be a comprehensive list. FEMA Mitigation Planners are not required to answer each bullet item, and should use them as a guide to paraphrase their own written assessment (2-3 sentences) of each Element.

The Plan Assessment must not reiterate the required revisions from the Regulation Checklist or be regulatory in nature, and should be open-ended and to provide the community with suggestions for improvements or recommended revisions. The recommended revisions are suggestions for improvement and are not required to be made for the Plan to meet Federal regulatory requirements. The italicized text should be deleted once FEMA has added comments regarding strengths of the plan and potential improvements for future plan revisions. It is recommended that the Plan Assessment be a short synopsis of the overall strengths and weaknesses of the Plan (no longer than two pages), rather than a complete recap section by section.

Resources for Implementing Your Approved Plan provides a place for FEMA to offer information, data sources and general suggestions on the overall plan implementation and maintenance process. Information on other possible sources of assistance including, but not limited to, existing publications, grant funding or training opportunities, can be provided. States may add state and local resources, if available.

LOCAL MITIGATION PLAN REVIEW TOOL

A. Plan Strengths and Opportunities for Improvement
This section provides a discussion of the strengths of the plan document and identifies areas where these could be improved beyond minimum requirements.

Element A: Planning Process

Element B: Hazard Identification and Risk Assessment

The plan utilizes a numerical scoring methodology (pgs. 56-57) to identify hazard rankings. While each ranking (high, medium, low) has points, these designations are not defined. There is no explanation for the scoring cut-off, although it appears to be those outside the HSSDRS with a score above 15. The plan should also include what denotes the high, medium, low criteria and how it applies to the ranking of the hazards.

Element C: Mitigation Strategy

The plan includes multiple actions however, many are not mitigation related. Actions that are passive (consider, encourage, continue, explore, evaluate, seek funding, planning, comply with Federal requirements, maintenance, etc.) are not accepted towards the requirement since they do not accomplish a change or an improvement. Actions that are to "study" are only acceptable when there is a data deficiency. Non-mitigation actions (response, recovery, preparedness, etc.) are not accepted towards the requirement. Several actions do not contain enough information to know what they do. For example, P-5 Increase Open Space Areas. It is unclear how this will be done. Is it through zoning, acquisition, or something else?

Element D: Plan Update, Evaluation, and Implementation (Plan Updates Only)

B. Resources for Implementing Your Approved Plan
This section provides examples of possible resources plan implementation.

Ideas may be offered on moving the mitigation plan forward and continuing the relationship with key mitigation stakeholders such as the following:

- What FEMA assistance (funding) programs are available (for example, Hazard Mitigation Assistance (HMA)) to the jurisdiction(s) to assist with implementing the mitigation actions?
- What other Federal programs (National Flood Insurance Program (NFIP), Community Rating System (CRS), Risk MAP, etc.) may provide assistance for mitigation activities?
- What publications, technical guidance or other resources are available to the jurisdiction(s) relevant to the identified mitigation actions?
- Are there upcoming trainings/workshops (Benefit-Cost Analysis (BCA), HMA, etc.) to assist the jurisdictions(s)?
- What mitigation actions can be funded by other Federal agencies (for example, U.S. Forest Service, National Oceanic and Atmospheric Administration (NOAA), Environmental Protection Agency (EPA) Smart Growth, Housing and Urban Development (HUD) Sustainable Communities, etc.) and/or state and local agencies?

FEMA Mitigation grants are available to eligible applicants. Search grants.gov for additional resources for implementing mitigation actions.

LOCAL MITIGATION PLAN REVIEW TOOL

SECTION 3:
MULTI-JURISDICTION SUMMARY SHEET (OPTIONAL)

INSTRUCTIONS: For multi-jurisdictional plans, a Multi-jurisdiction Summary Spreadsheet may be completed by listing each participating jurisdiction, which required Elements for each jurisdiction were 'Met' or 'Not Met,' and when the adoption resolutions were received. This Summary Sheet does not imply that a mini-plan be developed for each jurisdiction; it should be used as an optional worksheet to ensure that each jurisdiction participating in the Plan has been documented and has met the requirements for those Elements (A through E).

MULTI-JURISDICTION SUMMARY SHEET												
							Requirements Met (Y/N)					
#	Jurisdiction Name	Jurisdiction Type (city/borough/ township/ village, etc.)	Plan POC	Mailing Address	Email	Phone	A. Planning Process	B. Hazard Identification & Risk Assessment	C. Mitigation Strategy	D. Plan Review, Evaluation & Implementation	E. Plan Adoption	F. State Requirements
1	Jefferson Parish	Parish	Maggie Talley	1221 Elmwood Park Blvd Ste 801, Jefferson, LA 70123	mtalley@jeffparish.net	504-736-6541						
2	Gretna	City	Danika Gorrondona	740 2nd St, Gretna, LA 70053	dgorrondona@gretnala.com	504-363-1563						
3	Harahan	City	Edwin Lauricella	1075 Hickory Ave, Harahan, LA 70123	edwin.lauricella@ci.harahan.la.us	504-737-0188						
4	Kenner	City	Doug	1610	ddodt@kenner.la.us	504-						

			Dodt	Rev. Richard Wilson Dr, Kenner, LA 70062		471-2100						
5	Westwego	City	Lisa Tapia	1100 Fourth St, Westwego, LA 70094	lisatapia@cityofwestwego.com	504-341-3424						
6	Grand Isle	Town	Nora Combel	PO Box 200, Grand Isle, LA 70358	nc.togi@viscom.net	985-787-3196						
7	Jean Lafitte	Town	Nicole Cooper	2654 Jean Lafitte Blvd, Lafitte, LA 70067	ncooper@townofjeanlafitte.com	504-689-2208						

Adoption Resolutions

Jefferson Parish

On motion of **Mr. Walker,** seconded by **Mr. Templet,** the following resolution was offered:

RESOLUTION NO. 135781

A resolution authorizing the Jefferson Parish Council to adopt the updated 2020 Multijurisdictional Hazard Mitigation Plan Update prepared and completed by Jefferson Parish Floodplain Management and Hazard Mitigation Department, Jefferson Parish Incorporated Municipalities, and Barowka and Bonura Engineers and Consultants, LLC (BBEC) under contract RP-0352, utilizing funding provided from HMA Grants FMA-PL-06-LA-2016-008 and PDMC-PL-06-LA-2016-002. (Parishwide)

WHEREAS, Jefferson Parish previously received approval from the Federal Emergency Management Agency (FEMA) for the initial Hazard Mitigation Plan (HMP) on September 16, 2005, the HMP update on March 11, 2010, the HMP update on June 30, 2015, and said plan is required to be revised every five (5) years; and

WHEREAS, Jefferson Parish recognizes the threat that natural hazards pose to people within Jefferson Parish; and

WHEREAS, The Jefferson Parish Floodplain Management and Hazard Mitigation Department with Jefferson Parish Incorporated Municipalities and BBEC have prepared a multi-hazard mitigation plan, hereby known as the 2020 Multijurisdictional Hazard Mitigation Plan Update in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, The 2020 Multijurisdictional Hazard Mitigation Plan Update identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Jefferson Parish from the impacts of future hazards and disaster; and

WHEREAS, FEMA has reviewed and approved the 2020 Multijurisdictional Hazard Mitigation Plan Update as of December 18, 2019; and

WHEREAS, Adoption by the Jefferson Parish Council demonstrates commitment to hazard mitigation and achieving the goals as outlined in the 2020 Multijurisdictional Hazard Mitigation Plan Update.

NOW, THEREFORE, BE IT RESOLVED, by the Jefferson Parish Council, the governing authority of said Parish:

SECTION 1. The adoption of the 2020 Multijurisdictional Hazard Mitigation Plan Update, as approved by FEMA, be granted.

SECTION 2. That the Chairperson of the Jefferson Parish Council, or in his absence the Vice Chairperson, be and is authorized to execute any and all documents necessary to give full force and effect to this resolution.

The foregoing resolution having been submitted to a vote, the vote thereon was as follows:

YEAS: 7 **NAYS: None** **ABSENT: None**

The resolution was declared to be adopted on this the **13th day of May, 2020.**

THE FOREGOING IS CERTIFIED
TO BE A TRUE & CORRECT COPY

Eula A. Lopez

EULA A. LOPEZ
PARISH CLERK
JEFFERSON PARISH COUNCIL

City of Gretna

On motion by **Councilman Rau** and seconded by **Councilman Miller**, the following resolution was offered:

RESOLUTION NO. 2020-033

A resolution authorizing the Gretna City Council to adopt the updated 2020 Multi-Jurisdictional Hazard Mitigation Plan Update prepared and completed by the City of Gretna, Jefferson Parish Floodplain Management and Hazard Mitigation Department, and Barowka and Bonura Engineers and Consultants, LLC (BBEC) under contract RP-0352, utilizing funding provided from HMA Grants FMA-PL-06-LA-2016-008 and PDMC-PL-06-LA-2016-002.

WHEREAS, the City of Gretna has an interest in the health, welfare and safety of the citizens of the City of Gretna; and

WHEREAS, the City of Gretna previously received approval from the Federal Emergency Management Agency (FEMA) for the initial Hazard Mitigation Plan (HMP) on September 16, 2005, the HMP update on March 11, 2010, the HMP update on June 30, 2015, and said plan is required to be revised every five (5) years; and

WHEREAS, the City of Gretna recognizes the threat that natural hazards pose to people within the City of Gretna; and

WHEREAS, the City of Gretna with the Jefferson Parish Floodplain Management and Hazard Mitigation Department and BBEC have prepared a multi-hazard mitigation plan, hereby known as the 2020 Multijurisdictional Hazard Mitigation Plan Update in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, the 2020 Multi-Jurisdictional Hazard Mitigation Plan Update identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the City of Gretna from the impacts of future hazards and disaster; and

WHEREAS, FEMA has reviewed and approved the 2020 Multijurisdictional Hazard Mitigation Plan Update as of December 18, 2019; and

WHEREAS, adoption by the Gretna City Council demonstrates commitment to hazard mitigation and achieving the goals as outlined in the 2020 Multijurisdictional Hazard Mitigation Plan Update.

NOW, THEREFORE, BE IT RESOLVED by the City Council of Gretna, Louisiana, acting as governing authority of said City that:

The Gretna City Council hereby adopts the updated 2020 Multi-Jurisdictional Hazard Mitigation Plan Update prepared and completed by the City of Gretna, Jefferson Parish Floodplain Management and Hazard Mitigation Department, and Barowka and Bonura Engineers and Consultants, LLC (BBEC) under contract RP-0352, utilizing funding provided from HMA Grants FMA-PL-06-LA-2016-008 and PDMC-PL-06-LA-2016-002.

The foregoing resolution having been submitted to a vote; the vote thereon was as follows:

Yeas: **Councilmen Rau, Miller, Hinyub and Berthelot**
Nays: None
Absent: Councilman Crosby

ADOPTED: MAY 13, 2020

/S/ NORMA J. CRUZ, CMC
CITY CLERK
CITY OF GRETNA
STATE OF LOUISIANA

/S/ BELINDA C. CONSTANT
MAYOR
CITY OF GRETNA
STATE OF LOUISIANA

A TRUE COPY:

/S/ NORMA J. CRUZ, CMC
CITY CLERK
CITY OF GRETNA
STATE OF LOUISIANA

City of Harahan

The following resolution was offered unanimously by the Council:

RESOLUTION NO. 2020 – 609

A resolution authorizing the Harahan City Council to adopt the updated 2020 Multijurisdictional Hazard Mitigation Plan Update prepared and completed by City of Harahan, Jefferson Parish Floodplain Management and Hazard Mitigation Department, and Barowka and Bonura Engineers and Consultants, LLC (BBEC) under contract RP-0352, utilizing funding provided from HMA Grants FMA-PL-06-LA-2016-008 and PDMC-PL-06-LA-2016-002. (Parishwide)

WHEREAS, the City of Harahan previously received approval from the Federal Emergency Management Agency (FEMA) for the initial Hazard Mitigation Plan (HMP) on September 16, 2005, the HMP update on March 11, 2010, the HMP update on June 30, 2015, and said plan is required to be revised every five (5) years; and

WHEREAS, the City of Harahan recognizes the threat that natural hazards pose to people within Jefferson Parish; and

WHEREAS, the City of Harahan with the Jefferson Parish Floodplain Management and Hazard Mitigation Department and BBEC have prepared a multi-hazard mitigation plan, hereby known as the 2020 Multijurisdictional Hazard Mitigation Plan Update in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, the 2020 Multijurisdictional Hazard Mitigation Plan Update identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the City of Harahan from the impacts of future hazards and disaster; and

WHEREAS, FEMA has reviewed and approved the 2020 Multijurisdictional Hazard Mitigation Plan Update as of December 18, 2019; and

WHEREAS, Adoption by the Harahan City Council demonstrates commitment to hazard mitigation and achieving the goals as outlined in the 2020 Multijurisdictional Hazard Mitigation Plan Update.

NOW THEREFORE, BE IT RESOLVED by the Harahan City Council acting as governing authority of said city that:

SECTION 1. The adoption of the 2020 Multijurisdictional Hazard Mitigation Plan Update, as approved by FEMA, be granted.

The foregoing resolution having been submitted to a vote, the vote thereon was as follows:

YEAS: Asbill, Budde, Chatelain, Johnston, Wheeler
NAYS: None
ABSENT: None
ABSTENTION: None

This resolution was declared adopted on the 21st day of May, 2020.

Nicole Lee

Nicole Lee
City Clerk
City of Harahan

City of Kenner

On motion of Councilmember Branigan, seconded by Councilmember Hayes, the following resolution was offered:

RESOLUTION NO. B-17103

A RESOLUTION ADOPTING THE UPDATED 2020 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN UPDATE PREPARED AND COMPLETED BY THE CITY OF KENNER, THE JEFFERSON PARISH FLOODPLAIN MANAGEMENT AND HAZARD MITIGATION DEPARTMENT, AND BAROWKA AND BONURA ENGINEERS AND CONSULTANTS, LLC (BBEC) UNDER CONTRACT RP-0352, UTILIZING FUNDING PROVIDED FROM HMA GRANTS FMA-PL-06-LA-2016-008 AND PDMC-PL-06-LA-2016-002

WHEREAS, the City of Kenner previously received approval from the Federal Emergency Management Agency (FEMA) for the initial Hazard Mitigation Plan (HMP) on September 16, 2005, the HMP update on March 11, 2010, the HMP update on June 30, 2015, and said plan is required to be revised every five (5) years; and,

WHEREAS, the City of Kenner recognizes the threat that natural hazards pose to people within the City of Kenner; and,

WHEREAS, the City of Kenner with the Jefferson Parish Floodplain Management and Hazard Mitigation Department and BBEC have prepared a multi-jurisdictional hazard mitigation plan, hereby known as the 2020 Multi-jurisdictional Hazard Mitigation Plan Update in accordance with the Disaster Mitigation Act of 2000; and,

WHEREAS, the 2020 Multi-jurisdictional Hazard Mitigation Plan Update identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Jefferson Parish from the impacts of future hazards and disaster; and,

WHEREAS, FEMA has reviewed and approved the 2020 Multi-jurisdictional Hazard Mitigation Plan Update as of December 18, 2019; and,

WHEREAS, adoption by the Kenner City Council demonstrates commitment to hazard mitigation and achieving the goals as outlined in the 2020 Multi-jurisdictional Hazard Mitigation Plan Update.

THE COUNCIL FOR THE CITY OF KENNER HEREBY RESOLVES:

SECTION ONE: That the City of Kenner hereby adopts the 2020 Multi-jurisdictional Hazard Mitigation Plan Update, as approved by FEMA.

SECTION TWO: That the Mayor of the City of Kenner is hereby authorized to sign any and all documents necessary to give effect to this resolution.

This resolution having been submitted to a vote, the vote thereon was as follows:

YEAS:	McKinney, Willmott, Carroll, Sigur, Hayes, Branigan, Brennan
NAYS:	0
ABSENT:	0
ABSTAINED:	0

This resolution was declared adopted on this, the 7th day of May, 2020.

CLERK OF THE COUNCIL

PRESIDENT OF THE COUNCIL

MAYOR

City of Westwego

On motion by Council Member Nobles, and seconded by, Council Member Valence, the following resolution was introduced:

RESOLUTION 2020-05(B)

A resolution authorizing the City of Westwego to adopt the updated 2020 Multijurisdictional Hazard Mitigation Plan Update prepared and completed by City of Westwego, Jefferson Parish Floodplain Management and Hazard Mitigation Department, and Barowka and Bonura Engineers and Consultants, LLC (BBEC) under contract RP-0352, utilizing funding provided from HMA Grants FMA-PL-06-LA-2016-008 and PDMC-PL-06-LA-2016-002. (Parishwide)

WHEREAS, City of Westwego previously received approval from the Federal Emergency Management Agency (FEMA) for the initial Hazard Mitigation Plan (HMP) on September 16, 2005, the HMP update on March 11, 2010, the HMP update on June 30, 2015, and said plan is required to be revised every five (5) years; and

WHEREAS, City of Westwego recognizes the threat that natural hazards pose to people within Jefferson Parish; and

WHEREAS, The City of Westwego with the Jefferson Parish Floodplain Management and Hazard Mitigation Department and BBEC have prepared a multi-hazard mitigation plan, hereby known as the 2020 Multijurisdictional Hazard Mitigation Plan Update in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, The 2020 Multijurisdictional Hazard Mitigation Plan Update identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the City of Westwego from the impacts of future hazards and disaster; and

WHEREAS, FEMA has reviewed and approved the 2020 Multijurisdictional Hazard Mitigation Plan Update as of December 18, 2019; and

WHEREAS, Adoption by the City of Westwego Council demonstrates commitment to hazard mitigation and achieving the goals as outlined in the 2020 Multijurisdictional Hazard Mitigation Plan Update.

NOW, THEREFORE, BE IT RESOLVED, by the Mayor and City Council of the City of Westwego, the governing authority of said city:

SECTION 1. The adoption of the 2020 Multijurisdictional Hazard Mitigation Plan Update, as approved by FEMA, be granted.

SECTION 2. The Mayor of the City of Westwego, or in his absence, the Mayor Pro Tempore, be and is authorized to execute any and all documents necessary to give full force and effect to this resolution.

The foregoing resolution having been submitted to a vote, the vote thereon was as follows:

Yeas: Green, Nobles, Valence, Rivere, Thibodeaux
Nays: None
Absent: None
Abstained: None
Adopted: Monday, May 11, 2020

Joe Peoples, Mayor

Lisa Tapia, City Clerk

Town of Grand Isle

RESOLUTION NO. 2778

A resolution authorizing the Town of Grand Isle Council to adopt the updated 2020 Multijurisdictional Hazard Mitigation Plan Update prepared and completed by The Town of Grand Isle, Jefferson Parish Floodplain Management and Hazard Mitigation Department, and Barowka and Bonura Engineers and Consultants, LLC (BBEC) under contract RP-0352, utilizing funding provided from HMA Grants FMA-PL-06-LA-2016-008 and PDMC-PL-06-LA-2016-002. (Parishwide)

WHEREAS, The Town of Grand Isle previously received approval from the Federal Emergency Management Agency (FEMA) for the initial Hazard Mitigation Plan (HMP) on September 16, 2005, the HMP update on March 11, 2010, the HMP update on June 30, 2015, and said plan is required to be revised every five (5) years; and

WHEREAS, The Town of Grand Isle recognizes the threat that natural hazards pose to people within Jefferson Parish; and

WHEREAS, The Town of Grand Isle with the Jefferson Parish Floodplain Management and Hazard Mitigation Department and BBEC have prepared a multi-hazard mitigation plan, hereby known as the 2020 Multijurisdictional Hazard Mitigation Plan Update in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, The 2020 Multijurisdictional Hazard Mitigation Plan Update identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Grand Isle from the impacts of future hazards and disaster; and

WHEREAS, FEMA has reviewed and approved the 2020 Multijurisdictional Hazard Mitigation Plan Update as of December 18, 2019; and

WHEREAS, Adoption by the Town of Grand Isle Council demonstrates commitment to hazard mitigation and achieving the goals as outlined in the 2020 Multijurisdictional Hazard Mitigation Plan Update.

NOW, THEREFORE, BE IT RESOLVED, by the Town of Grand Isle Council, the governing authority of said Parish:

SECTION 1. The adoption of the 2020 Multijurisdictional Hazard Mitigation Plan Update, as approved by FEMA, be granted.

SECTION 2. That the Chairperson of the Town of Grand Isle Council, or in her absence the Vice Chairperson, be and is authorized to execute any and all documents necessary to give full force and effect to this resolution.

The foregoing resolution having been submitted to a vote, the vote thereon was as follows:

YEAS: Kelly Besson, Jr., Mona LaBauve, Leoda Bladsacker
NAYS:
ABSENT: Ray Santiny, Brian Barthelemy

The resolution was declared to be adopted on this 12TH day of May, 2020.

David J. Camardelle, Mayor
Town of Grand Isle

ATTESTE:

Ray A. Santiny, Town Clerk
Town of Grand Isle

RESOLUTION NO: 2778

Town of Jean Lafitte

RESOLUTION #2147

On motion by Councilman Guillie and seconded by Councilman Creppel the following resolution was adopted:

> A resolution authorizing the Town of Jean Lafitte to adopt the updated 2020 Multijurisdictional Hazard Mitigation Plan Update prepared and completed by, Jefferson Parish Floodplain Management and Hazard Mitigation Department, and Barowka and Bonura Engineers and Consultants, LLC (BBEC) under contract RP-0352, utilizing funding provided from HMA Grants FMA-PL-06-LA-2016-008 and PDMC-PL-06-LA-2016-002. (Parishwide)

WHEREAS, Town of Jean Lafitte previously received approval from the Federal Emergency Management Agency (FEMA) for the initial Hazard Mitigation Plan (HMP) on September 16, 2005, the HMP update on March 11, 2010, the HMP update on June 30, 2015, and said plan is required to be revised every five (5) years; and

WHEREAS, the Town of Jean Lafitte recognizes the threat that natural hazards pose to people within the Town of Jean Lafitte; and

WHEREAS, Town of Jean Lafitte with the Jefferson Parish Floodplain Management and Hazard Mitigation Department and BBEC have prepared a multi-hazard mitigation plan, hereby known as the 2020 Multijurisdictional Hazard Mitigation Plan Update in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, The 2020 Multijurisdictional Hazard Mitigation Plan Update identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the Town of Jean Lafitte from the impacts of future hazards and disaster; and

WHEREAS, FEMA has reviewed and approved the 2020 Multijurisdictional Hazard Mitigation Plan Update as of December 18, 2019; and

WHEREAS, Adoption by the Town of Jean Lafitte demonstrates commitment to hazard mitigation and achieving the goals as outlined in the 2020 Multijurisdictional Hazard Mitigation Plan Update.

NOW, THEREFORE, BE IT RESOLVED, by the Town of Jean Lafitte, the governing authority of said town:

SECTION 1. The adoption of the 2020 Multijurisdictional Hazard Mitigation Plan Update, as approved by FEMA, be granted.

SECTION 2. That the Mayor of the Town of Jean Lafitte , be and is authorized to execute any and all documents necessary to give full force and effect to this resolution.

The foregoing resolution having been submitted to a vote, the vote thereon was as follows:

YEAS: 4	NAYS: 0	ABSENT: 1
Councilman Creppel		Councilman Bartholomew
Councilman Guillie		
Councilman LeBeau		
Councilman Smith		

This resolution was hereby adopted
On this 20th day of May 2020.

Mayor

Town Clerk

Appendix D
General Description of Natural Hazards

The following is a general description for each of the hazards listed below. The complete profile for each hazard can be found in Section 4.

1. Floods
2. Hurricanes and Tropical Storms
3. Storm Surge
4. Tornadoes
5. Coastal Erosion
6. Subsidence
7. Hailstorms
8. Winter Storms
9. Lightning
10. Drought
11. Wildfires
12. Earthquakes
13. Sea Level Rise
14. Extreme Heat

1. Floods

Definition of Flood Hazard

Flooding is the accumulation of water within a water body (e.g., stream, river, lake, or reservoir) and the overflow of excess water onto adjacent floodplains. As illustrated in **Figure D-1**, floodplains are usually lowlands adjacent to water bodies that are subject to recurring floods. Floods are natural events that are considered hazards only when people and property are affected. Nationwide, hundreds of floods occur each year, making them one of the most common hazards in the U.S. (FEMA, 1997). There are a number of categories of floods in the U.S., including the following:

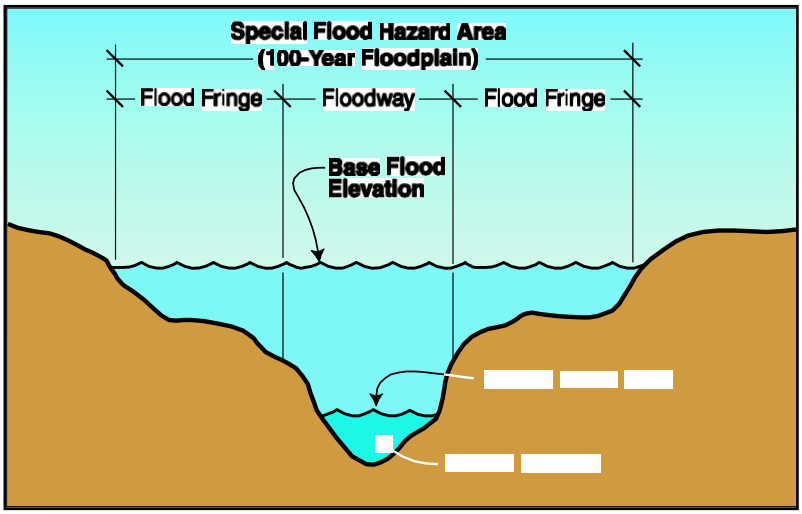
- Riverine flooding (river channel, flash floods, alluvial fan floods, ice-jam floods, dam breaks)
- Local drainage or high groundwater levels
- Fluctuating lake levels
- Coastal flooding, including storm surges
- Debris flows
- Subsidence

Characteristics of Floods

While there is no sharp distinction between riverine floods, flash floods, alluvial fan floods, ice jam floods, and dam-break floods, these types of floods are widely recognized and may be helpful in considering the range of flood risk and appropriate responses.

The most common kind of flooding event is riverine flooding, also known as overbank flooding. Riverine floodplains range from narrow, confined channels in the steep valleys of mountainous and hilly regions to wide, flat areas in plains and coastal regions. The amount of water in the floodplain is a function of the size and topography of the contributing watershed, the regional and local climate, and land use characteristics. In steep valleys, flooding is usually rapid and deep, but of short duration, while flooding in flat areas is typically slow, relatively shallow, and may last for long periods of time.

Figure D-1
Floodplain Definition
(Source: FEMA, August 2001)



Flash floods involve a rapid rise in water level, high velocity, and large amounts of debris, which can lead to significant damage that includes the tearing out of trees, undermining of buildings and bridges, and scouring new channels. The intensity of flash flooding is a function of the intensity and duration of rainfall, steepness of the watershed, stream gradients, watershed vegetation, natural and artificial flood storage areas, and configuration of the streambed and floodplain. Dam failure and ice jams may also lead to flash flooding.

Alluvial fan floods occur in the deposits of rock and soil that have eroded from mountainsides and accumulated on valley floors in the pattern of a fan. Alluvial fan floods often cause greater damage than overbank flooding due to the high velocity of the flow, amount of debris, and broad area affected. Human activities may exacerbate flooding and erosion on alluvial fans via increased velocity along roadways acting as temporary drainage channels or changes to natural drainage channels from fill, grading, and structures.

Ice jam flood occur when an upstream part of a river thaws first (possibly because it flows away from the equator), and the ice gets carried downstream into the still-frozen part. Masses of ice can become lodged under bridges and other wiers, causing an ice dam, flooding areas upstream of the jam. After the ice dam breaks apart, the sudden surge of water that breaks through the dam can then flood areas downstream of the jam. While this usually occurs in spring, it can happen as winter sets in when the downstream part becomes frozen first. Dam-break floods may occur due to structural failures (e.g., progressive erosion), overtopping or breach from flooding, or earthquakes.

Local drainage floods may occur outside of recognized drainage channels or delineated floodplains for a variety of reasons, including concentrated local precipitation, a lack of infiltration, inadequate facilities for drainage and stormwater conveyance, and/or increased surface runoff. Such events often occur in flat areas, particularly during winter and spring where the ground is frozen. Drainage floods are found also in urbanized areas with large impermeable surfaces. High groundwater flooding is a seasonal occurrence in some areas but may occur in other areas after prolonged periods of above-average precipitation.

2. Hurricanes and Tropical Storms

Definition of Hurricanes and Tropical Storms

Hurricanes, tropical storms, and typhoons, collectively known as tropical cyclones, are among the most devastating naturally occurring hazards in the United States. They present flooding, storm surge, and high wind hazards to the communities that they impact.

A hurricane is defined as a low-pressure area of closed circulation winds that originates over tropical waters. A hurricane begins as a tropical depression with wind speeds below 39 mph. As it intensifies, it may develop into a tropical storm, with further development producing a hurricane. **Table D-1** below identifies the criteria for each stage of development.

Table D-1
Classification of Hurricanes

Stage of Development	Criteria
Tropical Depression (development)	Maximum sustained surface wind speed is < 39 mph
Tropical Storm	Maximum sustained wind speed ranges 39 - <74 mph
Hurricane	Maximum sustained surface wind speed 74 mph+
Tropical Depression (dissipation)	Decaying stages of a cyclone in which maximum sustained surface wind speed has dropped below 39 mph

Hurricane winds blow in a large spiral around a relative calm center known as the "eye." The "eye," the storms core, is an area of low barometric pressure and is generally 20 to 30 miles wide. The storm may extend outward 100 to 400 miles in diameter. As a hurricane approaches, the skies will begin to darken, and winds will grow in strength. As a hurricane nears land, it can bring torrential rains, high winds, storm surges, and severe flooding.

As shown in **Table D-2**, the Saffir-Simpson Hurricane Scale is used to classify storms by numbered categories. Hurricanes are classified as Categories 1 through 5 based on central pressure, wind speed, storm surge height, and damage potential.

Table D-2
Saffir-Simpson Hurricane Scale

Storm Category	Central Pressure	Sustained Winds	Storm Surge	Potential Damage
1	> 980 mbar	74 - 95 mph	4 – 5 ft	Minimal
2	965 – 979 mbar	96 - 110 mph	6 – 8 ft	Moderate
3	945 – 964 mbar	111 – 130 mph	9 – 12 ft	Extensive
4	920 – 944 mbar	131 – 155 mph	13 – 18 ft	Extreme
5	< 920 mbar	> 155 mph	> 18 ft	Catastrophic

A single hurricane can last for more than two weeks over open waters and can run a path across the entire length of the eastern seaboard. August and September are peak months during the hurricane season that lasts from June 1 through November 30.

Characteristics of Hurricanes and Tropical Storms

Hurricanes and Tropical Storms are categorized based on their wind speed. Both bring strong winds and are characterized by torrential rain that often results in widespread damage. Hurricanes can produce both extreme high winds and heavy rains. Tropical storms are most often associated with heavy rains that have the potential to produce severe flooding.

High winds from Hurricanes and Tropical Storms are capable of imposing large lateral (horizontal) and uplift (vertical) forces on buildings. Residential buildings can suffer extensive wind damage when they are improperly designed and constructed and when wind speeds exceed design levels. The effects of high winds on a building will depend on several factors:

- Wind speed (sustained and gusts) and duration of high winds
- Height of building above the ground
- Exposure or shielding of the building (by topography, vegetation, or other buildings) relative to wind direction
- Strength of the structural frame, connections, and envelope (walls and roof)
- Shape of building and building components
- Number, size, location, and strength of openings (windows, doors, vents)
- Presence and strength of shutters or opening protection
- Type, quantity, velocity of windborne debris

Proper design and construction of residential structures, particularly those close to water or near the coast, demand that every factor mentioned above be addressed. Failure to do so may result in building damage or destruction by wind.

3. Storm Surge

Definition of Storm Surge Hazard

Storm surges occur when the water level of a tidally influenced body of water increases above the normal high tide. Storm surges occur with coastal storms caused by massive low-pressure systems with cyclonic flows that are typical of hurricanes.

Changes in the earth's surface also contribute to the effects of surges. Rising seas and erosion have led to the deterioration of the state's barrier islands and marsh, important shields against storm surge. Furthermore, erosion has caused the entire delta to sink, meaning homes, businesses, and highways are becoming more susceptible to surges. New Orleans actually has pumps to keep rising seawaters from inundating the entire city, but they would hold little power in the face of a powerful hurricane.

Characteristics of Storm Surge

Storm surges are characterized by several factors that allow the displacement of water from oceans, bays, or rivers to travel so far inland. A combination of relatively flat terrain and an extensive system of bayous and tidal lakes allow the surge to flow easily northward. Shallow water off the coast also adds to the problem, contributing to a higher storm surge than would occur in a location that has deeper coastal water.

Because of our coastal marshes and barrier islands, Louisiana’s commercial and recreational fisheries are among the most abundant in America, providing 25 to 35 percent of the nation’s total catch. Louisiana is first in the annual harvest of oysters, crabs, and menhaden and is a top producer of shrimp. Some of the best recreational saltwater fishing in North America exists off Louisiana’s coast. The reason for this abundance is that our coastal marshes provide the nursery for young fish and shellfish.

Wetlands create friction and reduce high winds when hurricanes hit. They also absorb hurricane storm surges. Scientists estimate that every 2.7 miles of wetlands absorbs one foot of storm surge. The 3.5 million acres of wetlands that line Louisiana’s coast today have storm protection values of $728 million to $3.1 billion.

4. Tornadoes

Definition of Tornado Hazard

A tornado is a rapidly rotating funnel (or vortex) of air that extends toward the ground from a cumulonimbus cloud. Most tornadoes do not touch the ground, but when the lower tip of a tornado touches the earth, it can cause extensive damage. Tornadoes often form in convective cells such as thunderstorms or at the front of hurricanes. Tornadoes may also result from earthquake induced fires, wildfires, or atomic bombs (FEMA, 1997). The formation of tornadoes from thunderstorms is explained below in **Figure D-4**.

Characteristics of Tornadoes

Tornadoes in the dissipating stage can appear like narrow tubes, or ropes, twisting into all manner of curls, twists, and s-shapes. These tornadoes are *roping out* or becoming a *rope tornado*. Multiple-vortex tornadoes can appear as a family of swirls circling a common center or may be completely obscured by condensation, dust, and debris, appearing to be a single funnel. In addition to these appearances, tornadoes may be obscured completely by rain or dust. These tornadoes are especially dangerous as even experienced meteorologists might not spot them.

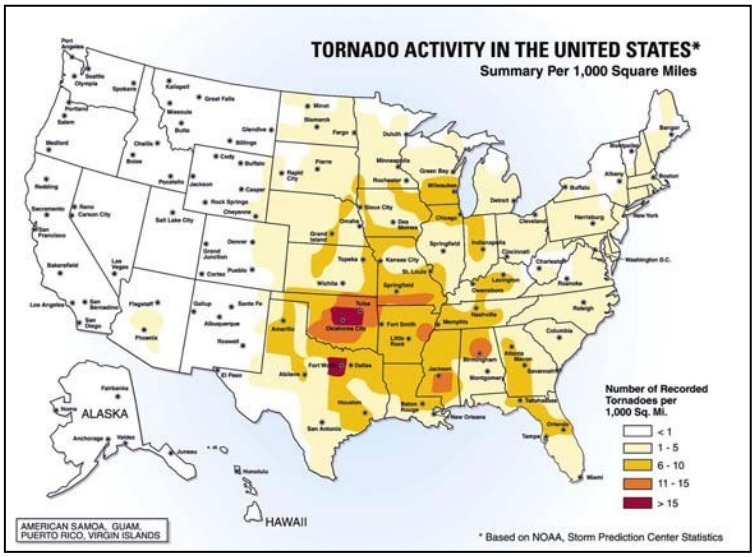
As shown in **Table D-3**, tornadoes are measured by the Fujita Scale, an empirical system that determines the severity by observed damages (last column).

Table D-3
The Fujita Tornado Scale
(Source: FEMA 1997)

Category	Wind Speed	Description of Damage
F0	40-72 mph	Light damage. Some damage to chimneys; break branches off trees; push over shallow-rooted trees; damage to sign boards.
F1	73-112 mph	Moderate damage. The lower limit is the beginning of hurricane speed. Roof surfaces peeled off; mobile homes pushed off foundations or overturned; moving autos pushed off roads.
F2	113-157 mph	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light-object missiles generated.
F3	158-206 mph	Severe damage. Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; cars lifted off ground and thrown.
F4	207-260 mph	Devastating damage. Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
F5	261-318 mph	Incredible damage. Strong frame houses lifted off foundations and carried considerable distance to disintegrate; automobile- sized missiles fly through the air in excess of 100-yards; trees debarked.

Figure D-2 illustrates the frequency of tornado strikes in the U.S. per 1,000 square miles. While tornadoes can occur in any month and at all hours of the day or night, they occur with greatest frequency during the late spring and early summer months during late afternoon and early evening hours.

Figure D-2
Historic Tornado Activity in the United States, Summary per 1,000 Square Miles



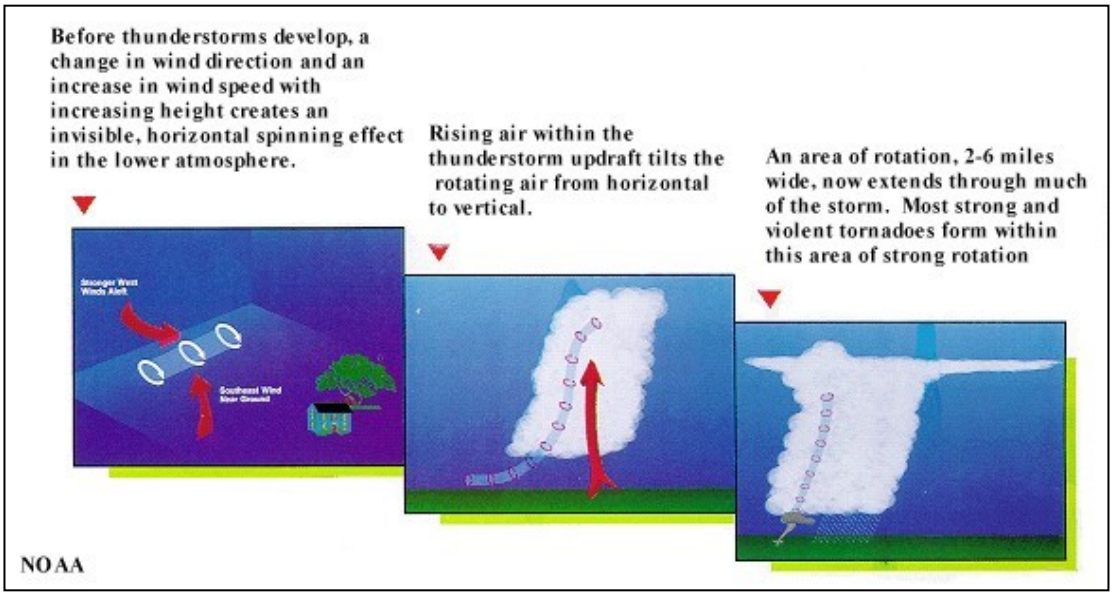
The severity and duration of tornadoes is a function of several factors, including weather conditions, topography, and the F class of the event. As noted earlier, tornado severity is measured with the Fujita scale, an empirical system that classifies events after they occur. In some cases, there are anomalous patterns for various reasons (including the reliability and completeness of reporting), but generally speaking, smaller events are more probable and larger (more severe) ones are less likely.

Tornado duration is usually relatively short, varying from a matter of seconds to several minutes on the ground, although in rare cases they can last significantly longer. The path width of a single tornado generally is less than 0.6 miles. The path length of a single tornado can range from a few hundred yards to miles. A tornado typically moves at speeds between 30 and 125 mph and can generate internal winds exceeding 300 mph. **Figure D-3** illustrates the effects of strong winds.

Figure D-3
Strong Wind Effects
(Source: FEMA)

Most tornadoes take on the traditional appearance of a narrow funnel, a few hundred yards across, with a small cloud of debris near the ground. Tornadoes can appear, however, in all manner of shapes and sizes. **Figure D-4** explains how tornadoes form.

Figure D-4
Formation of Tornadoes



Small, relatively weak landspouts might only be visible as a small swirl of dust on the ground. While the condensation funnel may not extend all the way to the ground, if associated surface winds are greater than 40 mph (64 km/h), it is considered a tornado. Large single-vortex twisters, often violent, can look like a large wedge stuck into the ground and are known as *wedge tornadoes* or *wedges*. Wedges can be so wide that they appear to be a block of dark clouds. Even experienced storm observers may not be able to tell the difference between a low-hanging cloud and a wedge tornado from a distance.

5. Coastal Erosion

Definition of Coastal Erosion

Coastal erosion is the wearing away of land or the removal of beach or dune sediments by wave action, tidal currents, wave currents, wind, or drainage.

Characteristics of Coastal Erosion

Coastal erosion is a dynamic process that is constantly occurring at varying rates along the coasts and shorelines of the U.S. Numerous factors can influence the severity and rate of coastal erosion including human activities, tides, the possibility of rising sea levels, and the frequency and intensity of hurricanes. Strong storms and hurricanes can erode large sections of coastline with a single event. The process of coastal erosion results in permanent changes to the shape and structure of the coastline. Human activities such as poor land use practices and boating activities can also accelerate the process of coastal erosion.

Billions of dollars of economic development are potentially threatened by the impacts of coastal erosion. In a report to Congress in the year 2000, FEMA estimated that erosion may cost property owners along the coast $500 million a year in structural damages and loss of land. The report also stated as many as 87,000 residential homes may be at risk of eroding into the oceans or Great Lakes over the next 60 years.

Coastal erosion is a significant problem along the entire Louisiana Gulf Coast. The barrier islands and marshes of Louisiana provide protection for inland development during hurricanes. These islands act as a buffer and help to reduce the intensity of hurricanes as they make landfall prior to reaching more densely populated areas such as New Orleans. Tides and strong storms moving onshore from the Gulf of Mexico are eroding Louisiana's marshy coastline at an alarming rate. Erosion of several of the barrier islands, which lie offshore of the estuaries and wetlands that buffer and protect these important ecosystems from the open marine environment, exceeds 20 meters per year.

On the west coast, powerful winter storms during El Niño years can cause considerable erosion along sections of the Pacific coastline. El Niño winters can include more frequent storms, large waves, and extreme high tides. Along the pacific coastline, erosion can lead to flooding, collapsed bluffs, destroyed houses, and closed roads. **Figure D-5** illustrates coastal erosion caused by El Niño.

Figure D-5
Coastal Erosion in Pacifica, California During El Niño Year in 1998
(Source: USGS)

6. Subsidence

Definition of Subsidence Hazard

Land subsidence is the loss of surface elevation due to the removal of subsurface support and ranges from broad, regional lowering of the land surface to localized collapse. In geology, engineering, and surveying, subsidence is the motion of a surface (usually, the Earth's surface) as it shifts downward relative to a datum such as sea-level. The opposite of subsidence is uplift, which results in an increase in elevation. The inhabitation of lowlands, such as coastal or delta plains, requires drainage. The resulting aeration of the soil leads to the oxidation of its organic components, such as peat, and this decomposition process may cause significant land subsidence. This applies especially when ground water levels are periodically adapted to subsidence, in order to maintain desired unsaturated zone depths, exposing more and more peat to oxygen. In addition to this, drained soils compact as result of pore-tension reduction. In this way, land subsidence has the potential of becoming self-perpetuating, collapsing at rates up to 5 centimeters per year. Water management used to be tuned primarily to factors such as crop optimization but, to varying extent, avoiding subsidence has come to be taken into account as well.

If natural gas is extracted from a natural gas field, the initial pressure (up to 600 bar) in the field will drop over the years. The gas pressure also supports the soil layers above the field. If the pressure drops, then the soil pressure increases, and this leads to subsidence at the ground level. This type of subsidence can similarly be caused by extraction of other resources, e.g., ground water, petroleum, or rock salt.

Characteristics of Subsidence

The term subsidence commonly involves a gradual sinking, but it also refers to an instantaneous or catastrophic collapse. Subsidence is caused by a diverse set of human activities and natural processes. Different types of subsidence are address below:

- Collapse into Voids – Collapse of surficial materials into underground voids is the most dramatic form of subsidence. Most of the subsidence-related voids in the United States were created by coal mining.

- Sediment Compaction – Sediment compaction typically causes broad regional subsidence. Rates of subsidence usually are low, ranging from a few millimeters to centimeters per year, but total subsidence may reach several meters over decades. Sediment compaction results from underground fluid withdrawal, natural compaction, and hydrocompaction. Underground fluid withdrawal is one of the major causes of sediment compaction in the U.S. When fluids are withdrawn, fluid pressures decline and support of the overburden is transferred to the solid skeleton. If the reservoir soil is compressible, sediment compaction and subsidence occur.

- Another type of sediment compaction occurs naturally as older sediment is buried by younger sediment. Natural subsidence is occurring most rapidly in the Mississippi River Delta area of southern Louisiana where approximately 1,500 square miles of land are subsiding. Estimating average rates of subsidence range from 0.3 to 0.4 inches per century. Maximum rates measured by geodetic surveys are approximately 0.5 inches per year.

- Drainage of Organic Soils – Drainage of organic soils, particularly peat and muck, induces a series of processes that reduces the volume of soil. These processes include biological oxidation, compaction, and desiccation. Biological oxidation usually dominates in warm climates. The principal areas of organic soil subsidence in the United States are in the greater New Orleans and Jefferson Parish area.

- Tides and heavy storms in the Gulf are eroding Louisiana's marshy coastline at an alarming rate. Coastlines in southern Jefferson Parish are sinking or eroding away with incoming water eating at the marshes and wetlands that buffer and drain the higher drier land. Parts of Jefferson Parish's coastal evacuation routes are indeed vulnerable to storm flooding due to land subsidence. One such place is along Louisiana Highway 1.

A "triggering mechanism" can cause a change in the local environment that affects the soil mass causing subsidence. Water is the main factor affecting the local environment that causes subsidence. The main triggering mechanisms for subsidence follow:

- Water level decline
- Changes in groundwater flow
- Increased loading
- Deterioration (abandoned coalmines)

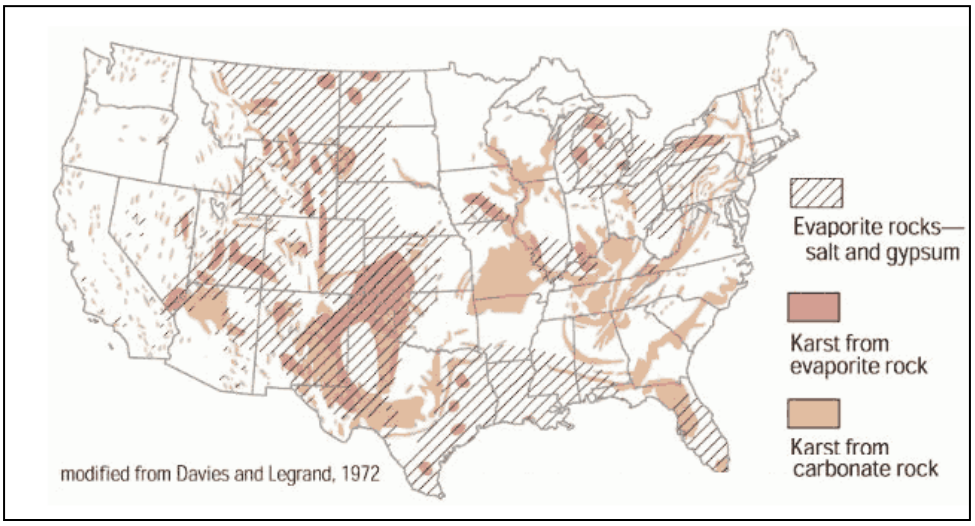
Water level decline can happen naturally or be human induced. Main factors in water decline are:

- Pumping of water from wells
- Localized drainage from construction
- Dewatering
- Drought

Changes in the groundwater flow include an increase in the velocity of groundwater movement, increase in the frequency of water table fluctuations, and increased or reduced recharge.

Figure D-6 shows areas of the United States where certain rock types are susceptible to dissolution in water occur.

Figure D-6
Rock Types Susceptible to Dissolution in Water
(Source: USGS)



7. Hailstorms

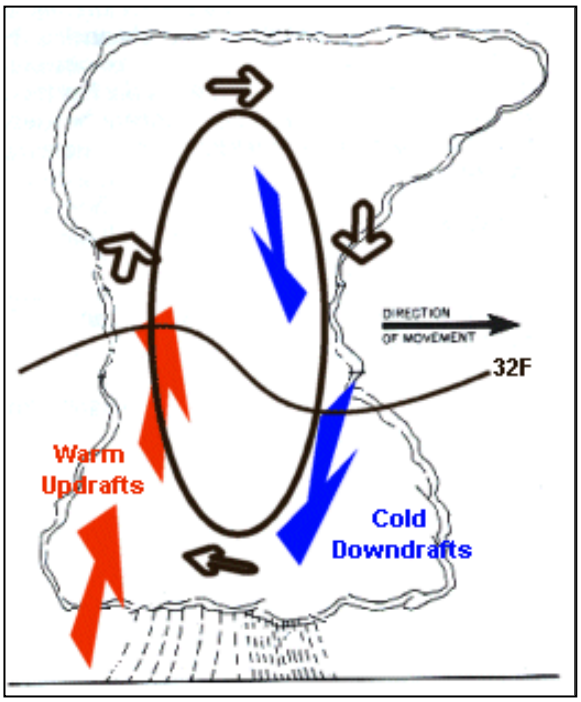
Definition of Hailstorm Hazard

Hail is defined as balls or pieces of ice falling as precipitation from a thunderstorm. Known as hailstones, these ice balls typically range from 5 mm–50 mm in diameter on average, with much larger hailstones forming in severe thunderstorms. The size of hailstones is a direct function of the severity and size of the storm.

Characteristics of Hail

Hail is an outgrowth of severe thunderstorms and develops within a low-pressure front as warm air rises rapidly into the upper atmosphere and is subsequently cooled, as shown in **Figure D-7**, leading to the formation of ice crystals. These are bounced about by high-velocity updraft winds and accumulate into frozen droplets, falling as precipitation after developing enough weight (FEMA, 1997). The National Weather Service (NWS) defines severe thunderstorms as those with downdraft winds in excess of 58 miles an hour and/or hail at least 3/4 inches in diameter. While only about 10 percent of thunderstorms are classified as severe, all thunderstorms are dangerous because they produce numerous dangerous conditions, including one or more of the following: hail, strong winds, lightning, tornadoes, and flash flooding.

Figure D-7
How Hail Is Formed



Hailstorms occur most frequently during the late spring and early summer. During this period, extreme temperature changes occur from the surface up to the jet stream, resulting in the strong updrafts required for hail formation.

The size of hailstones varies and is related to the severity and size of the thunderstorm that produced it. The higher the temperatures at the Earth's surface, the greater the strength of the updrafts, and the greater the amount of time the hailstones are suspended, giving the hailstones more time to increase in size. Hailstones vary widely in size as shown in **Table D-4**. Note that penny size (3/4 inches in diameter) or larger hail is considered severe. **Figure D-8** provides an example of a large hailstone.

Table D-4
Estimating Hail Size

Size	Inches in Diameter
Pea	1/4 inch
Marble/Mothball	1/2 inch
Dime/Penny	3/4 inch
Nickle	7/8 inch
Quarter	1 inch
Ping-Pong Ball	1 1/2 inch
Golf Ball	1 3/4 inch
Tennis Ball	2 1/2 inch
Baseball	2 3/4 inch
Tea Cup	3 inches
Grapefruit	4 inches
Softball	4 1/2 inches

Figure D-8
Large Hailstone
(Source: NOAA)

8. Winter Storms

Definition of Winter Storm Hazards

A winter storm is a type of precipitation in which the dominant varieties of precipitation are forms that only occur at cold temperatures, such as snow or sleet, or a rainstorm where ground temperatures are cold enough to allow ice to form (i.e., freezing rain). In temperate continental climates, these storms are not restricted to the winter season and may occur in the late autumn and early spring. Also, there are very rare occasions when they form in summer although it would have to be an abnormally cold summer, such as the summer of 1816 in the Northeast U.S. In many locations in the Northern Hemisphere, the most powerful winter storms usually occur in March and, in regions where temperatures are cold enough, April. **Figure D-9** shows a tree that was damaged during an ice storm.

Figure D-9
Split Tree Caused by Ice Storm
(Source: FEMA)

Characteristics of Winter Storms

Winter storms typically form along a front generally following the meandering path of the jet stream. These storms, called mid-latitude cyclones or extra-tropical cyclones, differ from hurricanes in that they move from west to east as opposed to east to west. These weather patterns carry cold air from Canada and the Rockies into the southern U.S. The origins of the weather patterns that cause winter storms in Louisiana are affected by differences in temperature and pressure, moisture availability, and wind direction as well as weather systems in the Atlantic Ocean and Gulf of Mexico.

Winter storms vary in size and strength and include heavy snowstorms, blizzards, freezing rain, sleet, ice storms, and blowing and drifting snow conditions. Extremely cold temperatures accompanied by strong winds can result in wind chills that cause bodily injury such as frostbite and death. Severe winter and ice storms can cause unusually heavy rain or snowfall, high winds, extreme cold, and ice storms throughout the continental United States.

NOAA describes the jet streams that carry storm systems across the United States as narrow bands of strong wind in the upper atmosphere that follow the boundaries between hot and cold air masses. These boundaries are most pronounced during the winter months when the jet streams travel to their southernmost position over the United States and surrounding water.

In the last 11 winters, no region in the United States has escaped flooding during the winter months. The Southeastern and Gulf Coast states (regularly hit by autumn hurricanes) experience damaging floods in the winter months too. No region is immune. Global warming threatens to disrupt weather patterns around the world and may increase the frequency of winter flooding.

Another weather phenomenon, El Niño, can have a significant effect on precipitation in the United States. Named by Peruvian fishermen who noticed the periodic appearance of warming surface temperatures in the Pacific Ocean around Christmas, El Niño is now understood to be the warm phase of a temperature oscillation in the Pacific Basin's water and atmosphere. The cool phase of the oscillation is nicknamed La Niña. During the warm phase, heat and moisture are released into the upper atmosphere, creating precipitation. El Niño alters the course of the jet stream, pushing it farther south than usual.

According to NOAA, El Niño winters tend to be wetter than normal in the Southeastern United States and contribute to flooding along the Gulf Coast. Storms that spin up in the Gulf of Mexico typically track northeast on the southern jet stream, bringing rain as well as ice and even snow to the Gulf states.

Winter storm occurrences tend to be very disruptive to transportation and commerce. Trees, cars, roads, and other surfaces develop a coating or glaze of ice, making even small accumulations of ice extremely hazardous to motorists and pedestrians. The most prevalent impacts of heavy accumulations of ice are slippery roads and walkways that lead to vehicle and pedestrian accidents; collapsed roofs from fallen trees and limbs and heavy ice and snow loads; and felled trees, telephone poles and lines, electrical wires, and communication towers. As a result of severe ice storms, telecommunications and power can be disrupted for days. Such storms can also cause exceptionally high rainfall that persists for days, resulting in heavy flooding.

9. Lightning

Definition of Lightning

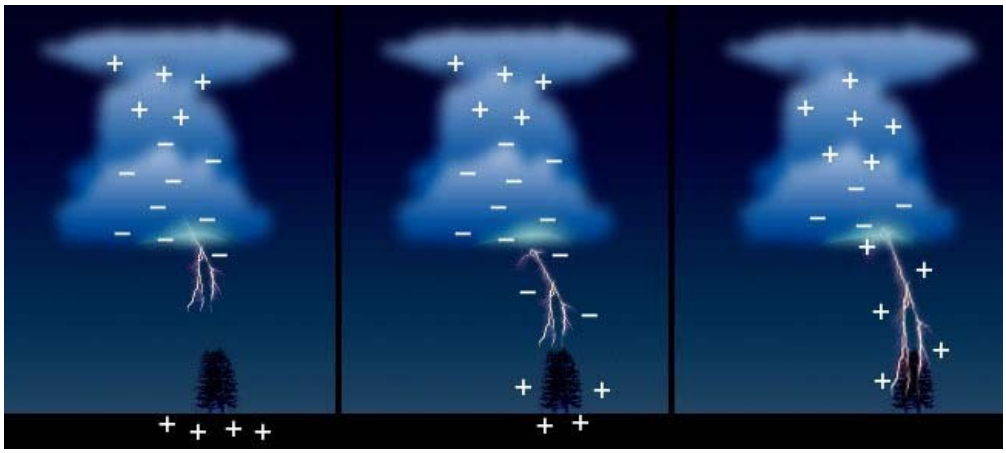
Lightning is a powerful natural electrostatic discharge produced during a thunderstorm. This abrupt electric discharge is accompanied by the emission of visible light and other forms of electromagnetic radiation. The electric current passing through the discharge channels rapidly heats and expands the air into plasma, producing acoustic shock waves (thunder) in the atmosphere.

Lightning, which occurs during all thunderstorms, can strike anywhere. Generated by the buildup of charged ions in a thundercloud, the discharge of a lightning bolt interacts with the best conducting object or surface on the ground. The air in the channel of a lightning strike reaches temperatures higher than 50,000 degrees Fahrenheit. The rapid heating and cooling of the air near the channel causes a shock wave, which produces thunder.

Characteristics of Lightning

Lightning typically occurs as a by-product of a thunderstorm. The action of rising and descending air in a thunderstorm separates positive and negative charges, with lightning the result of the buildup and discharge of energy between positive and negative charge areas. Water and ice particles may also affect the distribution of the electrical charge. In only a few millionths of a second, the air near a lightning strike is heated to 50,000 degrees Fahrenheit, a temperature hotter than the surface of the sun. Thunder is the result of the very rapid heating and cooling of air near the lightning that causes a shock wave. **Figure D-10** shows how lightning it formed.

Figure D-10
Formation of Lightning
(Source: University Corporation for Atmospheric Research (UCAR))



The hazard posed by lightning is significantly underrated. High winds, rainfall, and a darkening cloud cover are the warning signs for possible cloud-to-ground lightning strikes. While many lightning casualties happen at the beginning of an approaching storm, more than half of lightning deaths occur after a thunderstorm has passed. The lightning threat diminishes after the last sound of thunder but may persist for more than 30 minutes. When thunderstorms are in the area, but not

overhead, the lightning threat continues to exist. Lightning has been known to strike more than 10 miles from the storm in an area with clear sky above.

Lightning is the most dangerous and frequently encountered weather hazard that most people in the United States experience annually. Lightning is the second most frequent killer in the U.S., behind floods and flash floods, with nearly 100 deaths and 500 injuries annually. These numbers are likely to underestimate the actual number of casualties because of the under reporting of suspected lightning deaths and injuries. Cloud-to-ground lightning can kill or injure people by either direct or indirect means.

According to the National Oceanic and Atmospheric Administration (NOAA), an average of 20 million cloud-to-ground flashes has been detected every year in the continental United States. About half of all flashes have more than one ground strike point, so at least 30 million points on the ground are struck on average each year. In addition, there are roughly 5 to 10 times as many cloud-to-cloud flashes as there are to cloud-to-ground flashes (NOAA, July 7, 2003). **Figure D-11** shows a lightning bolt in the sky.

Figure D-11
Lightning Bolt in Night Sky
(Source: FEMA)

Cloud-to-ground lightning is nearly always associated with thunderstorms and related weather phenomena. Thunderstorms occur in most warm and hot months and occasionally at other times as well. The entire planning area is subject to the lightning hazard. While the duration of individual lightning strikes is only milliseconds, the duration of thunderstorms that create the lightning ranges from very short periods (15 minutes or less) to long periods when storms are relatively stationary.

Damages from lightning hazards are generally limited to those related to power surges and contact with electrical equipment. In some cases, ungrounded structures are hit by lightning and experience damage, either as a direct result of the lightning or via fires secondary to the hazard. There are also reports of brushfires being started by lightning although these are usually relatively small and quickly contained. No reliable database or information exists to determine the cost of recovery from lightning.

10. Drought

Definition of Drought Hazard

A drought is an extended dry climate condition when there is not enough water to support urban, agricultural, human, or environmental water needs. It usually refers to a period of below-normal rainfall but can also be caused by drying bores or lakes or anything that reduces the amount of liquid water available. Drought is a recurring feature of nearly all the world's climatic regions.

Drought is the result of a decline in the expected precipitation over an extended period of time, typically one or more seasons in length. Meteorological drought is defined solely on the degree of dryness expressed as a departure of actual precipitation from an expected average or normal amount based on monthly, seasonal, or annual time scales. Hydrological drought is related to the effects of precipitation shortfalls on streamflows and reservoir, lake, and groundwater levels. Agricultural drought is defined principally in terms of soil moisture deficiencies relative to water demands of plant life, usually crops. Socioeconomic drought associates the supply and demand of economic goods or services with elements of meteorological, hydrologic, and agricultural drought. Socioeconomic drought occurs when the demand for water exceeds the supply as a result of weather-related supply shortfall. This may also be called a water management drought. **Figure D-12** shows a boy wheeling water during a drought.

Figure D-12
Boy Wheeling Water during Drought
(Source: FEMA)

Characteristics of Drought

Drought produces a complex web of impacts that spans many sectors of the economy and reaches well beyond the area experiencing physical drought. This complexity exists because water is integral to our ability to produce goods and provide services. Impacts are commonly referred to as direct or indirect. Reduced crop, rangeland, and forest productivity; increased fire hazard; reduced water levels; increased livestock and wildlife mortality rates; and damage to wildlife and fish habitat are a few examples of direct impacts. The consequences of these impacts illustrate indirect impacts. For example, a reduction in crop, rangeland, and forest productivity may result in reduced

income for farmers and agribusiness, increased prices for food and timber, unemployment, reduced tax revenues because of reduced expenditures, increased crime, foreclosures on bank loans to farmers and businesses, migration, and disaster relief programs.

Drought is a normal part of virtually every climate on the planet, including areas of both high and low normal rainfall. The severity of drought can be aggravated by other climatic factors, such as prolonged high winds and low relative humidity (FEMA, 1997). A drought's severity depends on numerous factors, including duration, intensity, and geographic extent as well as regional water supply demands by humans and vegetation. Due to its multi-dimensional nature, drought is difficult to define in exact terms and also poses difficulties in terms of comprehensive risk assessments.

Drought differs from other natural hazards in three ways. First, the onset and end of a drought are difficult to determine due to the slow accumulation and lingering effects of an event. Second, the lack of an exact and universally accepted definition adds to the confusion of its existence and severity. Third, in contrast with other natural hazards, the impact of drought is less obvious and may be spread over a larger geographic area. These characteristics have hindered the preparation of drought contingency or mitigation plans by many governments.

Droughts may cause a shortage of water for human and industrial consumption and cause a decrease in hydroelectric power. Water quality may also be negatively impacted while the number and severity of wildfires may increase. Severe droughts may result in the loss of agricultural crops and forest products, undernourished wildlife and livestock, lower land values, and higher unemployment.

11. Wildfires

Definition of Wildfire Hazard

A wildfire, also known as a forest fire, vegetation fire, grass fire, brush fire, or hill fire, is an uncontrolled fire often occurring in wildland areas, which can also consume houses or agricultural resources. Common causes include lightning, human carelessness, and arson.

Wildfires are fueled by naturally occurring or non-native species of trees, brush, and grasses. Topography, fuel, and weather are the three principal factors that impact wildfire hazards and behavior. **Figure D-13** shows an example of a warehouse fire.

Figure D-13
Warehouse Fire
(Source: FEMA)

Characteristics of Wildfires

Wildfires often begin unnoticed, spread quickly, and are usually signaled by dense smoke that may fill the area for miles around. As mentioned, wildfires can be human-caused through acts such as arson or campfires or can be caused by natural events such as lightning. Wildfires can be categorized into three types:

1. Wildland fires occur in very rural areas and are fueled primarily by natural vegetation.

2. Interface fires occur in areas where homes or other structures are endangered by the wildfires. The fires are fueled by both natural vegetation and man-made structures. These are often referred to as Wildland Urban Interface fires.

3. Firestorms occur during extreme weather (e.g., high temperatures, low humidity, and high winds) with such intensity that fire suppression is virtually impossible. These events typically burn until the conditions change or the fuel is exhausted.

The following three factors contribute significantly to wildfire behavior:

- Fuel: The type of fuel and the fuel loading (measured in tons of vegetative matter per acre) have a direct impact on fire behavior. Fuel types vary from light fuels (grass) to moderate fuels (Southern Rough) to heavy fuels (slash). The type of fuel and the fuel load determines the potential intensity of the wildfire and how much effort must be expended to contain and control it.

- Weather: The most variable factor affecting wildfire behavior is weather. Important weather variables are precipitation, humidity, and wind. Weather events ranging in scale from localized thunderstorms to large cold fronts can have major effects on wildfire occurrence and behavior. Extreme weather, such as extended drought and low humidity, can lead to extreme wildfire activity.

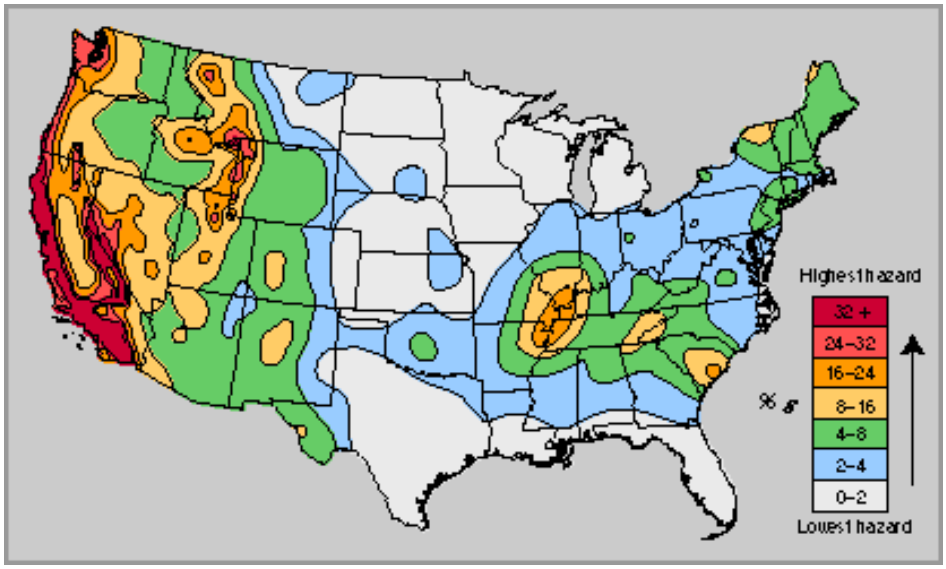
- Topography: Topography can have a powerful influence on wildfire behavior. The movement of air over the terrain tends to direct a fire's course.

12. Earthquakes

Definition of Earthquake Hazard

An earthquake is "…a sudden motion or trembling caused by an abrupt release of accumulated strain in the tectonic plates that comprise the earth's crust." These rigid plates, known as tectonic plates, are some 50 to 60 miles in thickness and move slowly and continuously over the earth's interior. The plates meet along their edges, where they move away from or pass under each other at rates varying from less than a fraction of an inch up to five inches per year. While this sounds small, at a rate of two inches per year, a distance of 30 miles would be covered in approximately one million years (FEMA, 1997). **Figure D-14** shows a USGS seismic probability map for the continental U.S.

Figure D-14
United States Earthquake Zones



Characteristics of Earthquakes

The vibration or shaking of the ground during an earthquake is described by ground motion. Severity of ground motion generally increases with the amount of energy released and decreases with distance from the fault or epicenter of the earthquake. Ground motion causes waves in the earth's interior, also known as seismic waves, and along the earth's surface, known as surface waves. The following are the two kinds of seismic waves:

- P (primary) waves are longitudinal or compressional waves similar in character to sound waves that cause back-and-forth oscillation along the direction of travel (vertical motion), with particle motion in the same direction as wave travel. They move through the earth at approximately 15,000 miles per hour.

- S (secondary) waves, also known as shear waves, are slower than P waves and cause structures to vibrate from side-to-side (horizontal motion) due to particle motion at right-

angles to the direction of wave travel. Unreinforced buildings are more easily damaged by S waves.

Earthquakes are often relatively short duration but there may be aftershocks and other effects (such as liquefaction) that prolong and exacerbate their effects. The potential for either of these effects depends on local conditions and other technical factors that are not discussed in this Plan.

There is some potential for seismic activity virtually anywhere on the earth. Locations that are close to tectonic faults, however, are much more likely to be impacted by earthquakes than other places. The United States Geologic Survey and other organizations develop maps to indicate the relatively probability of earthquakes in particular areas. **Figure D-15** shows an example of damage caused by an earthquake.

Figure D-15
Earthquake Damage
(Source: FEMA)

13. Sea Level Rise

Definition of Sea Level Rise Hazard

Sea Level Rise is defined as the mean rise in sea level. It is caused by two factors: 1) as the ocean warms, sea water expands in volume and 2) continental ice shelves melt, increasing the amount of water in the oceans. This leads to a greater area of land being inundated by sea water.

Rising sea level contributes to the loss of coastal wetlands (which provide protective buffers from flood events), beach erosion, impacts on population and property in low areas, and disruption of coastal habitats and species. Further, flooding and hurricane events are more severe and affect a greater area.

Characteristics of Sea Level Rise

Over the past century, global sea level has been rising, and, in recent decades, the rate of rise has increased. In 2014, global sea level was 2.6 inches above the 1993 average, and sea level continues to rise at a rate of about one-eighth of an inch per year (NOAA, 2018). Sea level rise at a specific location may be more or less than the global average due to many local factors including subsidence, upstream flood control, erosion, regional ocean currents, and variations in land height.

Higher sea levels result in storm surges pushing farther inland than before, which also results in more frequent nuisance flooding. According to NOAA, nuisance flooding, which is not only disruptive but also costly, is estimated to occur from 300 percent to 900 percent more frequently within U.S. coastal communities than 50 years ago.

In the United States, almost 40 percent of the population lives in relatively high-population-density coastal areas in which sea level impacts flooding, shoreline erosion, and hazards from storms. Rising seas pose a threat to the infrastructure on which local jobs and regional industries rely. Roads, bridges, subways, water supplies, oil and gas wells, power plants, sewage treatment plants, and landfills are all at risk from sea level rise.

14. Extreme Heat

Definition of Extreme Heat Hazard

Extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and that last for an extended period of time. A heat wave may occur when temperatures hover 10 degrees or more above the average high temperature for the region and last for a prolonged number of days or several weeks. Humid conditions may also add to the discomfort of high temperatures.

Characteristics of Extreme Heat

The National Weather Service devised the Heat Index as a mechanism to better inform the public of heat dangers. The Heat Index Chart, shown in **Figure D-16**, uses air temperature and humidity to determine the heat index or apparent temperature. **Table D-5** shows the dangers associated with different heat index temperatures. Some populations, such as the elderly and young, are more susceptible to heat danger than other segments of the population.

Figure D-16
Heat Index Chart
(Source: NOAA)

Air Temp (in F) \ Relative Humidity (in percent)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
140	125																				
135	120	128																			
130	117	122	131																		
125	111	116	123	131	141																
120	107	111	116	123	130	139	148														
115	103	107	111	115	120	127	135	143	151												
110	99	102	105	108	112	117	123	130	137	143	150										
105	95	97	100	102	105	109	113	118	123	129	135	142	149								
100	91	93	95	97	99	101	104	107	110	115	120	126	132	138	144						
95	87	88	90	91	93	94	96	98	101	104	107	110	114	119	124	130	136				
90	83	84	85	86	87	88	90	91	93	95	96	98	100	102	106	109	113	117	122		
85	78	79	80	81	82	83	84	85	86	87	88	89	90	91	93	95	97	99	102	105	108
80	73	74	75	76	77	77	78	79	79	80	81	81	82	83	85	86	86	87	88	89	91
75	69	69	70	71	72	72	73	73	74	74	75	75	76	76	77	77	78	78	79	79	80
70	64	64	65	65	66	66	67	67	68	68	69	69	70	70	70	70	71	71	71	71	72

Table D-5
Heat Disorders Associated with Heat Index Temperature
(Source: NWS, NOAA)

Heat Index Temperature (Fahrenheit)	Description of Risks
80°- 90°	Fatigue possible with prolonged exposure and/or physical activity
90°- 105°	Sunstroke, heat cramps, and heat exhaustion possible with prolonged exposure and/or physical activity
105°- 130°	Sunstroke, heat cramps, and heat exhaustion likely, and heatstroke possible with prolonged exposure and/or physical activity
130° or higher	Heatstroke or sunstroke is highly likely with continued exposure

Appendix E
Repetitive Loss Area Analyses

Jefferson Parish
Repetitive Loss Area Analysis

Adopted by Council May 16, 2018

TABLE OF CONTENTS

INTRODUCTION

In the United States, flooding is the most common natural disaster; resulting in more loss of life and property than any other types of hazards and severe weather events. More than 20,000 communities experience floods and this hazard accounts for approximately 73 percent of all Presidential Disaster Declarations over the 2008-2017 time period.[1] Recent studies also indicate how the cost of recovery is spread over local, state and federal government and the disaster victims who are themselves affected by the disaster.

Statistics indicate that there are thousands of NFIP's policyholders whose properties have flooded multiple times. "Repetitive Loss properties," are buildings and/or contents for which the NFIP has paid at least two claims of more than $1,000 in any 10-year period since 1978.[2]. Severe Repetitive Loss property (SRL) is four or more separate claim payments of more than $5,000 each (including building and contents payments); or two or more separate claim payments (building payments only) where the total of the payments exceeds the current value of the property. In this Repetitive Loss Area Analysis (RLAA), flooding issues and potential mitigation measures are discussed for homes and apartments located in Repetitive Loss Area (RLA) of Jefferson Parish. Based on the nature of flooding, type of structure and the number of flood insurance claims, five subareas are selected as representative of the Parish. – i) Crown Point, Lafitte, Barataria ii) River Ridge, iii) Harvey, iv) Metairie Arcadia Place, and v) Metairie Mason Subdivision. These subareas have repetitively flooded and have continually undergone personal losses and stresses associated with living in a flood-prone house. To form appropriate and effective recommendations, this report has been created in collaboration with the residents and civic associations of Jefferson Parish particularly of the subareas selected in this analysis.

It is anticipated that informed residents can become stronger advocates for policy change at the neighborhood, city, parish, state and even federal levels. This report is therefore an attempt to help homeowners reduce their flood risk by being aware of the flooding problems in their neighborhood, and the potential solutions to the continual suffering that results from repetitive flooding. Finally, mitigation of these repetitive loss properties will ultimately be instrumental in reducing the overall costs to the NFIP as well as to individual homeowners.

[1] Federal Emergency Management Agency, "Protecting Homes," last updated June 24, 2016, http://www.fema.gov/protecting-homes

[2] Federal Emergency Management Agency, National Flood Insurance Program Flood Insurance Manual (April 2016), http://www.fema.gov/media-library/assets/documents/115549.

BACKGROUND

The National Flood Insurance Program (NFIP), a program overseen by the Federal Emergency Management (FEMA), is continually faced with the task of paying claims while trying to keep the price of flood insurance at an affordable rate since 1968. There are approximately 5.3 million NFIP policies across the United States in more than 22,000 communities. As of 2009, repetitive loss properties represent only one (1) percent of all flood insurance policies, yet historically they account for nearly one-third (1/3) of the claim payments. While the NFIP has resulted in forty years of successful floodplain management, repetitive loss properties still remain a drain on the NFIP.[3] Jefferson Parish, Louisiana (CID-225199) participates in the regular phase of the NFIP. In addition to meeting the basic requirements of the NFIP, Jefferson Parish has completed additional components to participate in the Community Rating System (CRS) program. Jefferson Parish is currently a CRS Class 6 which rewards all policyholders in the SFHA with a 20 percent reduction in their flood insurance premiums. Non-SFHA policies (Standard X Zone policies) receive a 10% discount, and preferred risk policies receive no discount. Jefferson Parish has been participating in the CRS program since October 1, 1992.

As of April 30, 2017, there are 88,406 NFIP policies in force in unincorporated Jefferson Parish and insurance coverage of approximately $23 billion.

Terminology

Area Analysis: An approach to identify repetitive loss areas, evaluate mitigation approaches, and determine the most appropriate alternatives to reduce future repetitive losses

Hazard Mitigation: Defined by FEMA as sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event

Repetitive Loss*:* Any insurable building for which two or more claims of more than 1,000 have been paid within a 10-year period, since 1978. To focus resources on those properties that represent the best opportunities for mitigation, a subcategory of Severe Repetitive Loss Properties is listed.

Severe Repetitive Loss*:* As defined by the Flood Insurance Reform Act of 2004, SRLs are 1-4 family residences that have had four or more claims of more than $5,000 or at least two claims that cumulatively exceed the building's value. The Act creates new funding mechanisms to help mitigate flood damage for these properties.

A repetitive loss property does not have to have a current flood insurance policy to be considered a repetitive loss property or a severe repetitive loss property. In some cases, a community will find that properties on its repetitive loss list are not currently insured. Once it is designated as a repetitive loss property, that property remains a repetitive loss property from owner to owner; insured policy to no policy; and even after that property has been mitigated. Almost eighty percent of all structures having policies in Jefferson Parish are currently insured. According to repetitive loss data received from NFIP Repetitive Loss (RL) AW-501 Worksheets in August, 2017, there are a total of 5115 unmitigated and over 3500 mitigated repetitive loss properties within Jefferson Parish.

An updated Activity 510 Floodplain Mitigation Plan (FMP) for Jefferson Parish was done in 2015. Since the FMP examines flooding issues as a whole within the Parish and does not assess individual properties, the

[3] Federal Emergency Management Agency, "Federal Flood Risk Management Standard," last updated March 29, 2016, http://www.fema.gov/news-release/2015/02/05/federal-flood-risk-management-standard

Jefferson Parish has opted to complete a Repetitive Loss Area Analysis (RLAA) using the 2017 CRS Coordinator's Manual. The RLAA will benefit the Parish by examining potential mitigation measures for specific repetitive loss areas and increasing its credit in the CRS Program.

COMMUNITY RATING SYSTEM

The Community Rating System (CRS) is a voluntary program designed to reward a community for doing more than meeting the NFIP minimum requirements to reduce flood damages. Communities can be rewarded for activities such as reducing flood damage to existing buildings, managing development in areas not shown in the floodplain on the Flood Insurance Rate Map (FIRM), protecting new buildings from floods greater than the 100-year flood, helping insurance agents obtain flood data, and helping people obtain flood insurance. The reward for these activities comes in the form of reduced premiums for flood insurance policy holders. Once a community has been accepted into the CRS, the community's floodplain management activities are rated according to the scoring system described in the CRS Coordinator's Manual. CRS communities are rated on a scale of 1-10. A Class 10 community receives no reduction in flood insurance premiums, but every class above 10 receives an additional 5% premium reduction. Class 1 requires the most credit points and provides a 45% premium reduction.

THE AREA

Jefferson Parish is located in southeastern Louisiana and bordered by Lake Pontchartrain on the north, Orleans and Plaquemines Parish to the east, Gulf of Mexico to the south, and Lafourche and St. Charles Parishes to the west. See Figure.1 below.

Figure 1

Principal physiographic features of the area are the Mississippi River channel, natural levee ridges along its banks and along the banks of abandoned distributary channels, and low marshlands situated between and bordering the channels. Jefferson Parish is divided into an East and West Bank by the Mississippi River which meanders through the northern section of the Parish. The highest land in the Parish is approximately 10 feet above the North American Vertical Datum (NAVD) along the natural levee that borders the Mississippi River. The East Bank is nearly surrounded by water and bound by the Mississippi River to the south, Lake Pontchartrain to the north, the 17th Street Canal to the east, and St. Charles Parish to the west. The West Bank of Jefferson Parish, east of the Harvey canal, is bound by the Donner Canal to the east, the Mississippi River to the north, the Harvey Canal to the west, and the Intracoastal Waterway to the south.

With a total population of 432,552 as of the 2010 census, Jefferson Parish is spread over a total land area of 305 square miles or 195,793 acres and a water area of 336 miles or 215,358 acres.[4] The Parish extends about 55 miles in a north-south direction from the southern shores of Lake Pontchartrain to the Gulf of Mexico. The southern part of the parish is less populated and is characterized by estuarine systems that lead in from the Gulf of Mexico. The coastal marshes, wetlands, and estuaries contain numerous bodies of shallow water. These bodies of water and wetlands make up over 85 percent of the parish.

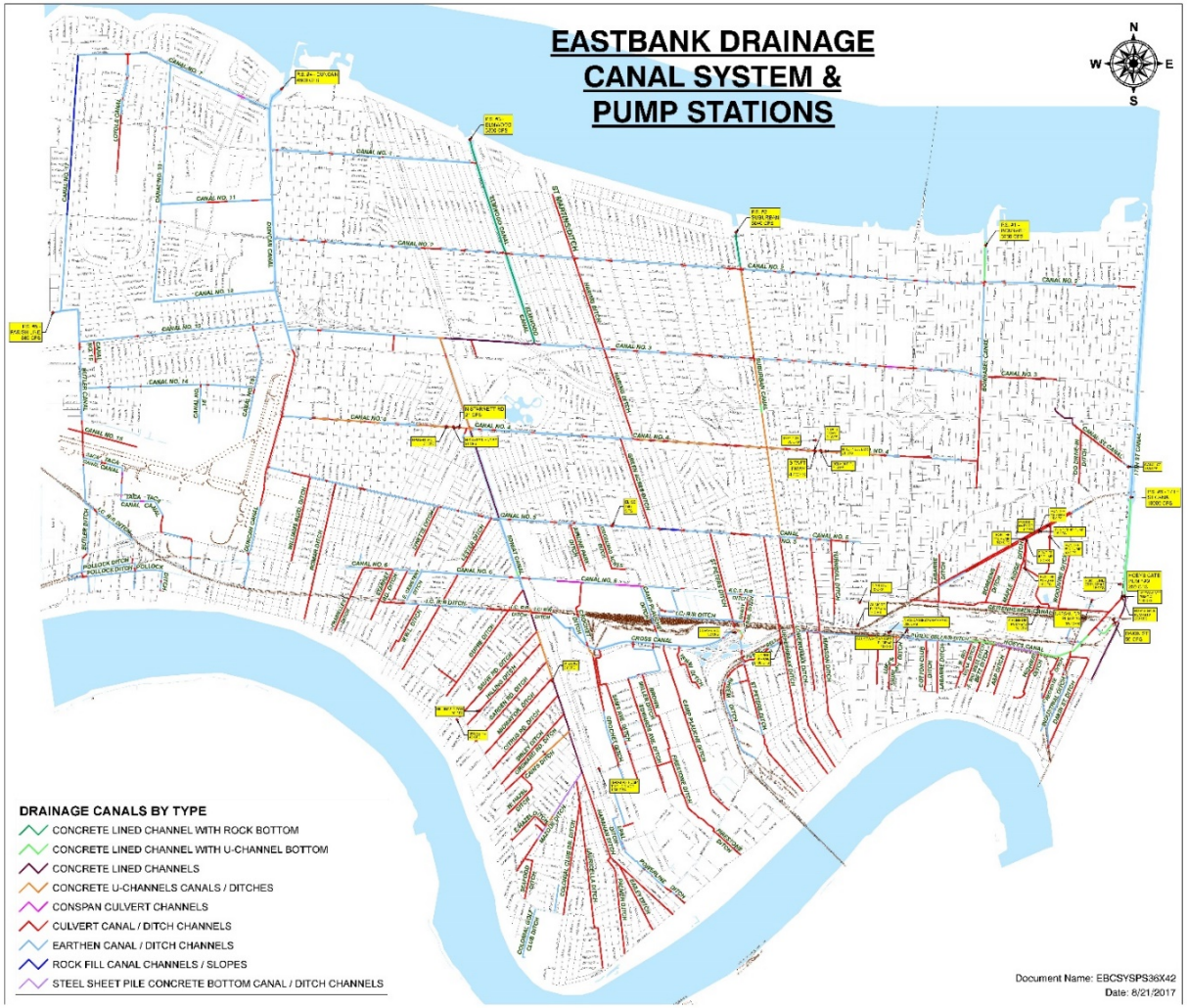
Hundreds of floods occur each year in the United States, including overbank flooding of rivers and streams and shoreline inundation along lakes and coasts. Given the geographic location and physiographic nature of Jefferson Parish, flooding in the area typically results from large-scale weather systems generating prolonged rainfall due to hurricanes, thunderstorms (convectional and frontal), storm surge or winter storms. According to the Floodplain Hazard Mitigation Plan (FMP) there have been 49 floods recorded in Jefferson Parish in the period from 1996 to 2014. The history of flooding in Jefferson Parish indicate that flooding may occur during any season of the year. In the cooler months, the area is subject to heavy rainfalls resulting from frontal passages. In the summer months, heavy rainfalls result from convective thunderstorms. In the late summer, hurricanes accompanied by rainfall and super-elevated water-surface elevations pose the largest threat of flooding to the area. With an average annual precipitation of 64.16 inches, flood protection is vital to the parish[5].

[4] https://www.census.gov/quickfacts/fact/table/jeffersonparishlouisiana/PST120216 , accessed 3/28/2018

[5] Jefferson Parish, October 2015: Jefferson United Mitigation Professionals Multijurisdictional Program for Public Information.

Flood protection in northern Jefferson Parish is achieved by a system of levees, floodwalls, canals and drainage pump stations. The parish has 340 miles of canal waterways, drainage ditches, cross drains, culverts, and internal levee systems. There are also 70 pump stations (24 major stations) that include 167 pumps installed throughout the parish drainage system for a total capacity of 47,569 cfs.[6] With the exception of some areas inside the levee protected areas of northern Jefferson Parish, most of the land is located within FEMA's 100-year floodplain. The land area outside of the 100-year floodplain may still be subject to flooding if a levee failure were to occur. The area outside the levee protection system, including Jean Lafitte and Grand Isle, in the southern part of the Parish is most vulnerable to storm surge flooding. Figures 2 and 3 on the next page illustrate drainage in Jefferson Parish along with the main canals and other water features.

[6] Jefferson Parish Drainage Department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CONCRETE LINED CHANNEL WITH ROCK BOTTOM
CONCRETE LINED CHANNEL WITH U-CHANNEL BOTTOM
CONCRETE LINED CHANNELS
CONCRETE U-CHANNELS CANALS / DITCHES
CONSPAN CULVERT CHANNELS
CULVERT CANAL / DITCH CHANNELS
EARTHEN CANAL / DITCH CHANNELS
ROCK FILL CANAL CHANNELS / SLOPES
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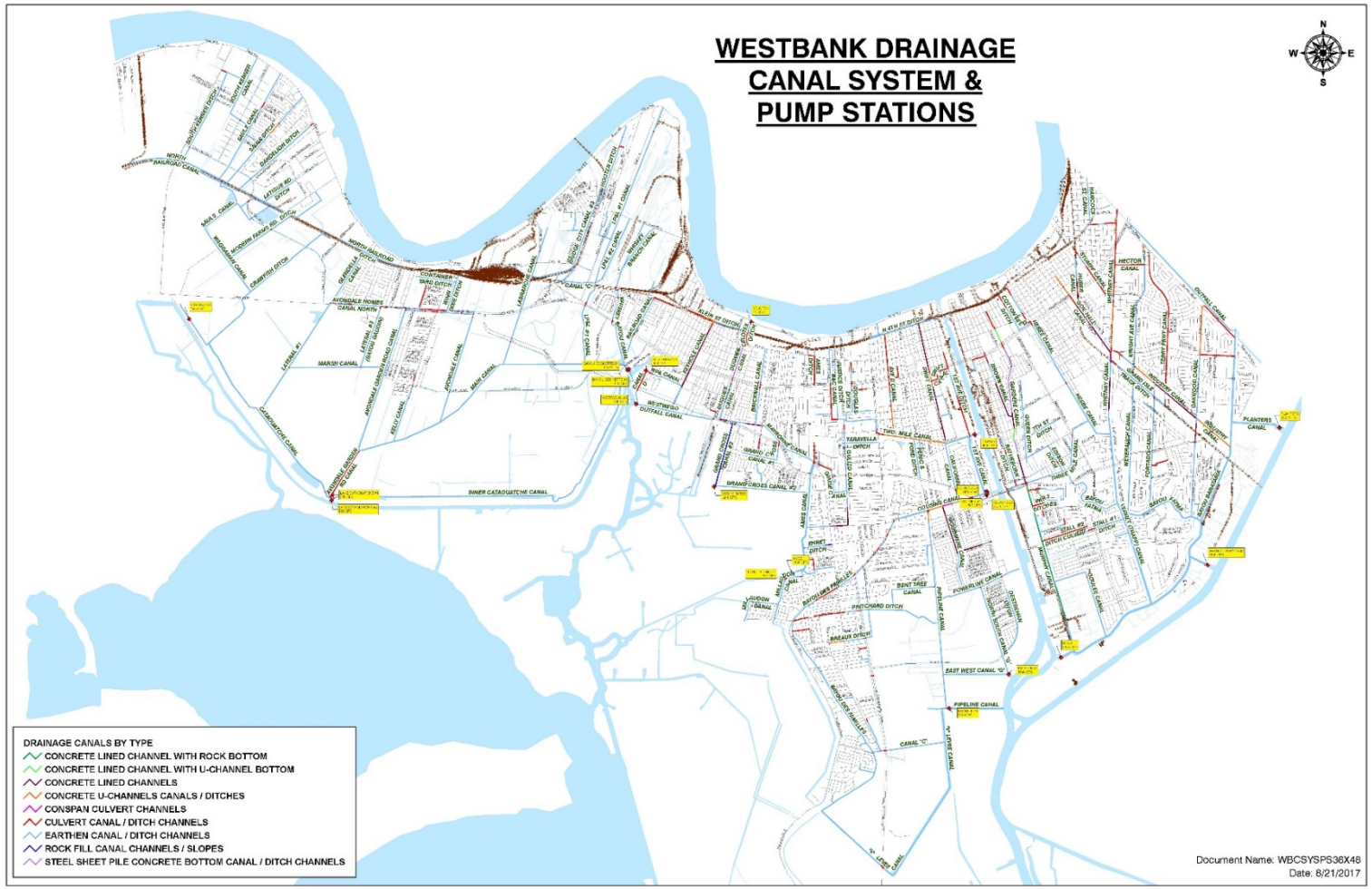
Date: 8/21/2017

Figure 2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DRAINAGE CANALS BY TYPE
CONCRETE LINED CHANNEL WITH ROCK BOTTOM
CONCRETE LINED CHANNEL WITH U-CHANNEL BOTTOM
CONCRETE LINED CHANNELS
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CONSPAN CULVERT CHANNELS
CULVERT CANAL / DITCH CHANNELS
EARTHEN CANAL / DITCH CHANNELS
ROCK FILL CANAL CHANNELS / SLOPES
STEEL SHEET PILE CONCRETE BOTTOM CANAL / DITCH CHANNELS
Document Name: WBCSYSPS36X48
Date: 8/21/2017

Figure 3

REPETITIVE LOSS REQUIREMENT

Repetitive loss data must be maintained and updated annually in order to participate in the CRS. Since many of the losses under the NFIP come from repetitively flooded properties, addressing these properties is a priority for participating in the CRS Program. Depending on the severity of the repetitive loss problem, a CRS community has different responsibilities.

- **Category A**: A community with no unmitigated repetitive loss properties. No special requirements from the CRS.
- **Category B**: A community with at least one, but fewer than 10, unmitigated repetitive loss properties. Category B communities are required by the CRS to research and describe their repetitive loss problem, create a map showing the showing the location of all repetitive loss areas and complete an annual outreach activity directed to repetitive loss properties.
- **Category C**: A community with 50 or more unmitigated repetitive loss properties. Category C communities are required to do everything in Category B and prepare either a floodplain management plan that covers all repetitive loss areas or prepare a RLAA for all repetitive loss areas.

As of August 1, 2017, Jefferson Parish has a total of 5115 unmitigated Repetitive Loss and Severe Repetitive Loss properties.[7] The Parish is, therefore, designated as a Category C repetitive loss community.

[7] NFIP Repetitive Loss (RL) AW-501 Worksheets provided to Jefferson Parish Department of Floodplain and Hazard Mitigation on 8/1/2017

MAPPING REPETITIVE LOSS AREAS

In accordance with the principles outlined in the CRS guidance titled Mapping Repetitive Loss Areas dated October, 2015, five (5) repetitive loss subareas were identified within Jefferson Parish. There are total 5115 unmitigated repetitive loss properties in Jefferson Parish.

This RLLA consists of repetitive loss properties and the surrounding properties that experience the same or similar flooding conditions, whether or not the buildings on those surrounding properties have been damaged by flooding. The methodology adopted to select the subareas are as follows:

- Total number of flood insurance claims post Hurricane Katrina;
- Percentage of repetitive flood loss properties as compared to the structures, between October 2005 and June 2017; and
- Cluster of repetitive flood loss properties in the neighborhood.

Based on the data analysis, the subareas listed below were selected for the RLAA. A detailed map of each subarea is provided in Step 4 of the RLAA process. An overview map of Jefferson Parish and the repetitive flood loss subareas' location in the Parish are shown in Figure 4 on the following page.

Subarea 1: Crown Point, Lafitte, Barataria

Subarea 2: River Ridge

Subarea 3: Harvey

Subarea 4: Metairie Arcadia Place

Subarea 5: Metairie Manson Subdivision

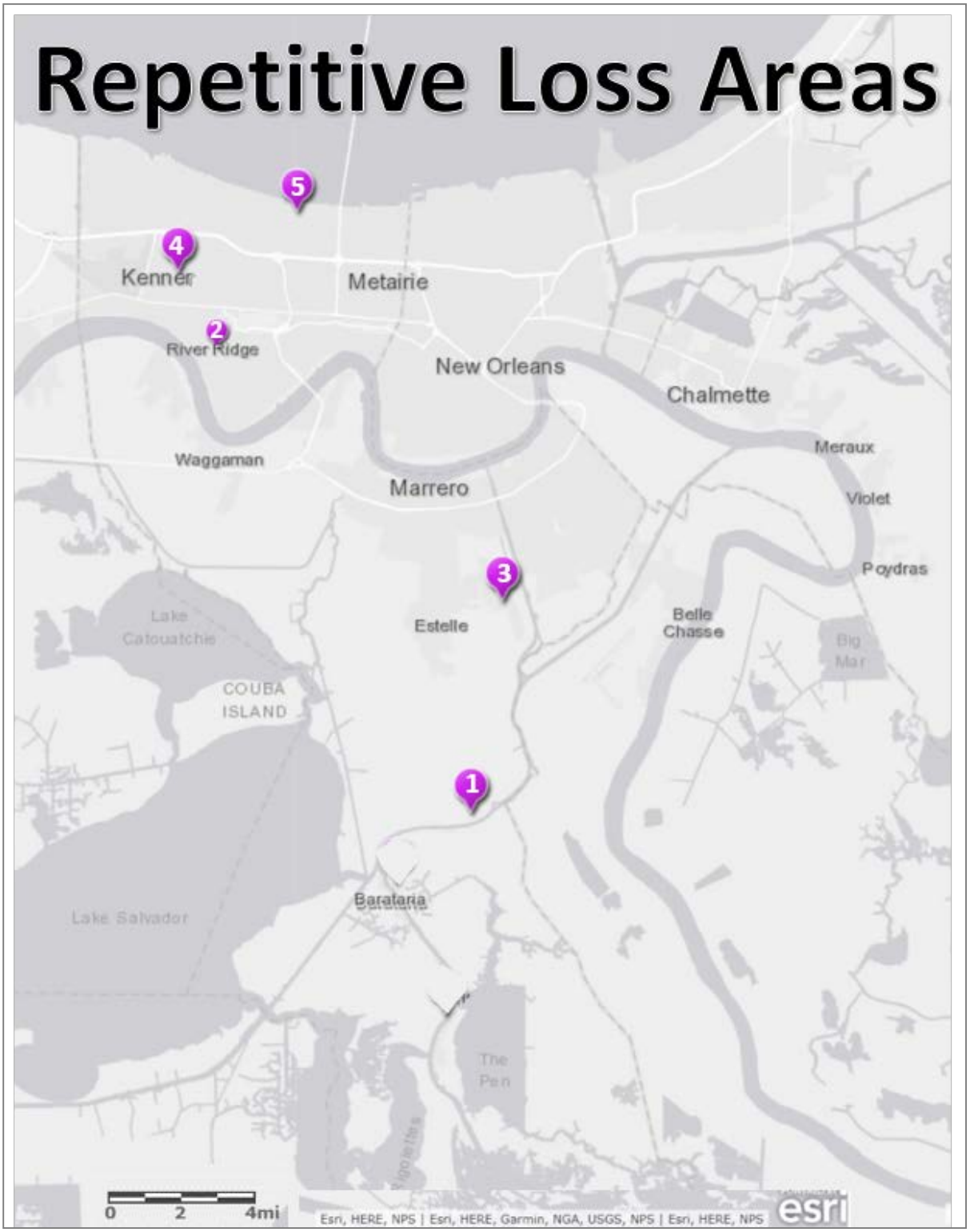
Repetitive Loss Areas
5
4
Kenner
Metairie
2
River Ridge
New Orleans
Chalmette
Meraux
Waggaman
Marrero
Violet
3
Poydras
Lake
Catouatchie
Estelle
Belle
Chasse
Big
Mar
COUBA
ISLAND
1
Barataria
Lake Salvador
The
Pen
0
2
4mi
Esri, HERE, NPS | Esri, HERE, Garmin, NGA, USGS, NPS | Esri, HERE, NPS
esri

Figure 4

THE RLAA PROCESS

The RLAA planning process incorporated requirements from Section 510 of the 2017 CRS Coordinator's Manual. The planning process also incorporated requirements from the following guidance documents: 1) FEMA publication Reducing Damage from Localized Flooding: A Guide for Communities, Part III Chapter 7; 2) CRS publication Mapping Repetitive Loss Areas dated October, 2015; and 3) Center for Hazards Assessment Response and Technology, University of New Orleans draft publication The Guidebook to Conducting Repetitive Loss Area Analyses. Most specifically, this RLAA included all five planning steps included in the 2017 CRS Coordinator's Manual:

Step 1. Advise all the properties in the repetitive loss areas that the analysis will be conducted and request their input on the hazard and recommended actions.

Step 2. Contact agencies and organizations that may have plans or studies that could affect the cause or impacts of the flooding. The agencies and organizations must be identified in the analysis report.

Step 3. Visit each building and collect basic data.

Step 4. Review alternative approaches and determine whether any property protection measures or drainage improvements are feasible.

Step 5. Document the findings. A separate analysis report must be prepared for each area.

Beyond the 5 planning steps, additional credit criteria must be met:

1. The community must have at least one repetitive loss area delineated in accordance with the criteria in Section 503 of the 2017 CRS Coordinator's Manual.
2. The repetitive loss area must be mapped as described in Section 503.b. A Category "C" community must prepare analyses for all of its repetitive loss areas if it wants to use RLAA to meet its repetitive loss planning prerequisite.
3. The repetitive loss area analysis report(s) must be submitted to the community's governing body and made available to the media and the public. The complete repetitive loss area analysis report(s) must be adopted by the community's governing body or by an office that has been delegated approval authority by the community's governing body.
4. The community must prepare an annual progress report for its area analysis.
5. The community must update its repetitive loss area analyses in time for each CRS cycle verification visit.

Subarea 1

CROWN POINT, LAFITTE, BARATARIA

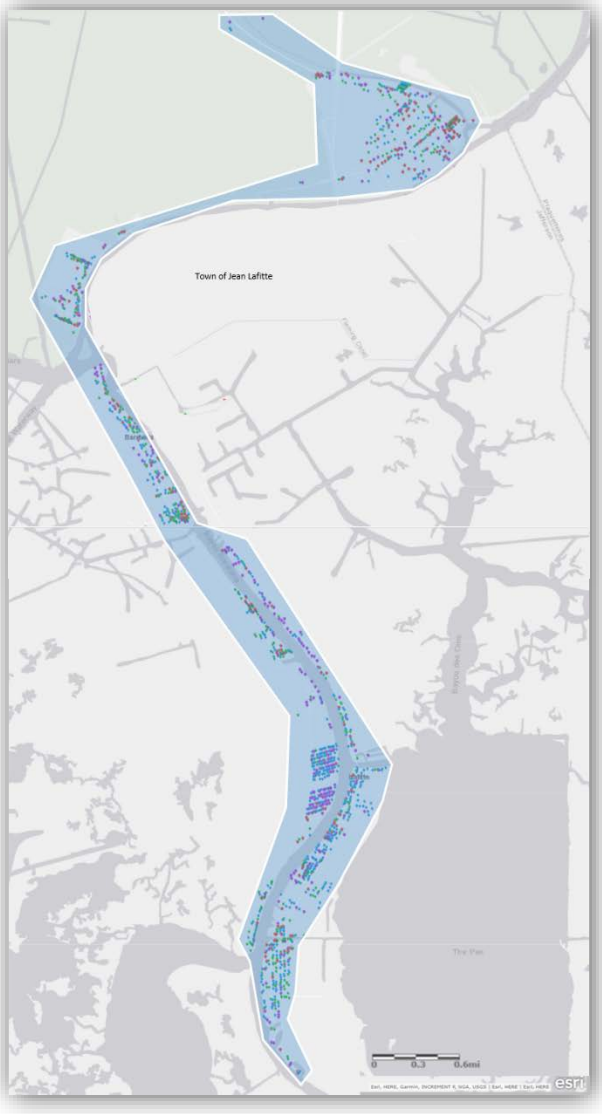

Figure 1- 1 Outline of Subarea 1

STEP 1. ADVISE ALL PROPERTY OWNERS

Before field work began on the RLAA, individual notices were mailed to property owners within the 5 identified Repetitive Loss subareas. The notices advised the properties owners about the analysis and requested their input on the flooding problem in their area and mitigation actions taken. The notice also advised the property owners how they would be able to provide comments on the draft report once it was posted online.

Subarea 1: The property owner notice with questionnaire was sent out the week of August 7, 2017 (See Figures 1-2 and 1-3). Following the mailed notification, a letter was posted on September 19, 2017 at Laffite's Town Hall and library (Figure 1-4) for one month. A follow up notice was mailed to Subarea 1 to seek additional comments (See Figure 1-5 and 1-6) on the week of March 26, 2018. A total of 2553 letters were mailed to the repetitive loss properties in this area.

Stamp

1221 Elmwood Pk Blvd Suite 310
Jefferson, LA 70123

Cut Here

Area Flood Risk Analysis

The Jefferson Parish Department of Floodplain Management and Hazard Mitigation will be conducting a repetitive loss area analysis in your area starting October 2017. Parish assigned staff will be in your area to collect data specific to your property. We will not need to enter your home, but may need to drive into your driveway and photograph your property to determine if your foundation is above or below the FEMA Base Flood Elevation to apply for additional mitigation funding.

To help us better assess the flooding you may have experienced, we are requesting your input. Please complete the questionnaire to the left and return by October, 02, 2017. A draft report will be developed based on the data collected and will be available for review on our website at jeffparish.net/RLAA later this year. You will be able to provide comments on the draft report either online or in person at a project meeting in the spring of 2018.

Questions about this project can be directed to:

Maggie Olivier
Floodplain/CRS Specialist
molivier@jeffparish.net
(504) 736-6541.

1221 Elmwood Pk Blvd Suite 310
Jefferson, LA 70123

Current Resident

You are receiving this mailer because your property is in an area that has flooded several times. Flooding in your area is commonly due to hurricanes and their tidal surges. Most of Jefferson Parish lies at or below sea level, and flooding can happen during any season of the year. On the back side of this brochure, there is a list of things you can do to be prepared and rise above the risk.

Figure 1- 2 Front of Notice

If the Water Rises...

Is your family prepared & property protected?

1. If required to evacuate today, do you know your evacuation route?
   ___Yes ___No ___Unsure
2. Are you aware that flooding in Jefferson Parish can happen at any time of the year, whether you live in the levee system or outside of it?
   ___Yes ___No
3. Have you registered with JPAlert—the Jefferson Parish flood warning system?
   ___Yes ___No ___Unsure
4. Do you have flood insurance for the property(ies) you own or rent?
   ___Yes ___No
5. Have you floodproofed your home?
   ___Yes ___No ___Unsure
6. After answering questions 1-5: Is your family prepared & property covered **if the water rises?**
   ___Very ___ Somewhat
   ___Need to Prepare

Visit jeffparish.net/flood to determine your flood zone, access contraflow maps and register for JP Alert.

BE PREPARED

1. Determine your flood zone. Complete a Flood Zone Determination Request at jeffparish.net/flood or call (504) 736-6541 to get information about your flood zone.

2. Get flood coverage. Contact your flood insurance agent. Homeowner's and business multi-peril insurance policies do not cover flood losses. Flood insurance must be purchased separately, and must be effective at the time of flooding to make a claim. There is a 30-day waiting period for a policy to become effective. Because Jefferson Parish participates in the Community Rating System (CRS), you will receive a 20 percent reduction on your flood insurance premium if you are in the Special Flood Hazard Area.

3. Protect people. Never walk or drive through flood water. If ever caught in a building by suddenly rising water, move to a higher floor or the roof. Take a tool on hand in case you need to break through to the roof as well as drinking water, a flashlight and a portable radio. Wait for help.

4. Protect natural floodplain functions. Keep drains and catch basins free of debris so water can flow freely through the drainage system.

5. Build responsibly. Flood proofing options include installing storm water management features, elevating your house and/or utilities, and building flood walls. Be sure to obtain all necessary permits.

6. Funding sources. Grant funds may be available to assist with permanent flood proofing measures. Call (504) 736-6540 to learn if you are eligible for any funding sources such as HMGP, HMA, or ICC.

7. Stay informed. Register for JP Alert at jeffparish.net/flood to get flood warning notifications. Go immediately to a safe shelter when Parish officials announce an evacuation. Visit jeffparish.net/flood for contraflow maps and driving instructions.

Cut Here

Please tear off and return to Yvette at Town of Jean Lafitte—Town Hall or stamp and mail.

1. In what year did you move into this home ? _____
2. Has the property ever flooded?
   ___Yes ___No
   (if "no," skip to number 5)
3. In what year(s) did the flooding occur?
   _____
   _____
   _____
4. How deep did the flood water get?
   1st floor: _____
   yard only:_____
5. Was water kept out of house by sandbagging or other protective measure?
   ___Yes ___No
6. Do you have flood insurance?
   ___Yes ___No
7. Are you interested in pursuing measures to protect your property from flooding?
   ___Yes ___ No

Figure 1- 3 Back of Notice with Questionnaire

Area Flood Risk Analysis

The Jefferson Parish Department of Floodplain Management and Hazard Mitigation will be conducting a repetitive loss area analysis in your area starting October 2017. Parish assigned staff will be in your area to collect data specific to your property. We will not need to enter your home, but may need to drive into your driveway and photograph your property to determine if your foundation is above or below the FEMA Base Flood Elevation to apply for additional mitigation funding.

A draft report will be developed based on the data collected and will be available for review on our website at jeffparish.net/RLAA later this year. You will be able to provide comments on the draft report either online or in person at a project meeting in the spring of 2018.

Questions about this project can be directed to:

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Floodplain/CRS Specialist
molivier@jeffparish.net
(504) 736-6541

Figure 1-4 Posting at Town Hall and Library

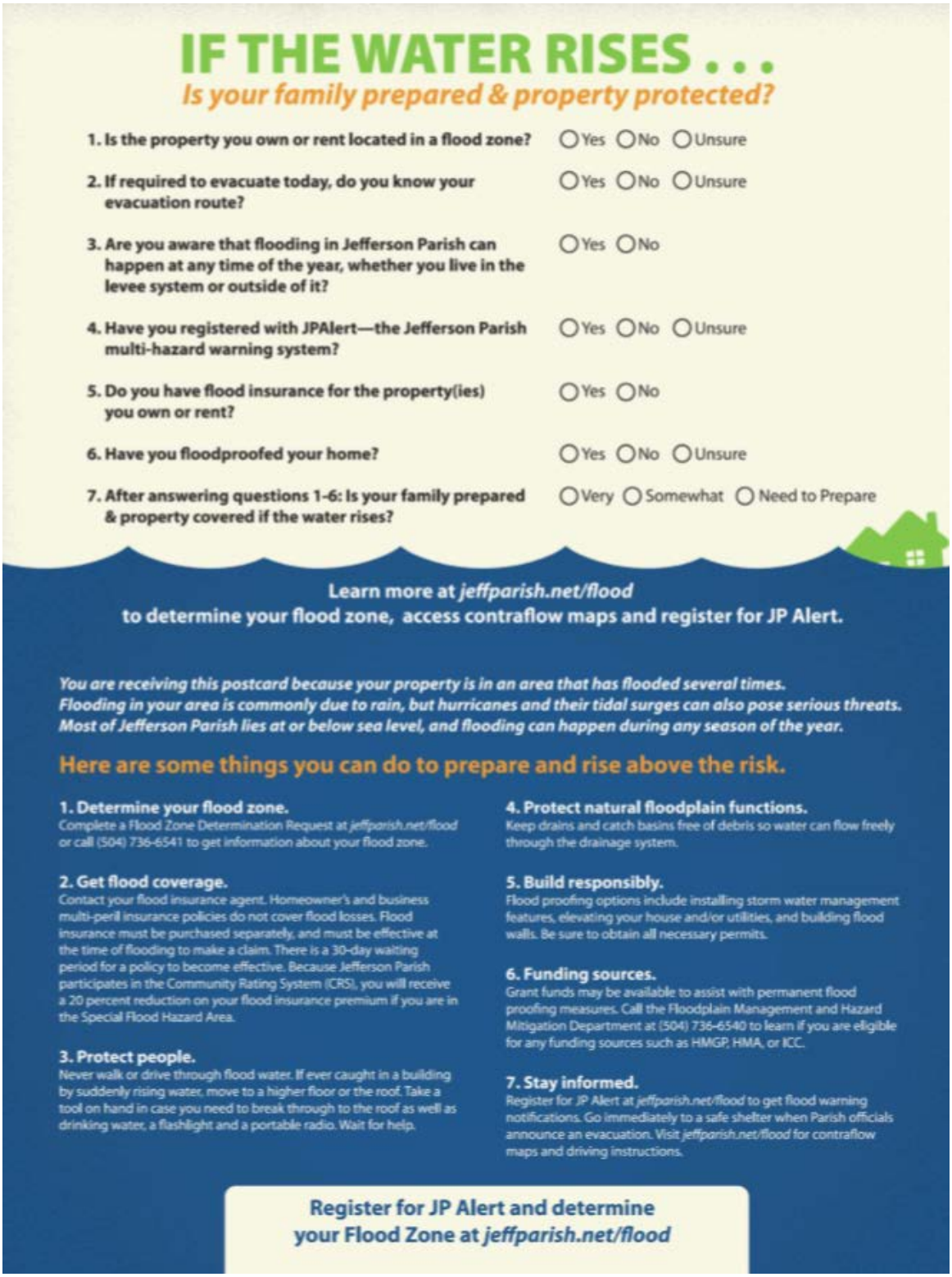


Figure 1- 2 Inside of Follow-up Mailer

Figure 1- 3 Outside of Follow-up Mailer

QUESTIONNAIRE RESPONSES SUBAREA 1

Out of the 2553 mailed questionnaires, Jefferson Parish received 51 responses which corresponds to a response rate of approximately 3 percent. Questionnaire responses are summarized below. Note: respondents may have skipped questions and/or provided more than one response to a question.

Q1: In what year did you move into this home?

Responses Received	Percentage	Number Responding
<10 years ago	11.76	**6**
10-20 years ago	32.69	**17**
20-30 years ago	11.53	**6**
30-40 years ago	15.38	**8**
40-50 years ago	13.46	**7**
> 50 years ago	13.46	**7**
Total	100	51

Q2: Has the property ever been flooded?

Answer Choices	Percentage	Number Responding
No	25.49	**13**
Yes	74.51	**38**
Total	100	51

Q3: In what year(s) did it flooding occur?

Responses Received	Percentage	Number Responding
1985	5.6	**5**
2003	4.4	**4**
2004	1.1	**1**
2005	24.4	**22**
2007	1.1	**1**
2008	22.2	**20**
2009	3.3	**3**
2010	3.3	**3**
2011	3.3	**3**
2012	26.7	**24**
2013	1.1	**1**
2014	2.2	**2**
2017	1.1	**1**

Total	100	90

Q4: How deep did the water get?

Answer Choices	Percentage	Number Responding	Depth	
			< 3 ft.	> 3 ft.
First floor	58	22	12	**4**
Yard only	42	16	10	**2**
Total	100	38	22	7

Q5: Was water kept out of the house by sandbagging or other protective measures?

Answer Choices	Percentage	Number Responding
No	85.71	**42**
Yes	14.28	**7**
Total	100	49

Q6: Do you have Flood Insurance?

Answer Choices	Percentage	Number Responding
No	19.60	**10**
Yes	80.39	**41**
Total	100	51

Q7: Are you interested in protecting your property from flooding?

Answer Choices	Percentage	Number Responding
No	2	**1**
Yes	98	**50**
Total	100	51

The following trends in survey responses should be considered when evaluating mitigation measures for Subarea 1:

- Ninety-eight (98) percent of respondents are interested in protecting their home/building from flooding. This could indicate trust in Jefferson Parish and interest in installing floodproofing measures.
- Over 80 percent of the respondents currently have FEMA flood insurance.
- Eighty-six (86) percent of the respondents mentioned that none of the protective measures helped to keep the water out of the house.
- The majority of the respondents (58 percent) reported that the floodwaters came into their homes at a depth of less than 3 feet. Four (4) respondents reported that they had flooding on the first floor with floodwaters reaching greater than 3 feet. Forty-two (42) percent of the respondents reported that the floodwaters only reached their yard, 2 respondents reported that the floodwaters were greater than 3 feet, but still only reached their yard.

- Thirty-three (33) percent of the respondents moved to their homes over the period of last 10-20 years.
- The years with the largest number of reported flooding incidents are 2005, 2008 and 2012. The following flood events are detailed in NOAA's National Climatic Data Center (NCDC) database:

    - **August 29, 2005** – The Category 3 Hurricane Katrina caused catastrophic damage along the Gulf coast from central Florida to Texas, much of it due to storm surge and levee failure. Severe property damage occurred in coastal areas, such as Mississippi beachfront towns where boats and casino barges rammed buildings, pushing cars and houses inland; water reached 6–12 miles (10–19 km) from the beach. The storm was the third most intense United States landfalling tropical cyclone, behind the 1935 Labor Day Hurricane and Hurricane Camille in 1969. Overall, a reported 1,245 people died in the hurricane and subsequent floods, making it the deadliest United States hurricane since the 1928 Okeechobee Hurricane. Total property damage was estimated at $125 billion (2005 USD), roughly four times the damage wrought by Hurricane Andrew in 1992 in the United States.

    - **August-September, 2008** - The storm surge ahead of Ike blew onshore of Louisiana well ahead of Ike's predicted landfall in Texas on September 13. Areas in coastal south-central and southwestern Louisiana, some of which were flooded by Gustav, were re-flooded as a result of Ike. Some areas that had not yet recovered from Gustav power outages received additional outages of 200,000. The hardest-hit areas were in and around Cameron Parish, with nearly every square inch of the coastline in that area was flooded heavily, reaching as far north as Lake Charles, nearly 30 miles inland.

    - **August 28, 2012** - Hurricane Isaac made landfall along Louisiana's coast on August 28th, with maximum sustained winds of 80 mph. The major impacts from the hurricane were storm surge along the Gulf Coast and heavy rainfall, both of which were driven partially by the storm's slow motion and large size. Isaac contributed to Louisiana and Mississippi's second wettest August on record, as well as Florida's fourth wettest and Alabama's eighth wettest.

STEP 2. CONTACT AGENCIES AND ORGANIZATIONS

Jefferson Parish Department of Floodplain Management and Hazard Mitigation contacted external agencies and internal departments that have plans or studies that could affect the cause or impacts of flooding within the identified repetitive loss subareas. The data collected was used to analyze the problems further and to help identify potential solutions and mitigation measures for property owners. The agencies contacted and reports which were analyzed and reviewed are as follows:

Agencies

- Jefferson Parish Electronic Information System Department
- Jefferson Parish Streets Department

- Jefferson Parish Office of Risk Management
- Jefferson Parish Drainage Department

Reports

- FEMA – Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) for Jefferson Parish, February 2, 2018
- ISO – Repetitive Flood Insurance Claims Data
- Jefferson Parish Hazard Mitigation Plan

SUMMARY OF STUDIES AND REPORTS

FEMA FLOOD INSURANCE STUDY (FIS) AND FLOOD INSURANCE RATE MAP (FIRM)

FEMA's FIS for Jefferson Parish, LA is dated February 2, 2018. The FIS revises and updates information on the existence and severity of flood hazards within the Parish. The FIS also includes revised digital Flood Insurance Rate Maps (FIRMs) which reflect updated Special Flood Hazard Areas (SFHAs) and flood zones for the Parish. SFHA boundaries within the Parish were updated due to new detailed coastal analyses which were performed by the USACE-MVN, for FEMA. This study also incorporates the Hurricane Storm Damage Risk Reduction System (HSDRRS) completed by the USACE. Finally, these maps depict the potential for flooding and are the basis for building requirements and flood insurance rates.

FLOOD INSURANCE CLAIMS DATA

The Privacy Act of 1974 (5 U.S.C. 522a) restricts the release of flood insurance policy and claims data to the public. This information can only be released to state and local governments for the use in floodplain management related activities. Therefore all claims data in this report are only discussed in general terms.

JEFFERSON PARISH HAZARD MITIGATION PLAN

The purpose of a mitigation plan is to rationalize the process of determining appropriate hazard mitigation actions. The document includes a detailed description of natural hazards in Jefferson Parish; a risk assessment that describes potential losses to physical assets, people and operations; a set of goals, objectives, strategies and actions that will guide the Parish's mitigation activities, and a detailed plan for implementing and monitoring the Plan. This Plan identified 12 hazards and included a risk assessment of the four hazards with the highest potential for damaging physical assets, people and operations in Jefferson Parish. These hazards are floods, hurricanes and tropical storms, storm surge, and tornadoes. Both the risk assessment section and goals sections reflect this emphasis, which was the result of careful consideration and a numerical ranking process carried out by the Mitigation Planning Team (MPT).

STEP 3. BUILDING DATA COLLECTION

The on-site field survey for this subarea was conducted over multiple days between the months of October 2017 and January 2018. The Collector App through ESRI was utilized to save field data from the site visits. In addition, multiple site photos were taken of each structure on the property. Photos were also taken of current drainage features and mitigation and floodproofing measures if evident from street or parking lot views. The following information was recorded for each property:

Table 1- 1

Structure		Foundation		Type	
No structure	176	Slab on grade	508	Residential	2126
Occupied	1465	Low (less than 2ft.)	311	Non-residential	188
Vacant	121	Medium	729		
		High	773		

COLLECTOR FOR ARCGIS (ESRI)

Jefferson Parish used the ESRI Collector Application in order to be able to store and spatially view repetitive loss data for the Parish. The Collector App contains all field data collected by parcels for the RLAA including pictures of each structure on the parcel. The data is stored in ArcGIS and is used for internal review and continued analysis of repetitive flood loss areas.

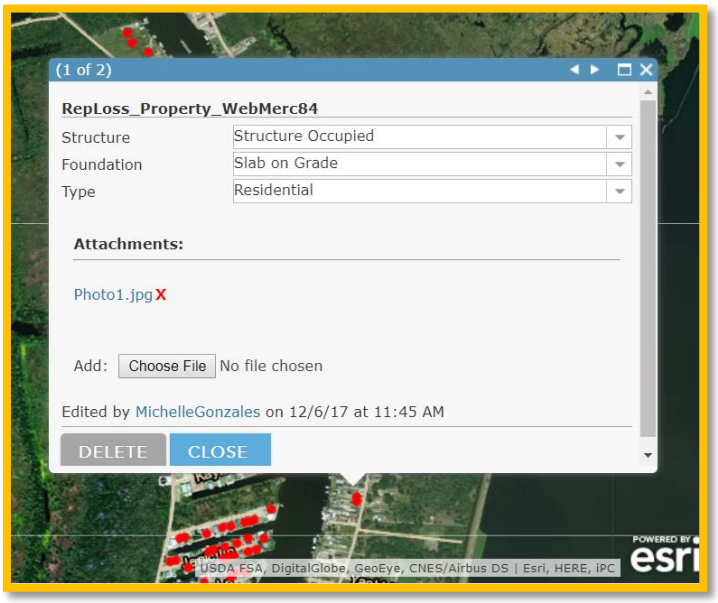


Figure 1- 4 Collector Application Sample

PROBLEM STATEMENT

Subarea 1 contains three communities (Crown Point, Lafitte, Barataria) that are located near the Gulf of Mexico. The land's elevation near or below sea level exposes the subarea to flooding risk due to subsidence, hurricanes, tropical storms, and other weather events. These natural disasters can create catastrophic conditions that affect nearly every aspect of life in the subarea.

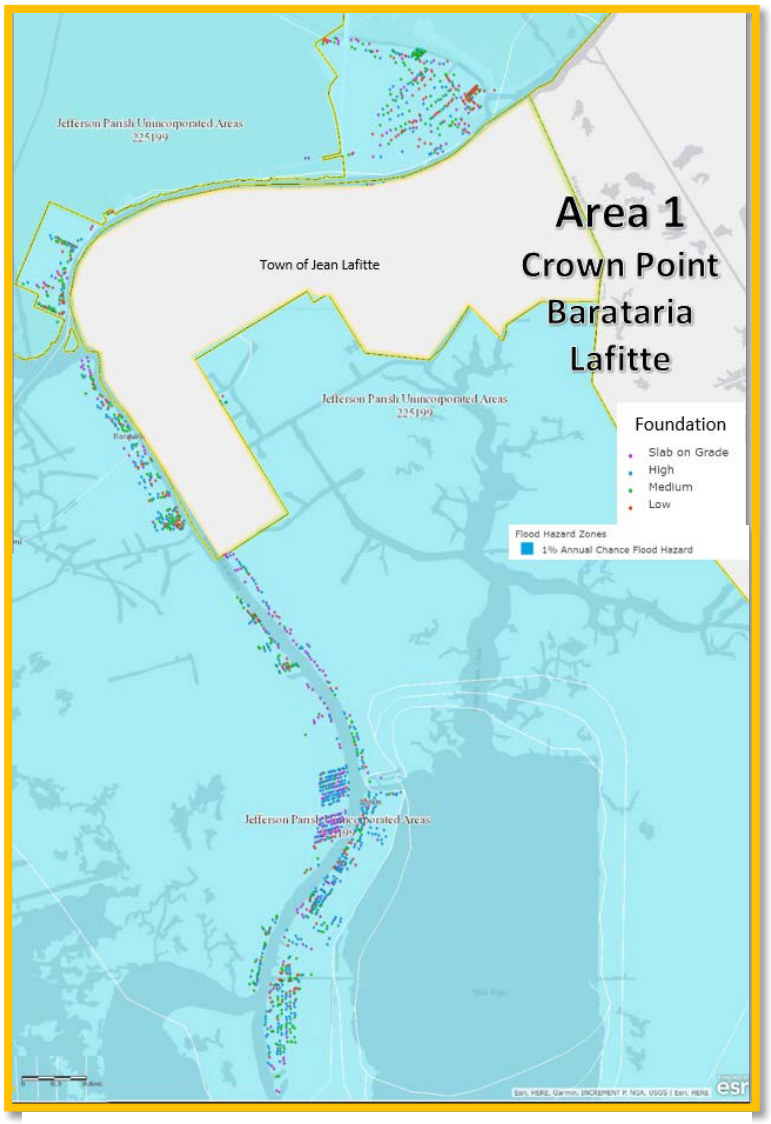


Figure 1- 5 2018 Effective FIRM

Extreme vulnerability to storms and rain events have caused flooding (ranging from 3 feet to 12 feet) in the subarea. Due to low elevation, floodwaters quickly cover the highways and main roads preventing evacuation and rescue. The residential flooding, power outages, and street flooding due to high water levels have repeatedly caused stress and challenges in performing regular life activities amongst the residents.

Crown Point, Lafitte and Barataria are located almost entirely within the 100-year floodplain (Zone AE). Repetitive loss properties are those that have received at least two NFIP insurance payments of more than $1,000 each in any rolling ten-year period. In Lafitte, repetitive loss properties represent 248 claims, at an average of $36,412 (1.6 times more than the parish-wide average claim).[8] Lafitte has more paid claims than it has policies on pre-FIRM houses (220 claims on 72 policies, or 3.1 claims per policy) indicating numerous repetitive loss properties. On the other hand, post FIRM dwellings in Lafitte have a lower number of paid claims per property (114 claims on 181 policies, or 0.6 claims per policy). Payouts on pre-FIRM houses were also larger, averaging $32,086 per claim versus $12,289 per post-FIRM property claim.[9]

[8] Jefferson Parish Hazard Mitigation Plan, Pg. 67-70

[9] Resilient Jean Lafitte, Louisiana: A Flood Emergency Preparedness Plan *prepared* by Center for Planning Excellence (CPEX)

While some protection in the form of stronger, higher levees, can help reduce the frequency of flooding, they are very expensive to build and maintain. There is a lack in vital infrastructure such as levees, utilities, bridges, as well as streets, sidewalks, and bike paths that meet the contemporary standards so that the community can thrive.[10] The effort to reduce repetitive flooding becomes somewhat more complex with the structure type and nature of some buildings. In accordance with FEMA publication *551 Selecting Appropriate Mitigation Measures for Floodprone Structures*, mitigation options are limited for structures outside levee protection.

The approach to reducing repetitive flooding in Subarea 1 will require a combination of floodproofing techniques, education, and drainage improvement projects.

Figure 1- 6 Tropical Storm Cindy 2017 Flooding in Lower Lafitte

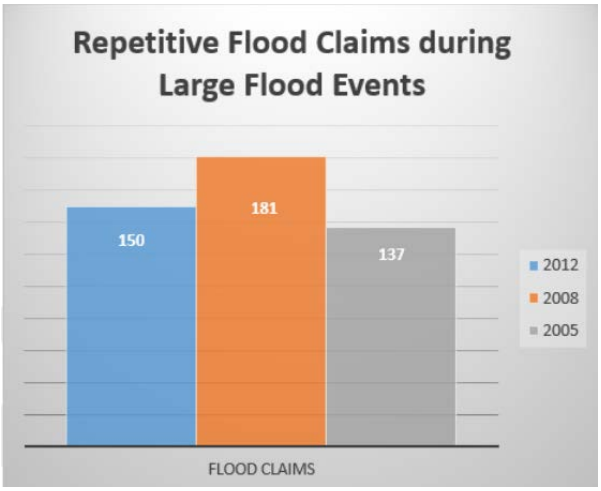
[10] Jean Lafitte Tomorrow, Town Resiliency Plan , 2013

CLAIMS DATA:

In review of the unmitigated Repetitive Loss List, there are 200 properties within the 2553 property study area that qualify as repetitive loss. Of those 200 repetitive loss properties, 28 are considered to be severe repetitive loss properties.

The majority of the remaining claims are from relatively small rainfall events that affected between one and five homes, with a significant rain event that affected 35 homes in June 2011. Hurricanes Isadore and Lili affected 15 homes in September 2002. Thus, while the area does experience some flooding from rainfall events, the most damaging flooding came from hurricane events, particularly during Hurricanes Issac (2012), Ike (2008), and Rita (2005).

Table 1-2



There have been 557 flood claims in the study area totaling $18,984,746. The average claim in the area is $34,083. The homeowners of the 180 repetitive loss properties have made 443 claims and received $15,629,262 in flood insurance payments since 1978. The homeowners of the 28 severe repetitive loss properties have made 136 claims, and received $3,919,651 in flood insurance payments since 1978. Approximately 36% of the total number of claims came from the 180 repetitive loss and 28 severe repetitive loss payments. The average repetitive flood loss claim was $35,280 and the average severe repetitive loss claim was $ 28,821. If less than 50% of the home is damaged, it is not subject to the substantial improvement requirements.

The severe repetitive loss homes are similar to the other homes on their block and are on separate streets. They have each flooded more than 4 times, and all of them flooded for Hurricanes Isaac, Ike, and Rita as well as other storms.

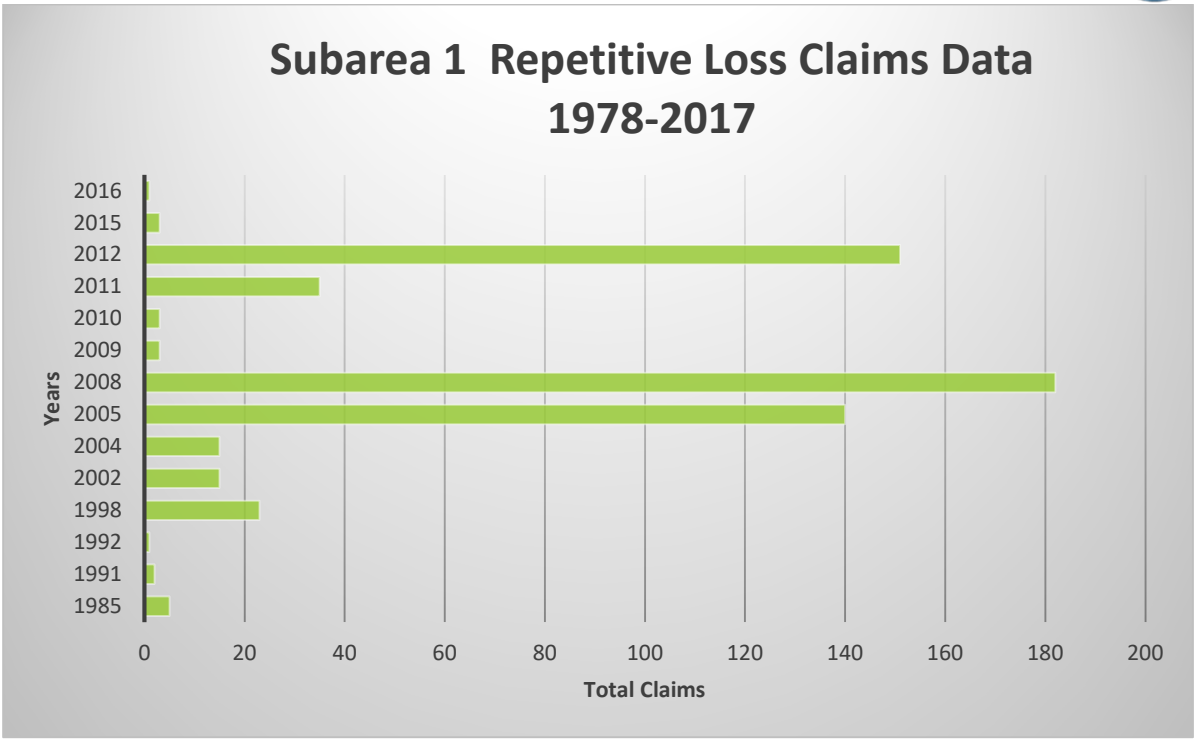


Table 1- 3

FIELD DATA:

The on-site field survey for this subarea was conducted over multiple days between the months of October 2017 and January 2018. The team collected information such as the type and height of the foundation, occupancy status of the structure, and use of the structure.

Table 1-4 shows a majority of the structures are elevated and have a foundation height greater than 5 feet high on piers. About 35 percent of the structures in the area are low or slab on grade and have the greatest risk of flooding. Approximately 8 percent of the structures in the parish building layer were field validated as “no structure on site”. As new codes in the area require new structures to be built to a plus two feet of freeboard, any new structure would be relatively safe from flooding.

Most of the structures in the subarea are that have an elevation of high have been mitigated with grant funds from HMGP and FMA as well as are the newer Post FIRM structures.

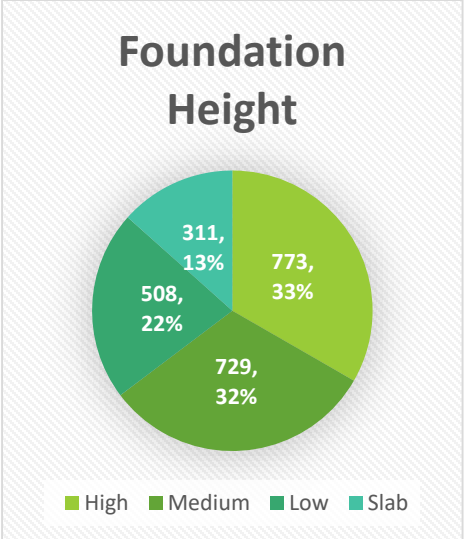


Table 1- 4

The project team visually observed the occupancy and building type of the structures in the area. Eighty-five (85) percent of structures in the area were occupied, 6.3 percent were vacant. Out of 162 vacant properties, 5 properties are covered by insurance, 9 properties are uninsured and the rest are unknown. A majority of the structures (83 percent) are residential, while 7 percent of the structures are non-residential.

The remainder of the percentage of sites did not have structures, therefore were left out of this analysis.

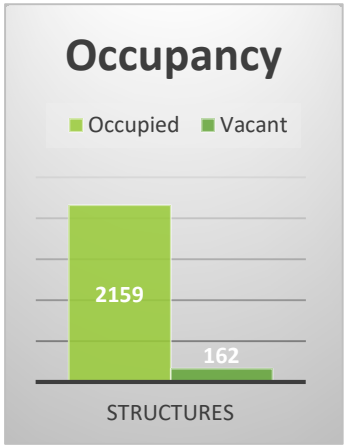


Table 1- 5

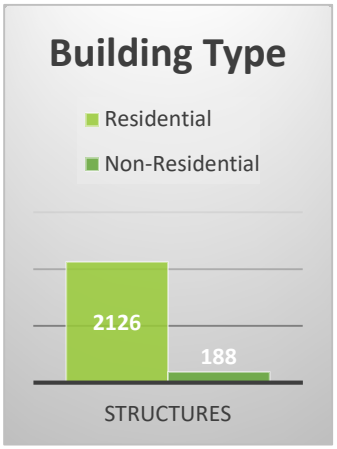


Table 1- 6

In conclusion, it should be noted that given the nature and uniqueness of Subarea 1, there are properties located outside levee protection that have made repetitive flood loss claims. Although the majority of the properties are elevated, a storm surge during a hurricane can cause substantial damage and raise the water up to 10 to 12 feet.

Figure 1- 7 Example of unmitigated property in Subarea 1

Figure 1- 8 Example of mitigated property in Subarea 1

STEP 4. REVIEW ALTERNATIVE MITIGATION APPROACHES - SUBAREA 1

There are many ways to protect a property from flood damage. Different measures are appropriate for different flood hazards, building types and building conditions. Figure 1-12 below, found in the *2017 CRS Coordinator's Manual*, lists typical property protection measures.

To protect property from flood damage . . .

- Demolish the building or relocate it out of harm's way.
- Elevate the building above the flood level.
- Elevate damage-prone components, such as the furnace or air conditioning unit.
- Dry floodproof the building so water cannot get into it.
- Wet floodproof portions of the building so water won't cause damage.
- Construct a berm or redirect drainage away from the building.
- Maintain nearby streams, ditches, and storm drains so debris does not obstruct them.
- Correct sewer backup problems.

Figure 1- 9

Mitigation measures should fall into one of the mitigation categories listed below which are based on the Community Rating System planning process:

- Prevention
- Property Protection
- Natural Resource Protection
- Emergency Services
- Structural Projects
- Public Information and Outreach

MITIGATION FUNDING

There are several types of mitigation measures, listed in the table below, which can be considered for each repetitive loss property. Each mitigation measure qualifies for one or more grant program(s). Depending on the type of structure, severity of flooding and proximity to additional structures with similar flooding conditions, the most appropriate measure can be determined. In addition to these grant funded projects, several mitigation measures can be taken by the homeowner to protect their home. Please note, the Biggert- Waters 2012 National Flood Insurance Reform Act eliminated the previously available Severe Repetitive Flood Claims grant program.

Table 1- 7 Mitigation Funding Sources

Types of Projects Funded	HMGP	FMA	PDM	ICC	SBA
Acquisition of the entire property by govt. agency	✔	✔	✔		
Relocation of the building to a flood free site	✔	✔	✔	✔	✔
Demolition of the structure	✔	✔	✔	✔	✔
Elevation of the structure above flood levels	✔	✔	✔	✔	✔
Replacing the old building with a new elevated one	✔	✔	✔	✔	✔
Local drainage and small flood control projects	✔	✔	✔		
Dry floodproofing (non-residential only)	✔	✔	✔		
Percent paid by Federal program	75%	75%, 90%, or 100%	75%	Up to $30K	

There are several possible sources of funding for mitigation projects:

- **FEMA grants**: Most of the FEMA programs provide 75% of the cost of a project. In most communities, the 25% non-FEMA share is paid by the benefitting property owner. Each program has different Congressional authorization and slightly different rules.
  - **The Hazard Mitigation Grant Program (HMGP)**: The HMGP provides grants to States and local governments to implement long-term hazard mitigation measures after a major disaster declaration. Projects must provide a long-term solution to a problem (e.g., elevation of a home to reduce the risk of flood damages as opposed to buying sandbags and pumps to fight the flood). Examples of eligible projects include acquisition and elevation, as well as local drainage projects.
  - **The Flood Mitigation Assistance Program (FMA)**: FMA funds assist States and communities in implementing measures that reduce or eliminate the long-term risk of flood damage to structures insured under the NFIP. FMA offers grants to implement measures to reduce flood losses, such as elevation, acquisition, or relocation of NFIP-insured structures. States are encouraged to prioritize FMA funds for applications that include repetitive loss properties; these include structures with 2 or more losses each with a claim of at least $1,000 within any ten-year period since 1978.
  - **Pre-Disaster Mitigation Program (PDM)**: The Pre-Disaster Mitigation (PDM) program provides funds to states, territories, Indian tribal governments, communities, and universities

for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. For more information visit http://www.fema.gov/government/grant/pdm/index.shtm.

- **Flood insurance**: There is a special funding provision in the National Flood Insurance Program (NFIP) for insured buildings that have been substantially damaged by a flood, "Increased Cost of Compliance." ICC coverage pays for the cost to comply with floodplain management regulations after a flood if the building has been declared substantially damaged. ICC will pay up to $30,000 to help cover elevation, relocation, demolition, and (for nonresidential buildings) floodproofing. It can also be used to help pay the 25% owner's share of a FEMA funded mitigation project.

The building's flood insurance policy must have been in effect during the flood. This payment is in addition to the damage claim payment that would be made under the regular policy coverage, as long as the total claim does not exceed $250,000. Claims must be accompanied by a substantial or repetitive damage determination made by the local floodplain administrator. For more information, contact your insurance agent or visit: www.fema.gov/plan/prevent/floodplain/ICC.shtm.

Coverage under ICC does have limitations: It covers only damage caused by a flood, as opposed to wind or fire damage. The building's flood insurance policy must have been in effect during the flood. ICC payments are limited to $30,000 per structure. Claims must be accompanied by a substantial or repetitive damage determination made by the local floodplain administrator and the structure typically must be in the Special Flood Hazard Area (Zones AE and VE).

The average claims payment in the study area is $34,083. With an average claim of that amount, it is not likely that many homes in the study area would sustain substantial damage from a flood event. Homeowners should make themselves aware of the approximate value of their homes, and in the case of incurring flood damage, be aware of the need for a substantial damage declaration in order to receive the ICC coverage.

Alternative language adopted into the local floodplain management ordinance would enable residents with shallower flooding to access ICC funding. Since local ordinances determine the threshold at which substantial damage and/or repetitive claims are reached, adopting language that would lower these thresholds would benefit the homeowners of repetitive loss properties. Adopting alternative language allows for cumulative damages to reach the threshold for federal mitigation resources more quickly, meaning that some of the properties in Jefferson Parish that sustain minor damage regularly would qualify for mitigation assistance through ICC.

- Rebates: A rebate is a grant in which the costs are shared by the homeowner and another source, such as the local government, usually given to a property owner after a project has been completed. Many communities favor it because the owner handles all the design details, contracting, and payment before the community makes a final commitment. The owner ensures that the project meets all of the program's criteria, has the project constructed, and then goes to the community for the rebate after the completed project passes inspection.

Rebates are more successful where the cost of the project is relatively small, e.g., under $5,000, because the owner is more likely to be able to afford the bulk of the cost. The rebate acts more as an incentive, rather than as needed financial support.

- Small Business Administration Mitigation Loans: The Small Business Administration (SBA) offers mitigation loans to SBA disaster loan applicants who have not yet closed on their disaster loan.

Applicants who have already closed must demonstrate that the delay in application was beyond their control.

For example, mitigation loans made following a flood can only be used for a measure to protect against future flooding, not a tornado. If the measure existed prior to the declared disaster, an SBA mitigation loan will cover the replacement cost. If the measure did not exist prior to the declared disaster the mitigation loan will only cover the cost of the measure if it is deemed absolutely necessary for repairing the property by a professional third-party, such as an engineer.

MITIGATION ALTERNATIVES

Subarea 1 is a unique area with 2553 total properties identified. This subarea is located outside levee protection. Flooding in this area is considered high risk flooding that causes substantial damage and considered high priority for mitigation (due to recurrent significant flooding).

Flooding in this area can be attributed to its susceptibility to high tides, tropical storms and hurricanes. Floodwaters can quickly cover main roads and highways during storm events, often preventing evacuations and rescues. Heavy rains within a short period of time have caused the drainage system to be inundated an unable to keep up, resulting in ponding water in streets and homes. It is vitally important for citizens to be well informed and take preventative actions.

Promoting floodproofing techniques and increasing public education and awareness of the flood hazards can be the next best alternative for property owners in this area. The Parish's websites, e-mail distribution lists, press releases and variable message boards can provide benefit to business owners and residents.

Potential mitigation measures for Subarea 1:

Structural Alternatives:

- **Elevation/Mitigation Reconstruction** of a structure involves elevating the existing or new home above the regulatory floodplain to allow flood waters to flow under the structure during a 1% annual chance flood event.
- **Foodproofing** a structure involves making the uninhabited portions of the structure resistant to flood damage and allowing water to enter during flooding. For example, in a basement or crawl space, mechanical equipment and ductwork would not be damaged.
- **Barriers** include building a floodwall or a levee around a structure or group of structures to hold back flood waters. Levees are usually embankments of compacted soil, and floodwalls are usually built of concrete or masonry or a combination of both measures. Alternatives to a permanent barrier is a temporary one, such as large, water-filled tubes or bladders, metal walls lined with impermeable materials that act as floodwalls, and expandable gates that block floodwaters from entering structures through openings such as doors and windows.
- **Acquire and/or relocate** properties by targeting abandoned properties or locations that would provide a public benefit as the location will need to be maintained by the Parish in perpetuity.
- Improve stormwater system maintenance program to ensure inlets and canals are free of clogging debris.

Non Structural Alternatives:

- **Relocate internal supplies**, products/goods, and belongings above the flooding depth.

- Improve the Parish's floodplain and zoning ordinances.
- **Provide public education** through posting information about local flood hazards on Parish website, posting signs at various locations in neighborhoods or discussing flood protection measures at local neighborhood association meetings.
- Promote the purchase of flood insurance.
- Continue coordination with GOHSEP, the National Weather Service (NWS), and United States Geological Survey (USGS) to enhance flood warning systems, including the use of rain/stream gauges, to provide greater warning time for citizens. NWS can use the real- time data collected to issue timely warnings.

COST AND BENEFITS OF MITIGATION MEASURES

Knowing the flooding history, type, and condition of the buildings in the area, leads to the fourth step in the area analysis procedure – a review of alternative mitigation approaches to protect properties from, or reduce, future flood damage. Property owners should look at these alternatives but understand they are not all guaranteed to provide protection at different levels of flooding. Six approaches were reviewed:

- Elevating the houses above the 1% annual flood level
- Acquisition
- Floodproofing
- Barriers

ELEVATION

Raising the structure above the flood level is generally viewed as the best flood protection measure, short of removing the building from the floodplain. All damageable portions of the building and its contents are high and dry during a flood, which flows under the building instead of into the house. Houses can be elevated on fill, posts/piles, or a crawlspace.

- A house elevated on fill requires adding a specific type of dirt to a lot and building the house on top of the added dirt.
- A house elevated on posts/piles is either built or raised on a foundation of piers that are driven into the earth and rise high enough above the ground to elevate the house above the flow of flood water or the design flood elevation.
- A house elevated on a crawlspace or enclosure is built or raised on a continuous wall-like foundation that elevates the house above the design flood level. It is important to include vents or openings in the walls below the design flood level that are appropriately sized: one square inch for each square foot of the crawlspace or enclosure's footprint. Additionally all materials below the design flood level must be flood resistant and all machinery, equipment, and plumbing must be above the design flood level.

    - Cost: A majority of the cost to elevate a building is in the preparation and foundation construction. The cost to elevate six feet is little more than the cost to go up two feet. Elevation is usually cost-effective for wood frame buildings on posts/piles or crawlspace because it is easiest for lifting equipment to be used under the floor and disruption to the habitable part of the house is minimal. Elevating a slab house is much more costly and disruptive. In this subarea, 13% percent of the structures in the study area are on a slab and 22% of the structures are less than 2 feet high from the grade. The actual cost of elevating a particular building

depends on factors such as its condition, whether it is masonry or brick faced, and if additions have been added on over time. While the cost of elevating a home can be high, there are funding programs that can help. The usual arrangement is for a FEMA grant to pay 75% of the cost while the owner pays the remaining 25%. In the case of elevating a slab foundation, the homeowner's portion could be as high as $50,000 or more. In some cases, assistance can be provided by Increased Cost of Compliance (ICC) funds, which is discussed on page 30 under Possible Funding Sources, or the use of state funds.

- Feasibility: Federal funding support for an elevation project requires a study that shows that the benefits of the project exceed the cost of the elevation. Project benefits include savings in insurance claims paid on the structure. Elevating a masonry or a slab home can cost up to $300,000, which means that benefit/cost ratios may be low. Looking at each property individually could result in funding for the worst case properties, i.e., those that are the lowest below the base flood elevation, subject to the most frequent flooding, and in good enough condition to elevate.

Advantages	Disadvantages
• Elevating to or above the BFE allows a substantially damaged or substantially improved house to be brought into compliance. • Often reduces flood insurance premiums. • May be fundable under FEMA mitigation grant programs.	• Cost may be prohibitive. • The appearance of the structure and access to it may be adversely affected. • May require property owner cooperation and right-of-way acquisition. • May require road or walkway closures during construction.

Table 1- 8 Advantages and Disadvantages of Elevation

ACQUISITION:

This measure involves buying one or more properties and clearing the site (demolishing the building). If there is no building subject to flooding, there is no flood damage. Acquisitions are usually recommended where the flood hazard is so great or so frequent that it is not safe to leave the structure on the site.

An alternative to buying and clearing the whole subdivision is buying out individual, "worst case," structures with FEMA funds.

- Cost: This approach would involve purchasing and clearing the lowest or the most severe repeatedly flooded homes. If FEMA funds are to be used, three requirements will apply:
  - The applicant for FEMA must demonstrate that the benefits exceed the costs, using one of FEMA's approved Benefit Cost methodologies.
  - The owner must be a willing seller.
  - The parcel must be deeded to a public agency that agrees to maintain the lot and keep it forever as open space.

- Feasibility: Due to the high cost and difficulty to obtain a favorable benefit-cost ratio in shallow flooding areas, acquisitions are reserved for the worst case buildings. Not everyone wants to sell their home, so a checkerboard pattern of vacant and occupied lots often remains after a buyout project, leaving "holes" in the neighborhood. There is no reduction in expenses to maintain the neighborhood's infrastructure for the Parish, although the tax base is reduced. The vacant lots must be maintained by the new owner agency, and additional expense is added to the community. If the lot is only minimally maintained, its presence may reduce the property values of the remaining houses. Jefferson Parish is not considering acquisitions at this time for the above reasons.

Advantages	Disadvantages
• Permanently removes problem since the structure no longer exists. • Allows a substantially damaged or substantially improved structure to be brought into compliance with the community's floodplain management ordinance or law. • Expands open space and enhances natural and beneficial uses. • May be fundable under FEMA mitigation grant programs.	• Cost may be prohibitive. • Resistance may be encountered by local communities due to loss of tax base, maintenance of empty lots, and liability for injuries on empty, community-owned lots.

Table 1- 9 Advantages and Disadvantages of Acquisition

There are 3 criteria that must be met for FEMA to fund an acquisition project:

- The local community must inform the property owners interested in the acquisition program that the community will not use condemnation authority to purchase their property and that the participation in the program is strictly voluntary,
- The subsequent deed to the property to be acquired will be amended such that the landowner will be restricted from receiving any further Federal disaster assistance grants, the property shall remain in open space in perpetuity, and the property will be retained in ownership by a public entity, and
- Any replacement housing or relocated structures will be located outside the 100-year floodplain.

FLOODPROOFING

This measure keeps floodwaters out of a building by modifying the structure. Walls are coated with waterproofing compounds or plastic sheeting. Openings (i.e. doors, windows, and vents) are closed either permanently, or temporarily with removable shields or sandbags.

- Make the walls watertight. This is easiest to do for masonry or brick faced walls. The brick or stucco walls can be covered with a waterproof sealant and bricked or stuccoed over with a veneer to camouflage the sealant. Houses with wood, vinyl, or metal siding need to be wrapped with plastic sheeting to make walls watertight, and then covered with a veneer to camouflage and protect the plastic sheeting. Provide closures, such as removable shields or sandbags, for the openings; including doors, windows, dryer vents and weep holes. There must also be an account for sewer backup and other sources of water entering the building. For shallow flood levels, this can be done with a floor drain plug or standpipe; although a check valve system is more secure.

- Dry floodproofing employs the building itself as part of the barrier to the passage of floodwaters, and therefore this technique is only recommended for buildings with slab foundations that are not cracked. The solid slab foundation prevents floodwaters from entering a building from below. Also, even if the building is in sound condition, tests by the Corps of Engineers have shown that dry floodproofing should not be used for depths greater than three feet above the first floor, because water pressure on the structure can collapse the walls and/or buckle the floor.

- Dry floodproofing is a mitigation technique that is appropriate for some houses in the area: those with slab foundations that typically receive floodwater up to three feet in the house. From the fieldwork it was found that twenty-two percent of the houses in Subarea 1 are on slab foundations, and according to the questionnaire responses fifty-eight percent of the respondents experienced three feet of flooding that entered the first floor of the property and forty-two percent of the respondents had three feet or less than three feet of yard flooding.

- Not all parts of the building need to be floodproofed. It is difficult to floodproof a garage door, for example, so some owners let the garage flood and floodproof the walls between the garage and the rest of the house. Appliances, electrical outlets, and other damage-prone materials located in the garage should be elevated above the expected flood levels.

    - Cost: The cost for a floodproofing project can vary according to the building's construction and condition. It can range from $5,000 to $20,000, depending on how secure the owner wants to be from flooding. Owners can do some of the work themselves, although an experienced

contractor provides greater security. Each property owner can determine how much of their own labor they can contribute and whether the cost and appearance of a project is worth the protection from flooding that it may provide.

- Feasibility: As with floodwalls, floodproofing is appropriate where flood depths are shallow and are of relatively short duration. It can be an effective measure for some of the structures and flood conditions found in the study area. It can also be more attractive than a floodwall around a house. However, floodproofing requires the homeowner to install or place door and window shields or sandbags and to ensure maintenance on a yearly basis. This may be difficult for the elderly or disabled. Finally ample warning of flooding must be available, so the homeowner can determine when to place the door or window shields and sandbags.

Dry floodproofing has the following shortcomings as a flood protection measure:

- It usually requires human intervention, i.e., someone must be home to close the openings.
- Its success depends on the building's condition, which may not be readily evident. It is very difficult to tell if there are cracks in the slab under the floor covering.
- Periodic maintenance is required to check for cracks in the walls and to ensure that the waterproofing compounds do not decompose.
- There is no government financial assistance programs available for dry floodproofing, therefore the entire cost of the project must be paid by the homeowner.
- The NFIP will typically not offer a lower insurance rate for dry floodproofed residences. However, this may be a viable option if homeowners want to protect their structure and contents.

Advantages	Disadvantages
• Often less costly than other mitigation measures. • Allows internal and external hydrostatic pressures to equalize, lessening the loads on walls and floors.	• Extensive cleanup may be necessary if the structure becomes wet inside and possibly contaminated by sewage, chemicals and other materials borne by floodwaters. • Does not minimize the potential damage from a high-velocity flood flow and wave action.

Table 1- 10 Advantages and Disadvantages of Wet Floodproofing

Advantages	Disadvantages
• Often less costly than other retrofitting methods • Does not require additional land. • May not be funded by a FEMA mitigation grant program.	• Requires human intervention and adequate warning to install protective measures. • Does not minimize the potential damage from high-velocity flood flow and wave action. • May not be aesthetically pleasing.

Table 1- 11 Advantages and Disadvantages of Dry Floodproofing

BARRIERS

Levees and floodwalls are types of flood protection barriers. A levee (or berm) is typically a compacted earthen structure; a floodwall is an engineered structure usually built of concrete, masonry or combination of both. Barriers can be built to protect single structure or multiple structures as regional facilities.

The relative cost ranking is based on the combination of the estimated costs for the barrier project and a determination of cost-effectiveness.

- Cost: the cost for a barrier project, such as floodwalls and levees, are generally inexpensive. The cost for levee construction can vary greatly, depending on the distance between the construction site and the source of the fill dirt used to build the levee. The greater the distance that fill dirt must be hauled, the greater the cost.

Advantages	Disadvantages
• Floodwaters cannot reach the structure(s) in the protected area and therefore will not cause damage through inundation, hydrodynamic pressure, erosion, scour, or debris impact. • The structure and the area around it will be protected from inundation, and no significant changes to the structure will be required.	• Barriers may not be used to bring a substantially damaged or substantially improved structure into compliance with the community's floodplain management ordinance or law. • Cost may be prohibitive, as a large area may be required for construction. • Periodic maintenance is required • Local drainage can be affected, possibly creating or worsening flood problems for others.

Table 1- 22 Advantages and Disadvantages of Barriers

STEP 5. CONCLUSION AND RECOMMENDATIONS

CONCLUSION

Based on the field survey and collection of data, the analysis of existing studies and reports, and the evaluation of various structural and non-structural mitigation measures, the Parish proposes that mitigation measures be implemented for Subarea 1. Table 1-13 examines past and current mitigation actions in this area.

Table 1- 33 Current and Past Mitigation Actions in Subarea 1

RECOMMENDATIONS

Jefferson Parish should continue to encourage everyone to pursue mitigation measures and assist interested property owners in applying for a mitigation grant. The Parish should address street drainage in order to improve the drainage in the study area, seek out and secure funding for the drainage improvements outlined in this report, and institute a maintenance program that encourages homeowners to frequently clear their catch basin inlets of debris to ensure open flow for stormwater. The Parish should also continue to improve its CRS classification and adopt this Repetitive Loss Area Analysis according to the process detailed in the CRS Coordinator's Manual.

For the residents of the study area, they should contact Jefferson Parish for more information about possible funding opportunities and site visits to determine remedial measures. Review the alternative mitigation measures discussed in this analysis and implement those that are most appropriate for their situation. Purchase and maintain a flood insurance policy on the home and its contents.

Jefferson Parish recommends the following mitigation actions:

MITIGATION ACTION 1:

Property owners should obtain and keep a flood insurance policy on their structure(s) (building and contents coverage). The Parish will continue on an **annual basis** to target all properties in the repetitive loss area reminding them of the advantages to maintaining flood insurance through its annual outreach effort.

RESPONSIBILITY

The Floodplain Management and Hazard Mitigation Department will provide the most relevant up-to-date flood insurance information to all property owners within the repetitive loss areas located in this area.

FUNDING

The cost will be paid for from the department's operating budget.

MITIGATION ACTION 2:

When appropriate, property owners should consider floodproofing measures such as flood gates or shields, flood walls, and hydraulic pumps.

RESPONSIBILITY

The Floodplain Management and Hazard Mitigation department will promote effective flood protection

measures and provide advice and assistance to property owners who may wish to implement such measures in an **on-going** program.

FUNDING

The cost will be paid for by individual property owners. Advice and assistance will require staff time which will be covered in the department's annual budget.

MITIGATION ACTION 3:

Continue elevation or reconstruction mitigation of high-risk flood-prone properties. The highest priorities are properties at the greatest flood risk and where drainage improvements will not provide an adequate level of protection.

RESPONSIBILITY

The Floodplain Management and Hazard Mitigation department will continue to target the most at-risk properties for grant applications.

FUNDING

Construction cost would be covered with FEMA and/or ICC funds. Staff time to develop the list of target properties will require funds from the department's operating budget.

MITIGATION ACTION 4:

Encourage property owners to elevate inside and outside mechanical equipment above the BFE and install flood-resistant materials in crawl spaces.

RESPONSIBILITY

The Floodplain Management and Hazard Mitigation Department will promote effective flood protection measures and provide advice and assistance to property owners who may wish to implement such measures in an **on-going** program.

FUNDING

The cost will be paid for by individual property owners. Advice and assistance will require staff time which will be covered in the department's annual budget.

MITIGATION ACTION 5:

Encourage property owners to install barriers as a mitigation measure.

RESPONSIBILITY

The Floodplain Management and Hazard Mitigation Department will promote effective flood protection measures and provide advice and assistance to property owners who may wish to implement such measures in an **on-going** program.

FUNDING

The cost will be paid for by individual property owners. Advice and assistance will require staff time which will be covered in the department's annual budget.

SUBAREA 2

RIVER RIDGE

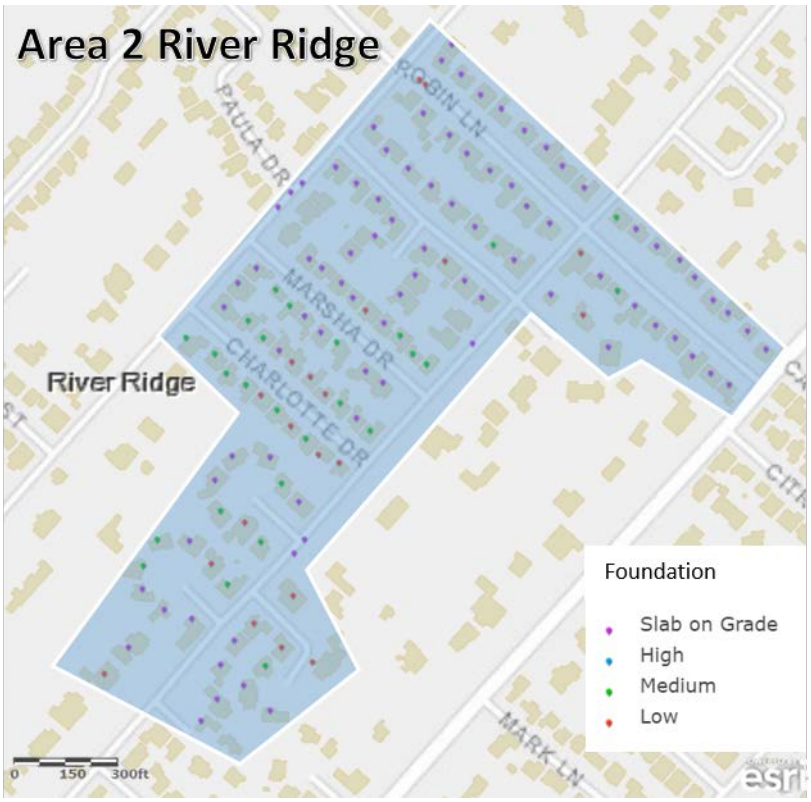


Figure 2- 1 Outline of Subarea 2

STEP 1. ADVISE ALL PROPERTY OWNERS

Before field work began on the RLAA, individual notices were mailed to property owners within the 5 identified Repetitive Loss subareas. The notices advised properties owners about the analysis and requested their input on the flooding problem in their area and mitigation actions taken. The notice also advised property owners how they could provide comments on the draft report once it was posted online.

Subarea 2: The property owner notice with questionnaire was mailed to 133 residents in Subarea 2 the week of January 29, 2018.

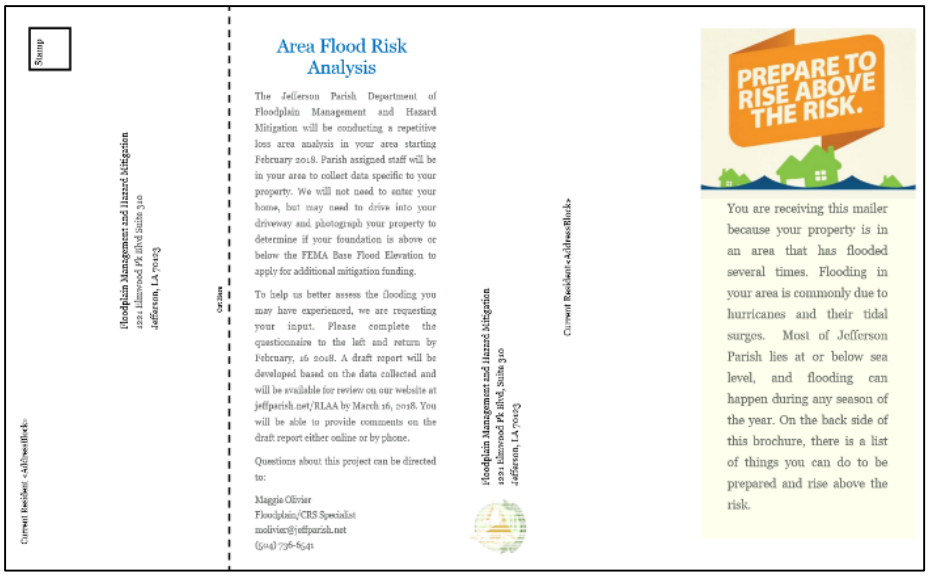


Figure 2- 2 Front of Notice

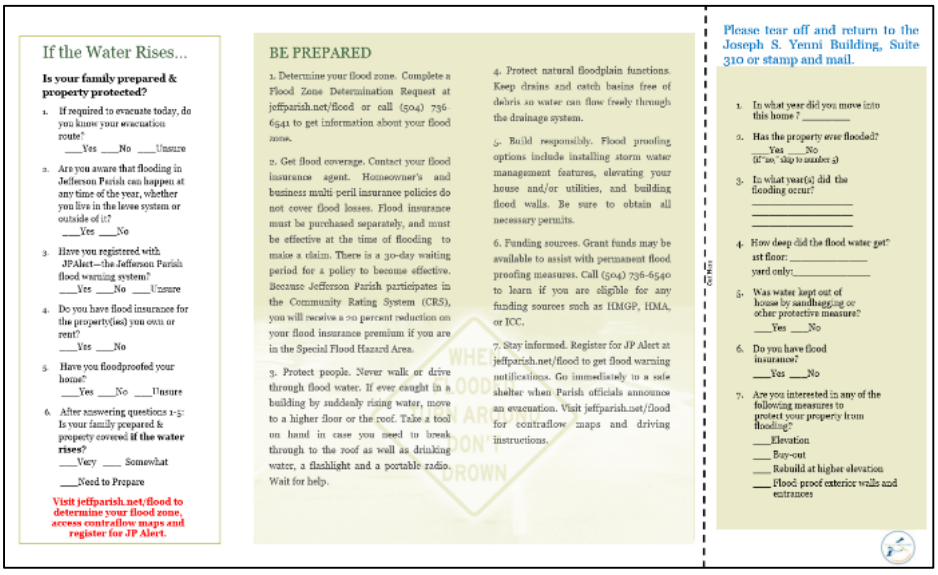


Figure 2- 3 Back of Notice with Questionnaire

QUESTIONNAIRE RESPONSES SUBAREA 2

Out of the 133 mailed questionnaires, Jefferson Parish received 15 responses which corresponds to a response rate of approximately 11 percent. Questionnaire responses are summarized below. Note: respondents may have skipped questions and/or provided more than one response to a question. Three (3) addresses were undeliverable and one (1) property was vacant.

Q1: In what year did you move into this home?

Responses Received	Percentage	Number Responding
<10 years ago	40	**6**
10-20 years ago	6.6	**3**
20-30 years ago	6.6	**3**
30-40 years ago	None	**None**
40-50 years ago	6.6	**3**
> 50 years ago	None	**None**
Total	**100**	**15**

Q2: Has the property ever been flooded?

Answer Choices	Percentage	Number
No	27	**4**
Yes	73	**11**
Total	**100**	**15**

Q3: In what year(s) did it flooding occur?

Responses Received	Percentage	Number Responding
1978	7.7	**2**
1980	7.7	**2**
1989	7.7	**2**
1995	31	**8**
2005	27	**7**
2008	11.5	**3**
2017	4	**1**
2018	4	**1**
Total	**100**	**26**

Q4: How deep did the water get?

Answer Choices	Percentage	Number Responding	Depth	
			< 3 ft	> 3 ft
First floor	83	10	8	**None**
Yard only	17	2	None	**None**
Total	**100**	**12**	**8**	**None**

Q5: Was water kept out of the house by sandbagging or other protective measures?

Answer Choices	Percentage	Number Responding
No	92	**11**
Yes	8	**1**
Total	**100**	**12**

Q6: Do you have Flood Insurance?

Answer Choices	Percentage	Number Responding
No	None	**None**
Yes	100	**15**
Total	**100**	**15**

Q7: Are you interested in protecting your property from flooding?

Answer Choices	Percentage	Number Responding
No	11	**1**
Yes	89	**8**
Total	**100**	**9**

The following trends in survey responses should be considered when evaluating mitigation measures for Subarea 2:

- Eighty-nine (89) percent of respondents are interested in protecting their home/building from flooding. This could indicate trust in Jefferson Parish and interest in installing floodproofing measures. Eleven (11) percent respondents were not interested in any mitigation measures on their property.
- All of the respondents currently have FEMA flood insurance.

- Ninety-two (92) percent of respondents mentioned that none of the protective measures helped to keep the water out of the house whereas, eight (8) percent of respondents believed that mitigation measures helped them to keep the water outside their homes.
- The majority (83 percent) of flooding has been over the first floor of the home with less than 3 feet in depth. Seventeen (17) percent of the respondents reported that the floodwaters only reached their yard.
- Approximately 40 percent of the respondents moved into their houses less than 10 years ago.
- The years with the largest number of reported flooding incidents are 1995, 2005 and 2008. The following flood events are detailed in NOAA's National Climatic Data Center (NCDC) database:

    - **Southeast Louisiana and Southern Mississippi Flood, 1995** - It was a heavy rainfall event which occurred across an area stretching from the New Orleans metropolitan area into southern Mississippi. A storm total rainfall maximum of 27.5 inches (70 cm) was recorded near Necaise, Mississippi. Considerable flooding was caused by the rainfall including several record flood crests along impacted river systems. The flooding caused six fatalities and more than $3.1 billion in damage.

    - **August 29, 2005** – The Category 3 Hurricane Katrina caused catastrophic damage along the Gulf coast from central Florida to Texas, much of it due to the storm surge and levee failure. Severe property damage occurred in coastal areas, such as Mississippi beachfront towns where boats and casino barges rammed buildings, pushing cars and houses inland; water reached 6–12 miles (10–19 km) from the beach. The storm was the third most intense United States landfalling tropical cyclone, behind the 1935 Labor Day hurricane and Hurricane Camille in 1969. Overall, at least 1,245 people died in the hurricane and subsequent floods, making it the deadliest United States hurricane since the 1928 Okeechobee hurricane. Total property damage was estimated at $125 billion (2005 USD), roughly four times the damage wrought by Hurricane Andrew in 1992 in the United States.

    - **August-September, 2008** - The storm surge ahead of Ike blew onshore of Louisiana well ahead of Ike's predicted landfall in Texas on September 13. Areas in coastal south-central and southwestern Louisiana, some of which were flooded by Gustav, were re-flooded as a result of Ike. Some areas that had not yet recovered from Gustav power outages received additional outages of 200,000. The hardest-hit areas were in and around Cameron Parish, with nearly every square inch of the coastline in that area was flooded heavily, reaching as far north as Lake Charles, nearly 30 miles inland.

STEP 2. CONTACT AGENCIES AND ORGANIZATIONS

Jefferson Parish Department of Hazard Mitigation and Floodplain Management contacted external agencies and internal departments that have plans or studies that could affect the cause or impacts of flooding within the identified repetitive loss subareas. The data collected was used to analyze the problems further and to help identify potential solutions and mitigation measures for property owners. The agencies contacted and reports which were analyzed and reviewed are as follows:

Agencies

- Jefferson Parish Electronic Information System Department
- Jefferson Parish Streets Department
- Jefferson Parish Office of Risk Management
- Jefferson Parish Drainage Department

Reports

- FEMA – Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) for Jefferson Parish, February 2, 2018
- ISO – Repetitive Flood Insurance Claims Data
- Jefferson Parish Hazard Mitigation Plan

SUMMARY OF STUDIES AND REPORTS

FEMA FLOOD INSURANCE STUDY (FIS) AND FLOOD INSURANCE RATE MAP (FIRM)

FEMA's FIS for Jefferson Parish, LA is dated February 2, 2018. The FIS revises and updates information on the existence and severity of flood hazards within the Parish. The FIS also includes revised digital Flood Insurance Rate Maps (FIRMs) which reflect updated Special Flood Hazard Areas (SFHAs) and flood zones for the Parish. SFHA boundaries within the Parish were updated due to new detailed coastal analyses which were performed by the USACE-MVN, for FEMA. This study also incorporates the Hurricane Storm Damage Risk Reduction System (HSDRRS) completed by the USACE. Finally, these maps depict the potential for flooding and are the basis for building requirements and flood insurance rates.

FLOOD INSURANCE CLAIMS DATA

The Privacy Act of 1974 (5 U.S.C. 522a) restricts the release of flood insurance policy and claims data to the public. This information can only be released to state and local governments for the use in floodplain management related activities. Therefore all claims data in this report are only discussed in general terms.

JEFFERSON PARISH HAZARD MITIGATION PLAN

The purpose of a mitigation plan is to rationalize the process of determining appropriate hazard mitigation actions. The document includes a detailed description of natural hazards in Jefferson Parish; a risk assessment that describes potential losses to physical assets, people and operations; a set of goals, objectives, strategies and actions that will guide the Parish's mitigation activities, and a detailed plan for implementing and monitoring the Plan. This Plan identified 12 hazards and included a risk assessment of the four hazards with the highest potential for damaging physical assets, people and operations in Jefferson Parish. These hazards are floods, hurricanes and tropical storms, storm surge, and tornadoes. Both the risk assessment section and goals sections reflect this emphasis, which was the result of careful consideration and a numerical ranking process carried out by the Mitigation Planning Team (MPT).

STEP 3. BUILDING DATA COLLECTION

The on-site field survey for this analysis was conducted over multiple days between the months of October 2017 and January 2018. Initial visits in November assisted with area definition. The Collector App through ESRI was utilized to save field data from the site visits. In addition, multiple site photos were taken of each structure on the property. Photos were also taken of current drainage features and mitigation and floodproofing measures if evident from street or parking lot views. The following information was recorded for each property:

Table 2- 1

Structure		Foundation		Type	
No structure	1	Slab on grade	86	Residential	133
Occupied	130	Low (less than 2ft.)	20	Non-residential	none
Vacant	2	Medium	26		
		High	none		

COLLECTOR FOR ARCGIS (ESRI)

Jefferson Parish used the ESRI Collector Application in order to be able to store and spatially view repetitive loss data for the Parish. The Collector App contains all field data collected by parcels for RLAA including pictures of each structure on the parcel. The data is stored in ArcGIS and is used for internal review and continued analysis of repetitive flood loss areas.

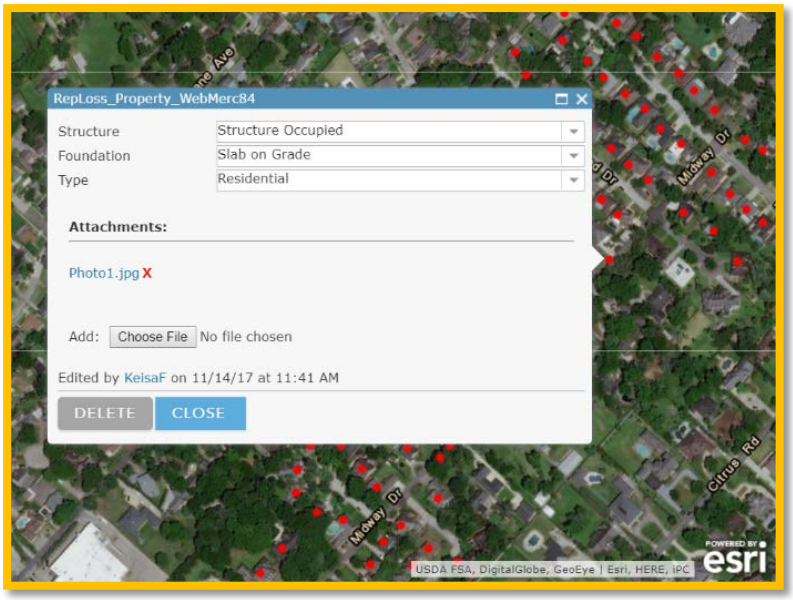


Figure 2- 4 Collector Application Sample

PROBLEM STATEMENT

SUBAREA 2- RIVER RIDGE

Subarea 2 is located entirely within the 100-year floodplain (Zone AE). The formal boundaries for the River Ridge Census Designated Place encompasses a land area of 2.8 sq. miles and a water area of 0.75 sq. miles. The elevation of ground is approximately +1 and the Base Flood Elevation is +3 NAVD.

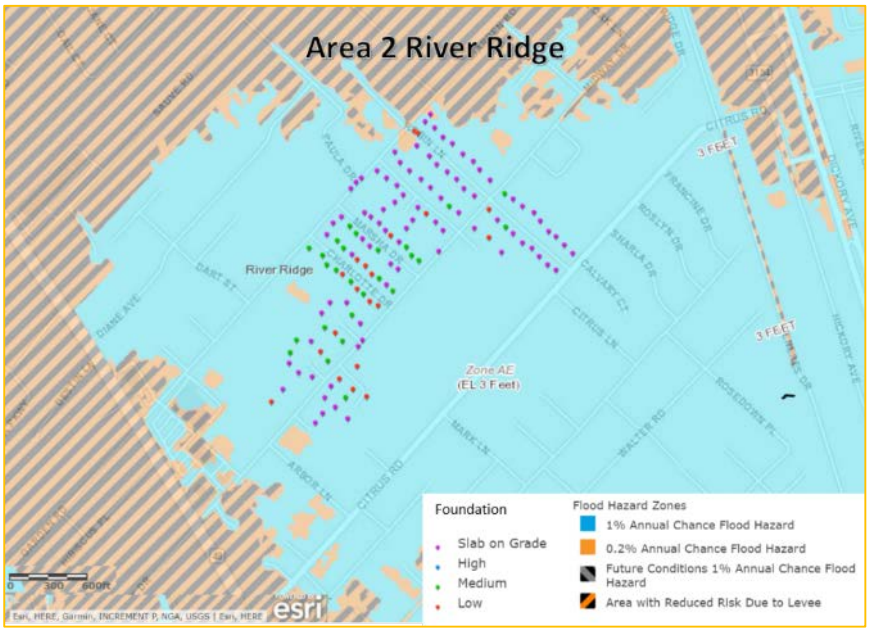


Figure 2- 5 2018 Effective FIRM

Excessive runoff from heavy rainfall causes flooding of urban areas, highways, and main streets as well as other low-lying spots in this area. Quick, heavy rains oftentimes results in overwhelming the existing pumping infrastructure and causing widespread street flooding. According to Parish officials, the pump system in this area is designed to handle an inch/hour and half-inch in the next hour. Therefore, any event causing rainfall over an inch can result into over working of the pump systems to clear water in the area. There is a lack in vital infrastructure such as pump stations, utilities and drainage that meet the contemporary standards so that the community can thrive.

In accordance with FEMA publication *551 Selecting Appropriate Mitigation Measures for Floodprone Structures*, mitigation options are discussed. The approach to reducing repetitive flooding in Subarea 2 will require a combination of floodproofing techniques, education, and drainage improvement projects.

CLAIMS DATA:

In review of the unmitigated Repetitive Loss List, there are 28 properties within the 133 property study area that qualify as repetitive loss. Of those 28 repetitive loss properties, 17 are considered to be severe repetitive loss properties.

The majority of the rest of the claims are from relatively small rainfall events that affected between 5 -15 homes. In analyzing the claims data, it could be derived that the area experiences most flooding from rainfall events. Hurricane Katrina was the hurricane that had the maximum number of claims in the area.

There have been 120 flood claims in the study area totaling $4,664,082. The average claim in the area is $38,867. The homeowners of the 11 repetitive loss properties have made 30 claims and received $1,381,087 in flood insurance payments since 1978. The homeowners of the 17 severe repetitive loss properties have made 90 claims, and received $3,282,994 in flood insurance payments since 1978.The average repetitive flood loss claim was $40,036 and the average severe repetitive loss claim was $36,478. The severe repetitive loss homes are similar to the other homes on their block and are on separate streets. They have each flooded more than 4 times, and all of them flooded during most of the heavy rainfall events in the area. (See bar graph below, Table 2-3)

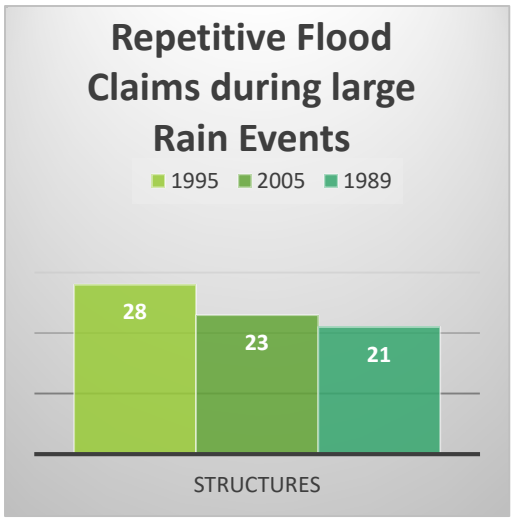


Table 2- 2

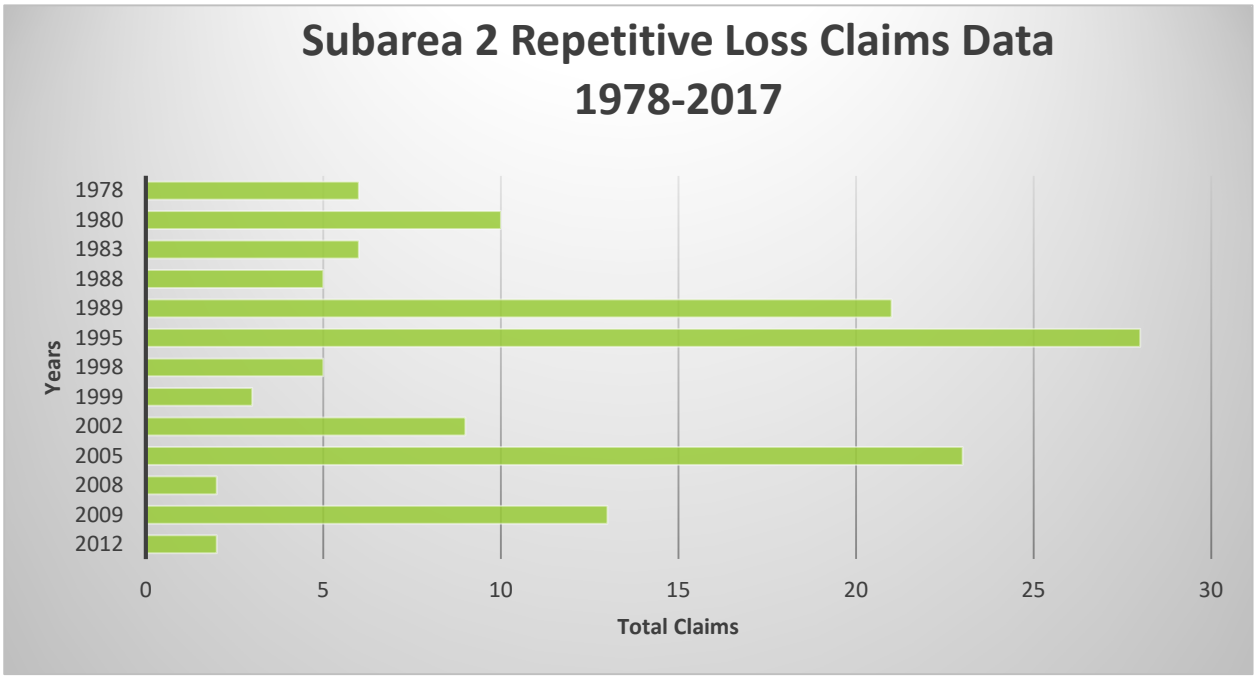


Table 2- 3

FIELD DATA:

The on-site field survey for this analysis was conducted over multiple days between the months of October 2017 and January 2018. The team collected information such as the type and height of the foundation, occupancy status of the structure, and use of the structure.

A majority of the structures are slab on grade (86 or 65%). About 20 percent (26) of the structures are medium high. Approximately 15 percent (20) structures are low, less than 2 feet from grade. It could be evaluated that although most of the structures in the subarea are slab on grade, there has been damage to the other properties due to flooding form several hurricane and rain events.

The project team observed that majority (130 or 97 percent) of the structures in the area were occupied, while approximately 2, or 1.6 percent, are vacant and 1 (1.6 percent) had no structure. Also, all the structures are of residential use.

In conclusion, it should be noted that given the location of Subarea 2, all of the properties are inside levee protection. Majority of the properties are built slab on grade; therefore, a heavy rain event can cause substantial damage to these properties.

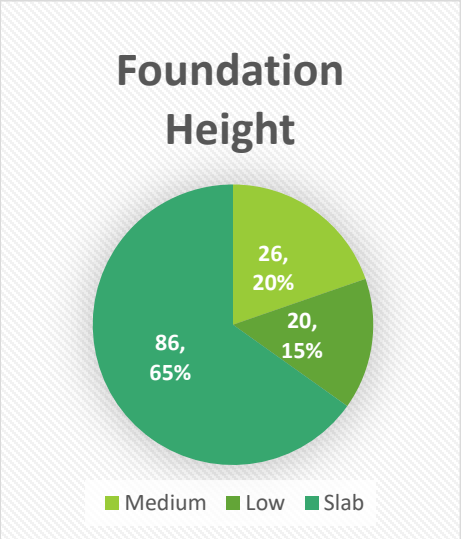


Table 2- 4

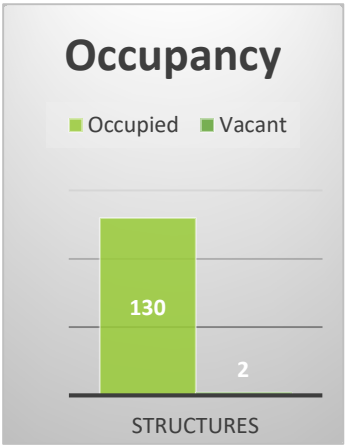


Table 2- 5

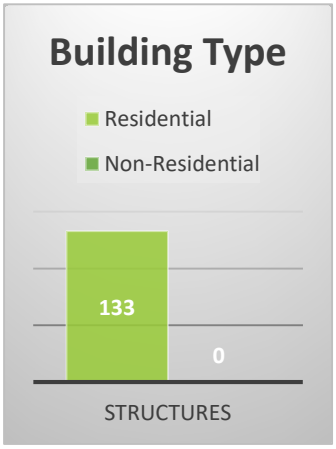


Table 2- 6

Figure 2- 6 Example property in Subarea 2

Figure 2- 7 Example Mitigated Property in Subarea 2

STEP 4. REVIEW ALTERNATIVE MITIGATION APPROACHES

There are many ways to protect a property from flood damage. Different measures are appropriate for different flood hazards, building types and building conditions. Figure 2-8 below, found in the *2017 CRS Coordinator's Manual*, lists typical property protection measures.

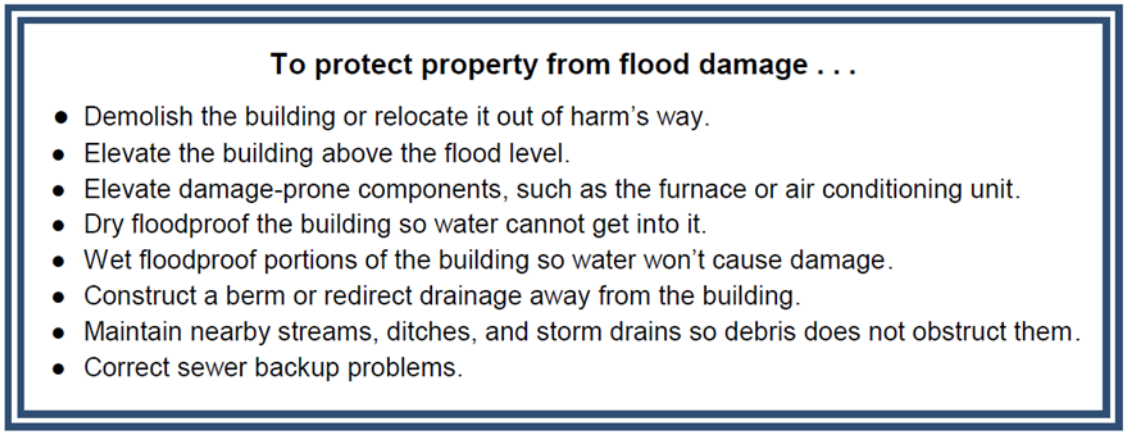


Figure 2- 8 Typical Property Protection Measures

Mitigation measures should fall into one of the mitigation categories listed below which are based on the Community Rating System planning process:

- Prevention
- Property Protection
- Natural Resource Protection
- Emergency Services
- Structural Projects
- Public Information and Outreach

MITIGATION FUNDING

There are several types of mitigation measures, listed in the table below, which can be considered for each repetitive loss property. Each mitigation measure qualifies for one or more grant program(s). Depending on the type of structure, severity of flooding and proximity to additional structures with similar flooding conditions, the most appropriate measure can be determined. In addition to these grant funded projects, several mitigations measures can be taken by the homeowner to protect their home.

Table 2- 7

Types of Projects Funded	HMGP	FMA	PDM	ICC	SBA
Acquisition of the entire property by govt. agency	✔	✔	✔		
Relocation of the building to a flood free site	✔	✔	✔	✔	✔
Demolition of the structure	✔	✔	✔	✔	✔
Elevation of the structure above flood levels	✔	✔	✔	✔	✔
Replacing the old building with a new elevated one	✔	✔	✔	✔	✔
Local drainage and small flood control projects	✔	✔	✔		
Dry floodproofing (non-residential only)	✔	✔	✔		
Percent paid by Federal program	75%	75%, 90%, or 100%	75%	Up to $30K	

There are several possible sources of funding for mitigation projects:

- **FEMA grants**: Most of the FEMA programs provide 75% of the cost of a project. In most communities, the 25% non-FEMA share is paid by the benefitting property owner. Each program has different Congressional authorization and slightly different rules.
  - **The Hazard Mitigation Grant Program (HMGP)**: The HMGP provides grants to States and local governments to implement long-term hazard mitigation measures after a major disaster declaration. Projects must provide a long-term solution to a problem (e.g., elevation of a home to reduce the risk of flood damages as opposed to buying sandbags and pumps to fight the flood). Examples of eligible projects include acquisition and elevation, as well as local drainage projects.
  - **The Flood Mitigation Assistance Program (FMA)**: FMA funds assist States and communities in implementing measures that reduce or eliminate the long-term risk of flood damage to structures insured under the NFIP. Project Grants to implement measures to reduce flood losses, such as elevation, acquisition, or relocation of NFIP-insured structures. States are encouraged to prioritize FMA funds for applications that include repetitive loss properties; these include structures with 2 or more losses each with a claim of at least $1,000 within any ten-year period since 1978.
  - **Pre-Disaster Mitigation Program (PDM)**: The Pre-Disaster Mitigation (PDM) program provides funds to states, territories, Indian tribal governments, communities, and universities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. For more information visit http://www.fema.gov/government/grant/pdm/index.shtm.

- **Flood insurance**: There is a special funding provision in the National Flood Insurance Program (NFIP) for insured buildings that have been substantially damaged by a flood, “Increased Cost of Compliance.” ICC coverage pays for the cost to comply with floodplain management regulations after a flood if the building has been declared substantially damaged. ICC will pay up to $30,000 to help cover elevation, relocation, demolition, and (for nonresidential buildings) floodproofing. It can also be used to help pay the 25% owner’s share of a FEMA funded mitigation project.

The building's flood insurance policy must have been in effect during the flood. This payment is in addition to the damage claim payment that would be made under the regular policy coverage, as long as the total claim does not exceed $250,000. Claims must be accompanied by a substantial or repetitive damage determination made by the local floodplain administrator. For more information, contact your insurance agent or visit: www.fema.gov/plan/prevent/floodplain/ICC.shtm.

Coverage under the ICC does have limitations: It covers only damage caused by a flood, as opposed to wind or fire damage. The building's flood insurance policy must have been in effect during the flood. ICC payments are limited to $30,000 per structure. Claims must be accompanied by a substantial or repetitive damage determination made by the local floodplain administrator and the structure must be in Zone AE.

The average claims payment in the Subarea 2 is $38,867. With an average claim of that amount, it is not likely that many homes in the study area would sustain substantial damage from a flood event. Homeowners should make themselves aware of the approximate value of their homes, and in the case of incurring flood damage, be aware of the need for a substantial damage declaration in order to receive the ICC coverage.

Alternative language adopted into the local floodplain management ordinance would enable residents with shallower flooding to access ICC funding. Since local ordinances determine the threshold at which substantial damage and/or repetitive claims are reached, adopting language that would lower these thresholds would benefit the homeowners of repetitive loss properties. Adopting alternative language allows for cumulative damages to reach the threshold for federal mitigation resources more quickly, meaning that some of the properties in Jefferson Parish that sustain minor damage regularly would qualify for mitigation assistance through ICC.

- Rebates: A rebate is a grant in which the costs are shared by the homeowner and another source, such as the local government, usually given to a property owner after a project has been completed. Many communities favor it because the owner handles all the design details, contracting, and payment before the community makes a final commitment. The owner ensures that the project meets all of the program's criteria, has the project constructed, and then goes to the community for the rebate after the completed project passes inspection.

Rebates are more successful where the cost of the project is relatively small, e.g., under $5,000, because the owner is more likely to be able to afford the bulk of the cost. The rebate acts more as an incentive, rather than as needed financial support.

- Small Business Administration Mitigation Loans: The Small Business Administration (SBA) offers mitigation loans to SBA disaster loan applicants who have not yet closed on their disaster loan. Applicants who have already closed must demonstrate that the delay in application was beyond their control.

For example mitigation loans made following a flood can only be used for a measure to protect against future flooding, not a tornado. If the measure existed prior to the declared disaster, an SBA mitigation loan will cover the replacement cost. If the measure did not exist prior to the declared disaster the mitigation loan will only cover the cost of the measure if it is deemed absolutely necessary for repairing the property by a professional third-party, such as an engineer.

MITIGATION ALTERNATIVES

The River Ridge area is a unique area with 133 total properties identified. The majority of the flooding in this area is considered “nuisance” flash flooding that causes minimal damage but does require costly cleanup and numerous street closures due to floodwaters overtopping the roadway.

Flooding in this area can be attributed to its flat topography, aging stormwater infrastructure and proximity between the Mississippi River Levee, Jefferson Hwy, and the railroad tracks. Flash flooding can occur when the capacity of the drainage system is exceeded or if conveyance is obstructed by debris, sediment and other materials that limit the volume of drainage. Heavy rains within a short period of time have caused the drainage system to be inundated and unable to keep up, resulting in ponding water in streets and homes.

Improving the drainage system can eliminate some road and home inundation in this area. These structural methods require large capital expenditures and cooperation from private property owners. Promoting floodproofing techniques and increasing public education and awareness of the flood hazards can be the next best alternative for property owners in this area. The Parish’s websites, e-mail distribution lists, press releases and variable message boards can provide benefit to business owners and residents.

POTENTIAL MITIGATION MEASURES FOR SUBAREA 2

Structural Alternatives:

- **Elevate** structures and damage-prone components, such as the water heater or air conditioning unit, above the Base Flood Elevation (BFE).
- **Dry floodproofing** can be done on commercial structures and even residential structures; however, in many instances this requires human intervention to complete the measure and ensure success. For example, installing watertight shields over doors or windows requires timely action by the homeowner; especially in a heavy rainfall event.
- **Wet floodproofing** a structure involves making the uninhabited portions of the structure resistant to flood damage and allowing water to enter during flooding. For example, in a basement or crawl space, mechanical equipment and ductwork would not be damaged.
- **Acquire and/or relocate** properties/target abandoned properties or locations that would provide a public benefit as the location will need to be maintained by the Parish in perpetuity.
- **Increase the size of culverts** under Jefferson Hwy to allow for increased capacity.
- **Implement drainage** i**mprovements** such as increasing capacity in the system (up-sizing pipes) and provide additional inlets to receive more stormwater.
- Improve stormwater system maintenance program to ensure inlets and canals are free of clogging debris.

Non Structural Alternatives:

- **Relocate internal supplies**, products/goods, and belongings above the flooding depth.
- Improve the Parish’s floodplain and zoning ordinances.
- **Provide public education** through posting information about local flood hazards on Parish website, posting signs at various locations in neighborhoods or discussing flood protection measures at local neighborhood association meetings.
- Promote the purchase of flood insurance.

- Continue coordination with GOHSEP, the National Weather Service (NWS), and United States Geological Survey (USGS) to enhance flood warning system, including the use of rain/stream gauges, to provide greater warning time for citizens. NWS can use the real- time data collected to issue timely warnings.

COST AND BENEFITS OF MITIGATION MEASURES

Knowing the flooding history, type, and condition of the buildings in the area, leads to the fourth step in the area analysis procedure – a review of alternative mitigation approaches to protect properties from, or reduce, future flood damage. Property owners should look at these alternatives but understand they are not all guaranteed to provide protection at different levels of flooding. Six approaches were reviewed:

- Elevating the houses above the 1% annual flood level
- Acquisition
- Floodproofing
- Drainage improvements

ELEVATION

Raising the structure above the flood level is generally viewed as the best flood protection measure, short of removing the building from the floodplain. All damageable portions of the building and its contents are high and dry during a flood, which flows under the building instead of into the house. Houses can be elevated on fill, posts/piles, or a crawlspace.

- A house elevated on fill requires adding a specific type of dirt to a lot and building the house on top of the added dirt.
- A house elevated on posts/piles is either built or raised on a foundation of piers that are driven into the earth and rise high enough above the ground to elevate the house above the flow of flood water or the design flood elevation.
- A house elevated on a crawlspace or enclosure is built or raised on a continuous wall-like foundation that elevates the house above the design flood level. It is important to include vents or openings in the walls below the design flood level that are appropriately sized: one square inch for each square foot of the crawlspace or enclosures footprint. Additionally all materials below the design flood level must be flood resistance and all machinery, equipment, and plumbing must be above the design flood level.
    - Cost: A majority of the cost to elevate a building is in the preparation and foundation construction. The cost to elevate six feet is little more than the cost to go up two feet. Elevation is usually cost-effective for wood frame buildings on posts/piles or crawlspace because it is easiest for lifting equipment to be used under the floor and disruption to the habitable part of the house is minimal. Elevating a slab house is much more costly and disruptive. In Subarea 2, 65% percent of the houses in the study area are on a slab. The actual cost of elevating a particular building depends on factors such as its condition, whether it is masonry or brick faced, and if additions have been added on over time. While the cost of elevating a home can be high, there are funding programs that can help. The usual arrangement is for a FEMA grant to pay 75% of the cost while the owner pays the other 25%. In the case of elevating a slab foundation, the homeowner's portion could be as high as $50,000 or more. In some cases,

assistance can be provided by Increased Cost of Compliance (ICC) funds, which is discussed on page 53 under Possible Funding Sources, or the use of state funds.

- Feasibility: Federal funding support for an elevation project requires a study that shows that the benefits of the project exceed the cost of the elevation. Project benefits include savings in insurance claims paid on the structure. Elevating a masonry or a slab home can cost up to $300,000, which means that benefit/cost ratios may be low. Looking at each property individually could result in funding for the worst case properties, i.e., those that are the lowest below the base flood elevation, subject to the most frequent flooding, and in good enough condition to elevate.

Advantages	Disadvantages
• Elevating to or above the BFE allows a substantially damaged or substantially improved house to be brought into compliance. • Often reduces flood insurance premiums. • May be fundable under FEMA mitigation grant programs.	• Cost may be prohibitive. • The appearance of the structure and access to it may be adversely affected. • May require property owner cooperation and right-of-way acquisition. • May require road or walkway closures during construction.

Table 2- 8 Advantages and Disadvantages of Elevation

ACQUISITION:

This measure involves buying one or more properties and clearing the site (demolishing the building). If there is no building subject to flooding, there is no flood damage. Acquisitions are usually recommended where the flood hazard is so great or so frequent that it is not safe to leave the structure on the site.

An alternative to buying and clearing the whole subdivision is buying out individual, “worst case,” structures with FEMA funds.

- Cost: This approach would involve purchasing and clearing the lowest or the most severe repeatedly flooded homes. If FEMA funds are to be used, three requirements will apply:
  - The applicant for FEMA must demonstrate that the benefits exceed the costs, using FEMA’s one of FEMA’s approved Benefit Cost methodologies.
  - The owner must be a willing seller.
  - The parcel must be deeded to a public agency that agrees to maintain the lot and keep it forever as open space.

- Feasibility: Due to the high cost and difficulty to obtain a favorable benefit-cost ratio in shallow flooding areas, acquisitions are reserved for the worst case buildings. Not everyone wants to sell their home, so a checkerboard pattern of vacant and occupied lots often remains after a buyout project, leaving "holes" in the neighborhood. There is no reduction in expenses to maintain the neighborhood's infrastructure for the Parish, although the tax base is reduced. The vacant lots must be maintained by the new owner agency, and additional expense is added to the community. If the lot is only minimally maintained, its presence may reduce the property values of the remaining houses. Jefferson Parish is not considering acquisitions at this time for the above reasons.

Advantages	Disadvantages
• Permanently removes problem since the structure no longer exists. • Allows a substantially damaged or substantially improved structure to be brought into compliance with the community's floodplain management ordinance or law. • Expands open space and enhances natural and beneficial uses. • May be fundable under FEMA mitigation grant programs.	• Cost may be prohibitive. • Resistance may be encountered by local communities due to loss of tax base, maintenance of empty lots, and liability for injuries on empty, community-owned lots.

Table 2- 9 Advantages and Disadvantages of Acquisition

There are 3 criteria that must be met for FEMA to fund an acquisition project:

- The local community must inform the property owners interested in the acquisition program that the community will not use condemnation authority to purchase their property and that the participation in the program is strictly voluntary,
- The subsequent deed to the property to be acquired will be amended such that the landowner will be restricted from receiving any further Federal disaster assistance grants, the property shall remain in open space in perpetuity, and the property will be retained in ownership by a public entity, and
- Any replacement housing or relocated structures will be located outside the 100-year floodplain.

FLOODPROOFING

This measure keeps floodwaters out of a building by modifying the structure. Walls are coated with waterproofing compounds or plastic sheeting. Openings (i.e. doors, windows, and vents) are closed either permanently, or temporarily with removable shields or sandbags.

- Make the walls watertight. This is easiest to do for masonry or brick faced walls. The brick or stucco walls can be covered with a waterproof sealant and bricked or stuccoed over with a veneer to camouflage the sealant. Houses with wood, vinyl, or metal siding need to be wrapped with plastic sheeting to make walls watertight, and then covered with a veneer to camouflage and protect the plastic sheeting. Provide closures, such as removable shields or sandbags, for the openings;

including doors, windows, dryer vents and weep holes. There must also be an account for sewer backup and other sources of water entering the building. For shallow flood levels, this can be done with a floor drain plug or standpipe; although a check valve system is more secure.

- Dry floodproofing employs the building itself as part of the barrier to the passage of floodwaters, and therefore this technique is only recommended for buildings with slab foundations that are not cracked. The solid slab foundation prevents floodwaters from entering a building from below. Also, even if the building is in sound condition, tests by the Corps of Engineers have shown that dry floodproofing should not be used for depths greater than three feet above the first floor, because water pressure on the structure can collapse the walls and/or buckle the floor.

- Dry floodproofing is a mitigation technique that is appropriate for some houses in the area: those with slab foundations that typically receive floodwater up to three feet in the house. From the fieldwork it was found that approximately sixty-five percent of the houses in Subarea 2 are on slab foundations, and according to the questionnaire responses eighty-three percent of the respondents experienced less than three feet of flooding on the first floor.

- Not all parts of the building need to be floodproofed. It is difficult to floodproof a garage door, for example, so some owners let the garage flood and floodproof the walls between the garage and the rest of the house. Appliances, electrical outlets, and other damage-prone materials located in the garage should be elevated above the expected flood levels.

    - Cost: The cost for a floodproofing project can vary according to the building's construction and condition. It can range from $5,000 to $20,000, depending on how secure the owner wants to be from flooding. Owners can do some of the work by themselves, although an experienced contractor provides greater security. Each property owner can determine how much of their own labor they can contribute and whether the cost and appearance of a project is worth the protection from flooding that it may provide.

    - Feasibility: As with floodwalls, floodproofing is appropriate where flood depths are shallow and are of relatively short duration. It can be an effective measure for some of the structures and flood conditions found in the study analysis area. It can also be more attractive than a floodwall around a house. However, floodproofing requires the homeowner to install or place door and window shields or sandbags and to ensure maintenance on a yearly basis. This may be difficult for the elderly or disabled. Finally ample warning of flooding must be available, so the homeowner can determine when to place the door or window shields and sandbags.

Dry floodproofing has the following shortcomings as a flood protection measure:

- It usually requires human intervention, i.e., someone must be home to close the openings.
- Its success depends on the building's condition, which may not be readily evident. It is very difficult to tell if there are cracks in the slab under the floor covering.
- Periodic maintenance is required to check for cracks in the walls and to ensure that the waterproofing compounds do not decompose.
- There is no government financial assistance programs available for dry floodproofing, therefore the entire cost of the project must be paid by the homeowner.

- The NFIP will typically not offer a lower insurance rate for dry floodproofed residences. However, this may be a viable option if homeowners want to protect their structure and contents.

Advantages	Disadvantage
• Often less costly than other mitigation measures. • Allows internal and external hydrostatic pressures to equalize, lessening the loads on walls and floors.	• Extensive cleanup may be necessary if the structure becomes wet inside and possibly contaminated by sewage, chemicals and other materials borne by floodwaters. • Does not minimize the potential damage from a high-velocity flood flow and wave action.

Table 2- 10 Advantages and Disadvantages of Wet Floodproofing

Advantages	Disadvantage
• Often less costly than other retrofitting methods • Does not require additional land. • Maybe funded by a FEMA mitigation grant program.	• Requires human intervention and adequate warning to install protective measures. • Does not minimize the potential damage from high-velocity flood flow and wave action. • May not be aesthetically pleasing.

Table 2- 11 Advantages and Disadvantages of Dry Floodproofing

DRAINAGE IMPROVEMENTS

The Parish is currently in the process of developing a Parish-wide Subsurface Drainage Master Plan. The purpose of this Plan is to help identify deficient drainage areas throughout the Parish, develop preliminary solutions for the problem areas, split problem areas into individual projects for bidding purposes, develop cost estimates, and prioritize needed work. The Plan shall have a list of recommendations that were created after reviewing previous studies and reports. There are several different drainage improvements called for in the Drainage Master Plan that might help in reducing some of the flooding within this Repetitive Loss area. Maintenance for all projects and ongoing street sweeping continues for this area. Whenever drainage improvements are considered as a flood mitigation measure, the effects upstream and downstream from the proposed improvements need to be considered.

Advantages	Disadvantages
• Can increase channel carrying capacity through overflow channels, channel straightening, crossing replacements, or runoff volume storage. • Minor projects may be fundable under FEMA mitigation grant programs.	• May help one area but create new problems upstream or downstream. • Channel straightening increases the capacity to accumulate and carry sediment. • May require property owner cooperation and right-of-way acquisition.

Table 2- 12 Advantages and Disadvantages of Drainage Improvements

STEP 5. CONCLUSION AND RECOMMENDATIONS

CONCLUSION

Based on the field survey and collection of data, the analysis of existing studies and reports, and the evaluation of various structural and non-structural mitigation measures, the Parish proposes that mitigation measures be implemented for Subarea 2. The table below examines past and current mitigation actions in this area.

RECOMMENDATIONS

Jefferson Parish should continue to encourage everyone to pursue mitigation measures and assist interested property owners in applying for a mitigation grant. The Parish should address street drainage in order to improve the drainage in the study area, seek out and secure funding for the drainage improvements outlined in this report, and institute a maintenance program that encourages homeowners to frequently clear their catch basin inlets of debris to ensure open flow for stormwater. The Parish should also continue to improve its CRS classification and adopt this Repetitive Loss Area Analysis according to the process detailed in the CRS Coordinator's Manual.

For the residents of the study area, they should contact Jefferson Parish for more information about possible funding opportunities and site visits to determine remedial measures. Review the alternative mitigation measures discussed in this analysis and implement those that are most appropriate for their situation. Purchase and maintain a flood insurance policy on the home and its contents.

Jefferson Parish recommends the following mitigation actions:

MITIGATION ACTION 1:

Property owners should obtain and keep a flood insurance policy on their structures (building and contents coverage). The Parish will continue on an **annual basis** to target all properties in the repetitive loss area reminding them of the advantages to maintaining flood insurance through its annual outreach effort.

RESPONSIBILITY

The Floodplain Management and Hazard Mitigation Department will provide the most relevant up-to-date flood insurance information to all property owners within the repetitive loss areas located in this area.

FUNDING

The cost will be paid for from the department's operating budget.

MITIGATION ACTION 2:

When appropriate, property owners should consider floodproofing measures such as flood gates or shields, flood walls, and hydraulic pumps.

RESPONSIBILITY

The Floodplain Management and Hazard Mitigation department will promote effective flood protection measures and provide advice and assistance to property owners who may wish to implement such measures in an **on-going** program.

FUNDING

The cost will be paid for by individual property owners. Advice and assistance will require staff time which will be covered in the department's annual budget.

MITIGATION ACTION 3:

Continue elevation or reconstruction mitigation of high-risk flood-prone properties. The highest priorities are properties at the greatest flood risk and where drainage improvements will not provide an adequate level of protection.

RESPONSIBILITY

The Floodplain Management and Hazard Mitigation department will continue to target the most at risk properties for grant applications.

FUNDING

Construction cost would be covered with FEMA or ICC funds. Staff time to develop the list of target properties will require funds from the department's operating budget.

MITIGATION ACTION 4:

Prioritize CIP projects to focus on drainage improvement projects in those basins containing repetitive loss areas.

RESPONSIBILITY

The Parish's Drainage Department in conjunction with the Engineering Department.

FUNDING

Bond funds or state grants.

MITIGATION ACTION 5:

Encourage property owners to elevate inside and outside mechanical equipment above the BFE and install flood resistant materials in crawl spaces.

RESPONSIBILITY

The Floodplain Management and Hazard Mitigation Department will promote effective flood protection measures and provide advice and assistance to property owners who may wish to implement such measures in an **on-going** program.

FUNDING

The cost will be paid for by individual property owners. Advice and assistance will require staff time which will be covered in the department's annual budget.

SUBAREA 3

HARVEY

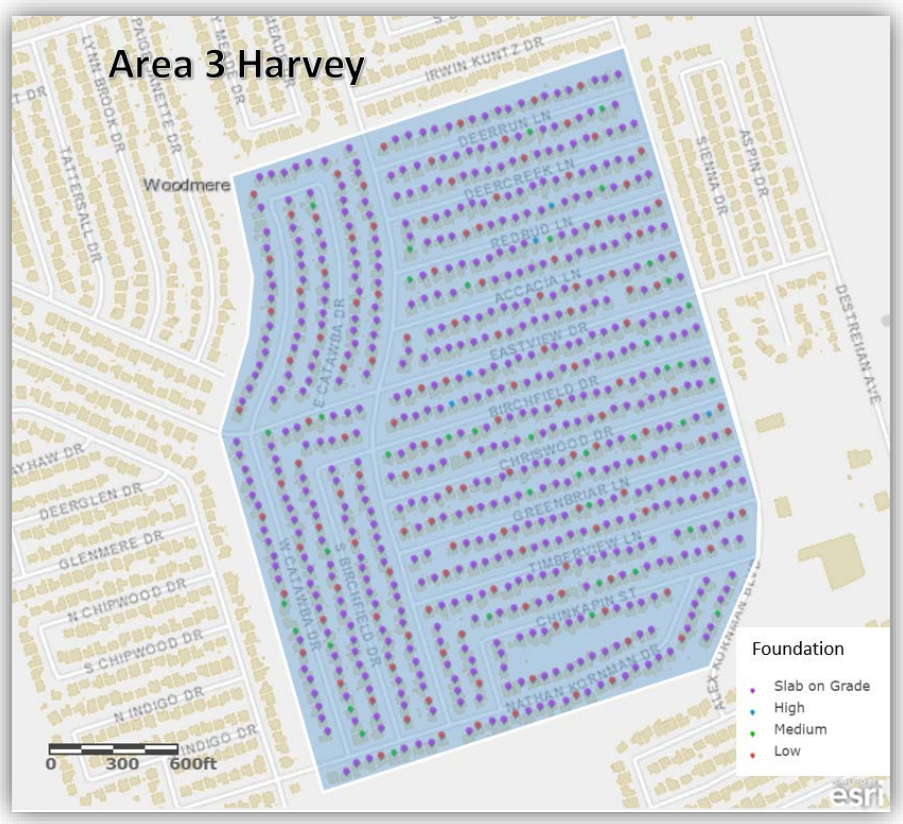


Figure 3- 1 Outline of Subarea 3

STEP 1. ADVISE ALL PROPERTY OWNERS

Before field work began on the RLAA, individual notices were mailed to property owners within the 5 identified Repetitive Loss subareas. The notices advised properties owners about the analysis and requested their input on the flooding problem in their area and mitigation actions taken. The notice also advised property owners how they could provide comments on the draft report once it was posted online.

Subarea 3: A property owner notice with questionnaire was mailed to 749 residents in Subarea 3 the week of January 29, 2018.

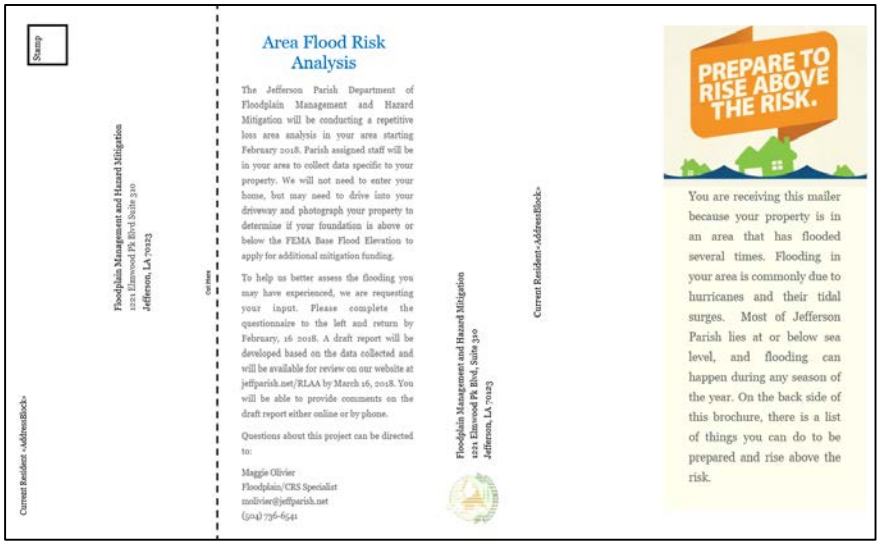


Figure 3- 2 Front of Notice

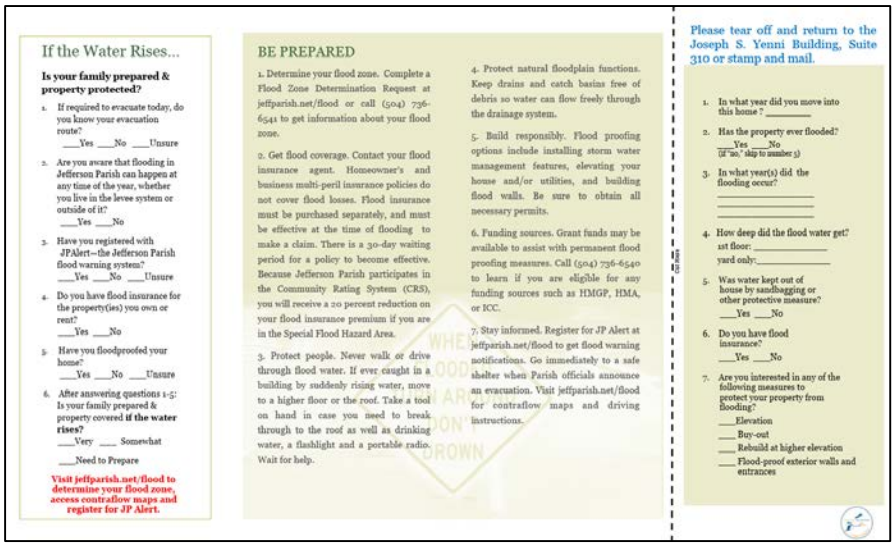


Figure 3- 3 Back of Notice with Questionnaire

QUESTIONNAIRE RESPONSES SUBAREA 3

Out of the 749 mailed questionnaires, Jefferson Parish received 23 responses which corresponds to a response rate of approximately 3 percent. Questionnaire responses are summarized below. Note: respondents may have skipped questions and/or provided more than one response to a question. Sixteen (16) addresses were undeliverable and two (2) properties were vacant.

Q1: In what year did you move into this home?

Responses Received	Percentage	Number Responding
<10 years ago	17.39	**4**
10-20 years ago	17.39	**4**
20-30 years ago	48	**11**
30-40 years ago	13	**3**
40-50 years ago	4.34	**1**
> 50 years ago	-	**None**
Total	**100**	**23**

Q2: Has the property ever been flooded?

Answer Choices	Percentage	Number
No	74	**17**
Yes	22	**5**
Don't know	4	**1**
Total	**100**	**23**

Q3: In what year(s) did it flooding occur?

Responses Received	Percentage	Number
2005	50	**2**
2006	25	**1**
2012	25	**1**
Total	**100**	**4**

Q4: How deep did the water get?

Answer Choices	Percentage	Number Responding	Depth	
			< 3 ft	> 3 ft
First floor	43	3	2	**1**
Yard only	57	4	4	**None**
Total	**100**	**7**	**6**	**1**

Q5: Was water kept out of the house by sandbagging or other protective measures?

Answer Choices	Percentage	Number Responding
No	91.3	**21**
Yes	9	**2**
Total	**100**	**23**

Q6: Do you have Flood Insurance?

Answer Choices	Percentage	Number Responding
No	--	**None**
Yes	100	**22**
Total	**100**	**22**

Q7: Are you interested in protecting your property from flooding?

Answer Choices	Percentage	Number Responding
No	--	**None**
Yes	100	**13**
Total	**100**	**13**

The following trends in survey responses should be considered when evaluating mitigation measures for Subarea 3:

- All the respondents are interested in protecting their home/building from flooding. This could indicate trust in Jefferson Parish and interest in installing floodproofing measures. Two of the properties already have applied for elevation in the area.
- All the respondents currently have FEMA flood insurance.
- About 91 percent of the respondents mentioned that none of the protective measures helped to keep the water out of the house.

- The majority (57 percent) of the respondents noted that flooding was only in the yard. Thirty-three (33) percent respondents had first flood flooding with depth less than 3 feet. Also 74 percent of the respondents mentioned that they did not flood between 1978-2017.
- However, those who flooded responded that the years with the largest number of reported flooding incidents are 2005, 2006 and 2012. The following flood events are detailed in NOAA's National Climatic Data Center (NCDC) database:

    - **August 29, 2005** – The Category 3 hurricane Katrina caused catastrophic damage along the Gulf coast from central Florida to Texas, much of it due to the storm surge and levee failure. Severe property damage occurred in coastal areas, such as Mississippi beachfront towns where boats and casino barges rammed buildings, pushing cars and houses inland; water reached 6–12 miles (10–19 km) from the beach. The storm was the third most intense United States landfalling tropical cyclone, behind the 1935 Labor Day hurricane and Hurricane Camille in 1969. Overall, at least 1,245 people died in the hurricane and subsequent floods, making it the deadliest United States hurricane since the 1928 Okeechobee hurricane. Total property damage was estimated at $125 billion (2005 USD), roughly four times the damage wrought by Hurricane Andrew in 1992 in the United States.

    - **June, 2006** – Heavy rains fell over Southwest Louisiana from the 16th through the 20th of June, 2006. This event developed as upper level high pressure began to break down, allowing an upper low to approach the area from the northwest. Counter clockwise flow around this low brought Pacific and Gulf moisture into the upper levels of the atmosphere. At the surface, high pressure situated over the southeastern United States brought southerly winds and Gulf moisture into the lower levels. The combination of these two features produced a deep moisture rich layer of air over the northwestern Gulf Coast.

    - **August 28, 2012** - Hurricane Isaac made landfall along Louisiana's coast on August 28th, with maximum sustained winds of 80 mph. The major impacts from the hurricane were storm surge along the Gulf Coast and heavy rainfall, both of which were driven partially by the storm's slow motion and large size. Isaac contributed to Louisiana and Mississippi's second wettest August on record, as well as Florida's fourth wettest and Alabama's eighth wettest.

STEP 2. CONTACT AGENCIES AND ORGANIZATIONS

Jefferson Parish Department of Hazard Mitigation and Floodplain Management contacted external agencies and internal departments that have plans or studies that could affect the cause or impacts of flooding within the identified repetitive loss subareas. The data collected was used to analyze the problems further and to help identify potential solutions and mitigation measures for property owners. The agencies contacted and reports which were analyzed and reviewed are as follows:

Agencies

- Jefferson Parish Electronic Information System Department
- Jefferson Parish Streets Department
- Jefferson Parish Office of Risk Management
- Jefferson Parish Drainage Department

Reports

- FEMA – Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) for Jefferson Parish, February 2, 2018
- ISO – Repetitive Flood Insurance Claims Data
- Jefferson Parish Hazard Mitigation Plan

SUMMARY OF STUDIES AND REPORTS

FEMA FLOOD INSURANCE STUDY (FIS) AND FLOOD INSURANCE RATE MAP (FIRM)

FEMA's FIS for Jefferson Parish, LA is dated February 2, 2018. The FIS revises and updates information on the existence and severity of flood hazards within the Parish. The FIS also includes revised digital Flood Insurance Rate Maps (FIRMs) which reflect updated Special Flood Hazard Areas (SFHAs) and flood zones for the Parish. SFHA boundaries within the Parish were updated due to new detailed coastal analyses which were performed by the USACE-MVN, for FEMA. This study also incorporates the Hurricane Storm Damage Risk Reduction System (HSDRRS) completed by the USACE. Finally, these maps depict the potential for flooding and are the basis for building requirements and flood insurance rates.

FLOOD INSURANCE CLAIMS DATA

The Privacy Act of 1974 (5 U.S.C. 522a) restricts the release of flood insurance policy and claims data to the public. This information can only be released to state and local governments for the use in floodplain management related activities. Therefore all claims data in this report are only discussed in general terms.

The purpose of a mitigation plan is to rationalize the process of determining appropriate hazard mitigation actions. The document includes a detailed description of natural hazards in Jefferson Parish; a risk assessment that describes potential losses to physical assets, people and operations; a set of goals, objectives, strategies and actions that will guide the Parish's mitigation activities, and a detailed plan for implementing and monitoring the Plan. This Plan identified 12 hazards and included a risk assessment of the four hazards with the highest potential for damaging physical assets, people and operations in Jefferson Parish. These hazards are floods, hurricanes and tropical storms, storm surge, and tornadoes. Both the risk assessment section and goals sections reflect this emphasis, which was the result of careful consideration and a numerical ranking process carried out by the Mitigation Planning Team (MPT).

STEP 3. BUILDING DATA COLLECTION

The on-site field survey for this analysis was conducted over multiple days between the months of October 2017 and January 2018. The early site visits assisted with defining the area. The Collector App through ESRI was utilized to save field data from the site visits. In addition, multiple site photos were taken of each structure on the property. Photos were also taken of current drainage features and mitigation and floodproofing measures if evident from street or parking lot views. The following information was recorded for each property:

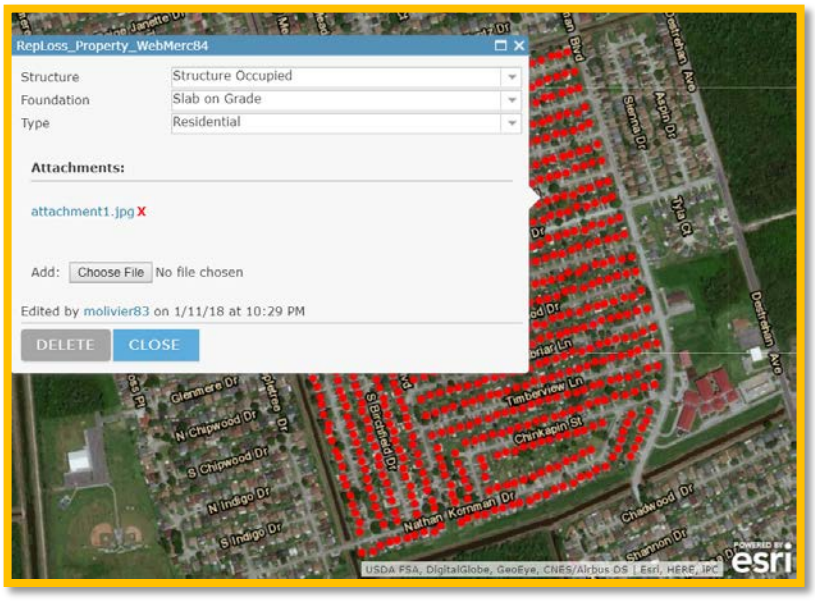
Table 3 - 1

Structure		Foundation		Type	
No structure	12	Slab on grade	559	Residential	738
Occupied	725	Low (less than 2ft.)	134	Non-residential	none
Vacant	12	Medium	40		
		High	5		

COLLECTOR FOR ARCGIS (ESRI)

Jefferson Parish used the ESRI Collector Application in order to be able to store and spatially view repetitive loss data for the Parish. The Collector App contains all field data collected by parcels for RLAA including pictures of each structure on the parcel. The data is stored in ArcGIS and is used for internal review and continued analysis of repetitive flood loss areas.

Figure 3- 4 Collector Application Sample



PROBLEM STATEMENT

SUBAREA 3-HARVEY

Subarea 3 is majorly located in the Zone X levee protected area. Some portion of the study area falls in AE flood zone as well. Harvey is located on the Westbank of Mississippi river within the New Orleans-Metairie- Kenner Metropolitan Statistical Area. The formal boundaries for the Harvey Census Designated Place encompasses a land area of 7.0 sq. miles and a water area of 0.5 sq. miles.

Figure 3- 5 2018 Effective FIRM in Subarea 3

Excessive runoff from heavy rainfall causes flooding of urban areas, highways, and main streets as well as other low-lying spots in this area. Quick heavy rains oftentimes results in overwhelming the existing pumping infrastructure and causing widespread street flooding. According to Parish officials, the pump system in this area is designed to handle an inch/ hour and half-inch in the next hour. Therefore, any event causing rainfall over an inch can result into over working of the pump systems to clear water in the area. There is a lack in vital infrastructure such as pump stations, utilities and drainage that meet the contemporary standards so that the community can thrive.

In accordance with FEMA publication *551 Selecting Appropriate Mitigation Measures for Floodprone Structures*, mitigation options are discussed. The approach to reducing repetitive flooding in Subarea 2 will require a combination of floodproofing techniques, education, and drainage improvement projects.

CLAIMS DATA:

In review of the unmitigated Repetitive Loss List, there are 46 repetitive loss properties within 749 property study area that qualify as repetitive loss. Of those 749 repetitive loss properties, 16 are considered to be severe repetitive loss properties.

The majority of the rest of the claims are relatively small rainfall events that affected between 1 -10 homes. In analyzing the claims data, it could be derived that the area experiences most flooding from rainfall events. Hurricane Katrina was the only hurricane that had resulted in claims in the area (see graph below, Table 3-2).

There have been 276 flood claims in the study area totaling $1,878,801. The average claim in the area is $6,807. The homeowners of the 31 repetitive loss properties have made 73 claims and received $957,886 in flood insurance payments since 1978. The homeowners of the 15 severe repetitive loss properties have made 70 claims, and received $920,915 in flood insurance payments since 1978.The average repetitive flood loss claim was $13,121 and the average severe repetitive loss claim was $13,115. If less than 50% of the home is damaged, it will not be subject to the substantial improvement requirements.

The severe repetitive loss homes are similar to the other homes on their block and are on separate streets. They have each flooded more than 4 times, and all of them flooded during most of the heavy rainfall events in the area.

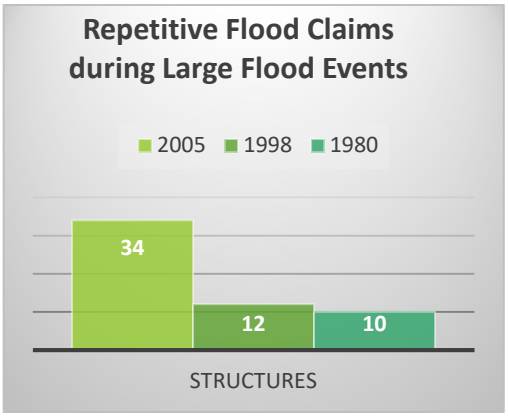


Table 3 - 2

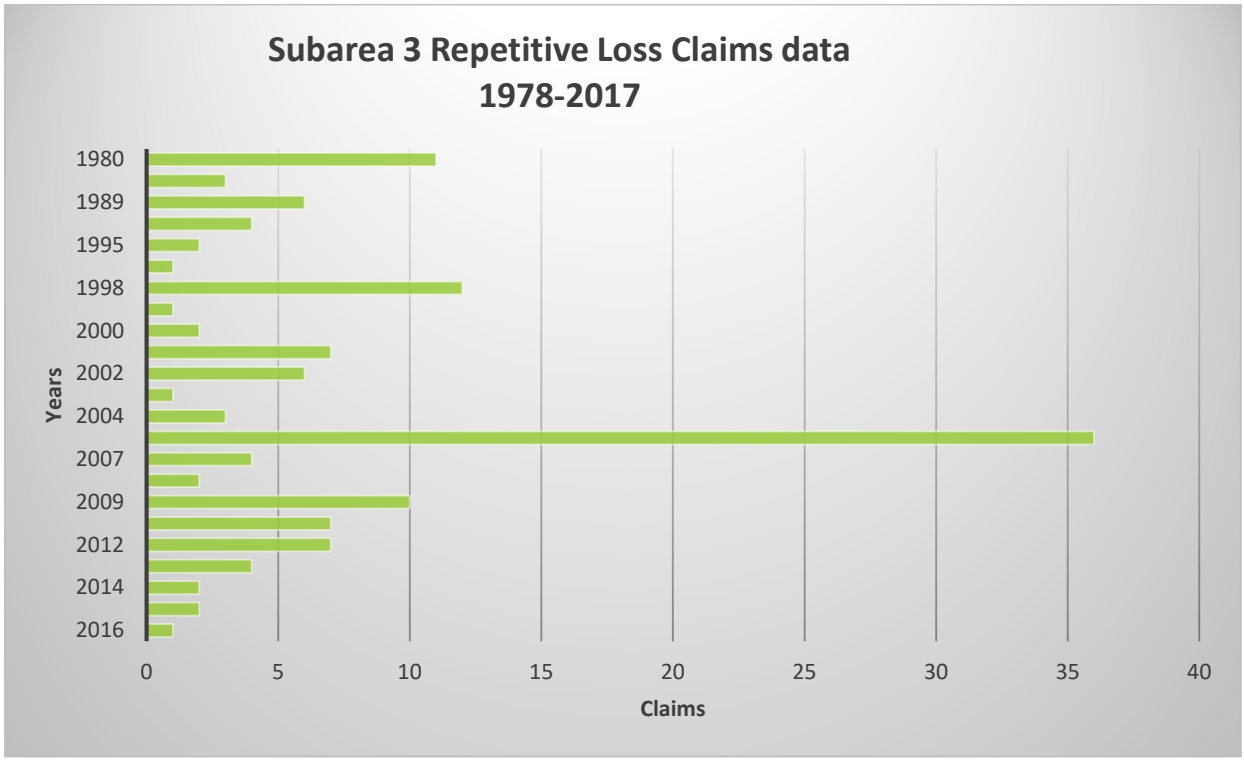


Table 3 - 3

FIELD DATA:

The on-site field survey for this analysis was conducted over multiple days between the months of October 2017 and January 2018. The team collected information such as the type and height of the foundation, occupancy status of the structure, and use of the structure.

Table 3-4 shows a majority of the structures are slab on grade (559 or 75%). About 18 percent (134) of the structures are low (less than 2 feet). Approximately 5 percent (40) structures are medium high and 5 structures are elevated. About 2 percent of the structures' elevation could not be determined. It could be evaluated that although most of the structures in the subarea are slab on grade, there has been damage to the other properties due to flooding form several hurricane and rain events.

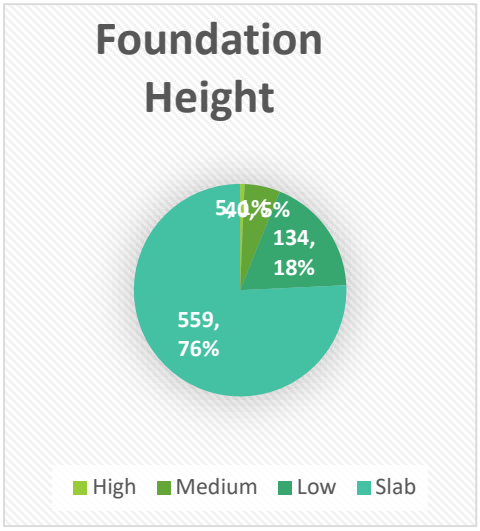


Table 3 - 4

The project team observed that majority (725 or 97 percent) of the structures in the area were occupied, while approximately 12, or 1.6 percent, were vacant and 12 (1.6 percent) had no structure. Also, all the structures are of residential use.

In conclusion, it should be noted that given the location of Subarea 3, all of the properties are inside levee protection. Majority of the properties are built slab on grade, therefore, a heavy rain event can cause substantial damage to the properties.

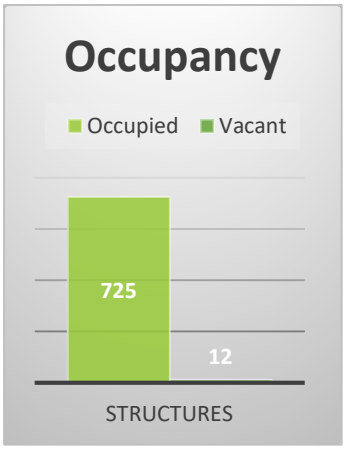


Table 3 - 5

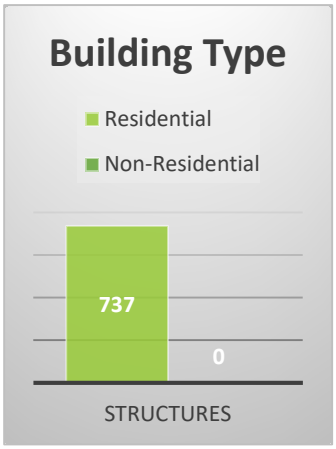


Table 3 - 6

Figure 3- 6 Example of Slab on Grade Structure in Subarea 3

Figure 3- 7 Example of Medium Foundation in Subarea 3

STEP 4. REVIEW ALTERNATIVE MITIGATION APPROACHES

There are many ways to protect a property from flood damage. Different measures are appropriate for different flood hazards, building types and building conditions. Figure 3-8 below, found in the *2017 CRS Coordinator's Manual*, lists typical property protection measures.

Figure 3- 8 Typical Property Protection Measures

To protect property from flood damage . . .

- Demolish the building or relocate it out of harm's way.
- Elevate the building above the flood level.
- Elevate damage-prone components, such as the furnace or air conditioning unit.
- Dry floodproof the building so water cannot get into it.
- Wet floodproof portions of the building so water won't cause damage.
- Construct a berm or redirect drainage away from the building.
- Maintain nearby streams, ditches, and storm drains so debris does not obstruct them.
- Correct sewer backup problems.

Mitigation measures should fall into one of the mitigation categories listed below which are based on the Community Rating System planning process:

- Prevention
- Property Protection
- Natural Resource Protection
- Emergency Services
- Structural Projects
- Public Information and Outreach

MITIGATION FUNDING

There are several types of mitigation measures, listed in the table below, which can be considered for each repetitive loss property. Each mitigation measure qualifies for one or more grant programs. Depending on the type of structure, severity of flooding and proximity to additional structures with similar flooding conditions, the most appropriate measure can be determined. In addition to these grant funded projects, several mitigations measures can be taken by the homeowner to protect their home.

Table 3 - 7

Types of Projects Funded	HMGP	FMA	PDM	ICC	SBA
Acquisition of the entire property by govt agency	✔	✔	✔		
Relocation of the building to a flood free site	✔	✔	✔	✔	✔
Demolition of the structure	✔	✔	✔	✔	✔
Elevation of the structure above flood levels	✔	✔	✔	✔	✔
Replacing the old building with a new elevated one	✔	✔	✔	✔	✔
Local drainage and small flood control projects	✔	✔	✔		
Dry floodproofing (non-residential only)	✔	✔	✔		
Percent paid by Federal program	75%	75%, 90%, or 100%	75%	Up to $30K	

There are several possible sources of funding for mitigation projects:

- **FEMA grants**: Most of the FEMA programs provide 75% of the cost of a project. In most communities, the 25% non-FEMA share is paid by the benefitting property owner. Each program has different Congressional authorization and slightly different rules.
  - **The Hazard Mitigation Grant Program (HMGP)**: The HMGP provides grants to States and local governments to implement long-term hazard mitigation measures after a major disaster declaration. Projects must provide a long-term solution to a problem (e.g., elevation of a home to reduce the risk of flood damages as opposed to buying sandbags and pumps to fight the flood). Examples of eligible projects include acquisition and elevation, as well as local drainage projects.
  - **The Flood Mitigation Assistance Program (FMA)**: FMA funds assist States and communities in implementing measures that reduce or eliminate the long-term risk of flood damage to structures insured under the NFIP. Project Grants to implement measures to reduce flood losses, such as elevation, acquisition, or relocation of NFIP-insured structures. States are encouraged to prioritize FMA funds for applications that include repetitive loss properties; these include structures with 2 or more losses each with a claim of at least $1,000 within any ten-year period since 1978.
  - **Pre-Disaster Mitigation Program (PDM)**: The Pre-Disaster Mitigation (PDM) program provides funds to states, territories, Indian tribal governments, communities, and universities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. For more information visit http://www.fema.gov/government/grant/pdm/index.shtm.

- **Flood insurance**: There is a special funding provision in the National Flood Insurance Program (NFIP) for insured buildings that have been substantially damaged by a flood, “Increased Cost of Compliance.” ICC coverage pays for the cost to comply with floodplain management regulations after a flood if the building has been declared substantially damaged. ICC will pay up to $30,000 to help cover elevation, relocation, demolition, and (for nonresidential buildings) floodproofing. It can also be used to help pay the 25% owner’s share of a FEMA funded mitigation project.

The building's flood insurance policy must have been in effect during the flood. This payment is in addition to the damage claim payment that would be made under the regular policy coverage, as long as the total claim does not exceed $250,000. Claims must be accompanied by a substantial or repetitive damage determination made by the local floodplain administrator. For more information, contact your insurance agent or visit: www.fema.gov/plan/prevent/floodplain/ICC.shtm.

Coverage under the ICC does have limitations: It covers only damage caused by a flood, as opposed to wind or fire damage. The building's flood insurance policy must have been in effect during the flood. ICC payments are limited to $30,000 per structure. Claims must be accompanied by a substantial or repetitive damage determination made by the local floodplain administrator and the structure must be in Zone AE.

The average claims payment in the study area is $6,807. With an average claim of that amount, it is not likely that many homes in the study area would sustain substantial damage from a flood event. Homeowners should make themselves aware of the approximate value of their homes, and in the case of incurring flood damage, be aware of the need for a substantial damage declaration in order to receive the ICC coverage.

Alternative language adopted into the local floodplain management ordinance would enable residents with shallower flooding to access ICC funding. Since local ordinances determine the threshold at which substantial damage and/or repetitive claims are reached, adopting language that would lower these thresholds would benefit the homeowners of repetitive loss properties. Adopting alternative language allows for cumulative damages to reach the threshold for federal mitigation resources more quickly, meaning that some of the properties in Jefferson Parish that sustain minor damage regularly would qualify for mitigation assistance through ICC.

- Rebates: A rebate is a grant in which the costs are shared by the homeowner and another source, such as the local government, usually given to a property owner after a project has been completed. Many communities favor it because the owner handles all the design details, contracting, and payment before the community makes a final commitment. The owner ensures that the project meets all of the program's criteria, has the project constructed, and then goes to the community for the rebate after the completed project passes inspection.

Rebates are more successful where the cost of the project is relatively small, e.g., under $5,000, because the owner is more likely to be able to afford the bulk of the cost. The rebate acts more as an incentive, rather than as needed financial support.

- Small Business Administration Mitigation Loans: The Small Business Administration (SBA) offers mitigation loans to SBA disaster loan applicants who have not yet closed on their disaster loan. Applicants who have already closed must demonstrate that the delay in application was beyond their control.

For example mitigation loans made following a flood can only be used for a measure to protect against future flooding, not a tornado. If the measure existed prior to the declared disaster, an SBA mitigation loan will cover the replacement cost. If the measure did not exist prior to the declared disaster the mitigation loan will only cover the cost of the measure if it is deemed absolutely necessary for repairing the property by a professional third-party, such as an engineer.

MITIGATION ALTERNATIVES

The Harvey subarea is a unique identified area with 749 total properties identified. The majority of the flooding in this area is considered “nuisance” flash flooding that causes minimal damage but does require costly cleanup and numerous street closures due to floodwaters overtopping the roadway.

Flooding in this area can be attributed to its flat topography, aging stormwater infrastructure and proximity between the Mississippi River Levee, Jefferson Hwy, and the railroad tracks. Flash flooding can occur when the capacity of the drainage system is exceeded or if conveyance is obstructed by debris, sediment and other materials that limit the volume of drainage. Heavy rains within a short period of time have caused the drainage system to be inundated and unable to keep up, resulting in ponding water in streets and homes.

Improving the drainage system can eliminate some road and home inundation in this area. These structural methods require large capital expenditures and cooperation from private property owners. Promoting floodproofing techniques and increasing public education and awareness of the flood hazards can be the next best alternative for property owners in this area. The Parish’s websites, e-mail distribution lists, press releases and variable message boards can provide benefit to business owners and residents.

POTENTIAL MITIGATION MEASURES

Structural Alternatives:

- **Elevate** structures and damage-prone components, such as the water heater or air conditioning unit, above the Base Flood Elevation (BFE).
- **Dry floodproofing** can be done on commercial structures and even residential structures; however, in many instances this requires human intervention to complete the measure and ensure success. For example, installing watertight shields over doors or windows requires timely action by the homeowner; especially in a heavy rainfall event.
- **Wet floodproofing** a structure involves making the uninhabited portions of the structure resistant to flood damage and allowing water to enter during flooding. For example, in a basement or crawl space, mechanical equipment and ductwork would not be damaged.
- **Acquire and/or relocate** properties/target abandoned properties or locations that would provide a public benefit as the location will need to be maintained by the Parish in perpetuity.
- **Increase the size of culverts** under Jefferson Hwy to allow for increased capacity.
- **Implement drainage** i**mprovements** such as increasing capacity in the system (up-sizing pipes) and provide additional inlets to receive more stormwater.
- Improve stormwater system maintenance program to ensure inlets and canals are free of clogging debris.

Non Structural Alternatives:

- **Relocate internal supplies**, products/goods, and belongings above the flooding depth.
- Improve the Parish’s floodplain and zoning ordinances.
- **Provide public education** through posting information about local flood hazards on Parish website, posting signs at various locations in neighborhoods or discussing flood protection measures at local neighborhood association meetings.
- Promote the purchase of flood insurance.

- Continue coordination with GOHSEP, the National Weather Service (NWS), and United States Geological Survey (USGS) to enhance flood warning system, including the use of rain/stream gauges, to provide greater warning time for citizens. NWS can use the real- time data collected to issue timely warnings.

COST AND BENEFITS OF MITIGATION MEASURES

Knowing the flooding history, type, and condition of the buildings in the area, leads to the fourth step in the area analysis procedure – a review of alternative mitigation approaches to protect properties from, or reduce, future flood damage. Property owners should look at these alternatives but understand they are not all guaranteed to provide protection at different levels of flooding. Six approaches were reviewed:

- Elevating the houses above the 1% annual flood level
- Acquisition
- Floodproofing
- Drainage improvements

ELEVATION

Raising the structure above the flood level is generally viewed as the best flood protection measure, short of removing the building from the floodplain. All damageable portions of the building and its contents are high and dry during a flood, which flows under the building instead of into the house. Houses can be elevated on fill, posts/piles, or a crawlspace.

- A house elevated on fill requires adding a specific type of dirt to a lot and building the house on top of the added dirt.
- A house elevated on posts/piles is either built or raised on a foundation of piers that are driven into the earth and rise high enough above the ground to elevate the house above the flow of flood water or the design flood elevation.
- A house elevated on a crawlspace or enclosure is built or raised on a continuous wall-like foundation that elevates the house above the design flood level. It is important to include vents or openings in the walls below the design flood level that are appropriately sized: one square inch for each square foot of the crawlspace or enclosures footprint. Additionally all materials below the design flood level must be flood resistance and all machinery, equipment, and plumbing must be above the design flood level.
    - Cost: A majority of the cost to elevate a building is in the preparation and foundation construction. The cost to elevate six feet is little more than the cost to go up two feet. Elevation is usually cost-effective for wood frame buildings on posts/piles or crawlspace because it is easiest for lifting equipment to be used under the floor and disruption to the habitable part of the house is minimal. Elevating a slab house is much more costly and disruptive. In Subarea 3, 75% percent of the houses in the study area are on a slab. The actual cost of elevating a particular building depends on factors such as its condition, whether it is masonry or brick faced, and if additions have been added on over time. While the cost of elevating a home can be high, there are funding programs that can help. The usual arrangement is for a FEMA grant to pay 75% of the cost while the owner pays the other 25%. In the case of elevating a slab foundation, the homeowner's portion could be as high as $50,000 or more. In some cases, assistance can be provided by Increased Cost of Compliance (ICC) funds or state funds.

- Feasibility: Federal funding support for an elevation project requires a study that shows that the benefits of the project exceed the cost of the elevation. Project benefits include savings in insurance claims paid on the structure. Elevating a masonry or a slab home can cost up to $300,000, which means that benefit/cost ratios may be low. Looking at each property individually could result in funding for the worst case properties, i.e., those that are the lowest below the base flood elevation, subject to the most frequent flooding, and in good enough condition to elevate.

Advantages	Disadvantages
● Elevating to or above the BFE allows a substantially damaged or substantially improved house to be brought into compliance. ● Often reduces flood insurance premiums. ● May be fundable under FEMA mitigation grant programs.	● Cost may be prohibitive. ● The appearance of the structure and access to it may be adversely affected. ● May require property owner cooperation and right-of-way acquisition. ● May require road or walkway closures during construction.

Table 3 - 8 Advantages and Disadvantages of Elevation

ACQUISITION:

This measure involves buying one or more properties and clearing the site (demolishing the building). If there is no building subject to flooding, there is no flood damage. Acquisitions are usually recommended where the flood hazard is so great or so frequent that it is not safe to leave the structure on the site.

An alternative to buying and clearing the whole subdivision is buying out individual, "worst case," structures with FEMA funds.

- Cost: This approach would involve purchasing and clearing the lowest or the most severe repeatedly flooded homes. If FEMA funds are to be used, three requirements will apply:
  - The applicant for FEMA must demonstrate that the benefits exceed the costs, using FEMA's one of FEMA's approved Benefit Cost methodologies.
  - The owner must be a willing seller.
  - The parcel must be deeded to a public agency that agrees to maintain the lot and keep it forever as open space.

- Feasibility: Due to the high cost and difficulty to obtain a favorable benefit-cost ratio in shallow flooding areas, acquisitions are reserved for the worst case buildings. Not everyone wants to sell their home, so a checkerboard pattern of vacant and occupied lots often remains after a buyout project, leaving "holes" in the neighborhood. There is no reduction in expenses to maintain the neighborhood's infrastructure for the Parish, although the tax base is reduced. The vacant lots must be maintained by the new owner agency, and additional expense is added to the community. If the

lot is only minimally maintained, its presence may reduce the property values of the remaining houses. Jefferson Parish is not considering acquisitions at this time for the above reasons.

Advantages	Disadvantages
• Permanently removes problem since the structure no longer exists. • Allows a substantially damaged or substantially improved structure to be brought into compliance with the community's floodplain management ordinance or law. • Expands open space and enhances natural and beneficial uses. • May be fundable under FEMA mitigation grant programs.	• Cost may be prohibitive. • Resistance may be encountered by local communities due to loss of tax base, maintenance of empty lots, and liability for injuries on empty, community-owned lots.

Table 3 - 9 Advantages and Disadvantages of Acquisition

There are 3 criteria that must be met for FEMA to fund an acquisition project:

- The local community must inform the property owners interested in the acquisition program that the community will not use condemnation authority to purchase their property and that the participation in the program is strictly voluntary,
- The subsequent deed to the property to be acquired will be amended such that the landowner will be restricted from receiving any further Federal disaster assistance grants, the property shall remain in open space in perpetuity, and the property will be retained in ownership by a public entity, and
- Any replacement housing or relocated structures will be located outside the 100-year floodplain.

FLOODPROOFING

This measure keeps floodwaters out of a building by modifying the structure. Walls are coated with waterproofing compounds or plastic sheeting. Openings (i.e. doors, windows, and vents) are closed either permanently, or temporarily with removable shields or sandbags.

- Make the walls watertight. This is easiest to do for masonry or brick faced walls. The brick or stucco walls can be covered with a waterproof sealant and bricked or stuccoed over with a veneer to camouflage the sealant. Houses with wood, vinyl, or metal siding need to be wrapped with plastic sheeting to make walls watertight, and then covered with a veneer to camouflage and protect the plastic sheeting. Provide closures, such as removable shields or sandbags, for the openings; including doors, windows, dryer vents and weep holes. There must also be an account for sewer backup and other sources of water entering the building. For shallow flood levels, this can be done with a floor drain plug or standpipe; although a check valve system is more secure.

- Dry floodproofing employs the building itself as part of the barrier to the passage of floodwaters, and therefore this technique is only recommended for buildings with slab foundations that are not cracked. The solid slab foundation prevents floodwaters from entering a building from below. Also, even if the building is in sound condition, tests by the Corps of Engineers have shown that dry floodproofing should not be used for depths greater than three feet above the first floor, because water pressure on the structure can collapse the walls and/or buckle the floor.

- Dry floodproofing is a mitigation technique that is appropriate for some houses in the area: those with slab foundations that typically receive floodwater up to three feet in the house. From the fieldwork it was found that approximately seventy-six percent of the houses in Subarea 3 are on slab foundations, and according to the questionnaire responses forty-three percent of the respondents experienced three feet of flooding on the first floor and fifty-seven percent experienced less than three feet in the yard.

- Not all parts of the building need to be floodproofed. It is difficult to floodproof a garage door, for example, so some owners let the garage flood and floodproof the walls between the garage and the rest of the house. Appliances, electrical outlets, and other damage-prone materials located in the garage should be elevated above the expected flood levels.

    - Cost: The cost for a floodproofing project can vary according to the building's construction and condition. It can range from $5,000 to $20,000, depending on how secure the owner wants to be from flooding. Owners can do some of the work by themselves, although an experienced contractor provides greater security. Each property owner can determine how much of their own labor they can contribute and whether the cost and appearance of a project is worth the protection from flooding that it may provide.

    - Feasibility: As with floodwalls, floodproofing is appropriate where flood depths are shallow and are of relatively short duration. It can be an effective measure for some of the structures and flood conditions found in the study analysis area. It can also be more attractive than a floodwall around a house. However, floodproofing requires the homeowner to install or place door and window shields or sandbags and to ensure maintenance on a yearly basis. This may be difficult for the elderly or disabled. Finally ample warning of flooding must be available, so the homeowner can determine when to place the door or window shields and sandbags.

Dry floodproofing has the following shortcomings as a flood protection measure:

- It usually requires human intervention, i.e., someone must be home to close the openings.
- Its success depends on the building's condition, which may not be readily evident. It is very difficult to tell if there are cracks in the slab under the floor covering.
- Periodic maintenance is required to check for cracks in the walls and to ensure that the waterproofing compounds do not decompose.
- There is no government financial assistance programs available for dry floodproofing, therefore the entire cost of the project must be paid by the homeowner.
- The NFIP will typically not offer a lower insurance rate for dry floodproofed residences. However, this may be a viable option if homeowners want to protect their structure and contents.

Advantages	Disadvantage
• Often less costly than other mitigation measures. • Allows internal and external hydrostatic pressures to equalize, lessening the loads on walls and floors.	• Extensive cleanup may be necessary if the structure becomes wet inside and possibly contaminated by sewage, chemicals and other materials borne by floodwaters. • Does not minimize the potential damage from a high-velocity flood flow and wave action.

Table 3 - 10 Advantages and Disadvantages of Wet Floodproofing

Advantages	Disadvantages
• Often less costly than other retrofitting methods • Does not require additional land. • Maybe funded by a FEMA mitigation grant program.	• Requires human intervention and adequate warning to install protective measures. • Does not minimize the potential damage from high-velocity flood flow and wave action. • May not be aesthetically pleasing.

Table 3 - 11 Advantages and Disadvantages of Dry Floodproofing

DRAINAGE IMPROVEMENTS

The Parish is currently in the process of developing a Parish-wide Subsurface Drainage Master Plan. The purpose of this Plan is to help identify deficient drainage areas throughout the Parish, develop preliminary solutions for the problem areas, split problem areas into individual projects for bidding purposes, develop cost estimates, and prioritize needed work. The Plan shall have a list of recommendations that were created after reviewing previous studies and reports. There are several different drainage improvements called for in the Drainage Master Plan that might help in reducing some of the flooding within this Repetitive Loss area. Maintenance for all projects and ongoing street sweeping continues for this area. Whenever drainage improvements are considered as a flood mitigation measure, the effects upstream and downstream from the proposed improvements need to be considered

Advantages	Disadvantages
• Can increase channel carrying capacity through overflow channels, channel straightening, crossing replacements, or runoff volume storage. • Minor projects may be fundable under FEMA mitigation grant programs.	• May help one area but create new problems upstream or downstream. • Channel straightening increases the capacity to accumulate and carry sediment. • May require property owner cooperation and right-of-way acquisition.

Table 3 - 12 Advantages and Disadvantages of Drainage Improvements

STEP 5. CONCLUSION AND RECOMMENDATIONS

CONCLUSION

Based on the field survey and collection of data, the analysis of existing studies and reports, and the evaluation of various structural and non-structural mitigation measures, the Parish proposes that mitigation measures be implemented for Subarea 3. Table 3-13 examines past and current mitigation actions in this area.

RECOMMENDATIONS

Jefferson Parish should continue to encourage everyone to pursue mitigation measures and assist interested property owners in applying for a mitigation grant. The Parish should address street drainage in order to improve the drainage in the study area, seek out and secure funding for the drainage improvements outlined in this report, and institute a maintenance program that encourages homeowners to frequently clear their catch basin inlets of debris to ensure open flow for stormwater. The Parish should also continue to improve its CRS classification and adopt this Repetitive Loss Area Analysis according to the process detailed in the CRS Coordinator's Manual.

For the residents of the study area, they should contact Jefferson Parish for more information about possible funding opportunities and site visits to determine remedial measures. Review the alternative mitigation measures discussed in this analysis and implement those that are most appropriate for their situation. Purchase and maintain a flood insurance policy on the home and its contents.

Jefferson Parish recommends the following mitigation actions:

MITIGATION ACTION 1:

Property owners should obtain and keep a flood insurance policy on their structures (building and contents coverage). The Parish will continue on an **annual basis** to target all properties in the repetitive loss area reminding them of the advantages to maintaining flood insurance through its annual outreach effort.

RESPONSIBILITY

The Floodplain Management and Hazard Mitigation Department will provide the most relevant up-to-date flood insurance information to all property owners within the repetitive loss areas located in this area.

FUNDING

The cost will be paid for from the department's operating budget.

MITIGATION ACTION 2:

When appropriate, property owners should consider floodproofing measures such as flood gates or shields, flood walls, and hydraulic pumps.

RESPONSIBILITY

The Floodplain Management and Hazard Mitigation department will promote effective flood protection measures and provide advice and assistance to property owners who may wish to implement such measures in an **on-going** program.

FUNDING

The cost will be paid for by individual property owners. Advice and assistance will require staff time which will be covered in the department's annual budget.

MITIGATION ACTION 3:

Continue elevation or reconstruction mitigation of high-risk flood-prone properties. The highest priorities are properties at the greatest flood risk and where drainage improvements will not provide an adequate level of protection.

RESPONSIBILITY

The Floodplain Management and Hazard Mitigation department will continue to target the most at risk properties for grant applications.

FUNDING

Construction cost would be covered with FEMA or ICC funds. Staff time to develop the list of target properties will require funds from the department's operating budget.

MITIGATION ACTION 4:

Prioritize CIP projects to focus on drainage improvement projects in those basins containing repetitive loss areas.

RESPONSIBILITY

The Parish's Drainage Department in conjunction with the Engineering Department.

FUNDING

Bond funds or state grants.

MITIGATION ACTION 5:

Encourage property owners to elevate inside and outside mechanical equipment above the BFE and install flood resistant materials in crawl spaces.

RESPONSIBILITY

The Floodplain Management and Hazard Mitigation Department will promote effective flood protection measures and provide advice and assistance to property owners who may wish to implement such measures in an **on-going** program.

FUNDING

The cost will be paid for by individual property owners. Advice and assistance will require staff time which will be covered in the department's annual budget.

SUBAREA 4

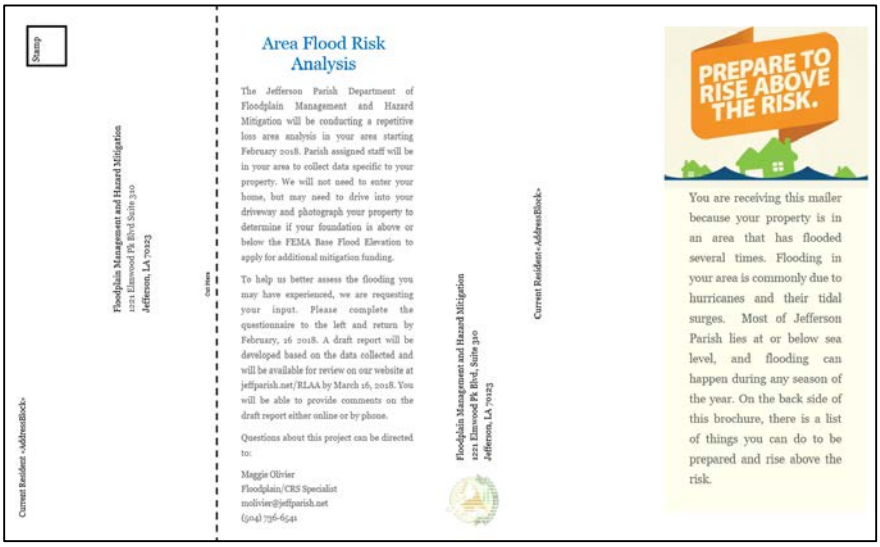
Metairie Arcadia Place

Figure 4- 1 Outline of Subarea 4

STEP 1. ADVISE ALL PROPERTY OWNERS

Before field work began on the RLAA, individual notices were mailed to property owners within the 5 identified Repetitive Loss subareas. The notices advised properties owners about the analysis and requested their input on the flooding problem in their area and mitigation actions taken. The notice also advised property owners how they could provide comments on the draft report once it was posted online.

Subarea 4: A property owner notice with questionnaire was mailed to 273 residents in Subarea 4 the week of January 29, 2018.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Current Resident <AddressBlock>

Floodplain Management and Hazard Mitigation
1221 Elmwood Pk Blvd Suite 310
Jefferson, LA 70123

Area Flood Risk Analysis

The Jefferson Parish Department of Floodplain Management and Hazard Mitigation will be conducting a repetitive loss area analysis in your area starting February 2018. Parish assigned staff will be in your area to collect data specific to your property. We will not need to enter your home, but may need to drive into your driveway and photograph your property to determine if your foundation is above or below the FEMA Base Flood Elevation to apply for additional mitigation funding.

To help us better assess the flooding you may have experienced, we are requesting your input. Please complete the questionnaire to the left and return by February, 16 2018. A draft report will be developed based on the data collected and will be available for review on our website at jeffparish.net/RLAA by March 16, 2018. You will be able to provide comments on the draft report either online or by phone.

Questions about this project can be directed to:

Maggie Olivier
Floodplain/CRS Specialist
molivier@jeffparish.net
(504) 736-6541

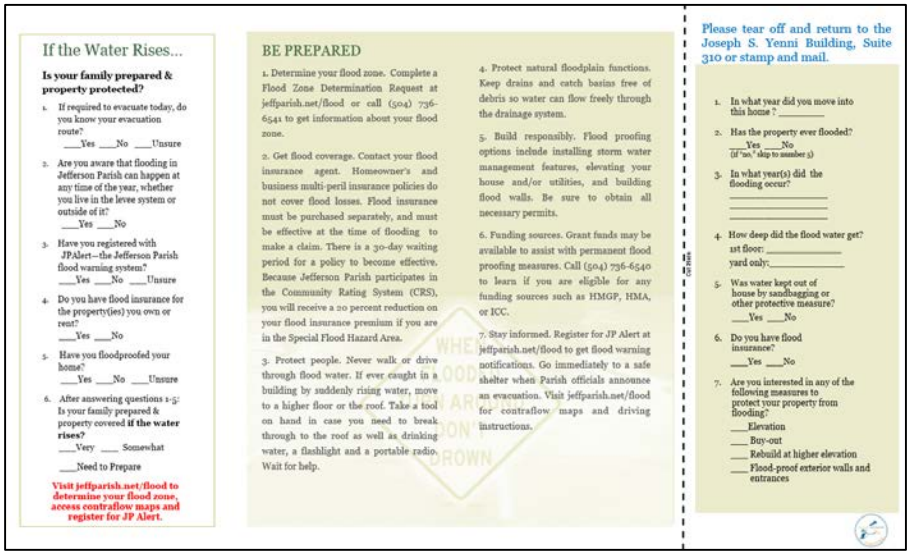
Floodplain Management and Hazard Mitigation
1221 Elmwood Pk Blvd, Suite 310
Jefferson, LA 70123

Current Resident <AddressBlock>

PREPARE TO RISE ABOVE THE RISK.

You are receiving this mailer because your property is in an area that has flooded several times. Flooding in your area is commonly due to hurricanes and their tidal surges. Most of Jefferson Parish lies at or below sea level, and flooding can happen during any season of the year. On the back side of this brochure, there is a list of things you can do to be prepared and rise above the risk.

Figure 4- 2 Front of Notice


If the Water Rises...

Is your family prepared & property protected?

1. If required to evacuate today, do you know your evacuation route?
   ___Yes ___No ___Unsure
2. Are you aware that flooding in Jefferson Parish can happen at any time of the year, whether you live in the levee system or outside of it?
   ___Yes ___No
3. Have you registered with JPAlert—the Jefferson Parish flood warning system?
   ___Yes ___No ___Unsure
4. Do you have flood insurance for the property(ies) you own or rent?
   ___Yes ___No
5. Have you floodproofed your home?
   ___Yes ___No ___Unsure
6. After answering questions 1-5: Is your family prepared & property covered **if the water rises?**
   ___Very ___ Somewhat
   ___Need to Prepare

Visit jeffparish.net/flood to determine your flood zone, access contraflow maps and register for JP Alert.

BE PREPARED

1. Determine your flood zone. Complete a Flood Zone Determination Request at jeffparish.net/flood or call (504) 736-6541 to get information about your flood zone.
2. Get flood coverage. Contact your flood insurance agent. Homeowner's and business multi-peril insurance policies do not cover flood losses. Flood insurance must be purchased separately, and must be effective at the time of flooding to make a claim. There is a 30-day waiting period for a policy to become effective. Because Jefferson Parish participates in the Community Rating System (CRS), you will receive a 10 percent reduction on your flood insurance premium if you are in the Special Flood Hazard Area.
3. Protect people. Never walk or drive through flood water. If ever caught in a building by suddenly rising water, move to a higher floor or the roof. Take a tool on hand in case you need to break through to the roof as well as drinking water, a flashlight and a portable radio. Wait for help.
4. Protect natural floodplain functions. Keep drains and catch basins free of debris so water can flow freely through the drainage system.
5. Build responsibly. Flood proofing options include installing storm water management features, elevating your house and/or utilities, and building flood walls. Be sure to obtain all necessary permits.
6. Funding sources. Grant funds may be available to assist with permanent flood proofing measures. Call (504) 736-6540 to learn if you are eligible for any funding sources such as HMGP, HMA, or ICC.
7. Stay informed. Register for JP Alert at jeffparish.net/flood to get flood warning notifications. Go immediately to a safe shelter when Parish officials announce an evacuation. Visit jeffparish.net/flood for contraflow maps and driving instructions.

Please tear off and return to the Joseph S. Yenni Building, Suite 310 or stamp and mail.

1. In what year did you move into this home ? _____
2. Has the property ever flooded?
   ___Yes ___No
   (if "no," skip to number 5)
3. In what year(s) did the flooding occur?
   _____
   _____
   _____
   _____
4. How deep did the flood water get?
   1st floor: _____
   yard only: _____
5. Was water kept out of house by sandbagging or other protective measure?
   ___Yes ___No
6. Do you have flood insurance?
   ___Yes ___No
7. Are you interested in any of the following measures to protect your property from flooding?
   ___Elevation
   ___Buy-out
   ___Rebuild at higher elevation
   ___Flood-proof exterior walls and entrances

Figure 4- 3 Back of Notice with Questionnaire

QUESTIONNAIRE RESPONSES SUBAREA 4

Out of the 273 mailed questionnaires, Jefferson Parish received 15 responses which corresponds to a response rate of approximately 5.5 percent. Questionnaire responses are summarized below. Note: respondents may have skipped questions and/or provided more than one response to a question. One (1) address was undeliverable and three (3) properties were vacant.

Q1: In what year did you move into this home?

Responses Received	Percentage	Number Responding
<10 years ago	20	**3**
10-20 years ago	13	**2**
20-30 years ago	--	**None**
30-40 years ago	40	**6**
40-50 years ago	13	**2**
> 50 years ago	13	**2**
Total	**100**	**15**

Q2: Has the property ever been flooded?

Answer Choices	Percentage	Number
No	73.33	**11**
Yes	27	**4**
Don't know	--	**--**
Total	**100**	**15**

Q3: In what year(s) did it flooding occur?

Responses Received	Percentage	Number
1985	14	**1**
1995	29	**2**
2005	57	**4**
Total	**100**	**7**

Q4: How deep did the water get?

Answer Choices	Percentage	Number Responding	Depth	
			< 3 ft	> 3 ft
First floor	67	4	1	**None**
Yard only	33	2	None	**None**
Total	**100**	**6**	**1**	**None**

Q5: Was water kept out of the house by sandbagging or other protective measures?

Answer Choices	Percentage	Number Responding
No	100	**9**
Yes	--	**None**
Total	**100**	**9**

Q6: Do you have Flood Insurance?

Answer Choices	Percentage	Number Responding
No	--	**None**
Yes	100	**13**
Total	**100**	**13**

Q7: Are you interested in protecting your property from flooding?

Answer Choices	Percentage	Number Responding
No	11	**2**
Yes	89	**17**
Total	**100**	**19**

The following trends in survey responses should be considered when evaluating mitigation measures for Subarea 4:

- Eighty-nine (89) percent of respondents are interested in protecting their home/building from flooding. About 11 percent of the respondents are not willing to take any measure to mitigate their properties.
- All the respondents in this subarea currently have FEMA flood insurance.
- All the respondents mentioned that none of the protective measures helped to keep the water out of the house. According to the data above, 73 percent of the respondents noted that there was no

flooding in the area therefore, no measures were required. Most of the respondents have been residing in the neighborhood for about 30-40 years.

- The majority (67 percent) of flooding has been over the first floor of the home with less than 3 feet in depth. Thirty-three (33) percent of the flooding was only in the yard.
- The years with the largest number of reported flooding incidents are 1985, 1995 and 2005. The following flood events are detailed in NOAA's National Climatic Data Center (NCDC) database:

    - **Hurricane Juan, 1985** - Due to the cyclone's slow movement over Louisiana, it dropped over 10 in (250 mm) of rainfall across much of the southern portion of the state. The intense rainfall increased levels along rivers in southwestern Louisiana. High waves and a storm surge of 5 to 8 ft (1.5 to 2.4 m) flooded low-lying and coastal areas of southeastern Louisiana. The storm left about $2.9 million in damage to oil facilities in the state, including the cost of damaged pipelines. Overall, Juan flooded about 50,000 houses in Louisiana causing $250 million in property damage.

    - **Southeast Louisiana and Southern Mississippi Flood, 1995** - It was a heavy rainfall event which occurred across an area stretching from the New Orleans metropolitan area into southern Mississippi. A storm total rainfall maximum of 27.5 inches (70 cm) was recorded near Necaise, Mississippi. Considerable flooding was caused by the rainfall including several record flood crests along impacted river systems. The flooding caused six fatalities and more than $3.1 billion in damage.

    - **August 29, 2005** – The Category 3 hurricane Katrina caused catastrophic damage along the Gulf coast from central Florida to Texas, much of it due to the storm surge and levee failure. Severe property damage occurred in coastal areas, such as Mississippi beachfront towns where boats and casino barges rammed buildings, pushing cars and houses inland; water reached 6–12 miles (10–19 km) from the beach. The storm was the third most intense United States landfalling tropical cyclone, behind the 1935 Labor Day hurricane and Hurricane Camille in 1969. Overall, at least 1,245 people died in the hurricane and subsequent floods, making it the deadliest United States hurricane since the 1928 Okeechobee hurricane. Total property damage was estimated at $125 billion (2005 USD), roughly four times the damage wrought by Hurricane Andrew in 1992 in the United States.

STEP 2. CONTACT AGENCIES AND ORGANIZATIONS

Jefferson Parish Department of Hazard Mitigation and Floodplain Management contacted external agencies and internal departments that have plans or studies that could affect the cause or impacts of flooding within the identified repetitive loss subareas. The data collected was used to analyze the problems further and to help identify potential solutions and mitigation measures for property owners. The agencies contacted and reports which were analyzed and reviewed are as follows:

Agencies

- Jefferson Parish Electronic Information System Department
- Jefferson Parish Streets Department
- Jefferson Parish Office of Risk Management
- Jefferson Parish Drainage Department

Reports

- FEMA – Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) for Jefferson Parish, February 2, 2018
- ISO – Repetitive Flood Insurance Claims Data
- Jefferson Parish Hazard Mitigation Plan

SUMMARY OF STUDIES AND REPORTS

FEMA FLOOD INSURANCE STUDY (FIS) AND FLOOD INSURANCE RATE MAP (FIRM)

FEMA's FIS for Jefferson Parish, LA is dated February 2, 2018. The FIS revises and updates information on the existence and severity of flood hazards within the Parish. The FIS also includes revised digital Flood Insurance Rate Maps (FIRMs) which reflect updated Special Flood Hazard Areas (SFHAs) and flood zones for the Parish. SFHA boundaries within the Parish were updated due to new detailed coastal analyses which were performed by the USACE-MVN, for FEMA. This study also incorporates the Hurricane Storm Damage Risk Reduction System (HSDRRS) completed by the USACE. Finally, these maps depict the potential for flooding and are the basis for building requirements and flood insurance rates.

FLOOD INSURANCE CLAIMS DATA

The Privacy Act of 1974 (5 U.S.C. 522a) restricts the release of flood insurance policy and claims data to the public. This information can only be released to state and local governments for the use in floodplain management related activities. Therefore all claims data in this report are only discussed in general terms.

JEFFERSON PARISH HAZARD MITIGATION PLAN

The purpose of a mitigation plan is to rationalize the process of determining appropriate hazard mitigation actions. The document includes a detailed description of natural hazards in Jefferson Parish; a risk assessment that describes potential losses to physical assets, people and operations; a set of goals, objectives, strategies and actions that will guide the Parish's mitigation activities, and a detailed plan for

implementing and monitoring the Plan. This Plan identified 12 hazards and included a risk assessment of the four hazards with the highest potential for damaging physical assets, people and operations in Jefferson Parish. These hazards are floods, hurricanes and tropical storms, storm surge, and tornadoes. Both the risk assessment section and goals sections reflect this emphasis, which was the result of careful consideration and a numerical ranking process carried out by the Mitigation Planning Team (MPT).

STEP 3. BUILDING DATA COLLECTION

The on-site field survey for this analysis was conducted over multiple days between the months of October 2017 and January 2018. The October site visits assisted with defining the area. The Collector App through ESRI was utilized to save field data from the site visits. In addition, multiple site photos were taken of each structure on the property. Photos were also taken of current drainage features and mitigation and floodproofing measures if evident from street or parking lot views. The following information was recorded for each property:

Table 4- 1

Structure		Foundation		Type	
No structure	3	Slab on grade	213	Residential	265
Occupied	226	Low (less than 2ft.)	32	Non-residential	3
Vacant	4	Medium	26		
		High	none		

COLLECTOR FOR ARCGIS (ESRI)

Jefferson Parish used the ESRI Collector Application in order to be able to store and spatially view repetitive loss data for the Parish. The Collector App contains all field data collected by parcels for RLAA including pictures of each structure on the parcel. The data is stored in ArcGIS and is used for internal review and continued analysis of repetitive flood loss areas.

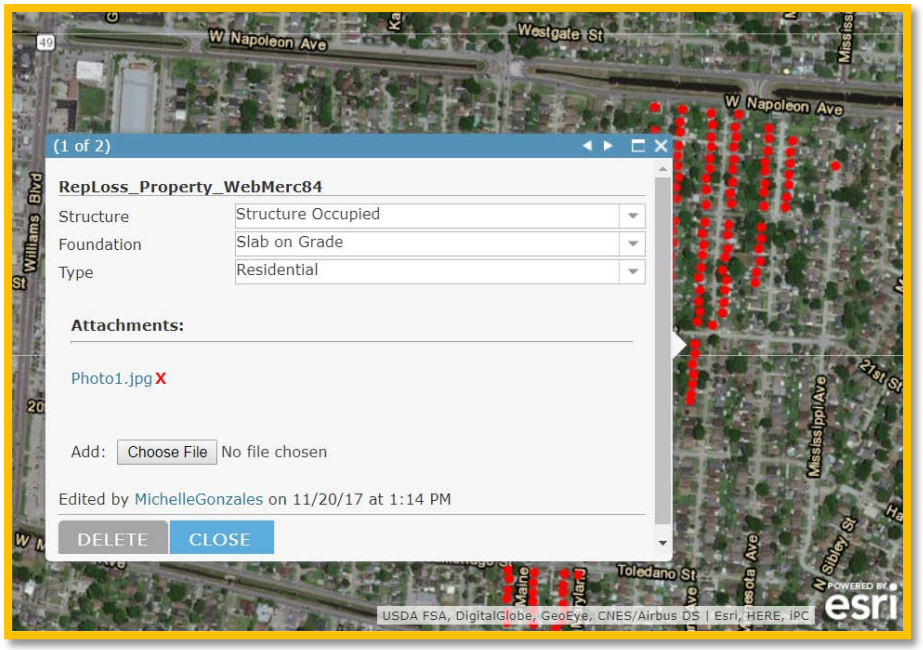


Figure 4- 4 Collector Application Sample

SUBAREA 4- METAIRIE ARCADIA PLACE

Subarea 4 is located on the Eastbank of Mississippi River within the New Orleans-Metairie- Kenner Metropolitan Statistical Area. The elevation in the area is approximately -4 NAVD and the BFE is -3 feet in this subarea.

The subarea is located almost entirely in AE flood zone, but some portion does fall within Zone X. Flood water collects in this subarea because it lies at or below sea level with land prone to subsidence or sinking. The low, flat ground provides little natural gravity drainage.

In accordance with FEMA publication *551 Selecting Appropriate Mitigation Measures for Floodprone Structures*, mitigation options are discussed. The approach to reducing repetitive flooding in Subarea 4 will require a combination of floodproofing techniques, education, and drainage improvement projects.

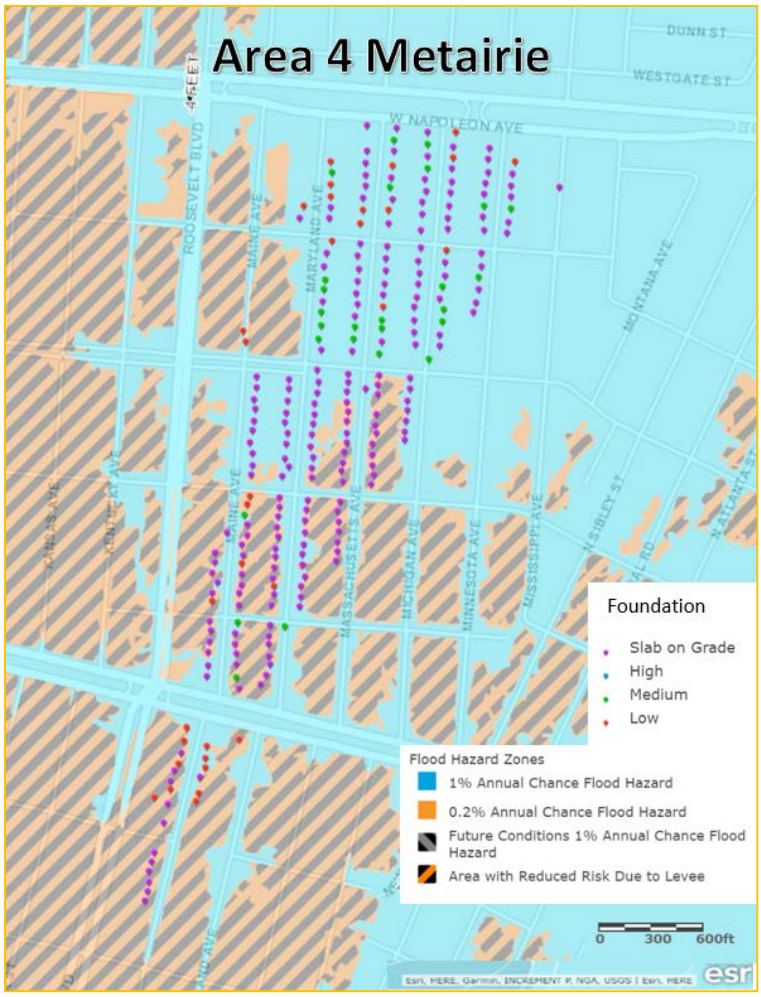


Figure 4- 5 2018 Effective FIRM in Subarea 4

CLAIMS DATA:

In review of the unmitigated Repetitive Loss List, there are 17 properties within the 273 property study area that qualify as repetitive loss. Of those 17 repetitive loss properties, 5 are considered to be severe repetitive loss properties.

Majority of the claims are from May 1995 flooding. The rest of the claims are relatively small rainfall events that affected between 1 -10 homes. On analyzing the claims data, it could be derived that the area experiences most flooding from rainfall events. Hurricane Katrina had resulted in maximum number of claims in the area (see graph below, Table 4-2).

There have been 64 flood claims in the study area totaling $1,433,919. The average claim in the area is $22,404. The homeowners of the 12 repetitive loss properties have made 33 claims and received $853,315 in flood insurance payments since 1978. The homeowners of the 5 severe repetitive loss properties have made 31 claims, and received $ 580,603 in flood insurance payments since 1978.The average repetitive flood loss claim was $25,858 and the average severe repetitive loss claim was $ 18,729. If less than 50% of the home is damaged, it will not be subject to the substantial improvement requirements.

The severe repetitive loss homes are similar to the other homes on their block and are on separate streets. They have each flooded more than 4 times, and all of them flooded during most of the heavy rainfall events in the area. See graph below.

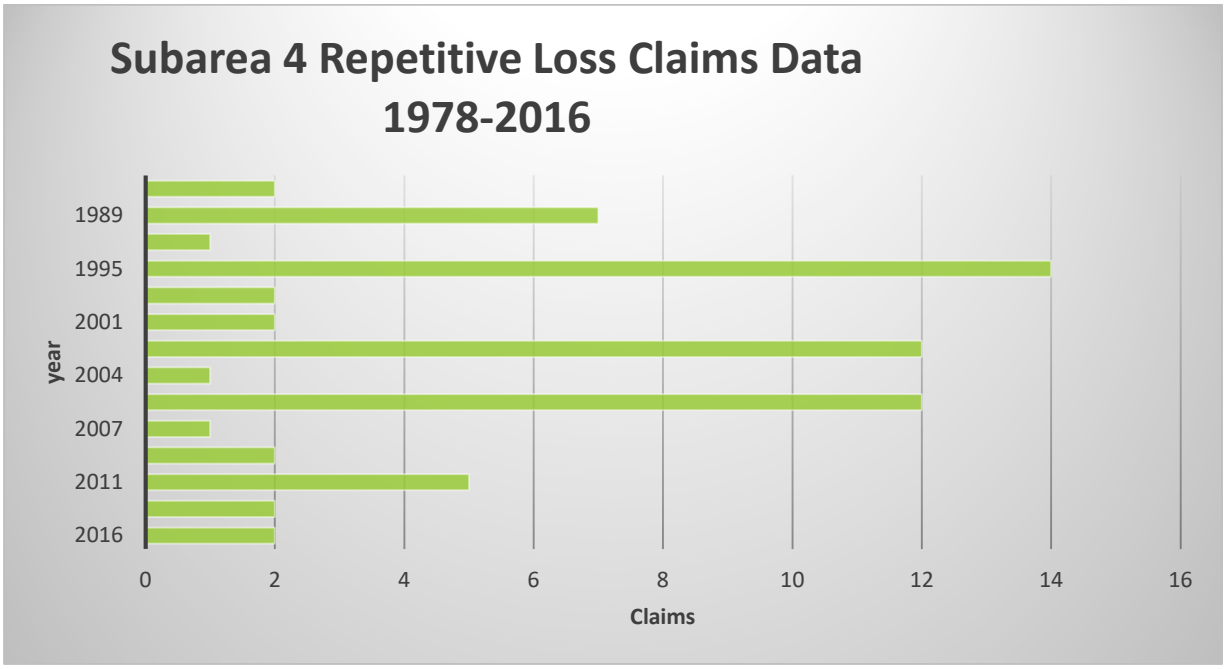


Table 4- 2

FIELD DATA:

The on-site field survey for this analysis was conducted over multiple days between the months of October 2017 and January 2018. The team collected information such as the type and height of the foundation, occupancy status of the structure, and use of the structure.

A majority of the structures are slab on grade (213 or 79%). About 12 percent (32) of the structures are low, less than 2 feet. Approximately 10 percent (26) structures are medium high. None of the properties are elevated in this subarea. It could be evaluated that although most of the structures in the subarea are slab on grade, there has been damage to the other properties due to flooding form several hurricane and rain events.

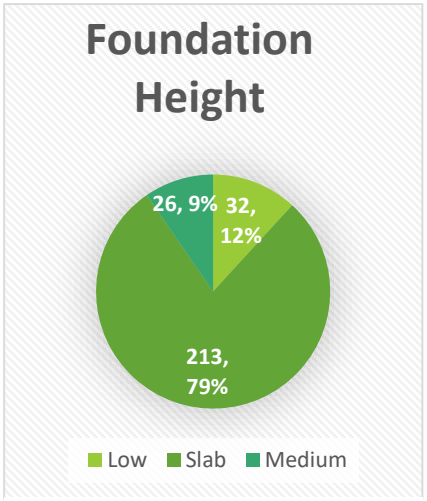


Table 4- 3

The project team observed that majority (266 or 97 percent) of the structures in the area were occupied, while approximately 4, or 1.7 percent, were vacant and 3 (1.5 percent) had no structure. Also, majority of the structures are of residential use.

In conclusion, it should be noted that given the location of Subarea 4, all of the properties are inside levee protection. Majority of the properties are built on slab on grade, therefore, a heavy rain event can cause substantial damage to the properties.

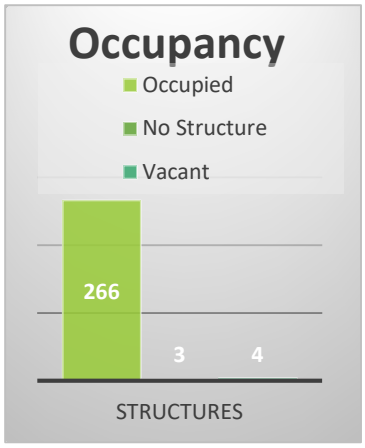


Table 4- 4

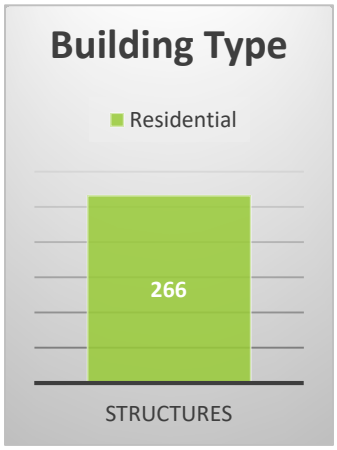


Table 4- 5

Figure 4- 6 Sample Slab on Grade Structure in Subarea 4

Figure 4- 7 Sample Low Foundation in Subarea 4

Figure 4- 8 Sample Mitigated Property in Subarea 4

STEP 4. REVIEW ALTERNATIVE MITIGATION APPROACHES

There are many ways to protect a property from flood damage. Different measures are appropriate for different flood hazards, building types and building conditions. Figure 4-9 below, found in the *2017 CRS Coordinator's Manual*, lists typical property protection measures.

To protect property from flood damage . . .

- Demolish the building or relocate it out of harm's way.
- Elevate the building above the flood level.
- Elevate damage-prone components, such as the furnace or air conditioning unit.
- Dry floodproof the building so water cannot get into it.
- Wet floodproof portions of the building so water won't cause damage.
- Construct a berm or redirect drainage away from the building.
- Maintain nearby streams, ditches, and storm drains so debris does not obstruct them.
- Correct sewer backup problems.

Figure 4- 9 Typical Property Protection Methods

Mitigation measures should fall into one of the mitigation categories listed below which are based on the Community Rating System planning process:

- Prevention
- Property Protection
- Natural Resource Protection
- Emergency Services
- Structural Projects
- Public Information and Outreach

MITIGATION FUNDING

There are several types of mitigation measures, listed in the table below, which can be considered for each repetitive loss property. Each mitigation measure qualifies for one or more grant programs. Depending on the type of structure, severity of flooding and proximity to additional structures with similar flooding conditions, the most appropriate measure can be determined. In addition to these grant funded projects, several mitigations measures can be taken by the homeowner to protect their home.

Table 4- 6 Mitigation Funding Sources

Types of Projects Funded	HMGP	FMA	PDM	ICC	SBA
Acquisition of the entire property by govt agency	✔	✔	✔		
Relocation of the building to a flood free site	✔	✔	✔	✔	✔
Demolition of the structure	✔	✔	✔	✔	✔
Elevation of the structure above flood levels	✔	✔	✔	✔	✔
Replacing the old building with a new elevated one	✔	✔	✔	✔	✔
Local drainage and small flood control projects	✔	✔	✔		
Dry floodproofing (non-residential only)	✔	✔	✔		
Percent paid by Federal program	75%	75%, 90%, or 100%	75%	Up to $30K	

There are several possible sources of funding for mitigation projects:

- **FEMA grants**: Most of the FEMA programs provide 75% of the cost of a project. In most communities, the 25% non-FEMA share is paid by the benefitting property owner. Each program has different Congressional authorization and slightly different rules.
  - **The Hazard Mitigation Grant Program (HMGP)**: The HMGP provides grants to States and local governments to implement long-term hazard mitigation measures after a major disaster declaration. Projects must provide a long-term solution to a problem (e.g., elevation of a home to reduce the risk of flood damages as opposed to buying sandbags and pumps to fight the flood). Examples of eligible projects include acquisition and elevation, as well as local drainage projects.
  - **The Flood Mitigation Assistance Program (FMA)**: FMA funds assist States and communities in implementing measures that reduce or eliminate the long-term risk of flood damage to structures insured under the NFIP. Project Grants to implement measures to reduce flood losses, such as elevation, acquisition, or relocation of NFIP-insured structures. States are encouraged to prioritize FMA funds for applications that include repetitive loss properties; these include structures with 2 or more losses each with a claim of at least $1,000 within any ten-year period since 1978.
  - **Pre-Disaster Mitigation Program (PDM)**: The Pre-Disaster Mitigation (PDM) program provides funds to states, territories, Indian tribal governments, communities, and universities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. For more information visit http://www.fema.gov/government/grant/pdm/index.shtm.

- **Flood insurance**: There is a special funding provision in the National Flood Insurance Program (NFIP) for insured buildings that have been substantially damaged by a flood, “Increased Cost of Compliance.” ICC coverage pays for the cost to comply with floodplain management regulations after a flood if the building has been declared substantially damaged. ICC will pay up to $30,000 to help cover elevation, relocation, demolition, and (for nonresidential buildings) floodproofing. It can also be used to help pay the 25% owner’s share of a FEMA funded mitigation project.

The building's flood insurance policy must have been in effect during the flood. This payment is in addition to the damage claim payment that would be made under the regular policy coverage, as long as the total claim does not exceed $250,000. Claims must be accompanied by a substantial or repetitive damage determination made by the local floodplain administrator. For more information, contact your insurance agent or visit: www.fema.gov/plan/prevent/floodplain/ICC.shtm.

Coverage under the ICC does have limitations: It covers only damage caused by a flood, as opposed to wind or fire damage. The building's flood insurance policy must have been in effect during the flood. ICC payments are limited to $30,000 per structure Claims must be accompanied by a substantial or repetitive damage determination made by the local floodplain administrator and the structure must be in an A zone.

The average claims payment in the study area is $22,404. With an average claim of that amount, it is not likely that many homes in the study area would sustain substantial damage from a flood event. Homeowners should make themselves aware of the approximate value of their homes, and in the case of incurring flood damage, be aware of the need for a substantial damage declaration in order to receive the ICC coverage.

Alternative language adopted into the local floodplain management ordinance would enable residents with shallower flooding to access ICC funding. Since local ordinances determine the threshold at which substantial damage and/or repetitive claims are reached, adopting language that would lower these thresholds would benefit the homeowners of repetitive loss properties. Adopting alternative language allows for cumulative damages to reach the threshold for federal mitigation resources more quickly, meaning that some of the properties in Jefferson Parish that sustain minor damage regularly would qualify for mitigation assistance through ICC.

- Rebates: A rebate is a grant in which the costs are shared by the homeowner and another source, such as the local government, usually given to a property owner after a project has been completed. Many communities favor it because the owner handles all the design details, contracting, and payment before the community makes a final commitment. The owner ensures that the project meets all of the program's criteria, has the project constructed, and then goes to the community for the rebate after the completed project passes inspection.

Rebates are more successful where the cost of the project is relatively small, e.g., under $5,000, because the owner is more likely to be able to afford the bulk of the cost. The rebate acts more as an incentive, rather than as needed financial support.

- Small Business Administration Mitigation Loans: The Small Business Administration (SBA) offers mitigation loans to SBA disaster loan applicants who have not yet closed on their disaster loan. Applicants who have already closed must demonstrate that the delay in application was beyond their control.

For example mitigation loans made following a flood can only be used for a measure to protect against future flooding, not a tornado. If the measure existed prior to the declared disaster, an SBA mitigation loan will cover the replacement cost. If the measure did not exist prior to the declared disaster the mitigation loan will only cover the cost of the measure if it is deemed absolutely necessary for repairing the property by a professional third-party, such as an engineer.

MITIGATION ALTERNATIVES

The Metairie Arcadia Place area is a unique identified area with 273 total properties identified. The majority of the flooding in this area is considered “nuisance” flash flooding that causes minimal damage but does require costly cleanup and numerous street closures due to floodwaters overtopping the roadway.

Flooding in this area can be attributed to its flat topography, aging stormwater infrastructure and proximity between the Mississippi River Levee, Jefferson Hwy, and the railroad tracks. Flash flooding can occur when the capacity of the drainage system is exceeded or if conveyance is obstructed by debris, sediment and other materials that limit the volume of drainage. Heavy rains within a short period of time have caused the drainage system to be inundated and unable to keep up, resulting in ponding water in streets and homes.

Improving the drainage system can eliminate some road and home inundation in this area. These structural methods require large capital expenditures and cooperation from private property owners. Promoting floodproofing techniques and increasing public education and awareness of the flood hazards can be the next best alternative for property owners in this area. The Parish’s websites, e-mail distribution lists, press releases and variable message boards can provide benefit to business owners and residents.

POTENTIAL MITIGATION MEASURES

Structural Alternatives:

- **Elevate** structures and damage-prone components, such as the water heater or air conditioning unit, above the base flood elevation BFE.
- **Dry floodproofing** can be done on commercial structures and even residential structures; however, in many instances this requires human intervention to complete the measure and ensure success. For example, installing watertight shields over doors or windows requires timely action by the homeowner; especially in a heavy rainfall event.
- **Wet floodproofing** a structure involves making the uninhabited portions of the structure resistant to flood damage and allowing water to enter during flooding. For example, in a basement or crawl space, mechanical equipment and ductwork would not be damaged.
- **Acquire and/or relocate** properties/target abandoned properties or locations that would provide a public benefit as the location will need to be maintained by the Parish in perpetuity.
- **Increase the size of culverts** under Jefferson Hwy to allow for increased capacity.
- **Implement drainage** i**mprovements** such as increasing capacity in the system (up-sizing pipes) and provide additional inlets to receive more stormwater.
- Improve stormwater system maintenance program to ensure inlets and canals are free of clogging debris.

Non Structural Alternatives:

- **Relocate internal supplies**, products/goods above the flooding depth.
- Improve the Parish’s floodplain and zoning ordinances.
- **Provide public education** through posting information about local flood hazards on City websites, posting signs at various locations in neighborhoods or discussing flood protection measures at local neighborhood association meetings.
- Promote the purchase of flood insurance.

- Continue coordination with GOHSEP, the National Weather Service (NWS), and United States Geological Survey (USGS) to enhance flood warning system, including the use of rain/stream gauges, to provide greater warning time for citizens. NWS can use the real- time data collected to issue timely warnings.

COST AND BENEFITS OF MITIGATION MEASURES

Knowing the flooding history, type, and condition of the buildings in the area, leads to the fourth step in the area analysis procedure – a review of alternative mitigation approaches to protect properties from, or reduce, future flood damage. Property owners should look at these alternatives but understand they are not all guaranteed to provide protection at different levels of flooding. Six approaches were reviewed:

- Elevating the houses above the 1% annual flood level
- Acquisition
- Floodproofing
- Drainage improvements

ELEVATION

Raising the structure above the flood level is generally viewed as the best flood protection measure, short of removing the building from the floodplain. All damageable portions of the building and its contents are high and dry during a flood, which flows under the building instead of into the house. Houses can be elevated on fill, posts/piles, or a crawlspace.

- A house elevated on fill requires adding a specific type of dirt to a lot and building the house on top of the added dirt.
- A house elevated on posts/piles is either built or raised on a foundation of piers that are driven into the earth and rise high enough above the ground to elevate the house above the flow of flood water or the design flood elevation.
- A house elevated on a crawlspace or enclosure is built or raised on a continuous wall-like foundation that elevates the house above the design flood level. It is important to include vents or openings in the walls below the design flood level that are appropriately sized: one square inch for each square foot of the crawlspace or enclosures footprint. Additionally all materials below the design flood level must be flood resistance and all machinery, equipment, and plumbing must be above the design flood level.
    - Cost: A majority of the cost to elevate a building is in the preparation and foundation construction. The cost to elevate six feet is little more than the cost to go up two feet. Elevation is usually cost-effective for wood frame buildings on posts/piles or crawlspace because it is easiest for lifting equipment to be used under the floor and disruption to the habitable part of the house is minimal. Elevating a slab house is much more costly and disruptive. In Subarea 4, 79% percent of the houses in the study area are on a slab. The actual cost of elevating a particular building depends on factors such as its condition, whether it is masonry or brick faced, and if additions have been added on over time. While the cost of elevating a home can be high, there are funding programs that can help. The usual arrangement is for a FEMA grant to pay 75% of the cost while the owner pays the other 25%. In the case of elevating a slab foundation, the homeowner's portion could be as high as $50,000 or more. In some cases, assistance can be provided by Increased Cost of Compliance (ICC) funds or state funds.

- Feasibility: Federal funding support for an elevation project requires a study that shows that the benefits of the project exceed the cost of the elevation. Project benefits include savings in insurance claims paid on the structure. Elevating a masonry or a slab home can cost up to $300,000, which means that benefit/cost ratios may be low. Looking at each property individually could result in funding for the worst case properties, i.e., those that are the lowest below the base flood elevation, subject to the most frequent flooding, and in good enough condition to elevate.

Advantages	Disadvantages
• **Elevating to or above the BFE allows a substantially damaged or substantially improved house to be brought into compliance.** • **Often reduces flood insurance premiums.** • **May be fundable under FEMA mitigation grant programs.**	• **Cost may be prohibitive.** • **The appearance of the structure and access to it may be adversely affected.** • **May require property owner cooperation and right-of-way acquisition.** • **May require road or walkway closures during construction.**

Table 4- 7 Advantages and Disadvantages of Elevation

ACQUISITION:

This measure involves buying one or more properties and clearing the site (demolishing the building). If there is no building subject to flooding, there is no flood damage. Acquisitions are usually recommended where the flood hazard is so great or so frequent that it is not safe to leave the structure on the site.

An alternative to buying and clearing the whole subdivision is buying out individual, “worst case,” structures with FEMA funds.

- Cost: This approach would involve purchasing and clearing the lowest or the most severe repeatedly flooded homes. If FEMA funds are to be used, three requirements will apply:
  - The applicant for FEMA must demonstrate that the benefits exceed the costs, using FEMA’s one of FEMA’s approved Benefit Cost methodologies.
  - The owner must be a willing seller.
  - The parcel must be deeded to a public agency that agrees to maintain the lot and keep it forever as open space.

- Feasibility: Due to the high cost and difficulty to obtain a favorable benefit-cost ratio in shallow flooding areas, acquisitions are reserved for the worst case buildings. Not everyone wants to sell

their home, so a checkerboard pattern of vacant and occupied lots often remains after a buyout project, leaving "holes" in the neighborhood. There is no reduction in expenses to maintain the neighborhood's infrastructure for the Parish, although the tax base is reduced. The vacant lots must be maintained by the new owner agency, and additional expense is added to the community. If the lot is only minimally maintained, its presence may reduce the property values of the remaining houses. Jefferson Parish is not considering acquisitions at this time for the above reasons.

Advantages	Disadvantages
• **Permanently removes problem since the structure no longer exists.** • **Allows a substantially damaged or substantially improved structure to be brought into compliance with the community's floodplain management ordinance or law.** • **Expands open space and enhances natural and beneficial uses.** • **May be fundable under FEMA mitigation grant programs.**	• **Cost may be prohibitive.** • **Resistance may be encountered by local communities due to loss of tax base, maintenance of empty lots, and liability for injuries on empty, community-owned lots.**

Table 4- 8 Advantages and Disadvantages of Acquisition

There are 3 criteria that must be met for FEMA to fund an acquisition project:

- The local community must inform the property owners interested in the acquisition program that the community will not use condemnation authority to purchase their property and that the participation in the program is strictly voluntary,
- The subsequent deed to the property to be acquired will be amended such that the landowner will be restricted from receiving any further Federal disaster assistance grants, the property shall remain in open space in perpetuity, and the property will be retained in ownership by a public entity, and
- Any replacement housing or relocated structures will be located outside the 100-year floodplain.

FLOODPROOFING

This measure keeps floodwaters out of a building by modifying the structure. Walls are coated with waterproofing compounds or plastic sheeting. Openings (i.e. doors, windows, and vents) are closed either permanently, or temporarily with removable shields or sandbags.

- Make the walls watertight. This is easiest to do for masonry or brick faced walls. The brick or stucco walls can be covered with a waterproof sealant and bricked or stuccoed over with a veneer to camouflage the sealant. Houses with wood, vinyl, or metal siding need to be wrapped with plastic sheeting to make walls watertight, and then covered with a veneer to camouflage and protect the plastic sheeting. Provide closures, such as removable shields or sandbags, for the openings; including doors, windows, dryer vents and weep holes. There must also be an account for sewer backup and other sources of water entering the building. For shallow flood levels, this can be done with a floor drain plug or standpipe; although a check valve system is more secure.

- Dry floodproofing employs the building itself as part of the barrier to the passage of floodwaters, and therefore this technique is only recommended for buildings with slab foundations that are not cracked. The solid slab foundation prevents floodwaters from entering a building from below. Also, even if the building is in sound condition, tests by the Corps of Engineers have shown that dry floodproofing should not be used for depths greater than three feet above the first floor, because water pressure on the structure can collapse the walls and/or buckle the floor.

- Dry floodproofing is a mitigation technique that is appropriate for some houses in the area: those with slab foundations that typically receive floodwater up to three feet in the house. From the fieldwork it was found that approximately seventy-nine percent of the houses in the analysis area are on slab foundations, and according to the questionnaire responses sixty-seven percent of the respondents experienced less than three feet of flooding on the first floor and thirty-three percent experienced no yard flooding.

- Not all parts of the building need to be floodproofed. It is difficult to floodproof a garage door, for example, so some owners let the garage flood and floodproof the walls between the garage and the rest of the house. Appliances, electrical outlets, and other damage-prone materials located in the garage should be elevated above the expected flood levels.

    - Cost: The cost for a floodproofing project can vary according to the building's construction and condition. It can range from $5,000 to $20,000, depending on how secure the owner wants to be from flooding. Owners can do some of the work by themselves, although an experienced contractor provides greater security. Each property owner can determine how much of their own labor they can contribute and whether the cost and appearance of a project is worth the protection from flooding that it may provide.

    - Feasibility: As with floodwalls, floodproofing is appropriate where flood depths are shallow and are of relatively short duration. It can be an effective measure for some of the structures and flood conditions found in the study analysis area. It can also be more attractive than a floodwall around a house. However, floodproofing requires the homeowner to install or place door and window shields or sandbags and to ensure maintenance on a yearly basis. This may be difficult for the elderly or disabled. Finally ample warning of flooding must be available, so the homeowner can determine when to place the door or window shields and sandbags.

Dry floodproofing has the following shortcomings as a flood protection measure:

- It usually requires human intervention, i.e., someone must be home to close the openings.
- Its success depends on the building's condition, which may not be readily evident. It is very difficult to tell if there are cracks in the slab under the floor covering.
- Periodic maintenance is required to check for cracks in the walls and to ensure that the waterproofing compounds do not decompose.
- There is no government financial assistance programs available for dry floodproofing, therefore the entire cost of the project must be paid by the homeowner.
- The NFIP will typically not offer a lower insurance rate for dry floodproofed residences. However, this may be a viable option if homeowners want to protect their structure and contents.

Advantages	Disadvantages
• Often less costly than other mitigation measures. • Allows internal and external hydrostatic pressures to equalize, lessening the loads on walls and floors.	• Extensive cleanup may be necessary if the structure becomes wet inside and possibly contaminated by sewage, chemicals and other materials borne by floodwaters. • Does not minimize the potential damage from a high-velocity flood flow and wave action

Table 4- 9 Advantages and Disadvantages of Wet Floodproofing

Advantages	Disadvantages
• Often less costly than other retrofitting methods • Does not require additional land. • May not be funded by aFEMA mitigation grant program.	• Requires human intervention and adequate warning to install protective measures. • Does not minimize the potential damage from high-velocity flood flow and wave action. • May not be aesthetically pleasing.

Table 4- 10 Advantages and Disadvantages of Dry Floodproofing

DRAINAGE IMPROVEMENTS

The Parish is currently in the process of developing a Parish-wide Subsurface Drainage Master Plan. The purpose of this Plan is to help identify deficient drainage areas throughout the Parish, develop preliminary solutions for the problem areas, split problem areas into individual projects for bidding purposes, develop cost estimates, and prioritize needed work. The Plan shall have a list of recommendations that were created after reviewing previous studies and reports. There are several different drainage improvements called for in the Drainage Master Plan that might help in reducing some of the flooding within this Repetitive Loss area. Maintenance for all projects and ongoing street sweeping continues for this area. Whenever drainage improvements are considered as a flood mitigation measure, the effects upstream and downstream from the proposed improvements need to be considered.

Advantages	Disadvantages
• Can increase channel carrying capacity through overflow channels, channel straightening, crossing replacements, or runoff volume storage. • Minor projects may be fundable under FEMA mitigation grant programs.	• May help one area but create new problems upstream or downstream. • Channel straightening increases the capacity to accumulate and carry sediment. • May require property owner cooperation and right-of-way acquisition.

STEP 5. CONCLUSION AND RECOMMENDATIONS

CONCLUSION

Based on the field survey and collection of data, the analysis of existing studies and reports, and the evaluation of various structural and non-structural mitigation measures, the Parish proposes that mitigation measures be implemented for Subarea 4. The table below examines past and current mitigation actions in this area.

RECOMMENDATIONS

Jefferson Parish should continue to encourage everyone to pursue mitigation measures and assist interested property owners in applying for a mitigation grant. The Parish should address street drainage in order to improve the drainage in the study area, seek out and secure funding for the drainage improvements outlined in this report, and institute a maintenance program that encourages homeowners to frequently clear their catch basin inlets of debris to ensure open flow for stormwater. The Parish should also continue to improve its CRS classification and adopt this Repetitive Loss Area Analysis according to the process detailed in the CRS Coordinator's Manual.

For the residents of the study area, they should contact Jefferson Parish for more information about possible funding opportunities and site visits to determine remedial measures. Review the alternative mitigation measures discussed in this analysis and implement those that are most appropriate for their situation. Purchase and maintain a flood insurance policy on the home and its contents.

Jefferson Parish recommends the following mitigation actions:

MITIGATION ACTION 1:

Property owners should obtain and keep a flood insurance policy on their structures (building and contents coverage). The Parish will continue on an **annual basis** to target all properties in the repetitive loss area reminding them of the advantages to maintaining flood insurance through its annual outreach effort.

RESPONSIBILITY

The Floodplain Management and Hazard Mitigation Department will provide the most relevant up-to-date flood insurance information to all property owners within the repetitive loss areas located in this area.

FUNDING

The cost will be paid for from the department's operating budget.

MITIGATION ACTION 2:

When appropriate, property owners should consider floodproofing measures such as flood gates or shields, flood walls, and hydraulic pumps.

RESPONSIBILITY

The Floodplain Management and Hazard Mitigation department will promote effective flood protection measures and provide advice and assistance to property owners who may wish to implement such

measures in an **on-going** program.

FUNDING

The cost will be paid for by individual property owners. Advice and assistance will require staff time which will be covered in the department's annual budget.

MITIGATION ACTION 3:

Continue elevation or reconstruction mitigation of high-risk flood-prone properties. The highest priorities are properties at the greatest flood risk and where drainage improvements will not provide an adequate level of protection.

RESPONSIBILITY

The Floodplain Management and Hazard Mitigation department will continue to target the most at risk properties for grant applications.

FUNDING

Construction cost would be covered with FEMA or ICC funds. Staff time to develop the list of target properties will require funds from the department's operating budget.

MITIGATION ACTION 4:

Prioritize CIP projects to focus on drainage improvement projects in those basins containing repetitive loss areas.

RESPONSIBILITY

The Parish's Drainage Department in conjunction with the Engineering Department.

FUNDING

Bond funds or state grants.

MITIGATION ACTION 5:

Encourage property owners to elevate inside and outside mechanical equipment above the BFE and install flood resistant materials in crawl spaces.

RESPONSIBILITY

The Floodplain Management and Hazard Mitigation Department will promote effective flood protection measures and provide advice and assistance to property owners who may wish to implement such measures in an **on-going** program.

FUNDING

The cost will be paid for by individual property owners. Advice and assistance will require staff time which will be covered in the department's annual budget.

SUBAREA 5

Metairie Mason Subdivision

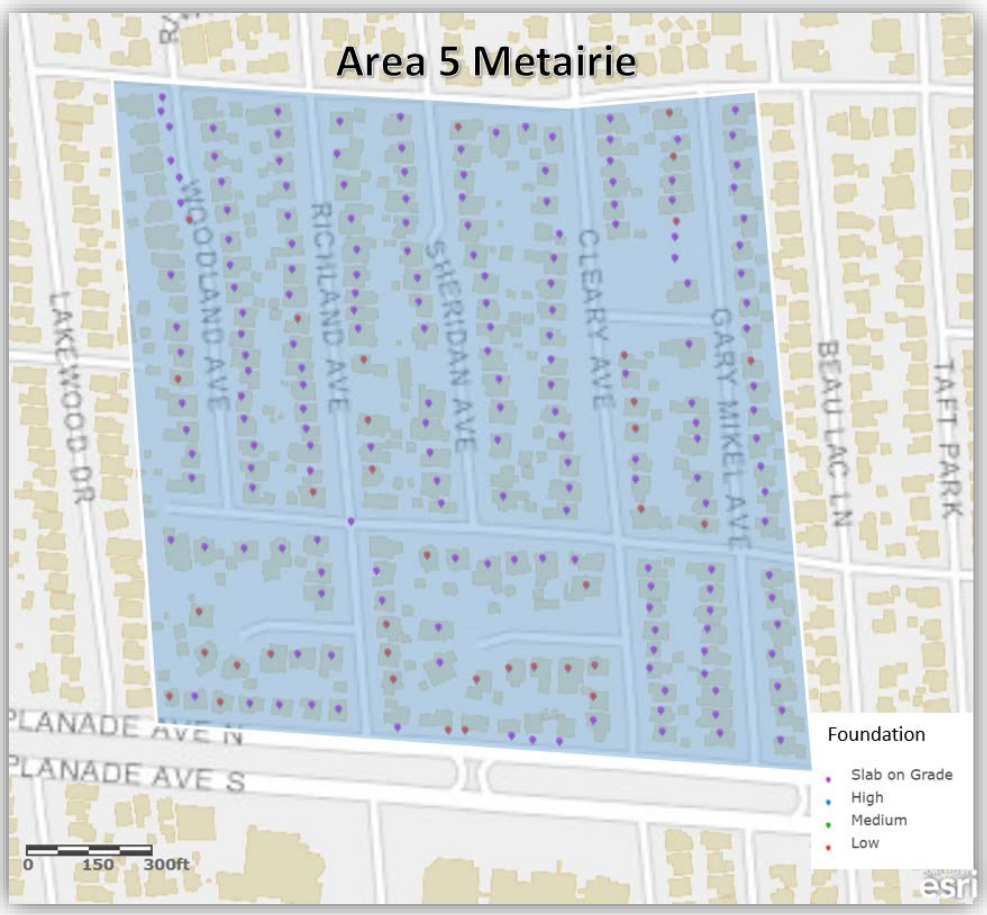
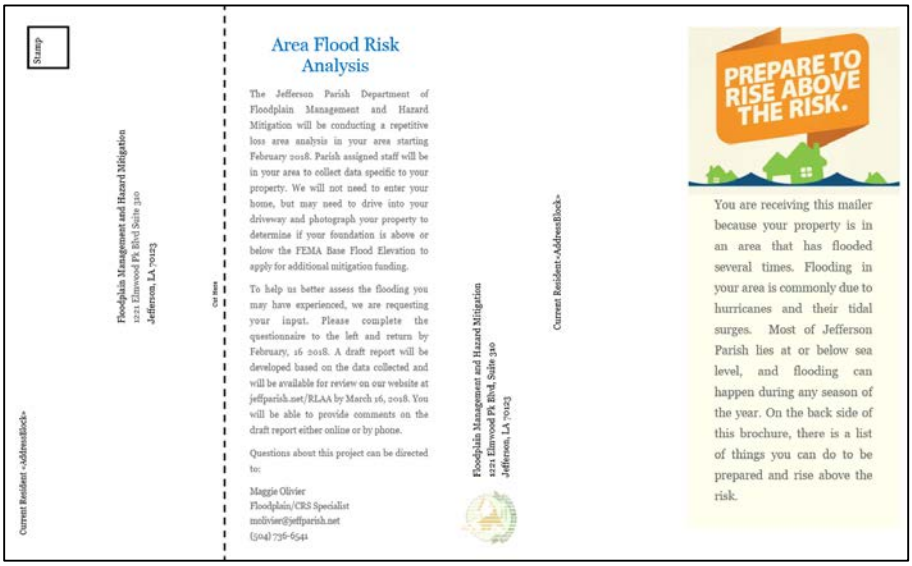


Figure 5- 1 Outline of Subarea 5

STEP 1. ADVISE ALL PROPERTY OWNERS

Before field work began on the RLAA, individual notices were mailed to property owners within the 5 identified Repetitive Loss subareas. The notices advised properties owners about the analysis and requested their input on the flooding problem in their area and mitigation actions taken. The notice also advised property owners how they could provide comments on the draft report once it was posted online.

Subarea 5: A property owner notice with questionnaire was mailed to 225 residents in Subarea 5 the week of January 29, 2018.


Stamp

Current Resident <<AddressBlock>>

Floodplain Management and Hazard Mitigation
1221 Elmwood Pk Blvd Suite 310
Jefferson, LA 70123

Area Flood Risk Analysis

The Jefferson Parish Department of Floodplain Management and Hazard Mitigation will be conducting a repetitive loss area analysis in your area starting February 2018. Parish assigned staff will be in your area to collect data specific to your property. We will not need to enter your home, but may need to drive into your driveway and photograph your property to determine if your foundation is above or below the FEMA Base Flood Elevation to apply for additional mitigation funding.

To help us better assess the flooding you may have experienced, we are requesting your input. Please complete the questionnaire to the left and return by February, 16 2018. A draft report will be developed based on the data collected and will be available for review on our website at jeffparish.net/RLAA by March 16, 2018. You will be able to provide comments on the draft report either online or by phone.

Questions about this project can be directed to:

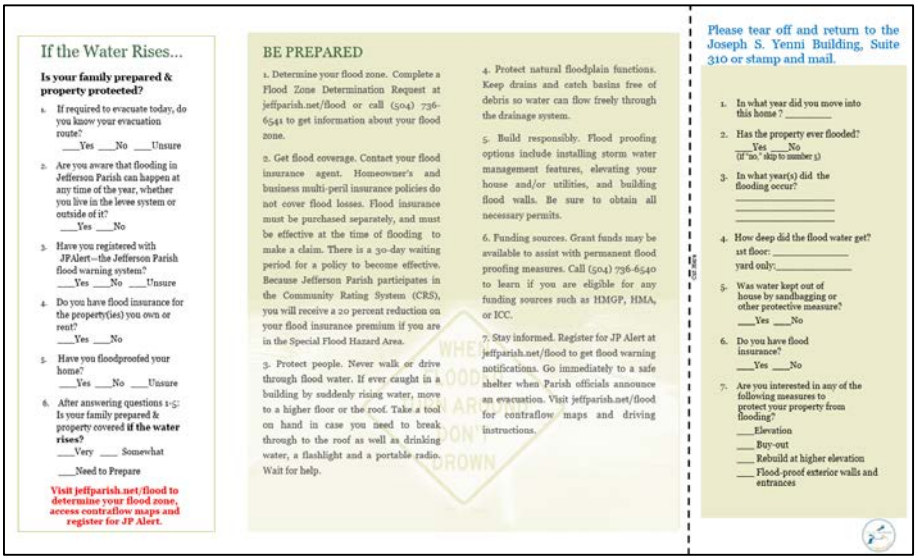
Maggie Olivier
Floodplain/CRS Specialist
molivier@jeffparish.net
(504) 736-6541

Floodplain Management and Hazard Mitigation
1221 Elmwood Pk Blvd, Suite 310
Jefferson, LA 70123

Current Resident <<AddressBlock>>

You are receiving this mailer because your property is in an area that has flooded several times. Flooding in your area is commonly due to hurricanes and their tidal surges. Most of Jefferson Parish lies at or below sea level, and flooding can happen during any season of the year. On the back side of this brochure, there is a list of things you can do to be prepared and rise above the risk.

Figure 5- 2 Front of Notice


If the Water Rises...

Is your family prepared & property protected?

1. If required to evacuate today, do you know your evacuation route?
   ___Yes ___No ___Unsure
2. Are you aware that flooding in Jefferson Parish can happen at any time of the year, whether you live in the levee system or outside of it?
   ___Yes ___No
3. Have you registered with JPAlert—the Jefferson Parish flood warning system?
   ___Yes ___No ___Unsure
4. Do you have flood insurance for the property(ies) you own or rent?
   ___Yes ___No
5. Have you floodproofed your home?
   ___Yes ___No ___Unsure
6. After answering questions 1-5: Is your family prepared & property covered **if the water rises?**
   ___Very ___ Somewhat
   ___Need to Prepare

Visit jeffparish.net/flood to determine your flood zone, access contraflow maps and register for JP Alert.

BE PREPARED

1. Determine your flood zone. Complete a Flood Zone Determination Request at jeffparish.net/flood or call (504) 736-6541 to get information about your flood zone.

2. Get flood coverage. Contact your flood insurance agent. Homeowner's and business multi-peril insurance policies do not cover flood losses. Flood insurance must be purchased separately, and must be effective at the time of flooding to make a claim. There is a 30-day waiting period for a policy to become effective. Because Jefferson Parish participates in the Community Rating System (CRS), you will receive a 20 percent reduction on your flood insurance premium if you are in the Special Flood Hazard Area.

3. Protect people. Never walk or drive through flood water. If ever caught in a building by suddenly rising water, move to a higher floor or the roof. Take a tool on hand in case you need to break through to the roof as well as drinking water, a flashlight and a portable radio. Wait for help.

4. Protect natural floodplain functions. Keep drains and catch basins free of debris so water can flow freely through the drainage system.

5. Build responsibly. Flood proofing options include installing storm water management features, elevating your house and/or utilities, and building flood walls. Be sure to obtain all necessary permits.

6. Funding sources. Grant funds may be available to assist with permanent flood proofing measures. Call (504) 736-6540 to learn if you are eligible for any funding sources such as HMGP, HMA, or ICC.

7. Stay informed. Register for JP Alert at jeffparish.net/flood to get flood warning notifications. Go immediately to a safe shelter when Parish officials announce an evacuation. Visit jeffparish.net/flood for contraflow maps and driving instructions.

Please tear off and return to the Joseph S. Yenni Building, Suite 310 or stamp and mail.

1. In what year did you move into this home ? _____
2. Has the property ever flooded?
   ___Yes ___No
   (If "no," skip to number 5)
3. In what year(s) did the flooding occur?
   _____
   _____
   _____
4. How deep did the flood water get?
   1st floor: _____
   yard only: _____
5. Was water kept out of house by sandbagging or other protective measure?
   ___Yes ___No
6. Do you have flood insurance?
   ___Yes ___No
7. Are you interested in any of the following measures to protect your property from flooding?
   ___Elevation
   ___Buy-out
   ___Rebuild at higher elevation
   ___Flood-proof exterior walls and entrances

Figure 5- 3 Back of Notice with Questionnaire

QUESTIONNAIRE RESPONSES SUBAREA 5

Out of the 225 mailed questionnaires, Jefferson Parish received 23 responses which corresponds to a response rate of approximately 3 percent. Questionnaire responses are summarized below. Note: respondents may have skipped questions and/or provided more than one response to a question. Two (2) addresses were undeliverable and three (3) properties were vacant.

Q1: In what year did you move into this home?

Responses Received	Percentage	Number Responding
<10 years ago	7	**1**
10-20 years ago	14	**2**
20-30 years ago	7	**1**
30-40 years ago	21	**3**
40-50 years ago	50	**7**
> 50 years ago	--	**None**
Total	**100**	**14**

Q2: Has the property ever been flooded?

Answer Choices	Percentage	Number
No	--	**None**
Yes	100	**14**
Don't know	--	**None**
Total	**100**	**14**

Q3: In what year(s) did it flooding occur?

Responses Received	Percentage	Number
2005	100	**14**
Total	**100**	**14**

Q4: How deep did the water get?

Answer Choices	Percentage	Number Responding	Depth	
			< 3 ft	> 3 ft
First floor	93	13	10	**None**
Yard only	7	1		**None**
Total	**100**	**14**	**10**	**None**

Q5: Was water kept out of the house by sandbagging or other protective measures?

Answer Choices	Percentage	Number Responding
No	92	**12**
Yes	8	**1**
Total	**100**	**13**

Q6: Do you have Flood Insurance?

Answer Choices	Percentage	Number Responding
No	None	**None**
Yes	100	**14**
Total	**100**	**14**

Q7: Are you interested in protecting your property from flooding?

Answer Choices	Percentage	Number Responding
No	--	**None**
Yes	100	**13**
Total	**100**	**13**

The following trends in survey responses should be considered when evaluating mitigation measures for Subarea 5:

- All respondents are interested in protecting their home/building from flooding. This could indicate trust in Jefferson Parish and interest in installing floodproofing measures. A respondent mentioned that elevation is an expensive mitigation measure.
- All respondents in this subarea currently have FEMA flood insurance.
- Ninety-two (92) percent of the respondents mentioned that none of the protective measures helped to keep the water out of the house during Hurricane Katrina.

- Two of the respondents mentioned that the flooding in the neighborhood was mainly due to pump failure during the Hurricane Katrina.
- Half of the respondents have been residing in the area for the last 50 years.
- The majority (93 percent) of flooding has been over the first floor of the home with less than 3 feet in depth. Seven percent of the respondents mentioned that the flooding occurred only in their yard.
- The years with the largest number of reported flooding incidents is 2005. The following flood event are detailed in NOAA's National Climatic Data Center (NCDC) database:

> **August 29, 2005** – The Category 3 hurricane Katrina caused catastrophic damage along the Gulf coast from central Florida to Texas, much of it due to the storm surge and levee failure. Severe property damage occurred in coastal areas, such as Mississippi beachfront towns where boats and casino barges rammed buildings, pushing cars and houses inland; water reached 6–12 miles (10–19 km) from the beach. The storm was the third most intense United States land falling tropical cyclone, behind the 1935 Labor Day hurricane and Hurricane Camille in 1969. Overall, at least 1,245 people died in the hurricane and subsequent floods, making it the deadliest United States hurricane since the 1928 Okeechobee hurricane. Total property damage was estimated at $125 billion (2005 USD), roughly four times the damage wrought by Hurricane Andrew in 1992 in the United States.

STEP 2. CONTACT AGENCIES AND ORGANIZATIONS

Jefferson Parish Department of Hazard Mitigation and Floodplain Management contacted external agencies and internal departments that have plans or studies that could affect the cause or impacts of flooding within the identified repetitive loss subareas. The data collected was used to analyze the problems further and to help identify potential solutions and mitigation measures for property owners. The agencies contacted and reports which were analyzed and reviewed are as follows:

Agencies

- Jefferson Parish Electronic Information System Department
- Jefferson Parish Streets Department
- Jefferson Parish Office of Risk Management
- Jefferson Parish Drainage Department

Reports

- FEMA – Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) for Jefferson Parish, February 2, 2018
- ISO – Repetitive Flood Insurance Claims Data
- Jefferson Parish Hazard Mitigation Plan

SUMMARY OF STUDIES AND REPORTS

FEMA FLOOD INSURANCE STUDY (FIS) AND FLOOD INSURANCE RATE MAP (FIRM)

FEMA's FIS for Jefferson Parish, LA is dated February 2, 2018. The FIS revises and updates information on the existence and severity of flood hazards within the Parish. The FIS also includes revised digital Flood Insurance Rate Maps (FIRMs) which reflect updated Special Flood Hazard Areas (SFHAs) and flood zones for the Parish. SFHA boundaries within the Parish were updated due to new detailed coastal analyses which were performed by the USACE-MVN, for FEMA. This study also incorporates the Hurricane Storm Damage Risk Reduction System (HSDRRS) completed by the USACE. Finally, these maps depict the potential for flooding and are the basis for building requirements and flood insurance rates.

FLOOD INSURANCE CLAIMS DATA

The Privacy Act of 1974 (5 U.S.C. 522a) restricts the release of flood insurance policy and claims data to the public. This information can only be released to state and local governments for the use in floodplain management related activities. Therefore all claims data in this report are only discussed in general terms.

JEFFERSON PARISH HAZARD MITIGATION PLAN

The purpose of a mitigation plan is to rationalize the process of determining appropriate hazard mitigation actions. The document includes a detailed description of natural hazards in Jefferson Parish; a risk assessment that describes potential losses to physical assets, people and operations; a set of goals, objectives, strategies and actions that will guide the Parish's mitigation activities, and a detailed plan for implementing and monitoring the Plan. This Plan identified 12 hazards and included a risk assessment of the four hazards with the highest potential for damaging physical assets, people and operations in Jefferson Parish. These hazards are floods, hurricanes and tropical storms, storm surge, and tornadoes. Both the risk assessment section and goals sections reflect this emphasis, which was the result of careful consideration and a numerical ranking process carried out by the Mitigation Planning Team (MPT).

STEP 3. BUILDING DATA COLLECTION

The on-site field survey for this analysis was conducted over multiple days between the months of October 2017 and January 2018.The Collector App through ESRI was utilized to save field data from the site visits. In addition, multiple site photos were taken of each structure on the property. Photos were also taken of current drainage features and mitigation and floodproofing measures if evident from street or parking lot views. The following information was recorded for each property:

Table 5- 1

Structure		Foundation		Type	
No structure	2	Slab on grade	188	Residential	225
Occupied	223	Low (less than 2ft.)	36	Non-residential	none
Vacant	none	Medium	none		
		High	none		

COLLECTOR FOR ARCGIS (ESRI)

Jefferson Parish used the ESRI Collector Application in order to be able to store and spatially view repetitive loss data for the Parish. The Collector App contains all field data collected by parcels for RLAA including pictures of each structure on the parcel. The data is stored in ArcGIS and is used for internal review and continued analysis of repetitive flood loss areas.

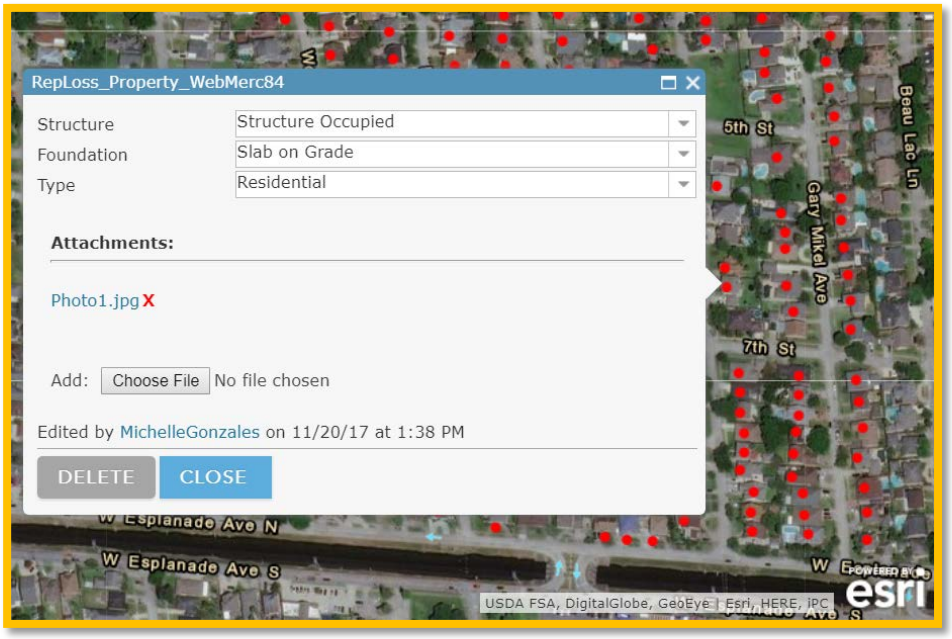


Figure 5- 4 Collector Application Sample

SUBAREA 5-METAIRIE MASON SUBDIVISION

Metairie Mason Subdivision is located on the Eastbank of Mississippi River within the New Orleans-Metairie-Kenner. Metropolitan Statistical Area and falls under both Zone X (levee protected) and Zone AE. The ground elevation is approximately -5 NAVD in this subarea.

Excessive runoff from heavy rainfall causes flooding of urban areas, highways, main streets, as well as other low-lying spots in this area. Quick heavy rains oftentimes results in overwhelming the existing pumping infrastructure and causing widespread street flooding. According to the officials, the pump system in this area is designed to handle an inch/ hour and half-inch in the next hour. Therefore, any event causing rainfall over an inch can result into over working of the pump systems to clear water in the area. There is a lack in vital infrastructure such as pump stations, utilities and drainage that meet the contemporary standards so that the community can thrive.

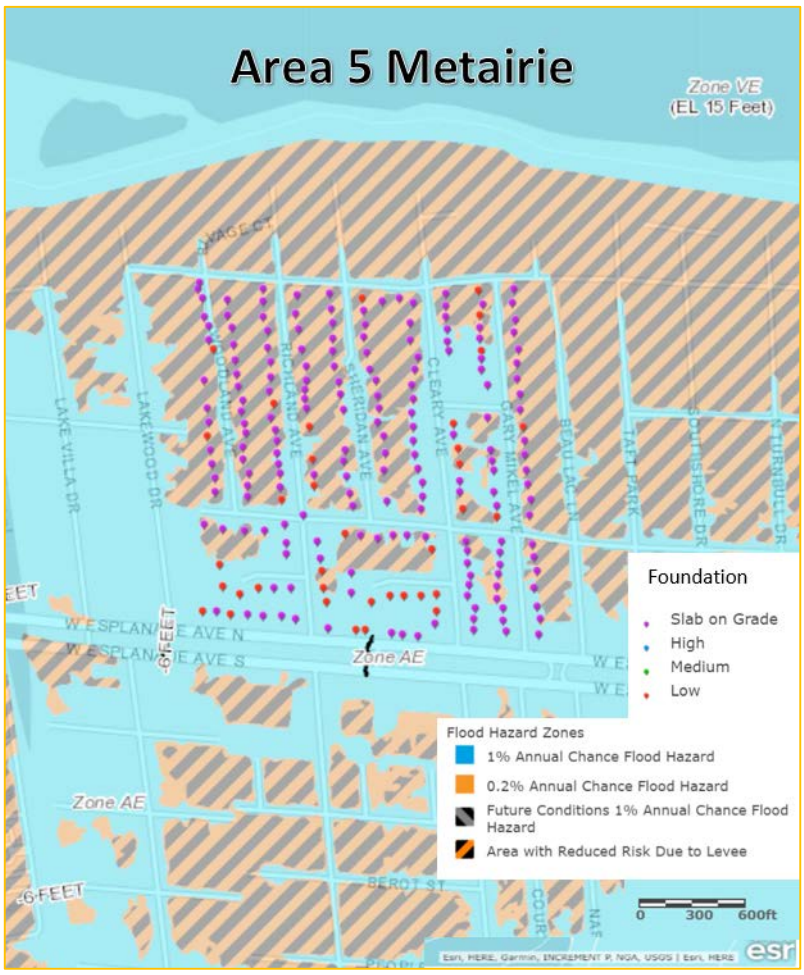


Figure 5- 5 2018 Effective FIRM for Subarea 5

In accordance with FEMA publication *551 Selecting Appropriate Mitigation Measures for Floodprone Structures*, mitigation options are discussed. The approach to reducing repetitive flooding in Subarea 5 will require a combination of floodproofing techniques, education, and drainage improvement projects.

CLAIMS DATA:

In total, 225 homes have made 16 claims since 1978. Of those 225 homes, 7 homes, or 44 percent, made at least one claim during Hurricane Katrina. The rest of the claims (9 homes or 56 percent) are from relatively small rainfall events that affected between 1 -5 homes. In analyzing the claims data, it could be derived that the area experiences most flooding from rainfall events. Hurricane Katrina was the only hurricane that had resulted in maximum number of claims in the area (see graph below, Table 5-2).

There are 16 properties within the 225 property study area that qualify as repetitive loss. All of them are repetitive flood loss properties with 16 flood claims totaling $1,234,991. The average claim in the area is $77,186. If less than 50% of the home is damaged, it will not be subject to the substantial improvement requirements.

The severe repetitive loss homes are similar to the other homes on their block and are on separate streets. They have each flooded more than 1 time, and all of them flooded during most of the heavy rainfall events in the area.

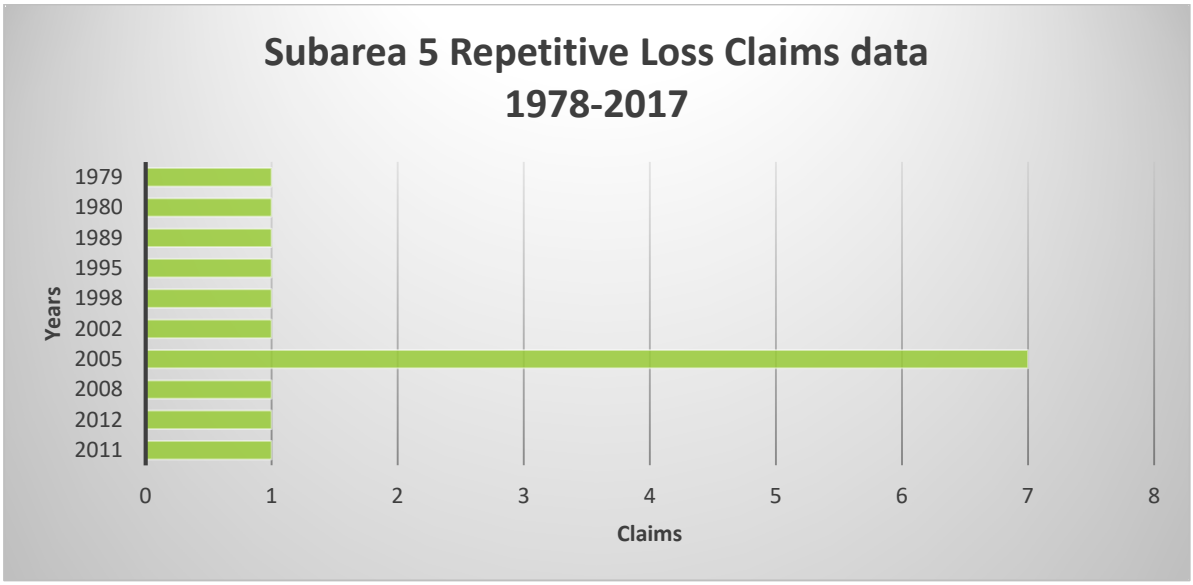


Table 5- 2

FIELD DATA:

The on-site field survey for this analysis was conducted over multiple days between the months of October 2017 and January 2018. The team collected information such as the type and height of the foundation, occupancy status of the structure, and use of the structure.

A majority of the structures are on slab on grade (approximately 188 or 84%). About 16 percent (36) of the structures are low (less than 2 feet). About 1 percent structures' elevation could not be determined. It could be evaluated that although most of the structures in the subarea are slab on grade, there has been damage to the other properties due to flooding form several hurricane and rain events.

The project team observed that majority (223 or 99 percent) of the structures in the area were occupied, while approximately 2 (1.2 percent) had no structure. Also, all the structures are of residential use.

In conclusion, it should be noted that given the geographic location of Subarea 5, all of the properties are inside levee protection. Majority of the properties are built on slab at the grade, therefore, a heavy rain event can cause substantial damage to the properties.

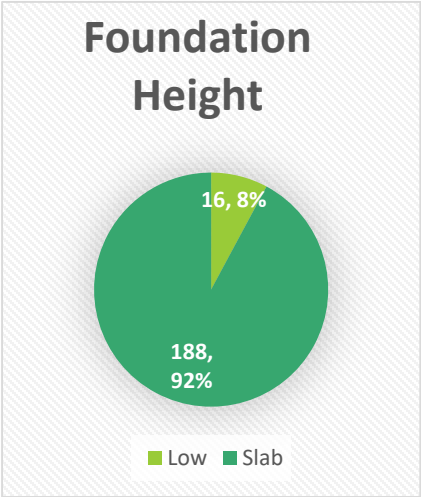


Table 5- 3

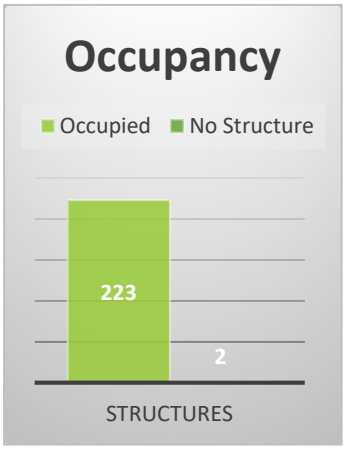


Table 5- 4

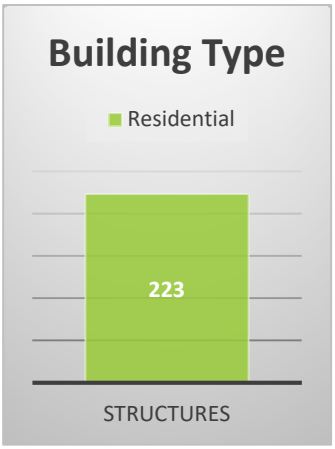


Table 5- 4

Figure 5- 6 Sample Slab on Grade Property in Subarea 5

Figure 5- 7 Sample Property in Subarea 5

STEP 4. REVIEW ALTERNATIVE MITIGATION APPROACHES

There are many ways to protect a property from flood damage. Different measures are appropriate for different flood hazards, building types and building conditions. The figure below, found in the *2017 CRS Coordinator's Manual*, lists typical property protection measures.

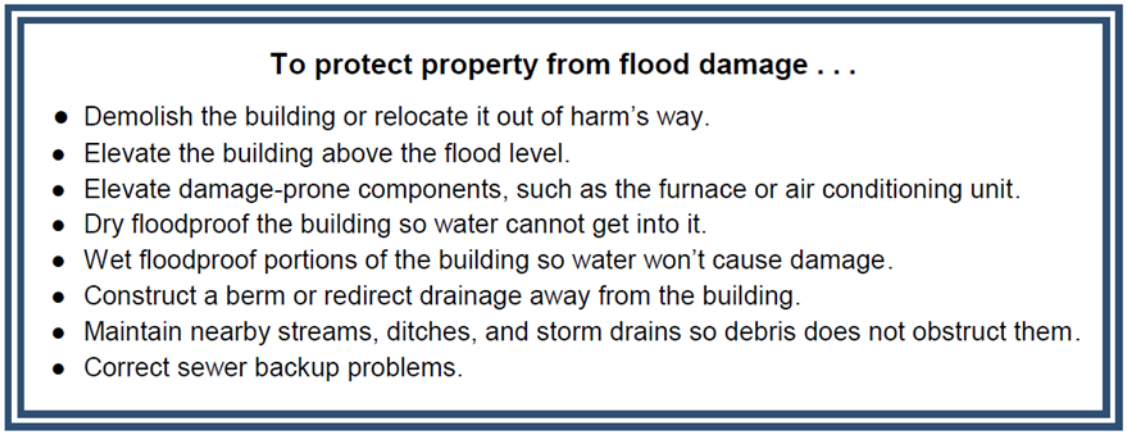


Figure 5- 8 Typical Property Protection Measures

Mitigation measures should fall into one of the mitigation categories listed below which are based on the Community Rating System planning process:

- Prevention
- Property Protection
- Natural Resource Protection
- Emergency Services
- Structural Projects
- Public Information and Outreach

MITIGATION FUNDING

There are several types of mitigation measures, listed in the table below, which can be considered for each repetitive loss property. Each mitigation measure qualifies for one or more grant programs. Depending on the type of structure, severity of flooding and proximity to additional structures with similar flooding conditions, the most appropriate measure can be determined. In addition to these grant funded projects, several mitigations measures can be taken by the homeowner to protect their home.

Table 5- 5

Types of Projects Funded	HMGP	FMA	PDM	ICC	SBA
Acquisition of the entire property by govt agency	✔	✔	✔		
Relocation of the building to a flood free site	✔	✔	✔	✔	✔
Demolition of the structure	✔	✔	✔	✔	✔
Elevation of the structure above flood levels	✔	✔	✔	✔	✔
Replacing the old building with a new elevated one	✔	✔	✔	✔	✔
Local drainage and small flood control projects	✔	✔	✔		
Dry floodproofing (non-residential only)	✔	✔	✔		
Percent paid by Federal program	75%	75%, 90%, or 100%	75%	Up to $30K	

There are several possible sources of funding for mitigation projects:

- **FEMA grants**: Most of the FEMA programs provide 75% of the cost of a project. In most communities, the 25% non-FEMA share is paid by the benefitting property owner. Each program has different Congressional authorization and slightly different rules.
  - **The Hazard Mitigation Grant Program (HMGP)**: The HMGP provides grants to States and local governments to implement long-term hazard mitigation measures after a major disaster declaration. Projects must provide a long-term solution to a problem (e.g., elevation of a home to reduce the risk of flood damages as opposed to buying sandbags and pumps to fight the flood). Examples of eligible projects include acquisition and elevation, as well as local drainage projects.
  - **The Flood Mitigation Assistance Program (FMA)**: FMA funds assist States and communities in implementing measures that reduce or eliminate the long-term risk of flood damage to structures insured under the NFIP. Project Grants to implement measures to reduce flood losses, such as elevation, acquisition, or relocation of NFIP-insured structures. States are encouraged to prioritize FMA funds for applications that include repetitive loss properties; these include structures with 2 or more losses each with a claim of at least $1,000 within any ten-year period since 1978.
  - **Pre-Disaster Mitigation Program (PDM)**: The Pre-Disaster Mitigation (PDM) program provides funds to states, territories, Indian tribal governments, communities, and universities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. For more information visit http://www.fema.gov/government/grant/pdm/index.shtm.

- **Flood insurance**: There is a special funding provision in the National Flood Insurance Program (NFIP) for insured buildings that have been substantially damaged by a flood, “Increased Cost of Compliance.” ICC coverage pays for the cost to comply with floodplain management regulations after a flood if the building has been declared substantially damaged. ICC will pay up to $30,000 to help cover elevation, relocation, demolition, and (for nonresidential buildings) floodproofing. It can also be used to help pay the 25% owner’s share of a FEMA funded mitigation project.

The building's flood insurance policy must have been in effect during the flood. This payment is in addition to the damage claim payment that would be made under the regular policy coverage, as long as the total claim does not exceed $250,000. Claims must be accompanied by a substantial or repetitive damage determination made by the local floodplain administrator. For more information, contact your insurance agent or visit: www.fema.gov/plan/prevent/floodplain/ICC.shtm.

Coverage under the ICC does have limitations: It covers only damage caused by a flood, as opposed to wind or fire damage. The building's flood insurance policy must have been in effect during the flood. ICC payments are limited to $30,000 per structure Claims must be accompanied by a substantial or repetitive damage determination made by the local floodplain administrator and the structure must be in an AE zone.

The average claims payment in the study area is $77,186. With an average claim of that amount, it is not likely that many homes in the study area would sustain substantial damage from a flood event. Homeowners should make themselves aware of the approximate value of their homes, and in the case of incurring flood damage, be aware of the need for a substantial damage declaration in order to receive the ICC coverage.

Alternative language adopted into the local floodplain management ordinance would enable residents with shallower flooding to access ICC funding. Since local ordinances determine the threshold at which substantial damage and/or repetitive claims are reached, adopting language that would lower these thresholds would benefit the homeowners of repetitive loss properties. Adopting alternative language allows for cumulative damages to reach the threshold for federal mitigation resources more quickly, meaning that some of the properties in Jefferson Parish that sustain minor damage regularly would qualify for mitigation assistance through ICC.

- Rebates: A rebate is a grant in which the costs are shared by the homeowner and another source, such as the local government, usually given to a property owner after a project has been completed. Many communities favor it because the owner handles all the design details, contracting, and payment before the community makes a final commitment. The owner ensures that the project meets all of the program's criteria, has the project constructed, and then goes to the community for the rebate after the completed project passes inspection.

Rebates are more successful where the cost of the project is relatively small, e.g., under $5,000, because the owner is more likely to be able to afford the bulk of the cost. The rebate acts more as an incentive, rather than as needed financial support.

- Small Business Administration Mitigation Loans: The Small Business Administration (SBA) offers mitigation loans to SBA disaster loan applicants who have not yet closed on their disaster loan. Applicants who have already closed must demonstrate that the delay in application was beyond their control.

For example mitigation loans made following a flood can only be used for a measure to protect against future flooding, not a tornado. If the measure existed prior to the declared disaster, an SBA mitigation loan will cover the replacement cost. If the measure did not exist prior to the declared disaster the mitigation loan will only cover the cost of the measure if it is deemed absolutely necessary for repairing the property by a professional third-party, such as an engineer.

MITIGATION ALTERNATIVES

The majority of the flooding in this area is considered “nuisance” flash flooding that causes minimal damage but does require costly cleanup and numerous street closures due to floodwaters overtopping the roadway.

Flooding in this area can be attributed to its flat topography, aging stormwater infrastructure and proximity between the Mississippi River Levee, Jefferson Hwy, and the railroad tracks. Flash flooding can occur when the capacity of the drainage system is exceeded or if conveyance is obstructed by debris, sediment and other materials that limit the volume of drainage. Heavy rains within a short period of time have caused the drainage system to be inundated an unable to keep up resulting in ponding water in streets and homes.

Improving the drainage system can eliminate some road and home inundation in this area. These structural methods require large capital expenditures and cooperation from private property owners. Promoting floodproofing techniques and increasing public education and awareness of the flood hazards can be the next best alternative for property owners in this area. The Parish’s websites, e-mail distribution lists, press releases and variable message boards can provide benefit to business owners and residents.

POTENTIAL MITIGATION MEASURES

Structural Alternatives:

- **Elevate** structures and damage-prone components, such as the water heater or air conditioning unit, above the base flood elevation BFE.
- **Dry floodproofing** can be done on commercial structures and even residential structures; however, in many instances this requires human intervention to complete the measure and ensure success. For example, installing watertight shields over doors or windows requires timely action by the homeowner; especially in a heavy rainfall event.
- **Wet floodproofing** a structure involves making the uninhabited portions of the structure resistant to flood damage and allowing water to enter during flooding. For example, in a basement or crawl space, mechanical equipment and ductwork would not be damaged.
- **Acquire and/or relocate** properties/target abandoned properties or locations that would provide a public benefit as the location will need to be maintained by the Parish in perpetuity.
- **Increase the size of culverts** under Jefferson Hwy to allow for increased capacity.
- **Implement drainage** i**mprovements** such as increasing capacity in the system (up-sizing pipes) and provide additional inlets to receive more stormwater.
- Improve stormwater system maintenance program to ensure inlets and canals are free of clogging debris.

Non Structural Alternatives:

- **Relocate internal supplies**, products/goods, belongings above the flooding depth.
- Improve the Parish’s floodplain and zoning ordinances.
- **Provide public education** through posting information about local flood hazards on Parish website, posting signs at various locations in neighborhoods or discussing flood protection measures at local neighborhood association meetings.
- Promote the purchase of flood insurance.
- Continue coordination with GOHSEP, the National Weather Service (NWS), and United States Geological Survey (USGS) to enhance flood warning system, including the use of rain/stream

gauges, to provide greater warning time for citizens. NWS can use the real- time data collected to issue timely warnings.

COST AND BENEFITS OF MITIGATION MEASURES

Knowing the flooding history, type, and condition of the buildings in the area, leads to the fourth step in the area analysis procedure – a review of alternative mitigation approaches to protect properties from, or reduce, future flood damage. Property owners should look at these alternatives but understand they are not all guaranteed to provide protection at different levels of flooding. Six approaches were reviewed:

- Elevating the houses above the 1% annual flood level
- Acquisition
- Floodproofing
- Drainage improvements

ELEVATION

Raising the structure above the flood level is generally viewed as the best flood protection measure, short of removing the building from the floodplain. All damageable portions of the building and its contents are high and dry during a flood, which flows under the building instead of into the house. Houses can be elevated on fill, posts/piles, or a crawlspace.

- A house elevated on fill requires adding a specific type of dirt to a lot and building the house on top of the added dirt.
- A house elevated on posts/piles is either built or raised on a foundation of piers that are driven into the earth and rise high enough above the ground to elevate the house above the flow of flood water or the design flood elevation.
- A house elevated on a crawlspace or enclosure is built or raised on a continuous wall-like foundation that elevates the house above the design flood level. It is important to include vents or openings in the walls below the design flood level that are appropriately sized: one square inch for each square foot of the crawlspace or enclosures footprint. Additionally all materials below the design flood level must be flood resistance and all machinery, equipment, and plumbing must be above the design flood level.
    - Cost: A majority of the cost to elevate a building is in the preparation and foundation construction. The cost to elevate six feet is little more than the cost to go up two feet. Elevation is usually cost-effective for wood frame buildings on posts/piles or crawlspace because it is easiest for lifting equipment to be used under the floor and disruption to the habitable part of the house is minimal. Elevating a slab house is much more costly and disruptive. In Subarea 5, 84% percent of the houses in the study area are on a slab. The actual cost of elevating a particular building depends on factors such as its condition, whether it is masonry or brick faced, and if additions have been added on over time. While the cost of elevating a home can be high, there are funding programs that can help. The usual arrangement is for a FEMA grant to pay 75% of the cost while the owner pays the other 25%. In the case of elevating a slab foundation, the homeowner's portion could be as high as $50,000 or more. In some cases, assistance can be provided by Increased Cost of Compliance (ICC) funds or state funds.

- Feasibility: Federal funding support for an elevation project requires a study that shows that the benefits of the project exceed the cost of the elevation. Project benefits include savings in insurance claims paid on the structure. Elevating a masonry or a slab home can cost up to $300,000, which means that benefit/cost ratios may be low. Looking at each property individually could result in funding for the worst case properties, i.e., those that are the lowest below the base flood elevation, subject to the most frequent flooding, and in good enough condition to elevate.

Advantages	Disadvantages
● **Elevating to or above the BFE allows a substantially damaged or substantially improved house to be brought into compliance.** ● **Often reduces flood insurance premiums.** ● **May be fundable under FEMA mitigation grant programs.**	● **Cost may be prohibitive.** ● **The appearance of the structure and access to it may be adversely affected.** ● **May require property owner cooperation and right-of-way acquisition.** ● **May require road or walkway closures during construction.**

Table 5- 7 Advantages and Disadvantages of Elevation

ACQUISITION:

This measure involves buying one or more properties and clearing the site (demolishing the building). If there is no building subject to flooding, there is no flood damage. Acquisitions are usually recommended where the flood hazard is so great or so frequent that it is not safe to leave the structure on the site.

An alternative to buying and clearing the whole subdivision is buying out individual, "worst case," structures with FEMA funds.

- Cost: This approach would involve purchasing and clearing the lowest or the most severe repeatedly flooded homes. If FEMA funds are to be used, three requirements will apply:
  - The applicant for FEMA must demonstrate that the benefits exceed the costs, using FEMA's one of FEMA's approved Benefit Cost methodologies.
  - The owner must be a willing seller.
  - The parcel must be deeded to a public agency that agrees to maintain the lot and keep it forever as open space.

- Feasibility: Due to the high cost and difficulty to obtain a favorable benefit-cost ratio in shallow flooding areas, acquisitions are reserved for the worst case buildings. Not everyone wants to sell their home, so a checkerboard pattern of vacant and occupied lots often remains after a buyout project, leaving "holes" in the neighborhood. There is no reduction in expenses to maintain the neighborhood's infrastructure for the Parish, although the tax base is reduced. The vacant lots must be maintained by the new owner agency, and additional expense is added to the community. If the

lot is only minimally maintained, its presence may reduce the property values of the remaining houses. Jefferson Parish is not considering acquisitions at this time for the above reasons.

Advantages	Disadvantages
• **Permanently removes problem since the structure no longer exists.** • **Allows a substantially damaged or substantially improved structure to be brought into compliance with the community's floodplain management ordinance or law.** • **Expands open space and enhances natural and beneficial uses.** • **May be fundable under FEMA mitigation grant programs.**	• **Cost may be prohibitive.** • **Resistance may be encountered by local communities due to loss of tax base, maintenance of empty lots, and liability for injuries on empty, community-owned lots.**

Table 5- 8 Advantages and Disadvantages of Acquisition

There are 3 criteria that must be met for FEMA to fund an acquisition project:

- The local community must inform the property owners interested in the acquisition program that the community will not use condemnation authority to purchase their property and that the participation in the program is strictly voluntary,
- The subsequent deed to the property to be acquired will be amended such that the landowner will be restricted from receiving any further Federal disaster assistance grants, the property shall remain in open space in perpetuity, and the property will be retained in ownership by a public entity, and
- Any replacement housing or relocated structures will be located outside the 100-year floodplain.

FLOODPROOFING

This measure keeps floodwaters out of a building by modifying the structure. Walls are coated with waterproofing compounds or plastic sheeting. Openings (i.e. doors, windows, and vents) are closed either permanently, or temporarily with removable shields or sandbags.

- Make the walls watertight. This is easiest to do for masonry or brick faced walls. The brick or stucco walls can be covered with a waterproof sealant and bricked or stuccoed over with a veneer to camouflage the sealant. Houses with wood, vinyl, or metal siding need to be wrapped with plastic sheeting to make walls watertight, and then covered with a veneer to camouflage and protect the plastic sheeting. Provide closures, such as removable shields or sandbags, for the openings; including doors, windows, dryer vents and weep holes. There must also be an account for sewer backup and other sources of water entering the building. For shallow flood levels, this can be done with a floor drain plug or standpipe; although a check valve system is more secure.

- Dry floodproofing employs the building itself as part of the barrier to the passage of floodwaters, and therefore this technique is only recommended for buildings with slab foundations that are not cracked. The solid slab foundation prevents floodwaters from entering a building from below. Also, even if the building is in sound condition, tests by the Corps of Engineers have shown that dry floodproofing should not be used for depths greater than three feet above the first floor, because water pressure on the structure can collapse the walls and/or buckle the floor.

- Dry floodproofing is a mitigation technique that is appropriate for some houses in the area: those with slab foundations that typically receive floodwater up to three feet in the house. From the fieldwork it was found that approximately eighty-four percent of the houses in the analysis area are on slab foundations, and according to the questionnaire responses ninety-three percent of the respondents experienced less than three feet of flooding on the first floor and seven percent reported no flooding in the yard.

- Not all parts of the building need to be floodproofed. It is difficult to floodproof a garage door, for example, so some owners let the garage flood and floodproof the walls between the garage and the rest of the house. Appliances, electrical outlets, and other damage-prone materials located in the garage should be elevated above the expected flood levels.

    - Cost: The cost for a floodproofing project can vary according to the building's construction and condition. It can range from $5,000 to $20,000, depending on how secure the owner wants to be from flooding. Owners can do some of the work by themselves, although an experienced contractor provides greater security. Each property owner can determine how much of their own labor they can contribute and whether the cost and appearance of a project is worth the protection from flooding that it may provide.

    - Feasibility: As with floodwalls, floodproofing is appropriate where flood depths are shallow and are of relatively short duration. It can be an effective measure for some of the structures and flood conditions found in the study analysis area. It can also be more attractive than a floodwall around a house. However, floodproofing requires the homeowner to install or place door and window shields or sandbags and to ensure maintenance on a yearly basis. This may be difficult for the elderly or disabled. Finally ample warning of flooding must be available, so the homeowner can determine when to place the door or window shields and sandbags.

Dry floodproofing has the following shortcomings as a flood protection measure:

- It usually requires human intervention, i.e., someone must be home to close the openings.
- Its success depends on the building's condition, which may not be readily evident. It is very difficult to tell if there are cracks in the slab under the floor covering.
- Periodic maintenance is required to check for cracks in the walls and to ensure that the waterproofing compounds do not decompose.
- There is no government financial assistance programs available for dry floodproofing, therefore the entire cost of the project must be paid by the homeowner.
- The NFIP will typically not offer a lower insurance rate for dry floodproofed residences. However, this may be a viable option if homeowners want to protect their structure and contents.

Advantages	Disadvantage
• Often less costly than other mitigation measures. • Allows internal and external hydrostatic pressures to equalize, lessening the loads on walls and floors.	• Extensive cleanup may be necessary if the structure becomes wet inside and possibly contaminated by sewage, chemicals and other materials borne by floodwaters. • Does not minimize the potential damage from a high-velocity flood flow and wave action

Table 5- 9 Advantages and Disadvantages of Wet Floodproofing

Advantages	Disadvantages
• Often less costly than other retrofitting methods • Does not require additional land. • May be funded by a FEMA mitigation grant program.	• Requires human intervention and adequate warning to install protective measures. • Does not minimize the potential damage from high-velocity flood flow and wave action. • May not be aesthetically pleasing.

Table 5- 10 Advantages and Disadvantages of Dry Floodproofing

DRAINAGE IMPROVEMENTS

The Parish is currently in the process of developing a Parish-wide Subsurface Drainage Master Plan. The purpose of this Plan is to help identify deficient drainage areas throughout the Parish, develop preliminary solutions for the problem areas, split problem areas into individual projects for bidding purposes, develop cost estimates, and prioritize needed work. The Plan shall have a list of recommendations that were created after reviewing previous studies and reports. There are several different drainage improvements called for in the Drainage Master Plan that might help in reducing some of the flooding within this Repetitive Loss area. Maintenance for all projects and ongoing street sweeping continues for this area. Whenever drainage improvements are considered as a flood mitigation measure, the effects upstream and downstream from the proposed improvements need to be considered.

Advantages	Disadvantages
• Can increase channel carrying capacity through overflow channels, channel straightening, crossing replacements, or runoff volume storage. • Minor projects may be fundable under FEMA mitigation grant programs.	• May help one area but create new problems upstream or downstream. • Channel straightening increases the capacity to accumulate and carry sediment. • May require property owner cooperation and right-of-way acquisition.

STEP 5. CONCLUSION AND RECOMMENDATIONS

CONCLUSION

Based on the field survey and collection of data, the analysis of existing studies and reports, and the evaluation of various structural and non-structural mitigation measures, the Parish proposes that mitigation measures be implemented for Subarea 5. The table below examines past and current mitigation actions in this area.

RECOMMENDATIONS

Jefferson Parish should continue to encourage everyone to pursue mitigation measures and assist interested property owners in applying for a mitigation grant. The Parish should address street drainage in order to improve the drainage in the study area, seek out and secure funding for the drainage improvements outlined in this report, and institute a maintenance program that encourages homeowners to frequently clear their catch basin inlets of debris to ensure open flow for stormwater. The Parish should also continue to improve its CRS classification and adopt this Repetitive Loss Area Analysis according to the process

Table 5- 6 Current and Past Mitigation Actions in Subarea 5

detailed in the CRS Coordinator's Manual.

For the residents of the study area, they should contact Jefferson Parish for more information about possible funding opportunities and site visits to determine remedial measures. Review the alternative mitigation measures discussed in this analysis and implement those that are most appropriate for their situation. Purchase and maintain a flood insurance policy on the home and its contents.

Jefferson Parish recommends the following mitigation actions:

MITIGATION ACTION 1:

Property owners should obtain and keep a flood insurance policy on their structures (building and contents coverage). The Parish will continue on an **annual basis** to target all properties in the repetitive loss area reminding them of the advantages to maintaining flood insurance through its annual outreach effort.

RESPONSIBILITY

The Floodplain Management and Hazard Mitigation Department will provide the most relevant up-to-date flood insurance information to all property owners within the repetitive loss areas located in this area.

FUNDING

The cost will be paid for from the department's operating budget.

MITIGATION ACTION 2:

When appropriate, property owners should consider floodproofing measures such as flood gates or shields, flood walls, and hydraulic pumps.

RESPONSIBILITY

The Floodplain Management and Hazard Mitigation department will promote effective flood protection measures and provide advice and assistance to property owners who may wish to implement such measures in an **on-going** program.

FUNDING

The cost will be paid for by individual property owners. Advice and assistance will require staff time which will be covered in the department's annual budget.

MITIGATION ACTION 3:

Continue elevation or reconstruction mitigation of high-risk flood-prone properties. The highest priorities are properties at the greatest flood risk and where drainage improvements will not provide an adequate level of protection.

RESPONSIBILITY

The Floodplain Management and Hazard Mitigation department will continue to target the most at risk properties for grant applications.

FUNDING

Construction cost would be covered with FEMA or ICC funds. Staff time to develop the list of target properties will require funds from the department's operating budget.

MITIGATION ACTION 4:

Prioritize CIP projects to focus on drainage improvement projects in those basins containing repetitive loss areas.

RESPONSIBILITY

The Parish's Drainage Department in conjunction with the Engineering Department.

FUNDING

Bond funds or state grants.

MITIGATION ACTION 5:

Encourage property owners to elevate inside and outside mechanical equipment above the BFE and install flood resistant materials in crawl spaces.

RESPONSIBILITY

The Floodplain Management and Hazard Mitigation Department will promote effective flood protection measures and provide advice and assistance to property owners who may wish to implement such measures in an **on-going** program.

FUNDING

The cost will be paid for by individual property owners. Advice and assistance will require staff time which will be covered in the department's annual budget.

REPETITIVE LOSS AREA ANALYSIS CONCLUSION

Jefferson Parish, due to its proximity to the Gulf of Mexico, has always lived with the risk of flooding. Responding to annual storms and dealing with the challenges presented with repetitive flooding have brought the community closer together and made it more resilient. However, the risk has been exacerbated by both natural and man-made disasters, including climate change and subsidence. As per the analysis, the properties in the five subareas are subject to flooding because of the following reasons:

- For areas outside the levee protection (Subarea 1), hurricanes and storm surge have been the major cause of flooding.
- Heavy rainfall from tropical storms and thunderstorms that overwhelm the Parish drainage system within the levee protected area (Subareas 2-5), as indicated in the Parish Hazard Mitigation Plan and the data collected through the on-site field surveys. This is particularly an issue for properties that are slab on grade or have low foundations.
- Overtopping and breaching of the hurricane protection levee as evidenced by Hurricane Katrina (2005).

There are various municipal initiatives in regards to framing and funding existing planning and implementation efforts towards flood-risk reduction. These include updating existing levee system around the Parish (and the ongoing and planned expansion and heightening of these levees), elevation of private structures, open space conservation, flood insurance participation, floodplain management, implementation and compliance with building codes, and public outreach and education.

The RLAA draws upon on the existing initiatives and presents a series of mitigation recommendations related to repetitive flood loss properties in each subarea, particularly via non-structural means. All recommendations are made with the intent to improve the Parish's Community Rating System score; thereby, reducing resident's overall insurance rates.

It is recommended that Jefferson Parish i) adopts this Repetitive Loss Area Analysis according to the process detailed in the 2017 CRS Coordinator's Manual, ii) encourage the owners of repetitive flood loss structures to pursue a mitigation measure, iii) continue to assist interested property owners in applying mitigation grants, iv) continue to improve and maintain the drainage system, and finally v) continue public information activities such as outreach projects, website postings and flood protection assistance that help residents learn about various mitigation measures.

Additionally, it is recommended that the property owners participate be i) reviewing the mitigation measures listed in this report and implement those as appropriate, ii) stay updated on the Jefferson Parish flood risk reduction initiative and finally, iii) purchase or maintain a flood insurance policy on their home and contents (see www.floodsmart.gov for more information).

The draft RLAA report was posted on the Jefferson Parish website www.jeffparish.net/RLAA for comments from April 6 through April 20, 2018. No comments were received.

City of Gretna
Repetitive Loss Area Analysis

Adopted by Council August 8, 2018

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INTRODUCTION

In the United States, flooding is the most common natural disaster; resulting in more loss of life and property than any other types of hazards and severe weather events. More than 20,000 communities experience floods and this hazard accounts for approximately 73 percent of all Presidential Disaster Declarations over the 2008-2017 time period.[1] Recent studies also indicate how the cost of recovery is spread over local, state and federal government and the disaster victims who are themselves affected by the disaster.

Statistics indicate that there are thousands of NFIP's policyholders whose properties have flooded multiple times. "Repetitive Loss properties," are buildings and/or contents for which the NFIP has paid at least two claims of more than $1,000 in any 10-year period since 1978.[2]. Severe Repetitive Loss property (SRL) is four or more separate claim payments of more than $5,000 each (including building and contents payments); or two or more separate claim payments (building payments only) where the total of the payments exceeds the current value of the property. In this Repetitive Loss Area Analysis (RLAA), flooding issues and potential mitigation measures are discussed for homes located in the City of Gretna's Repetitive Loss Areas referred to as Area 1 and Area 2. These areas have experienced repetitive flooding and were chosen based on the nature of flooding, type of structure and the number of flood insurance claims made. The residents have continually undergone personal losses and stresses associated with living in a flood-prone house. To form appropriate and effective recommendations, this report has been created in collaboration with the residents of Area 1 and Area 2.

It is anticipated that informed residents can become stronger advocates for policy change at the neighborhood, city, parish, state and even federal levels. This report is therefore an attempt to help homeowners reduce their flood risk by being aware of the flooding problems in their neighborhood, and the potential solutions to the continual suffering that results from repetitive flooding. Finally, mitigation of these repetitive loss properties will ultimately be instrumental in reducing the overall costs to the NFIP as well as to individual homeowners.

[1] Federal Emergency Management Agency, "Protecting Homes," last updated June 24, 2016, http://www.fema.gov/protecting-homes

[2] Federal Emergency Management Agency, National Flood Insurance Program Flood Insurance Manual (April 2016), http://www.fema.gov/media-library/assets/documents/115549.

BACKGROUND

The National Flood Insurance Program (NFIP), a program overseen by the Federal Emergency Management (FEMA), is continually faced with the task of paying claims while trying to keep the price of flood insurance at an affordable rate since 1968. There are approximately 5.3 million NFIP policies across the United States in more than 22,000 communities. As of 2009, repetitive loss properties represent only one (1) percent of all flood insurance policies, yet historically they account for nearly one-third (1/3) of the claim payments. While the NFIP has resulted in forty years of successful floodplain management, repetitive loss properties still remain a drain on the NFIP.[3] The City of Gretna, located in Louisiana (CID-225198), participates in the NFIP. In addition to meeting the basic requirements of the NFIP, Gretna has completed additional components to participate in the Community Rating System (CRS) program. Gretna is currently a CRS Class 8 which rewards all policyholders in the SFHA with a 10 percent reduction in their flood insurance premiums. Non-SFHA policies (Standard X Zone policies) receive a 10% discount, and preferred risk policies receive no discount. The City of Gretna has been participating in the CRS program since October 1, 2000.

As of March 31, 2018, there are 3,115 NFIP policies in force in the City of Gretna and insurance coverage of approximately $776 million.

Terminology

Area Analysis: An approach to identify repetitive loss areas, evaluate mitigation approaches, and determine the most appropriate alternatives to reduce future repetitive losses

Hazard Mitigation: Defined by FEMA as sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event

Repetitive Loss*:* Any insurable building for which two or more claims of more than 1,000 have been paid within a 10-year period, since 1978. To focus resources on those properties that represent the best opportunities for mitigation, a subcategory of Severe Repetitive Loss Properties is listed.

Severe Repetitive Loss*:* As defined by the Flood Insurance Reform Act of 2004, SRLs are 1-4 family residences that have had four or more claims of more than $5,000 or at least two claims that cumulatively exceed the building's value. The Act creates new funding mechanisms to help mitigate flood damage for these properties.

A repetitive loss property does not have to have a current flood insurance policy to be considered a repetitive loss property or a severe repetitive loss property. In some cases, a community will find that properties on its repetitive loss list are not currently insured. Once it is designated as a repetitive loss property, that property remains a repetitive loss property from owner to owner; insured policy to no policy; and even after that property has been mitigated. Almost forty-one percent of all structures having policies in Gretna are currently insured. According to repetitive loss data received from NFIP Repetitive Loss (RL) AW-501 Worksheets, there are a total of 276 unmitigated and over 219 mitigated repetitive loss properties within the City of Gretna.

[3] Federal Emergency Management Agency, "Federal Flood Risk Management Standard," last updated March 29, 2016, http://www.fema.gov/news-release/2015/02/05/federal-flood-risk-management-standard

A Multijurisdictional Floodplain Mitigation Plan (FMP) for Jefferson Parish was updated in 2015. Since the FMP examines flooding issues as a whole within the Parish and does not assess individual properties, the City of Gretna has opted to complete a Repetitive Loss Area Analysis (RLAA) using the 2017 CRS Coordinator's Manual. The RLAA will benefit the city by examining potential mitigation measures for its Repetitive Loss Areas 1 and 2 and increasing its credit in the CRS Program.

COMMUNITY RATING SYSTEM

The Community Rating System (CRS) is a voluntary program designed to reward a community for doing more than meeting the NFIP minimum requirements to reduce flood damages. Communities can be rewarded for activities such as reducing flood damage to existing buildings, managing development in areas not shown in the floodplain on the Flood Insurance Rate Map (FIRM), protecting new buildings from floods greater than the 100-year flood, helping insurance agents obtain flood data, and helping people obtain flood insurance. The reward for these activities comes in the form of reduced premiums for flood insurance policy holders. Once a community has been accepted into the CRS, the community's floodplain management activities are rated according to the scoring system described in the CRS Coordinator's Manual. CRS communities are rated on a scale of 1-10. A Class 10 community receives no reduction in flood insurance premiums, but every class above 10 receives an additional 5% premium reduction. Class 1 requires the most credit points and provides a 45% premium reduction.

THE AREA

The City of Gretna is an incorporated municipality located within Jefferson Parish in southeastern Louisiana. The parish is bordered by Lake Pontchartrain on the north, Orleans and Plaquemines Parish to the east, Gulf of Mexico to the south, and Lafourche and St. Charles Parishes to the west. See Figure.1-1 below.

Figure 1-1

Principal physiographic features of the area are the Mississippi River channel, natural levee ridges along its banks and along the banks of abandoned distributary channels, and low marshlands situated between and bordering the channels. Jefferson Parish is divided into an East and West Bank by the Mississippi River which meanders through the northern section of the Parish. The highest land in the Parish is approximately 10 feet above the North American Vertical Datum (NAVD) along the natural levee that borders the Mississippi River. The East Bank is nearly surrounded by water and bound by the Mississippi River to the south, Lake Pontchartrain to the north, the 17th Street Canal to the east, and St. Charles Parish to the west. The West Bank of Jefferson Parish, east of the Harvey canal, is bound by the Donner Canal to the east, the Mississippi River to the north, the Harvey Canal to the west, and the Intracoastal Waterway to the south.

With a total population of 432,552 as of the 2010 census, Jefferson Parish is spread over a total land area of 305 square miles or 195,793 acres and a water area of 336 miles or 215,358 acres.[4] The Parish extends about 55 miles in a north-south direction from the southern shores of Lake Pontchartrain to the Gulf of Mexico. The southern part of the parish is less populated and is characterized by estuarine systems that lead in from the Gulf of Mexico. The coastal marshes, wetlands, and estuaries contain numerous bodies of shallow water. These bodies of water and wetlands make up over 85 percent of the parish.

The City of Gretna is a community of approximately 18,000 residents directly across the Mississippi River from Downtown New Orleans. The City was first settled in the early 19th century and expanded considerably during the latter half of the 20th century. Development patterns are reflective of many American Cities, with a historic core and more recent outward suburban expansion. The City is approximately four (4) square miles bound by the Mississippi River to the north, extending southward – in a gradual decent off of the natural levee - into the South Louisiana coastal plain. The entirety of the City is within the Hurricane and Storm Damage Risk Reduction System (HSDRRS), relying on gravity fed stormwater management networks which feed into Jefferson Parish managed outfall canals and pump stations.

Hundreds of floods occur each year in the United States, including overbank flooding of rivers and streams and shoreline inundation along lakes and coasts. Given the geographic location and physiographic nature of Gretna, flooding in the area typically results from large-scale weather systems generating prolonged rainfall due to hurricanes, thunderstorms (convectional and frontal) or winter storms. According to the

[4] https://www.census.gov/quickfacts/fact/table/jeffersonparishlouisiana/PST120216 , accessed 3/28/2018

Floodplain Hazard Mitigation Plan (FMP) there have been 4 floods recorded in Gretna in the period from 1998 to 2014. The history of flooding in Gretna indicates that flooding may occur during any season of the year. In the cooler months, the area is subject to heavy rainfalls resulting from frontal passages. In the summer months, heavy rainfalls result from convective thunderstorms. In the late summer, hurricanes accompanied by rainfall and super-elevated water-surface elevations pose the largest threat of flooding to the area. With an average annual precipitation of 64.16 inches, flood protection is vital to Jefferson Parish and the City of Gretna[5].

Flood protection in northern Jefferson Parish is achieved by a system of levees, floodwalls, canals and drainage pump stations. The parish has 340 miles of canal waterways, drainage ditches, cross drains, culverts, and internal levee systems. There are also 70 pump stations (24 major stations) that include 167 pumps installed throughout the parish drainage system for a total capacity of 47,569 cfs.[6] With the exception of some areas inside the levee protected areas of northern Jefferson Parish, most of the land is located within FEMA's 100-year floodplain. The land area outside of the 100-year floodplain may still be subject to flooding if a levee failure were to occur. Figure 1-2 on the next page illustrates drainage on the West Bank of Jefferson Parish along with the main canals and other water features.

[5] Jefferson Parish, October 2015: Jefferson United Mitigation Professionals Multijurisdictional Program for Public Information.

[6] Jefferson Parish Drainage Department

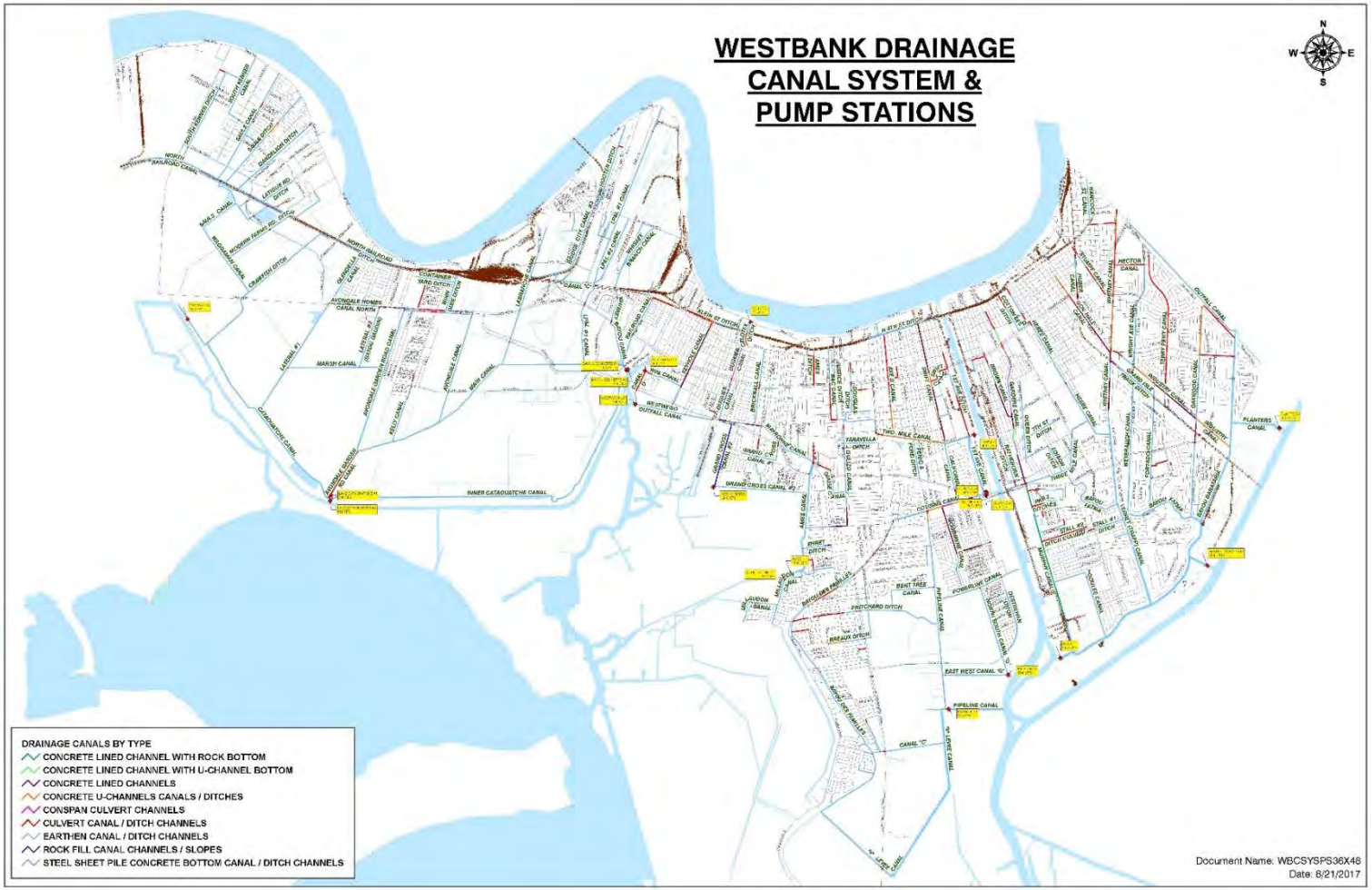

WESTBANK DRAINAGE
CANAL SYSTEM &
PUMP STATIONS
N
W
E
S
DRAINAGE CANALS BY TYPE
CONCRETE LINED CHANNEL WITH ROCK BOTTOM
CONCRETE LINED CHANNEL WITH U-CHANNEL BOTTOM
CONCRETE LINED CHANNELS
CONCRETE U-CHANNELS CANALS / DITCHES
CONSPAN CULVERT CHANNELS
CULVERT CANAL / DITCH CHANNELS
EARTHEN CANAL / DITCH CHANNELS
ROCK FILL CANAL CHANNELS / SLOPES
STEEL SHEET PILE CONCRETE BOTTOM CANAL / DITCH CHANNELS
Document Name: WBCSYSPS36X48
Date: 8/21/2017

Figure 1-2

REPETITIVE LOSS REQUIREMENT

Repetitive loss data must be maintained and updated annually in order to participate in the CRS. Since many of the losses under the NFIP come from repetitively flooded properties, addressing these properties is a priority for participating in the CRS Program. Depending on the severity of the repetitive loss problem, a CRS community has different responsibilities.

- **Category A**: A community with no unmitigated repetitive loss properties. No special requirements from the CRS.

- **Category B**: A community with at least one, but fewer than 10, unmitigated repetitive loss properties. Category B communities are required by the CRS to research and describe their repetitive loss problem, create a map showing the showing the location of all repetitive loss areas and complete an annual outreach activity directed to repetitive loss properties.

- **Category C**: A community with 50 or more unmitigated repetitive loss properties. Category C communities are required to do everything in Category B and prepare either a floodplain management plan that covers all repetitive loss areas or prepare a RLAA for all repetitive loss areas.

As of 2018, the City of Gretna has a total of 276 unmitigated Repetitive Loss and Severe Repetitive Loss properties. The City of Gretna is, therefore, designated as a Category C repetitive loss community.

MAPPING REPETITIVE LOSS AREAS

In accordance with the principles outlined in the CRS guidance titled Mapping Repetitive Loss Areas dated October, 2015, two (2) repetitive loss areas were identified within the City of Gretna. There are total 276 unmitigated repetitive loss properties in the City of Gretna.

This RLLA consists of repetitive loss properties and the surrounding properties that experience the same or similar flooding conditions, whether or not the buildings on those surrounding properties have been damaged by flooding. The methodology adopted to select the areas are as follows:

- Total number of flood insurance claims post Hurricane Katrina;
- Percentage of repetitive flood loss properties as compared to the structures, between October 2005 and June 2017; and
- Cluster of repetitive flood loss properties in the neighborhood.

Based on the data analysis, the areas illustrated in Figure 1-3 were selected for the RLAA.

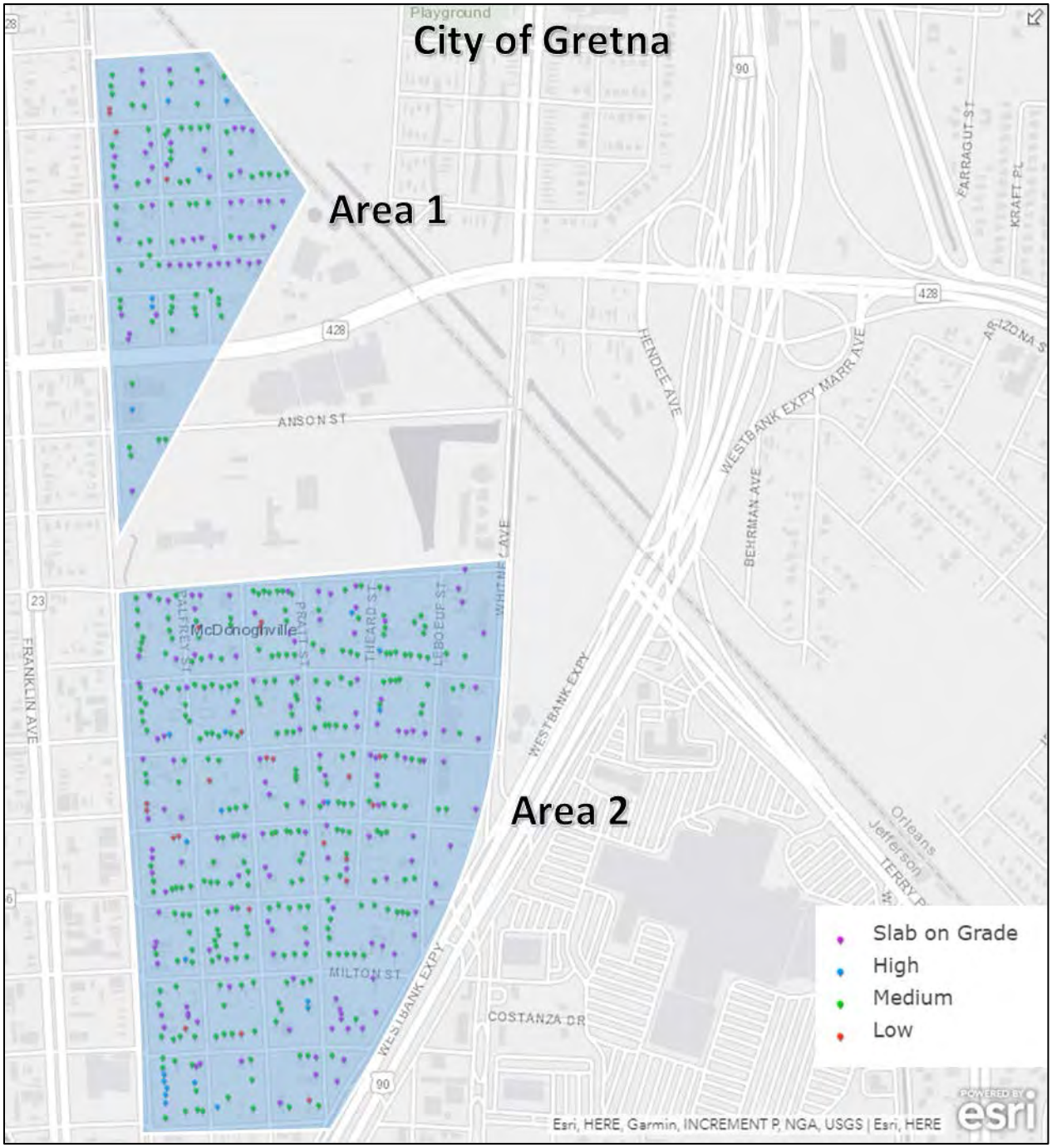


Figure 1-3- Outline of Areas 1 and 2

THE RLAA PROCESS

The RLAA planning process incorporated requirements from Section 510 of the 2017 CRS Coordinator's Manual. The planning process also incorporated requirements from the following guidance documents: 1) FEMA publication Reducing Damage from Localized Flooding: A Guide for Communities, Part III Chapter 7; 2) CRS publication Mapping Repetitive Loss Areas dated October, 2015; and 3) Center for Hazards Assessment Response and Technology, University of New Orleans draft publication The Guidebook to Conducting Repetitive Loss Area Analyses. Most specifically, this RLAA included all five planning steps included in the 2017 CRS Coordinator's Manual:

Step 1. Advise all the properties in the repetitive loss areas that the analysis will be conducted and request their input on the hazard and recommended actions.

Step 2. Contact agencies and organizations that may have plans or studies that could affect the cause or impacts of the flooding. The agencies and organizations must be identified in the analysis report.

Step 3. Visit each building and collect basic data.

Step 4. Review alternative approaches and determine whether any property protection measures or drainage improvements are feasible.

Step 5. Document the findings. A separate analysis report must be prepared for each area.

Beyond the 5 planning steps, additional credit criteria must be met:

1. The community must have at least one repetitive loss area delineated in accordance with the criteria in Section 503 of the 2017 CRS Coordinator's Manual.
2. The repetitive loss area must be mapped as described in Section 503.b. A Category "C" community must prepare analyses for all of its repetitive loss areas if it wants to use RLAA to meet its repetitive loss planning prerequisite.
3. The repetitive loss area analysis report(s) must be submitted to the community's governing body and made available to the media and the public. The complete repetitive loss area analysis report(s) must be adopted by the community's governing body or by an office that has been delegated approval authority by the community's governing body.
4. The community must prepare an annual progress report for its area analysis.
5. The community must update its repetitive loss area analyses in time for each CRS cycle verification visit.

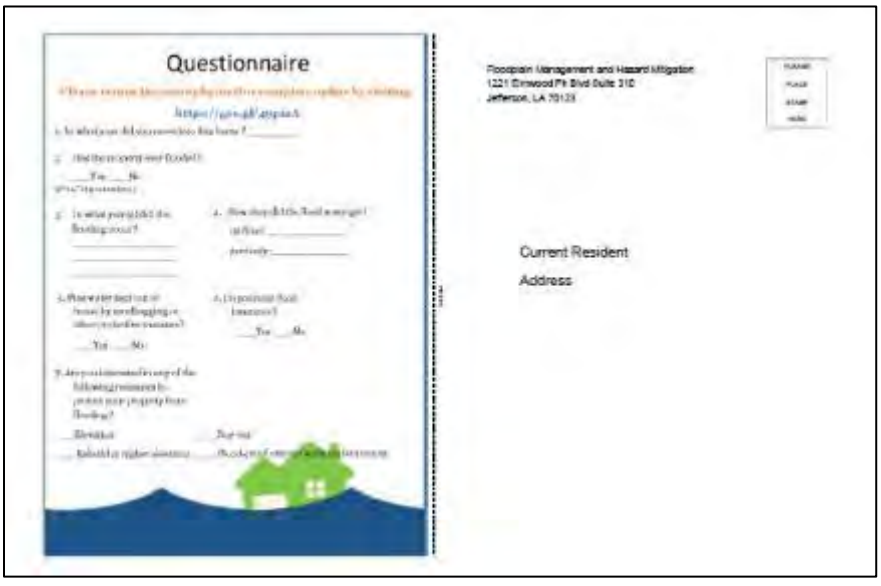
STEP 1. ADVISE ALL PROPERTY OWNERS

Before field work began on the RLAA, individual notices were mailed to property owners within the 2 identified Repetitive Loss Areas. The notices advised properties owners about the analysis and requested their input on the flooding problem in their area and mitigation actions taken. The notice also advised property owners how they could provide comments on the draft report once it was posted online. Property owners could fill out the questionnaire postcard that was mailed to them and send it back in via USPS, or they could take an online survey with a link that was provided on the mailer.

The property owner notice with questionnaire was mailed to 634 residents in Areas 1 and 2 the week of April 27, 2018.

Figure 1- 4 Front of Notice

Figure 1- 5 Back of Notice with Questionnaire



GRETNA

Out of the 634 mailed questionnaires, Jefferson Parish received three responses which corresponds to a response rate of less than 1 percent. Questionnaire responses are summarized below. Note: respondents may have skipped questions and/or provided more than one response to a question. Three addresses were returned as undeliverable.

Q1: In what year did you move into this home?

Responses Received	Percentage	Number Responding
<10 years ago	-	**None**
10-20 years ago	33.3	**1**
20-30 years ago	-	**None**
30-40 years ago	33.3	**1**
40-50 years ago	-	**None**
> 50 years ago	33.3	**1**
Total	**99.9**	**3**

Q2: Has the property ever been flooded?

Answer Choices	Percentage	Number
No	67	**2**
Yes	33	**1**
Total	**100**	**3**

Q3: In what year(s) did the flooding occur?

Responses Received	Percentage	Number Responding
Unanswered/NA	100	**3**
Total	**100**	**3**

Q4: How deep did the water get?

Answer Choices	Percentage	Number Responding	Depth	
			< 3 ft	> 3 ft
First floor	-	None	-	-
Yard only	-	None	-	-
Unanswered/NA	100	3	-	-
Total	100	3	-	-

Q5: Was water kept out of the house by sandbagging or other protective measures?

Answer Choices	Percentage	Number Responding
No	-	None
Yes	-	None
Unanswered/NA	100	3
Total	100	3

Q6: Do you have Flood Insurance?

Answer Choices	Percentage	Number Responding
No	67	2
Yes	33	1
Total	100	3

Q7: Are you interested in any of the following measures to protect your property from flooding?

Answer Choices (can choose more than one)	Percentage	Number Responding
Elevation	-	None
Buy-out	-	None
Rebuild at higher elevation	33.3	1
Flood-proof exterior walls and entrances	33.3	1
Total	33.3	1

The following trends in survey responses should be considered when evaluating mitigation measures for Areas 1 and 2:

- One of the three respondents is interested in protecting his or her home/building from flooding by either rebuilding at a higher elevation or floodproofing exterior walls and entrances.
- One of the three respondents currently has FEMA flood insurance.
- All of the respondents have been living in their houses for at 10 years.
- Historically, within Jefferson Parish, the greatest flood events occurred in 1995, 2005 and 2008. The following flood events are detailed in NOAA's National Climatic Data Center (NCDC) database:

    - **Southeast Louisiana and Southern Mississippi Flood, 1995** - It was a heavy rainfall event which occurred across an area stretching from the New Orleans metropolitan area into southern Mississippi. A storm total rainfall maximum of 27.5 inches (70 cm) was recorded near Necaise, Mississippi. Considerable flooding was caused by the rainfall including several record flood crests along impacted river systems. The flooding caused six fatalities and more than $3.1 billion in damage.

    - **August 29, 2005** – The Category 3 Hurricane Katrina caused catastrophic damage along the Gulf coast from central Florida to Texas, much of it due to the storm surge and levee failure. Severe property damage occurred in coastal areas, such as Mississippi beachfront towns where boats and casino barges rammed buildings, pushing cars and houses inland; water reached 6–12 miles (10–19 km) from the beach. The storm was the third most intense United States landfalling tropical cyclone, behind the 1935 Labor Day hurricane and Hurricane Camille in 1969. Overall, at least 1,245 people died in the hurricane and subsequent floods, making it the deadliest United States hurricane since the 1928 Okeechobee hurricane. Total property damage was estimated at $125 billion (2005 USD), roughly four times the damage wrought by Hurricane Andrew in 1992 in the United States.

    - **August-September, 2008** - The storm surge ahead of Ike blew onshore of Louisiana well ahead of Ike's predicted landfall in Texas on September 13. Areas in coastal south-central and southwestern Louisiana, some of which were flooded by Gustav, were re-flooded as a result of Ike. Some areas that had not yet recovered from Gustav power outages received additional outages of 200,000. The hardest-hit areas were in and around Cameron Parish, with nearly every square inch of the coastline in that area was flooded heavily, reaching as far north as Lake Charles, nearly 30 miles inland.

STEP 2. CONTACT AGENCIES AND ORGANIZATIONS

Jefferson Parish Department of Hazard Mitigation and Floodplain Management contacted external agencies and internal departments that have plans or studies that could affect the cause or impacts of flooding within the identified repetitive loss subareas. The data collected was used to analyze the problems further and to help identify potential solutions and mitigation measures for property owners. The agencies contacted and reports which were analyzed and reviewed are as follows:

Agencies

- Jefferson Parish Electronic Information System Department
- Jefferson Parish Streets Department
- Jefferson Parish Office of Risk Management
- Jefferson Parish Drainage Department

Reports

- FEMA – Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) for Jefferson Parish, February 2, 2018
- ISO – Repetitive Flood Insurance Claims Data
- Jefferson Parish Hazard Mitigation Plan

SUMMARY OF STUDIES AND REPORTS

FEMA FLOOD INSURANCE STUDY (FIS) AND FLOOD INSURANCE RATE MAP (FIRM)

FEMA's FIS for Jefferson Parish, LA is dated February 2, 2018. The FIS revises and updates information on the existence and severity of flood hazards within the Parish. The FIS also includes revised digital Flood Insurance Rate Maps (FIRMs) which reflect updated Special Flood Hazard Areas (SFHAs) and flood zones for the Parish. SFHA boundaries within the Parish were updated due to new detailed coastal analyses which were performed by the USACE-MVN, for FEMA. This study also incorporates the Hurricane Storm Damage Risk Reduction System (HSDRRS) completed by the USACE. Finally, these maps depict the potential for flooding and are the basis for building requirements and flood insurance rates.

FLOOD INSURANCE CLAIMS DATA

The Privacy Act of 1974 (5 U.S.C. 522a) restricts the release of flood insurance policy and claims data to the public. This information can only be released to state and local governments for the use in floodplain management related activities. Therefore all claims data in this report are only discussed in general terms.

The purpose of a mitigation plan is to rationalize the process of determining appropriate hazard mitigation actions. The document includes a detailed description of natural hazards in Jefferson Parish; a risk assessment that describes potential losses to physical assets, people and operations; a set of goals, objectives, strategies and actions that will guide the Parish's mitigation activities, and a detailed plan for implementing and monitoring the Plan. This Plan identified 12 hazards and included a risk assessment of the four hazards with the highest potential for damaging physical assets, people and operations in Jefferson Parish. These hazards are floods, hurricanes and tropical storms, storm surge, and tornadoes. Both the risk assessment section and goals sections reflect this emphasis, which was the result of careful consideration and a numerical ranking process carried out by the Mitigation Planning Team (MPT).

STEP 3. BUILDING DATA COLLECTION

The on-site field survey for this analysis was conducted over multiple days in May 2018. The Collector App through ESRI was utilized to save field data from the site visits. In addition, multiple site photos were taken of each structure on the property. Photos were also taken of current drainage features and mitigation and floodproofing measures if evident from street or parking lot views. The following information was recorded for each property:

Table 1- 1

Structure		Foundation		Type	
No structure	49	Slab on grade	183	Residential	561
Occupied	536	Low (less than 2ft.)	27	Non-residential	51
Vacant	28	Medium	341		
		High	25		

COLLECTOR FOR ARCGIS (ESRI)

The team used the ESRI Collector Application in order to be able to store and spatially view repetitive loss data for the City of Gretna. The Collector App contains all field data collected by parcels for RLAA including pictures of each structure on the parcel. The data is stored in ArcGIS and is used for internal review and continued analysis of repetitive flood loss areas.

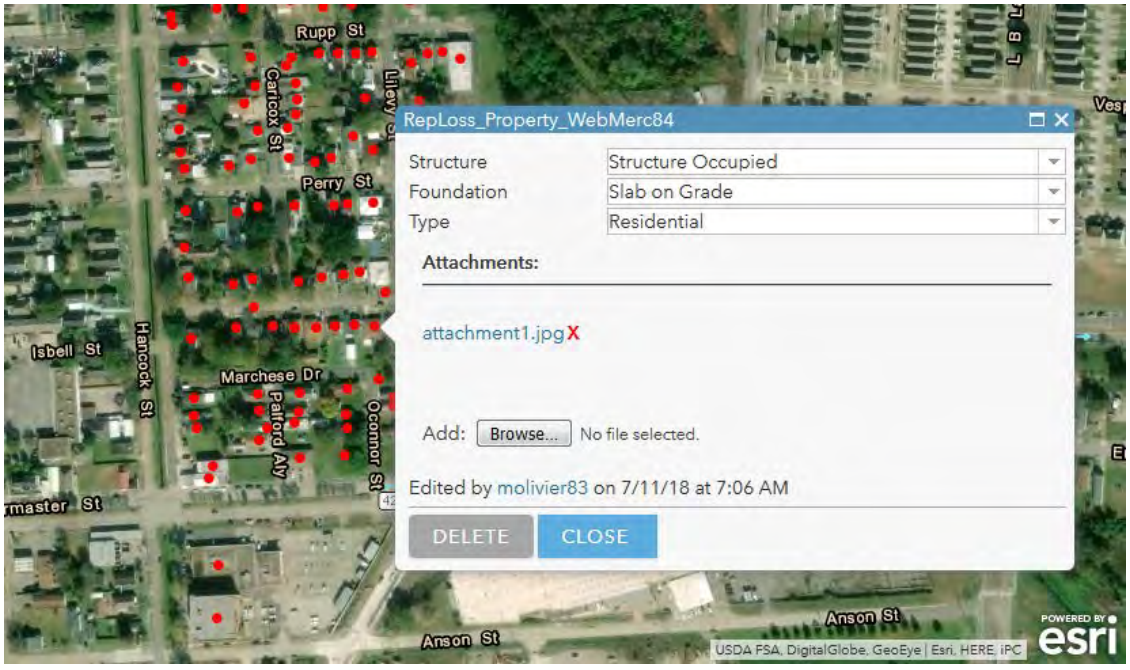


Figure 1- 6 Collector Application Sample

PROBLEM STATEMENT

The RL areas in the City of Gretna are located majorly within the 100-year floodplain (Zone AE) as shown on the map to the right; however, Area 2 has more Zone X properties than Area 1. Gretna encompasses a land area of 4 square miles and a water area of 0.75 sq. miles. The Base Flood Elevation ranges from 2 to 0 feet in this area.

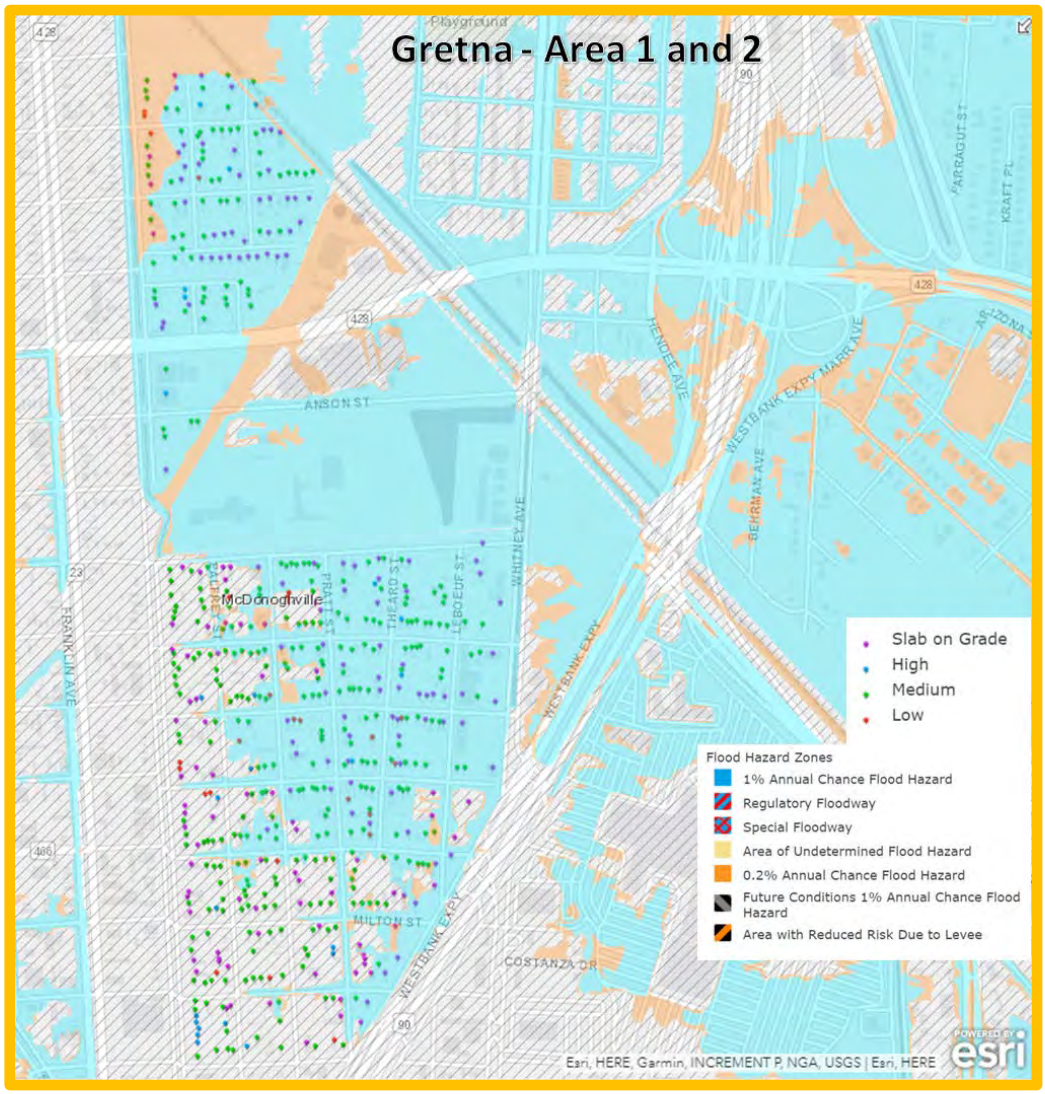


Figure 1- 7 2018 Effective FIRM

Excessive runoff from heavy rainfall causes flooding of urban areas, highways, and main streets as well as other low-lying spots in this area. Quick, heavy rains oftentimes results in overwhelming the existing pumping infrastructure and causing widespread street flooding. Any event causing rainfall over an inch can result into over working of the pump systems to clear water in the area. There is a lack in vital infrastructure such as pump stations, utilities and drainage that meet the contemporary standards so that the community can thrive.

In accordance with FEMA publication *551 Selecting Appropriate Mitigation Measures for Floodprone Structures*, mitigation options are discussed. The approach to reducing repetitive flooding in the City of Gretna's two Repetitive Loss Areas will require a combination of floodproofing techniques, education, and drainage improvement projects.

CLAIMS DATA:

In review of the unmitigated Repetitive Loss List, there are 16 properties within the 634 property study area that qualify as repetitive loss. Of those 16 repetitive loss properties, 4 are considered to be severe repetitive loss properties.

The majority of the rest of the claims are from relatively small rainfall events.

In analyzing the claims data, it could be derived that the area experiences most flooding from rainfall events. There have been 62 flood claims in the study areas totaling $921,876.20. The average claim in the study areas is $210,692.43. The homeowners of the 12 repetitive loss properties have made 37 claims and received $416,685.62 in flood insurance payments since 1978. The homeowners of the 4 severe repetitive loss properties have made 25 claims, and received $505,190.58 in flood insurance payments since 1978.The average repetitive flood loss claim was $132,175.97 and the average severe repetitive loss claim was $78,516.46. The severe repetitive loss homes are similar to the other homes on their block and on separate streets. They have each flooded more than 5 times, and all of them flooded during most of the heavy rainfall events in the area. (See bar graph below, Table 1-3).

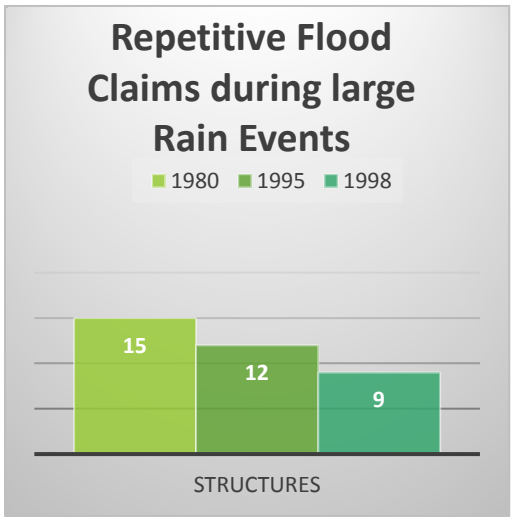


Table 1- 2

Table 1- 3

FIELD DATA:

The on-site field survey for this analysis was conducted over multiple days in May 2018. The team collected information such as the type and height of the foundation, occupancy status of the structure, and use of the structure.

With a count of 341, the majority of the structures are medium foundation height (59%). There are 183 structures (32%) that are slab on grade. Twenty-seven (5%) structures are low (less than 2 feet from grade), and 25 structures (4%) have high foundations.

The project team observed that majority (536 or 87%) of the structures in the area are occupied, while approximately 28, or 5%, are vacant and 49 (8%) have no structure. Also, majority of the structures are of residential use (92% or 561), while 8% (51) are non-residential.

In conclusion, it should be noted that given the location of the study areas, all of the properties are inside levee protection. Majority of the properties are built slab on grade or of medium height; therefore, a heavy rain event can cause substantial damage to these properties.

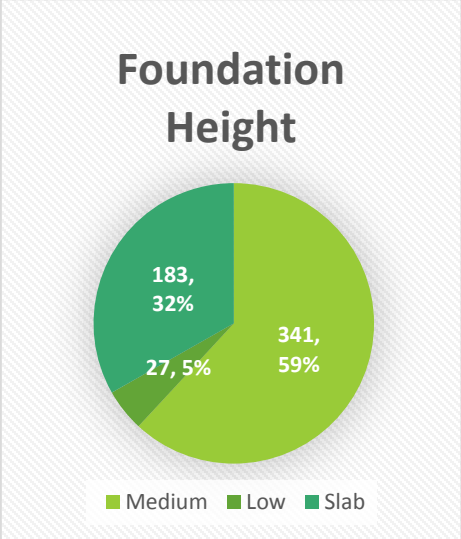


Table 1- 4

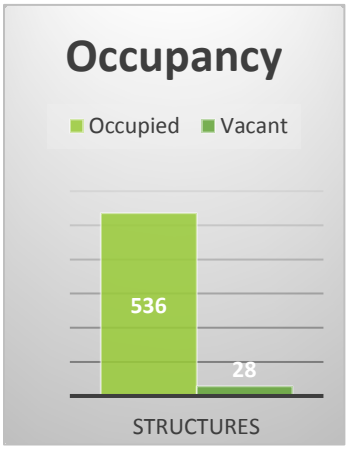


Table 1- 5

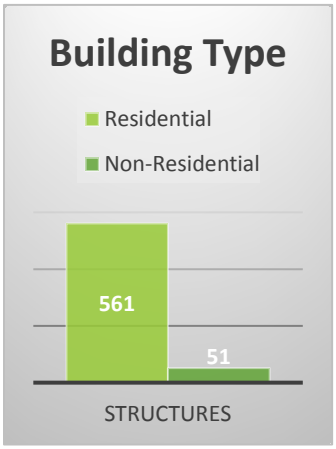


Table 1- 6

Figure 1- 8 Example property in Area 1

Figure 1- 9 Example property in Area 2

STEP 4. REVIEW ALTERNATIVE MITIGATION APPROACHES

There are many ways to protect a property from flood damage. Different measures are appropriate for different flood hazards, building types and building conditions. Figure 1-10 below, found in the *2017 CRS Coordinator's Manual*, lists typical property protection measures.

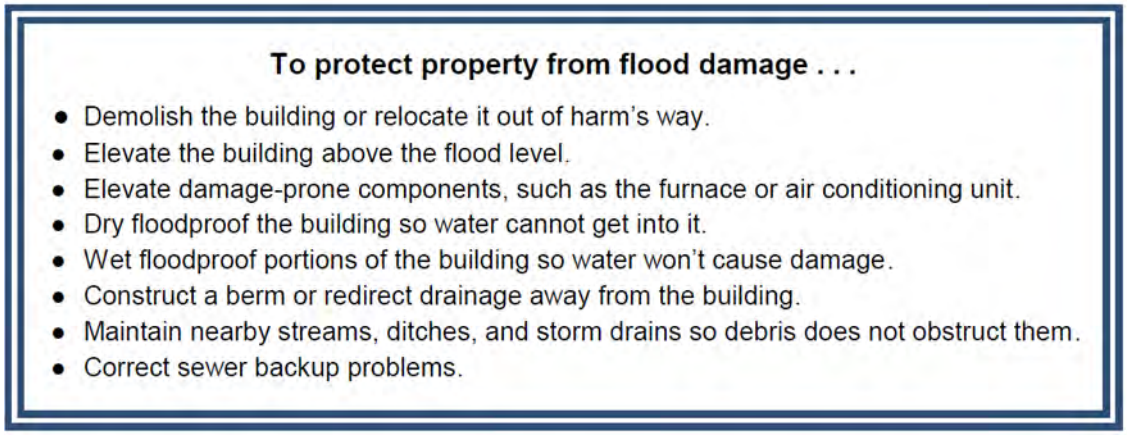


Figure 1- 10 Typical Property Protection Measures

Mitigation measures should fall into one of the mitigation categories listed below which are based on the Community Rating System planning process:

- Prevention
- Property Protection
- Natural Resource Protection
- Emergency Services
- Structural Projects
- Public Information and Outreach

MITIGATION FUNDING

There are several types of mitigation measures, listed in the table below, which can be considered for each repetitive loss property. Each mitigation measure qualifies for one or more grant program(s). Depending on the type of structure, severity of flooding and proximity to additional structures with similar flooding conditions, the most appropriate measure can be determined. In addition to these grant funded projects, several mitigations measures can be taken by the homeowner to protect their home.

Table 1- 7

Types of Projects Funded	HMGP	FMA	PDM	ICC	SBA
Acquisition of the entire property by govt. agency	✔	✔	✔		
Relocation of the building to a flood free site	✔	✔	✔	✔	✔
Demolition of the structure	✔	✔	✔	✔	✔
Elevation of the structure above flood levels	✔	✔	✔	✔	✔
Replacing the old building with a new elevated one	✔	✔	✔	✔	✔
Local drainage and small flood control projects	✔	✔	✔		
Dry floodproofing (non-residential only)	✔	✔	✔		
Percent paid by Federal program	75%	75%, 90%, or 100%	75%	Up to $30K	

There are several possible sources of funding for mitigation projects:

- **FEMA grants**: Most of the FEMA programs provide 75% of the cost of a project. In most communities, the 25% non-FEMA share is paid by the benefitting property owner. Each program has different Congressional authorization and slightly different rules.
  - **The Hazard Mitigation Grant Program (HMGP)**: The HMGP provides grants to States and local governments to implement long-term hazard mitigation measures after a major disaster declaration. Projects must provide a long-term solution to a problem (e.g., elevation of a home to reduce the risk of flood damages as opposed to buying sandbags and pumps to fight the flood). Examples of eligible projects include acquisition and elevation, as well as local drainage projects.
  - **The Flood Mitigation Assistance Program (FMA)**: FMA funds assist States and communities in implementing measures that reduce or eliminate the long-term risk of flood damage to structures insured under the NFIP. Project Grants to implement measures to reduce flood losses, such as elevation, acquisition, or relocation of NFIP-insured structures. States are encouraged to prioritize FMA funds for applications that include repetitive loss properties; these include structures with 2 or more losses each with a claim of at least $1,000 within any ten-year period since 1978.
  - **Pre-Disaster Mitigation Program (PDM)**: The Pre-Disaster Mitigation (PDM) program provides funds to states, territories, Indian tribal governments, communities, and universities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. For more information visit http://www.fema.gov/government/grant/pdm/index.shtm.

- **Flood insurance**: There is a special funding provision in the National Flood Insurance Program (NFIP) for insured buildings that have been substantially damaged by a flood, “Increased Cost of Compliance.” ICC coverage pays for the cost to comply with floodplain management regulations after a flood if the building has been declared substantially damaged. ICC will pay up to $30,000 to help cover elevation, relocation, demolition, and (for nonresidential buildings) floodproofing. It can also be used to help pay the 25% owner’s share of a FEMA funded mitigation project.

The building's flood insurance policy must have been in effect during the flood. This payment is in addition to the damage claim payment that would be made under the regular policy coverage, as long as the total claim does not exceed $250,000. Claims must be accompanied by a substantial or repetitive damage determination made by the local floodplain administrator. For more information, contact your insurance agent or visit: www.fema.gov/plan/prevent/floodplain/ICC.shtm.

Coverage under the ICC does have limitations: It covers only damage caused by a flood, as opposed to wind or fire damage. The building's flood insurance policy must have been in effect during the flood. ICC payments are limited to $30,000 per structure. Claims must be accompanied by a substantial or repetitive damage determination made by the local floodplain administrator and the structure must be in Zone AE.

The average claims payment in the study areas is $210,692.43. With an average claim of that amount, it is not likely that many homes in the study area would sustain substantial damage from a flood event. Homeowners should make themselves aware of the approximate value of their homes, and in the case of incurring flood damage, be aware of the need for a substantial damage declaration in order to receive the ICC coverage.

Alternative language adopted into the local floodplain management ordinance would enable residents with shallower flooding to access ICC funding. Since local ordinances determine the threshold at which substantial damage and/or repetitive claims are reached, adopting language that would lower these thresholds would benefit the homeowners of repetitive loss properties. Adopting alternative language allows for cumulative damages to reach the threshold for federal mitigation resources more quickly, meaning that some of the properties in the City of Gretna that sustain minor damage regularly would qualify for mitigation assistance through ICC.

- Rebates: A rebate is a grant in which the costs are shared by the homeowner and another source, such as the local government, usually given to a property owner after a project has been completed. Many communities favor it because the owner handles all the design details, contracting, and payment before the community makes a final commitment. The owner ensures that the project meets all of the program's criteria, has the project constructed, and then goes to the community for the rebate after the completed project passes inspection.

Rebates are more successful where the cost of the project is relatively small, e.g., under $5,000, because the owner is more likely to be able to afford the bulk of the cost. The rebate acts more as an incentive, rather than as needed financial support.

- Small Business Administration Mitigation Loans: The Small Business Administration (SBA) offers mitigation loans to SBA disaster loan applicants who have not yet closed on their disaster loan. Applicants who have already closed must demonstrate that the delay in application was beyond their control.

For example mitigation loans made following a flood can only be used for a measure to protect against future flooding, not a tornado. If the measure existed prior to the declared disaster, an SBA mitigation loan will cover the replacement cost. If the measure did not exist prior to the declared disaster the mitigation loan will only cover the cost of the measure if it is deemed absolutely necessary for repairing the property by a professional third-party, such as an engineer.

MITIGATION ALTERNATIVES

The majority of the flooding in these areas is considered “nuisance” flash flooding that causes minimal damage but does require costly cleanup and numerous street closures due to floodwaters overtopping the roadway.

Flooding in Gretna can be attributed to its flat topography, aging stormwater infrastructure. Flash flooding can occur when the capacity of the drainage system is exceeded or if conveyance is obstructed by debris, sediment and other materials that limit the volume of drainage. Heavy rains within a short period of time have caused the drainage system to be inundated and unable to keep up, resulting in ponding water in streets and homes.

Improving the drainage system can eliminate some road and home inundation in this area. These structural methods require large capital expenditures and cooperation from private property owners. Promoting floodproofing techniques and increasing public education and awareness of the flood hazards can be the next best alternative for property owners in this area. The Parish’s and the City’s websites, e-mail distribution lists, press releases and variable message boards can provide benefit to business owners and residents.

POTENTIAL MITIGATION MEASURES FOR GRETNA

Structural Alternatives:

- **Elevate** structures and damage-prone components, such as the water heater or air conditioning unit, above the Base Flood Elevation (BFE).
- **Dry floodproofing** can be done on commercial structures and even residential structures; however, in many instances this requires human intervention to complete the measure and ensure success. For example, installing watertight shields over doors or windows requires timely action by the homeowner; especially in a heavy rainfall event.
- **Wet floodproofing** a structure involves making the uninhabited portions of the structure resistant to flood damage and allowing water to enter during flooding. For example, in a basement or crawl space, mechanical equipment and ductwork would not be damaged.
- **Acquire and/or relocate** properties/target abandoned properties or locations that would provide a public benefit as the location will need to be maintained by the City in perpetuity.
- **Increase the size of culverts** under Jefferson Hwy to allow for increased capacity.
- **Implement drainage** i**mprovements** such as increasing capacity in the system (up-sizing pipes) and provide additional inlets to receive more stormwater.
- Improve stormwater system maintenance program to ensure inlets and canals are free of clogging debris.

Non Structural Alternatives:

- **Relocate internal supplies**, products/goods, and belongings above the flood depth.
- Improve the Parish’s floodplain and zoning ordinances.
- **Provide public education** through posting information about local flood hazards on City website, posting signs at various locations in neighborhoods or discussing flood protection measures at local neighborhood association meetings.
- Promote the purchase of flood insurance.

- Continue coordination with GOHSEP, the National Weather Service (NWS), and United States Geological Survey (USGS) to enhance flood warning system, including the use of rain/stream gauges, to provide greater warning time for citizens. NWS can use the real- time data collected to issue timely warnings.

COST AND BENEFITS OF MITIGATION MEASURES

Knowing the flooding history, type, and condition of the buildings in the area, leads to the fourth step in the area analysis procedure – a review of alternative mitigation approaches to protect properties from, or reduce, future flood damage. Property owners should look at these alternatives but understand they are not all guaranteed to provide protection at different levels of flooding. Six approaches were reviewed:

- Elevating the houses above the 1% annual flood level
- Acquisition
- Floodproofing
- Drainage improvements
- Utility protection
- Maintaining flood insurance coverage on the building

ELEVATION

Raising the structure above the flood level is generally viewed as the best flood protection measure, short of removing the building from the floodplain. All damageable portions of the building and its contents are high and dry during a flood, which flows under the building instead of into the house. Houses can be elevated on fill, posts/piles, or a crawlspace.

- A house elevated on fill requires adding a specific type of dirt to a lot and building the house on top of the added dirt.
- A house elevated on posts/piles is either built or raised on a foundation of piers that are driven into the earth and rise high enough above the ground to elevate the house above the flow of flood water or the design flood elevation.
- A house elevated on a crawlspace or enclosure is built or raised on a continuous wall-like foundation that elevates the house above the design flood level. It is important to include vents or openings in the walls below the design flood level that are appropriately sized: one square inch for each square foot of the crawlspace or enclosures footprint. Additionally all materials below the design flood level must be flood resistance and all machinery, equipment, and plumbing must be above the design flood level.
    - Cost: A majority of the cost to elevate a building is in the preparation and foundation construction. The cost to elevate six feet is little more than the cost to go up two feet. Elevation is usually cost-effective for wood frame buildings on posts/piles or crawlspace because it is easiest for lifting equipment to be used under the floor and disruption to the habitable part of the house is minimal. Elevating a slab house is much more costly and disruptive. In the study areas, 32% percent of the houses in the study area are on a slab. The actual cost of elevating a particular building depends on factors such as its condition, whether it is masonry or brick faced, and if additions have been added on over time. While the cost of elevating a home can be high, there are funding programs that can help. The usual arrangement is for a FEMA grant to pay 75% of the cost while the owner pays the other 25%. In the case of elevating a slab

foundation, the homeowner's portion could be as high as $50,000 or more. In some cases, assistance can be provided by Increased Cost of Compliance (ICC) funds, which is discussed on page 23 under Possible Funding Sources, or the use of state funds.

- Feasibility: Federal funding support for an elevation project requires a study that shows that the benefits of the project exceed the cost of the elevation. Project benefits include savings in insurance claims paid on the structure. Elevating a masonry or a slab home can cost up to $300,000, which means that benefit/cost ratios may be low. Looking at each property individually could result in funding for the worst case properties, i.e., those that are the lowest below the base flood elevation, subject to the most frequent flooding, and in good enough condition to elevate.

Advantages	Disadvantages
• **Elevating to or above the BFE allows a substantially damaged or substantially improved house to be brought into compliance.**	• **Cost may be prohibitive.**
• **Often reduces flood insurance premiums.**	• **The appearance of the structure and access to it may be adversely affected.**
• **Reduces or eliminates road closures due to overtopping.**	• **May require property owner cooperation and right-of-way acquisition.**
• **May be fundable under FEMA mitigation grant programs.**	• **May require road or walkway closures during construction.**

Table 1- 8 Advantages and Disadvantages of Elevation

ACQUISITION:

This measure involves buying one or more properties and clearing the site (demolishing the building). If there is no building subject to flooding, there is no flood damage. Acquisitions are usually recommended where the flood hazard is so great or so frequent that it is not safe to leave the structure on the site.

An alternative to buying and clearing the whole subdivision is buying out individual, "worst case," structures with FEMA funds.

- Cost: This approach would involve purchasing and clearing the lowest or the most severe repeatedly flooded homes. If FEMA funds are to be used, three requirements will apply:
  - The applicant for FEMA must demonstrate that the benefits exceed the costs, using FEMA's one of FEMA's approved Benefit Cost methodologies.
  - The owner must be a willing seller.
  - The parcel must be deeded to a public agency that agrees to maintain the lot and keep it forever as open space.

- Feasibility: Due to the high cost and difficulty to obtain a favorable benefit-cost ratio in shallow flooding areas, acquisitions are reserved for the worst case buildings. Not everyone wants to sell their home, so a checkerboard pattern of vacant and occupied lots often remains after a buyout project, leaving “holes” in the neighborhood. There is no reduction in expenses to maintain the neighborhood’s infrastructure for the City, although the tax base is reduced. The vacant lots must be maintained by the new owner agency, and additional expense is added to the community. If the lot is only minimally maintained, its presence may reduce the property values of the remaining houses. The City of Gretna is not considering acquisitions at this time for the above reasons.

Advantages	Disadvantages
• **Permanently removes problem since the structure no longer exists.** • **Allows a substantially damaged or substantially improved structure to be brought into compliance with the community’s floodplain management ordinance or law.** • **Expands open space and enhances natural and beneficial uses.** • **May be fundable under FEMA mitigation grant programs.**	• **Cost may be prohibitive.** • **Resistance may be encountered by local communities due to loss of tax base, maintenance of empty lots, and liability for injuries on empty, community-owned lots.**

Table 1- 9 Advantages and Disadvantages of Acquisition

There are 3 criteria that must be met for FEMA to fund an acquisition project:

- The local community must inform the property owners interested in the acquisition program that the community will not use condemnation authority to purchase their property and that the participation in the program is strictly voluntary,
- The subsequent deed to the property to be acquired will be amended such that the landowner will be restricted from receiving any further Federal disaster assistance grants, the property shall remain in open space in perpetuity, and the property will be retained in ownership by a public entity, and
- Any replacement housing or relocated structures will be located outside the 100-year floodplain.

FLOODPROOFING

This measure keeps floodwaters out of a building by modifying the structure. Walls are coated with waterproofing compounds or plastic sheeting. Openings (i.e. doors, windows, and vents) are closed either permanently, or temporarily with removable shields or sandbags.

- Make the walls watertight. This is easiest to do for masonry or brick faced walls. The brick or stucco walls can be covered with a waterproof sealant and bricked or stuccoed over with a veneer to camouflage the sealant. Houses with wood, vinyl, or metal siding need to be wrapped with plastic sheeting to make walls watertight, and then covered with a veneer to camouflage and protect the plastic sheeting. Provide closures, such as removable shields or sandbags, for the openings;

including doors, windows, dryer vents and weep holes. There must also be an account for sewer backup and other sources of water entering the building. For shallow flood levels, this can be done with a floor drain plug or standpipe; although a check valve system is more secure.

- Dry floodproofing employs the building itself as part of the barrier to the passage of floodwaters, and therefore this technique is only recommended for buildings with slab foundations that are not cracked. The solid slab foundation prevents floodwaters from entering a building from below. Also, even if the building is in sound condition, tests by the Corps of Engineers have shown that dry floodproofing should not be used for depths greater than three feet above the first floor, because water pressure on the structure can collapse the walls and/or buckle the floor.

- Dry floodproofing is a mitigation technique that is appropriate for some houses in the area: those with slab foundations that typically receive floodwater up to three feet in the house. From the fieldwork it was found that approximately thirty-two percent of the houses in the study area are on slab foundations so they may be good candidates for this type of mitigation.

- Not all parts of the building need to be floodproofed. It is difficult to floodproof a garage door, for example, so some owners let the garage flood and floodproof the walls between the garage and the rest of the house. Appliances, electrical outlets, and other damage-prone materials located in the garage should be elevated above the expected flood levels.

    - Cost: The cost for a floodproofing project can vary according to the building's construction and condition. It can range from $5,000 to $20,000, depending on how secure the owner wants to be from flooding. Owners can do some of the work by themselves, although an experienced contractor provides greater security. Each property owner can determine how much of their own labor they can contribute and whether the cost and appearance of a project is worth the protection from flooding that it may provide.

    - Feasibility: As with floodwalls, floodproofing is appropriate where flood depths are shallow and are of relatively short duration. It can be an effective measure for some of the structures and flood conditions found in the study analysis area. It can also be more attractive than a floodwall around a house. However, floodproofing requires the homeowner to install or place door and window shields or sandbags and to ensure maintenance on a yearly basis. This may be difficult for the elderly or disabled. Finally ample warning of flooding must be available, so the homeowner can determine when to place the door or window shields and sandbags.

Dry floodproofing has the following shortcomings as a flood protection measure:

- It usually requires human intervention, i.e., someone must be home to close the openings.
- Its success depends on the building's condition, which may not be readily evident. It is very difficult to tell if there are cracks in the slab under the floor covering.
- Periodic maintenance is required to check for cracks in the walls and to ensure that the waterproofing compounds do not decompose.
- There is no government financial assistance programs available for dry floodproofing, therefore the entire cost of the project must be paid by the homeowner.
- The NFIP will typically not offer a lower insurance rate for dry floodproofed residences. However, this may be a viable option if homeowners want to protect their structure and contents.

Advantages	Disadvantage
• Often less costly than other mitigation measures. • Allows internal and external hydrostatic pressures to equalize, lessening the loads on walls and floors.	• Extensive cleanup may be necessary if the structure becomes wet inside and possibly contaminated by sewage, chemicals and other materials borne by floodwaters. • Pumping floodwaters out of a basement too soon after a flood may lead to structural damage. • Does not minimize the potential damage from a high-velocity flood flow and wave action.

Table 1- 10 Advantages and Disadvantages of Wet Floodproofing

Advantages	Disadvantage
• Often less costly than other retrofitting methods • Does not require additional land. • May be funded by a FEMA mitigation grant program.	• Requires human intervention and adequate warning to install protective measures. • Does not minimize the potential damage from high-velocity flood flow and wave action. • May not be aesthetically pleasing.

Table 1- 11 Advantages and Disadvantages of Dry Floodproofing

DRAINAGE IMPROVEMENTS

The Parish is currently in the process of developing a Parish-wide Subsurface Drainage Master Plan that will include the incorporated jurisdictions such as the City of Gretna. The purpose of this Plan is to help identify deficient drainage areas throughout the Parish, develop preliminary solutions for the problem areas, split problem areas into individual projects for bidding purposes, develop cost estimates, and prioritize needed work. The Plan shall have a list of recommendations that were created after reviewing previous studies and reports. There are several different drainage improvements called for in the Drainage Master Plan that might help in reducing some of the flooding within this Repetitive Loss area. Maintenance for all projects and ongoing street sweeping continues for this area. Whenever drainage improvements are considered as a flood mitigation measure, the effects upstream and downstream from the proposed improvements need to be considered.

Advantages	Disadvantages
• **Can increase channel carrying capacity through overflow channels, channel straightening, crossing replacements, or runoff volume storage.** • **Minor projects may be fundable under FEMA mitigation grant programs.**	• **May help one area but create new problems upstream or downstream.** • **Channel straightening increases the capacity to accumulate and carry sediment.** • **May require property owner cooperation and right-of-way acquisition.**

Table 1- 12 Advantages and Disadvantages of Drainage Improvements

STEP 5. CONCLUSION AND RECOMMENDATIONS

CONCLUSION

Based on the field survey and collection of data, the analysis of existing studies and reports, and the evaluation of various structural and non-structural mitigation measures, the City proposes that mitigation measures be implemented for the City of Gretna's Repetitive Loss Areas 1 and 2. The table below examines past and current mitigation actions in these areas.

Table 1- 13 Current and Past Mitigation Actions in Areas 1 and 2

Mitigation Actions	
1	**Property owners have documented flooding and identified flooding concerns in returned questionnaires from this analysis.**
2	**Property owners are aware of flooding causes. Some property owners have undertaken specific floodproofing measures at their own expense.**
3	**The Parish and City have undertaken numerous, costly capital improvement projects to improve drainage within the study area.**

RECOMMENDATIONS

The City of Gretna should continue to encourage everyone to pursue mitigation measures and assist interested property owners in applying for mitigation grants. The City of Gretna should continue to address street drainage in order to improve the drainage in the study area, seek out and secure funding for the drainage improvements outlined in this report, and institute a maintenance program that encourages homeowners to frequently clear their catch basin inlets of debris to ensure open flow for stormwater. The City of Gretna should also continue to improve its CRS classification and adopt this Repetitive Loss Area Analysis according to the process detailed in the CRS Coordinator's Manual.

For the residents of the study areas, they should contact the City of Gretna and Jefferson Parish for more information about possible funding opportunities and site visits to determine remedial measures. Review the alternative mitigation measures discussed in this analysis and implement those that are most appropriate for their situation. Purchase and maintain a flood insurance policy on the home and its contents.

The City of Gretna recommends the following mitigation actions:

MITIGATION ACTION 1:

Property owners should obtain and keep a flood insurance policy on their structures (building and contents coverage). The City will continue on an **annual basis** to target all properties in the repetitive loss area reminding them of the advantages to maintaining flood insurance through its annual outreach effort.

RESPONSIBILITY

The City of Gretna will provide the most relevant up-to-date flood insurance information to all property owners within the repetitive loss areas located in the study area.

FUNDING

The cost will be paid for from the City's operating budget.

MITIGATION ACTION 2:

When appropriate, property owners should consider floodproofing measures such as flood gates or shields, flood walls, and hydraulic pumps.

RESPONSIBILITY

The City of Gretna will promote effective flood protection measures and provide advice and assistance to property owners who may wish to implement such measures in an **on-going** program with assistance from Jefferson Parish.

FUNDING

The cost will be paid for by individual property owners. Advice and assistance will require staff time which will be covered in the City's annual budget.

MITIGATION ACTION 3:

Continue elevation or reconstruction mitigation of high-risk flood-prone properties. The highest priorities are properties at the greatest flood risk and where drainage improvements will not provide an adequate level of protection.

RESPONSIBILITY

The Jefferson Parish Floodplain Management and Hazard Mitigation department will continue to target the most at risk properties for grant applications.

FUNDING

Construction cost would be covered with FEMA or ICC funds. Staff time to develop the list of target properties will require funds from the department's operating budget.

MITIGATION ACTION 4:

Prioritize Capital Improvement Projects to focus on drainage improvement projects in those basins containing repetitive loss areas.

RESPONSIBILITY

Jefferson Parish's Drainage Department in conjunction with the Engineering Department and City staff.

FUNDING

Bond funds or state grants.

MITIGATION ACTION 5:

Encourage property owners to elevate inside and outside mechanical equipment above the BFE and install flood resistant materials in crawl spaces.

RESPONSIBILITY

The City of Gretna will continue to promote effective flood protection measures and provide advice and assistance to property owners who may wish to implement such measures in an **on-going** program with assistance from Jefferson Parish.

FUNDING

The cost will be paid for by individual property owners. Advice and assistance will require staff time which will be covered in the City's annual budget.

The RLAA draws upon on the existing initiatives and presents a series of mitigation recommendations related to repetitive flood loss properties in each Repetitive Loss Area, particularly via non-structural means. All recommendations are made with the intent to improve the City's Community Rating System score; thereby, reducing resident's overall insurance rates.

It is recommended that the City of Gretna i) adopt this Repetitive Loss Area Analysis according to the process detailed in the 2017 CRS Coordinator's Manual, ii) encourage the owners of repetitive flood loss structures to pursue a mitigation measure, iii) continue to assist interested property owners in applying for mitigation grants, iv) continue to improve and maintain the drainage system, and finally v) continue public information activities such as outreach projects, website postings and flood protection assistance that help residents learn about various mitigation measures.

Additionally, it is recommended that the property owners participate by i) reviewing the mitigation measures listed in this report and implement those as appropriate, ii) stay updated on the City of Gretna's flood risk reduction initiative and finally, iii) purchase or maintain a flood insurance policy on their home and contents (see www.floodsmart.gov for more information).

The draft RLAA report for the City of Gretna was posted on the Jefferson Parish website www.jeffparish.net/RLAA for comments from July 20 through August 1, 2018. No comments were received.

REPETITIVE LOSS AREA ANALYSIS

FOR THE TOWN OF JEAN LAFITTE

Adopted by Council March 13, 2019

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INTRODUCTION

In the United States, flooding is the most common natural disaster; resulting in more loss of life and property than any other types of hazards and severe weather events. More than 20,000 communities experience floods and this hazard accounts for approximately 73 percent of all Presidential Disaster Declarations over the 2008-2017 time period.[1] Recent studies also indicate how the cost of recovery is spread over local, state and federal government and the disaster victims who are themselves affected by the disaster.

Statistics indicate that there are thousands of NFIP's policyholders whose properties have flooded multiple times. "Repetitive Loss properties," are buildings and/or contents for which the NFIP has paid at least two claims of more than $1,000 in any 10-year period since 1978.[2]. Severe Repetitive Loss property (SRL) is four or more separate claim payments of more than $5,000 each (including building and contents payments); or two or more separate claim payments (building payments only) where the total of the payments exceeds the current value of the property. In this Repetitive Loss Area Analysis (RLAA), flooding issues and potential mitigation measures are discussed for homes located in the Town of Jean Lafitte. -. The Town has experienced repetitive flooding. The residents have continually undergone personal losses and stresses associated with living in flood-prone houses. To form appropriate and effective recommendations, this report has been created in collaboration with the residents of the Town of Jean Lafitte.

It is anticipated that informed residents can become stronger advocates for policy change at the neighborhood, city, parish, state and even federal levels. This report is therefore an attempt to help homeowners reduce their flood risk by being aware of the flooding problems in their neighborhood, and the potential solutions to the continual suffering that results from repetitive flooding. Finally, mitigation of these repetitive loss properties will ultimately be instrumental in reducing the overall costs to the NFIP as well as to individual homeowners.

[1] Federal Emergency Management Agency, "Protecting Homes," last updated June 24, 2016, http://www.fema.gov/protecting-homes

[2] Federal Emergency Management Agency, National Flood Insurance Program Flood Insurance Manual (April 2016), http://www.fema.gov/media-library/assets/documents/115549.

BACKGROUND

The National Flood Insurance Program (NFIP), a program overseen by the Federal Emergency Management (FEMA), is continually faced with the task of paying claims while trying to keep the price of flood insurance at an affordable rate since 1968. There are approximately 5.3 million NFIP policies across the United States in more than 22,000 communities. As of 2009, repetitive loss properties represent only one (1) percent of all flood insurance policies, yet historically they account for nearly one-third (1/3) of the claim payments. While the NFIP has resulted in forty years of successful floodplain management, repetitive loss properties still remain a drain on the NFIP.[3] The Town of Jean Lafitte, located in Louisiana (CID-220371), participates in the NFIP. In addition to meeting the basic requirements of the NFIP, Jean Lafitte has completed additional components to participate in the Community Rating System (CRS) program. Jean Lafitte is currently a CRS Class 8 which rewards all policyholders in the SFHA with a 10 percent reduction in their flood insurance premiums. The Town of Jean Lafitte has been participating in the CRS program since May 1, 2015.

As of July 9, 2018, there are 288 NFIP policies in force in the Town of Jean Lafitte and insurance coverage of approximately $66 million.

A repetitive loss property does not have to have a current flood insurance policy to be considered a repetitive loss property or a severe repetitive loss property. In some cases, a community will find that properties on its repetitive loss list are not currently insured. Once it is designated as a repetitive loss property, that property remains a repetitive loss property from owner to owner; insured policy to no policy; and even after that property has been mitigated. Almost forty-one percent of all structures having policies in Jean Lafitte are currently insured. According to repetitive loss data received from NFIP Repetitive Loss (RL) AW-501 Worksheets, there are a total of 78 unmitigated and over 56 mitigated repetitive loss properties within the Town of Jean Lafitte.

Terminology

Area Analysis: An approach to identify repetitive loss areas, evaluate mitigation approaches, and determine the most appropriate alternatives to reduce future repetitive losses

Hazard Mitigation: Defined by FEMA as sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event

Repetitive Loss*:* Any insurable building for which two or more claims of more than 1,000 have been paid within a 10-year period, since 1978. To focus resources on those properties that represent the best opportunities for mitigation, a subcategory of Severe Repetitive Loss Properties is listed.

Severe Repetitive Loss*:* As defined by the Flood Insurance Reform Act of 2004, SRLs are 1-4 family residences that have had four or more claims of more than $5,000 or at least two claims that cumulatively exceed the building's value. The Act creates new funding mechanisms to help mitigate flood damage for these properties.

[3] Federal Emergency Management Agency, "Federal Flood Risk Management Standard," last updated March 29, 2016, http://www.fema.gov/news-release/2015/02/05/federal-flood-risk-management-standard

A Multijurisdictional Floodplain Mitigation Plan (FMP) for Jefferson Parish was updated in 2015. Since the FMP examines flooding issues as a whole within the Parish and does not assess individual properties, the Town of Jean Lafitte has opted to complete a Repetitive Loss Area Analysis (RLAA) using the 2017 CRS Coordinator's Manual. The RLAA will benefit the Town by examining potential mitigation measures for the Town as it considers the entire Town its Repetitive Loss Area. This can also help to increase its credit in the CRS Program.

COMMUNITY RATING SYSTEM

The Community Rating System (CRS) is a voluntary program designed to reward a community for doing more than meeting the NFIP minimum requirements to reduce flood damages. Communities can be rewarded for activities such as reducing flood damage to existing buildings, managing development in areas not shown in the floodplain on the Flood Insurance Rate Map (FIRM), protecting new buildings from floods greater than the 100-year flood, helping insurance agents obtain flood data, and helping people obtain flood insurance. The reward for these activities comes in the form of reduced premiums for flood insurance policy holders. Once a community has been accepted into the CRS, the community's floodplain management activities are rated according to the scoring system described in the CRS Coordinator's Manual. CRS communities are rated on a scale of 1-10. A Class 10 community receives no reduction in flood insurance premiums, but every class above 10 receives an additional 5% premium reduction. Class 1 requires the most credit points and provides a 45% premium reduction.

THE AREA

The Town of Jean Lafitte is an incorporated municipality located within Jefferson Parish in southeastern Louisiana. The parish is bordered by Lake Pontchartrain on the north, Orleans and Plaquemines Parish to the east, Gulf of Mexico to the south, and Lafourche and St. Charles Parishes to the west. See Figure.1 below.

Figure 1

Principal physiographic features of the area are the Mississippi River channel, natural levee ridges along its banks and along the banks of abandoned distributary channels, and low marshlands situated between and bordering the channels. Jefferson Parish is divided into an East and West Bank by the Mississippi River which meanders through the northern section of the Parish. The highest land in the Parish is approximately 10 feet above the North American Vertical Datum (NAVD) along the natural levee that borders the Mississippi River. The East Bank is nearly surrounded by water and bound by the Mississippi River to the south, Lake Pontchartrain to the north, the 17th Street Canal to the east, and St. Charles Parish to the west. The West Bank of Jefferson Parish, east of the Harvey canal, is bound by the Donner Canal to the east, the Mississippi River to the north, the Harvey Canal to the west, and the Intracoastal Waterway to the south.

With a total population of 432,552 as of the 2010 census, Jefferson Parish is spread over a total land area of 305 square miles or 195,793 acres and a water area of 336 miles or 215,358 acres.[4] The Parish extends about 55 miles in a north-south direction from the southern shores of Lake Pontchartrain to the Gulf of Mexico. The southern part of the parish is less populated and is characterized by estuarine systems that lead in from the Gulf of Mexico. The coastal marshes, wetlands, and estuaries contain numerous bodies of shallow water. These bodies of water and wetlands make up over 85 percent of the parish.

The Town of Jean Lafitte is a community of approximately 1,900 residents located along Bayou Barataria approximately 30 miles from the Gulf Coast separated by large areas of marsh wetlands that extend inland from Grand Isle. The area was first settled in the early 19th century. The notorious pirate, Jean Lafitte, established the area as a port and smuggled in goods during the early 1800's when American ships were prohibited from visiting foreign ports. Fast forward to the 1970's, Leo E. Kerner Jr., who was Justice of the Peace at the time, was a driving force to incorporate The Town. The area was incorporated as a village on January 9, 1974, and three years later it changed classification from village of Jean Lafitte to Town. Jean Lafitte is approximately six (6) square miles bound by the Mississippi River to the east, Lake Salvador to the west, the Jean Lafitte National Historic Park and Preserve to the north, and bayou and marshland to the south of the Town. The entirety of the Town is outside the Hurricane and Storm Damage Risk Reduction System (HSDRRS), and is susceptible to storm surge.

Hundreds of floods occur each year in the United States, including overbank flooding of rivers and streams and shoreline inundation along lakes and coasts. Given the geographic location and physiographic nature

[4] https://www.census.gov/quickfacts/fact/table/jeffersonparishlouisiana/PST120216 , accessed 3/28/2018

of Jean Lafitte, flooding in the area typically results from large-scale weather systems generating prolonged rainfall due to tidal surge. There have been 12 tropical storm/hurricane events directly impacting Jean Lafitte in the period from 1998 to 2017. Many of these have resulted in flooding. The history of flooding in Jean Lafitte indicates that flooding may occur during any season of the year. In the cooler months, the area is subject to heavy rainfalls resulting from frontal passages. In the summer months, heavy rainfalls result from convective thunderstorms. In the late summer, hurricanes accompanied by rainfall and super-elevated water-surface elevations pose the largest threat of flooding to the area. With an average annual precipitation of 64.16 inches, flood protection is vital to Jefferson Parish and the Town of Jean Lafitte[5].

Ponding and flash floods are infrequent in the Town of Jean Lafitte, yet floods are a significant threat to the Town. Almost all floods associated with this area are a result from tropical storms and hurricanes making land fall to the west of the Town. Past flood events were almost all associated with hurricanes that produced large storm surges along the Louisiana coastline.

Flood protection in northern Jefferson Parish is achieved by a system of levees, floodwalls, canals and drainage pump stations. The parish has 340 miles of canal waterways, drainage ditches, cross drains, culverts, and internal levee systems. There are also 70 pump stations (24 major stations) that include 167 pumps installed throughout the parish drainage system for a total capacity of 47,569 cfs.[6] With the exception of some areas inside the levee protected areas of northern Jefferson Parish, most of the land is located within FEMA's 100-year floodplain. The land area outside of the 100-year floodplain may still be subject to flooding if a levee failure were to occur. Figure 2 on the next page illustrates drainage on the West Bank of Jefferson Parish along with the main canals and other water features.

[5] Jefferson Parish, October 2015: Jefferson United Mitigation Professionals Multijurisdictional Program for Public Information.

[6] Jefferson Parish Drainage Department

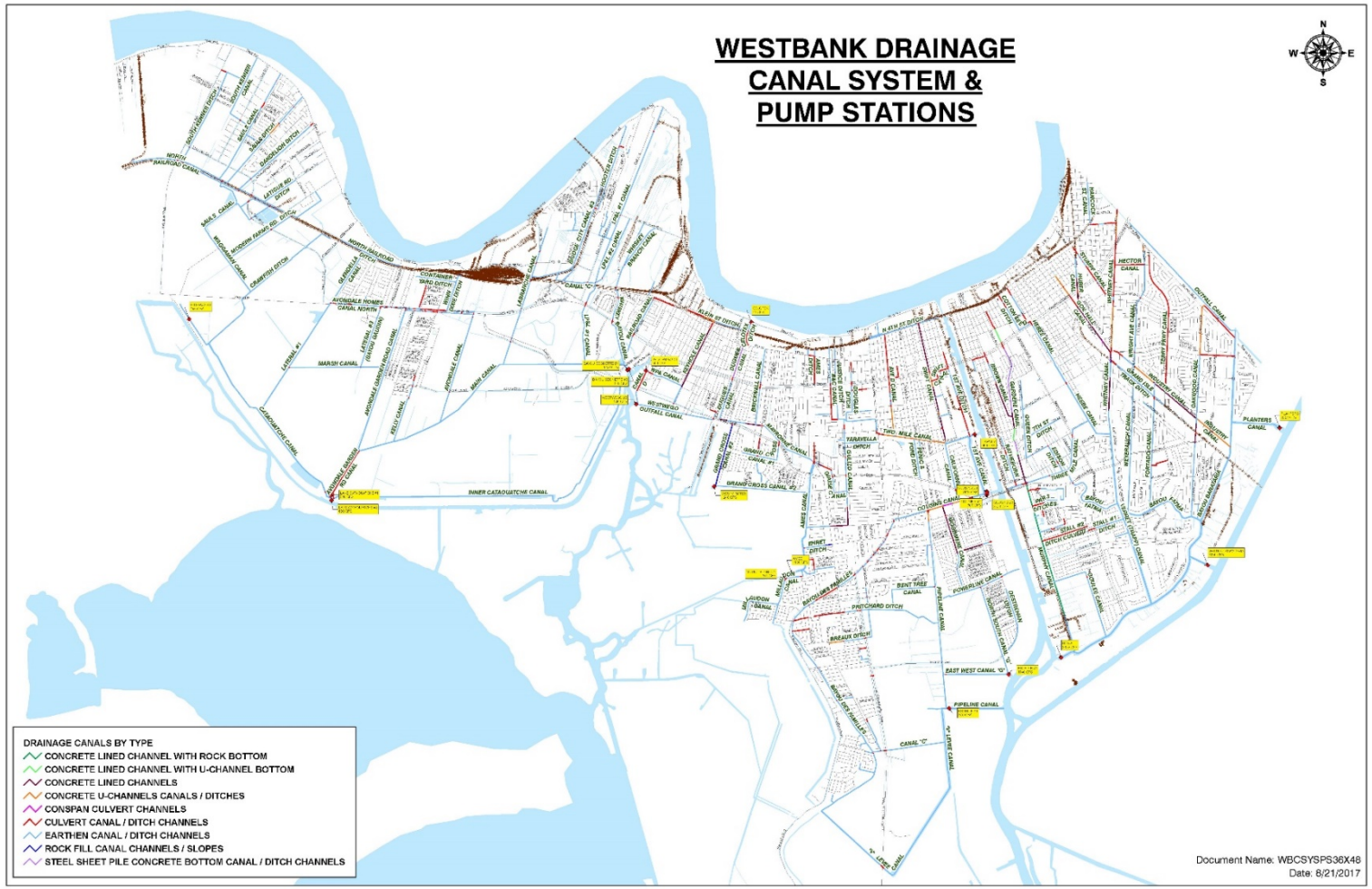

WESTBANK DRAINAGE
CANAL SYSTEM &
PUMP STATIONS
N
W
E
S
DRAINAGE CANALS BY TYPE
CONCRETE LINED CHANNEL WITH ROCK BOTTOM
CONCRETE LINED CHANNEL WITH U-CHANNEL BOTTOM
CONCRETE LINED CHANNELS
CONCRETE U-CHANNELS CANALS / DITCHES
CONSPAN CULVERT CHANNELS
CULVERT CANAL / DITCH CHANNELS
EARTHEN CANAL / DITCH CHANNELS
ROCK FILL CANAL CHANNELS / SLOPES
STEEL SHEET PILE CONCRETE BOTTOM CANAL / DITCH CHANNELS
Document Name: WBCSYSPS36X48
Date: 8/21/2017

Figure 2

REPETITIVE LOSS REQUIREMENT

Repetitive loss data must be maintained and updated annually in order to participate in the CRS. Since many of the losses under the NFIP come from repetitively flooded properties, addressing these properties is a priority for participating in the CRS Program. Depending on the severity of the repetitive loss problem, a CRS community has different responsibilities.

- **Category A**: A community with no unmitigated repetitive loss properties. No special requirements from the CRS.
- **Category B**: A community with at least one, but fewer than 10, unmitigated repetitive loss properties. Category B communities are required by the CRS to research and describe their repetitive loss problem, create a map showing the showing the location of all repetitive loss areas and complete an annual outreach activity directed to repetitive loss properties.
- **Category C**: A community with 50 or more unmitigated repetitive loss properties. Category C communities are required to do everything in Category B and prepare either a floodplain management plan that covers all repetitive loss areas or prepare a RLAA for all repetitive loss areas.

As of July 9, 2018, the Town of Jean Lafitte has a total of 78 unmitigated Repetitive Loss and Severe Repetitive Loss properties.[7] The Town of Jean Lafitte is, therefore, designated as a Category C repetitive loss community.

[7] NFIP Repetitive Loss (RL) AW-501 Worksheets provided to the Town of Jean Lafitte on 7/9/2018

MAPPING REPETITIVE LOSS AREAS

In accordance with the principles outlined in the CRS guidance titled Mapping Repetitive Loss Areas dated October, 2015, the Town of Jean Lafitte identified the entire town as one (1) repetitive loss area. There are 78 unmitigated repetitive loss properties in the Town of Jean Lafitte.

This RLLA consists of repetitive loss properties and the surrounding properties that experience the same or similar flooding conditions, whether or not the buildings on those surrounding properties have been damaged by flooding. The methodology adopted to select the areas are as follows:

- Total number of flood insurance claims post Hurricane Katrina, and
- Percentage of repetitive flood loss properties as compared to the structures, between October 2005 and July 2018.

Based on the data analysis, the entire Town of Jean Lafitte illustrated below was selected for the RLAA.

REPEITITVE LOSS AREA IN JEAN LAFITTE

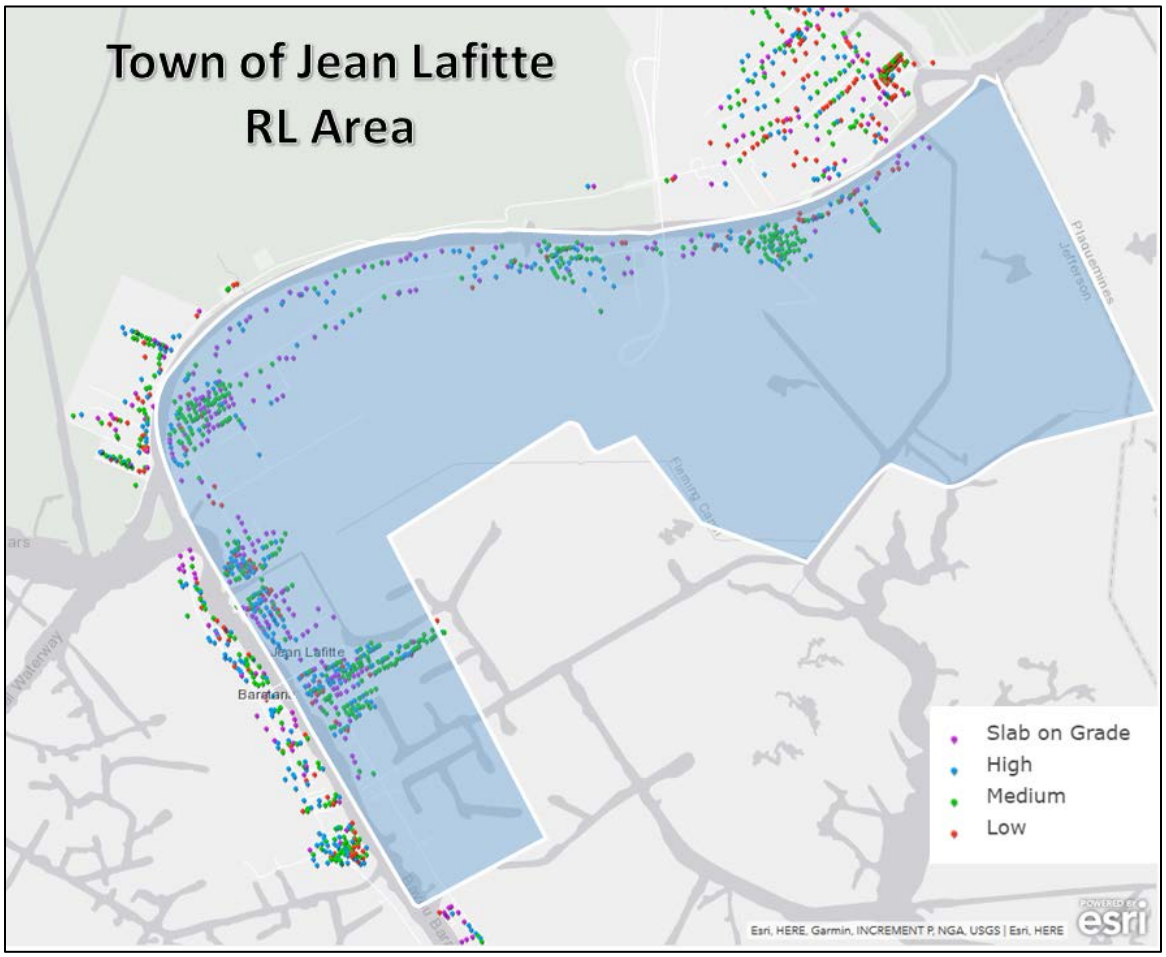


Figure 3

THE RLAA PROCESS

The RLAA planning process incorporated requirements from Section 510 of the 2017 CRS Coordinator's Manual. The planning process also incorporated requirements from the following guidance documents: 1) FEMA publication Reducing Damage from Localized Flooding: A Guide for Communities, Part III Chapter 7; 2) CRS publication Mapping Repetitive Loss Areas dated October, 2015; and 3) Center for Hazards Assessment Response and Technology, University of New Orleans draft publication The Guidebook to Conducting Repetitive Loss Area Analyses. Most specifically, this RLAA included all five planning steps included in the 2017 CRS Coordinator's Manual:

Step 1. Advise all the properties in the repetitive loss areas that the analysis will be conducted and request their input on the hazard and recommended actions.

Step 2. Contact agencies and organizations that may have plans or studies that could affect the cause or impacts of the flooding. The agencies and organizations must be identified in the analysis report.

Step 3. Visit each building and collect basic data.

Step 4. Review alternative approaches and determine whether any property protection measures or drainage improvements are feasible.

Step 5. Document the findings. A separate analysis report must be prepared for each area.

Beyond the 5 planning steps, additional credit criteria must be met:

1. The community must have at least one repetitive loss area delineated in accordance with the criteria in Section 503 of the 2017 CRS Coordinator's Manual.
2. The repetitive loss area must be mapped as described in Section 503.b. A Category "C" community must prepare analyses for all of its repetitive loss areas if it wants to use RLAA to meet its repetitive loss planning prerequisite.
3. The repetitive loss area analysis report(s) must be submitted to the community's governing body and made available to the media and the public. The complete repetitive loss area analysis report(s) must be adopted by the community's governing body or by an office that has been delegated approval authority by the community's governing body.
4. The community must prepare an annual progress report for its area analysis.
5. The community must update its repetitive loss area analyses in time for each CRS cycle verification visit.

STEP 1. ADVISE ALL PROPERTY OWNERS

Before field work began on the RLAA, individual notices were mailed to property owners within the Town of Jean Lafitte. The notices advised properties owners about the analysis and requested their input on the flooding problem in their area and mitigation actions taken. The notice also advised property owners how they could provide comments on the draft report once it was posted online. Property owners could fill out the questionnaire postcard that was mailed to them and send it back in via USPS, or they could take an online survey with a link that was provided on the mailer.

The property owner notice with questionnaire was mailed to 675 residents in the Town of Jean Lafitte the week of October 10, 2017. The annual 2018 mailer included a follow up informing residents of the project's progress. Additionally, the annual 2019 mailer included an update for residents that the draft report was available for review. The Town also posted a public notice at Town Hall and the library.

Figure 2-1 Front of Notice

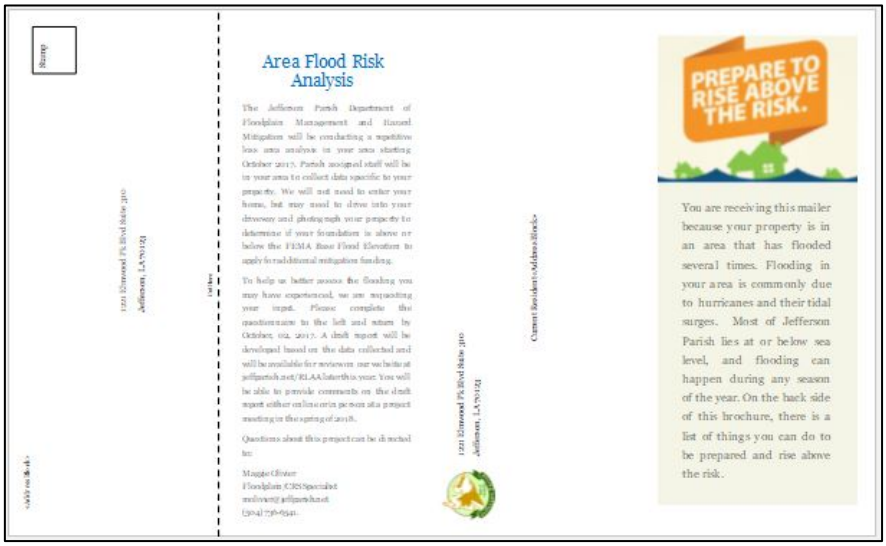


Figure 2- 2 Back of Notice with Questionnaire

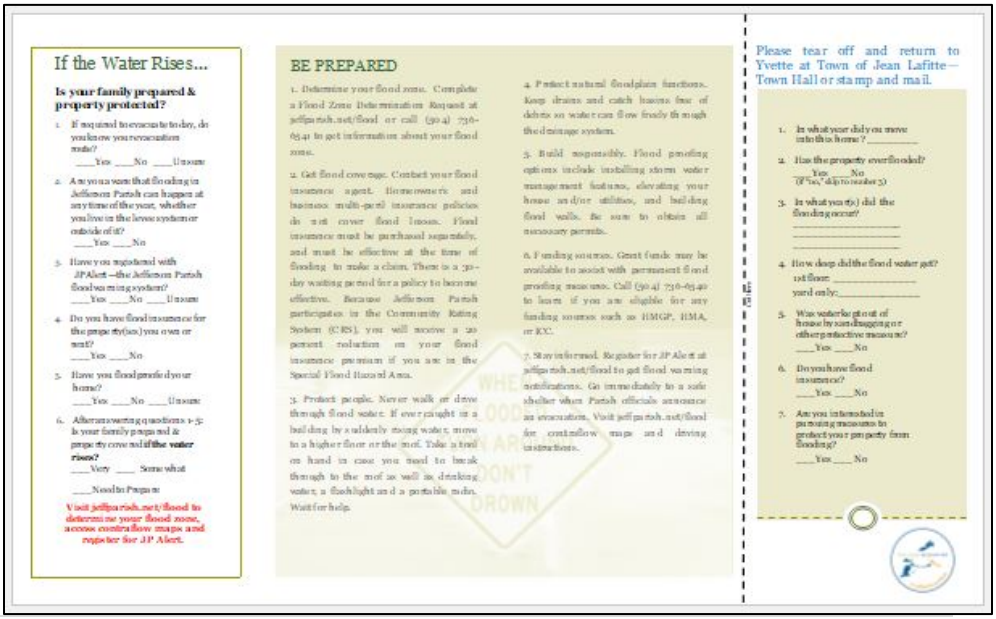
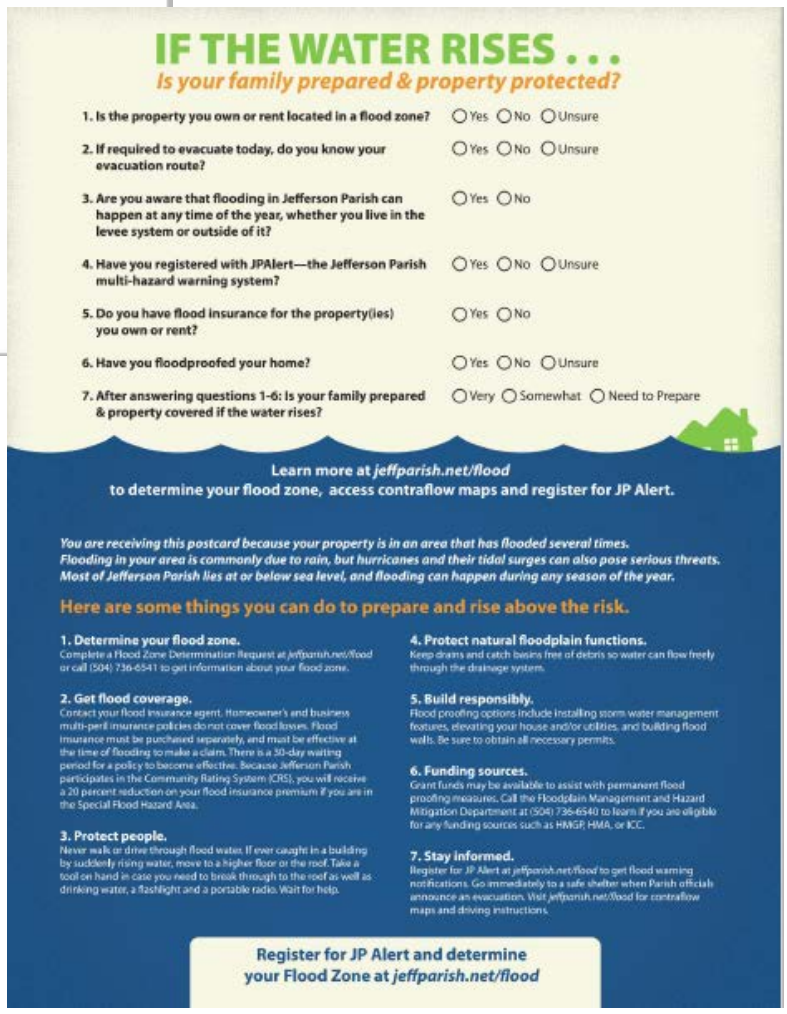


Figure 2-3 Outside of 2018 Mailer



2-4 Inside of 2018 Mailer

Figure 2-5 2019 Town Annual RL Letter

TOWN OF JEAN LAFITTE
OFFICE OF THE MAYOR

TIMOTHY P. KERNER
MAYOR

YVETTE CRAIN
TOWN CLERK

MARCELL RODRIGUEZ
CHIEF OF POLICE

2654 Jean Lafitte Blvd.
Lafitte, Louisiana 70067
Office: (504) 689-2208
Police: (504) 689-3132
Fax: (504) 689-7801

COUNCIL MEMBERS

SHIRLEY GUILLIE
MAYOR PROTEM

BARRY BARTHOLOMEW
CHRISTY CREPPEL
VERNA SMITH
CALVIN LEBEAU

Feburary 21, 2019

Dear Resident:

You have received this letter because your property is in an area that has flooded several times. The Town of Jean Lafitte is concerned about repetitive flooding and has an active program to help you protect yourself and your structure from future flooding.

1. Check with the Town of Jean Lafitte on the extent of past flooding in your area. We can tell you about the causes of repetitive flooding, and what the town is doing about it, and what would be an appropriate flood protection level.

2. Prepare for flooding by doing the following:

- Know how to shut of the electricity and gas to you house when a flood comes.
- Make a list of emergency numbers and identify a safe place to go.
- Make a household inventory, especially of contents.
- Put insurance policies, valuable papers, medicine, etc. in a safe place.
- Collect and put cleaning supplies, camera, waterproof boots, etc. in a handy place.

3. Consider some permanent flood protection measures.

- Consider elevating your house above flood levels.
- Install a floor drain plug, standpipe, overhead sewer, or sewer backup valve to prevent sewer backup flooding.
- More information can be found in the "Homeowner's Guide to Retrofitting: Six ways to Protect Your House from Flooding" on FEMA's web site http://www.fema.gov/floodplain-management/homeowners-guide-retrofitting.

4. Visit the Town Hall for information on financial assistance in terms of a flood insurance policy. Get a flood insurance policy-it will help pay for repairs after a flood and in some cases, it will help pay the costs of elevating a substantially damaged building.

- Homeowner's insurance policies DO NOT cover damage from floods. However, because the Town of Jean Lafitte participates in the National Flood Insurance Program, you can purchase a separate flood insurance policy. This flood insurance is backed by the Federal government and is available to everyone, even properties that have been flooded.
- Any area that is NOT mapped as a Special Flood Hazard Area may quality for a lower-cost Preferred Risk Policy.
- Do not wait for the next flood to buy flood insurance protection. In most cases, there is a 30-day waiting period before the NFIP coverage takes effect.

Last year you received notice about an analysis of your area for Repetitive Flooding. Our data collection is now complete. Starting February 22, 2019, a draft report and online comment form will be available at www.jeffparish.net/RLAA. Please provide any comments by March 8, 2019 to ensure your experience and ideas are incorporated into the final report. Questions about this project can be directed to Maggie Talley, Director of Floodplain Management and Hazard Mitigation, Jefferson Parish, mtalley@jeffparish.net or 504-736-6541.

Please contact our office for more information.

Yvette Crain
Yvette Crain
Flood Plain Manager

Timothy P. Kerner
Timothy P. Kerner
Mayor

Town of Jean Lafitte
2654 Jean Lafitte Blvd.
Lafitte, LA 70067

$ 000.50⁰

Residential Customer
Lafitte, LA 70067

Figure 2-6 2019 RLAA Public Notice

Area Flood Risk Analysis

The Jefferson Parish Department of Floodplain Management and Hazard Mitigation has been conducting a repetitive loss area analysis in your area, and our data collection is now complete. Starting February 22, 2019, a draft report and online comment form will be available at www.jeffparish.net/RLAA. Please provide any comments by March 8, 2019 to ensure your experience and ideas are incorporated into the final report. We look forward to hearing from you. Thank you in advance for you input.

Questions about this project can be directed to:

Maggie Talley
Jefferson Parish
Director of Floodplain Management and Hazard Mitigation
mtalley@jeffparish.net
(504) 736-6541

Out of the 675 mailed questionnaires, Jefferson Parish received eight responses which corresponds to a response rate of less than 1 percent. Questionnaire responses are summarized below. Note: respondents may have skipped questions and/or provided more than one response to a question.

Q1: In what year did you move into this home?

Responses Received	Percentage	Number Responding
<10 years ago	12.5	**1**
10-20 years ago	37.5	**3**
20-30 years ago	12.5	**1**
30-40 years ago	12.5	**1**
40-50 years ago	-	**None**
> 50 years ago	25	**2**
Total	**100**	**8**

Q2: Has the property ever been flooded?

Answer Choices	Percentage	Number
No	75	**6**
Yes	25	**2**
Total	**100**	**8**

Q3: In what year(s) did the flooding occur?

Responses Received	Percentage	Number Responding
2005	12.5	**1**
2008	25	**2**
2009	12.5	**1**
2012	12.5	**1**
Other	12.5	**1**
Unanswered/NA	25	**2**
Total	**100**	**8**

Q4: How deep did the water get?

Answer Choices	Percentage	Number Responding	Depth	
			< 3 ft	> 3 ft
First floor	50	**4**	4	**-**
Yard only	25	**2**	1	**1**
Unanswered/NA	25	**2**	2	**7**
Total	**100**	**8**	**8**	**8**

Q5: Was water kept out of the house by sandbagging or other protective measures?

Answer Choices	Percentage	Number Responding
No	75	**6**
Yes	25	**2**
Total	**100**	**8**

Q6: Do you have Flood Insurance?

Answer Choices	Percentage	Number Responding
No	25	**2**
Yes	75	**6**
Total	**100**	**8**

Q7: Are you interested in any of the following measures to protect your property from flooding?

Answer Choices (can choose more than one)	Percentage	Number Responding
No	13	**1**
Yes	87	**7**
Total	**100**	**8**

The following trends in survey responses should be considered when evaluating mitigation measures for the Town of Jean Lafitte:

- Six of the eight respondents currently has FEMA flood insurance.
- All but one of the respondents have been living in their houses for at least 10 years.
- Historically, within Jefferson Parish, the greatest flood events occurred in 1995, 2005 and 2008.

The following flood events are detailed in NOAA's National Climatic Data Center (NCDC) database:

- **Southeast Louisiana and Southern Mississippi Flood, 1995** - It was a heavy rainfall event which occurred across an area stretching from the New Orleans metropolitan area into southern Mississippi. A storm total rainfall maximum of 27.5 inches (70 cm) was recorded near Necaise, Mississippi. Considerable flooding was caused by the rainfall including several record flood crests along impacted river systems. The flooding caused six fatalities and more than $3.1 billion in damage.

- **August 29, 2005** – The Category 3 Hurricane Katrina caused catastrophic damage along the Gulf coast from central Florida to Texas, much of it due to the storm surge and levee failure. Severe property damage occurred in coastal areas, such as Mississippi beachfront towns where boats and casino barges rammed buildings, pushing cars and houses inland; water reached 6–12 miles (10–19 km) from the beach. The storm was the third most intense United States landfalling tropical cyclone, behind the 1935 Labor Day hurricane and Hurricane Camille in 1969. Overall, at least 1,245 people died in the hurricane and subsequent floods, making it the deadliest United States hurricane since the 1928 Okeechobee hurricane. Total property damage was estimated at $125 billion (2005 USD), roughly four times the damage wrought by Hurricane Andrew in 1992 in the United States.

- **August-September, 2008** - The storm surge ahead of Ike blew onshore of Louisiana well ahead of Ike's predicted landfall in Texas on September 13. Areas in coastal south-central and southwestern Louisiana, some of which were flooded by Gustav, were re-flooded as a result of Ike. Some areas that had not yet recovered from Gustav power outages received additional outages of 200,000. The hardest-hit areas were in and around Cameron Parish, with nearly every square inch of the coastline in that area was flooded heavily, reaching as far north as Lake Charles, nearly 30 miles inland.

STEP 2. CONTACT AGENCIES AND ORGANIZATIONS

Jefferson Parish Department of Hazard Mitigation and Floodplain Management contacted external agencies and internal departments that have plans or studies that could affect the cause or impacts of flooding within the identified repetitive loss subareas. The data collected was used to analyze the problems further and to help identify potential solutions and mitigation measures for property owners. The agencies contacted and reports which were analyzed and reviewed are as follows:

Agencies

- Jefferson Parish Electronic Information System Department
- Jefferson Parish Streets Department
- Jefferson Parish Office of Risk Management
- Jefferson Parish Drainage Department

Reports

- FEMA – Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) for Jefferson Parish, February 2, 2018
- ISO – Repetitive Flood Insurance Claims Data
- Jefferson Parish Hazard Mitigation Plan

SUMMARY OF STUDIES AND REPORTS

FEMA FLOOD INSURANCE STUDY (FIS) AND FLOOD INSURANCE RATE MAP (FIRM)

FEMA's FIS for Jefferson Parish, LA is dated February 2, 2018. The FIS revises and updates information on the existence and severity of flood hazards within the Parish. The FIS also includes revised digital Flood Insurance Rate Maps (FIRMs) which reflect updated Special Flood Hazard Areas (SFHAs) and flood zones for the Parish. SFHA boundaries within the Parish were updated due to new detailed coastal analyses which were performed by the USACE-MVN, for FEMA. This study also incorporates the Hurricane Storm Damage Risk Reduction System (HSDRRS) completed by the USACE. Finally, these maps depict the potential for flooding and are the basis for building requirements and flood insurance rates.

FLOOD INSURANCE CLAIMS DATA

The Privacy Act of 1974 (5 U.S.C. 522a) restricts the release of flood insurance policy and claims data to the public. This information can only be released to state and local governments for the use in floodplain management related activities. Therefore all claims data in this report are only discussed in general terms.

The purpose of a mitigation plan is to rationalize the process of determining appropriate hazard mitigation actions. The document includes a detailed description of natural hazards in Jefferson Parish; a risk assessment that describes potential losses to physical assets, people and operations; a set of goals, objectives, strategies and actions that will guide the Parish's mitigation activities, and a detailed plan for implementing and monitoring the Plan. This Plan identified 12 hazards and included a risk assessment of the four hazards with the highest potential for damaging physical assets, people and operations in Jefferson Parish. These hazards are floods, hurricanes and tropical storms, storm surge, and tornadoes. Both the risk assessment section and goals sections reflect this emphasis, which was the result of careful consideration and a numerical ranking process carried out by the Mitigation Planning Team (MPT).

STEP 3. BUILDING DATA COLLECTION

The on-site field survey for this analysis was conducted over multiple days in November 2017. The Collector App through ESRI was utilized to save field data from the site visits. In addition, multiple site photos were taken of each structure on the property. Photos were also taken of current drainage features and mitigation and floodproofing measures if evident from street or parking lot views. The following information was recorded for each property:

Table 2-1

Structure		Foundation		Type	
No structure	0	Slab on grade	174	Residential	698
Occupied	722	Low (less than 2ft.)	67	Non-residential	66
Vacant	42	Medium	330		
		High	193		

COLLECTOR FOR ARCGIS (ESRI)

The team used the ESRI Collector Application in order to be able to store and spatially view repetitive loss data for the Town of Jean Lafitte. The Collector App contains all field data collected by parcels for RLAA including pictures of each structure on the parcel. The data is stored in ArcGIS and is used for internal review and continued analysis of repetitive flood loss areas.

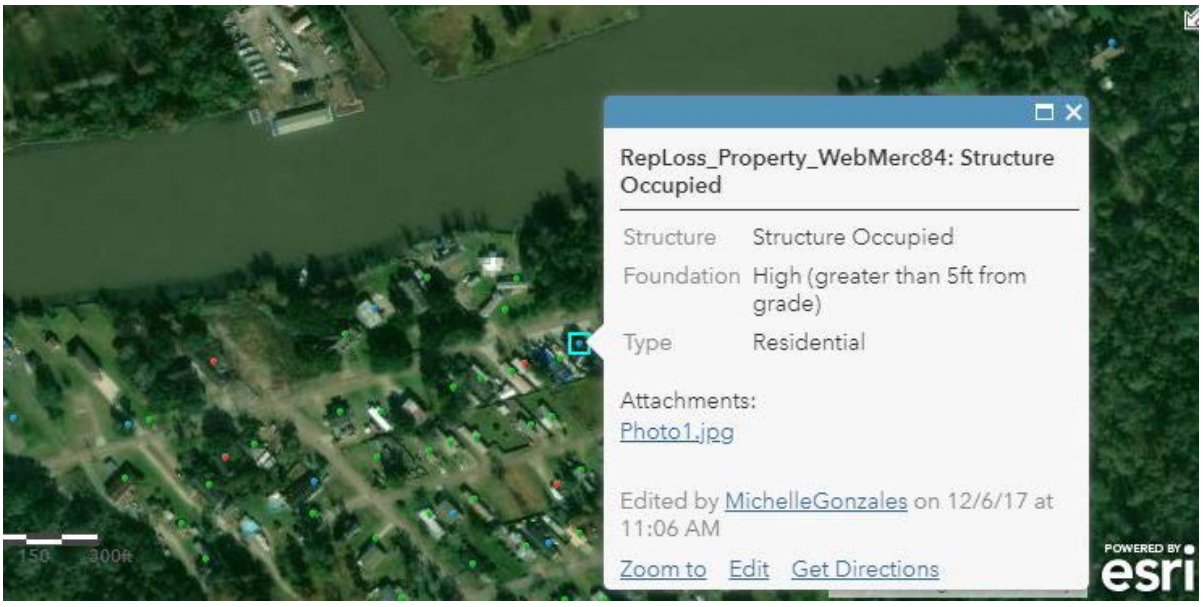


Figure 2-7 Collector Application Sample

PROBLEM STATEMENT

JEAN LAFITTE

The RL area in the Town of Jean Lafitte is located entirely within the 100-year floodplain (Zone AE) as shown on the map to the right. The Town of Jean Lafitte encompasses a land area of 6 square miles and a water area of 0.3 sq. miles. The Base Flood Elevation ranges from 8 to 9 feet NAVD 1988 in this area.

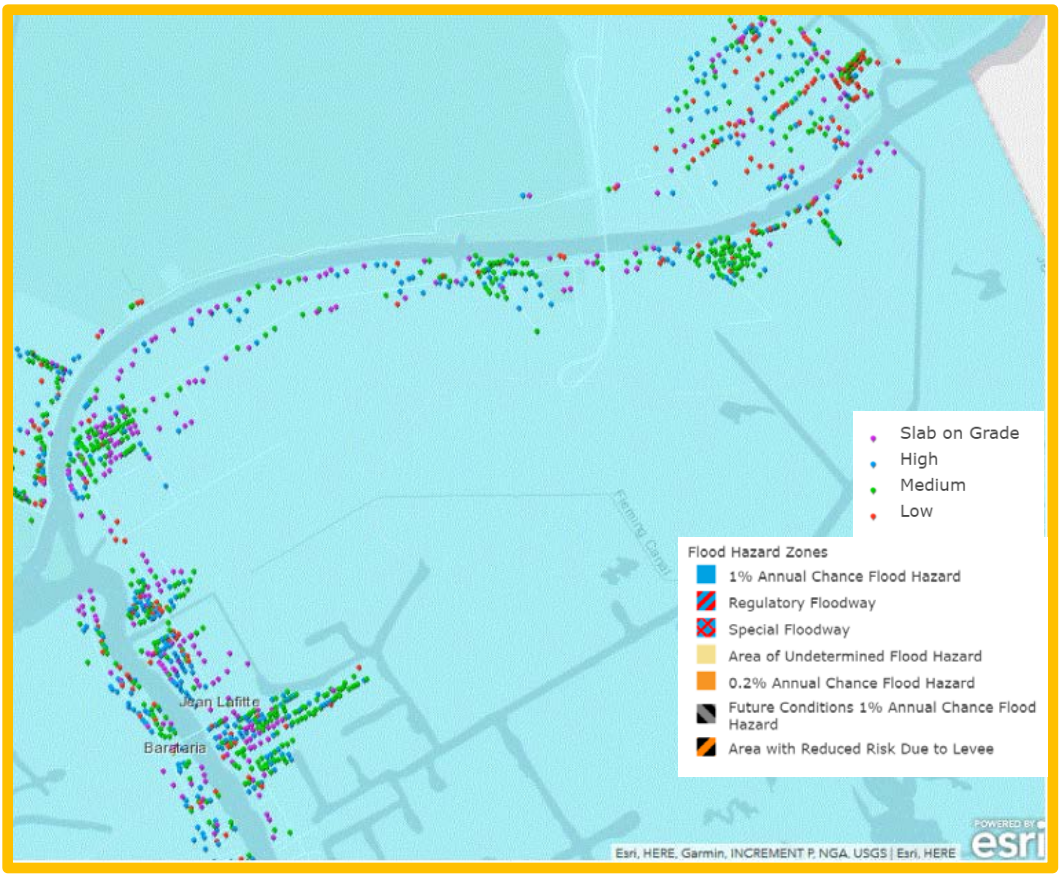


Figure 2-8 2018 Effective FIRM

Unlike other communities in Southeast Louisiana, so called "nuisance rain" from quick, heavy rainfall that causes widespread street flooding, is not an issue for the Town. Because of the surrounding open waterways and low elevation, storm surge is the major threat to the Town of Jean Lafitte. Tropical storms and hurricanes that make landfall to the west of the Town are responsible for the storm surge threat to residents.

In the last 25 years, the Town has taken steps to improve its drainage by installing 4 new pumping stations. The Lafitte Drainage Improvement Program included the installation of more than 30,000 linear feet of subsurface drainage on 27 different streets throughout the Town of Jean Lafitte and surrounding areas to improve the drainage conveyance to the existing pump stations. In addition, crews have converted open ditches into large culverts for safety reasons. As of March of 2019, the Town is in the final stage of enclosing the tidal levee along the Fleming Curve that will protect the town from storm surge in a tropical storm or hurricane event.

In accordance with FEMA publication *551 Selecting Appropriate Mitigation Measures for Floodprone Structures*, mitigation options are discussed. The approach to reducing repetitive flooding in the Town of Jean Lafitte's Repetitive Loss Area will require a combination of floodproofing techniques, education, and drainage improvement projects.

CLAIMS DATA:

In review of the unmitigated Repetitive Loss List, there are 78 properties within the 764 property study area that qualify as repetitive loss. Of those 78 repetitive loss properties, 8 are considered to be severe repetitive loss properties.

In analyzing the claims data, it could be derived that the area experiences most flooding from rainfall events. There have been 209 flood claims in the study areas totaling $7,157,844.54. The average claim in the study area is $31,464.66. The homeowners of the 71 repetitive loss properties have made 178 claims and received $5,521,698.09 in flood insurance payments since 1978. The homeowners of the 8 severe repetitive loss properties have made 31 claims, and received $1,636,146.45 in flood insurance payments since 1978. The average repetitive flood loss claim was $29,079.21 and the average severe repetitive loss claim was $52,635.54. (See bar graph below, Table 2-3).

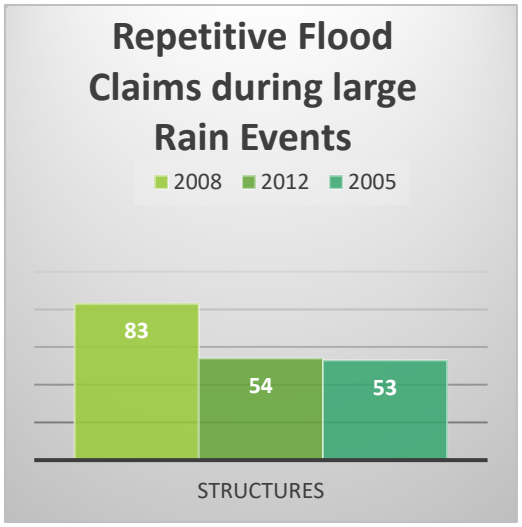


Table 2-2

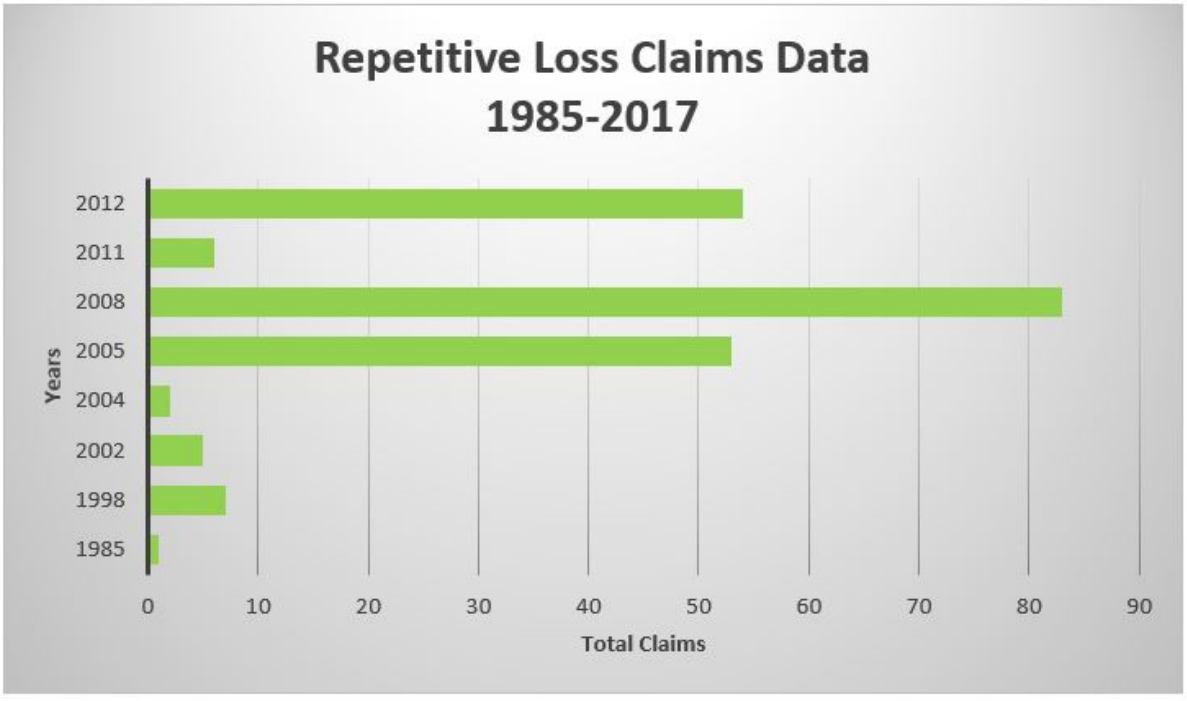


Table 2-3

FIELD DATA:

The on-site field survey for this analysis was conducted over multiple days in November 2017. The team collected information such as the type and height of the foundation, occupancy status of the structure, and use of the structure.

With a count of 764, the majority of the structures are medium foundation height (43%). There are 193 structures (25%) that have high foundations. One hundred and seventy four (23%) structures are slab on grade and 67 structures (9%) have low foundations (less than 2 feet from grade).

The project team observed that majority (722 or 95%) of the structures in the area are occupied, while approximately 42, or 5%, are vacant. Also, majority of the structures are of residential use (92% or 698), while 8% (66) are non-residential.

In conclusion, it should be noted that given the location of the study area, all of the properties are outside the Hurricane and Storm Damage Risk Reduction System. Since 75% of the properties have slab on grade, or low or medium foundation heights, a heavy rain event can cause substantial damage to these properties.

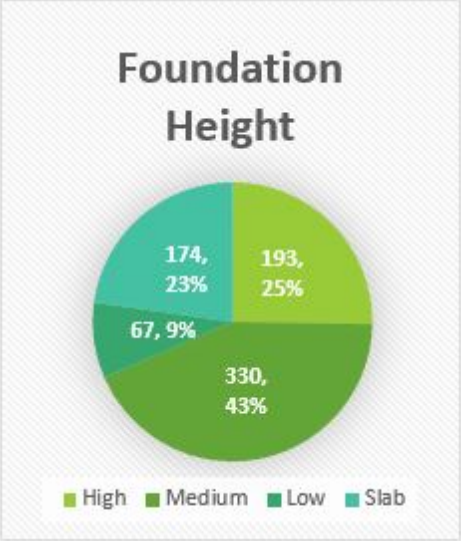


Table 2-4

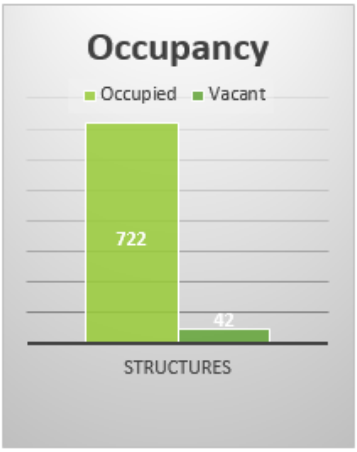


Table 2-5

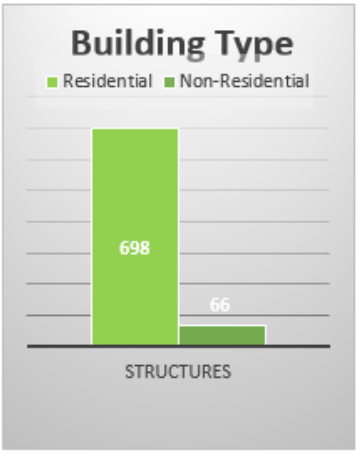


Table 2-6

Figure 2-9 Example slab on grade property in study area

Figure 2-10 Example elevated property in study area

STEP 4. REVIEW ALTERNATIVE MITIGATION APPROACHES

There are many ways to protect a property from flood damage. Different measures are appropriate for different flood hazards, building types and building conditions. Figure 2-8 below, found in the *2017 CRS Coordinator's Manual*, lists typical property protection measures.

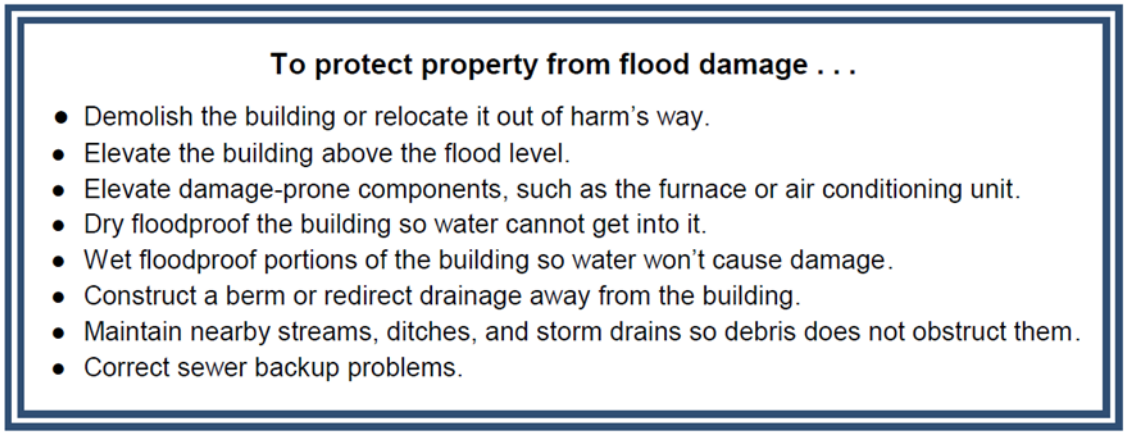


Figure 2- 11 Typical Property Protection Measures

Mitigation measures should fall into one of the mitigation categories listed below which are based on the Community Rating System planning process:

- Prevention
- Property Protection
- Natural Resource Protection
- Emergency Services
- Structural Projects
- Public Information and Outreach

MITIGATION FUNDING

There are several types of mitigation measures, listed in the table below, which can be considered for each repetitive loss property. Each mitigation measure qualifies for one or more grant program(s). Depending on the type of structure, severity of flooding and proximity to additional structures with similar flooding conditions, the most appropriate measure can be determined. In addition to these grant funded projects, several mitigations measures can be taken by the homeowner to protect their home.

Table 2-5

Types of Projects Funded	HMGP	FMA	PDM	ICC	SBA
Acquisition of the entire property by govt. agency	✔	✔	✔		
Relocation of the building to a flood free site	✔	✔	✔	✔	✔
Demolition of the structure	✔	✔	✔	✔	✔
Elevation of the structure above flood levels	✔	✔	✔	✔	✔
Replacing the old building with a new elevated one	✔	✔	✔	✔	✔
Local drainage and small flood control projects	✔	✔	✔		
Dry floodproofing (non-residential only)	✔	✔	✔		
Percent paid by Federal program	75%	75%, 90%, or 100%	75%	Up to $30K	

There are several possible sources of funding for mitigation projects:

- **FEMA grants**: Most of the FEMA programs provide 75% of the cost of a project. In most communities, the 25% non-FEMA share is paid by the benefitting property owner. Each program has different Congressional authorization and slightly different rules.

    - **The Hazard Mitigation Grant Program (HMGP)**: The HMGP provides grants to States and local governments to implement long-term hazard mitigation measures after a major disaster declaration. Projects must provide a long-term solution to a problem (e.g., elevation of a home to reduce the risk of flood damages as opposed to buying sandbags and pumps to fight the flood). Examples of eligible projects include acquisition and elevation, as well as local drainage projects.
    - **The Flood Mitigation Assistance Program (FMA)**: FMA funds assist States and communities in implementing measures that reduce or eliminate the long-term risk of flood damage to structures insured under the NFIP. Project Grants to implement measures to reduce flood losses, such as elevation, acquisition, or relocation of NFIP-insured structures. States are encouraged to prioritize FMA funds for applications that include repetitive loss properties; these include structures with 2 or more losses each with a claim of at least $1,000 within any ten-year period since 1978.
    - **Pre-Disaster Mitigation Program (PDM)**: The Pre-Disaster Mitigation (PDM) program provides funds to states, territories, Indian tribal governments, communities, and universities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. For more information visit http://www.fema.gov/government/grant/pdm/index.shtm.

- **Flood insurance**: There is a special funding provision in the National Flood Insurance Program (NFIP) for insured buildings that have been substantially damaged by a flood, “Increased Cost of Compliance.” ICC coverage pays for the cost to comply with floodplain management regulations after a flood if the building has been declared substantially damaged. ICC will pay up to $30,000 to help cover elevation, relocation, demolition, and (for nonresidential buildings) floodproofing. It can also be used to help pay the 25% owner’s share of a FEMA funded mitigation project.

The building's flood insurance policy must have been in effect during the flood. This payment is in addition to the damage claim payment that would be made under the regular policy coverage, as long as the total claim does not exceed $250,000. Claims must be accompanied by a substantial or repetitive damage determination made by the local floodplain administrator. For more information, contact your insurance agent or visit: www.fema.gov/plan/prevent/floodplain/ICC.shtm.

Coverage under the ICC does have limitations: It covers only damage caused by a flood, as opposed to wind or fire damage. The building's flood insurance policy must have been in effect during the flood. ICC payments are limited to $30,000 per structure. Claims must be accompanied by a substantial or repetitive damage determination made by the local floodplain administrator and the structure must be in Zone AE.

The average claims payment in the study area is $31,464.66. With an average claim of that amount, it is not likely that many homes in the study area would sustain substantial damage from a flood event. Homeowners should make themselves aware of the approximate value of their homes, and in the case of incurring flood damage, be aware of the need for a substantial damage declaration in order to receive the ICC coverage.

Alternative language adopted into the local floodplain management ordinance would enable residents with shallower flooding to access ICC funding. Since local ordinances determine the threshold at which substantial damage and/or repetitive claims are reached, adopting language that would lower these thresholds would benefit the homeowners of repetitive loss properties. Adopting alternative language allows for cumulative damages to reach the threshold for federal mitigation resources more quickly, meaning that some of the properties in the Town of Jean Lafitte that sustain minor damage regularly would qualify for mitigation assistance through ICC.

- Rebates: A rebate is a grant in which the costs are shared by the homeowner and another source, such as the local government, usually given to a property owner after a project has been completed. Many communities favor it because the owner handles all the design details, contracting, and payment before the community makes a final commitment. The owner ensures that the project meets all of the program's criteria, has the project constructed, and then goes to the community for the rebate after the completed project passes inspection.

Rebates are more successful where the cost of the project is relatively small, e.g., under $5,000, because the owner is more likely to be able to afford the bulk of the cost. The rebate acts more as an incentive, rather than as needed financial support.

- Small Business Administration Mitigation Loans: The Small Business Administration (SBA) offers mitigation loans to SBA disaster loan applicants who have not yet closed on their disaster loan. Applicants who have already closed must demonstrate that the delay in application was beyond their control.

For example mitigation loans made following a flood can only be used for a measure to protect against future flooding, not a tornado. If the measure existed prior to the declared disaster, an SBA mitigation loan will cover the replacement cost. If the measure did not exist prior to the declared disaster the mitigation loan will only cover the cost of the measure if it is deemed absolutely necessary for repairing the property by a professional third-party, such as an engineer.

MITIGATION ALTERNATIVES

The majority of the flooding in this area are a result from tropical storms and hurricanes that produce large storms surges along the Louisiana coastline, particularly storms that make landfall west of the Town. Floodwaters can quickly cover main roads and highways during storm events, often preventing evacuations and rescues.

Flooding in the Town of Jean Lafitte can be attributed to its flat topography. These structural methods require large capital expenditures and cooperation from private property owners. Promoting floodproofing techniques and increasing public education and awareness of the flood hazards can be the next best alternative for property owners in this area. The Parish's and the Town's websites, e-mail distribution lists, press releases and variable message boards can provide benefit to business owners and residents.

POTENTIAL MITIGATION MEASURES FOR THE TOWN OF JEAN LAFITTE

Structural Alternatives:

- **Elevate** structures and damage-prone components, such as the water heater or air conditioning unit, above the Base Flood Elevation (BFE).
- **Dry floodproofing** can be done on commercial structures and even residential structures; however, in many instances this requires human intervention to complete the measure and ensure success. For example, installing watertight shields over doors or windows requires timely action by the homeowner; especially in a heavy rainfall event.
- **Wet floodproofing** a structure involves making the uninhabited portions of the structure resistant to flood damage and allowing water to enter during flooding. For example, in a basement or crawl space, mechanical equipment and ductwork would not be damaged.
- **Acquire and/or relocate** properties/target abandoned properties or locations that would provide a public benefit as the location will need to be maintained by the City in perpetuity.
- **Increase the size of culverts** under Jefferson Hwy to allow for increased capacity.
- **Implement drainage** i**mprovements** such as increasing capacity in the system (up-sizing pipes) and provide additional inlets to receive more stormwater.
- Improve stormwater system maintenance program to ensure inlets and canals are free of clogging debris.

Non Structural Alternatives:

- **Relocate internal supplies**, products/goods, and belongings above the flood depth.
- Improve the Parish's floodplain and zoning ordinances.
- **Provide public education** through posting information about local flood hazards on City website, posting signs at various locations in neighborhoods or discussing flood protection measures at local neighborhood association meetings.
- Promote the purchase of flood insurance.
- Continue coordination with GOHSEP, the National Weather Service (NWS), and United States Geological Survey (USGS) to enhance flood warning system, including the use of rain/stream gauges, to provide greater warning time for citizens. NWS can use the real- time data collected to issue timely warnings.

COST AND BENEFITS OF MITIGATION MEASURES

Knowing the flooding history, type, and condition of the buildings in the area, leads to the fourth step in the area analysis procedure – a review of alternative mitigation approaches to protect properties from, or reduce, future flood damage. Property owners should look at these alternatives but understand they are not all guaranteed to provide protection at different levels of flooding. Six approaches were reviewed:

- Elevating the houses above the 1% annual flood level
- Acquisition
- Floodproofing
- Drainage improvements
- Utility protection
- Maintaining flood insurance coverage on the building

ELEVATION

Raising the structure above the flood level is generally viewed as the best flood protection measure, short of removing the building from the floodplain. All damageable portions of the building and its contents are high and dry during a flood, which flows under the building instead of into the house. Houses can be elevated on fill, posts/piles, or a crawlspace.

- A house elevated on fill requires adding a specific type of dirt to a lot and building the house on top of the added dirt.
- A house elevated on posts/piles is either built or raised on a foundation of piers that are driven into the earth and rise high enough above the ground to elevate the house above the flow of flood water or the design flood elevation.
- A house elevated on a crawlspace or enclosure is built or raised on a continuous wall-like foundation that elevates the house above the design flood level. It is important to include vents or openings in the walls below the design flood level that are appropriately sized: one square inch for each square foot of the crawlspace or enclosures footprint. Additionally all materials below the design flood level must be flood resistance and all machinery, equipment, and plumbing must be above the design flood level.
    - Cost: A majority of the cost to elevate a building is in the preparation and foundation construction. The cost to elevate six feet is little more than the cost to go up two feet. Elevation is usually cost-effective for wood frame buildings on posts/piles or crawlspace because it is easiest for lifting equipment to be used under the floor and disruption to the habitable part of the house is minimal. Elevating a slab house is much more costly and disruptive. In the study area, 23% percent of the houses in the study area are on a slab. The actual cost of elevating a particular building depends on factors such as its condition, whether it is masonry or brick faced, and if additions have been added on over time. While the cost of elevating a home can be high, there are funding programs that can help. The usual arrangement is for a FEMA grant to pay 75% of the cost while the owner pays the other 25%. In the case of elevating a slab foundation, the homeowner's portion could be as high as $50,000 or more. In some cases, assistance can be provided by Increased Cost of Compliance (ICC) funds, which is discussed on page 26 under Possible Funding Sources, or the use of state funds.

- Feasibility: Federal funding support for an elevation project requires a study that shows that the benefits of the project exceed the cost of the elevation. Project benefits include savings in insurance claims paid on the structure. Elevating a masonry or a slab home can cost up to $300,000, which means that benefit/cost ratios may be low. Looking at each property individually could result in funding for the worst case properties, i.e., those that are the lowest below the base flood elevation, subject to the most frequent flooding, and in good enough condition to elevate.

Advantages	Disadvantages
• **Elevating to or above the BFE allows a substantially damaged or substantially improved house to be brought into compliance.** • **Often reduces flood insurance premiums.** • **Reduces or eliminates road closures due to overtopping.** • **May be fundable under FEMA mitigation grant programs.**	• **Cost may be prohibitive.** • **The appearance of the structure and access to it may be adversely affected.** • **May require property owner cooperation and right-of-way acquisition.** • **May require road or walkway closures during construction.**

Table 2-6 Advantages and Disadvantages of Elevation

ACQUISITION:

This measure involves buying one or more properties and clearing the site (demolishing the building). If there is no building subject to flooding, there is no flood damage. Acquisitions are usually recommended where the flood hazard is so great or so frequent that it is not safe to leave the structure on the site.

An alternative to buying and clearing the whole subdivision is buying out individual, “worst case,” structures with FEMA funds.

- Cost: This approach would involve purchasing and clearing the lowest or the most severe repeatedly flooded homes. If FEMA funds are to be used, three requirements will apply:
  - The applicant for FEMA must demonstrate that the benefits exceed the costs, using FEMA’s one of FEMA’s approved Benefit Cost methodologies.
  - The owner must be a willing seller.
  - The parcel must be deeded to a public agency that agrees to maintain the lot and keep it forever as open space.

- Feasibility: Due to the high cost and difficulty to obtain a favorable benefit-cost ratio in shallow flooding areas, acquisitions are reserved for the worst case buildings. Not everyone wants to sell their home, so a checkerboard pattern of vacant and occupied lots often remains after a buyout

project, leaving “holes” in the neighborhood. There is no reduction in expenses to maintain the neighborhood’s infrastructure for the City, although the tax base is reduced. The vacant lots must be maintained by the new owner agency, and additional expense is added to the community. If the lot is only minimally maintained, its presence may reduce the property values of the remaining houses. The Town of Jean Lafitte is not considering acquisitions at this time for the above reasons.

Advantages	Disadvantages
• **Permanently removes problem since the structure no longer exists.** • **Allows a substantially damaged or substantially improved structure to be brought into compliance with the community’s floodplain management ordinance or law.** • **Expands open space and enhances natural and beneficial uses.** • **May be fundable under FEMA mitigation grant programs.**	• **Cost may be prohibitive.** • **Resistance may be encountered by local communities due to loss of tax base, maintenance of empty lots, and liability for injuries on empty, community-owned lots.**

Table 2-7 Advantages and Disadvantages of Acquisition

There are 3 criteria that must be met for FEMA to fund an acquisition project:

- The local community must inform the property owners interested in the acquisition program that the community will not use condemnation authority to purchase their property and that the participation in the program is strictly voluntary,
- The subsequent deed to the property to be acquired will be amended such that the landowner will be restricted from receiving any further Federal disaster assistance grants, the property shall remain in open space in perpetuity, and the property will be retained in ownership by a public entity, and
- Any replacement housing or relocated structures will be located outside the 100-year floodplain.

FLOODPROOFING

This measure keeps floodwaters out of a building by modifying the structure. Walls are coated with waterproofing compounds or plastic sheeting. Openings (i.e. doors, windows, and vents) are closed either permanently, or temporarily with removable shields or sandbags.

- Make the walls watertight. This is easiest to do for masonry or brick faced walls. The brick or stucco walls can be covered with a waterproof sealant and bricked or stuccoed over with a veneer to camouflage the sealant. Houses with wood, vinyl, or metal siding need to be wrapped with plastic sheeting to make walls watertight, and then covered with a veneer to camouflage and protect the plastic sheeting. Provide closures, such as removable shields or sandbags, for the openings; including doors, windows, dryer vents and weep holes. There must also be an account for sewer backup and other sources of water entering the building. For shallow flood levels, this can be done with a floor drain plug or standpipe; although a check valve system is more secure.

- Dry floodproofing employs the building itself as part of the barrier to the passage of floodwaters, and therefore this technique is only recommended for buildings with slab foundations that are not cracked. The solid slab foundation prevents floodwaters from entering a building from below. Also, even if the building is in sound condition, tests by the Corps of Engineers have shown that dry floodproofing should not be used for depths greater than three feet above the first floor, because water pressure on the structure can collapse the walls and/or buckle the floor.

- Dry floodproofing is a mitigation technique that is appropriate for some houses in the area: those with slab foundations that typically receive floodwater up to three feet in the house. From the fieldwork it was found that approximately thirty-two percent of the houses in the study area are on slab foundations so they may be good candidates for this type of mitigation.

- Not all parts of the building need to be floodproofed. It is difficult to floodproof a garage door, for example, so some owners let the garage flood and floodproof the walls between the garage and the rest of the house. Appliances, electrical outlets, and other damage-prone materials located in the garage should be elevated above the expected flood levels.

    - Cost: The cost for a floodproofing project can vary according to the building's construction and condition. It can range from $5,000 to $20,000, depending on how secure the owner wants to be from flooding. Owners can do some of the work by themselves, although an experienced contractor provides greater security. Each property owner can determine how much of their own labor they can contribute and whether the cost and appearance of a project is worth the protection from flooding that it may provide.

    - Feasibility: As with floodwalls, floodproofing is appropriate where flood depths are shallow and are of relatively short duration. It can be an effective measure for some of the structures and flood conditions found in the study analysis area. It can also be more attractive than a floodwall around a house. However, floodproofing requires the homeowner to install or place door and window shields or sandbags and to ensure maintenance on a yearly basis. This may be difficult for the elderly or disabled. Finally ample warning of flooding must be available, so the homeowner can determine when to place the door or window shields and sandbags.

Dry floodproofing has the following shortcomings as a flood protection measure:

- It usually requires human intervention, i.e., someone must be home to close the openings.
- Its success depends on the building's condition, which may not be readily evident. It is very difficult to tell if there are cracks in the slab under the floor covering.
- Periodic maintenance is required to check for cracks in the walls and to ensure that the waterproofing compounds do not decompose.
- There is no government financial assistance programs available for dry floodproofing, therefore the entire cost of the project must be paid by the homeowner.
- The NFIP will typically not offer a lower insurance rate for dry floodproofed residences. However, this may be a viable option if homeowners want to protect their structure and contents.

Advantages	Disadvantage
• Often less costly than other mitigation measures. • Allows internal and external hydrostatic pressures to equalize, lessening the loads on walls and floors.	• Extensive cleanup may be necessary if the structure becomes wet inside and possibly contaminated by sewage, chemicals and other materials borne by floodwaters. • Pumping floodwaters out of a basement too soon after a flood may lead to structural damage. • Does not minimize the potential damage from a high-velocity flood flow and wave action.

Table 2-8 Advantages and Disadvantages of Wet Floodproofing

Advantages	Disadvantage
• Often less costly than other retrofitting methods • Does not require additional land. • May be funded by a FEMA mitigation grant program.	• Requires human intervention and adequate warning to install protective measures. • Does not minimize the potential damage from high-velocity flood flow and wave action. • May not be aesthetically pleasing.

Table 2-9 Advantages and Disadvantages of Dry Floodproofing

DRAINAGE IMPROVEMENTS

The Parish is currently in the process of developing a Parish-wide Subsurface Drainage Master Plan that will include the incorporated jurisdictions such as the Town of Jean Lafitte. The purpose of this Plan is to help identify deficient drainage areas throughout the Parish, develop preliminary solutions for the problem areas, split problem areas into individual projects for bidding purposes, develop cost estimates, and prioritize needed work. The Plan shall have a list of recommendations that were created after reviewing previous studies and reports. There are several different drainage improvements called for in the Drainage Master Plan that might help in reducing some of the flooding within this Repetitive Loss area. Maintenance for all projects and ongoing street sweeping continues for this area. Whenever drainage improvements are considered as a flood mitigation measure, the effects upstream and downstream from the proposed improvements need to be considered.

Advantages	Disadvantages
• **Can increase channel carrying capacity through overflow channels, channel straightening, crossing replacements, or runoff volume storage.** • **Minor projects may be fundable under FEMA mitigation grant programs.**	• **May help one area but create new problems upstream or downstream.** • **Channel straightening increases the capacity to accumulate and carry sediment.** • **May require property owner cooperation and right-of-way acquisition.**

Table 2-10 Advantages and Disadvantages of Drainage Improvements

STEP 5. CONCLUSION AND RECOMMENDATIONS

CONCLUSION

Based on the field survey and collection of data, the analysis of existing studies and reports, and the evaluation of various structural and non-structural mitigation measures, the Town proposes that mitigation measures be implemented for the Town of Jean Lafitte's Repetitive Loss Area. The table below examines past and current mitigation actions in these areas.

Table 2-11 Current and Past Mitigation Actions in Subarea 2

Mitigation Actions	
1	**Property owners have documented flooding and identified flooding concerns in returned questionnaires from this analysis.**
2	**Property owners are aware of flooding causes. Some property owners have undertaken specific floodproofing measures at their own expense.**
3	**The Parish and Town have undertaken numerous, costly capital improvement projects to improve drainage within the study area.**

RECOMMENDATIONS

The Town of Jean Lafitte should continue to encourage everyone to pursue mitigation measures and assist interested property owners in applying for mitigation grants. The Town of Jean Lafitte should continue to address street drainage in order to improve the drainage in the study area, seek out and secure funding for the drainage improvements outlined in this report, and institute a maintenance program that encourages homeowners to frequently clear their catch basin inlets of debris to ensure open flow for stormwater. The Town of Jean Lafitte should also continue to improve its CRS classification and adopt this Repetitive Loss Area Analysis according to the process detailed in the CRS Coordinator's Manual.

For the residents of the study area, they should contact the Town of Jean Lafitte and Jefferson Parish for more information about possible funding opportunities and site visits to determine remedial measures. Review the alternative mitigation measures discussed in this analysis and implement those that are most appropriate for their situation. Purchase and maintain a flood insurance policy on the home and its contents.

The Town of Jean Lafitte recommends the following mitigation actions:

MITIGATION ACTION 1:

Property owners should obtain and keep a flood insurance policy on their structures (building and contents coverage). The Town will continue on an **annual basis** to target all properties in the repetitive loss area reminding them of the advantages to maintaining flood insurance through its annual outreach effort.

RESPONSIBILITY

The Town of Jean Lafitte will provide the most relevant up-to-date flood insurance information to all property owners within the repetitive loss areas located in the study area.

FUNDING

The cost will be paid for from the Town's operating budget.

MITIGATION ACTION 2:

When appropriate, property owners should consider floodproofing measures such as flood gates or shields, flood walls, and hydraulic pumps.

RESPONSIBILITY

The Town of Jean Lafitte will promote effective flood protection measures and provide advice and assistance to property owners who may wish to implement such measures in an **on-going** program with assistance from Jefferson Parish.

FUNDING

The cost will be paid for by individual property owners. Advice and assistance will require staff time which will be covered in the Town's annual budget.

MITIGATION ACTION 3:

Continue elevation or reconstruction mitigation of high-risk flood-prone properties. The highest priorities are properties at the greatest flood risk and where drainage improvements will not provide an adequate level of protection.

RESPONSIBILITY

The Jefferson Parish Floodplain Management and Hazard Mitigation department will continue to target the most at risk properties for grant applications.

FUNDING

Construction cost would be covered with FEMA or ICC funds. Staff time to develop the list of target properties will require funds from the department's operating budget.

MITIGATION ACTION 4:

Prioritize Capital Improvement Projects to focus on drainage improvement projects in those basins containing repetitive loss areas.

RESPONSIBILITY

Jefferson Parish's Drainage Department in conjunction with the Engineering Department and Town staff.

FUNDING

Bond funds or state grants.

MITIGATION ACTION 5:

Encourage property owners to elevate inside and outside mechanical equipment above the BFE and install flood resistant materials in crawl spaces.

RESPONSIBILITY

The Town of Jean Lafitte will continue to promote effective flood protection measures and provide advice and assistance to property owners who may wish to implement such measures in an **on-going** program with assistance from Jefferson Parish.

FUNDING

The cost will be paid for by individual property owners. Advice and assistance will require staff time which will be covered in the Town's annual budget.

The RLAA draws upon on the existing initiatives and presents a series of mitigation recommendations related to repetitive flood loss properties in the Repetitive Loss Area, particularly via non-structural means. All recommendations are made with the intent to improve the Town's Community Rating System score; thereby, reducing resident's overall insurance rates.

It is recommended that the Town of Jean Lafitte i) adopt this Repetitive Loss Area Analysis according to the process detailed in the 2017 CRS Coordinator's Manual, ii) encourage the owners of repetitive flood loss structures to pursue a mitigation measure, iii) continue to assist interested property owners in applying for mitigation grants, iv) continue to improve and maintain the drainage system, and finally v) continue public information activities such as outreach projects, website postings and flood protection assistance that help residents learn about various mitigation measures.

Additionally, it is recommended that the property owners participate by i) reviewing the mitigation measures listed in this report and implement those as appropriate, ii) stay updated on the Town of Jean Lafitte's flood risk reduction initiative and finally, iii) purchase or maintain a flood insurance policy on their home and contents (see www.floodsmart.gov for more information).

The draft RLAA report for the Town of Jean Lafitte was posted on the Jefferson Parish website www.jeffparish.net/RLAA for comments on February 22, 2019. No comments were received.

REPETITIVE LOSS AREA ANALYSIS

FOR THE CITY OF KENNER

Adopted by Council October 4, 2018

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INTRODUCTION

In the United States, flooding is the most common natural disaster; resulting in more loss of life and property than any other types of hazards and severe weather events. More than 20,000 communities experience floods and this hazard accounts for approximately 73 percent of all Presidential Disaster Declarations over the 2008-2017 time period.[1] Recent studies also indicate how the cost of recovery is spread over local, state and federal government and the disaster victims who are themselves affected by the disaster.

Statistics indicate that there are thousands of NFIP's policyholders whose properties have flooded multiple times. "Repetitive Loss properties," are buildings and/or contents for which the NFIP has paid at least two claims of more than $1,000 in any 10-year period since 1978.[2]. Severe Repetitive Loss property (SRL) is four or more separate claim payments of more than $5,000 each (including building and contents payments); or two or more separate claim payments (building payments only) where the total of the payments exceeds the current value of the property. In this Repetitive Loss Area Analysis (RLAA), flooding issues and potential mitigation measures are discussed for homes located in the City of Kenner's Repetitive Loss Area called Lincoln Manor. This area experiences repetitive flooding and was chosen based on the nature of flooding, type of structure and the number of flood insurance claims made. The residents have continually undergone personal losses and stresses associated with living in a flood-prone house. To form appropriate and effective recommendations, this report has been created in collaboration with the residents of Lincoln Manor.

It is anticipated that informed residents can become stronger advocates for policy change at the neighborhood, city, parish, state and even federal levels. This report is therefore an attempt to help homeowners reduce their flood risk by being aware of the flooding problems in their neighborhood, and the potential solutions to the continual suffering that results from repetitive flooding. Finally, mitigation of these repetitive loss properties will ultimately be instrumental in reducing the overall costs to the NFIP as well as to individual homeowners.

[1] Federal Emergency Management Agency, "Protecting Homes," last updated June 24, 2016, http://www.fema.gov/protecting-homes

[2] Federal Emergency Management Agency, National Flood Insurance Program Flood Insurance Manual (April 2016), http://www.fema.gov/media-library/assets/documents/115549.

BACKGROUND

The National Flood Insurance Program (NFIP), a program overseen by the Federal Emergency Management (FEMA), is continually faced with the task of paying claims while trying to keep the price of flood insurance at an affordable rate since 1968. There are approximately 5.3 million NFIP policies across the United States in more than 22,000 communities. As of 2009, repetitive loss properties represent only one (1) percent of all flood insurance policies, yet historically they account for nearly one-third (1/3) of the claim payments. While the NFIP has resulted in forty years of successful floodplain management, repetitive loss properties still remain a drain on the NFIP.[3] The City of Kenner, located in Louisiana (CID-225201), participates in the NFIP. In addition to meeting the basic requirements of the NFIP, Kenner has completed additional components to participate in the Community Rating System (CRS) program. Kenner is currently a CRS Class 7 which rewards all policyholders in the SFHA with a 15 percent reduction in their flood insurance premiums. Non-SFHA policies (Standard X Zone policies) receive a 10% discount, and preferred risk policies receive no discount. The City of Kenner has been participating in the CRS program since October 1, 1992.

As of March 31, 2018, there are 16,026 NFIP policies in force in the City of Kenner and insurance coverage of approximately $4 billion.

Terminology

Area Analysis: An approach to identify repetitive loss areas, evaluate mitigation approaches, and determine the most appropriate alternatives to reduce future repetitive losses

Hazard Mitigation: Defined by FEMA as sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event

Repetitive Loss*:* Any insurable building for which two or more claims of more than 1,000 have been paid within a 10-year period, since 1978. To focus resources on those properties that represent the best opportunities for mitigation, a subcategory of Severe Repetitive Loss Properties is listed.

Severe Repetitive Loss*:* As defined by the Flood Insurance Reform Act of 2004, SRLs are 1-4 family residences that have had four or more claims of more than $5,000 or at least two claims that cumulatively exceed the building's value. The Act creates new funding mechanisms to help mitigate flood damage for these properties.

A repetitive loss property does not have to have a current flood insurance policy to be considered a repetitive loss property or a severe repetitive loss property. In some cases, a community will find that properties on its repetitive loss list are not currently insured. Once it is designated as a repetitive loss property, that property remains a repetitive loss property from owner to owner; insured policy to no policy; and even after that property has been mitigated. Seventy-one percent of all structures having policies in Kenner are currently insured. According to repetitive loss data received from NFIP Repetitive Loss (RL) AW-501 Worksheets, there are a total of 495 unmitigated and 198 mitigated repetitive loss properties within the City of Kenner.

[3] Federal Emergency Management Agency, "Federal Flood Risk Management Standard," last updated March 29, 2016, http://www.fema.gov/news-release/2015/02/05/federal-flood-risk-management-standard

A Multijurisdictional Floodplain Mitigation Plan (FMP) for Jefferson Parish was updated in 2015. Since the FMP examines flooding issues as a whole within the Parish and does not assess individual properties, the City of Kenner has opted to complete a Repetitive Loss Area Analysis (RLAA) using the 2017 CRS Coordinator's Manual. The RLAA will benefit the city by examining potential mitigation measures for Lincoln Manor and increasing its credit in the CRS Program.

COMMUNITY RATING SYSTEM

The Community Rating System (CRS) is a voluntary program designed to reward a community for doing more than meeting the NFIP minimum requirements to reduce flood damages. Communities can be rewarded for activities such as reducing flood damage to existing buildings, managing development in areas not shown in the floodplain on the Flood Insurance Rate Map (FIRM), protecting new buildings from floods greater than the 100-year flood, helping insurance agents obtain flood data, and helping people obtain flood insurance. The reward for these activities comes in the form of reduced premiums for flood insurance policy holders. Once a community has been accepted into the CRS, the community's floodplain management activities are rated according to the scoring system described in the CRS Coordinator's Manual. CRS communities are rated on a scale of 1-10. A Class 10 community receives no reduction in flood insurance premiums, but every class above 10 receives an additional 5% premium reduction. Class 1 requires the most credit points and provides a 45% premium reduction.

THE AREA

The City of Kenner is an incorporated municipality located within Jefferson Parish in southeastern Louisiana. The parish is bordered by Lake Pontchartrain on the north, Orleans and Plaquemines Parish to the east, Gulf of Mexico to the south, and Lafourche and St. Charles Parishes to the west. See Figure.1-1 below.

Figure 1-1

Principal physiographic features of the area are the Mississippi River channel, natural levee ridges along its banks and along the banks of abandoned distributary channels, and low marshlands situated between and bordering the channels. Jefferson Parish is divided into an East and West Bank by the Mississippi River which meanders through the northern section of the Parish. The highest land in the Parish is approximately 10 feet above the North American Vertical Datum (NAVD) along the natural levee that borders the Mississippi River. The East Bank is nearly surrounded by water and bound by the Mississippi River to the south, Lake Pontchartrain to the north, the 17th Street Canal to the east, and St. Charles Parish to the west. The West Bank of Jefferson Parish, east of the Harvey canal, is bound by the Donner Canal to the east, the Mississippi River to the north, the Harvey Canal to the west, and the Intracoastal Waterway to the south.

With a total population of 432,552 as of the 2010 census, Jefferson Parish is spread over a total land area of 305 square miles or 195,793 acres and a water area of 336 miles or 215,358 acres.[4] The Parish extends about 55 miles in a north-south direction from the southern shores of Lake Pontchartrain to the Gulf of Mexico. The southern part of the parish is less populated and is characterized by estuarine systems that lead in from the Gulf of Mexico. The coastal marshes, wetlands, and estuaries contain numerous bodies of shallow water. These bodies of water and wetlands make up over 85 percent of the parish.

The City of Kenner is a community of approximately 67,451 residents.[5] The City is approximately fifteen (15) square miles bound by Lake Ponchartrain to the north, extending south to the Mississippi River, St. Charles Parish to the west and unincorporated areas of Metairie and River Ridge to the east. The entirety of the City is within the Hurricane and Storm Damage Risk Reduction System (HSDRRS), relying on gravity fed stormwater management networks which feed into Jefferson Parish managed outfall canals and pump stations.

[4] https://www.census.gov/quickfacts/fact/table/jeffersonparishlouisiana/PST120216 , accessed 3/28/2018

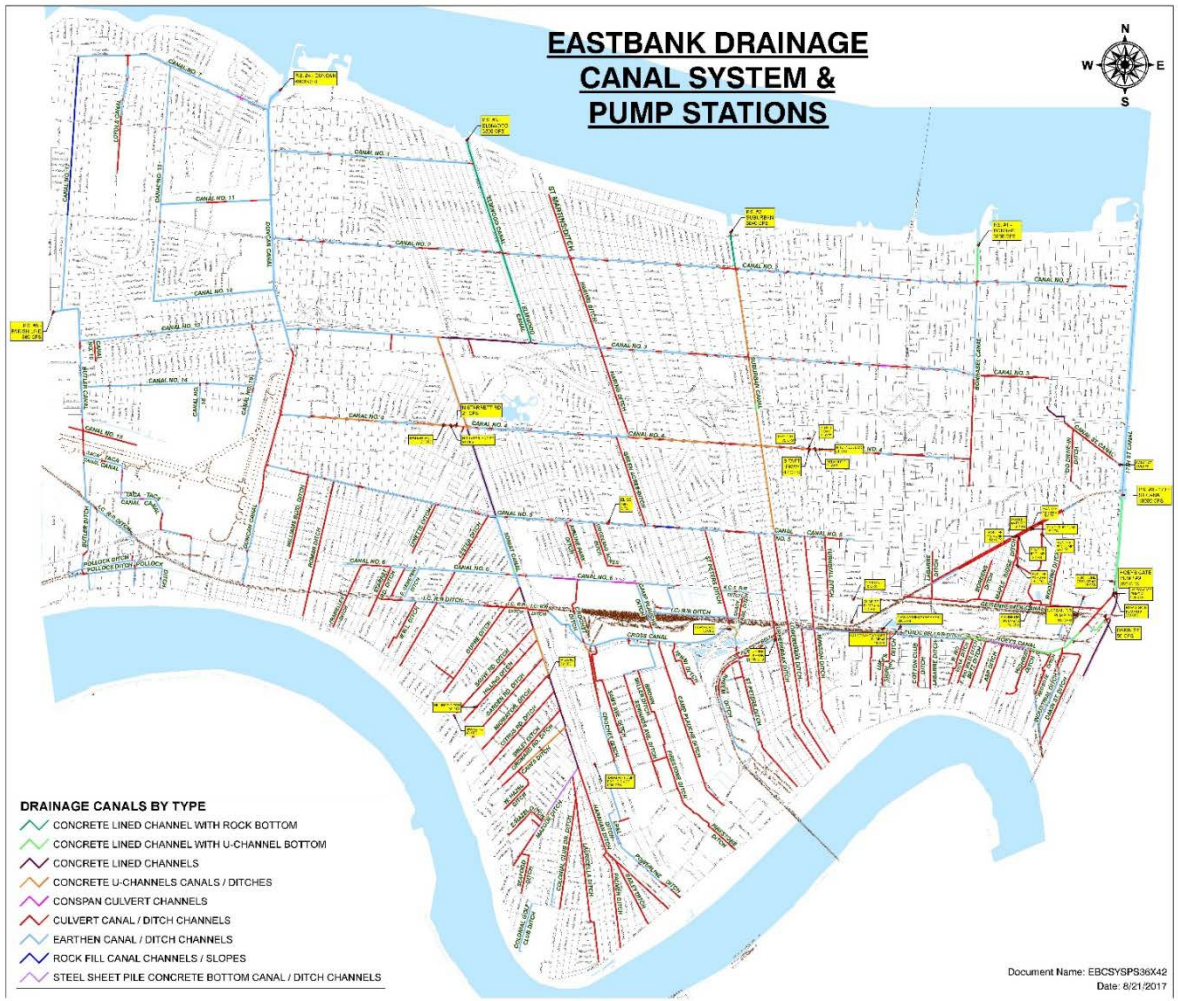
[5] https://www.census.gov/quickfacts/fact/table/kennercitylouisiana,US/PST045217, accessed 7/20/18

Hundreds of floods occur each year in the United States, including overbank flooding of rivers and streams and shoreline inundation along lakes and coasts. Given the geographic location and physiographic nature of Kenner, flooding in the area typically results from large-scale weather systems generating prolonged rainfall due to hurricanes, thunderstorms (convectional and frontal) or winter storms. According to the Floodplain Hazard Mitigation Plan (FMP) there have been 5 floods recorded in Kenner in the period from 1998 to 2014. The history of flooding in Kenner indicates that flooding may occur during any season of the year. In the cooler months, the area is subject to heavy rainfalls resulting from frontal passages. In the summer months, heavy rainfalls result from convective thunderstorms. In the late summer, hurricanes accompanied by rainfall and super-elevated water-surface elevations pose the largest threat of flooding to the area. With an average annual precipitation of 64.16 inches, flood protection is vital to Jefferson Parish and the City of Kenner[6].

Flood protection in northern Jefferson Parish is achieved by a system of levees, floodwalls, canals and drainage pump stations. The parish has 340 miles of canal waterways, drainage ditches, cross drains, culverts, and internal levee systems. There are also 70 pump stations (24 major stations) that include 167 pumps installed throughout the parish drainage system for a total capacity of 47,569 cfs.[7] With the exception of some areas inside the levee protected areas of northern Jefferson Parish, most of the land is located within FEMA's 100-year floodplain. The land area outside of the 100-year floodplain may still be subject to flooding if a levee failure were to occur. Figure 1-2 on the next page illustrates drainage on the East Bank of Jefferson Parish along with the main canals and other water features.

[6] Jefferson Parish, October 2015: Jefferson United Mitigation Professionals Multijurisdictional Program for Public Information.

[7] Jefferson Parish Drainage Department


EASTBANK DRAINAGE
CANAL SYSTEM &
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N
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E
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DRAINAGE CANALS BY TYPE
CONCRETE LINED CHANNEL WITH ROCK BOTTOM
CONCRETE LINED CHANNEL WITH U-CHANNEL BOTTOM
CONCRETE LINED CHANNELS
CONCRETE U-CHANNELS CANALS / DITCHES
CONSPAN CULVERT CHANNELS
CULVERT CANAL / DITCH CHANNELS
EARTHEN CANAL / DITCH CHANNELS
ROCK FILL CANAL CHANNELS / SLOPES
STEEL SHEET PILE CONCRETE BOTTOM CANAL / DITCH CHANNELS
Document Name: EBCSYSPS36X42
Date: 8/21/2017

Figure 1-2

REPETITIVE LOSS REQUIREMENT

Repetitive loss data must be maintained and updated annually in order to participate in the CRS. Since many of the losses under the NFIP come from repetitively flooded properties, addressing these properties is a priority for participating in the CRS Program. Depending on the severity of the repetitive loss problem, a CRS community has different responsibilities.

- **Category A**: A community with no unmitigated repetitive loss properties. No special requirements from the CRS.

- **Category B**: A community with at least one, but fewer than 10, unmitigated repetitive loss properties. Category B communities are required by the CRS to research and describe their repetitive loss problem, create a map showing the showing the location of all repetitive loss areas and complete an annual outreach activity directed to repetitive loss properties.

- **Category C**: A community with 50 or more unmitigated repetitive loss properties. Category C communities are required to do everything in Category B and prepare either a floodplain management plan that covers all repetitive loss areas or prepare a RLAA for all repetitive loss areas.

As of 2018, the City of Kenner has a total of 495 unmitigated Repetitive Loss and Severe Repetitive Loss properties. The City of Kenner is, therefore, designated as a Category C repetitive loss community.

MAPPING REPETITIVE LOSS AREAS

In accordance with the principles outlined in the CRS guidance titled Mapping Repetitive Loss Areas dated October, 2015, one repetitive loss area was identified within the City of Kenner. There are total 495 unmitigated repetitive loss properties in the City of Kenner.

This RLLA consists of repetitive loss properties and the surrounding properties that experience the same or similar flooding conditions, whether or not the buildings on those surrounding properties have been damaged by flooding. The methodology adopted to select the areas are as follows:

- Total number of flood insurance claims post Hurricane Katrina;
- Percentage of repetitive flood loss properties as compared to the structures, between October 2005 and June 2017; and
- Cluster of repetitive flood loss properties in the neighborhood.

Based on the data analysis, the areas illustrated in Figure 1-3 were selected for the RLAA.

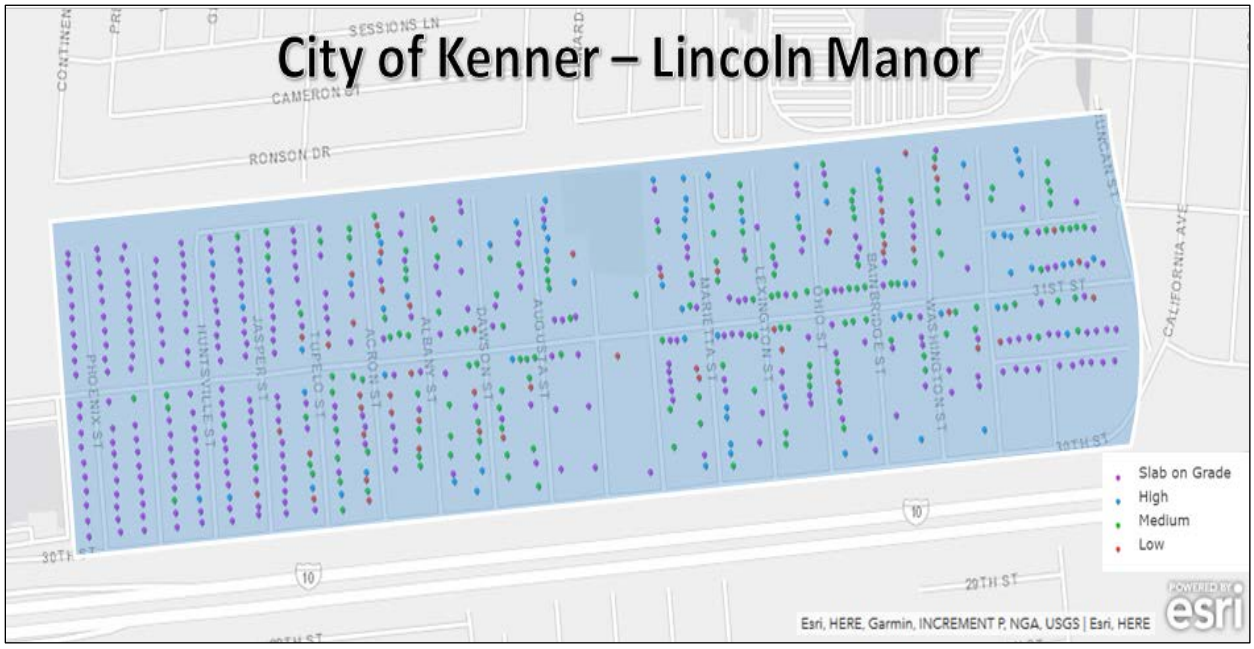


Figure 1-3- Outline of Lincoln Manor

THE RLAA PROCESS

The RLAA planning process incorporated requirements from Section 510 of the 2017 CRS Coordinator's Manual. The planning process also incorporated requirements from the following guidance documents: 1) FEMA publication Reducing Damage from Localized Flooding: A Guide for Communities, Part III Chapter 7; 2) CRS publication Mapping Repetitive Loss Areas dated October, 2015; and 3) Center for Hazards Assessment Response and Technology, University of New Orleans draft publication The Guidebook to Conducting Repetitive Loss Area Analyses. Most specifically, this RLAA included all five planning steps included in the 2017 CRS Coordinator's Manual:

Step 1. Advise all the properties in the repetitive loss areas that the analysis will be conducted and request their input on the hazard and recommended actions.

Step 2. Contact agencies and organizations that may have plans or studies that could affect the cause or impacts of the flooding. The agencies and organizations must be identified in the analysis report.

Step 3. Visit each building and collect basic data.

Step 4. Review alternative approaches and determine whether any property protection measures or drainage improvements are feasible.

Step 5. Document the findings. A separate analysis report must be prepared for each area.

Beyond the 5 planning steps, additional credit criteria must be met:

1. The community must have at least one repetitive loss area delineated in accordance with the criteria in Section 503 of the 2017 CRS Coordinator's Manual.
2. The repetitive loss area must be mapped as described in Section 503.b. A Category "C" community must prepare analyses for all of its repetitive loss areas if it wants to use RLAA to meet its repetitive loss planning prerequisite.
3. The repetitive loss area analysis report(s) must be submitted to the community's governing body and made available to the media and the public. The complete repetitive loss area analysis report(s) must be adopted by the community's governing body or by an office that has been delegated approval authority by the community's governing body.
4. The community must prepare an annual progress report for its area analysis.
5. The community must update its repetitive loss area analyses in time for each CRS cycle verification visit.

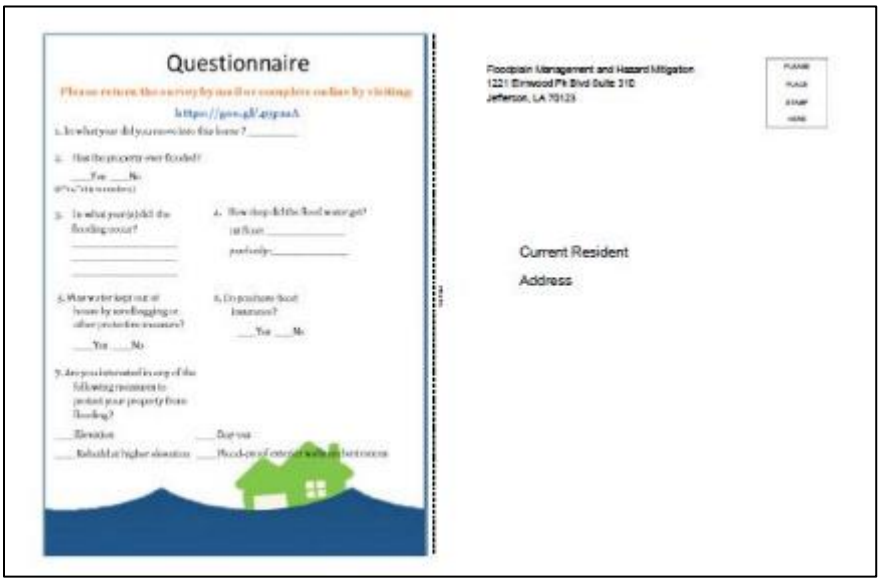
STEP 1. ADVISE ALL PROPERTY OWNERS

Before field work began on the RLAA, individual notices were mailed to property owners in Lincoln Manor. The notices advised properties owners about the analysis and requested their input on the flooding problem in their area and mitigation actions taken. The notice also advised property owners how they could provide comments on the draft report once it was posted online. Property owners could fill out the questionnaire postcard that was mailed to them and send it back in via USPS, or they could take an online survey with a link that was provided on the mailer.

The property owner notice with questionnaire was mailed to 612 residents in Lincoln Manor the week of April 27, 2018.

Figure 1- 4 Front of Notice

Figure 1- 5 Back of Notice with Questionnaire



KENNER

Out of the 612 mailed questionnaires, Jefferson Parish received three responses which corresponds to a response rate of less than 1 percent. Questionnaire responses are summarized below. Note: respondents may have skipped questions and/or provided more than one response to a question. Three addresses were returned as undeliverable.

Q1: In what year did you move into this home?

Responses Received	Percentage	Number Responding
<10 years ago	11	**1**
10-20 years ago	NONE	**0**
20-30 years ago	33	**3**
30-40 years ago	11	**1**
40-50 years ago	22	**2**
> 50 years ago	22	**2**
Total	**99.9**	**9**

Q2: Has the property ever been flooded?

Answer Choices	Percentage	Number
No	10	**1**
Yes	90	**9**
Total	**100**	**10**

Q3: In what year(s) did the flooding occur?

Responses Received	Percentage	Number Responding
1980	13.3	**2**
1985	NONE	**NONE**
1995	13.3	**2**
1998	NONE	**NONE**
2004	NONE	**NONE**
2005	46.7	**7**
OTHER	26.6	**4**
Total	99.9	15

Q4: How deep did the water get?

Answer Choices	Percentage	Number Responding	Depth	
			< 3 ft	> 3 ft
First floor	100	9	7	**2**
Yard only	-	0	-	**-**
Total	100	9	7	2

Q5: Was water kept out of the house by sandbagging or other protective measures?

Answer Choices	Percentage	Number Responding
No	100	**9**
Yes	NONE	**NONE**
Total	100	9

Q6: Do you have Flood Insurance?

Answer Choices	Percentage	Number Responding
No	30	**3**
Yes	70	**7**
Total	100	10

Q7: Are you interested in any of the following measures to protect your property from flooding?

Answer Choices	Percentage	Number Responding
Elevation	77.7	**7**
Buy-out	NONE	**NONE**
Rebuild at higher elevation	NONE	**NONE**
Flood-proof walls and entrances	22.2	**2**
Total	99.9	9

The following trends in survey responses should be considered when evaluating mitigation measures for Lincoln Manor:

- Seven of the nine respondents are interested in protecting his or her home/building from flooding through elevation.

- Seven of the three respondents currently have FEMA flood insurance.
- Eighty-nine percent of the respondents have been living in their houses for at least 10 years.
- Historically, within Jefferson Parish, the greatest flood events occurred in 1995, 2005 and 2008. The following flood events are detailed in NOAA's National Climatic Data Center (NCDC) database:

    - **Southeast Louisiana and Southern Mississippi Flood, 1995** - It was a heavy rainfall event which occurred across an area stretching from the New Orleans metropolitan area into southern Mississippi. A storm total rainfall maximum of 27.5 inches (70 cm) was recorded near Necaise, Mississippi. Considerable flooding was caused by the rainfall including several record flood crests along impacted river systems. The flooding caused six fatalities and more than $3.1 billion in damage.

    - **August 29, 2005** – The Category 3 Hurricane Katrina caused catastrophic damage along the Gulf coast from central Florida to Texas, much of it due to the storm surge and levee failure. Severe property damage occurred in coastal areas, such as Mississippi beachfront towns where boats and casino barges rammed buildings, pushing cars and houses inland; water reached 6–12 miles (10–19 km) from the beach. The storm was the third most intense United States landfalling tropical cyclone, behind the 1935 Labor Day hurricane and Hurricane Camille in 1969. Overall, at least 1,245 people died in the hurricane and subsequent floods, making it the deadliest United States hurricane since the 1928 Okeechobee hurricane. Total property damage was estimated at $125 billion (2005 USD), roughly four times the damage wrought by Hurricane Andrew in 1992 in the United States.

    - **August-September, 2008** - The storm surge ahead of Ike blew onshore of Louisiana well ahead of Ike's predicted landfall in Texas on September 13. Areas in coastal south-central and southwestern Louisiana, some of which were flooded by Gustav, were re-flooded as a result of Ike. Some areas that had not yet recovered from Gustav power outages received additional outages of 200,000. The hardest-hit areas were in and around Cameron Parish, with nearly every square inch of the coastline in that area was flooded heavily, reaching as far north as Lake Charles, nearly 30 miles inland.

STEP 2. CONTACT AGENCIES AND ORGANIZATIONS

Jefferson Parish Department of Hazard Mitigation and Floodplain Management contacted external agencies and internal departments that have plans or studies that could affect the cause or impacts of flooding within the identified repetitive loss subareas. The data collected was used to analyze the problems further and to help identify potential solutions and mitigation measures for property owners. The agencies contacted and reports which were analyzed and reviewed are as follows:

Agencies

- Jefferson Parish Electronic Information System Department
- Jefferson Parish Streets Department
- Jefferson Parish Office of Risk Management
- Jefferson Parish Drainage Department

Reports

- FEMA – Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) for Jefferson Parish, February 2, 2018
- ISO – Repetitive Flood Insurance Claims Data
- Jefferson Parish Hazard Mitigation Plan

SUMMARY OF STUDIES AND REPORTS

FEMA FLOOD INSURANCE STUDY (FIS) AND FLOOD INSURANCE RATE MAP (FIRM)

FEMA's FIS for Jefferson Parish, LA is dated February 2, 2018. The FIS revises and updates information on the existence and severity of flood hazards within the Parish. The FIS also includes revised digital Flood Insurance Rate Maps (FIRMs) which reflect updated Special Flood Hazard Areas (SFHAs) and flood zones for the Parish. SFHA boundaries within the Parish were updated due to new detailed coastal analyses which were performed by the USACE-MVN, for FEMA. This study also incorporates the Hurricane Storm Damage Risk Reduction System (HSDRRS) completed by the USACE. Finally, these maps depict the potential for flooding and are the basis for building requirements and flood insurance rates.

FLOOD INSURANCE CLAIMS DATA

The Privacy Act of 1974 (5 U.S.C. 522a) restricts the release of flood insurance policy and claims data to the public. This information can only be released to state and local governments for the use in floodplain management related activities. Therefore all claims data in this report are only discussed in general terms.

The purpose of a mitigation plan is to rationalize the process of determining appropriate hazard mitigation actions. The document includes a detailed description of natural hazards in Jefferson Parish; a risk assessment that describes potential losses to physical assets, people and operations; a set of goals, objectives, strategies and actions that will guide the Parish's mitigation activities, and a detailed plan for implementing and monitoring the Plan. This Plan identified 12 hazards and included a risk assessment of the four hazards with the highest potential for damaging physical assets, people and operations in Jefferson Parish. These hazards are floods, hurricanes and tropical storms, storm surge, and tornadoes. Both the risk assessment section and goals sections reflect this emphasis, which was the result of careful consideration and a numerical ranking process carried out by the Mitigation Planning Team (MPT).

STEP 3. BUILDING DATA COLLECTION

The on-site field survey for this analysis was conducted over multiple days in May 2018. The Collector App through ESRI was utilized to save field data from the site visits. In addition, multiple site photos were taken of each structure on the property. Photos were also taken of current drainage features and mitigation and floodproofing measures if evident from street or parking lot views. The following information was recorded for each property:

Table 1- 1

Structure		Foundation		Type	
No structure	53	Slab on grade	326	Residential	651
Occupied	596	Low (less than 2ft.)	51	Non-residential	14
Vacant	15	Medium	170		
		High	72		

COLLECTOR FOR ARCGIS (ESRI)

The team used the ESRI Collector Application in order to be able to store and spatially view repetitive loss data for the City of Kenner. The Collector App contains all field data collected by parcels for RLAA including pictures of each structure on the parcel. The data is stored in ArcGIS and is used for internal review and continued analysis of repetitive flood loss area.

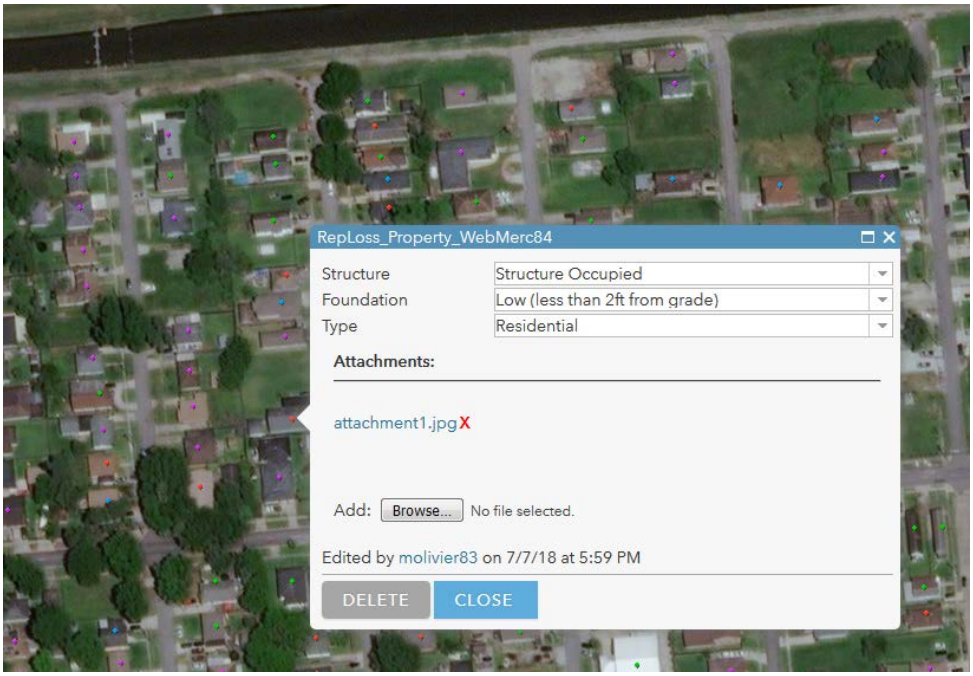


Figure 1- 6 Collector Application Sample

PROBLEM STATEMENT

The RL areas in the City of Kenner are located majorly within the 100-year floodplain (Zone AE) as shown on the map to the right. The Base Flood Elevation ranges from -6 to 0 feet in this area.

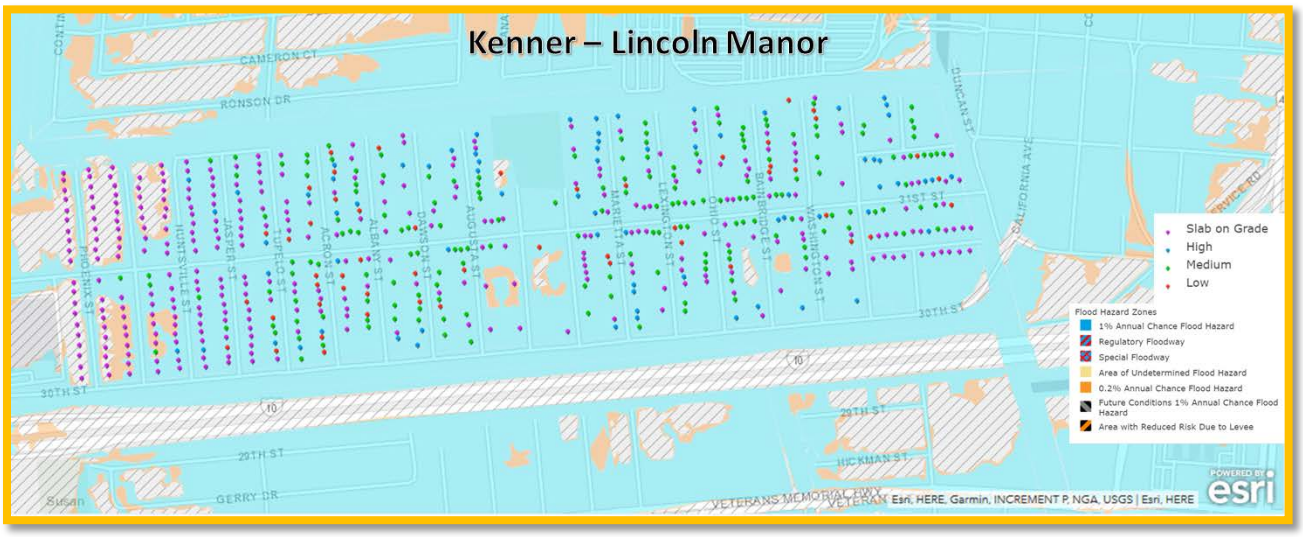


Figure 1- 7 2018 Effective FIRM

Excessive runoff from heavy rainfall causes flooding of urban areas, highways, and main streets as well as other low-lying spots in this area. Quick, heavy rains oftentimes results in overwhelming the existing pumping infrastructure and causing widespread street flooding. Any event causing rainfall over an inch can result into over working of the pump systems to clear water in the area. There is a lack in vital infrastructure such as pump stations, utilities and drainage that meet the contemporary standards so that the community can thrive.

In accordance with FEMA publication *551 Selecting Appropriate Mitigation Measures for Floodprone Structures*, mitigation options are discussed. The approach to reducing repetitive flooding in the City of Kenner's two Repetitive Loss Areas will require a combination of floodproofing techniques, education, and drainage improvement projects.

CLAIMS DATA:

In review of the unmitigated Repetitive Loss List, there are 95 properties within the 612 property study area that qualify as repetitive loss. Of those 95 repetitive loss properties, 34 are considered to be severe repetitive loss properties.

In analyzing the claims data, it could be derived that the area experiences most flooding from rainfall events. There have been 449 flood claims in the study area totaling $7,719,170.32. The average claim in the study area is $18,144.96. The homeowners of the 61 repetitive loss properties have made 195 claims and received $3,431,186.90 in flood insurance payments since 1978. The homeowners of the 34 severe repetitive loss properties have made 254 claims, and received $4,287,983.42 in flood insurance payments since 1978. The average repetitive flood loss claim was $18,338.89 and the average severe repetitive loss claim was $17,797.03. The severe repetitive loss homes are similar to the other homes on their block and on separate streets. They have each flooded more than 4 times, and all of them flooded during most of the heavy rainfall events in the area. (See bar graph below, Table1-3).

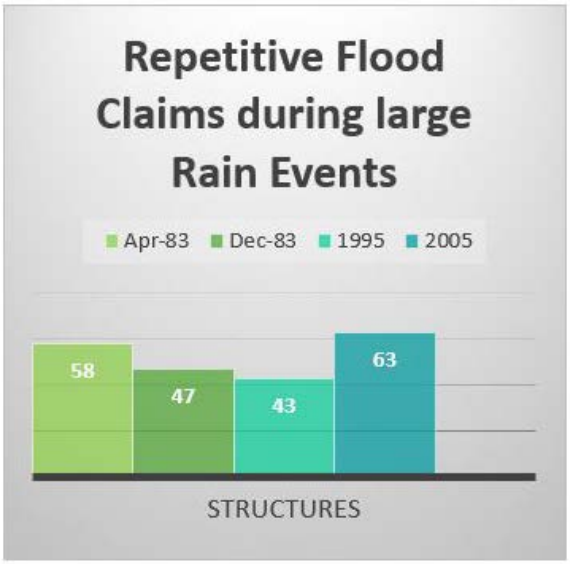


Table 1- 2

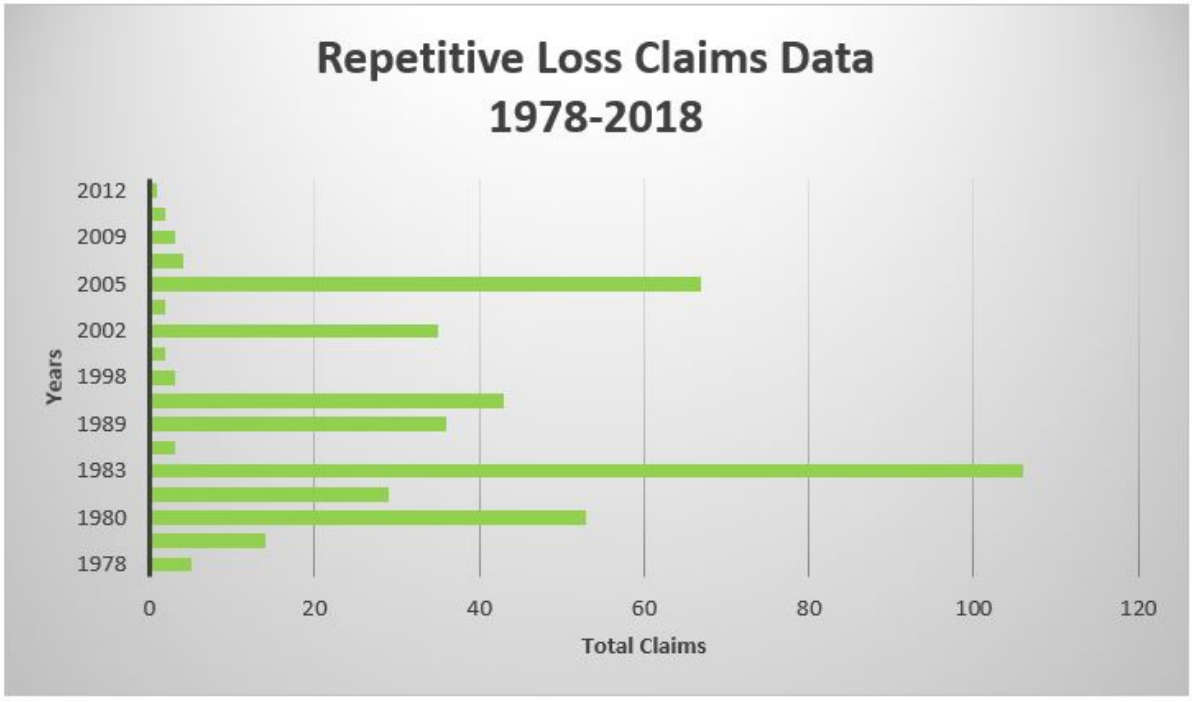


Table 1- 3

FIELD DATA:

The on-site field survey for this analysis was conducted over multiple days in May 2018. The team collected information on 665 structures, such as the type and height of the foundation, occupancy status of the structure, and use of the structure.

Of the 619 existing structures, the majority of the structures are slab on grade (53%). There are 170 structures (27%) that are medium foundation height. Seventy-two structures (12%) have high foundations, and 51 (8%) structures are low (less than 2 feet from grade).

The project team observed that majority (596 or 90%) of the structures in the area are occupied, while approximately 15, or 2%, are vacant and 53 (8%) have no structure. Also, majority of the structures are of residential use (98% or 651), while 2% (14) are non-residential.

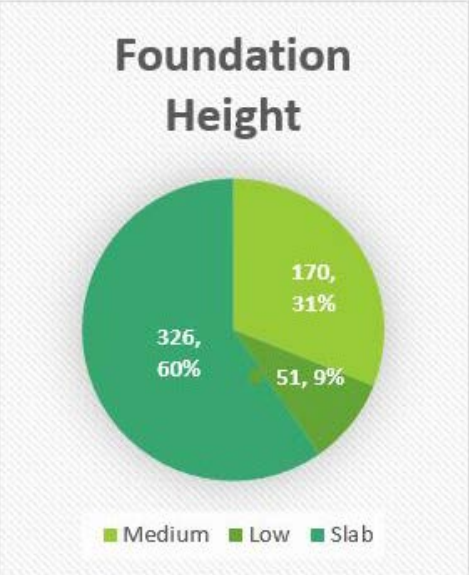


Table 1- 4

In conclusion, it should be noted that given the location of the study areas, all of the properties are inside levee protection. Majority of the properties are built slab on grade or of medium height; therefore, a heavy rain event can cause substantial damage to these properties.

Table 1- 5

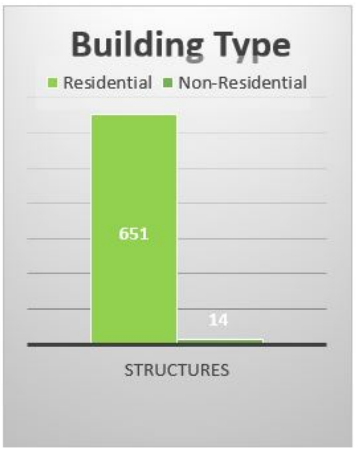


Table 1- 6

Figure 1- 8 Example Slab on Grade property in Lincoln Manor

Figure 1- 9 Example Elevated property in Lincoln Manor

STEP 4. REVIEW ALTERNATIVE MITIGATION APPROACHES

There are many ways to protect a property from flood damage. Different measures are appropriate for different flood hazards, building types and building conditions. Figure 1-10 below, found in the *2017 CRS Coordinator's Manual*, lists typical property protection measures.

To protect property from flood damage . . .

- Demolish the building or relocate it out of harm's way.
- Elevate the building above the flood level.
- Elevate damage-prone components, such as the furnace or air conditioning unit.
- Dry floodproof the building so water cannot get into it.
- Wet floodproof portions of the building so water won't cause damage.
- Construct a berm or redirect drainage away from the building.
- Maintain nearby streams, ditches, and storm drains so debris does not obstruct them.
- Correct sewer backup problems.

Figure 1- 10 Typical Property Protection Measures

Mitigation measures should fall into one of the mitigation categories listed below which are based on the Community Rating System planning process:

- Prevention
- Property Protection
- Natural Resource Protection
- Emergency Services
- Structural Projects
- Public Information and Outreach

MITIGATION FUNDING

There are several types of mitigation measures, listed in the table below, which can be considered for each repetitive loss property. Each mitigation measure qualifies for one or more grant program(s). Depending on the type of structure, severity of flooding and proximity to additional structures with similar flooding conditions, the most appropriate measure can be determined. In addition to these grant funded projects, several mitigations measures can be taken by the homeowner to protect their home.

Table 1- 7

Types of Projects Funded	HMGP	FMA	PDM	ICC	SBA
Acquisition of the entire property by govt. agency	✔	✔	✔		
Relocation of the building to a flood free site	✔	✔	✔	✔	✔
Demolition of the structure	✔	✔	✔	✔	✔
Elevation of the structure above flood levels	✔	✔	✔	✔	✔
Replacing the old building with a new elevated one	✔	✔	✔	✔	✔
Local drainage and small flood control projects	✔	✔	✔		
Dry floodproofing (non-residential only)	✔	✔	✔		
Percent paid by Federal program	75%	75%, 90%, or 100%	75%	Up to $30K	

There are several possible sources of funding for mitigation projects:

- **FEMA grants**: Most of the FEMA programs provide 75% of the cost of a project. In most communities, the 25% non-FEMA share is paid by the benefitting property owner. Each program has different Congressional authorization and slightly different rules.
  - **The Hazard Mitigation Grant Program (HMGP)**: The HMGP provides grants to States and local governments to implement long-term hazard mitigation measures after a major disaster declaration. Projects must provide a long-term solution to a problem (e.g., elevation of a home to reduce the risk of flood damages as opposed to buying sandbags and pumps to fight the flood). Examples of eligible projects include acquisition and elevation, as well as local drainage projects.
  - **The Flood Mitigation Assistance Program (FMA)**: FMA funds assist States and communities in implementing measures that reduce or eliminate the long-term risk of flood damage to structures insured under the NFIP. Project Grants to implement measures to reduce flood losses, such as elevation, acquisition, or relocation of NFIP-insured structures. States are encouraged to prioritize FMA funds for applications that include repetitive loss properties; these include structures with 2 or more losses each with a claim of at least $1,000 within any ten-year period since 1978.
  - **Pre-Disaster Mitigation Program (PDM)**: The Pre-Disaster Mitigation (PDM) program provides funds to states, territories, Indian tribal governments, communities, and universities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. For more information visit http://www.fema.gov/government/grant/pdm/index.shtm.

- **Flood insurance**: There is a special funding provision in the National Flood Insurance Program (NFIP) for insured buildings that have been substantially damaged by a flood, “Increased Cost of Compliance.” ICC coverage pays for the cost to comply with floodplain management regulations after a flood if the building has been declared substantially damaged. ICC will pay up to $30,000 to help cover elevation, relocation, demolition, and (for nonresidential buildings) floodproofing. It can also be used to help pay the 25% owner’s share of a FEMA funded mitigation project.

The building's flood insurance policy must have been in effect during the flood. This payment is in addition to the damage claim payment that would be made under the regular policy coverage, as long as the total claim does not exceed $250,000. Claims must be accompanied by a substantial or repetitive damage determination made by the local floodplain administrator. For more information, contact your insurance agent or visit: www.fema.gov/plan/prevent/floodplain/ICC.shtm.

Coverage under the ICC does have limitations: It covers only damage caused by a flood, as opposed to wind or fire damage. The building's flood insurance policy must have been in effect during the flood. ICC payments are limited to $30,000 per structure. Claims must be accompanied by a substantial or repetitive damage determination made by the local floodplain administrator and the structure must be in Zone AE.

The average claim payment in Lincoln Manor is $18,144.96. With an average claim of that amount, it is not likely that many homes in the study area would sustain substantial damage from a flood event. Homeowners should make themselves aware of the approximate value of their homes, and in the case of incurring flood damage, be aware of the need for a substantial damage declaration in order to receive the ICC coverage.

Alternative language adopted into the local floodplain management ordinance would enable residents with shallower flooding to access ICC funding. Since local ordinances determine the threshold at which substantial damage and/or repetitive claims are reached, adopting language that would lower these thresholds would benefit the homeowners of repetitive loss properties. Adopting alternative language allows for cumulative damages to reach the threshold for federal mitigation resources more quickly, meaning that some of the properties in the City of Kenner that sustain minor damage regularly would qualify for mitigation assistance through ICC.

- Rebates: A rebate is a grant in which the costs are shared by the homeowner and another source, such as the local government, usually given to a property owner after a project has been completed. Many communities favor it because the owner handles all the design details, contracting, and payment before the community makes a final commitment. The owner ensures that the project meets all of the program's criteria, has the project constructed, and then goes to the community for the rebate after the completed project passes inspection.

Rebates are more successful where the cost of the project is relatively small, e.g., under $5,000, because the owner is more likely to be able to afford the bulk of the cost. The rebate acts more as an incentive, rather than as needed financial support.

- Small Business Administration Mitigation Loans: The Small Business Administration (SBA) offers mitigation loans to SBA disaster loan applicants who have not yet closed on their disaster loan. Applicants who have already closed must demonstrate that the delay in application was beyond their control.

For example mitigation loans made following a flood can only be used for a measure to protect against future flooding, not a tornado. If the measure existed prior to the declared disaster, an SBA mitigation loan will cover the replacement cost. If the measure did not exist prior to the declared disaster the mitigation loan will only cover the cost of the measure if it is deemed absolutely necessary for repairing the property by a professional third-party, such as an engineer.

MITIGATION ALTERNATIVES

The majority of the flooding in these areas is considered “nuisance” flash flooding that causes minimal damage but does require costly cleanup and numerous street closures due to floodwaters overtopping the roadway.

Flooding in Kenner can be attributed to its flat topography, aging stormwater infrastructure. Flash flooding can occur when the capacity of the drainage system is exceeded or if conveyance is obstructed by debris, sediment and other materials that limit the volume of drainage. Heavy rains within a short period of time have caused the drainage system to be inundated and unable to keep up, resulting in ponding water in streets and homes.

Improving the drainage system can eliminate some road and home inundation in this area. These structural methods require large capital expenditures and cooperation from private property owners. Promoting floodproofing techniques and increasing public education and awareness of the flood hazards can be the next best alternative for property owners in this area. The Parish’s and the City’s websites, e-mail distribution lists, press releases and variable message boards can provide benefit to business owners and residents.

POTENTIAL MITIGATION MEASURES FOR KENNER

Structural Alternatives:

- **Elevate** structures and damage-prone components, such as the water heater or air conditioning unit, above the Base Flood Elevation (BFE).
- **Dry floodproofing** can be done on commercial structures and even residential structures; however, in many instances this requires human intervention to complete the measure and ensure success. For example, installing watertight shields over doors or windows requires timely action by the homeowner; especially in a heavy rainfall event.
- **Wet floodproofing** a structure involves making the uninhabited portions of the structure resistant to flood damage and allowing water to enter during flooding. For example, in a basement or crawl space, mechanical equipment and ductwork would not be damaged.
- **Acquire and/or relocate** properties/target abandoned properties or locations that would provide a public benefit as the location will need to be maintained by the City in perpetuity.
- **Increase the size of culverts** under Jefferson Hwy to allow for increased capacity.
- **Implement drainage** i**mprovements** such as increasing capacity in the system (up-sizing pipes) and provide additional inlets to receive more stormwater.
- Improve stormwater system maintenance program to ensure inlets and canals are free of clogging debris.

Non Structural Alternatives:

- **Relocate internal supplies**, products/goods, and belongings above the flood depth.
- Improve the Parish’s floodplain and zoning ordinances.
- **Provide public education** through posting information about local flood hazards on City website, posting signs at various locations in neighborhoods or discussing flood protection measures at local neighborhood association meetings.
- Promote the purchase of flood insurance.

- Continue coordination with GOHSEP, the National Weather Service (NWS), and United States Geological Survey (USGS) to enhance flood warning system, including the use of rain/stream gauges, to provide greater warning time for citizens. NWS can use the real- time data collected to issue timely warnings.

COST AND BENEFITS OF MITIGATION MEASURES

Knowing the flooding history, type, and condition of the buildings in the area, leads to the fourth step in the area analysis procedure – a review of alternative mitigation approaches to protect properties from, or reduce, future flood damage. Property owners should look at these alternatives but understand they are not all guaranteed to provide protection at different levels of flooding. Six approaches were reviewed:

- Elevating the houses above the 1% annual flood level
- Acquisition
- Floodproofing
- Drainage improvements
- Utility protection
- Maintaining flood insurance coverage on the building

ELEVATION

Raising the structure above the flood level is generally viewed as the best flood protection measure, short of removing the building from the floodplain. All damageable portions of the building and its contents are high and dry during a flood, which flows under the building instead of into the house. Houses can be elevated on fill, posts/piles, or a crawlspace.

- A house elevated on fill requires adding a specific type of dirt to a lot and building the house on top of the added dirt.
- A house elevated on posts/piles is either built or raised on a foundation of piers that are driven into the earth and rise high enough above the ground to elevate the house above the flow of flood water or the design flood elevation.
- A house elevated on a crawlspace or enclosure is built or raised on a continuous wall-like foundation that elevates the house above the design flood level. It is important to include vents or openings in the walls below the design flood level that are appropriately sized: one square inch for each square foot of the crawlspace or enclosures footprint. Additionally all materials below the design flood level must be flood resistance and all machinery, equipment, and plumbing must be above the design flood level.
    - Cost: A majority of the cost to elevate a building is in the preparation and foundation construction. The cost to elevate six feet is little more than the cost to go up two feet. Elevation is usually cost-effective for wood frame buildings on posts/piles or crawlspace because it is easiest for lifting equipment to be used under the floor and disruption to the habitable part of the house is minimal. Elevating a slab house is much more costly and disruptive. In the study areas, 53% percent of the houses in the study area are on a slab. The actual cost of elevating a particular building depends on factors such as its condition, whether it is masonry or brick faced, and if additions have been added on over time. While the cost of elevating a home can be high, there are funding programs that can help. The usual arrangement is for a FEMA grant to pay 75% of the cost while the owner pays the other 25%. In the case of elevating a slab

foundation, the homeowner's portion could be as high as $50,000 or more. In some cases, assistance can be provided by Increased Cost of Compliance (ICC) funds, which is discussed on page 23 under Possible Funding Sources, or the use of state funds.

- Feasibility: Federal funding support for an elevation project requires a study that shows that the benefits of the project exceed the cost of the elevation. Project benefits include savings in insurance claims paid on the structure. Elevating a masonry or a slab home can cost up to $300,000, which means that benefit/cost ratios may be low. Looking at each property individually could result in funding for the worst case properties, i.e., those that are the lowest below the base flood elevation, subject to the most frequent flooding, and in good enough condition to elevate.

Advantages	Disadvantages
• **Elevating to or above the BFE allows a substantially damaged or substantially improved house to be brought into compliance.**	• **Cost may be prohibitive.**
• **Often reduces flood insurance premiums.**	• **The appearance of the structure and access to it may be adversely affected.**
• **Reduces or eliminates road closures due to overtopping.**	• **May require property owner cooperation and right-of-way acquisition.**
• **May be fundable under FEMA mitigation grant programs.**	• **May require road or walkway closures during construction.**

Table 1- 8 Advantages and Disadvantages of Elevation

ACQUISITION:

This measure involves buying one or more properties and clearing the site (demolishing the building). If there is no building subject to flooding, there is no flood damage. Acquisitions are usually recommended where the flood hazard is so great or so frequent that it is not safe to leave the structure on the site.

An alternative to buying and clearing the whole subdivision is buying out individual, "worst case," structures with FEMA funds.

- Cost: This approach would involve purchasing and clearing the lowest or the most severe repeatedly flooded homes. If FEMA funds are to be used, three requirements will apply:
  - The applicant for FEMA must demonstrate that the benefits exceed the costs, using FEMA's one of FEMA's approved Benefit Cost methodologies.
  - The owner must be a willing seller.
  - The parcel must be deeded to a public agency that agrees to maintain the lot and keep it forever as open space.

- Feasibility: Due to the high cost and difficulty to obtain a favorable benefit-cost ratio in shallow flooding areas, acquisitions are reserved for the worst case buildings. Not everyone wants to sell their home, so a checkerboard pattern of vacant and occupied lots often remains after a buyout project, leaving “holes” in the neighborhood. There is no reduction in expenses to maintain the neighborhood’s infrastructure for the City, although the tax base is reduced. The vacant lots must be maintained by the new owner agency, and additional expense is added to the community. If the lot is only minimally maintained, its presence may reduce the property values of the remaining houses. The City of Kenner is not considering acquisitions at this time for the above reasons.

Advantages	Disadvantages
• **Permanently removes problem since the structure no longer exists.** • **Allows a substantially damaged or substantially improved structure to be brought into compliance with the community’s floodplain management ordinance or law.** • **Expands open space and enhances natural and beneficial uses.** • **May be fundable under FEMA mitigation grant programs.**	• **Cost may be prohibitive.** • **Resistance may be encountered by local communities due to loss of tax base, maintenance of empty lots, and liability for injuries on empty, community-owned lots.**

Table 1- 9 Advantages and Disadvantages of Acquisition

There are 3 criteria that must be met for FEMA to fund an acquisition project:

- The local community must inform the property owners interested in the acquisition program that the community will not use condemnation authority to purchase their property and that the participation in the program is strictly voluntary,
- The subsequent deed to the property to be acquired will be amended such that the landowner will be restricted from receiving any further Federal disaster assistance grants, the property shall remain in open space in perpetuity, and the property will be retained in ownership by a public entity, and
- Any replacement housing or relocated structures will be located outside the 100-year floodplain.

FLOODPROOFING

This measure keeps floodwaters out of a building by modifying the structure. Walls are coated with waterproofing compounds or plastic sheeting. Openings (i.e. doors, windows, and vents) are closed either permanently, or temporarily with removable shields or sandbags.

- Make the walls watertight. This is easiest to do for masonry or brick faced walls. The brick or stucco walls can be covered with a waterproof sealant and bricked or stuccoed over with a veneer to camouflage the sealant. Houses with wood, vinyl, or metal siding need to be wrapped with plastic sheeting to make walls watertight, and then covered with a veneer to camouflage and protect the plastic sheeting. Provide closures, such as removable shields or sandbags, for the openings;

including doors, windows, dryer vents and weep holes. There must also be an account for sewer backup and other sources of water entering the building. For shallow flood levels, this can be done with a floor drain plug or standpipe; although a check valve system is more secure.

- Dry floodproofing employs the building itself as part of the barrier to the passage of floodwaters, and therefore this technique is only recommended for buildings with slab foundations that are not cracked. The solid slab foundation prevents floodwaters from entering a building from below. Also, even if the building is in sound condition, tests by the Corps of Engineers have shown that dry floodproofing should not be used for depths greater than three feet above the first floor, because water pressure on the structure can collapse the walls and/or buckle the floor.

- Dry floodproofing is a mitigation technique that is appropriate for some houses in the area: those with slab foundations that typically receive floodwater up to three feet in the house. From the fieldwork it was found that approximately thirty-two percent of the houses in the study area are on slab foundations so they may be good candidates for this type of mitigation.

- Not all parts of the building need to be floodproofed. It is difficult to floodproof a garage door, for example, so some owners let the garage flood and floodproof the walls between the garage and the rest of the house. Appliances, electrical outlets, and other damage-prone materials located in the garage should be elevated above the expected flood levels.

    - Cost: The cost for a floodproofing project can vary according to the building's construction and condition. It can range from $5,000 to $20,000, depending on how secure the owner wants to be from flooding. Owners can do some of the work by themselves, although an experienced contractor provides greater security. Each property owner can determine how much of their own labor they can contribute and whether the cost and appearance of a project is worth the protection from flooding that it may provide.

    - Feasibility: As with floodwalls, floodproofing is appropriate where flood depths are shallow and are of relatively short duration. It can be an effective measure for some of the structures and flood conditions found in the study analysis area. It can also be more attractive than a floodwall around a house. However, floodproofing requires the homeowner to install or place door and window shields or sandbags and to ensure maintenance on a yearly basis. This may be difficult for the elderly or disabled. Finally ample warning of flooding must be available, so the homeowner can determine when to place the door or window shields and sandbags.

Dry floodproofing has the following shortcomings as a flood protection measure:

- It usually requires human intervention, i.e., someone must be home to close the openings.
- Its success depends on the building's condition, which may not be readily evident. It is very difficult to tell if there are cracks in the slab under the floor covering.
- Periodic maintenance is required to check for cracks in the walls and to ensure that the waterproofing compounds do not decompose.
- There is no government financial assistance programs available for dry floodproofing, therefore the entire cost of the project must be paid by the homeowner.
- The NFIP will typically not offer a lower insurance rate for dry floodproofed residences. However, this may be a viable option if homeowners want to protect their structure and contents.

Advantages	Disadvantage
• Often less costly than other mitigation measures. • Allows internal and external hydrostatic pressures to equalize, lessening the loads on walls and floors.	• Extensive cleanup may be necessary if the structure becomes wet inside and possibly contaminated by sewage, chemicals and other materials borne by floodwaters. • Pumping floodwaters out of a basement too soon after a flood may lead to structural damage. • Does not minimize the potential damage from a high-velocity flood flow and wave action.

Table 1- 10 Advantages and Disadvantages of Wet Floodproofing

Advantages	Disadvantage
• Often less costly than other retrofitting methods • Does not require additional land. • May be funded by a FEMA mitigation grant program.	• Requires human intervention and adequate warning to install protective measures. • Does not minimize the potential damage from high-velocity flood flow and wave action. • May not be aesthetically pleasing.

Table 1- 11 Advantages and Disadvantages of Dry Floodproofing

DRAINAGE IMPROVEMENTS

The Parish is currently in the process of developing a Parish-wide Subsurface Drainage Master Plan that will include the incorporated jurisdictions such as the City of Kenner. The purpose of this Plan is to help identify deficient drainage areas throughout the Parish, develop preliminary solutions for the problem areas, split problem areas into individual projects for bidding purposes, develop cost estimates, and prioritize needed work. The Plan shall have a list of recommendations that were created after reviewing previous studies and reports. There are several different drainage improvements called for in the Drainage Master Plan that might help in reducing some of the flooding within this Repetitive Loss area. Maintenance for all projects and ongoing street sweeping continues for this area. Whenever drainage improvements are considered as a flood mitigation measure, the effects upstream and downstream from the proposed improvements need to be considered.

Advantages	Disadvantages
• **Can increase channel carrying capacity through overflow channels, channel straightening, crossing replacements, or runoff volume storage.** • **Minor projects may be fundable under FEMA mitigation grant programs.**	• **May help one area but create new problems upstream or downstream.** • **Channel straightening increases the capacity to accumulate and carry sediment.** • **May require property owner cooperation and right-of-way acquisition.**

Table 1- 12 Advantages and Disadvantages of Drainage Improvements

STEP 5. CONCLUSION AND RECOMMENDATIONS

CONCLUSION

Based on the field survey and collection of data, the analysis of existing studies and reports, and the evaluation of various structural and non-structural mitigation measures, the City proposes that mitigation measures be implemented for the City of Kenner's Repetitive Loss Area of Lincoln Manor. The table below examines past and current mitigation actions in these areas.

Table 1- 13 Current and Past Mitigation Actions in Lincoln Manor

Mitigation Actions	
1	**Property owners have documented flooding and identified flooding concerns in returned questionnaires from this analysis.**
2	**Property owners are aware of flooding causes. Some property owners have undertaken specific floodproofing measures at their own expense.**
3	**The Parish and City have undertaken numerous, costly capital improvement projects to improve drainage within the study area.**

RECOMMENDATIONS

The City of Kenner should continue to encourage everyone to pursue mitigation measures and assist interested property owners in applying for mitigation grants. The City of Kenner should continue to address street drainage in order to improve the drainage in the study area, seek out and secure funding for the drainage improvements outlined in this report, and institute a maintenance program that encourages homeowners to frequently clear their catch basin inlets of debris to ensure open flow for stormwater. The City of Kenner should also continue to improve its CRS classification and adopt this Repetitive Loss Area Analysis according to the process detailed in the CRS Coordinator's Manual.

For the residents of the study areas, they should contact the City of Kenner and Jefferson Parish for more information about possible funding opportunities and site visits to determine remedial measures. Review the alternative mitigation measures discussed in this analysis and implement those that are most appropriate for their situation. Purchase and maintain a flood insurance policy on the home and its contents.

The City of Kenner recommends the following mitigation actions:

MITIGATION ACTION 1:

Property owners should obtain and keep a flood insurance policy on their structures (building and contents coverage). The City will continue on an **annual basis** to target all properties in the repetitive loss area reminding them of the advantages to maintaining flood insurance through its annual outreach effort.

RESPONSIBILITY

The City of Kenner will provide the most relevant up-to-date flood insurance information to all property owners within the repetitive loss areas located in the study area.

FUNDING

The cost will be paid for from the City's operating budget.

MITIGATION ACTION 2:

When appropriate, property owners should consider floodproofing measures such as flood gates or shields, flood walls, and hydraulic pumps.

RESPONSIBILITY

The City of Kenner will promote effective flood protection measures and provide advice and assistance to property owners who may wish to implement such measures in an **on-going** program with assistance from Jefferson Parish.

FUNDING

The cost will be paid for by individual property owners. Advice and assistance will require staff time which will be covered in the City's annual budget.

MITIGATION ACTION 3:

Continue elevation or reconstruction mitigation of high-risk flood-prone properties. The highest priorities are properties at the greatest flood risk and where drainage improvements will not provide an adequate level of protection.

RESPONSIBILITY

The Jefferson Parish Floodplain Management and Hazard Mitigation department will continue to target the most at risk properties for grant applications.

FUNDING

Construction cost would be covered with FEMA or ICC funds. Staff time to develop the list of target properties will require funds from the department's operating budget.

MITIGATION ACTION 4:

Prioritize Capital Improvement Projects to focus on drainage improvement projects in those basins containing repetitive loss areas.

RESPONSIBILITY

Jefferson Parish's Drainage Department in conjunction with the Engineering Department and City staff.

FUNDING

Bond funds or state grants.

MITIGATION ACTION 5:

Encourage property owners to elevate inside and outside mechanical equipment above the BFE and install flood resistant materials in crawl spaces.

RESPONSIBILITY

The City of Kenner will continue to promote effective flood protection measures and provide advice and assistance to property owners who may wish to implement such measures in an **on-going** program with assistance from Jefferson Parish.

FUNDING

The cost will be paid for by individual property owners. Advice and assistance will require staff time which will be covered in the City's annual budget.

The RLAA draws upon on the existing initiatives and presents a series of mitigation recommendations related to repetitive flood loss properties in each Repetitive Loss Area, particularly via non-structural means. All recommendations are made with the intent to improve the City's Community Rating System score; thereby, reducing resident's overall insurance rates.

It is recommended that the City of Kenner i) adopt this Repetitive Loss Area Analysis according to the process detailed in the 2017 CRS Coordinator's Manual, ii) encourage the owners of repetitive flood loss structures to pursue a mitigation measure, iii) continue to assist interested property owners in applying for mitigation grants, iv) continue to improve and maintain the drainage system, and finally v) continue public information activities such as outreach projects, website postings and flood protection assistance that help residents learn about various mitigation measures.

Additionally, it is recommended that the property owners participate by i) reviewing the mitigation measures listed in this report and implement those as appropriate, ii) stay updated on the City of Kenner's flood risk reduction initiative and finally, iii) purchase or maintain a flood insurance policy on their home and contents (see www.floodsmart.gov for more information).

The draft RLAA report for the City of Kenner was posted on the Jefferson Parish website www.jeffparish.net/RLAA for comments from August 31 through September 14, 2018. No comments were received.

REPETITIVE LOSS AREA ANALYSIS

FOR THE CITY OF WESTWEGO

Adopted by Council October 8, 2018

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INTRODUCTION

In the United States, flooding is the most common natural disaster; resulting in more loss of life and property than any other types of hazards and severe weather events. More than 20,000 communities experience floods and this hazard accounts for approximately 73 percent of all Presidential Disaster Declarations over the 2008-2017 time period.[1] Recent studies also indicate how the cost of recovery is spread over local, state and federal government and the disaster victims who are themselves affected by the disaster.

Statistics indicate that there are thousands of NFIP's policyholders whose properties have flooded multiple times. "Repetitive Loss properties," are buildings and/or contents for which the NFIP has paid at least two claims of more than $1,000 in any 10-year period since 1978.[2]. Severe Repetitive Loss property (SRL) is four or more separate claim payments of more than $5,000 each (including building and contents payments); or two or more separate claim payments (building payments only) where the total of the payments exceeds the current value of the property. In this Repetitive Loss Area Analysis (RLAA), flooding issues and potential mitigation measures are discussed for homes located in the City of Westwego's Repetitive Loss Area. These areas have experienced repetitive flooding and were chosen based on the nature of flooding, type of structure and the number of flood insurance claims made. The residents have continually undergone personal losses and stresses associated with living in a flood-prone house. To form appropriate and effective recommendations, this report has been created in collaboration with the residents of the Rep Loss Area.

It is anticipated that informed residents can become stronger advocates for policy change at the neighborhood, city, parish, state and even federal levels. This report is therefore an attempt to help homeowners reduce their flood risk by being aware of the flooding problems in their neighborhood, and the potential solutions to the continual suffering that results from repetitive flooding. Finally, mitigation of these repetitive loss properties will ultimately be instrumental in reducing the overall costs to the NFIP as well as to individual homeowners.

[1] Federal Emergency Management Agency, "Protecting Homes," last updated June 24, 2016, http://www.fema.gov/protecting-homes

[2] Federal Emergency Management Agency, National Flood Insurance Program Flood Insurance Manual (April 2016), http://www.fema.gov/media-library/assets/documents/115549.

BACKGROUND

The National Flood Insurance Program (NFIP), a program overseen by the Federal Emergency Management (FEMA), is continually faced with the task of paying claims while trying to keep the price of flood insurance at an affordable rate since 1968. There are approximately 5.3 million NFIP policies across the United States in more than 22,000 communities. As of 2009, repetitive loss properties represent only one (1) percent of all flood insurance policies, yet historically they account for nearly one-third (1/3) of the claim payments. While the NFIP has resulted in forty years of successful floodplain management, repetitive loss properties still remain a drain on the NFIP.[3] The City of Westwego, located in Louisiana (CID-220094), participates in the NFIP. In addition to meeting the basic requirements of the NFIP, Westwego has completed additional components to participate in the Community Rating System (CRS) program. Westwego is currently a CRS Class 8 which rewards all policyholders in the SFHA with a 10 percent reduction in their flood insurance premiums. Non-SFHA policies (Standard X Zone policies) receive a 10% discount, and preferred risk policies receive no discount. The City of Westwego has been participating in the CRS program since October 1, 2007.

As of March 31, 2018, there are 1,272 NFIP policies in force in the City of Westwego and insurance coverage of approximately $338 million.

Terminology

Area Analysis: An approach to identify repetitive loss areas, evaluate mitigation approaches, and determine the most appropriate alternatives to reduce future repetitive losses

Hazard Mitigation: Defined by FEMA as sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event

Repetitive Loss*:* Any insurable building for which two or more claims of more than 1,000 have been paid within a 10-year period, since 1978. To focus resources on those properties that represent the best opportunities for mitigation, a subcategory of Severe Repetitive Loss Properties is listed.

Severe Repetitive Loss*:* As defined by the Flood Insurance Reform Act of 2004, SRLs are 1-4 family residences that have had four or more claims of more than $5,000 or at least two claims that cumulatively exceed the building's value. The Act creates new funding mechanisms to help mitigate flood damage for these properties.

A repetitive loss property does not have to have a current flood insurance policy to be considered a repetitive loss property or a severe repetitive loss property. In some cases, a community will find that properties on its repetitive loss list are not currently insured. Once it is designated as a repetitive loss property, that property remains a repetitive loss property from owner to owner; insured policy to no policy; and even after that property has been mitigated. Almost thirty-eight percent of all structures having policies in Westwego are currently insured. According to repetitive

[3] Federal Emergency Management Agency, "Federal Flood Risk Management Standard," last updated March 29, 2016, http://www.fema.gov/news-release/2015/02/05/federal-flood-risk-management-standard

loss data received from NFIP Repetitive Loss (RL) AW-501 Worksheets dated June 23, 2016, there are a total of 92 unmitigated and 23 mitigated repetitive loss properties within the City of Westwego.

A Multijurisdictional Floodplain Mitigation Plan (FMP) for Jefferson Parish was updated in 2015. Since the FMP examines flooding issues as a whole within the Parish and does not assess individual properties, the City of Westwego has opted to complete a Repetitive Loss Area Analysis (RLAA) using the 2017 CRS Coordinator's Manual. The RLAA will benefit the city by examining potential mitigation measures for its Repetitive Loss Area and increasing its credit in the CRS Program.

COMMUNITY RATING SYSTEM

The Community Rating System (CRS) is a voluntary program designed to reward a community for doing more than meeting the NFIP minimum requirements to reduce flood damages. Communities can be rewarded for activities such as reducing flood damage to existing buildings, managing development in areas not shown in the floodplain on the Flood Insurance Rate Map (FIRM), protecting new buildings from floods greater than the 100-year flood, helping insurance agents obtain flood data, and helping people obtain flood insurance. The reward for these activities comes in the form of reduced premiums for flood insurance policy holders. Once a community has been accepted into the CRS, the community's floodplain management activities are rated according to the scoring system described in the CRS Coordinator's Manual. CRS communities are rated on a scale of 1-10. A Class 10 community receives no reduction in flood insurance premiums, but every class above 10 receives an additional 5% premium reduction. Class 1 requires the most credit points and provides a 45% premium reduction.

THE AREA

The City of Westwego is an incorporated municipality located within Jefferson Parish in southeastern Louisiana. The parish is bordered by Lake Pontchartrain on the north, Orleans and Plaquemines Parish to the east, Gulf of Mexico to the south, and Lafourche and St. Charles Parishes to the west. See Figure.1-1 below.

Figure 1-1

Principal physiographic features of the area are the Mississippi River channel, natural levee ridges along its banks and along the banks of abandoned distributary channels, and low marshlands situated between and bordering the channels. Jefferson Parish is divided into an East and West Bank by the Mississippi River which meanders through the northern section of the Parish. The highest land in the Parish is approximately 10 feet above the North American Vertical Datum (NAVD) along the natural levee that borders the Mississippi River. The East Bank is nearly surrounded by water and bound by the Mississippi River to the south, Lake Pontchartrain to the north, the 17th Street Canal to the east, and St. Charles Parish to the west. The West Bank of Jefferson Parish, east of the Harvey canal, is bound by the Donner Canal to the east, the Mississippi River to the north, the Harvey Canal to the west, and the Intracoastal Waterway to the south.

With a total population of 432,552 as of the 2010 census, Jefferson Parish is spread over a total land area of 305 square miles or 195,793 acres and a water area of 336 miles or 215,358 acres.[4] The Parish extends about 55 miles in a north-south direction from the southern shores of Lake Pontchartrain to the Gulf of Mexico. The southern part of the parish is less populated and is characterized by estuarine systems that lead in from the Gulf of Mexico. The coastal marshes, wetlands, and estuaries contain numerous bodies of shallow water. These bodies of water and wetlands make up over 85 percent of the parish.

The City of Westwego is a community of approximately 8,549 residents.[5] The City is approximately three and a half (3.5) square miles bound by the Mississippi River to the north, unincorporated area of Marrero to the east, unincorporated Bridge City and part of Bayou Segnette State Park to the west, and just past Lapalco Blvd to the south. The entirety of the City is within the Hurricane and Storm Damage Risk Reduction System (HSDRRS), relying on gravity fed stormwater management networks which feed into Jefferson Parish managed outfall canals and pump stations.

Hundreds of floods occur each year in the United States, including overbank flooding of rivers and streams and shoreline inundation along lakes and coasts. Given the geographic location and physiographic nature

[4] https://www.census.gov/quickfacts/fact/table/jeffersonparishlouisiana/PST120216 , accessed 3/28/2018

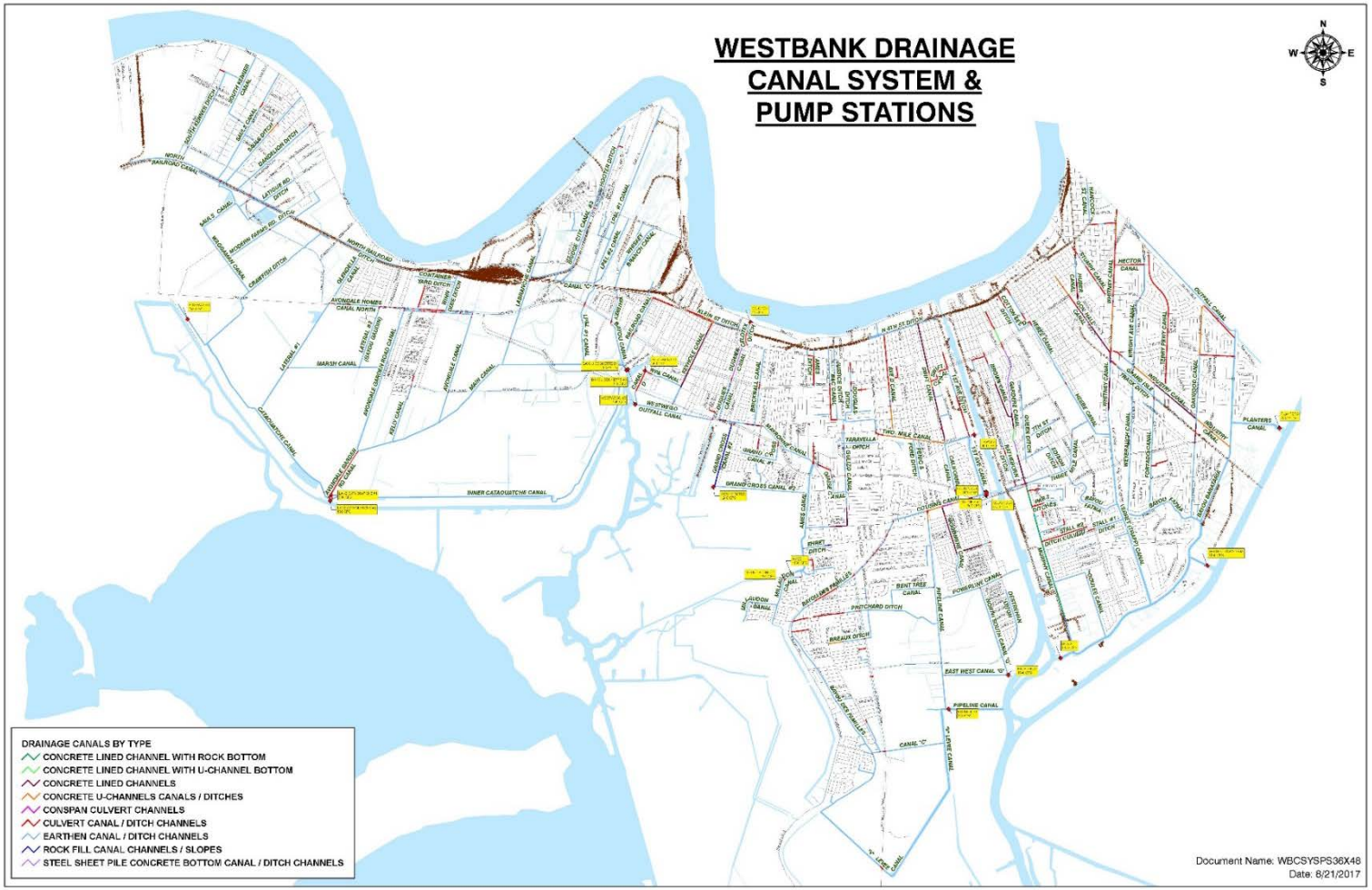
[5] https://www.census.gov/quickfacts/fact/table/westwegocitylouisiana,US/PST045217, accessed 7/20/18

of Westwego, flooding in the area typically results from large-scale weather systems generating prolonged rainfall due to hurricanes, thunderstorms (convectional and frontal) or winter storms. According to the Floodplain Hazard Mitigation Plan (FMP) there has been 1 flood recorded in Westwego in the period from 1998 to 2014. The history of flooding in Westwego indicates that flooding may occur during any season of the year. In the cooler months, the area is subject to heavy rainfalls resulting from frontal passages. In the summer months, heavy rainfalls result from convective thunderstorms. In the late summer, hurricanes accompanied by rainfall and super-elevated water-surface elevations pose the largest threat of flooding to the area. With an average annual precipitation of 64.16 inches, flood protection is vital to Jefferson Parish and the City of Westwego[6].

Flood protection in northern Jefferson Parish is achieved by a system of levees, floodwalls, canals and drainage pump stations. The parish has 340 miles of canal waterways, drainage ditches, cross drains, culverts, and internal levee systems. There are also 70 pump stations (24 major stations) that include 167 pumps installed throughout the parish drainage system for a total capacity of 47,569 cfs.[7] With the exception of some areas inside the levee protected areas of northern Jefferson Parish, most of the land is located within FEMA's 100-year floodplain. The land area outside of the 100-year floodplain may still be subject to flooding if a levee failure were to occur. Figure 1-2 on the next page illustrates drainage on the West Bank of Jefferson Parish along with the main canals and other water features.

[6] Jefferson Parish, October 2015: Jefferson United Mitigation Professionals Multijurisdictional Program for Public Information.

[7] Jefferson Parish Drainage Department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CONCRETE LINED CHANNEL WITH U-CHANNEL BOTTOM
CONCRETE LINED CHANNELS
CONCRETE U-CHANNELS CANALS / DITCHES
CONSPAN CULVERT CHANNELS
CULVERT CANAL / DITCH CHANNELS
EARTHEN CANAL / DITCH CHANNELS
ROCK FILL CANAL CHANNELS / SLOPES
STEEL SHEET PILE CONCRETE BOTTOM CANAL / DITCH CHANNELS
Document Name: WBCSYSPS36X48
Date: 8/21/2017

Figure 1-2

REPETITIVE LOSS REQUIREMENT

Repetitive loss data must be maintained and updated annually in order to participate in the CRS. Since many of the losses under the NFIP come from repetitively flooded properties, addressing these properties is a priority for participating in the CRS Program. Depending on the severity of the repetitive loss problem, a CRS community has different responsibilities.

- **Category A**: A community with no unmitigated repetitive loss properties. No special requirements from the CRS.

- **Category B**: A community with at least one, but fewer than 10, unmitigated repetitive loss properties. Category B communities are required by the CRS to research and describe their repetitive loss problem, create a map showing the showing the location of all repetitive loss areas and complete an annual outreach activity directed to repetitive loss properties.

- **Category C**: A community with 50 or more unmitigated repetitive loss properties. Category C communities are required to do everything in Category B and prepare either a floodplain management plan that covers all repetitive loss areas or prepare a RLAA for all repetitive loss areas.

As of 2018, the City of Westwego has a total of 92 unmitigated Repetitive Loss and Severe Repetitive Loss properties. The City of Westwego is, therefore, designated as a Category C repetitive loss community.

MAPPING REPETITIVE LOSS AREAS

In accordance with the principles outlined in the CRS guidance titled Mapping Repetitive Loss Areas dated October, 2015, one repetitive loss area were identified within the City of Westwego. There are total 92 unmitigated repetitive loss properties in the City of Westwego.

This RLLA consists of repetitive loss properties and the surrounding properties that experience the same or similar flooding conditions, whether or not the buildings on those surrounding properties have been damaged by flooding. The methodology adopted to select the areas are as follows:

- Total number of flood insurance claims post Hurricane Katrina;
- Percentage of repetitive flood loss properties as compared to the structures, between October 2005 and June 2017; and
- Cluster of repetitive flood loss properties in the neighborhood.

Based on the data analysis, the areas illustrated in Figure 1-3 were selected for the RLAA.

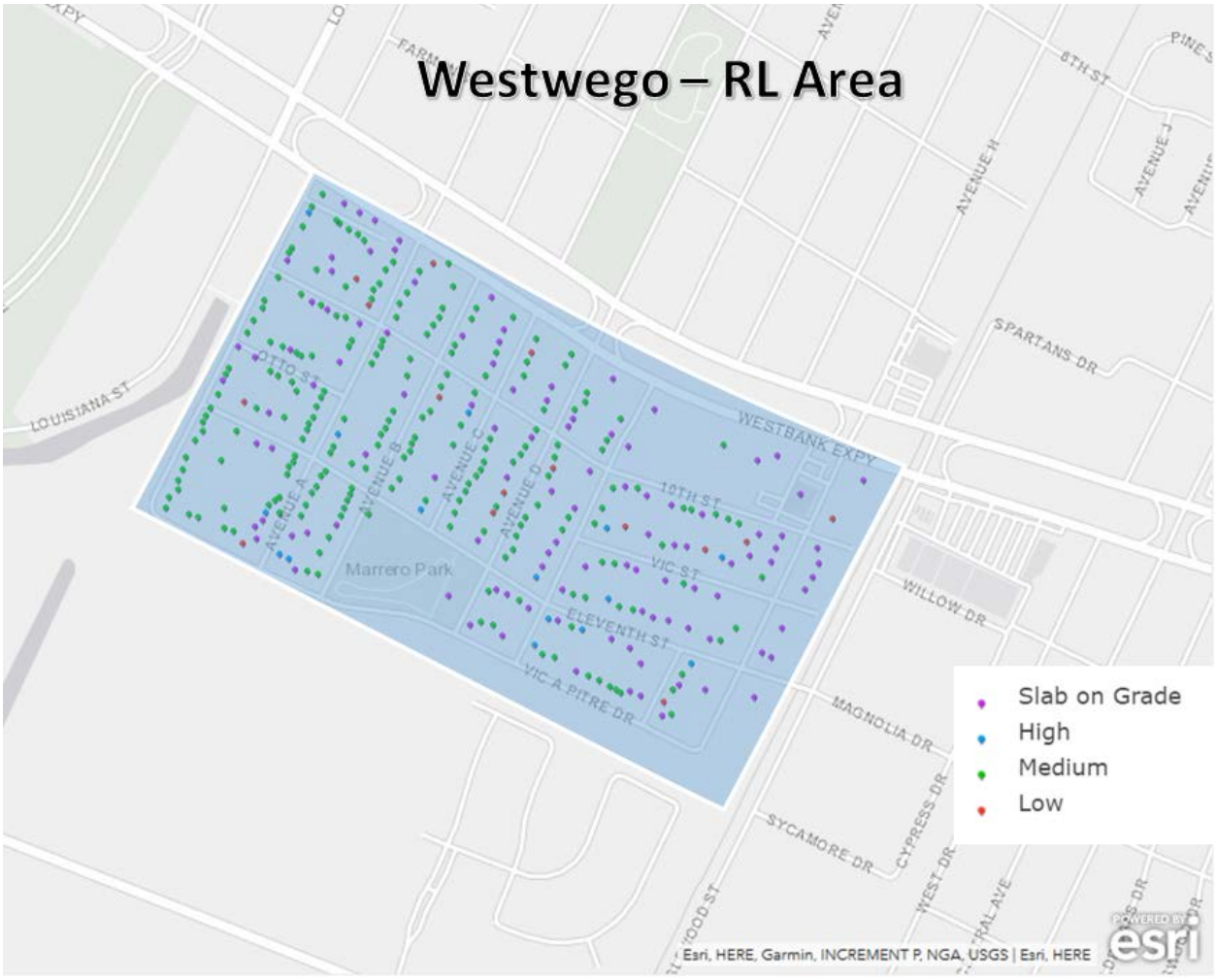


Figure 1-3- Outline of the Study Area

THE RLAA PROCESS

The RLAA planning process incorporated requirements from Section 510 of the 2017 CRS Coordinator's Manual. The planning process also incorporated requirements from the following guidance documents: 1) FEMA publication Reducing Damage from Localized Flooding: A Guide for Communities, Part III Chapter 7; 2) CRS publication Mapping Repetitive Loss Areas dated October, 2015; and 3) Center for Hazards Assessment Response and Technology, University of New Orleans draft publication The Guidebook to Conducting Repetitive Loss Area Analyses. Most specifically, this RLAA included all five planning steps included in the 2017 CRS Coordinator's Manual:

Step 1. Advise all the properties in the repetitive loss areas that the analysis will be conducted and request their input on the hazard and recommended actions.

Step 2. Contact agencies and organizations that may have plans or studies that could affect the cause or impacts of the flooding. The agencies and organizations must be identified in the analysis report.

Step 3. Visit each building and collect basic data.

Step 4. Review alternative approaches and determine whether any property protection measures or drainage improvements are feasible.

Step 5. Document the findings. A separate analysis report must be prepared for each area.

Beyond the 5 planning steps, additional credit criteria must be met:

1. The community must have at least one repetitive loss area delineated in accordance with the criteria in Section 503 of the 2017 CRS Coordinator's Manual.
2. The repetitive loss area must be mapped as described in Section 503.b. A Category "C" community must prepare analyses for all of its repetitive loss areas if it wants to use RLAA to meet its repetitive loss planning prerequisite.
3. The repetitive loss area analysis report(s) must be submitted to the community's governing body and made available to the media and the public. The complete repetitive loss area analysis report(s) must be adopted by the community's governing body or by an office that has been delegated approval authority by the community's governing body.
4. The community must prepare an annual progress report for its area analysis.
5. The community must update its repetitive loss area analyses in time for each CRS cycle verification visit.

STEP 1. ADVISE ALL PROPERTY OWNERS

Before field work began on the RLAA, individual notices were mailed to property owners within the identified Repetitive Loss Area. The notices advised properties owners about the analysis and requested their input on the flooding problem in their area and mitigation actions taken. The notice also advised property owners how they could provide comments on the draft report once it was posted online. Property owners could fill out the questionnaire postcard that was mailed to them and send it back in via USPS, or they could take an online survey with a link that was provided on the mailer.

The property owner notice with questionnaire was mailed to 333 residents the week of April 27, 2018.

Figure 1- 4 Front of Notice

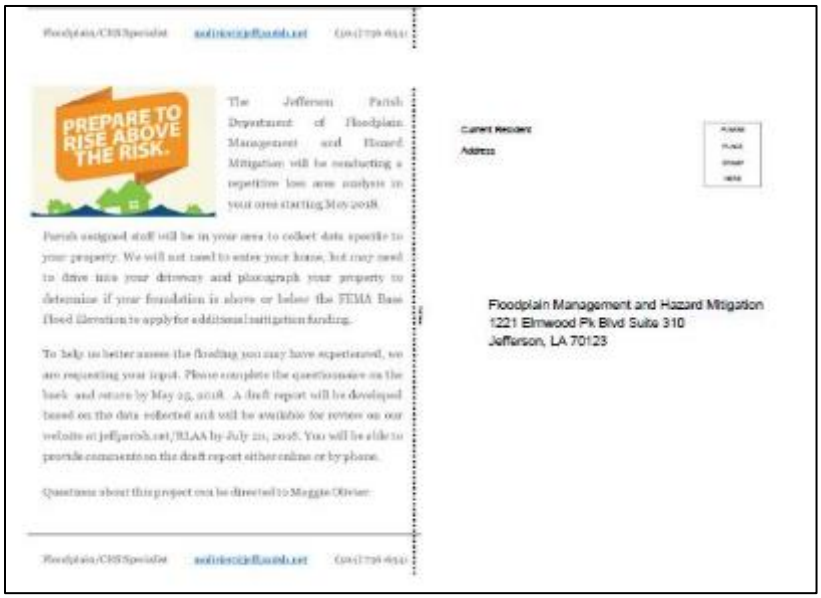
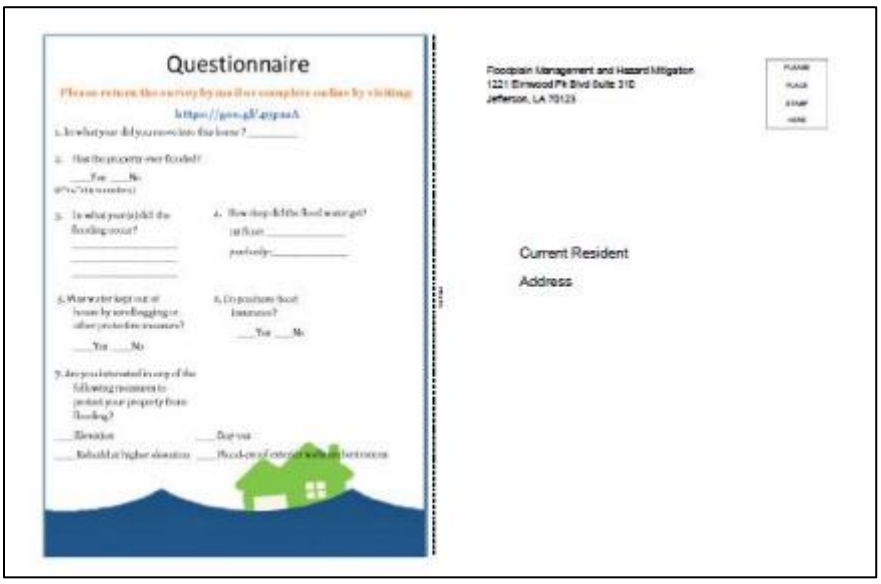


Figure 1- 5 Back of Notice with Questionnaire



Out of the 333 mailed questionnaires, Jefferson Parish received one response which corresponds to a response rate of less than 1 percent. Questionnaire responses are summarized below. Note: respondent may have skipped questions and/or provided more than one response to a question.

Q1: In what year did you move into this home?

Responses Received	Percentage	Number Responding
<10 years ago	100	**1**
10-20 years ago	NONE	**NONE**
20-30 years ago	NONE	**NONE**
30-40 years ago	NONE	**NONE**
40-50 years ago	NONE	**NONE**
> 50 years ago	NONE	**NONE**
Total	**100**	**1**

Q2: Has the property ever been flooded?

Answer Choices	Percentage	Number
No	NONE	**NONE**
Yes	100	**1**
Total	**100**	**1**

Q3: In what year(s) did the flooding occur?

Responses Received	Percentage	Number Responding
2005	100	**1**
Total	**100**	**1**

Q4: How deep did the water get?

Answer Choices	Percentage	Number Responding	Depth	
			< 3 ft	> 3 ft
First floor	-	NONE	-	-
Yard only	-	1	1	-
Total	100	1	-	-

Q5: Was water kept out of the house by sandbagging or other protective measures?

Answer Choices	Percentage	Number Responding
No	100	1
Yes	-	NONE
Total	100	1

Q6: Do you have Flood Insurance?

Answer Choices	Percentage	Number Responding
No	-	NONE
Yes	100	1
Total	100	3

Q7: Are you interested in any of the following measures to protect your property from flooding?

Answer Choices (can choose more than one)	Percentage	Number Responding
Elevation	50	1
Buy-out	-	NONE
Rebuild at higher elevation	50	1
Flood-proof exterior walls and entrances	-	-
Total	100	1

The following trends in survey responses should be considered when evaluating mitigation measures for the Rep Loss Area:

- The single respondent is interested in protecting his or her home/building from flooding by either elevating or rebuilding at a higher elevation.
- The respondent currently has FEMA flood insurance.
- The respondent has been living in their house for less than 10 years.
- Historically, within Jefferson Parish, the greatest flood events occurred in 1995, 2005 and 2008. The following flood events are detailed in NOAA's National Climatic Data Center (NCDC) database:

    - **Southeast Louisiana and Southern Mississippi Flood, 1995** - It was a heavy rainfall event which occurred across an area stretching from the New Orleans metropolitan area into southern Mississippi. A storm total rainfall maximum of 27.5 inches (70 cm) was recorded near Necaise, Mississippi. Considerable flooding was caused by the rainfall including several record flood crests along impacted river systems. The flooding caused six fatalities and more than $3.1 billion in damage.

    - **August 29, 2005** – The Category 3 Hurricane Katrina caused catastrophic damage along the Gulf coast from central Florida to Texas, much of it due to the storm surge and levee failure. Severe property damage occurred in coastal areas, such as Mississippi beachfront towns where boats and casino barges rammed buildings, pushing cars and houses inland; water reached 6–12 miles (10–19 km) from the beach. The storm was the third most intense United States landfalling tropical cyclone, behind the 1935 Labor Day hurricane and Hurricane Camille in 1969. Overall, at least 1,245 people died in the hurricane and subsequent floods, making it the deadliest United States hurricane since the 1928 Okeechobee hurricane. Total property damage was estimated at $125 billion (2005 USD), roughly four times the damage wrought by Hurricane Andrew in 1992 in the United States.

    - **August-September, 2008** - The storm surge ahead of Ike blew onshore of Louisiana well ahead of Ike's predicted landfall in Texas on September 13. Areas in coastal south-central and southwestern Louisiana, some of which were flooded by Gustav, were re-flooded as a result of Ike. Some areas that had not yet recovered from Gustav power outages received additional outages of 200,000. The hardest-hit areas were in and around Cameron Parish, with nearly every square inch of the coastline in that area was flooded heavily, reaching as far north as Lake Charles, nearly 30 miles inland.

STEP 2. CONTACT AGENCIES AND ORGANIZATIONS

Jefferson Parish Department of Hazard Mitigation and Floodplain Management contacted external agencies and internal departments that have plans or studies that could affect the cause or impacts of flooding within the identified repetitive loss subareas. The data collected was used to analyze the problems further and to help identify potential solutions and mitigation measures for property owners. The agencies contacted and reports which were analyzed and reviewed are as follows:

Agencies

- Jefferson Parish Electronic Information System Department
- Jefferson Parish Streets Department
- Jefferson Parish Office of Risk Management
- Jefferson Parish Drainage Department

Reports

- FEMA – Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) for Jefferson Parish, February 2, 2018
- ISO – Repetitive Flood Insurance Claims Data
- Jefferson Parish Hazard Mitigation Plan

SUMMARY OF STUDIES AND REPORTS

FEMA FLOOD INSURANCE STUDY (FIS) AND FLOOD INSURANCE RATE MAP (FIRM)

FEMA's FIS for Jefferson Parish, LA is dated February 2, 2018. The FIS revises and updates information on the existence and severity of flood hazards within the Parish. The FIS also includes revised digital Flood Insurance Rate Maps (FIRMs) which reflect updated Special Flood Hazard Areas (SFHAs) and flood zones for the Parish. SFHA boundaries within the Parish were updated due to new detailed coastal analyses which were performed by the USACE-MVN, for FEMA. This study also incorporates the Hurricane Storm Damage Risk Reduction System (HSDRRS) completed by the USACE. Finally, these maps depict the potential for flooding and are the basis for building requirements and flood insurance rates.

FLOOD INSURANCE CLAIMS DATA

The Privacy Act of 1974 (5 U.S.C. 522a) restricts the release of flood insurance policy and claims data to the public. This information can only be released to state and local governments for the use in floodplain management related activities. Therefore all claims data in this report are only discussed in general terms.

The purpose of a mitigation plan is to rationalize the process of determining appropriate hazard mitigation actions. The document includes a detailed description of natural hazards in Jefferson Parish; a risk assessment that describes potential losses to physical assets, people and operations; a set of goals, objectives, strategies and actions that will guide the Parish's mitigation activities, and a detailed plan for implementing and monitoring the Plan. This Plan identified 12 hazards and included a risk assessment of the four hazards with the highest potential for damaging physical assets, people and operations in Jefferson Parish. These hazards are floods, hurricanes and tropical storms, storm surge, and tornadoes. Both the risk assessment section and goals sections reflect this emphasis, which was the result of careful consideration and a numerical ranking process carried out by the Mitigation Planning Team (MPT).

STEP 3. BUILDING DATA COLLECTION

The on-site field survey for this analysis was conducted over multiple days in May 2018. The Collector App through ESRI was utilized to save field data from the site visits. In addition, multiple site photos were taken of each structure on the property. Photos were also taken of current drainage features and mitigation and floodproofing measures if evident from street or parking lot views. The following information was recorded for each property:

Table 1- 1

Structure		Foundation		Type	
No structure	21	Slab on grade	111	Residential	330
Occupied	336	Low (less than 2ft.)	15	Non-residential	39
Vacant	12	Medium	214		
		High	15		

COLLECTOR FOR ARCGIS (ESRI)

The team used the ESRI Collector Application in order to be able to store and spatially view repetitive loss data for the City of Westwego. The Collector App contains all field data collected by parcels for RLAA including pictures of each structure on the parcel. The data is stored in ArcGIS and is used for internal review and continued analysis of repetitive flood loss areas.

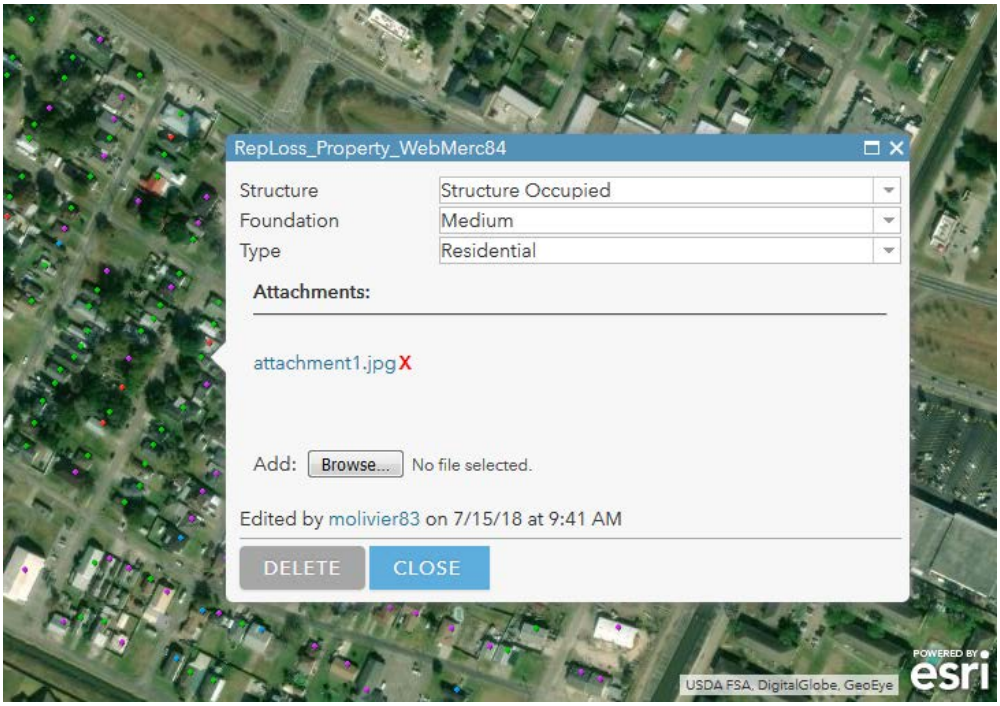
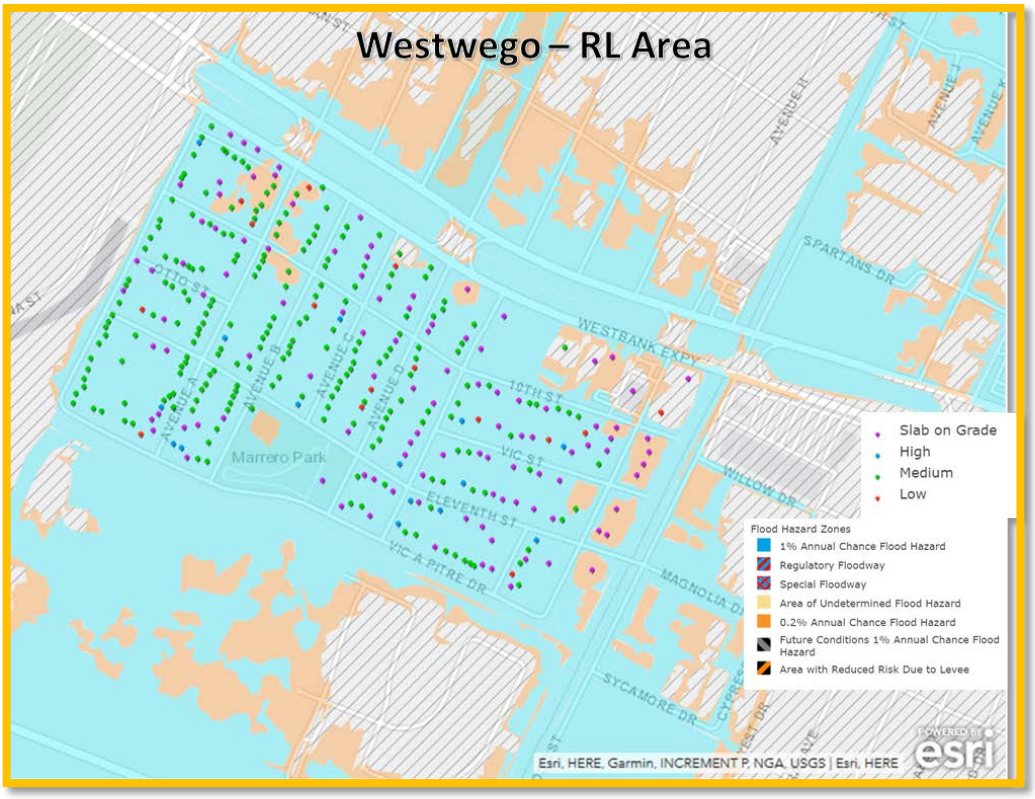


Figure 1- 6 Collector Application Sample

PROBLEM STATEMENT



The RL areas in the City of Westwego are located majorly within the 100-year floodplain (Zone AE) as shown on the map to the right. Westwego encompasses approximately three and a half (3.5) square miles. The Base Flood Elevation ranges from -2 to +3 feet in this area.

Excessive runoff from heavy rainfall causes flooding of urban areas, highways, and main streets as well as other low-lying spots in this area. Quick, heavy rains oftentimes results in overwhelming the existing pumping infrastructure and causing widespread street flooding. Any event causing rainfall over an inch can result into over working of the pump systems to clear water in the area. There is a lack in vital infrastructure such as pump stations, utilities and drainage that meet the contemporary standards so that the community can thrive.

In accordance with FEMA publication *551 Selecting Appropriate Mitigation Measures for Floodprone Structures*, mitigation options are discussed. The approach to reducing repetitive flooding in the City of Westwego's Repetitive Loss Area will require a combination of floodproofing techniques, education, and drainage improvement projects.

CLAIMS DATA:

In review of the unmitigated Repetitive Loss List, there are 37 properties within the 333 property study area that qualify as repetitive loss. Of those 37 repetitive loss properties, 2 are considered to be severe repetitive loss properties.

The majority of the rest of the claims are from relatively small rainfall events.

In analyzing the claims data, it could be derived that the area experiences most flooding from rainfall events. There have been 106 flood claims in the study area totaling $1,201,261.40. The average claim in the study area is $10,290.58. The homeowners of the 35 repetitive loss properties have made 94 claims and received $1,084,587.53 in flood insurance payments since 1978. The homeowners of the 2 severe repetitive loss properties have made 12 claims, and received $116,673.87 in flood insurance payments since 1978. The average repetitive flood loss claim was $10,295.21 and the average severe repetitive loss claim was $10,207.29. The severe repetitive loss homes are similar to the other homes on their block and on separate streets. They have each flooded more than 4 times, and all of them flooded during most of the heavy rainfall events in the area. (See bar graph below, Table 1-3).

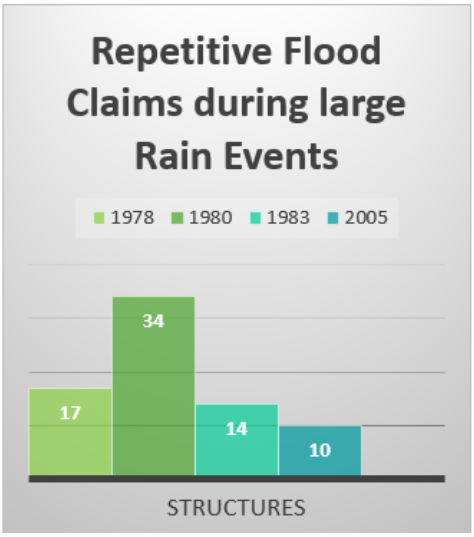


Table 1- 2

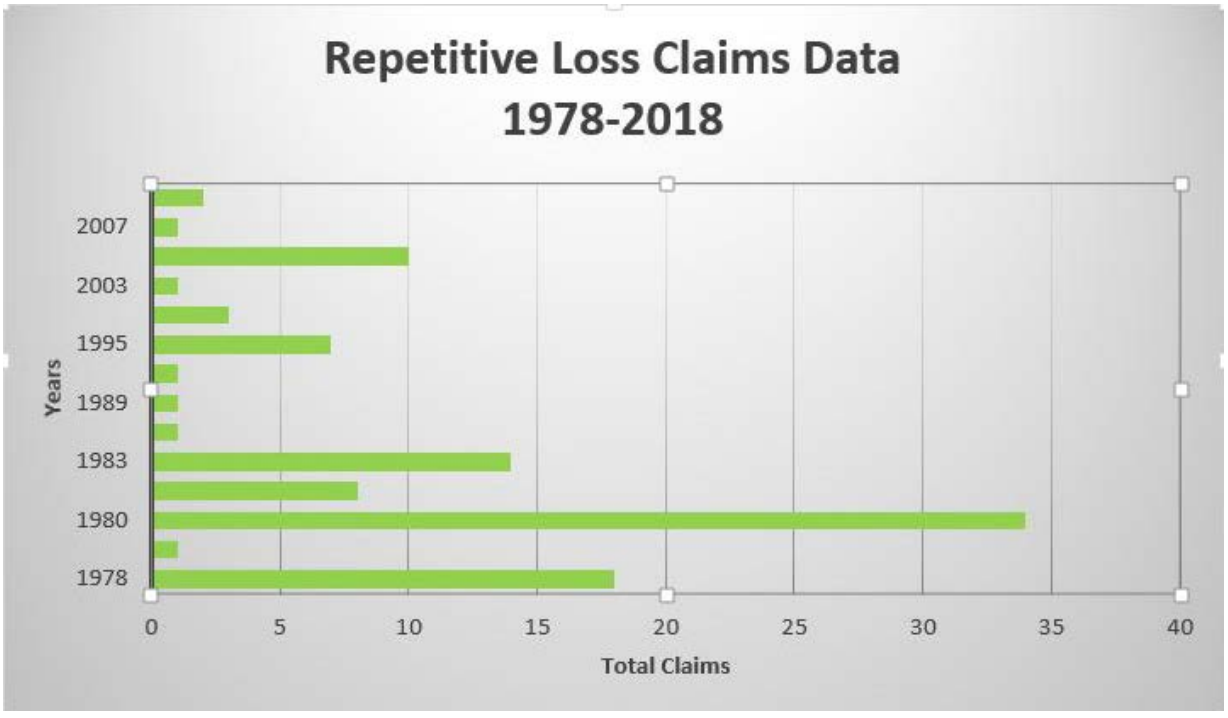


Table 1- 3

FIELD DATA:

The on-site field survey for this analysis was conducted over multiple days in May 2018. The team collected information such as the type and height of the foundation, occupancy status of the structure, and use of the structure.

With a count of 369, the majority of the structures are medium foundation height (58%). There are 111 structures (30%) that are slab on grade. Fifteen (4%) structures are low (less than 2 feet from grade), and another 15 structures (4%) have high foundations.

The project team observed that majority (336 or 91%) of the structures in the area are occupied, while approximately 12, or 3%, are vacant and 21 (6%) have no structure. Also, majority of the structures are of residential use (89% or 330), while 11% (39) are non-residential.

In conclusion, it should be noted that given the location of the study areas, all of the properties are inside levee protection. Majority of the properties are built slab on grade or of medium height; therefore, a heavy rain event can cause substantial damage to these properties.

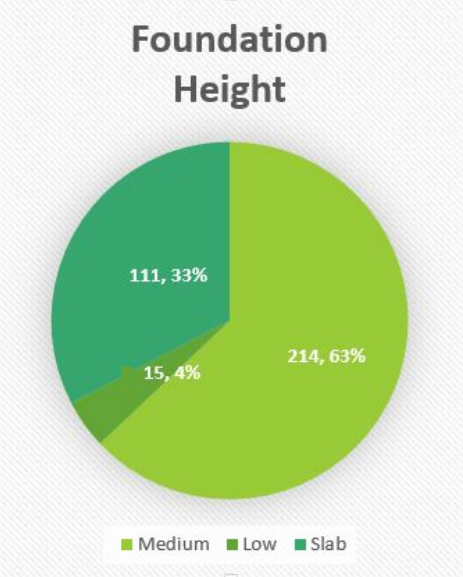


Table 1- 4

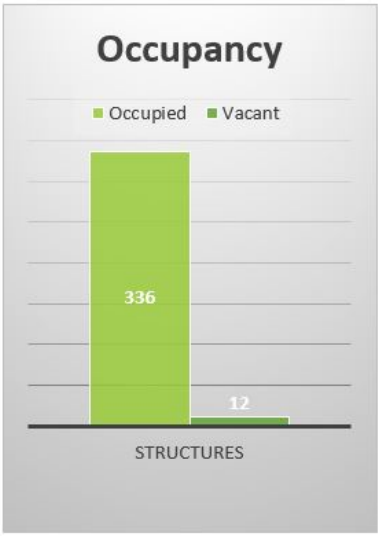


Table 1- 5

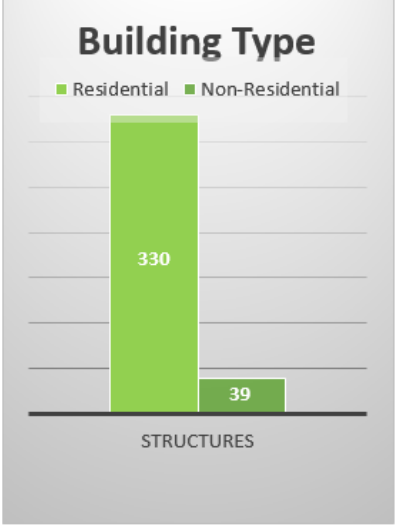


Table 1- 6

Figure 1- 8 Example property in Rep Loss Area

Figure 1- 9 Example Slab on Grade property in Rep Loss Area

STEP 4. REVIEW ALTERNATIVE MITIGATION APPROACHES

There are many ways to protect a property from flood damage. Different measures are appropriate for different flood hazards, building types and building conditions. Figure 1-10 below, found in the *2017 CRS Coordinator's Manual*, lists typical property protection measures.

To protect property from flood damage . . .

- Demolish the building or relocate it out of harm's way.
- Elevate the building above the flood level.
- Elevate damage-prone components, such as the furnace or air conditioning unit.
- Dry floodproof the building so water cannot get into it.
- Wet floodproof portions of the building so water won't cause damage.
- Construct a berm or redirect drainage away from the building.
- Maintain nearby streams, ditches, and storm drains so debris does not obstruct them.
- Correct sewer backup problems.

Figure 1- 10 Typical Property Protection Measures

Mitigation measures should fall into one of the mitigation categories listed below which are based on the Community Rating System planning process:

- Prevention
- Property Protection
- Natural Resource Protection
- Emergency Services
- Structural Projects
- Public Information and Outreach

MITIGATION FUNDING

There are several types of mitigation measures, listed in the table below, which can be considered for each repetitive loss property. Each mitigation measure qualifies for one or more grant program(s). Depending on the type of structure, severity of flooding and proximity to additional structures with similar flooding conditions, the most appropriate measure can be determined. In addition to these grant funded projects, several mitigations measures can be taken by the homeowner to protect their home.

Table 1- 7

Types of Projects Funded	HMGP	FMA	PDM	ICC	SBA
Acquisition of the entire property by govt. agency	✔	✔	✔		
Relocation of the building to a flood free site	✔	✔	✔	✔	✔
Demolition of the structure	✔	✔	✔	✔	✔
Elevation of the structure above flood levels	✔	✔	✔	✔	✔
Replacing the old building with a new elevated one	✔	✔	✔	✔	✔
Local drainage and small flood control projects	✔	✔	✔		
Dry floodproofing (non-residential only)	✔	✔	✔		
Percent paid by Federal program	75%	75%, 90%, or 100%	75%	Up to $30K	

There are several possible sources of funding for mitigation projects:

- **FEMA grants**: Most of the FEMA programs provide 75% of the cost of a project. In most communities, the 25% non-FEMA share is paid by the benefitting property owner. Each program has different Congressional authorization and slightly different rules.
  - **The Hazard Mitigation Grant Program (HMGP)**: The HMGP provides grants to States and local governments to implement long-term hazard mitigation measures after a major disaster declaration. Projects must provide a long-term solution to a problem (e.g., elevation of a home to reduce the risk of flood damages as opposed to buying sandbags and pumps to fight the flood). Examples of eligible projects include acquisition and elevation, as well as local drainage projects.
  - **The Flood Mitigation Assistance Program (FMA)**: FMA funds assist States and communities in implementing measures that reduce or eliminate the long-term risk of flood damage to structures insured under the NFIP. Project Grants to implement measures to reduce flood losses, such as elevation, acquisition, or relocation of NFIP-insured structures. States are encouraged to prioritize FMA funds for applications that include repetitive loss properties; these include structures with 2 or more losses each with a claim of at least $1,000 within any ten-year period since 1978.
  - **Pre-Disaster Mitigation Program (PDM)**: The Pre-Disaster Mitigation (PDM) program provides funds to states, territories, Indian tribal governments, communities, and universities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. For more information visit http://www.fema.gov/government/grant/pdm/index.shtm.

- **Flood insurance**: There is a special funding provision in the National Flood Insurance Program (NFIP) for insured buildings that have been substantially damaged by a flood, “Increased Cost of Compliance.” ICC coverage pays for the cost to comply with floodplain management regulations after a flood if the building has been declared substantially damaged. ICC will pay up to $30,000 to help cover elevation, relocation, demolition, and (for nonresidential buildings) floodproofing. It can also be used to help pay the 25% owner’s share of a FEMA funded mitigation project.

The building's flood insurance policy must have been in effect during the flood. This payment is in addition to the damage claim payment that would be made under the regular policy coverage, as long as the total claim does not exceed $250,000. Claims must be accompanied by a substantial or repetitive damage determination made by the local floodplain administrator. For more information, contact your insurance agent or visit: www.fema.gov/plan/prevent/floodplain/ICC.shtm.

Coverage under the ICC does have limitations: It covers only damage caused by a flood, as opposed to wind or fire damage. The building's flood insurance policy must have been in effect during the flood. ICC payments are limited to $30,000 per structure. Claims must be accompanied by a substantial or repetitive damage determination made by the local floodplain administrator and the structure must be in Zone AE.

The average claims payment in the study areas is $10,290.58. With an average claim of that amount, it is not likely that many homes in the study area would sustain substantial damage from a flood event. Homeowners should make themselves aware of the approximate value of their homes, and in the case of incurring flood damage, be aware of the need for a substantial damage declaration in order to receive the ICC coverage.

Alternative language adopted into the local floodplain management ordinance would enable residents with shallower flooding to access ICC funding. Since local ordinances determine the threshold at which substantial damage and/or repetitive claims are reached, adopting language that would lower these thresholds would benefit the homeowners of repetitive loss properties. Adopting alternative language allows for cumulative damages to reach the threshold for federal mitigation resources more quickly, meaning that some of the properties in the City of Westwego that sustain minor damage regularly would qualify for mitigation assistance through ICC.

- Rebates: A rebate is a grant in which the costs are shared by the homeowner and another source, such as the local government, usually given to a property owner after a project has been completed. Many communities favor it because the owner handles all the design details, contracting, and payment before the community makes a final commitment. The owner ensures that the project meets all of the program's criteria, has the project constructed, and then goes to the community for the rebate after the completed project passes inspection.

Rebates are more successful where the cost of the project is relatively small, e.g., under $5,000, because the owner is more likely to be able to afford the bulk of the cost. The rebate acts more as an incentive, rather than as needed financial support.

- Small Business Administration Mitigation Loans: The Small Business Administration (SBA) offers mitigation loans to SBA disaster loan applicants who have not yet closed on their disaster loan. Applicants who have already closed must demonstrate that the delay in application was beyond their control.

For example mitigation loans made following a flood can only be used for a measure to protect against future flooding, not a tornado. If the measure existed prior to the declared disaster, an SBA mitigation loan will cover the replacement cost. If the measure did not exist prior to the declared disaster the mitigation loan will only cover the cost of the measure if it is deemed absolutely necessary for repairing the property by a professional third-party, such as an engineer.

MITIGATION ALTERNATIVES

The majority of the flooding in these areas is considered “nuisance” flash flooding that causes minimal damage but does require costly cleanup and numerous street closures due to floodwaters overtopping the roadway.

Flooding in Westwego can be attributed to its flat topography, aging stormwater infrastructure. Flash flooding can occur when the capacity of the drainage system is exceeded or if conveyance is obstructed by debris, sediment and other materials that limit the volume of drainage. Heavy rains within a short period of time have caused the drainage system to be inundated and unable to keep up, resulting in ponding water in streets and homes.

Improving the drainage system can eliminate some road and home inundation in this area. These structural methods require large capital expenditures and cooperation from private property owners. Promoting floodproofing techniques and increasing public education and awareness of the flood hazards can be the next best alternative for property owners in this area. The Parish’s and the City’s websites, e-mail distribution lists, press releases and variable message boards can provide benefit to business owners and residents.

POTENTIAL MITIGATION MEASURES FOR WESTWEGO

Structural Alternatives:

- **Elevate** structures and damage-prone components, such as the water heater or air conditioning unit, above the Base Flood Elevation (BFE).
- **Dry floodproofing** can be done on commercial structures and even residential structures; however, in many instances this requires human intervention to complete the measure and ensure success. For example, installing watertight shields over doors or windows requires timely action by the homeowner; especially in a heavy rainfall event.
- **Wet floodproofing** a structure involves making the uninhabited portions of the structure resistant to flood damage and allowing water to enter during flooding. For example, in a basement or crawl space, mechanical equipment and ductwork would not be damaged.
- **Acquire and/or relocate** properties/target abandoned properties or locations that would provide a public benefit as the location will need to be maintained by the City in perpetuity.
- **Increase the size of culverts** under Jefferson Hwy to allow for increased capacity.
- **Implement drainage** i**mprovements** such as increasing capacity in the system (up-sizing pipes) and provide additional inlets to receive more stormwater.
- Improve stormwater system maintenance program to ensure inlets and canals are free of clogging debris.

Non Structural Alternatives:

- **Relocate internal supplies**, products/goods, and belongings above the flood depth.
- Improve the Parish’s floodplain and zoning ordinances.
- **Provide public education** through posting information about local flood hazards on City website, posting signs at various locations in neighborhoods or discussing flood protection measures at local neighborhood association meetings.
- Promote the purchase of flood insurance.

- Continue coordination with GOHSEP, the National Weather Service (NWS), and United States Geological Survey (USGS) to enhance flood warning system, including the use of rain/stream gauges, to provide greater warning time for citizens. NWS can use the real- time data collected to issue timely warnings.

COST AND BENEFITS OF MITIGATION MEASURES

Knowing the flooding history, type, and condition of the buildings in the area, leads to the fourth step in the area analysis procedure – a review of alternative mitigation approaches to protect properties from, or reduce, future flood damage. Property owners should look at these alternatives but understand they are not all guaranteed to provide protection at different levels of flooding. Six approaches were reviewed:

- Elevating the houses above the 1% annual flood level
- Acquisition
- Floodproofing
- Drainage improvements
- Utility protection
- Maintaining flood insurance coverage on the building

ELEVATION

Raising the structure above the flood level is generally viewed as the best flood protection measure, short of removing the building from the floodplain. All damageable portions of the building and its contents are high and dry during a flood, which flows under the building instead of into the house. Houses can be elevated on fill, posts/piles, or a crawlspace.

- A house elevated on fill requires adding a specific type of dirt to a lot and building the house on top of the added dirt.
- A house elevated on posts/piles is either built or raised on a foundation of piers that are driven into the earth and rise high enough above the ground to elevate the house above the flow of flood water or the design flood elevation.
- A house elevated on a crawlspace or enclosure is built or raised on a continuous wall-like foundation that elevates the house above the design flood level. It is important to include vents or openings in the walls below the design flood level that are appropriately sized: one square inch for each square foot of the crawlspace or enclosures footprint. Additionally all materials below the design flood level must be flood resistance and all machinery, equipment, and plumbing must be above the design flood level.
    - Cost: A majority of the cost to elevate a building is in the preparation and foundation construction. The cost to elevate six feet is little more than the cost to go up two feet. Elevation is usually cost-effective for wood frame buildings on posts/piles or crawlspace because it is easiest for lifting equipment to be used under the floor and disruption to the habitable part of the house is minimal. Elevating a slab house is much more costly and disruptive. In the study areas, 30% percent of the houses in the study area are on a slab. The actual cost of elevating a particular building depends on factors such as its condition, whether it is masonry or brick faced, and if additions have been added on over time. While the cost of elevating a home can be high, there are funding programs that can help. The usual arrangement is for a FEMA grant to pay 75% of the cost while the owner pays the other 25%. In the case of elevating a slab

foundation, the homeowner's portion could be as high as $50,000 or more. In some cases, assistance can be provided by Increased Cost of Compliance (ICC) funds, which is discussed on page 23 under Possible Funding Sources, or the use of state funds.

- Feasibility: Federal funding support for an elevation project requires a study that shows that the benefits of the project exceed the cost of the elevation. Project benefits include savings in insurance claims paid on the structure. Elevating a masonry or a slab home can cost up to $300,000, which means that benefit/cost ratios may be low. Looking at each property individually could result in funding for the worst case properties, i.e., those that are the lowest below the base flood elevation, subject to the most frequent flooding, and in good enough condition to elevate.

Advantages	Disadvantages
• **Elevating to or above the BFE allows a substantially damaged or substantially improved house to be brought into compliance.**	• **Cost may be prohibitive.**
• **Often reduces flood insurance premiums.**	• **The appearance of the structure and access to it may be adversely affected.**
• **Reduces or eliminates road closures due to overtopping.**	• **May require property owner cooperation and right-of-way acquisition.**
• **May be fundable under FEMA mitigation grant programs.**	• **May require road or walkway closures during construction.**

Table 1- 8 Advantages and Disadvantages of Elevation

ACQUISITION:

This measure involves buying one or more properties and clearing the site (demolishing the building). If there is no building subject to flooding, there is no flood damage. Acquisitions are usually recommended where the flood hazard is so great or so frequent that it is not safe to leave the structure on the site.

An alternative to buying and clearing the whole subdivision is buying out individual, "worst case," structures with FEMA funds.

- Cost: This approach would involve purchasing and clearing the lowest or the most severe repeatedly flooded homes. If FEMA funds are to be used, three requirements will apply:
  - The applicant for FEMA must demonstrate that the benefits exceed the costs, using FEMA's one of FEMA's approved Benefit Cost methodologies.
  - The owner must be a willing seller.
  - The parcel must be deeded to a public agency that agrees to maintain the lot and keep it forever as open space.

- Feasibility: Due to the high cost and difficulty to obtain a favorable benefit-cost ratio in shallow flooding areas, acquisitions are reserved for the worst case buildings. Not everyone wants to sell their home, so a checkerboard pattern of vacant and occupied lots often remains after a buyout project, leaving “holes” in the neighborhood. There is no reduction in expenses to maintain the neighborhood’s infrastructure for the City, although the tax base is reduced. The vacant lots must be maintained by the new owner agency, and additional expense is added to the community. If the lot is only minimally maintained, its presence may reduce the property values of the remaining houses. The City of Westwego is not considering acquisitions at this time for the above reasons.

Advantages	Disadvantages
• **Permanently removes problem since the structure no longer exists.** • **Allows a substantially damaged or substantially improved structure to be brought into compliance with the community’s floodplain management ordinance or law.** • **Expands open space and enhances natural and beneficial uses.** • **May be fundable under FEMA mitigation grant programs.**	• **Cost may be prohibitive.** • **Resistance may be encountered by local communities due to loss of tax base, maintenance of empty lots, and liability for injuries on empty, community-owned lots.**

Table 1- 9 Advantages and Disadvantages of Acquisition

There are 3 criteria that must be met for FEMA to fund an acquisition project:

- The local community must inform the property owners interested in the acquisition program that the community will not use condemnation authority to purchase their property and that the participation in the program is strictly voluntary,
- The subsequent deed to the property to be acquired will be amended such that the landowner will be restricted from receiving any further Federal disaster assistance grants, the property shall remain in open space in perpetuity, and the property will be retained in ownership by a public entity, and
- Any replacement housing or relocated structures will be located outside the 100-year floodplain.

FLOODPROOFING

This measure keeps floodwaters out of a building by modifying the structure. Walls are coated with waterproofing compounds or plastic sheeting. Openings (i.e. doors, windows, and vents) are closed either permanently, or temporarily with removable shields or sandbags.

- Make the walls watertight. This is easiest to do for masonry or brick faced walls. The brick or stucco walls can be covered with a waterproof sealant and bricked or stuccoed over with a veneer to camouflage the sealant. Houses with wood, vinyl, or metal siding need to be wrapped with plastic sheeting to make walls watertight, and then covered with a veneer to camouflage and protect the plastic sheeting. Provide closures, such as removable shields or sandbags, for the openings;

including doors, windows, dryer vents and weep holes. There must also be an account for sewer backup and other sources of water entering the building. For shallow flood levels, this can be done with a floor drain plug or standpipe; although a check valve system is more secure.

- Dry floodproofing employs the building itself as part of the barrier to the passage of floodwaters, and therefore this technique is only recommended for buildings with slab foundations that are not cracked. The solid slab foundation prevents floodwaters from entering a building from below. Also, even if the building is in sound condition, tests by the Corps of Engineers have shown that dry floodproofing should not be used for depths greater than three feet above the first floor, because water pressure on the structure can collapse the walls and/or buckle the floor.

- Dry floodproofing is a mitigation technique that is appropriate for some houses in the area: those with slab foundations that typically receive floodwater up to three feet in the house. From the fieldwork it was found that approximately thirty-two percent of the houses in the study area are on slab foundations so they may be good candidates for this type of mitigation.

- Not all parts of the building need to be floodproofed. It is difficult to floodproof a garage door, for example, so some owners let the garage flood and floodproof the walls between the garage and the rest of the house. Appliances, electrical outlets, and other damage-prone materials located in the garage should be elevated above the expected flood levels.

    - Cost: The cost for a floodproofing project can vary according to the building's construction and condition. It can range from $5,000 to $20,000, depending on how secure the owner wants to be from flooding. Owners can do some of the work by themselves, although an experienced contractor provides greater security. Each property owner can determine how much of their own labor they can contribute and whether the cost and appearance of a project is worth the protection from flooding that it may provide.

    - Feasibility: As with floodwalls, floodproofing is appropriate where flood depths are shallow and are of relatively short duration. It can be an effective measure for some of the structures and flood conditions found in the study analysis area. It can also be more attractive than a floodwall around a house. However, floodproofing requires the homeowner to install or place door and window shields or sandbags and to ensure maintenance on a yearly basis. This may be difficult for the elderly or disabled. Finally ample warning of flooding must be available, so the homeowner can determine when to place the door or window shields and sandbags.

Dry floodproofing has the following shortcomings as a flood protection measure:

- It usually requires human intervention, i.e., someone must be home to close the openings.
- Its success depends on the building's condition, which may not be readily evident. It is very difficult to tell if there are cracks in the slab under the floor covering.
- Periodic maintenance is required to check for cracks in the walls and to ensure that the waterproofing compounds do not decompose.
- There is no government financial assistance programs available for dry floodproofing, therefore the entire cost of the project must be paid by the homeowner.
- The NFIP will typically not offer a lower insurance rate for dry floodproofed residences. However, this may be a viable option if homeowners want to protect their structure and contents.

Advantages	Disadvantage
• Often less costly than other mitigation measures. • Allows internal and external hydrostatic pressures to equalize, lessening the loads on walls and floors.	• Extensive cleanup may be necessary if the structure becomes wet inside and possibly contaminated by sewage, chemicals and other materials borne by floodwaters. • Pumping floodwaters out of a basement too soon after a flood may lead to structural damage. • Does not minimize the potential damage from a high-velocity flood flow and wave action.

Table 1- 10 Advantages and Disadvantages of Wet Floodproofing

Advantages	Disadvantage
• Often less costly than other retrofitting methods • Does not require additional land. • May be funded by a FEMA mitigation grant program.	• Requires human intervention and adequate warning to install protective measures. • Does not minimize the potential damage from high-velocity flood flow and wave action. • May not be aesthetically pleasing.

Table 1- 11 Advantages and Disadvantages of Dry Floodproofing

DRAINAGE IMPROVEMENTS

The Parish is currently in the process of developing a Parish-wide Subsurface Drainage Master Plan that will include the incorporated jurisdictions such as the City of Westwego. The purpose of this Plan is to help identify deficient drainage areas throughout the Parish, develop preliminary solutions for the problem areas, split problem areas into individual projects for bidding purposes, develop cost estimates, and prioritize needed work. The Plan shall have a list of recommendations that were created after reviewing previous studies and reports. There are several different drainage improvements called for in the Drainage Master Plan that might help in reducing some of the flooding within this Repetitive Loss area. Maintenance for all projects and ongoing street sweeping continues for this area. Whenever drainage improvements are considered as a flood mitigation measure, the effects upstream and downstream from the proposed improvements need to be considered.

Advantages	Disadvantages
• **Can increase channel carrying capacity through overflow channels, channel straightening, crossing replacements, or runoff volume storage.** • **Minor projects may be fundable under FEMA mitigation grant programs.**	• **May help one area but create new problems upstream or downstream.** • **Channel straightening increases the capacity to accumulate and carry sediment.** • **May require property owner cooperation and right-of-way acquisition.**

Table 1- 12 Advantages and Disadvantages of Drainage Improvements

STEP 5. CONCLUSION AND RECOMMENDATIONS

CONCLUSION

Based on the field survey and collection of data, the analysis of existing studies and reports, and the evaluation of various structural and non-structural mitigation measures, the City proposes that mitigation measures be implemented for the City of Westwego's Repetitive Loss Area. The table below examines past and current mitigation actions in these areas.

Table 1- 33 Current and Past Mitigation Actions in the Study Area

Mitigation Actions	
1	**Property owners have documented flooding and identified flooding concerns in returned questionnaires from this analysis.**
2	**Property owners are aware of flooding causes. Some property owners have undertaken specific floodproofing measures at their own expense.**
3	**The Parish and City have undertaken numerous, costly capital improvement projects to improve drainage within the study area.**

RECOMMENDATIONS

The City of Westwego should continue to encourage everyone to pursue mitigation measures and assist interested property owners in applying for mitigation grants. The City of Westwego should continue to address street drainage in order to improve the drainage in the study area, seek out and secure funding for the drainage improvements outlined in this report, and institute a maintenance program that encourages homeowners to frequently clear their catch basin inlets of debris to ensure open flow for stormwater. The City of Westwego should also continue to improve its CRS classification and adopt this Repetitive Loss Area Analysis according to the process detailed in the CRS Coordinator's Manual.

For the residents of the study areas, they should contact the City of Westwego and Jefferson Parish for more information about possible funding opportunities and site visits to determine remedial measures. Review the alternative mitigation measures discussed in this analysis and implement those that are most appropriate for their situation. Purchase and maintain a flood insurance policy on the home and its contents.

The City of Westwego recommends the following mitigation actions:

MITIGATION ACTION 1:

Property owners should obtain and keep a flood insurance policy on their structures (building and contents coverage). The City will continue on an **annual basis** to target all properties in the repetitive loss area reminding them of the advantages to maintaining flood insurance through its annual outreach effort.

RESPONSIBILITY

The City of Westwego will provide the most relevant up-to-date flood insurance information to all property owners within the repetitive loss areas located in the study area.

FUNDING

The cost will be paid for from the City's operating budget.

MITIGATION ACTION 2:

When appropriate, property owners should consider floodproofing measures such as flood gates or shields, flood walls, and hydraulic pumps.

RESPONSIBILITY

The City of Westwego will promote effective flood protection measures and provide advice and assistance to property owners who may wish to implement such measures in an **on-going** program with assistance from Jefferson Parish.

FUNDING

The cost will be paid for by individual property owners. Advice and assistance will require staff time which will be covered in the City's annual budget.

MITIGATION ACTION 3:

Continue elevation or reconstruction mitigation of high-risk flood-prone properties. The highest priorities are properties at the greatest flood risk and where drainage improvements will not provide an adequate level of protection.

RESPONSIBILITY

The Jefferson Parish Floodplain Management and Hazard Mitigation department will continue to target the most at risk properties for grant applications.

FUNDING

Construction cost would be covered with FEMA or ICC funds. Staff time to develop the list of target properties will require funds from the department's operating budget.

MITIGATION ACTION 4:

Prioritize Capital Improvement Projects to focus on drainage improvement projects in those basins containing repetitive loss areas.

RESPONSIBILITY

Jefferson Parish's Drainage Department in conjunction with the Engineering Department and City staff.

FUNDING

Bond funds or state grants.

MITIGATION ACTION 5:

Encourage property owners to elevate inside and outside mechanical equipment above the BFE and install flood resistant materials in crawl spaces.

RESPONSIBILITY

The City of Westwego will continue to promote effective flood protection measures and provide advice and assistance to property owners who may wish to implement such measures in an **on-going** program with assistance from Jefferson Parish.

FUNDING

The cost will be paid for by individual property owners. Advice and assistance will require staff time which will be covered in the City's annual budget.

The RLAA draws upon on the existing initiatives and presents a series of mitigation recommendations related to repetitive flood loss properties in each Repetitive Loss Area, particularly via non-structural means. All recommendations are made with the intent to improve the City's Community Rating System score; thereby, reducing resident's overall insurance rates.

It is recommended that the City of Westwego i) adopt this Repetitive Loss Area Analysis according to the process detailed in the 2017 CRS Coordinator's Manual, ii) encourage the owners of repetitive flood loss structures to pursue a mitigation measure, iii) continue to assist interested property owners in applying for mitigation grants, iv) continue to improve and maintain the drainage system, and finally v) continue public information activities such as outreach projects, website postings and flood protection assistance that help residents learn about various mitigation measures.

Additionally, it is recommended that the property owners participate by i) reviewing the mitigation measures listed in this report and implement those as appropriate, ii) stay updated on the City of Westwego's flood risk reduction initiative and finally, iii) purchase or maintain a flood insurance policy on their home and contents (see www.floodsmart.gov for more information).

The draft RLAA report for the City of Westwego was posted on the Jefferson Parish website www.jeffparish.net/RLAA for comments from August 31 through September 14, 2018. No comments were received.

Appendix F
Asset Inventory

Asset Inventory Assessment Group 1(Pilot)

Jefferson Parish

August 28, 2017

Notice

This document and its contents have been prepared and are intended solely for Jefferson Parish's information and use in relation to the Hazard Mitigation Plan Update.

Atkins NA assumes no responsibility to any other party in respect of or arising out of or in connection with this document and/or its contents.

This document has XX pages including the cover.

Document history

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Revision	Purpose description	Originated	Checked	Reviewed	Authorized	Date
Rev 1.0	<purpose>	<Initials>	<Initials>	<Initials>	<Initials>	dd/mm/yy

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Executive summary

As part of the Hazard Mitigation Plan Update Process – Jefferson Parish requested BBEC/Atkins to pilot a data collection process developed to assess Jefferson Parish Administration Buildings as well as seats of government for incorporated communities, to include Kenner, Grand Isle, Jean Lafitte, Harahan, Westwego and Gretna. This report will provide high level assessment on the conditions of these 22 structures and their risk profile for flood, wind and subsidence. Recommendations for hazard mitigation have been provided by the BBEC/Atkins team, as appropriate, for each structure relating to each of these risks and the baseline condition is at the date of this report. This information is provided only as a recommendation and no engineering analysis or soil sampling/analysis was performed on these structures as part of this assessment. Information provided is not intended for any purpose other than identification of opportunities for risk reduction and risk analysis during the Hazard Mitigation Plan Update process.

Data collection forms used during the assessment have been provided in the appendix. The form will be evaluated and revised as result of lessons learned during the pilot phase of this project.

Overall questions for all facilities:

- Does the Parish have a Continuing Operations procedure for the functions of this facility?
- Have redundancies been established to provide for continued services?
- What functions are dependent upon this facility?

1. Jefferson Parish: Yenni Building

1221 Elmwood Park Blvd, Harahan, LA 70123

POC: Anthony Francis

1.1. Risk Profile

1.1.1. Flood

Low | Medium

Recommendations: As the structure is located in a Special Flood Hazard Area (SFHA) and approximately 1ft above Base Flood Elevation (BFE) – first floor functions and access to the structure could be at risk during a significant rain/flood event. Flood barriers for entry ways and assessment of exterior to withstand standing water may be appropriate. Reduction of impervious surfaces (parking lot) and installation of Stormwater Management features may provide reduction of nuisance flooding.

1.1.2. Wind

Low | Medium

Recommendations: As the structure's window frames are currently rated to 150 mph, the risk for wind and water intrusion should be minimal, but there is no window protection from wind borne debris to the glass, which increases risk from damage. The POC indicated that the cooling tower located on the roof is at risk from wind and he feels a wind screen is needed.

1.1.3. Subsidence

Low | Medium

Recommendations: There is limited capacity for stormwater absorption in the area surrounding this structure. It is estimated over 90% of the area is covered with impervious surfaces which could lead to an increase in subsidence of the soil (note: no soil analysis was performed and no history of subsidence is available). The majority of stormwater in the area is directly routed to traditional grey infrastructure with little to no green infrastructure installations to provide for infiltration of water.

Comments from POC: The Yenni Building is used as Jefferson Parish employee shelter in the case of a disaster event. In Anthony's own words, "the cooling tower on the roof is the weakest link of the Yenni building." He hopes to someday be able to install a good wind screen on the cooling tower and also hopes to be able to run the building on 100% generator power with 100% redundancy if a power outage were to occur.

2. Jefferson Parish: Central Plant

200 Derbigny Street, Gretna, LA 70053

POC: Anthony Francis

2.1. Risk Profile

2.1.1. Flood

Low | Medium

Recommendations: Structure is not located in a SFHA – but equipment located at grade may be at risk from stormwater back up and/or street flooding that may occur during an intense rain event. Provisions to ensure continuity of operations is recommended – potentially temporary flood barriers if elevation of equipment is cost-prohibitive or unfeasible from an engineering perspective.

2.1.2. Wind

Low | Medium | High

Recommendations: Install window protection to strengthen structure vulnerability to wind-borne debris – POC also indicated that there is currently risk from rain intrusion due to the current condition of the windows. Garage doors should be retrofitted with re-enforcement bars to protect from wind uplift.

2.1.3. Subsidence

Low

Recommendations: This site location is in close proximity to the Mississippi River and the soil type appears to be less susceptible to subsidence (NOTE: No soil sampling or analysis was performed.) POC indicates that there are no visible concerns with subsidence in the area.

During Hurricane season they bring in another generator to keep at the Central Plant in case a storm event occurs.

3. Jefferson Parish: Donelon Building

200 Derbigny Street, Gretna, LA 70053

POC: Anthony Francis

3.1. Risk Profile

3.1.1. Flood

Low | Medium

Recommendations: Structure is not located in a SFHA – but electrical equipment located at grade may be at risk from stormwater back up and/or street flooding that may occur during an intense rain event. Openings to the structure are also located at grade and temporary flood barriers could be an option to reduce potential intrusion from stormwater backup and street flooding.

3.1.2. Wind

Low | Medium | High

Recommendations: Install window protection to strengthen structure vulnerability to wind-borne debris – POC also indicated that there is currently risk from rain intrusion due to the current condition of the windows. HVAC is located on the roof is at risk from debris – an enclosed structure to protect this equipment should be considered.

3.1.3. Subsidence

Low

Recommendations: This site location is in close proximity to the Mississippi River and the soil type appears to be less susceptible to subsidence (NOTE: No soil sampling or analysis was performed.) POC indicates that there are no visible concerns with subsidence in the area.

4. Jefferson Parish: General Government Building

200 Derbigny Street, Gretna, LA 70053

POC: Anthony Francis

4.1. Risk Profile

4.1.1. Flood

Low | Medium

Recommendations: Structure is not located in a SFHA – but the boiler room, Automatic Transfer Switch and electrical equipment located on the first floor level may be at risk from stormwater back up and/or street flooding that may occur during an intense rain event. Openings to the structure are also located at grade and temporary flood barriers could be an option to reduce potential intrusion from stormwater backup and street flooding.

4.1.2. Wind

Low | Medium | High

Recommendations: Install window protection to strengthen structure vulnerability to wind-borne debris – POC also indicated that there is currently risk from rain intrusion due to the current condition of the windows. HVAC units are located on the roof and are not protected from all directions – it may be beneficial to provide for an enclosure for protection. Also, the current roof does not appear to be rated to the current wind speed for the area and may need to be considered for upgrade.

4.1.3. Subsidence

Low

Recommendations: This site location is in close proximity to the Mississippi River and the soil type appears to be less susceptible to subsidence (NOTE: No soil sampling or analysis was performed.) POC indicates that there are no visible concerns with subsidence in the area.

5. Jefferson Parish: District Attorney Building

200 Derbigny Street, Gretna, LA 70053

POC: Anthony Francis

5.1. Risk Profile

5.1.1. Flood

Low | Medium

Recommendations: Structure is not located in a SFHA – first floor functions and access to the structure could be at risk during a significant rain event from stormwater runoff. Openings to the structure are located at grade and temporary flood barriers could be an option to reduce potential intrusion from stormwater backup and street flooding.

5.1.2. Wind

Low | Medium | High

Recommendations: Install window protection to strengthen structure vulnerability to wind-borne debris – POC also indicated that there is currently risk from rain intrusion due to the current condition of the windows. HVAC units are located on the roof and are not protected from all directions – it may be beneficial to provide for an enclosure for protection. Also, the current roof does not appear to be rated to the current wind speed for the area and may need to be considered for upgrade.

5.1.3. Subsidence

Low

Recommendations: This site location is in close proximity to the Mississippi River and the soil type appears to be less susceptible to subsidence (NOTE: No soil sampling or analysis was performed.) POC indicates that there are no visible concerns with subsidence in the area.

6. Jefferson Parish: East Bank Drainage

4901 Jefferson Highway, Suite D, Metairie, LA 70123

POC: Earl Peters

6.1. Risk Profile

6.1.1. Flood

Low

Recommendations: Structure is not located in a SFHA – and first floor is elevated 3ft or more above grade – therefore there is a low risk of flooding to this facility. It was noted that the majority of the surrounding area is covered in impervious pavement – which may lead to increased run-off – or contribute to an increase of subsidence in the area..

6.1.2. Wind

Low | Medium | High

Recommendations: There is a significant risk associated with damage from wind or wind borne debris to this facility. Upon inspection, it appears that 30% of the roof has been upgraded to standing seam metal – leaving the remaining 70% of traditional metal roof at risk from wind. As this facility is used to store vehicles during storm events, it is recommended that the roof be upgraded for full coverage if this is the continued use for this facility. In addition to the roof, the overall metal building construction type of the facility is vulnerable to wind and wind borne debris with at risk openings with unsecured louvers as well as garage doors. It is recommended that you consider securing all openings.

(NOTE: Future Use Identification should be considered in upgrades considered for the facility.)

6.1.3. Subsidence

Low

Recommendations: There does not appear any significant concerns with subsidence to the existing structure. Existing Foundation damage is likely from age. During future repairs or upgrades to the parking lot, consideration for installing pervious pavement and/or retention areas should be made.

7. Jefferson Parish: East Bank Sewerage

4901 Jefferson Highway, Suite B, Metairie, LA 70123

POC: Glenn Miller

7.1. Risk Profile

7.1.1. Flood

Low

Recommendations: Structure is not located in a SFHA – First Floor is located at grade at the front of the building and elevated 3ft above grade in the rear portion of the building. This area is considered low risk – but there may be potential for stormwater in the front portion of the building. It was noted that the majority of the surrounding area is covered in impervious pavement – which may lead to increased run-off – or contribute to an increase of subsidence in the area.

7.1.2. Wind

Low

Recommendations: The building envelope is a mix of CMU covered with stucco for the front portion with roll down window protection and a metal building in the rear portion which is vulnerable to wind and wind borne debris with and an at risk opening with an unsecured garage door. It is recommended that you consider securing all openings. The roof has been upgraded to a standing seam metal roof – but the POC indicated that there may be at risk areas of current water intrusion where the roof meets the adjoining building.

(NOTE: Future Use Identification should be considered in upgrades considered for the facility.)

7.1.3. Subsidence

Low

Recommendations: There does not appear any significant concerns with subsidence to the existing structure. During future repairs or upgrades to the parking lot, consideration for installing pervious pavement and/or retention areas should be made.

8. Jefferson Parish: West Bank Sewer Field Office

1440 River Park Road, Bridge City, LA 70094

POC: Morris Sapia

8.1. Risk Profile

8.1.1. Flood

Low | Medium

Recommendations: The structure for this facility was built on fill with a slab, constructed above the BFE and not located in the SFHA. The surrounding parking lot is located in an AE EL3 zone and is some places appears to come very close to the edges of the structure. The first floor is primarily used for storage and training facility and therefore the damage would likely be limited to this area if flooding occurred. All office space and associated equipment is located on the 2nd floor. The HVAC system and the incoming electrical lines are located at grade and at potential risk from flooding – as they are located about 1 foot above BFE.

8.1.2. Wind

Low

Recommendations: The structure is a low risk from wind and wind borne debris. All windows are protected by either roll down shutters or permanent window protection (1st floor), the roof is standing seam metal (based on POC feedback), and the construction type is steel frame. The HVAC units are at some potential risk from wind borne debris as they are not enclosed in a protective structure. NOTE: No engineering structural analysis was completed.

8.1.3. Subsidence

Low | Medium

Recommendations: There does appear to be some subsidence as there is noted damage to sidewalks around the building. It is recommended that some sort of pervious pavement be considered for the parking area surrounding the structure as well as bioswales to allow for additional infiltration at the site.

NOTE: POC indicated that they are in need of an ATS for the generator.

9. Jefferson Parish: West Bank Drainage Administration

1440 River Park Road, Bridge City, LA 70094

POC: Lynne Champagne

9.1. Risk Profile

9.1.1. Flood

Low | Medium

Recommendations: The structure for this facility was built on fill with a slab on piles, constructed above the BFE and not located in the SFHA. The surrounding parking lot is located in an AE EL3 zone and is some places appears to come very close to the edges of the structure. The first floor is primarily used for storage and training facility and therefore the damage would likely be limited to this area if flooding occurred. All office space and associated equipment is located on the 2nd floor. The HVAC system is located at grade and the incoming electrical boxes are only elevated about 1 ft. above grade and at potential risk from flooding.

9.1.2. Wind

Low | Medium

Recommendations: The structure is steel frame construction and the windows were upgraded to Hurricane Wind Protection of 135 mph. The roof is still at risk as it is a standard metal roof and should be upgraded to at least match the wind rating of the windows for increased level of protection.

9.1.3. Subsidence

Low | Medium

Recommendations: There does appear to be some subsidence as the ground around the foundation has eroded or potentially subsided. It is recommended that some sort of pervious pavement be considered for the parking area surrounding the structure as well as bioswales, rain gardens or retention areas to allow for additional infiltration at the site.

NOTE: This structure is used as a safe room for Parish personnel during a storm – the lower level area is used for this purpose.

10. Jefferson Parish: East Bank Streets Maintenance

200 Shrewsbury Road, Jefferson, LA 70121

POC: Charles Colopy

10.1. Risk Profile

10.1.1. Flood

Low

Recommendations: The structure in located in an x-zone, on high ground near the river and also elevated 3 feet above grade. The flood risk to this structure is very low and no need for mitigation.

10.1.2. Wind

Low

Recommendations: The structure was built in 2011 with a standing seam metal roof and the windows are hurricane rated to 135 mph. The building is steel frame and good structural integrity. There may be an opportunity for additional protection to the windows from wind borne debris with shutters, both otherwise, this structure has minimal risk from wind.

10.1.3. Subsidence

Low

Recommendations: There are no signs of subsidence at this site, but It is recommended that some sort of pervious pavement be considered for the parking area surrounding the structure as well as bioswales, rain gardens or retention areas to allow for additional infiltration at the site. As this structure is located on high ground, it could reduce run off to the drainage system and any backups that may occur in lower lying areas.

11. Jefferson Parish: West Bank Streets Administration

1901 Ames Blvd, Marrero, LA 70072

POC: Charles Colopy

11.1. Risk Profile

11.1.1. Flood

Low | Medium

Recommendations: The structure is not located in a SFHA – but it is at risk from potential stormwater flooding during a high rain event as it is sited at grade. The HVAC and Electrical are also located at grade or less than 1 ft. above grade and should be considered for elevation. NOTE: POC indicated that he was looking to replace HVAC units in the future and already intends to elevate at that time.

11.1.2. Wind

Low | Medium | High

Recommendations: The roof is a standard metal roof, the siding of the building is sandwich metal and the windows are old metal framed windows. Taking this into consideration, this structure is at significant risk for wind or wind borne debris damage. NOTE: POC has indicated that there is a current HMA application for Wind Retrofit of the Structure – not sure of the status.

11.1.3. Subsidence

Low | Medium

Recommendations: 90% of the surrounding area of the structure is covered with impervious pavement with noticeable signs of damage. The foundation of the structure seems to be in good condition, but it is recommended that pervious pavement be considered during repair of current parking lot as well as opportunities for stormwater management features like bioswales or rain gardens.

NOTE: Functions of the facility may be moved to a more secure structure across the street to the old EOC building.

12. Grand Isle: Town Hall

170 Ludwig Lane, Grand Isle, LA 70358

POC: Nora Combel

12.1. Risk Profile

12.1.1. Flood

Recommendations: The structure is located in a VE zone on a coastal island and is at significant risk from flooding. The structure is elevated 3+ ft above BFE, but some equipment like HVAC and electrical is still at risk a sited below the BFE. It is recommended that this equipment be elevated at least to the same elevation as the structure. In addition, it was noted that the foundation supports have visible damage and may be at risk from storm surge. It is recommended that an engineering analysis be completed to determine if the foundation supports need to be repaired to withstand future storm events.

12.1.2. Wind

Recommendations: The structure is at high risk from wind and wind borne debris. The windows are in poor condition with not protection, the roof is a standard shingle roof with no upgrades and the construction type is wood frame. It is recommended that this structure be hardened with window upgrades, roof replacement and an engineering analysis performed to determine the structural integrity of the facility to withstand hurricane force winds.

12.1.3. Subsidence

Recommendations: As Grand Isle is an Island, it is a fair assumption that subsidence is occurring at this site – although there are no significant visual indications. It is recommended to replace current impervious parking lot with pervious pavers to allow for better infiltration and potentially reduce subsidence (noting it is an island and impacts are likely not measurable)

13. Gretna: Courthouse/Government

740 2nd Street, Gretna, LA 70053

POC: Michael Wesley

13.1. Risk Profile

13.1.1. Flood

Low | Medium

Recommendations: The structure is located in a x-zone and the majority of the building is elevated about 3 ft above grade (EC outstanding). There is a small basement that still houses some remaining phone equipment. It is recommended this equipment be relocated to a location above BFE and the basement filled in, it feasible from an engineering perspective.

13.1.2. Wind

Low | Medium | High

Recommendations: Currently the structure is at risk from wind and wind borne debris, but once the current grant and project for Wind Retrofit is complete, the primary and functioning portion of the structure (the front part) will be sufficiently protected from future damage. The Annex will still remain at risk until it can also be mitigated with upgraded windows and a roof.

13.1.3. Subsidence

Low

Recommendations: There are no signs of subsidence at this site, but It is recommended that some sort of pervious pavement be considered for the parking area surrounding the structure as well as bioswales, rain gardens or retention areas to allow for additional infiltration at the site. As this structure is located on high ground, it could reduce run off to the drainage system and any backups that may occur in lower lying areas.

14. Gretna: Public Works

224 Fourth Street, Gretna, LA 70053

POC: Dina Matthews

14.1. Risk Profile

14.1.1. Flood

Low

Recommendations: The structure is located in a x-zone and the building is elevated about 3 ft above grade. There is always a potential risk for flood – but this facility seems to be protected sufficiently from a flood risk at this time.

14.1.2. Wind

Low

Recommendations: The windows are protected with roll down shutters and the roof is made of cement. The building is constructed of CMU (cement blocks) and should withstand wind and wind borne debris effectively. The attached garage structure does not have support on the garage doors and the exterior is metal panels and a metal roof – which could leave this building at risk. NOTE: POC indicated that all equipment is relocated from this structure during an event.

14.1.3. Subsidence

Low

Recommendations: There are no significant signs of subsidence at this site, but It is recommended that some sort of pervious pavement be considered for the parking area surrounding the structure as well as bioswales, rain gardens or retention areas to allow for additional infiltration at the site.

15. Harahan: City Hall

6437 Jefferson Highway, Harahan, LA 70123

POC: Mayor Tina Miceli

15.1. Risk Profile

15.1.1. Flood

Low Medium

Recommendations: The structure is located in a levee protected x-zone and there is one entrance located at grade in the rear of the building – but the remaining entrances are elevated 2-3 ft. above grade. The structure is located close to the road and there may be a concern with stormwater flooding during a high rain event. The area is predominately impervious surfaces which increases run off and flood risk. It is recommended that flood tubes or barriers be considered for protection at the entrances if this type event does occur.

15.1.2. Wind

Low Medium

Recommendations: The windows and roof of the building are currently at risk – there is no window protection and the roof appears to need upgrades. As the building is constructed of a mix of materials, it is recommended that an engineering analysis be completed to assess the ability to withstand wind and wind borne debris.

NOTE: The City Engineer indicated that roof tie downs were installed during a renovation in 2006 and a Mitigation grant has been submitted and approved for wind retrofit of the building to protect the envelope.

15.1.3. Subsidence

Low Medium

Recommendations: 90% of the surrounding area of the structure is covered with impervious pavement with noticeable signs of damage. The foundation of the structure appears to have some minor damage and it is recommended that pervious pavement be considered during repair of current parking lot as well as opportunities for stormwater management features like bioswales or rain gardens.

16. Jean Lafitte: Town Hall

2654 Jean Lafitte Blvd, Jean Lafitte, LA 70067

POC: Yvette Crain

16.1. Risk Profile

16.1.1. Flood

Low | Medium | High

Recommendations: The structure is located in a SFHA – AE EL8. The FFE of the structure is at 5.29 ft according to an Elevation Certificate – which indicates that this structure is at significant risk of flooding. NOTE: POC indicated that water has never gotten in the building (since 1979) but has come up into the surrounding yard. Also, there is a flood control structure under construction – need to determine if it will provide additional protection for this structure. If not, then it is recommended that the structure be elevated to above the BFE. The HVAC, Generator and electrical are located on an elevated platform – but it appears to be close to the BFE and still at risk at the current elevation height and would recommend elevation of these components as well.

16.1.2. Wind

Low | Medium | High

Recommendations: The structure was built in 1979 and does not appear to have any upgrades to windows or roofs since construction and there is no sort of window protection, i.e. shutters. The exterior structure does appear to be sound and likely capable of withstanding wind and wind borne debris. It is recommended that the roof be assess and upgraded to withstand at least wind speeds of 141 mph and the windows either be upgraded or provided protection with the installation of shutters.

16.1.3. Subsidence

Low | Medium | High

Recommendations: Based on visual inspection of the ground elevation in relation to the foundation of the building – there does appear to be some subsidence. The traditional recommendations for subsidence reduction may not be applicable at this site location, but this risk should be considered during the potential elevation and installation of new foundation support, piles, etc.

17. Kenner: City Hall – Building A (City Hall, Courthouse, Fire Dept)

1801 Williams Blvd, Kenner, LA 70062

POC: George Bode

17.1. Risk Profile

17.1.1. Flood

Low | Medium

Recommendations: The structure is located in a levee protected x-zone and has no history of flooding. There are concerns with access to the facility when surrounding streets flood as well as potential back up from the nearby canal if pumps were not operational or stormwater during a high rain event. Most of the entrances are located above grade, but for those at grade entrances, it is recommended that flood tubes or flood barriers be available to reduce potential of water intrusion. One HVAC unit is located at grade and should be elevated to reduce chances of damage.

17.1.2. Wind

Low | Medium | High

Recommendations: There was no available information on the wind rating of the roof – or past history of damage. It appears to be in fair condition, but an assessment of current wind rating is recommended to determine level of risk and HVAC units need to be protected on the roof. Garage doors are not secured from wind uplift and could be a potential area of risk for wind damage. It is recommended that protection be put in place on the garage doors to reduce potential uplift. The windows are not protected and do not appear to have been upgraded. It is recommended that the building be assessed for the best approach to protect these areas (as there are some unusual shapes/sizes) from wind and wind borne debris.

17.1.3. Subsidence

Low | Medium

Recommendations: A large majority of the surrounding area of the structure is covered with impervious pavement with noticeable signs of damage. The foundation of the structure seems to be in good condition, but it is recommended that pervious pavement be considered during repair of current parking lot as well as opportunities for stormwater management features like bioswales or rain gardens.

NOTE: This structure does not have a generator, it is recommended that a generator be considered for this building as it houses the fire department.

18. Kenner: City Hall – Building B (Mayor, Code Enforcement, Council)

1801 Williams Blvd, Kenner, LA 70062

POC: George Bode

18.1. Risk Profile

18.1.1. Flood

Low | Medium

Recommendations: The structure is located in a levee protected x-zone and has no history of flooding. There are concerns with access to the facility when surrounding streets flood as well as potential back up from the nearby canal if pumps were not operational or stormwater during a high rain event. Most of the entrances are located slightly above grade, it is recommended that flood tubes or flood barriers be available to reduce potential of water intrusion.

18.1.2. Wind

Low | Medium

Recommendations: There was no available information on the wind rating of the roof – but it was replaced after Hurricane Katrina. It appears to be in fair condition, but an assessment of current wind rating is recommended to determine level of risk. HVAC units need to be protected on the roof from wind and wind borne debris. Windows have been upgraded to a wind rating of 135 mph (aka Hurricane Windows) and the exterior and structure is in good condition.

18.1.3. Subsidence

Low | Medium

Recommendations: A large majority of the surrounding area of the structure is covered with impervious pavement with noticeable signs of damage. The foundation of the structure seems to be in good condition, but it is recommended that pervious pavement be considered during repair of current parking lot as well as opportunities for stormwater management features like bioswales or rain gardens.

NOTE: Building does have a generator, but key personnel are evacuated to building D during a storm event.

19. Kenner: City Hall – Building C (Purchasing, IT, HR, City Attorney)

1801 Williams Blvd, Kenner, LA 70062

POC: George Bode

19.1. Risk Profile

19.1.1. Flood

Low | Medium

Recommendations: The structure is located in a levee protected x-zone and has no history of flooding. There are concerns with access to the facility when surrounding streets flood as well as potential back up from the nearby canal if pumps were not operational or stormwater during a high rain event. Most of the entrances are located slightly above grade, it is recommended that flood tubes or flood barriers be available to reduce potential of water intrusion.

19.1.2. Wind

Low | Medium

Recommendations: There was no available information on the wind rating of the roof – or past history of damage. It appears to be in fair condition, but an assessment of current wind rating is recommended to determine level of risk and HVAC units need to be protected on the roof. The windows are not protected and do not appear to have been upgraded. It is recommended that the building be assessed for the best approach to protect these areas from wind and wind borne debris.

19.1.3. Subsidence

Low | Medium

Recommendations: A large majority of the surrounding area of the structure is covered with impervious pavement with noticeable signs of damage. The foundation of the structure seems to be in good condition, but it is recommended that pervious pavement be considered during repair of current parking lot as well as opportunities for stormwater management features like bioswales or rain gardens.

20. Kenner: Public Works – Building D (Drainage, Public Works, EOC)

1610 3RD Street (Rev. Richard Wilson Dr.), Kenner, LA 70062

POC: Bill Duplaisir/Doug Dodt

20.1. Risk Profile

20.1.1. Flood

Low

Recommendations: The structure is located in a levee protected x-zone and has no history of flooding. There is a potential low risk of flooding due to stormwater during a high rain event. Most of the entrances are located slightly above grade, it is recommended that flood tubes or flood barriers be available to reduce potential of water intrusion.

20.1.2. Wind

Low

Recommendations: This structure is rated to 180 mph. Windows, roof and exterior have been hardened to allow for this facility to be used as and EOC. There is very little risk of wind damage to this facility.

20.1.3. Subsidence

Low

Recommendations: The foundation of the structure seems to be in good condition, but it is recommended that pervious pavement be considered during upgrades to the parking lot as well as opportunities for stormwater management features like bioswales or rain gardens.

21. Westwego: City Hall

1100 4th Street, Westwego, LA 70072

POC: Paul Bernard

21.1. Risk Profile

21.1.1. Flood

Low

Recommendations: According to the current FIRM, this structure is located in a levee protected X-zone and has a potential low risk of flooding due to stormwater during a high rain event. The structure was built on 4 feet of fill – and the street is located in a AE EL 0 SFHA. Most of the entrances are located slightly above grade, it is recommended that flood tubes or flood barriers be available to reduce potential of water intrusion.

21.1.2. Wind

Low

Recommendations: Structure and all components are designed to withstand 180 mph winds. No additional recommendations for risk reduction.

21.1.3. Subsidence

Low Medium

Recommendations: The landscape appears to already include a number of retention areas as well as trees planted to promote infiltration of water on-site. There may be an opportunity in the future to consider pervious pavement -but as the structure is relatively new – that may be a long term consideration.

NOTE: This is FEMA Public Assistance funded building that was constructed to higher standards than code.

22. Westwego: Sewerage Office/Lab

Vic a Pitre Drive, Westwego, LA 70072

POC: Paul Bernard

22.1. Risk Profile

22.1.1. Flood

Recommendations: The structure is located in a SFHA AE EL -2. The FFE is estimated at -1. Therefore it does appear that the facility is a medium to low risk of flooding. There is a small berm that protects the facility and the POC indicated that although there was about 18 inches in the structure during Katrina, it was due to a pump failure. As the entrances are located slightly above grade, it is recommended that flood tubes or flood barriers be available to reduce potential of water intrusion. Elevation is not recommended for this facility.

22.1.2. Wind

Recommendations: There was no available information on the wind rating of the roof – or past history of damage. It appears to be in fair condition, but an assessment of current wind rating is recommended to determine level of risk. It is a cement roof, so it is likely able to withstand significant wind. The windows are not upgraded and have no protection from wind or wind borne debris. It is recommended that shutters or hurricane windows be installed.

22.1.3. Subsidence

Recommendations: There does appear to be some indications of subsidence at the overall facility – but not specifically for this structure. There is little paving and it is likely traditional green infrastructure features to offset subsidence may not be appropriate. The risk level should be taken into consideration for any new construction on this site.

Appendices

Appendix A. Materials/Data

A.1. Data Collection Form

Jefferson Parish Asset Inventory and Assessment Form

Structure Name

POC Name | POC Title | E-mail

Date of Inspection | Follow up Inspection (If necessary)

Parish Department | Asset ID Number

Street Address | City, State, Zip

Latitude | Longitude

Date of Construction | Square Footage

Original Intended use of Structure (if different than current use)

Codes, Standards, Ordinances considered during design/construction
(Cross Reference with Date of Construction)

Type of Construction

Additional Comments

Number of Floors (above Grade) | Number of Floors (below Grade)

Foundation Type

Foundation Condition (identify Areas of concern or weakness)

Foundation Condition Rating Scale

	Very Poor	Poor	Good	Better	Excellent
Foundation Condition	○	○	○	○	○
	○	○	○	○	○

Base Flood Elevation

Source Data (map/panel)

Provide top of floor elevations for all floors
(estimate - use LIDAR as baseline or Elevation Certificate)

First Floor Elevation

Second Floor Elevation

Third Floor Elevation

Lowest Horizontal Member (if applicable)

Additional Floors Elevation (estimate)

Building Use by Floor (i.e. offices, support equipment, storage, etc) **PHASE 2 Analysis ONLY**

First Floor

Second Floor

Third Floor

Additional Floors, if necessary

Current facility features that owner/operator/tenant consider to be hazard resistant design and construction (flood proofing/roof tie downs/tank tie downs)

At Risk Equipment/Entries (at or below BFE) - Please List

Type of Emergency Power/Backup Fuel/Generators, etc

Sump Pump

NOTE: If there are multiple buildings on site, or if a building has been modified through the addition of square footage (new wings, new additions, etc.) a data collection must be provided for each portion of the facility.

RISK SPECIFIC ASSESSMENT

Flood (rainfall data)

Current Flood Protection

Local Site Flood History

Most Common Source of Flooding

Flood of Record and Associated Storm

Wind (Hurricane)

Assessment of the Building Envelope

Basic (design) wind speed (existing structure - if known)

Design (wind speed) for new construction at this location

Exterior Finish

Number of Windows

Type of Windows

Square Footage of Window Openings

Window Protection in Place

Window Condition

	Very Poor	Poor	Good	Better	Excellent
Window Condition	○	○	○	○	○
	○	○	○	○	○

Garage Doors and Square Footage of Openings

Protection on Garage Doors

Type of Roof

Roof Condition

	Very Poor	Poor	Good	Better	Excellent
Roof Condition	○	○	○	○	○
	○	○	○	○	○

Roof Decking Type

Roof Decking Condition

	Very Poor	Poor	Good	Better	Excellent
Roof Deck Condition	○	○	○	○	○
	○	○	○	○	○

Is there a safe room or storm shelter on site? If so, when was it constructed and what design criteria was used? What is the capacity (# of occupants), what is the elevation of the shelter space?

Subsidence

Soil Type (analysis at time of construction)

Seismic design coefficients used for facility design

History of Subsidence

Stormwater Management Installations on Site

Storm Surge

External Barriers for protection (i.e. Wetlands/Dunes, etc)

History/Projections of Land Loss

Anticipated Depth of Storm Surge at the Site

Appendix B. Resources

B.1. Subsidence Maps

B.1.1. https://www.earthobservatory.nasa.gov/IOTD/view.php?id=6623

B.1.2. https://www.jpl.nasa.gov/news/news.php?feature=6513

B.1.3. http://onlinelibrary.wiley.com/doi/10.1002/2015JB012636/abstract

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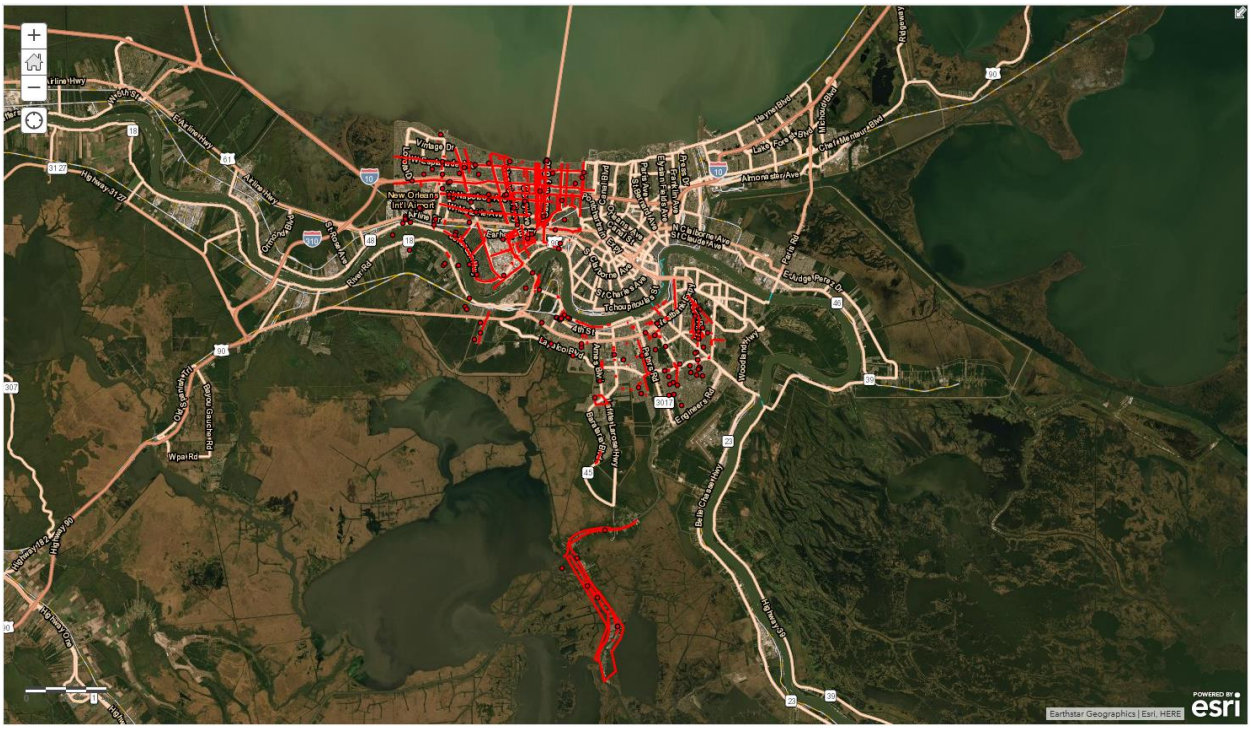
Appendix G
Historic Hazard Events Map

Jefferson Parish has developed an online platform for recording historic events that is updated regularly by Parish staff. These events are mapped using ArcGIS but are listed in table format for inclusion in this appendix.



Jefferson Parish Historic Hazard Events

Data Source Type	Data Source Description	Location	Description	Start Date	End Date	Duration (hrs)	Flood	Flood Mag (in)	Hurricanes Tropical Storm	Hurricanes Tropical Storm Mag	Tornado	Tornado Mag	Subsidence	Subsidence Mag (in)	Hailstorm	Hailstorm Mag (in dia)	Winter Storm	Winter Storm Mag (in)	Other Hazard	Other Hazard Mag	Other Hazard Notes	Deaths	Injuries	Comments
Parish Agency/Department	Work Management System - Streets Dept	Unincorporated West Bank	Heat - Street buckled at 825 Kathy St near Kathy Dr	8/6/2007 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Harvey	Heat - Street buckled at 1064 Beechwood Dr near Eunice	8/16/2007 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Unincorporated West Bank	Heat - Street buckled at Buttercup Dr at Evergold Ln	8/17/2007 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Unincorporated West Bank	Heat - Street buckled at 2145 Esplanade Pl	8/20/2007 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Harvey	Heat - Street buckled at Bradford Pl at Manhattan Blvd	8/21/2007 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Metairie	Heat - Sreet buckled at Rickey St at Elise Ave	6/18/2008 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Unincorporated West Bank	Heat - Street buckled at 805 Terry Pkwy	7/3/2008 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Unincorporated West Bank	Heat - 2145 Laurel St	7/29/2008 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Harvey	Heat - Street buckled at 2200 block of Killington Dr near Louise	10/8/2008 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Marrero	Heat - Street buckled at 1229 Westwood Dr	1/28/2009 5:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Unincorporated West Bank	Heat - Street buckled at 100 Gardenia Ln near Butter Cup	5/12/2009 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Unincorporated West Bank	Heat - Street buckled at 545 Wall Blvd near Mount Laurel	6/24/2009 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Metairie	Heat - Street buckled at 3720 and 3724 Tartan Dr near Meadowdale	6/24/2009 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Unincorporated West Bank	Heat - Street buckled at 827 Kathy St near Kathy Dr	6/30/2009 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Metairie	Heat - Street buckled at Avron Blvd at Dreyfous Ave	5/11/2010 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Unincorporated West Bank	Heat - Street buckled at Mount Laurel Dr at Melbrook Dr	5/24/2010 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Unincorporated West Bank	Heat - Street buckled at 600 block of Wall Blvd near U-Turn1	5/26/2010 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Metairie	Heat - Street buckled at 1616 David Dr near Lafreniere St	5/27/2010 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Metairie	Heat - Street buckled at W Esplanade Ave S at Academy Dr	5/28/2010 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Metairie	Heat - Street buckled at 812 Martin Behrman Ave near Dumaine	6/2/2010 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Metairie	Heat - Street buckled at 7414 Mistletoe St	6/2/2010 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Metairie	Heat - Street buckled at W Esplanade Ave S between Academy and Tartan	6/7/2010 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Unincorporated West Bank	Heat - Street buckled at 116 Becky Dr near S Jamie	6/15/2010 4:00															Yes					
Parish Agency/Department	Work Management System - Streets Dept	Harvey	Heat - Street buckled at Lac La Belle Dr between Lac du Bay and Lac St	6/17/2010 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Unincorporated West Bank	Heat - Street buckled at 250 Holmes Blvd near Athena	6/21/2010 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Metairie	Heat - Street buckled at 4817 York St near Harvard	7/2/2010 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Unincorporated West Bank	Heat - Street buckled at 209 Priest St near Layman	7/9/2010 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Unincorporated West Bank	Heat - Street buckled at 649 Bannerwood Dr near Hunterbrook	7/15/2010 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Unincorporated West Bank	Heat - Street buckled at Circle West Dr between Westbank Expwy and	7/26/2010 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Harvey	Heat - Street buckled at 2236 N Friendship Dr	7/29/2010 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Harvey	Heat - Street buckled at 2020 Hampton Dr near Cerritas Cir	8/2/2010 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Unincorporated West Bank	Heat - Street buckled at 600 block of Wall Blvd near U-Turn1	8/11/2010 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Unincorporated West Bank	Heat - Street buckled at Circle West Dr between Westbank Expwy and	8/11/2010 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Unincorporated West Bank	Heat - Street buckled at 209 Priest St near Layman	8/11/2010 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Harvey	Heat - Street buckled at 2236 N Friendship Dr	8/11/2010 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Unincorporated West Bank	Heat - Street buckled at 332 Federal Dr near Treasury	8/24/2010 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Marrero	Heat - Street buckled at 1000 Westwood Dr near 8th	9/2/2010 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Metairie	Heat - Street buckled at 3212 W Metairie Ave S	9/9/2010 4:00															Yes		Heat			Heat caused concrete panel blowout

Data Source Type	Data Source Description	Location	Description	Start Date	End Date	Duration (hrs)	Flood	Flood Mag (in)	Hurricanes Tropical Storm	Hurricanes Tropical Storm Mag	Tornado	Tornado Mag	Subsidence	Subsidence Mag (in)	Hailstorm	Hailstorm Mag (in dia)	Winter Storm	Winter Storm Mag (in)	Other Hazard	Other Hazard Mag	Other Hazard Notes	Deaths	Injuries	Comments
Parish Agency/Department	Work Management System - Streets Dept	Unincorporated West Bank	Heat - Street buckled at Ruth Dr at dead end	11/2/2010 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Unincorporated West Bank	Heat - Street buckled at 900 Ruth Dr near Nicolle Blvd S	1/31/2011 5:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Harvey	Heat - Street buckled at 2728 Jupiter St near Hampton Dr	6/26/2011 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Metairie	Heat - Street buckled at 7005 Wilty St near Craig	7/6/2011 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Unincorporated West Bank	Heat - Street buckled at 2461 Woodmere Blvd near Irwin D Kuntz	5/11/2012 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Metairie	Heat - Street buckled at Elise St between Rosalie and York	6/5/2012 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Metairie	Heat - Street buckled at 3504 Ridgeway Dr near 14th St	9/10/2012 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Work Management System - Streets Dept	Unincorporated West Bank	Heat - Street buckled at Evergold Ln at Buttercup Dr	3/26/2014 4:00															Yes		Heat			
Parish Agency/Department	FireAlarm - 3rd District Fire	Unincorporated East Bank	Widespread street flooding along both north and south sides of Jefferson Hwy in River Ridge	4/14/2015 15:24			Yes																	Flooding is coming from the Soniat Canal
Parish Agency/Department	JPSO	Harahan	Flooded/impassable street - 500 block of Hickory Ave, Ha.	4/14/2015 16:10			Yes																	
Parish Agency/Department	JPSO	Harvey	Flooded/impassable street - 1100 block of Maplewood, Harvey	4/14/2015 16:10			Yes																	
Parish Agency/Department	JPSO	Harvey	Flooded/impassable street - 1100-3000 block of Destrehan, Harvey	4/14/2015 16:10			Yes																	
Parish Agency/Department	JPSO	Harvey	Flooded/impassable street - 600 block of Maple, Harvey	4/14/2015 16:10			Yes																	
Parish Agency/Department	JPSO	Harvey	Flooded/impassable street - 2400 block of Oakmere, Harvey	4/14/2015 16:10			Yes																	
Parish Agency/Department	JPSO	Unincorporated West Bank	Flooded/impassable street - 600 block of Wall Blvd, Gretna	4/14/2015 16:10			Yes																	
Parish Agency/Department	JPSO	Unincorporated West Bank	Flooded/impassable street - 2600 Cedar Lawn Dr, Terrytown	4/14/2015 16:10			Yes																	
Parish Agency/Department	JPSO	Harvey	Flooded/impassable street - 2400 block of Manhattan, Harvey	4/14/2015 16:10			Yes																	
Parish Agency/Department	JPSO	Unincorporated West Bank	Flooded/impassable street - 3100 block of Alex Korhman, Harvey	4/14/2015 16:10			Yes																	
Parish Agency/Department	JPSO	Harvey	Flooded/impassable street - 2400 block of Manhattan Blvd	4/14/2015 16:10			Yes																	
Parish Agency/Department	JPSO	Harahan	Flooded/impassable street - Jefferson Hwy/Gordon Ave, Ha.	4/14/2015 16:10			Yes																	
Parish Agency/Department	JPSO	Unincorporated East Bank	Flooded/impassable street - Bloomfield/Hill St, Jefferson	4/14/2015 16:10			Yes																	
Parish Agency/Department	JPSO	Unincorporated East Bank	Flooded/impassable street - Mounes/S Clearview, Jefferson	4/14/2015 16:10			Yes																	
Parish Agency/Department	JPSO	Harvey	Flooded/impassable street - Laplaco/Manhattan, Harvey	4/14/2015 16:10			Yes																	
Parish Agency/Department	JPSO	Unincorporated West Bank	Flooded/impassable street - Carol Sue/Fairfield, Terrytown	4/14/2015 16:10			Yes																	
Parish Agency/Department	JPSO	Harvey	Flooded/impassable street - Lloyd Lewis/Peters Rd	4/14/2015 16:10			Yes																	
Parish Agency/Department	JPSO	Unincorporated West Bank	Flooded/impassable street - Lexington/Legion	4/14/2015 16:10			Yes																	
Other	City of Kenner Emergency Management	Kenner	Severe storm - Pontchartrain Center, 4545 Williams Blvd	4/15/2015 21:28															Yes		Severe storm			Severe storm resulted in power outage at Pontchartrain Center. Estimated 4-6 hrs to restore power. Scheduled event with 2,000 attendees cancelled.
Parish Agency/Department	Emergency Management Assistant Director	Kenner	Severe storm - NO International Airport	4/27/2015 4:00															Yes	56	Severe storm			Wind gusts reported up to 56 mph at NO International Airport
Parish Agency/Department	Emergency Management Assistant Director	Metairie	Severe storm - Tulane Lake Side Hospital, 4700 S I 10 Service Rd W	4/27/2015 4:00															Yes		Severe storm			Tulane Lake Side Hospital is on generator power
Parish Agency/Department	Emergency Management Assistant Director	Kenner	Severe storm - LSP Troop B, 2101 I-10 Service Rd	4/27/2015 4:00															Yes	112	Severe storm			Reports of wind gusts as high as 112 mph at the LSP Troop B
Parish Agency/Department	Emergency Management Assistant Director	Kenner	Severe storm - NO International Aisport	4/27/2015 4:00															Yes		Severe storm			NO International Airport reported terminal wide power outage
Parish Agency/Department	Fire Dept - Communications Center/Press Release	Unincorporated East Bank	Severe storm - Behind Copeland's Restaurant on S Clearview Pkwy	4/27/2015 4:00															Yes		Severe storm			11 shipping containers on railcars were blown off elevated trestle in Elmwood area during severe weather. Containers did not contain hazardous or sensitive materials. No injuries reported.
Parish Agency/Department	Narrative	Unincorporated East Bank	Severe storm - Yenni Building, 1221 Elmwood Park Blvd	4/27/2015 14:30	4/27/2015 19:30	5													Yes		Severe storm			Severe Thunderstorm - sky turned pitch black, strong winds, rain. Cypress Tree feel in parking lot, damaging several cars. 11 train cars fell from Huey P. Long Bridge track along Clearview Pkwy. No injuries reported. Harsh rain lasted approx. 5 hrs.
Other	New Orleans Airport Alert	Kenner	Power outage - Louis Armstrong New Orleans International Airport	4/28/2015 2:51															Yes		Severe storm			Terminal wide power outage
Media	nola.com	Kenner	Tornado - 3rd St and Williams Blvd	5/26/2015 4:00							Yes	EF Scale 1												Area hit by EF-1 tornado with winds of about 110 mph. Much of the damage is around 3rd St and Williams Blvd. No injuries reported.

Data Source Type	Data Source Description	Location	Description	Start Date	End Date	Duration (hrs)	Flood	Flood Mag (in)	Hurricanes Tropical Storm	Hurricanes Tropical Storm Mag	Tornado	Tornado Mag	Subsidence	Subsidence Mag (in)	Hailstorm	Hailstorm Mag (in dia)	Winter Storm	Winter Storm Mag (in)	Other Hazard	Other Hazard Mag	Other Hazard Notes	Deaths	Injuries	Comments
Parish Agency/Department	Work Management System - Streets Dept	Marrero	Heat - Street buckled at 1524 Westminister	6/8/2015 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Emergency Management Coordinator	Metairie	Heat - Road buckled at Shaw and Clearview	7/24/2015 22:28															Yes		Heat			Heat may have caused road to buckle.
Media	NOLA.com	Kenner	Heat - record high temperature at Louis Armstrong International	8/10/2015 4:00															Yes	98	Heat			Record high temperature of 98 degrees
Other	Photo	Unincorporated West Bank	Severe storm - near Cochiara's Marina	10/25/2015 4:00															Yes		Severe storm			Photo - aftermath of Hurricane Patricia in Mexico/Texas
Other	Photo	Town of Jean Lafitte	Severe storm - 1000 Blk Jean Lafitte	10/25/2015 4:00															Yes		Severe storm			Aftermath of Hurricane Patricia in Mexico/Texas
Other	Photo	Unincorporated West Bank	Severe storm - 3600 Block of	10/25/2015 4:00															Yes		Severe storm			Aftermath Hurricane Patricia in Mexico/Texas
Other	Port Fourchon	Unincorporated West Bank	Severe storm - LA-1	10/25/2015 4:00	10/26/2015 4:00														Yes		Severe storm			Flooding and closure from the passage of front moving through the Gulf. LA-1 is the only access and evacuation route to Grand Isle.
Parish Agency/Department	JPEM Update	Town of Jean Lafitte	Severe storm - Rosethorne park boat launch	10/25/2015 4:00															Yes		Severe storm			Water is covering boat launch and moving closer to roadway
Parish Agency/Department	JPEM Update	Unincorporated West Bank	Severe storm - 4300 block of Jean Lafitte Blvd to Goose Bayou Bridge	10/25/2015 4:00															Yes	4	Severe storm			Chief Rodrigues reports 4" of water on roadway
Parish Agency/Department	Fire Dept - Communication Center	Unincorporated West Bank	Severe storm - 3500 Blk of Privateer Blvd	10/25/2015 4:00															Yes		Severe storm			Laffite FD advised beginning to flood. Other conditions unknown at this time.
Parish Agency/Department	Fire Dept - Communication Center	Town of Jean Lafitte	Severe storm - 2422 Jean Lafitte Blvd	10/25/2015 9:25	10/25/2015 9:39														Yes		Severe storm			Shutdown due to electrical wires down on roadway
Parish Agency/Department	Fire Dept - Communication Center	Unincorporated West Bank	Severe storm - Fire Station 51, 341 Heritage Ave	10/25/2015 13:01															Yes		Severe storm			Station 51 in Terrytown reporting to be on generator power
Parish Agency/Department	Fire Dept - Communication Center	Unincorporated West Bank	Severe storm - Fire Station 53, 113 Willowbrook Dr	10/25/2015 13:01															Yes		Severe storm			Station 53 in Terrytown reporting to be on generator power
Parish Agency/Department	Fire Dept - Communications Center	Unincorporated West Bank	Severe storm - 3500 blk of Privateer Blvd	10/25/2015 17:12															Yes		Severe storm			Lafitte FD advised beginning to flood. Other conditions unknown.
Parish Agency/Department	Severe Weather Report Update	Metairie	Severe storm - Power Blvd area	10/26/2015 2:45	10/26/2015 4:19	1.5													Yes		Severe storm			Reports of street flooding in Power Blvd area
Parish Agency/Department	Severe Weather Report Update	Metairie	Severe storm - Transcontinental north of Veterans	10/26/2015 2:45	10/26/2015 4:00	1													Yes		Severe storm			Reports of street flooding Transcontinental north of Veterans
Parish Agency/Department	Severe Weather Report Update	Metairie	Severe storm - Elmwood area	10/26/2015 2:45	10/26/2015 4:24	1.5													Yes		Severe storm			Reports of street flooding in the Elmwood area
Parish Agency/Department	Emergency Management Assistant Director	Town of Jean Lafitte	Severe storm - 1000 Blk Jean Lafitte	10/26/2015 4:00															Yes		Severe storm			Picture - garage, no water in the home
Parish Agency/Department	Emergency Management Assistant Director	Unincorporated West Bank	Severe storm - 3600 Blk of Privateer Barataria side	10/26/2015 4:00															Yes		Severe storm			Picture
Parish Agency/Department	Emergency Management Assistant Director	Unincorporated West Bank	Severe storm - Cochiara's Marina near Goose Bayou Bridge on Lafitte	10/26/2015 4:00															Yes		Severe storm			Picture
Parish Agency/Department	News Release	Unincorporated West Bank	Severe storm - 100-4500 blocks of Jean Lafitte Blvd	10/26/2015 4:00															Yes		Severe storm			Standing water reported on roadways - aftermath of Hurricane Patricia in Mexico/Texas
Parish Agency/Department	JPEM Situational Awareness Report	Unincorporated West Bank	Severe storm - 5400 block through 3200 block Privateer Blvd	10/26/2015 7:30															Yes		Severe storm			Lt. Funk - Lafitte PD reported Privateer Blvd has water across the road, anywhere from 6-16 inches of water in some spots. Road remains open. No reports of flooded homes.
Parish Agency/Department	JPEM Situational Awareness Report	Unincorporated West Bank	Sever storm - 2900 block through 4400 block Jean Lafitte Blvd	10/26/2015 8:30															Yes		Severe storm			Lt. Funk - Lafitte PD reported 1-12 inches of water in some spots. Road does remain open. No reports of flooded homes.
Parish Agency/Department	911 Headquarters	Unincorporated West Bank	Severe storm - 5000 Blk Barataria to the boat launch	10/26/2015 17:09															Yes		Severe storm			Standing water
Parish Agency/Department	911 Headquarters	Unincorporated West Bank	Severe storm - 100-1000 Jean Lafitte Blvd	10/26/2015 17:09															Yes		Severe storm			Standing water
Parish Agency/Department	911 Headquarters	Town of Jean Lafitte	Severe storm - Rosethorne to Jones Point	10/26/2015 17:09															Yes		Severe storm			Laser units are in the Intercoastal canal from Rosethorne to Jones Point trying to slow the boats down due to water going in the houses in the area
Other	City of Kenner Emergency Management	Kenner	Severe storm - 124 E 3rd	2/23/2016 5:00															Yes		Severe storm			See photos
Parish Agency/Department	Fire Dept Emergency Notice	Kenner	Funnel cloud reported in area of Armstrong Airport; did not touch	2/23/2016 16:17															Yes		Funnel Cloud			
Other	City of Kenner Emergency Management	Kenner	Severe storm - KPD 500 Veterans	2/23/2016 16:21															Yes		Severe storm			See photo
Other	City of Kenner Emergency Management	Kenner	Severe storm - City Park on Salvador	2/23/2016 18:40															Yes		Severe storm			Damage to gazebo structure and debris strewn about field
Other	City of Kenner Emergency Management	Kenner	Severe storm - 311 1/2 Morey	2/23/2016 18:52															Yes		Severe storm			KPD reported tin roof torn off and sat disk torn from roof.
Other	City of Kenner Emergency Management	Kenner	Severe storm - 501 Salvador Ln	2/23/2016 18:52															Yes		Severe storm			KPD on scene confirms apparent storm path at residence
Other	City of Kenner Emergency Management	Kenner	Severe storm - 520 Centanni Rd	2/23/2016 18:52															Yes		Severe storm			Damage to residence
Parish Agency/Department	JPSO	Metairie	Flooded streets - South I 10-serv rd	3/11/2016 10:36			Yes																	
Parish Agency/Department	JPSO	Harahan	Flooded streets - Parts of Jefferson Hwy closer to Harahan	3/11/2016 10:36			Yes																	
Parish Agency/Department	Emergency Management - EM Coordinator	Unincorporated East Bank	Resident reported street flooding on Morris Pl near Tucker Ave in Metairie	4/1/2016 14:30			Yes																	No information about water going into homes at time of report
Parish Agency/Department	Emergency Management - Assistant Director	Unincorporated East Bank	Received word that Clearview in the Elmwood Area is flooded	4/1/2016 14:44			Yes																	No information about water going into homes at time of report

Data Source Type	Data Source Description	Location	Description	Start Date	End Date	Duration (hrs)	Flood	Flood Mag (in)	Hurricanes Tropical Storm	Hurricanes Tropical Storm Mag	Tornado	Tornado Mag	Subsidence	Subsidence Mag (in)	Hailstorm	Hailstorm Mag (in dia)	Winter Storm	Winter Storm Mag (in)	Other Hazard	Other Hazard Mag	Other Hazard Notes	Deaths	Injuries	Comments
Parish Agency/Department	Emergency Management - Executive Assistant	Metairie	Resident reported street flooding at 2906 N Turnbull St between Interstate and Vets	4/1/2016 15:06			Yes																	No information about water going into homes at time of report
Parish Agency/Department	JPSO	Metairie	Flooded streets - 1432 Lake Ave, Me	4/1/2016 15:33			Yes																	Water entering business, Street Dept advised in reference
Parish Agency/Department	JPSO	Metairie	Flooded streets - Oaklawn between Metairie Rd and the Service Rd	4/1/2016 15:33			Yes																	Advised water up to the hood of vehicles
Parish Agency/Department	JPSO	Unincorporated East Bank	Flooded streets - Tucker Ave	4/1/2016 15:33			Yes																	Impassable
Parish Agency/Department	JPSO	Unincorporated East Bank	Flooded streets - Morris Pl	4/1/2016 15:33			Yes																	Street flooding
Parish Agency/Department	JPSO	Metairie	Flooded streets - 400-Blk Rosa Ave	4/1/2016 15:33			Yes																	Advised water up to the hood of vehicles
Parish Agency/Department	JPSO	Metairie	Flooded streets - 1400-Blk Papworth Ave	4/1/2016 15:33			Yes																	
Parish Agency/Department	JPSO	Metairie	Flooded streets - Edenborn Ave	4/1/2016 15:33			Yes																	
Parish Agency/Department	JPSO	Metairie	Flooded streets - N Arnoult Ave	4/1/2016 15:33			Yes																	
Parish Agency/Department	JPSO	Unincorporated East Bank	Flooded streets - S Clearview	4/1/2016 15:33			Yes																	Impassable
Parish Agency/Department	JPSO	Metairie	Flooded streets - All of Bonnabel Blvd	4/1/2016 15:33			Yes																	Multiple vehicles stranded due to high water
Parish Agency/Department	JPSO	Metairie	Flooded streets - 1300-Blk Aris Ave	4/1/2016 15:33			Yes																	Water up to vehicle tires
Parish Agency/Department	JPSO	Metairie	Flooded streets - W Napoleon	4/1/2016 15:33			Yes																	
Parish Agency/Department	JPSO	Metairie	Flooded streets - 500-Blk Arlington Dr	4/1/2016 15:33			Yes																	
Parish Agency/Department	JPSO	Metairie	Flooded streets - 600-Blk Oaklawn Ave	4/1/2016 15:33			Yes																	Water going into garages/houses
Parish Agency/Department	JPSO	Metairie	Flooded streets - 1600 Blk of Carrollton Ave, Me	4/1/2016 15:33			Yes	24																Water is approx 2 ft deep
Parish Agency/Department	JPSO	Unincorporated East Bank	Flooded streets - 1200 Blk of Dealers Ave, Me	4/1/2016 15:33			Yes																	Reported water entering into a business
Parish Agency/Department	JPSO	Unincorporated East Bank	Flooded streets - significant water on Mounes between Clearview and Elmwood Park	4/1/2016 15:33			Yes																	
Parish Agency/Department	JPSO	Metairie	Flooded streets - Metairie Rd, Severn, Labarre, N Causeway	4/1/2016 15:33			Yes																	Impassable
Parish Agency/Department	JPSO	Unincorporated East Bank	Flooded streets - Entrance to Earhart from Clearview	4/1/2016 15:33			Yes																	Impassable
Parish Agency/Department	JPSO	Unincorporated East Bank	Flooded streets - Mounes at N Corporate	4/1/2016 15:33			Yes																	Standing water
Parish Agency/Department	Emergency Management - Assistant Director	Unincorporated East Bank	LA 3152 (Clearview Pkwy) at LA 3139 (Earhart Expwy) is flooded	4/1/2016 15:53			Yes																	Closed to traffic in both directions - traffic is not passing through. Traffic Management Center will advise of any changes.
		Unincorporated East Bank	Flooding - 6200 Block Jeff Hwy	4/1/2016 22:05			Yes																	See photos attached
Other	City of Harahan Chief of Police	Harahan	South side of Jefferson Hwy (6200 block) at Hickory Ave, in front of the EZ Stop Convenience Store is flooded	4/1/2016 22:25			Yes																	Appears Pump to the River Project at Jefferson Hwy and Powerline Dr interfered with the drainage. About 1/3 of the parking lot at the EZ Stop store, 6200 Jefferson Hwy, Harahan, LA, is flooded along with the intersection at Hickory Ave.
Parish Agency/Department	911 Headquarters	Marrero	Street impassible due to standing water - 5000-block of River Rd. Marrero	4/27/2016 19:08			Yes																	Flooded streets for a few hours
Parish Agency/Department	911 Headquarters	Harvey	Street impassible due to standing water - 1st Ave at 6th Ave in Harvey	4/27/2016 19:08	4/27/2016 20:47	1.5	Yes																	Flooded sreets for a few hours
Parish Agency/Department	911 Headquarters	Unincorporated East Bank	Street flooded - 237 Tullulah Ave	4/30/2016 20:39	5/1/2016 0:48	4	Yes																	
Parish Agency/Department	911 Headquarters	Metairie	Street flooded - 3109 Minnesota	4/30/2016 20:39	5/1/2016 0:48	4	Yes																	
Parish Agency/Department	911 Headquarters	Metairie	Street flooded - Veterans at 18th	4/30/2016 20:39	5/1/2016 0:48	4	Yes																	*need to confirm street location - Veterans does not intersect 18th
Parish Agency/Department	911 Headquarters	Metairie	Street flooded - Severn at 17th up to W Esplanade	4/30/2016 20:39	5/1/2016 0:48	4	Yes																	
Parish Agency/Department	911 Headquarters	Metairie	Street flooded - N Hullen	4/30/2016 20:39	5/1/2016 0:48	4	Yes																	
Parish Agency/Department	911 Headquarters	Metairie	Street flooded - 3400-Blk of Ferran	4/30/2016 20:39	5/1/2016 0:48	4	Yes																	
Parish Agency/Department	911 Headquarters	Metairie	Street flooded - N Arnoult to Lausat	4/30/2016 20:39	5/1/2016 0:48	4	Yes																	
Parish Agency/Department	911 Headquarters	Metairie	Street flooded - Hessmer	4/30/2016 20:39	5/1/2016 0:48	4	Yes																	
Parish Agency/Department	911 Headquarters	Metairie	Street flooded - David from York to Veterans	4/30/2016 20:39	5/1/2016 0:48	4	Yes																	
Parish Agency/Department	911 Headquarters	Metairie	Street flooded - Veterans to W Esplanade	4/30/2016 20:39	5/1/2016 0:48	4	Yes																	*need to confirm street - Veterans and W Esplanade are parallel streets
Parish Agency/Department	911 Headquarters	Metairie	Street flooded - Bonnabel from the parish line to New Orleans	4/30/2016 20:39	5/1/2016 0:48	4	Yes																	

Data Source Type	Data Source Description	Location	Description	Start Date	End Date	Duration (hrs)	Flood	Flood Mag (in)	Hurricanes Tropical Storm	Hurricanes Tropical Storm Mag	Tornado	Tornado Mag	Subsidence	Subsidence Mag (in)	Hailstorm	Hailstorm Mag (in dia)	Winter Storm	Winter Storm Mag (in)	Other Hazard	Other Hazard Mag	Other Hazard Notes	Deaths	Injuries	Comments
Parish Agency/Department	911 Headquarters	Unincorporated East Bank	Street flooded - 500-Blk of Tucker Ave	4/30/2016 20:39	5/1/2016 0:48	4	Yes																	
Parish Agency/Department	911 Headquarters	Metairie	Street flooded - Power at Kawanee	4/30/2016 20:39	5/1/2016 0:48	4	Yes																	
Parish Agency/Department	911 Headquarters	Unincorporated East Bank	Street flooded - Dickory at Earhart	4/30/2016 20:39	5/1/2016 0:48	4	Yes																	
Parish Agency/Department	911 Headquarters	Metairie	Street flooded - Cleary at Melville Dewey	4/30/2016 20:39	5/1/2016 0:48	4	Yes																	
Parish Agency/Department	911 Headquarters	Metairie	Street flooded - Lake Trail and Bruin	4/30/2016 20:39	5/1/2016 0:48	4	Yes																	
Parish Agency/Department	911 Headquarters	Unincorporated East Bank	Street flooded - S Clearview at Bloomfield	4/30/2016 20:39	5/1/2016 0:48	4	Yes																	
Other	Terrytown Fire Dept - Station 52	Unincorporated West Bank	Strong thunderstorm - tree down on Oakwood Dr at Carol Sue Ave	6/5/2016 2:31															Yes		Thunderstorm			Advised tree is blocking the road
Other	Terrytown Fire Dept	Unincorporated West Bank	Strong thunderstorm - tree down at 207 Brett Dr	6/5/2016 2:31															Yes		Thunderstorm			Reported a tree down is blocking the road and also hit cars that were parked
Other	Eastbank Conslidate Fire Dept	Metairie	Flooding - Transcontinental completely under water	6/5/2016 2:31	6/5/2016 3:49	1.5	Yes																	Unknown hundred block
Parish Agency/Department	Fire Dept - Communication Center	Unincorporated East Bank	Flooding - Jefferson Hwy from Causeway to Ochsner Hospital	6/5/2016 2:31	6/5/2016 3:17	1	Yes																	Flooded eastbound
Parish Agency/Department	Fire Dept - Communication Center	Metairie	Flooding - 17th St between Causeway and Severn	6/5/2016 2:31	6/5/2016 3:17	1	Yes																	Is not passable
Parish Agency/Department	Fire Dept - Communication Center	Unincorporated East Bank	Flooding - Northbound Causeway Blvd at Jefferson Hwy	6/5/2016 2:31	6/5/2016 3:17	1	Yes	24																About 2 ft of water
Other	City of Kenner Emergency Management Director	Kenner	Hail - Near Williams and Airline Dr	7/13/2016 18:10	7/13/2016 18:15										Yes	0.5								KFD employee reported mothball size hail (half-inch) falling within past 5 minutes
Parish Agency/Department	Fire Dept - Communication Center	Harahan	Flooding - 8417 Huntley in Harahan	7/20/2016 22:35			Yes																	Ms. Taylor Picou called for them to turn on the pumps. They are flooding and it is getting close to the house.
Parish Agency/Department	Fire Dept - Communication Center	Unincorporated East Bank	Flooding - 9261 2nd St, River Ridge	7/20/2016 22:45			Yes	6																Mr. James Romer said that he has 6 in of water inside his house.
Parish Agency/Department	Fire Dept - Communication Center	Harahan	Flooding - 8314 Huntley	7/20/2016 22:54			Yes																	Ms. Diane Beauler advised water in her house.
Parish Agency/Department	Fire Dept - Communication Center	Harahan	Flooding - 8300-8400 Huntley	7/20/2016 22:54			Yes																	Ms. Diane Beauler advised 8300-8400 Huntley is underwater
Parish Agency/Department	Fire Dept - Communication Center	Harahan	Flooding - E Shannon	7/20/2016 22:54			Yes																	Ms. Diane Beauler advised E Shannon is underwater
Parish Agency/Department	Fire Dept - Communication Center	Harahan	Flooding - W Shannon	7/20/2016 22:54			Yes																	Ms. Diane Beauler advised W Shannon is underwater
Parish Agency/Department	911 Headquarters	Metairie	Flooding - 18th St	9/3/2016 1:02			Yes																	
Parish Agency/Department	911 Headquarters	Metairie	Flooding - Hessmer	9/3/2016 1:02			Yes																	
Parish Agency/Department	911 Headquarters	Metairie	Flooding - Edenborn	9/3/2016 1:02			Yes																	
Parish Agency/Department	911 Headquarters	Metairie	Flooding - Veterans	9/3/2016 1:02			Yes																	
Parish Agency/Department	911 Headquarters	Metairie	Flooding - W Esplanade	9/3/2016 1:02			Yes																	
Parish Agency/Department	911 Headquarters	Metairie	Flooding - 4300 Blk Pratt St	9/3/2016 1:02			Yes																	
Parish Agency/Department	911 Headquarters	Metairie	Flooding - Cleary/W Metairie	9/3/2016 1:02			Yes																	
Parish Agency/Department	911 Notificaiton Email	Unincorporated West Bank	Street flooding - standing water in the roadway on 1800 block of Carol Sue Ave	9/3/2016 18:38	9/3/2016 20:58	2	Yes																	
Parish Agency/Department	911 Notification Email	Marrero	Street flooding - standing water in the roadway on 1500 block of Barataria Blvd	9/3/2016 18:38	9/3/2016 20:58	2	Yes																	
Parish Agency/Department	911 Notification Email	Unincorporated West Bank	Street flooding - standing water in the roadway on 1800 block of	9/3/2016 18:38	9/3/2016 20:58	2	Yes																	
Parish Agency/Department	911 Notification Email	Harvey	Street flooding - standing water in the roadway on Lapalco Blvd/Manhattan Blvd	9/3/2016 18:38	9/3/2016 20:58	2	Yes																	
Parish Agency/Department	911 Headquarters	Unincorporated West Bank	Standing water - Patricia Ln, Ma	9/3/2016 18:47	9/3/2016 20:58	2	Yes																	
Parish Agency/Department	911 Headquarters	Unincorporated West Bank	Standing water - Park Place Dr	9/3/2016 18:47	9/3/2016 20:58	2	Yes																	
Parish Agency/Department	911 Headquarters	Unincorporated West Bank	Standing water - Wall Blvd/Mt Laurel Dr	9/3/2016 18:47	9/3/2016 20:58	2	Yes																	
Parish Agency/Department	911 Headquarters	Unincorporated West Bank	Standing water - Woodmere Blvd/Deerpark Dr	9/3/2016 18:47	9/3/2016 20:58	2	Yes																	
Parish Agency/Department	911 Headquarters	Unincorporated West Bank	Standing water - Behrman Hwy/Carol Sue Ave	9/3/2016 18:47	9/3/2016 20:58	2	Yes																	
Parish Agency/Department	911 Headquarters	Marrero	Standing water - Warwick Dr/Barataria Blvd	9/3/2016 18:47	9/3/2016 20:58	2	Yes																	
Parish Agency/Department	911 Headquarters	Marrero	Standing Water - Barataria/Wichers Dr	9/3/2016 18:47	9/3/2016 20:58	2	Yes																	
Parish Agency/Department	911 Headquarters	Marrero	Standing water - Barataria Blvd/Taravella Rd	9/3/2016 19:09	9/3/2016 20:58	2	Yes																	

Data Source Type	Data Source Description	Location	Description	Start Date	End Date	Duration (hrs)	Flood	Flood Mag (in)	Hurricanes Tropical Storm	Hurricanes Tropical Storm Mag	Tornado	Tornado Mag	Subsidence	Subsidence Mag (in)	Hailstorm	Hailstorm Mag (in dia)	Winter Storm	Winter Storm Mag (in)	Other Hazard	Other Hazard Mag	Other Hazard Notes	Deaths	Injuries	Comments
Parish Agency/Department	911 Headquarters	Unincorporated West Bank	Standing water - Woodmere Blvd/Post Dr	9/3/2016 19:09	9/3/2016 20:58	2	Yes																	
Parish Agency/Department	911 Headquarters	Harvey	Standing water - Lapalco Blvd/Apollo Dr	9/3/2016 19:09	9/3/2016 20:58	2	Yes																	
Parish Agency/Department	911 Headquarters	Unincorporated West Bank	Standing water - Terry Pkwy/Carol Sue Ave	9/3/2016 19:09	9/3/2016 20:58	2	Yes																	
Parish Agency/Department	911 Headquarters	Marrero	Standing water - Belle Terre Rd/Diane Dr	9/3/2016 19:09	9/3/2016 20:58	2	Yes																	
Parish Agency/Department	911 Headquarters	Marrero	Standing water - Manor Heights Dr/Bonnie Anne Dr	9/3/2016 19:09	9/3/2016 20:58	2	Yes																	
Parish Agency/Department	911 Headquarters	Unincorporated West Bank	Standing water - Behrman Hwy/Lapalco Dr	9/3/2016 19:09	9/3/2016 20:58	2	Yes																	
Parish Agency/Department	911 Headquarters	Harvey	Standing water - Peters Rd/Lester St	9/3/2016 19:09	9/3/2016 20:58	2	Yes																	
Parish Agency/Department	Fire Dept - Communication Center	Unincorporated East Bank	Flooded streets - Charlotte/Midway Dr in River Ridge	9/5/2016 14:39			Yes																	Impassable to cars. Cars speeding down the street.
Parish Agency/Department	911 Headquarters	Metairie	Street flooding - Hessmer Ave/W Esplanade Ave, Metairie	9/5/2016 15:21			Yes																	Impassable
Parish Agency/Department	JPSO	Unincorporated West Bank	Standing water - 800 blk of Matador in Terrytown	9/6/2016 22:13			Yes																	Vehicles are pulled over into yards along the street
Parish Agency/Department	911 Headquarters	Metairie	Flooded streets - Severn Ave/Metairie Rd	9/11/2016 19:18	9/11/2016 20:33	2	Yes																	Impassable
Media	houmatoday.com	Town of Grand Isle	SLR - Parking lot of Bridge Side Marina, 1618 La 1	9/13/2016 4:00	9/14/2016 4:00														Yes		SLR			Parking lot filled with water after heavy rains and high tides
Parish Agency/Department	News Release	Westwego	Tornado - Ave C, Ave D, LaBauve Dr, 73 and 640 River Rd, 100 block 4th St, 300 block 4th St, 300 block	11/30/2016 13:45							Yes	EF Scale 0												NWS confirmed a EF-0 tornado with 80 to 85 wind gust touched down in Westwego. Damage reported.
Parish Agency/Department	Emergency Management Coordinator	Westwego	Tornado - Ave C/Columbus St	11/30/2016 13:50							Yes	EF Scale 0												Down power pole. Power pole cracked.
Parish Agency/Department	Emergency Management Coordinator	Westwego	Tornado - 448 Avenue D	11/30/2016 13:50							Yes	EF Scale 0												Roof blown off house
Parish Agency/Department	Emergency Management Coordinator	Westwego	Tornado - Blackwater Midstream	11/30/2016 13:50							Yes	EF Scale 0												Approx. 1,000 gallon empty tank blown over
Parish Agency/Department	Emergency Management Coordinator	Westwego	Tornado - 640 River Rd	11/30/2016 13:50							Yes	EF Scale 0												Piece of metal roof came off and into powerlines
Parish Agency/Department	Emergency Management Coordinator	Westwego	Tornado - 329 4th St	11/30/2016 13:50							Yes	EF Scale 0												Broken window
Parish Agency/Department	Emergency Management Coordinator	Westwego	Tornado - 73 River Rd (wooded area by oil well)	11/30/2016 13:50							Yes	EF Scale 0												Treetop damage. Insulation debris on the levee in this same area.
Parish Agency/Department	Emergency Management Coordinator	Westwego	Tornado - 104 4th St	11/30/2016 13:50							Yes	EF Scale 0												Facial damage to the building
Parish Agency/Department	Emergency Management Coordinator	Westwego	Tornado - 146 4th St	11/30/2016 13:50							Yes	EF Scale 0												Tree blown down onto a fence by OLPS School
Parish Agency/Department	Emergency Management Coordinator	Westwego	Tornado - 300 4th St	11/30/2016 13:50							Yes	EF Scale 0												Wires down for a security camera system
Parish Agency/Department	Emergency Management Coordinator	Westwego	Tornado - 355 Columbus	11/30/2016 13:50							Yes	EF Scale 0												Minor roof damage
Parish Agency/Department	Emergency Management Coordinator	Westwego	Tornado - 333 Columbus	11/30/2016 13:50							Yes	EF Scale 0												Tree collapsed in yard
Parish Agency/Department	Emergency Management Coordinator	Westwego	Severe storm - Westwego VFD near Ave C/Columbus St	11/30/2016 14:01															Yes		Severe storm			Heavy rain fall and winds reported. Westwego VFD has a structre with roof damage, trees, and powerlines down
Parish Agency/Department	JPSO	Metairie	High water - 100 blk N Cumberland	1/1/2017 5:35			Yes																	
Parish Agency/Department	JPSO	Metairie	High water - Severn by the Mall	1/1/2017 5:35			Yes																	
Parish Agency/Department	JPSO	Metairie	High water - Edenborn	1/1/2017 5:35			Yes																	Unknown hundred blocks
Parish Agency/Department	JPSO	Metairie	High water - Trenton	1/1/2017 5:35			Yes																	Unknown hundred blocks
Parish Agency/Department	JPSO	Metairie	High water - Trenton	1/1/2017 5:35			Yes																	Unknown hundred blocks
Parish Agency/Department	JPSO	Metairie	High water - Lime	1/1/2017 5:35			Yes																	Unknown hundred blocks
Parish Agency/Department	JPSO	Metairie	High water - Lime	1/1/2017 5:35			Yes																	Unknown hundred blocks
Parish Agency/Department	JPSO	Metairie	Flooded streets - 3500 blk of Edenborn closed	1/1/2017 6:32			Yes																	Part of the street caved in
Parish Agency/Department	Fire Dept - Communications Center	Harvey	Ice - Manhattan between Central and Lapalco	1/8/2017 13:06													Yes							
Parish Agency/Department	Fire Dept - Communications Center	Harvey	Ice - Section of N/B Lapalco	1/8/2017 13:06													Yes							Closed due to ice on the inbound lane
Parish Agency/Department	News Release	Unincorporated East Bank	Tornado - area between Jefferson Hwy and St George Ave	2/7/2017 15:45							Yes	EF Scale 0												EF-0 tornado, 80 mph winds, 25 yds wide, traveled 1 mi path. Downed power lines, broke off large tree limbs, minor roof damage to homes and busineses. No injuries were reported.
Parish Agency/Department	JPEM Situation Awareness Report	Metairie	Severe storm - All of Power Blvd	4/30/2017 16:00															Yes		Severe storm			Reported street flooding
Parish Agency/Department	JPEM Situation Awareness Report	Metairie	Severe storm - Folse from Transcontinental to Lake Ave	4/30/2017 16:00															Yes		Severe storm			Reported street flooding

Data Source Type	Data Source Description	Location	Description	Start Date	End Date	Duration (hrs)	Flood	Flood Mag (in)	Hurricanes Tropical Storm	Hurricanes Tropical Storm Mag	Tornado	Tornado Mag	Subsidence	Subsidence Mag (in)	Hailstorm	Hailstorm Mag (in dia)	Winter Storm	Winter Storm Mag (in)	Other Hazard	Other Hazard Mag	Other Hazard Notes	Deaths	Injuries	Comments
Parish Agency/Department	JPEM Situation Awareness Report	Metairie	Severe storm - 18th St	4/30/2017 16:00															Yes		Severe storm			Reported street flooding, standing water
Parish Agency/Department	JPEM Situation Awareness Report	Metairie	Severe storm - Lake from Lilac to Veterans	4/30/2017 16:00															Yes		Severe storm			Reported street flooding, under water
Parish Agency/Department	JPEM Situation Awareness Report	Metairie	Severe storm - Edenborn on the south side of I-10	4/30/2017 16:00															Yes		Severe storm			Reported street flooding
Parish Agency/Department	JPEM Situation Awareness Report	Unincorporated West Bank	Severe storm - 4100-4400 Blk Jean Lafitte Blvd	4/30/2017 16:00															Yes		Severe storm			Reported street flooding. Under water due to tidal surge.
Parish Agency/Department	JPEM Situation Awareness Report	Metairie	Severe storm - Clearview Pkwy/Folse Dr	4/30/2017 16:00															Yes		Severe Storm			Reported street flooding
Parish Agency/Department	JPEM Situation Awareness Report	Metairie	Severe storm - Loveland/Clearview	4/30/2017 16:00															Yes		Severe storm			Reported street flooding
Parish Agency/Department	JPEM Situation Awareness Report	Metairie	Severe storm - Lynette/W Metairie	4/30/2017 16:00															Yes		Severe storm			Reported street flooding
Parish Agency/Department	News Release	Unincorporated West Bank	Severe storm - 3200 Privateer Blvd, Lafitte	4/30/2017 17:11															Yes		Severe storm			Flooded roadways
Parish Agency/Department	News Rlease	Unincorporated East Bank	Severe storm - North and Southbound Causeway	4/30/2017 17:11															Yes		Severe storm			Flooded roadways
Parish Agency/Department	News Release	Harvey	Severe storm - Manhattan Blvd between Harvey Blvd and Lapalco	4/30/2017 17:11															Yes		Severe storm			Flooded roadways
Parish Agency/Department	News Release	Unincorporated West Bank	Severe storm - 400 Bock of Wall Blvd	4/30/2017 17:11															Yes		Severe storm			Flooded roadways
Parish Agency/Department	News Release	Gretna	Severe storm - Franklin Ave in Gretna	4/30/2017 17:11															Yes		Severe storm			Flooded roadways
Parish Agency/Department	911 Headquarters	Unincorporated West Bank	Severe storm - 3000-5000 blk Privateer Blvd	5/1/2017 2:17	5/1/2017 19:08	5													Yes	6	Severe storm			Standing water 6 inches deep
Parish Agency/Department	911 Headquarters	Unincorporated West Bank	Severe storm - 4700 blk Jean Lafitte Blvd to the back by the bridge	5/1/2017 2:17	5/1/2017 7:08	5													Yes		Severe storm			Standing water
Parish Agency/Department	911 Headquarters	Metairie	Street flooding - 3500 block Hessmer Ave	5/3/2017 19:02			Yes																	
Parish Agency/Department	911 Headquarters	Metairie	Street flooding - W Esplanade between Edenborn and N Arnoult	5/3/2017 19:02			Yes																	
Parish Agency/Department	911 Headquarters	Metairie	Street flooding - Lime St from Utica to Veterans Blvd	5/3/2017 19:02			Yes																	
Parish Agency/Department	911 Headquarters	Metairie	Street flooding - N I 10 Service Rd between Severn and Edenborn	5/3/2017 19:02			Yes																	
Parish Agency/Department	911 Headquarters	Metairie	Street flooding - 17th/Severn (behind the mall area)	5/3/2017 19:02			Yes																	
Parish Agency/Department	News Release	Town of Grand Isle	Severe storm - Hwy 1	5/4/2017 12:43															Yes		Severe storm			Standing water and debris. One lane open.
Parish Agency/Department	Emergency Management Assistant Director	Unincorporated West Bank	Tornado - Mt Revarb Ct	5/12/2017 4:00							Yes													Ch. 4 did live report of some damage to homes and trees down. NWS confirmed some rotation on the radar in this area. JPEM sending staff member to investigate. Will gather information and submit to NWS for additional confirmation.
Parish Agency/Department	News Release	Unincorporated West Bank	Tornado - Mt Rushmore Dr, Mt Kennedy Dr, Colony Rd, Delta Point Dr, and Ames Blvd	5/12/2017 15:15							Yes	EF Scale 0												Visible damage in area. Ames Blvd Pumping Station was not damaged but structures on property sustained some minor damages. Tornado produced winds up to 85 mph. Working to confirm path. No reports of injuries.
Parish Agency/Department	Emergency Management Coordinator	Gretna	Street flooding - 1st St behind the GGB	6/12/2017 17:04			Yes																	Rainfall totals in Gretna at the Courthouse are showing 3.04"
Parish Agency/Department	Emergency Management Coordinator	Gretna	Street flooding - Lafayette St between 4th St and 1st St	6/12/2017 17:04			Yes																	Rainfall totals in Gretna at the Courthouse are showing 3.04"
Parish Agency/Department	Fire Dept - Communications Center	Harvey	Standing water - 1233 Westbank Expwy	6/12/2017 17:09			Yes																	
Parish Agency/Department	Fire Dept - Communications Center	Harvey	Standing water - 600 Blk Chalmette Ave	6/12/2017 17:09			Yes																	
Parish Agency/Department	Fire Dept - Communications Center	Harvey	Standing water - Manhattan/Ute	6/12/2017 17:09			Yes																	
Parish Agency/Department	Fire Dept - Communications Center	Harvey	Standing water - 1500 Redwood	6/12/2017 17:10			Yes																	Subjects driving on his lawn
Parish Agency/Department	Fire Dept - Communications Center	Harvey	Flooding - Manhattan/Lapalco	6/12/2017 17:15			Yes																	
Parish Agency/Department	Fire Dept - Communications Center	Harvey	Flooding - 8th St and all side streets in Harvey behind Best Buy	6/12/2017 17:15			Yes																	
Media	theadvocate.com	Town of Grand Isle	Hurricane - LA-1	6/21/2017 4:00					Yes															Tropical Storm Cindy - LA-1 in Grand Isle flooded
Other	City of Kenner Emergency Management Director	Kenner	Flooding - 2100 block of Connecticut	6/24/2017 18:25			Yes																	PWD responded to report of multiple residences taking water.
Other	City of Kenner Emergency Management Director	Kenner	High standing water - 2600-2700 Albany	6/24/2017 18:56			Yes																	KPD reported high standing water
Parish Agency/Department	JPSO	Metairie	Flooded streets - Metairie Rd to Hollwood under water	7/22/2017 17:45			Yes																	All side streets that run off Metairie Rd under water also
Parish Agency/Department	Fire Dept - Communications Center	Metairie	Flooded streets - 400 Blk Rosa completely flooded	7/22/2017 17:58			Yes																	
Parish Agency/Department	Fire Dept - Communications Center	Metairie	Flooded streets - Carrollton to lake completely flooded	7/22/2017 17:58			Yes																	

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Parish Agency/Department	Fire Dept - Communications Center	Metairie	Flooded streets - 400 Orion	7/22/2017 18:42			Yes	36																Per resident, 3 feet of water in roadway, requesting barricades, water being pushed into houses
Parish Agency/Department	Fire Dept - Communications Center	Unincorporated West Bank	Standing water - 700 Wall Blvd	7/22/2017 18:47	7/22/2017 20:20	1.5	Yes																	
Parish Agency/Department	Work Management System - Streets Dept	Metairie	Heat - Street buckled at W Metairie near Mike Miley Playground	7/27/2017 4:00															Yes		Heat			Heat caused concrete panel blowout
Parish Agency/Department	Fire Dept - Communications Center	Metairie	Sink hole - Barnett St/Murphy Dr	8/9/2017 13:19															Yes	12x12	Sink hole			Eastbank Fire units on scene, advise 12x12 sink hole. No injuries reported.
Parish Agency/Department	News Release	Metairie	Hurricane - Pontiff Playground	8/28/2017 4:00					Yes															All activities at Pontiff Playground are suspended for the remainder of the day due to the rain from Harvey
Parish Agency/Department	911 Headquarters	Metairie	Street flooded - 4700 block of Avron Blvd just past Transcontinental Dr, Metairie	9/15/2017 21:32	9/15/2017 22:45	1	Yes																	Officers on scene unsure of where water is coming from but water is everywhere (via Brittney Flowers). Heavy rain and debris found on inlets.
Parish Agency/Department	JPSO	Metairie	Flooded streets - 4600 blk of Woodland	10/2/2017 15:57			Yes																	Flooded and not draining. Water is beginning to get into vehicles.
Parish Agency/Department	JPSO	Metairie	Flooded streets - Oaklawn/I-10 under the overpass	10/2/2017 15:57			Yes																	Almost impassable
Parish Agency/Department	Fire Dept - Communications Center	Metairie	Flooded streets - 400 blk of Rosa Ave	10/2/2017 16:02			Yes																	Impassable
Parish Agency/Department	JPSO	Unincorporated West Bank	Flooded streets - Grape Pl	10/2/2017 16:06			Yes																	Substantial amounts of water
Parish Agency/Department	JPSO	Unincorporated West Bank	Flooded streets - Grinell	10/2/2017 16:06			Yes																	Substantial amounts of water
Parish Agency/Department	JPSO	Unincorporated West Bank	Flooded streets - Goucher	10/2/2017 16:06			Yes																	Substantial amounts of water
Parish Agency/Department	JPSO	Unincorporated West Bank	Flooded streets - 200 blk of Terry Pkwy	10/2/2017 16:06			Yes																	Medians are all that's usable, slow traffic in the area
Parish Agency/Department	Fire Dept - Communications Center	Metairie	Flooded streets - 4000 blk Hessmer	10/2/2017 16:14			Yes																	
Parish Agency/Department	Fire Dept - Communications Center	Metairie	Flooded streets - 18th St from Severn to Division	10/2/2017 16:14			Yes																	
Parish Agency/Department	Fire Dept - Communications Center	Metairie	Flooded streets - Causeway/Vets Service Road under overpass	10/2/2017 16:30			Yes																	Heavy flooding
Parish Agency/Department	JPEM Street Flooding Reports	Unincorporated West Bank	Street flooding - 400 Block Wall Blvd, Terrytown	10/2/2017 18:30			Yes																	According to JPSO 911 Headquarters, area is not passable
Parish Agency/Department	JPEM Street Flooding Reports	Metairie	Street flooding - 700 Block of Lake Ave, Metairie	10/2/2017 18:30			Yes																	According to JPSO 911 Headquarters, area is not passable
Parish Agency/Department	JPEM Street Flooding Reports	Metairie	Street flooding - 4600 Block Woodland St, Metairie	10/2/2017 18:30			Yes																	According to JPSO 911 Headquarters, area is not passable. Not draining and water starting to get into vehicles.
Parish Agency/Department	JPEM Street Flooding Reports	Metairie	Street flooding - 400 Block Rosa, Metairie	10/2/2017 18:30			Yes																	According to JPSO 911 Headquarters, area is not passable
Parish Agency/Department	JPEM Street Flooding Reports	Unincorporated West Bank	Street flooding - Mt. Laurel and Wall Blvd, Terrytown	10/2/2017 18:30			Yes																	According to JPSO 911 Headquarters, area is not passable
Parish Agency/Department	JPEM Street Flooding Reports	Metairie	Street flooding - Oaklawn Dr/I-10, Metairie	10/2/2017 18:30			Yes																	According to JPSO 911 Headquarters, area is not passable
Parish Agency/Department	JPEM Street Flooding Reports	Metairie	Street flooding - Woodland St and Mouton St, Metairie	10/2/2017 18:30			Yes																	According to JPSO 911 Headquarters, area is not passable
Parish Agency/Department	JPEM Street Flooding Reports	Metairie	Street flooding - Richland Ave and Mouton St, Metairie	10/2/2017 18:30			Yes																	According to JPSO 911 Headquarters, area is not passable
Parish Agency/Department	JPEM Street Flooding Reports	Metairie	Street flooding - Cleary Ave at Mouton St and 3rd St, Metairie	10/2/2017 18:30			Yes																	According to JPSO 911 Headquarters, area is not passable
Parish Agency/Department	JPEM Street Flooding Reports	Metairie	Street flooding - Overpass at Causeway Blvd and Veterans Blvd	10/2/2017 18:30			Yes																	According to JPSO 911 Headquarters, area is not passable. Heavy flooding under the overpass.
Parish Agency/Department	Fire Dept - Communications Center	Harvey	Severe storm - 1500 Lorene Dr	10/22/2017 16:54															Yes		Severe storm			Harvey Fire Dept responded to report of power lines down from a possible tornado or strong winds. Leaning power pole and damage to 3 apartment buildings. Damage assessed so far - siding ripped from 3 buildings and a hole in the wall. No injuries reported.
Parish Agency/Department	PIO and Fire Dept - Communications Center	Westwego	Winter weather - Lapalco Bridge over Bayou Segnette	12/8/2017 18:04	12/9/2017 1:25												Yes							Public Works Director advised will be laying down sand on elevated roads as icy conditions are expected. JP Streets Dept advised open in both directions.
Parish Agency/Department	PIO	Harvey	Winter weather - Lapalco Bridge over Harvey Canal	12/8/2017 18:04	12/8/2017 22:44	5											Yes							Public Works Director advised will be laying down sand on elevated roads as icy conditions are expected. WB lanes closed to traffic so crews could place sand to prevent icing.
Parish Agency/Department	PIO	Metairie	Winter weather - Roundabout over Airline Dr	12/8/2017 18:04													Yes							Public Works Director advised will be laying down sand on elevated roads as icy conditions are expected.
Parish Agency/Department	PIO	Metairie	Winter weather - Causeway Bridge over Veterans	12/8/2017 18:04													Yes							Public Works Director advised will be laying down sand on elevated roads as icy conditions are expected.

Data Source Type	Data Source Description	Location	Description	Start Date	End Date	Duration (hrs)	Flood	Flood Mag (in)	Hurricanes Tropical Storm	Hurricanes Tropical Storm Mag	Tornado	Tornado Mag	Subsidence	Subsidence Mag (in)	Hailstorm	Hailstorm Mag (in dia)	Winter Storm	Winter Storm Mag (in)	Other Hazard	Other Hazard Mag	Other Hazard Notes	Deaths	Injuries	Comments
Parish Agency/Department	911 Headquarters	Westwego	Winter weather - Lapalco Bridge in Westwego	12/9/2017 0:23													Yes							Closed in both directions temporarily due to ice on bridge.
Parish Agency/Department	911 Headquarters	Unincorporated East Bank	Winter weather - 300-400 Block of Rural St, River Ridge	1/2/2018 14:54													Yes							Streets iced over. Reports of a broken water main.
Parish Agency/Department	911 Headquarters	Unincorporated East Bank	Winter weather - Citrus Blvd/S Clearview Pkwy, Metairie	1/2/2018 14:54	1/2/2018 16:58	2											Yes							Streets iced over
Parish Agency/Department	911 Headquarters	Harahan	Winter weather - Dickory Ave/Dock St, Jefferson	1/2/2018 14:54	1/2/2018 16:58	2											Yes							Streets iced over. Road shut down all the way to Dunfrene.
Parish Agency/Department	911 Headquarters	Marrero	Winter weather - Pine St/Salome St, Marrero	1/2/2018 14:54													Yes							Streets iced over. Water Dept advised there is a busted pipe at the location.
Parish Agency/Department	911 Headquarters	Metairie	Winter weather - W Napoleon/Kent Ave, Metairie	1/2/2018 14:54													Yes							Streets iced over. Buste pipe at the location causing the roadway to ice over.
Parish Agency/Department	911 Headquarters	Harahan	Winter weather - Dufrene St/Dickory Ave, Jefferson	1/2/2018 14:54													Yes							Streets iced over
Parish Agency/Department	911 Headquarters	Metairie	Winter weather - David Dr/W Napoleon Ave, Metairie	1/2/2018 14:54													Yes							Streets iced over
Parish Agency/Department	911 Headquarters	Metairie	Winter weather - N I-10 Service E/27th St, Metairie	1/2/2018 15:09	1/2/2018 16:58	2											Yes							3 broken water mains. Road is icing over.
Parish Agency/Department	Emergency Management Coordinator	Metairie	Winter weather - W Napoleon Ave/Haring Rd, Metairie	1/2/2018 16:58													Yes							Doesn't appear to have ice but it is still blocked off
Parish Agency/Department	911 Headquarters	Unincorporated East Bank	Winter weather - Jefferson Hwy/Betz Ave	1/4/2018 12:17													Yes							Black ice on roadway
Parish Agency/Department	911 Headquarters	Unincorporated East Bank	Winter weather - Jefferson and Clearview Pkwy	1/4/2018 12:17													Yes							Black ice on roadway
Parish Agency/Department	911 Headquarters	Metairie	Winter weather - Clearview Pkwy/Prairie St, Metairie	1/4/2018 12:17													Yes							Black ice on roadway
Parish Agency/Department	Fire Dept - Communications Center	Unincorporated East Bank	Winter weather - 3806 Alfred	1/4/2018 13:16													Yes							Broken water main causing icing on roadway
Parish Agency/Department	Fire Dept - Communications Center	Harvey	Ice - 1701 Manhattan	1/8/2018 13:16													Yes							Ice reported in front of 1701 Manhattan
Parish Agency/Department	Emergency Management Coordinator	Unincorporated West Bank	Severe storm - 4800 block of Jean Lafitte Blvd	3/11/2018 16:54															Yes		Severe storm			Microburst came through Jean Lafitte near Barataria. Roof damages along with some power lines reported down.
Parish Agency/Department		Unincorporated East Bank	Road Closure	4/14/2018 5:00	4/14/2018 5:00		No												Yes	Rain				
Parish Agency/Department		Unincorporated East Bank		4/14/2018 15:30			Yes																	Per jpso 4300-blk hessmer flooded/under water....op15
Parish Agency/Department		Unincorporated East Bank		4/14/2018 15:30																				W Metairie Avenue is shut down in both directions until further notice between N Hullen St and Athania Pkwy due to a leaning tree tangled with electrical wires.
Parish Agency/Department		Unincorporated East Bank		4/14/2018 16:30			Yes																	
Parish Agency/Department		Unincorporated East Bank		4/14/2018 16:30			Yes																	
Parish Agency/Department		Unincorporated East Bank		4/14/2018 16:30			Yes																	
Parish Agency/Department		Unincorporated East Bank		4/14/2018 16:30			Yes																	
Parish Agency/Department		Kenner		4/14/2018 17:00			Yes																	
Parish Agency/Department		Unincorporated East Bank		4/14/2018 17:00			Yes																	
Parish Agency/Department		Kenner		4/14/2018 17:00			Yes																	
Parish Agency/Department		Kenner		4/14/2018 17:00			Yes																	
Parish Agency/Department		Kenner		4/14/2018 17:00			Yes																	
Parish Agency/Department		Unincorporated East Bank		4/14/2018 17:00			Yes																	
Parish Agency/Department		Unincorporated East Bank		4/14/2018 17:00			Yes																	
Parish Agency/Department		Unincorporated East Bank		4/14/2018 17:00			Yes																	
Parish Agency/Department		Unincorporated East Bank		4/14/2018 17:00			Yes																	
Parish Agency/Department		Unincorporated East Bank		4/14/2018 17:00			Yes																	
Parish Agency/Department		Kenner		4/14/2018 17:15			Yes																	
Parish Agency/Department		Unincorporated West Bank		4/14/2018 17:30			Yes																	
Parish Agency/Department		Kenner		4/14/2018 17:30			Yes																	
Parish Agency/Department		Kenner		4/14/2018 17:30			Yes																	
Parish Agency/Department		Unincorporated East Bank		4/14/2018 17:45			Yes																	
Parish Agency/Department	911 Headquarters	Unincorporated West Bank	Flooding - Heritage	6/12/2018 20:01	6/12/2018 21:21	1	Yes																	Impassable

Data Source Type	Data Source Description	Location	Description	Start Date	End Date	Duration (hrs)	Flood	Flood Mag (in)	Hurricanes Tropical Storm	Hurricanes Tropical Storm Mag	Tornado	Tornado Mag	Subsidence	Subsidence Mag (in)	Hailstorm	Hailstorm Mag (in dia)	Winter Storm	Winter Storm Mag (in)	Other Hazard	Other Hazard Mag	Other Hazard Notes	Deaths	Injuries	Comments
Parish Agency/Department	911 Headquarters	Unincorporated West Bank	Flooding - 1800 blk of Carol Sue Ave	6/12/2018 20:01	6/12/2018 21:21	1	Yes																	Lights completely out
Parish Agency/Department	911 Headquarters	Unincorporated West Bank	Flooding - Terry Pkwy/Carol Sue Ave	6/12/2018 20:01	6/12/2018 21:21	1	Yes																	Lights completely out
Parish Agency/Department	911 Headquarters	Unincorporated West Bank	Severe storm - Terry Pkwy	6/12/2018 20:03															Yes		Severe storm			Signal lights completely out
Parish Agency/Department	911 Headquarters	Unincorporated West Bank	Severe storm - Homes Blvd/Stumpf Blvd	6/12/2018 20:03															Yes		Severe storm			Signal lights complete out
Other	Member of the public	Metairie	Flooding - Causeway by Veterans	8/17/2018 4:00			Yes																	Located right off the service road and eastside of Causeway. Flooding occurs whenever it rains.
Parish Agency/Department	911 Headquarters	Metairie	Street Flooding - David Dr btwn York and Veterans	10/25/2018 11:51	10/25/2018 13:39	2	Yes																	Standing water on David Dr btwn York and Vetereans - center lane is impassable.
Parish Agency/Department	911 Headquarters	Metairie	Street Flooding - Camphor St/Elise Ave, Metairie	10/25/2018 11:51	10/25/2018 13:39	2	Yes																	Camphor St/Elise Ave - impassable
Parish Agency/Department	911 Headquarters	Unincorporated East Bank	Street Flooding - Tudor Ave/Pear St, River Ridge	10/25/2018 11:51	10/25/2018 13:39	2	Yes																	Tudor Ave/Pear St - impassable
Parish Agency/Department	911 Headquarters	Metairie	Street Flooding - 1500 block of Transcontinental Dr, ME	10/25/2018 12:02	10/25/2018 13:39	1.5	Yes																	northbound is impassable
Parish Agency/Department	911 Headquarters	Metairie	Street Flooding - 5700 block of Lafreniere St, Me	10/25/2018 12:02	10/25/2018 13:39	1.5	Yes																	almost impassable
Other	City of Kenner EM Director	Kenner	Street Flooding - Williams btwn Jeff Hwy and Airline	10/25/2018 12:04	10/25/2018 12:39	0.5	Yes																	closed both directions duw to high water
Other	City of Kenner EM Director	Kenner	Street Flooding - 600-800 block Filmore	10/25/2018 12:04	10/25/2018 12:39	0.5	Yes																	
Parish Agency/Department	911 Headquarters	Metairie	Street Flooding - 3000 block of Taft Pk, ME	10/25/2018 12:43			Yes																	impassable
Parish Agency/Department	911 Headquarters	Metairie	Street Flooding - Transcontinental Dr/Hearst St, Me	10/25/2018 12:43	10/25/2018 13:39	1	Yes																	impassable
Parish Agency/Department	JPEM	Metairie	Street buckling - Transcontinental north bound at Wabash	10/25/2018 16:15			Yes																	Street closed until further notice due to street buckling.
Parish Agency/Department	Fire Dept Communications Center	Metairie	Straight Line Winds - Roof damage to two buildings at 1840 L and A Rd	11/4/2018 21:00															Yes		Straight Line Winds			Eastbank Consolidated FD on scene of fire alarm - roof damage to two buildlings. Initially reported as tornado but radar reviewed and likely straight line winds.
Parish Agency/Department	911 Headquarters	Unincorporated East Bank	Street Flooding - 501 Tullulah Ave, River Ridge	11/4/2018 22:03			Yes	8																8 inches of water reported.
Parish Agency/Department	911 Headquarters	Unincorporated West Bank	Street Flooding - 800 block of Behrman, Terrytown	11/4/2018 22:03	11/4/2018 23:34	1.5	Yes																	Reported flooding in the area - street impassable.
Parish Agency/Department	911 Headquarters	Unincorporated West Bank	Street Flooding - 500 and 400 block of Wall Blvd, Gretna	11/4/2018 22:03	11/4/2018 23:34	1.5	Yes																	Reported flooding in the area.
Parish Agency/Department	911 Headquarters	Metairie	Street Flooding - Airline Dr/N Lester Ave, Metairie	11/4/2018 22:03	11/4/2018 22:29	0.5	Yes																	Reported flooding in the area.
Parish Agency/Department	911 Headquarters	Harvey	Street Flooding - Manhattan Blvd/Lapalco Blvd, Harvey	11/4/2018 22:03	11/4/2018 23:34	1.5	Yes																	Reported flooding in the area.
Parish Agency/Department	911 Headquarters	Harvey	Street Flooding - 2584 Apollo Ave, Harvey	11/4/2018 22:29	11/5/2018 0:10	1.5	Yes																	Very high water
Other	City of Kenner EM Assistant Director	Kenner	Flooding - I-10 eastbound exit of Williams Blvd headed northbound	12/27/2018 5:00	12/27/2018 20:39		Yes																	Now reopened
Other	City of Kenner EM Assistant Director	Kenner	Power Outage - traffic lights at W Esplanade Ave/Williams intersection	12/27/2018 5:00	12/27/2018 15:55														Yes		Severe Storm			At this time, per Kenner Police Dept, traffic lights are restored for W Esplanade/Williams intersection.
Other	City of Kenner EM Assistant Director	Kenner	Power Lines Down - 2100 W Esplanade	12/27/2018 15:55															Yes		Severe Storm			Additional down power lines reported in business parking lot and have been reported to Entergy.
Other	City of Kenner EM Assistant Director	Kenner	Street closed - Williams Blvd northbound from 32nd St to W Esplanade Ave	12/27/2018 15:55	12/27/2018 20:39		Yes												Yes		Severe Storm			Williams northbound travel lanes closed during repairs - 3200 block to W Esplanade. Southbound lanes remain open. KPD monitoring traffic. Reopened Williams Blvd to northbound traffic - limited to two lanes from 32nd St to W Esplanade Ave
Parish Agency/Department	JPEM	Metairie	Power outage - 2525 Severn Ave	3/18/2019 4:00															Yes		Power outage			Omega Hospital experienced a power outage within facility. Entergy found underground wire damage. At 4:40 PM, repairs estimated to take 4 to 5 hours.
Other	City of Kenner EM	Kenner	Street flooding - The Crossing, Rivertown	4/4/2019 17:00			Yes																	High water. Some street flooding, nothing to be overly concerned about. Rainfall is light.
Parish Agency/Department	JPEM	Metairie	Street flooding - Elmwood Pkwy	4/4/2019 17:00			Yes																	
Parish Agency/Department	JPEM	Metairie	Street flooding - 1100 blk Lake Ave	4/4/2019 17:00			Yes																	
Parish Agency/Department	JPEM	Metairie	Street flooding - Hessmer Ave btwn Veterans Blvd and 18th St	4/4/2019 17:00			Yes																	
Parish Agency/Department	JPEM	Metairie	Street flooding - Homestead Ave	4/4/2019 17:00			Yes																	
Parish Agency/Department	JPEM	Harvey	Street flooding - Scottsdale Dr	4/4/2019 17:00			Yes																	Street is not passable.
Parish Agency/Department	JPEM	Harvey	Street flooding - Apache Dr	4/4/2019 17:00			Yes																	Street is not passable.
Parish Agency/Department	JPEM	Harvey	Street flooding - Tensas Dr	4/4/2019 17:00			Yes																	Street is not passable.

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Parish Agency/Department	JPEM	Marrero	Street flooding - 900 blk Carmadelle St	4/4/2019 17:00			Yes																	Street is not passable.
Parish Agency/Department	JPEM	Metairie	Street flooding - Metairie Rd btwn Causeway Blvd and Tokalon Pl	4/4/2019 17:00			Yes																	Street is not passable.
Parish Agency/Department	JPEM	Metairie	Street flooding - Metairie Rd btwn Sena Dr and 700 blk Metairie Rd	4/4/2019 17:00			Yes																	Street is not passable.
Parish Agency/Department	JPEM	Unincorporated East Bank	Street flooding - 200 to 300 blk Central Ave, Jefferson	4/4/2019 17:00			Yes																	Street is not passable.
Other	City of Kenner EM	Kenner	Street flooding - 800 blk Williams Blvd	4/4/2019 17:00			Yes																	Under standing water. Some street flooding, nothing to be overly concerned about. Rainfall is light.
Parish Agency/Department	JPEM	Unincorporated East Bank	Street flooding - Clearview Pkwy and Earhart Blvd	4/4/2019 17:00			Yes																	
Parish Agency/Department	JPEM	Metairie	Street flooding - 17th St and Severn Ave	4/4/2019 17:00			Yes																	
Parish Agency/Department	JPEM	Gretna	Street flooding - Lafayette Blvd and WBX	4/4/2019 17:00			Yes																	
Parish Agency/Department	JPEM	Harvey	Street flooding - Price Dr at Marvin Ct	4/4/2019 17:00			Yes																	Street is not passable.
Parish Agency/Department	JPEM	Metairie	Street flooding - Richland Ave and S I-10 Service Rd	4/4/2019 17:00			Yes																	Street is not passable.
Parish Agency/Department	JPEM	Metairie	Street flooding - Hessmer Ave and 18t St	4/4/2019 17:00			Yes																	Street is not passable.
Other	City of Kenner EM	Kenner	Street flooding - Pellerin Dr and Loyola Dr	4/4/2019 17:00			Yes																	Some street flooding, nothing to be overly concerned about. Rainfall is light.
Other	City of Kenner EM	Kenner	Street flooding - Kenner Ave and Williams Blvd	4/4/2019 17:00			Yes																	Some street flooding, nothing to be overly concerned about. Rainfall is light.
Parish Agency/Department	JPEM	Metairie	Flooding - Airline Dr at Causeway underpass	4/4/2019 18:16			Yes																	Both directions closed due to flooding. Alternate route: elevated traffic circle.
Parish Agency/Department	JPSO	Unincorporated West Bank	Street closed - River Rd around Sweet Pea Ln and Acadia Drive, Waggaman	4/8/2019 0:59	4/8/2019 2:00	1																		Traffic is blocked both east and westbound on River Rd from Sweet Pea Ln to Acadia Drive due to a powerline down across the road.
Parish Agency/Department	Fire Alarm	Metairie	Street flooding - around library on W Napoleon Ave and Clearview Pkwy	4/8/2019 1:04			Yes																	
Parish Agency/Department	JPEM	Unincorporated West Bank	Vehicle accident - Carol Sue Ave at Terry Pkwy, Terrytown	4/18/2019 15:49	4/18/2019 16:33	0.75													Yes		Vehicle accident			Road closure due to a vehicle accident.
Parish Agency/Department	JPEM	Unincorporated West Bank	Car accident - Carol Sue Ave from Behrman Hwyto Morningside Dr	4/24/2019 17:27															Yes		Car accident			Road closure due to car accident.
Parish Agency/Department	JPEM	Harvey	Accident involving power pole - 2300 blk of Westbank Expwy	5/6/2019 22:43	5/6/2019 23:44	1													Yes	Accident involving JPSO unit and power pole. Caused a power outage for appox. 2,500				
Parish Agency/Department	JPSO	Unincorporated East Bank	Street flooding - 400 blk Jefferson Hwy	5/12/2019 9:26			Yes																	
Parish Agency/Department	JPSO	Metairie	Street flooding - 4400 blk Hearst St	5/12/2019 9:26			Yes																	
Parish Agency/Department	JPSO	Unincorporated East Bank	Street flooding - 500 blk Tucker Ave	5/12/2019 9:26			Yes																	
Parish Agency/Department	JPSO	Metairie	Street flooding - W Metairie Ave and Severn Ave	5/12/2019 9:26			Yes																	
Parish Agency/Department	JPSO	Metairie	Street flooding - Carrollton Ave and Georgia Ct	5/12/2019 9:57			Yes																	Car stuck in the middle of the street.
Parish Agency/Department	JPSO	Unincorporated West Bank	Street flooding - approach to Huey P Long Bridge westbound	5/12/2019 9:57			Yes																	Completely impassable and vehicles are stalling.
Parish Agency/Department	JPSO	Unincorporated East Bank	Street flooding - 300 blk Edwards Ave	5/12/2019 9:57			Yes																	
Parish Agency/Department	JPSO	Metairie	Street flooding - Transcontinental Dr	5/12/2019 9:57			Yes																	
Parish Agency/Department	JPSO	Metairie	Street flooding - Clearview Pkwy	5/12/2019 9:57			Yes																	
Parish Agency/Department	JPSO	Metairie	Street flooding - 3500 blk Severn Ave	5/12/2019 9:57			Yes																	
Parish Agency/Department	JPSO	Metairie	Street flooding - 400 blk Rosa Ave	5/12/2019 9:57			Yes																	Water is going into homes
Parish Agency/Department	JPSO	Unincorporated East Bank	Street flooding - 5400 blk Mounes St	5/12/2019 9:57			Yes																	
Parish Agency/Department	JPSO	Metairie	Street flooding - W Napoleon canal	5/12/2019 9:57			Yes																	Canal is overflowing
Parish Agency/Department	JPSO	Metairie	Street flooding - W Metairie canal	5/12/2019 9:57			Yes																	
Parish Agency/Department	JPSO	Unincorporated East Bank	Street flooding - Little Farms Ave to railroad tracks	5/12/2019 9:57			Yes																	
Parish Agency/Department	JPSO	Metairie	Street flooding - Avron Blvd and Lefkoe St	5/12/2019 9:57			Yes																	
Parish Agency/Department	JPSO	Metairie	Street fooding - Bonnabel Blvd and Homer St	5/12/2019 9:57			Yes																	
Parish Agency/Department	JPSO	Metairie	Street flooding - W Metairie Ave and Transcontinental Dr	5/12/2019 9:57			Yes																	

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Parish Agency/Department	Fire Alarm	Unincorporated West Bank	House fire - 3873 Eastview Dr	5/12/2019 10:33	5/12/2019 11:10	0.5													Yes		House fire	0	0	Marrero Estelle Fire Dept on scene. No report of downed wires, injuries, or exposures.
Parish Agency/Department	Fire Alarm	Harvey	House fire - 2108 Killington Dr	5/12/2019 10:41	5/12/2019 11:10	0.5													Yes		House fire	0	0	Harvey Fire Dept on scene. No report of downed wires, injuries, or exposures.
Parish Agency/Department	JPSO	Metairie	Street flooded - Clearview Pkwy and Airline Dr underpass	5/12/2019 11:44			Yes																	Underpass is flooded.
Parish Agency/Department	JPSO	Unincorporated East Bank	Street flooding - Hickory Ave to Jefferson Hwy	5/12/2019 11:44			Yes																	Completely impassable
Parish Agency/Department	JPSO	Metairie	Street flooding - L and A Rd	5/12/2019 11:44			Yes																	Impassable - units are unable to access the "1-1" area.
Parish Agency/Department	JPSO	Metairie	Street flooding - Causeway Blvd	5/12/2019 11:44			Yes																	Impassable - units are unable to access the "1-1" area.
Parish Agency/Department	JPSO	Unincorporated East Bank	Street flooding - Central Ave	5/12/2019 11:44			Yes																	Impassable - units are unable to access the "1-1" area.
Parish Agency/Department	JPSO	Metairie	Street flooding - Bonabel Blvd to S I-10 Service Rd	5/12/2019 11:44			Yes																	Completely impassable
Parish Agency/Department	JPSO	Metairie	Street flooding - Hesper Ave	5/12/2019 11:44			Yes																	Impassable
Parish Agency/Department	JPSO	Metairie	Street flooding - 2100 blk N Causeway Blvd	5/12/2019 11:44			Yes																	Water in some houses.
Parish Agency/Department	JPSO	Unincorporated East Bank	Street flooding - 5400 blk River Rd	5/12/2019 11:44			Yes																	Westbound lane is impassable.
Parish Agency/Department	JPSO	Unincorporated East Bank	Street flooding - S Clearview Pkwy and Citrus Blvd	5/12/2019 11:44			Yes																	Completely impassable and has several 18B's.
Parish Agency/Department	JPSO	Unincorporated West Bank	Street flooding - Seven Oaks Blvd and RIver Rd	5/12/2019 11:44			Yes																	Tree blocking the roadway.
Parish Agency/Department	JPEM	Harvey	Street flooding - 1725 Destrehan Ave to Patriot St	5/12/2019 13:45			Yes																	Flooded and impassable due to Harvey Canal being high and water seeping through Stewart Stephenson bulkhead.
Other	Resident	Metairie	Flooding - 1708 Michigan Ave	5/13/2019 4:00			Yes	10																Resident reported 10 in of flooding in his house.
Other	Social media	Metairie	Flooding - Martin Behrman Ave	5/13/2019 4:00			Yes																	People reported flooding via social media - did not indicate if homes impacted.
Other	Social media	Metairie	Flooding - Versailles St	5/13/2019 4:00			Yes																	People reported flooding via social media - did not indicate if homes impacted.
Other	Social media	Metairie	Flooding - Ferran Dr	5/13/2019 4:00			Yes																	People reported flooding via social media - did not indicate if homes impacted.
Other	Social media	Metairie	Flooding - Courtland Dr	5/13/2019 4:00			Yes																	People reported flooding via social media - did not indicate if homes impacted.
Other	Social media	Metairie	Flooding - Loveland St and Kent Ave	5/13/2019 4:00			Yes																	People reported flooding via social media - did not indicate if homes impacted.
Other	Social media	Unincorporated West Bank	Flooding - Dover Ln and Deerfield Rd	5/13/2019 4:00			Yes																	People reported flooding via social media - did not indicate if homes impacted.
Parish Agency/Department	JPEM	Gretna	Trail derailment - between Richard St and Ocean Ave	5/17/2019 17:06															Yes		Trail derailment	0	0	13 car train derailment. Total train length 110 cars loaded with grain and no hazardous materials on board. Only the 300 blk of Richard St is impassable. No injuries reported.
Parish Agency/Department	JP School System	Unincorporated West Bank	School Fight - John Ehret High School	5/23/2019 4:00															Yes		Incident at school involving several fights. One weapon retrieved from campus. JPSO on scene and students released.			
Parish Agency/Department	JPEM	Unincorporated West Bank	Street buckled - 732 Bellemeade Blvd	6/1/2019 20:44															Yes		Stree buckled			Bellemeade Blvd at Charlie Dr is closed. All traffic is being diverted at Charlie Dr. Westbank Streets on scene.
Other	Parish Resident	Unincorporated West Bank	Sinkhole - 6709 River Rd, Waggaman	6/2/2019 4:00									Yes	18										Sinkhole on public access side of sidewalk. 18 in circumference and 4 ft deep. Sidewalk has cracked, broken, and sliding into the hole. Continues to grow larger and may be a water line break.
Other	USCG	Unincorporated West Bank	Oil spill - Mississippi River MM 126 to 116	6/8/2019 19:23															Yes	3,500 gallons	Oil spill	0		Freighter collided with tug carrying 37,000 gallons of diesel fuel at MM 126 in St. Charles Parish. 3,500 gallons spilled into the river and sheen from the diesel fuel reached MM 116.
Parish Agency/Department	Fire Alarm	Unincorporated East Bank	Flooded street - S Clearview Pkwy btwn Village East St and Mounes	6/18/2019 0:23			Yes																	Standing water reported (north and southbound)
Parish Agency/Department	Fire Alarm	Unincorporated East Bank	Flooded streets - Mounes St	6/18/2019 0:23			Yes																	Standing water reported
Other	Kenner PD	Kenner	High wind - 31st St and Helena St	6/28/2019 4:00															Yes		High wind			Stop signs blown down
Other	Kenner PD	Kenner	High wind - 22nd St and Roosevelt	6/28/2019 4:00															Yes		High wind			Stop signs blown down
Other	Kenner PD	Kenner	High wind - 32nd St mall entrance	6/28/2019 4:00															Yes		High wind			Tree branches in the roadway
Other	Kenner PD	Kenner	High wind - Veterans Blvd and Roosevelt Blvd	6/28/2019 4:00															Yes		High wind			Light post down
Parish Agency/Department	JPEM	Metairie	Power outage - Entergy Substation, Cleary Ave, Metairie	7/10/2019 4:00															Yes		Severe Storm			Approx 14,841 Entergy customers still without power due to a down substation. Entergy on scene working on repairs and power should be restored NLT 10:00 pm.
Parish Agency/Department	JPEM	Marrero	Flooding - 500 block of Francis from Wallace St to Division St, Marrero	7/10/2019 4:00			Yes																	Barricades requested by Fire Alarm

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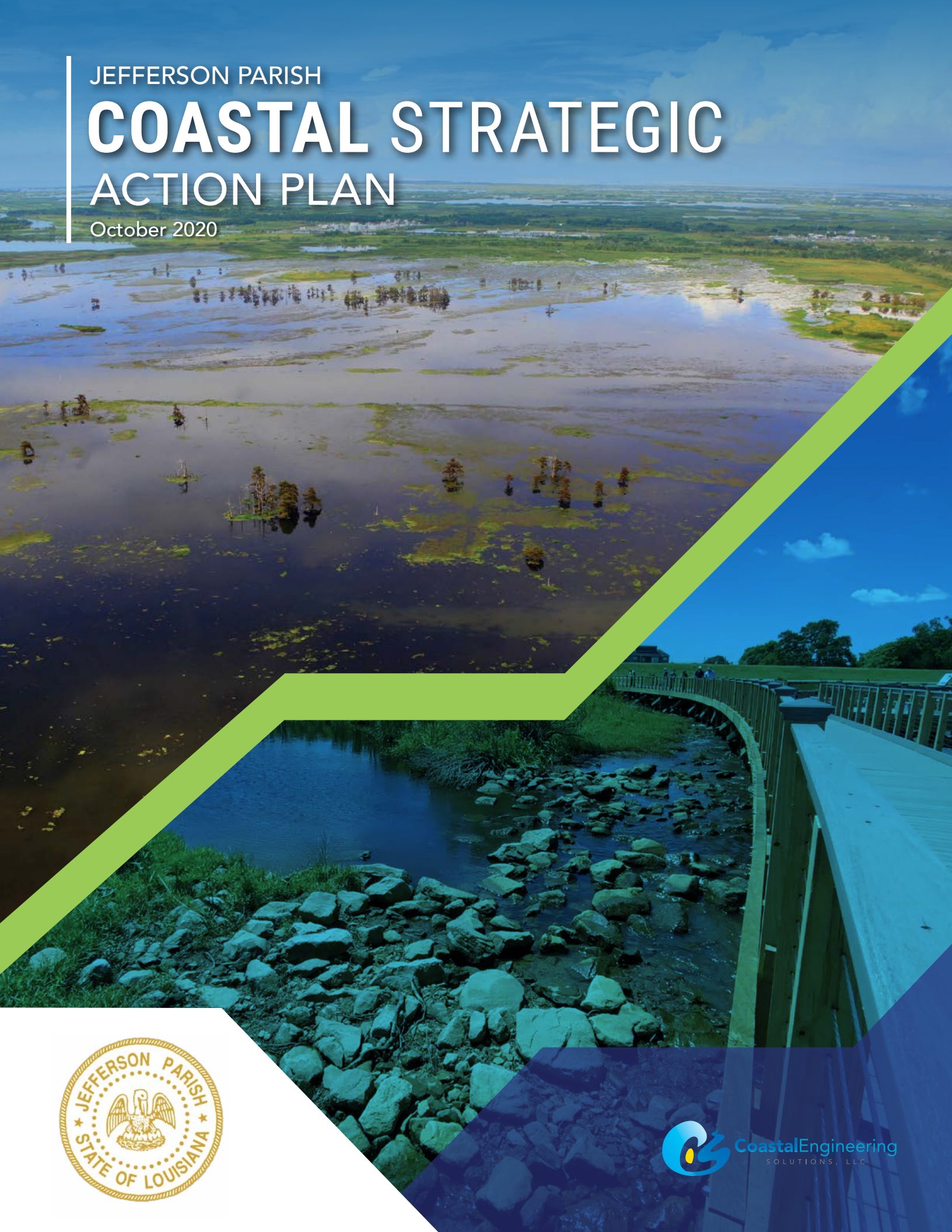
Parish Agency/Department	JPEM	Marrero	Flooding - 500 Westwood Dr, Marrero	7/10/2019 4:00			Yes																	Barricades requested by Fire Alarm
Parish Agency/Department	JPEM	Unincorporated West Bank	Flooding - Jamie Blvd and S Jamie Blvd, Avondale	7/10/2019 4:00			Yes																	Barricades requested by Fire Alarm. Streets flooded and requested to be closed on both sides of Hwy 90.
Parish Agency/Department	JPSO	Marrero	Flood street - 500 blk of Westwood Dr	7/10/2019 13:23			Yes																	
Parish Agency/Department	JPSO	Gretna	Flood street - 900 Huey P Long Ave to Mississippi River	7/10/2019 13:23			Yes																	
Parish Agency/Department	JPSO	Unincorporated East Bank	Flooded St - 2614 Jefferson Hwy to Labarre Rd	7/10/2019 13:23			Yes																	
Parish Agency/Department	JPSO	Unincorporated East Bank	Flooded street - 5000 to 7000 blk River Rd	7/10/2019 13:23			Yes																	
Parish Agency/Department	JPSO	Unincorporated East Bank	Flood street - 4400 blk River Rd	7/10/2019 13:23			Yes																	
Parish Agency/Department	JPSO	Gretna	Flooded street - Lafayette St and Westbank Expwy	7/10/2019 13:23			Yes																	
Parish Agency/Department	JPSO	Unincorporated West Bank	Flooded Street - S Jamie Blvd and Dialita Dr	7/10/2019 13:23			Yes																	
Parish Agency/Department	JPSO	Unincorporated East Bank	Flooded street - Bloomfield St and St George Ave	7/10/2019 13:23			Yes																	
Parish Agency/Department	JPSO	Harahan	Flooded street - Magnolia Blvd and Jefferson Hwy	7/10/2019 13:23			Yes																	
Parish Agency/Department	JPSO	Harahan	Flood street - Wilson St and Hickory Ave	7/10/2019 13:23			Yes																	
Parish Agency/Department	JPEM	Harvey	Flooded street - 600 blk 1st Ave	7/10/2019 13:41			Yes																	
Parish Agency/Department	JPEM	Marrero	Flooded street - Barataria Blvd and Randolph St	7/10/2019 13:41			Yes																	
Parish Agency/Department	JPEM	Harvey	Flooded street - Orange Blossom Ln and Pygmalion Dr	7/10/2019 13:41			Yes																	
Parish Agency/Department	JPEM	Marrero	Flooded street - River Rd from Kline St, Westwego to Robinson Ave,	7/10/2019 13:46			Yes																	DOTD closed that portion of the road.
Parish Agency/Department	JPEM	Marrero	Street flooding - 1100 blk Farrington Dr	7/10/2019 13:58			Yes																	
Parish Agency/Department	JPEM	Unincorporated West Bank	Flooding - 218 9th St, Bridge City	7/10/2019 15:07			Yes																	Water is getting into house.
Parish Agency/Department	JPEM	Unincorporated East Bank	Flooded street - Coolidge St at Jefferson Hwy	7/10/2019 15:07			Yes																	Barricades requested
Parish Agency/Department	JPEM	Unincorporated East Bank	Flooded street - Coolidge St at River Rd	7/10/2019 15:07			Yes																	Barricades requested
Parish Agency/Department	JPEM	Unincorporated West Bank	Flooded street - Utah Beach St, Avondale complex	7/10/2019 15:07			Yes																	
Parish Agency/Department	JPEM	Unincorporated West Bank	Flooded street - 800 blk to 1200 blk Weigand Dr	7/10/2019 15:07			Yes																	
Parish Agency/Department	JPEM	Unincorporated West Bank	Flooded street - Barnes St, Avondale	7/10/2019 15:07			Yes																	
Parish Agency/Department	JPEM	Metairie	Flooded street - L and A Rd and Airline underpass	7/10/2019 15:07			Yes																	Barricades needed - heading towards Labarre Rd, Jefferson.
Parish Agency/Department	Fire Alarm	Westwego	Tree down - Lapalco Blvd at Osprey Dr	7/14/2019 12:06	7/14/2019 13:36	1.5													Yes		Tree down			Tree down blocking 1 lane of Lapalco Blvd
Parish Agency/Department	Fire Alarm	Marrero	Power lines down - Barataria Blvd at Patriot St	7/17/2019 4:00															Yes		Power lines down			Power lines crossing road. Barataria Blvd is shut down to north and southbound traffic.
Parish Agency/Department	JPEM	Unincorporated West Bank	Flooded street - Hooter Rd, Avondale	7/20/2019 15:07			Yes																	
Parish Agency/Department	JPSO	Unincorporated West Bank	Flooded street - 400 blk Lapalco Blvd	7/23/2019 22:26	7/23/2019 4:00	2.5	Yes																	Standing water on road
Media	Media Outlets	Unincorporated East Bank	Causeway Bridge Closure	7/27/2019 4:00															Yes		Bridge Closure			Causeway Bridge north and south bound closed due to drawbridge malfunction.
Parish Agency/Department	JPSO	Harvey	Flooding - 1700 Destrehan Ave	7/30/2019 17:11			Yes																	Standing water and impassable.
Parish Agency/Department	JPEM	Metairie	Flooded roadways - Metairie Rd from Causeway Blvd to Labarre Rd	7/30/2019 17:29			Yes																	
Parish Agency/Department	JPEM	Unincorporated West Bank	Flooded roadways - 300 block of Heritage Ave	7/30/2019 17:29			Yes																	
Parish Agency/Department	JPEM	Unincorporated West Bank	Flooded roadways - 100-200 block of Terry Pkwy	7/30/2019 17:29			Yes																	
Parish Agency/Department	JPEM	Harvey	Flooded roadways - 600 block of Destrehan Blvd	7/30/2019 17:29			Yes																	
Parish Agency/Department	JPEM	Unincorporated East Bank	Flooded roadways - Jefferson Hwy and Elmwood Park Blvd	7/30/2019 17:29			Yes																	
Parish Agency/Department	JPEM	Metairie	Flooded roadways - Homestead Ave and Codifer Blvd	7/30/2019 17:29			Yes																	
Parish Agency/Department	JPEM	Marrero	Downed power line - 4th St between 3rd and 5th Ave, Marrero	7/30/2019 17:41	7/30/2019 20:14	2.5													Yes		Downed power line			Traffic is being diverted. 8th District Fire and Entergy are currently on the scene.
Other	US Coast Guard	Unincorporated West Bank	Barge accident and oil spill - Mile Marker 110 on Mississippi River	7/30/2019 18:00															Yes	123 gal	Barge accident and oil spill			At approx 1400 hrs, USCG notified of a sunken crane barge at ARTCOs MM110 fleeting area. No personnel onboard. 100 gal of hydraulic oil, 15 gal of diesel fuel, and 8 gal other misc oils were on board at time of incident.

Data Source Type	Data Source Description	Location	Description	Start Date	End Date	Duration (hrs)	Flood	Flood Mag (in)	Hurricanes Tropical Storm	Hurricanes Tropical Storm Mag	Tornado	Tornado Mag	Subsidence	Subsidence Mag (in)	Hailstorm	Hailstorm Mag (in dia)	Winter Storm	Winter Storm Mag (in)	Other Hazard	Other Hazard Mag	Other Hazard Notes	Deaths	Injuries	Comments
Parish Agency/Department	Emergency Management Coordinator	Harvey	Flooded roadways - Patriot St and MacArthur Ave	7/30/2019 18:29			Yes																	Standing water
Parish Agency/Department	News Release	Unincorporated West Bank	Contaminated drinking water - Privateer Blvd and Jean Lafitte Blvd, South of elevate water tower in Lafitte	7/31/2019 4:00	8/1/2019 4:00														Yes		Contaminated drinking water			Boil water advisory issued due to a loss of water pressure when performing repairs to a valve on Leo Kerner Blvd. The advisory was lifted the next day.
Parish Agency/Department	JPEM	Unincorporated West Bank	Power outage - John Ehret High School	9/9/2019 17:05	9/9/2019 17:11														Yes	Power outage and reports of smoke in several buildings on campus. School was evacuated. Following power restoration, two buildings				
Parish Agency/Department	JPEM	Unincorporated West Bank	Ammonia Leak - Cornerstone Chemical Plant	9/14/2019 4:00															Yes	100 lbs	Ammonia Leak			The leak has been contained to the plant property and there is no threat to the public.
Parish Agency/Department	JPEM	Unincorporated West Bank	Car accident - Seven Oaks Blvd and Oak Ave, Bridge City	9/28/2019 23:13															Yes		Car accident		1	Road closure in both directions due to an accident with injury.
Parish Agency/Department	JPEM	Unincorporated West Bank	Hail - Barataria	10/31/2019 4:00											Yes									Hail spotted near the Barataria area
Parish Agency/Department	JPEM	Unincorporated East Bank	HAZMAT incident - River Rd from Brooklyn Ave to Deckbar Ave	11/4/2019 21:50	11/4/2019 22:55	1													Yes		HAZMAT incident			Hydraulic fluid on the road behind Ochsner Hospital resulting in road closure.
Parish Agency/Department	JPEM	Unincorporated East Bank	Car Accident - MM 4.5 Causeway Bridge	11/13/2019 20:00															Yes	Car Accident		1		A wreck at MM 4.5 shut down both lanes of the southbound span of the Causeway Bridge. Southbound lanes closed for several hours.
Parish Agency/Department	JPEM	Marrero	Car Accident - Ames Blvd and Trinity Dr	12/18/2019 1:52															Yes		Injury accident and road closure			Ames Blvd north and southbound shut down
Media	houmatoday.com	Town of Grand Isle	Subsidence - Bridge between Leeville and Golden Meadow										Yes	12										Bridge has subsided 1 foot in 20 years
Parish Agency/Department	JPSO	Unincorporated East Bank	Street flooding - Citrus Rd btwn Generes Dr and Jefferson Hwy				Yes																	
Parish Agency/Department	JPEM	Unincorporated West Bank	Road closure - Holmes Blvd		4/11/2019 4:35														Yes		Road closure			Water dept will be on scene for the next several hours making repairs to hydrant. Water remains off btwn Stumpf Blvd and Bruce Ave.
Parish Agency/Department	JPEM	Unincorporated West Bank	Street flooding - Terry Pkwy btwn Hector Ave and Holmes Blvd				Yes																	Street is not passable.

JEFFERSON PARISH

COASTAL STRATEGIC ACTION PLAN

October 2020



JEFFERSON PARISH ★ STATE OF LOUISIANA ★

CoastalEngineering SOLUTIONS, LLC

Jefferson Parish President

Honorable Cynthia Lee Sheng

Jefferson Parish Council

Ricky J. Templet
At-Large Division A

Scott Walker
At-Large Division B

Marion F. Edwards
District 1

Deano Bonano
District 2

Byron Lee
District 3

Dominick Impastato
District 4

Jennifer Van Vrancken
District 5

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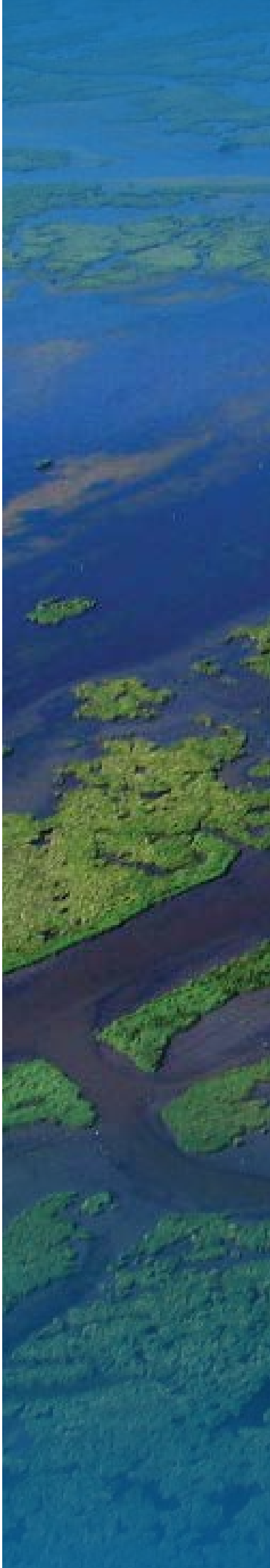
Director, Floodplain Management & Hazard Mitigation



Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

CONTENTS

ACRONYM LIST

BA	Barataria Basin
BI	Barrier Islands
BS	Bank Stabilization
BUDMAT	Beneficial Use of Dredge Material
CAP	Continuing Authorities Program
CDBG	Community Development Block Grant
CWPPRA	Coastal Wetland Planning, Protection, and Restoration Act
CPRA	Coastal Protection and Restoration Authority
GILD	Grand Isle Independent Levee District
GIS	Geographic Information System
GIWW	Gulf Intracoastal Waterway
GOMESA	Gulf of Mexico Energy Security Act
GRSC	GOMESA Revenue Sharing Coalition
HSDRRS	Hurricane and Storm Damage Risk Reduction System
JP-CSAP	Jefferson Parish Coastal Strategic Action Plan
LA SAFE	Louisiana's Strategic Adaptations for Future Environments
LCA	Louisiana Coastal Area
LDWF	Louisiana Department of Wildlife and Fisheries
LILD	Lafitte Area Independent Levee District
M	Million
NOAA	National Oceanic and Atmospheric Administration
NGO	Non-governmental organization
NFWF	National Fish and Wildlife Foundation
PACE	Parishes Advocating for Coastal Endurance
PO	Pontchartrain Basin
RESTORE	Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States
STEM	Science, Technology, Engineering, and Mathematics
USACE	U.S. Army Corps of Engineers

EXECUTIVE SUMMARY

Jefferson parish has 336 square miles of water and only 305 square miles of land, resulting in more than 50% of Jefferson Parish being water. The coastal areas of Jefferson Parish are home to world-class commercial and recreational fisheries along with hosting a vast array of birds, reptiles, and other wildlife. This complex ecosystem is disappearing and now is a critical time to invest in strategic coastal restoration and projection projects. The projects and strategies identified in this plan will strengthen Jefferson Parish's fight to save our coast which in turn will provide protection for our communities, habitat for wildlife, and recreation for generations to come.

Louisiana's coast represents one of the largest estuaries in the world, providing unique critical natural habitats, economic resources, and a natural barrier of protection to communities. Coastal Louisiana also provides economic benefits through tourism, world-class recreational and commercial fishing, beaches, boating, oil and gas production, and port commerce and represents a major portion of the nation's seafood and energy supply. The Barataria Basin, which includes coastal Jefferson Parish, accounted for 23 percent of Louisiana's commercial seafood landings in 2019, valued at $60 million.

Coastal barrier islands and wetlands also serve a critical role as multiple lines of defense for storm surge dissipating wave energy and to protect upland communities from surge and storm flood impacts. This important and fragile ecosystem is disappearing at an alarming rate. Without further coastal protection or restoration actions, an additional 112 square miles—or 42 percent of the land area in Jefferson Parish—could be lost in the next 50 years, jeopardizing the culture and heritage so important to Louisiana as well as increasing risk of coastal flooding.

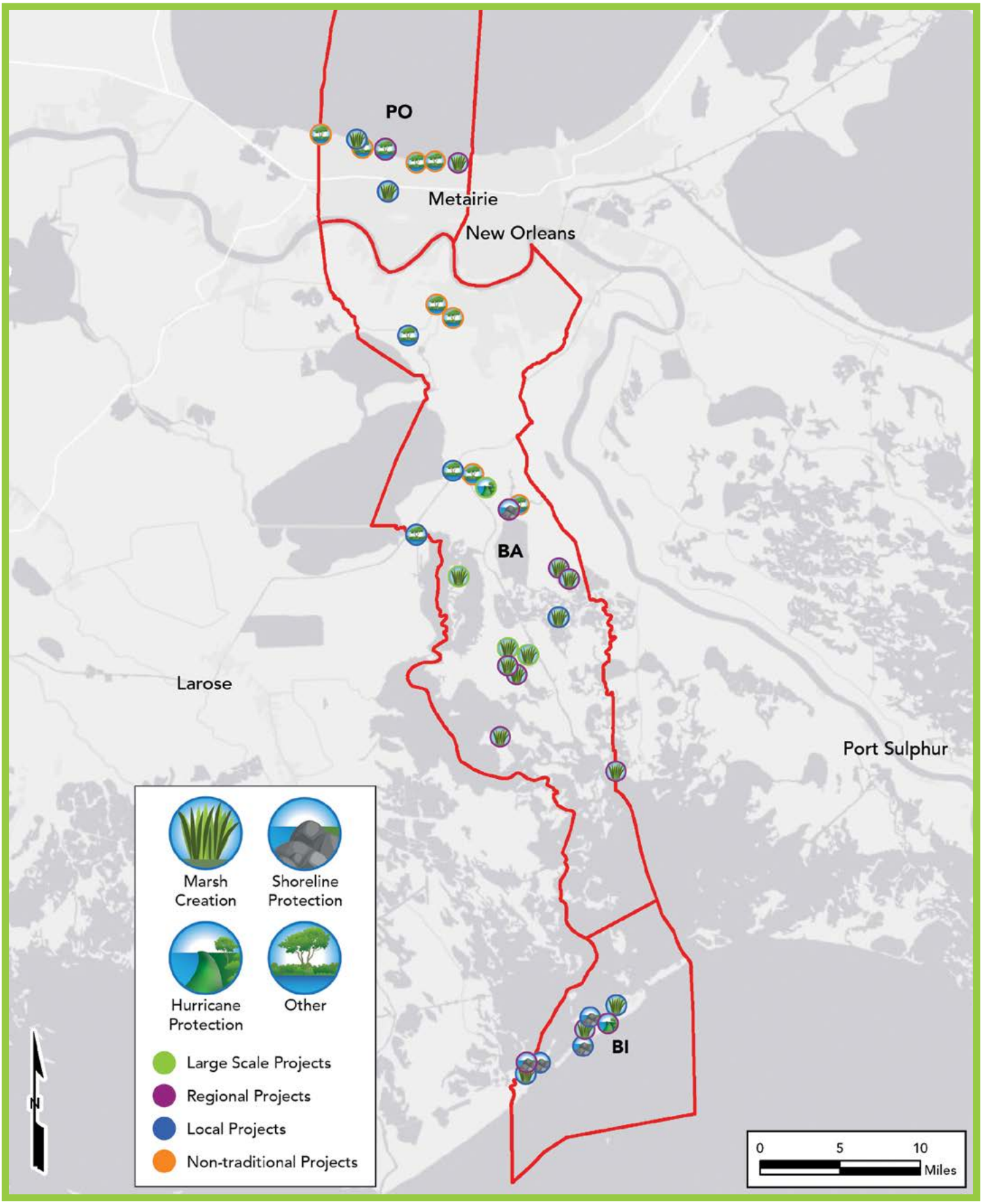
The geologic development of the Louisiana coast was the result of an active delta cycle, a process by which a river naturally changes course, depositing material as part of the natural delta building process. The formation of the Barataria Basin in Jefferson Parish was part of the Lafourche Delta, which was active 1,000 to 300 years Before Present (Figure 8). Currently, the Barataria Basin is in the abandoned delta geologic process, where the new land formation created by the delta lobe continues to settle over time in the absence of new material being deposited by the river into the system. Fresh water and sediment input to the Barataria Coastal Basin was almost eliminated by the construction of the Mississippi River and Tributaries Levee System and the closure of Bayou Lafourche at Donaldsonville, which have contributed to erosion and subsidence within the basin.

The Jefferson Parish Coastal Strategic Action Plan (JP-CSAP) builds upon previous planning efforts and identifies a list of projects that can reduce hurricane-related storm risks; protect existing wetlands, infrastructure, and communities; promote recreation and education; and maximize funding opportunities. The JP-CSAP is also a complementary document to the Louisiana Coastal Master Plan and the Jefferson Parish 2020 Hazard Mitigation Plan. The Louisiana Coastal Master Plan provides a long-term vision for coastal Louisiana and is the vehicle for coordinating Louisiana's local, state, and federal responses to land loss and potential threats from hurricanes and storm surge events. It provides a 50-year horizon list of projects that build/maintain land and reduce risk to our communities by seeking to improve flood protection, harness the natural processes that built Louisiana's coastal landscape, sustain our unique cultural heritage, and ensure that our coast continues to be both a Sportsman's Paradise and a hub for commerce and industry (CPRA, 2017a). All projects included in the 2017 Louisiana Coastal Master Plan and projects submitted for consideration for the 2023 Louisiana Coastal Master Plan included in the JP-CSAP.

More than 109 projects were evaluated and submitted to Parish leadership for review and prioritization. The plan narrows down 32 projects with a value greater than $780M. Because direct funding to the Parish is limited and falls far short of the funding needed for all 32 projects identified in this plan, it is important that existing funding be used for projects with the greatest opportunity for additional funding and partnerships identified in the plan.

Along with the prioritized project list, the plan identifies potential funding sources for the projects identified, as well as Goals, Objectives, and Strategic Actions for the greatest opportunity in successful implementation of the plan. In all, the JP-CSAP presents an analysis of the problem, describes a history of the program, identifies available funding sources, and lays out a plan of action for the greatest likelihood of successful implementation of the program.


GOALS
Identify projects that prevent future damages
Identify strategies for potential funding
Enhance public awareness of future risks
OBJECTIVES
Find and develop opportunities
Ensure the Parish is represented
Ensure the Parish is prepared
Increase involvement
STRATEGIES
Seek state and federal grant funding
Undertake risk and vulnerability studies
Perform planning and design of projects
Monitor previously implemented projects
Promote public support


PO
Metairie
New Orleans
BA
Larose
Port Sulphur
BI
Marsh Creation
Shoreline Protection
Hurricane Protection
Other
Large Scale Projects
Regional Projects
Local Projects
Non-traditional Projects
N
0
5
10
Miles

Jefferson Parish Coastal Strategic Action Plan Projects

PROJECT ID	TYPE	PROJECT NAME
LARGE-SCALE PROJECTS		
WBA-01	Marsh Creation	West Barataria Marsh Creation Corridor Project
WBA-02	Marsh Creation	West Barataria Waterway Marsh Restoration
BA-21	Marsh Creation	Bayou Perot and Bayou Rigolettes Peninsula Restoration
LILD	Hurricane Protection	Lafitte Levees
REGIONAL PROJECTS		
BA-195	Marsh Creation	Barataria Bay Rim Marsh Creation
JP-15	Marsh Creation	Bay Dosgris Marsh Creation
JP-07	Marsh Creation	Bayou Dupont Sediment Delivery #4
BA-15	Shoreline Protection	Goose Bayou Ridge Creation and Shoreline Protection
BA-04	Marsh Creation	Northeast Turtle Bay Extension
JP-14	Marsh Creation	South Cheniere Traverse Bayou Marsh Creation
BA-02	Marsh Creation	Three Bayou Bay Marsh Creation
GILD-1	Shoreline Protection	Cheniere Caminada Breakwaters
GILD-7	Hurricane Protection	Grand Isle Back Levee
JP-09	Marsh Creation	Grand Isle Bayside Marsh Creation
JP-02	Marsh Creation	Bucktown Marsh Restoration and Living Shoreline
JP-03	Other	Lake Pontchartrain Marsh Protection Feasibility Study West
LOCAL PROJECTS		
JP-42	Other	Bayou Villars Channel Management
JP-41	Other	Lake Salvador / Bayou Perot Channel Management
JP-16	Marsh Creation	Northeast Lake Cataouatche Marsh Creation
JP-23	Marsh Creation	Upper Barataria Terracing Project
GILD-2	Shoreline Protection	Bayou Thunder Rock Dike Project
GILD-3	Marsh Creation	Cheniere Caminada Marsh Restoration
GILD-6	Marsh Creation	Fifi Island Restoration
GILD-5	Shoreline Protection	Grand Isle Bayside Segmented Breakwaters Completion
GILD-4	Shoreline Protection	Grand Isle Gulfside Segmented Breakwaters
JP-24	Marsh Creation	Lafreniere Marsh Restoration
JP-43	Marsh Creation	Laketown Breakwaters / Living Shoreline
NON-TRADITIONAL PROJECTS		
JP-22	Shoreline Protection	Northeast Pen Shoreline Protection
JP-35	Other	The Wetlands Center
WHARF	Other	Wetland Harbor Activities Recreational Facility
JP-08	Other	Jefferson Tree Planting
JP-21	Other	Severn Lakefront Restoration

Photo courtesy of PJ Hahn Photography

CHAPTER 3
INTRODUCTION

- Jefferson Parish Coastal Strategic Action Plan (JP-CSAP)
- JP-CSAP Goals, Objectives, and Strategies
- 2020 Hazard Mitigation Plan

3 INTRODUCTION

Louisiana's coast represents one of the largest estuaries in the world providing unique critical natural habitats, economic resources, and a natural barrier of protection to communities.

Photo courtesy of PJ Hahn Photography

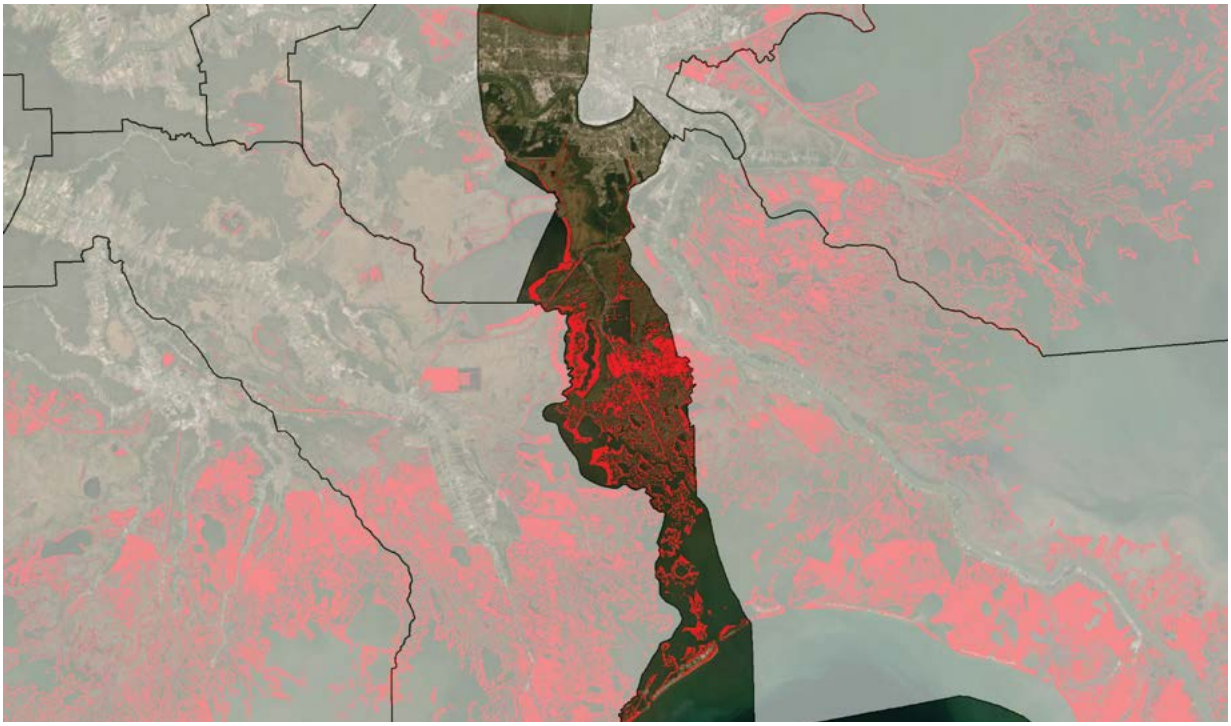
Coastal Louisiana also provides economic benefits through tourism, recreational fishing, commercial fishing, beaches, boating, oil and gas production, and port commerce and represents a major portion of the nation's seafood and energy supply. The Barataria Basin, which includes coastal Jefferson Parish, accounted for 23 percent of Louisiana's commercial seafood landings in 2019, valued at $60 million.

Coastal barrier islands and wetlands also serve a critical role as multiple lines of defense for storm surge dissipating wave energy and to protect upland communities from surge and storm flood impacts. The coastal community of Grand Isle and its other neighboring barrier islands take the initial brunt of a hurricane's force, thus protecting the 1.4 million plus residents of the greater New Orleans metropolitan area. It is estimated every 1 mile of wetlands reduces storm surge between 0.2 to 1.3 feet, depending on geography, vegetation type, storm direction, speed, and size (Wamsley et. al., 2010).

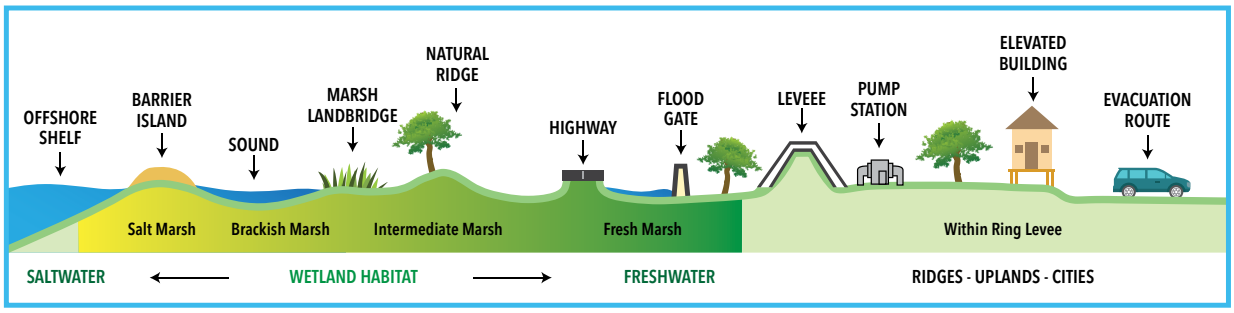
Due to the construction of the Mississippi River and Tributaries Levee System, subsidence, sea level rise, and increased oil and gas activity over the last century, Louisiana has lost approximately 2,000 square miles of land since the 1930s. Figure 1 shows the land loss in the Parish between 1932 and 2010. While local levees, the Mississippi River and Tributaries Levee System, and the Hurricane and Storm Damage Risk Reductions System (HSDRRS) have provided critical flood

control for development and economic growth, these protection systems have deprived the surrounding coastal ecosystems of needed sediment, fresh water, and nutrients essential to wetland sustainability. Additionally, navigation and oil and gas exploration and the resulting miles of canals and pipelines have altered hydrology and accelerated habitat degradation. These man-made alterations compound other land loss contributors to collectively reduce the natural landscape and its effectiveness as our first line of defense against hurricane events, posing an increasing substantial and real threat to the longevity and sustainability of the Parish and coastal Louisiana. Future coastal land loss estimates prepared as part of the 2017 Louisiana Coastal Master Plan modeling efforts indicate that, if no additional action is taken, an additional 2,250 square miles of coastal Louisiana could be lost in the next 50 years because of these factors.

Over the past several years, the region has been impacted by Hurricanes Katrina, Rita, Gustav, Ike, and Isaac, as well as the Deepwater Horizon oil spill, reinforcing the importance of restoring and sustaining barrier islands, marshes, swamps, and ridges that serve as multiple lines of defense because structural protection (levees, floodgates, floodwalls) alone cannot adequately safeguard communities as storm impacts become greater with the loss of coastal wetlands (Figure 2).



▲ **FIGURE 1:** Land Loss in Jefferson Parish between 1932 and 2010



▲ **FIGURE 2:** Multiple Lines of Defense

3.1 JEFFERSON PARISH COASTAL STRATEGIC ACTION PLAN

Recognizing the importance of this issue, the Parish has been actively engaged with the State of Louisiana, neighboring coastal parishes, levee districts, local communities, and the federal government's efforts to restore and protect coastal Louisiana.

The JP-CSAP is intended to be a subpart of Jefferson Parish's Hazard Mitigation Plan, which seeks to reduce the risk of loss throughout the Parish. It incorporates and builds upon numerous planning efforts, both local and state, undertaken to date that have been informed by numerous studies as well as planning efforts by local stakeholders, preliminary reconnaissance-level work done by Jefferson Parish, as well as the overarching Louisiana Coastal Master Plan development studies performed by the Coastal Protection and Restoration Authority (CPRA).

The JP-CSAP provides a list of priority projects for the Parish to focus efforts for traditional restoration and protection project types as well as "non-traditional," which includes other initiatives that are important socioeconomic drivers like outdoor recreation, workforce development, and resilience initiatives. Given the Parish's limited funding, it is important that decisions and actions be made in coordination with CPRA's and other agencies' objectives to maximize funding opportunities for the projects identified.

"Marsha" - Jefferson Parish Coastal Mascot

3.2 GOALS, OBJECTIVES, AND STRATEGIES

GOALS

Identify projects that prevent future damages to natural resources and the built environment from subsidence, sea level rise, and coastal land loss that are consistent with the goals of CPRA's Coastal Master Plan to the maximum extent practicable.

Identify strategies to maximize potential funding sources and create synergies among local, state, and federal partners.

Enhance public awareness of future risks and economic benefits of the Parish coastal environment.

OBJECTIVES

Find and develop opportunities to work with other agencies to leverage funds for projects and share information about risks and benefits.

Ensure the Parish is represented in the determination of regional, state, and federal project selection.

Ensure the Parish is prepared to maximize access to state/federal grant funds and other kinds of assistance.

Increase involvement with citizen and technical groups for communication of coastal risks and benefits.

STRATEGIES

Undertake risk and vulnerability studies for the refinement of projects.

Perform survey, geotechnical, and engineering of projects in a coordinated manner to maximize funding potential.

Monitor previously implemented projects to ensure functioning properly.

Promote public understanding, support, and demand for coastal restoration and protection efforts.

Seek state and federal grants to fund mitigation activities.

Implement elements of this Plan and monitor results.

3.3 HAZARD MITIGATION PLAN

Additionally, the JP-CSAP aligns with the goals, objectives, and strategies detailed in the 2020 Hazard Mitigation Plan (Jefferson Parish, 2020). Selected goals, objectives, and strategies are taken from Section 5 of this Plan describes the Parish's priorities for mitigation actions as follows.

HAZARD MITIGATION GOALS

No. 1	Identify and pursue preventive measures that will reduce future damages from hazards.
No. 2	Enhance public awareness and understanding of preparedness and risks through education and notification programs.
No. 3	Identify and pursue protective measures that will benefit the built environment and natural systems.
No. 5	Invest in structural and green infrastructure projects to manage future risk.

Photo courtesy of PJ Hahn Photography

HAZARD MITIGATION OBJECTIVES

No. 1	Reduce the exposure of residential areas to flooding and storm surge from the Mississippi River, Lake Pontchartrain, and the Gulf of Mexico.
No. 4	Find and develop opportunities to work with other agencies to leverage mitigation funds and to share information about the risks of natural hazards.
No. 6	Promote partnerships among federal, state, parish, interstate commissions, and local governments to identify, prioritize, and implement mitigation actions.
No. 7	Improve the Parish's Community Rating System rating through the National Flood Insurance Program to allow citizens to purchase flood insurance at a discounted price.
No. 8	Maintain continuity of operations and economic productivity of Parish businesses by preventing damage from hazards.
No. 9	Ensure the Parish maximizes its opportunities for access to state and federal grants and other kinds of assistance.
No. 12	Ensure the Parish continues to be represented in the determination of region-wide mitigation actions.
No. 13	Stay involved with citizen and technical groups concerning measures related to hazard mitigation.

HAZARD MITIGATION STRATEGIES

No. 1	Maintain awareness of the potential effects of natural hazards on Parish assets. Use new information from damaging events to increase local knowledge of risks.
No. 2	Undertake vulnerability and risk studies to better understand the potential for future damages.
No. 4	Implement cost-effective projects and actions to reduce risk from natural hazards for Parish assets and operations as well as for residents and businesses in the planning area.
No. 8	Monitor mitigation measures to ensure they are functioning efficiently.
No. 10	Continuously monitor this Plan to ensure that it remains current with regard to risks, strategies, priorities, and mitigation actions.
No. 11	Promote public understanding, support, and demand for hazard mitigation.
No. 13	Seek state and federal grants to fund mitigation activities.
No. 16	Implement elements of the Plan and monitor results.

CHAPTER 4

PREVIOUS INITIATIVES

Photo courtesy of PJ Hahn Photography

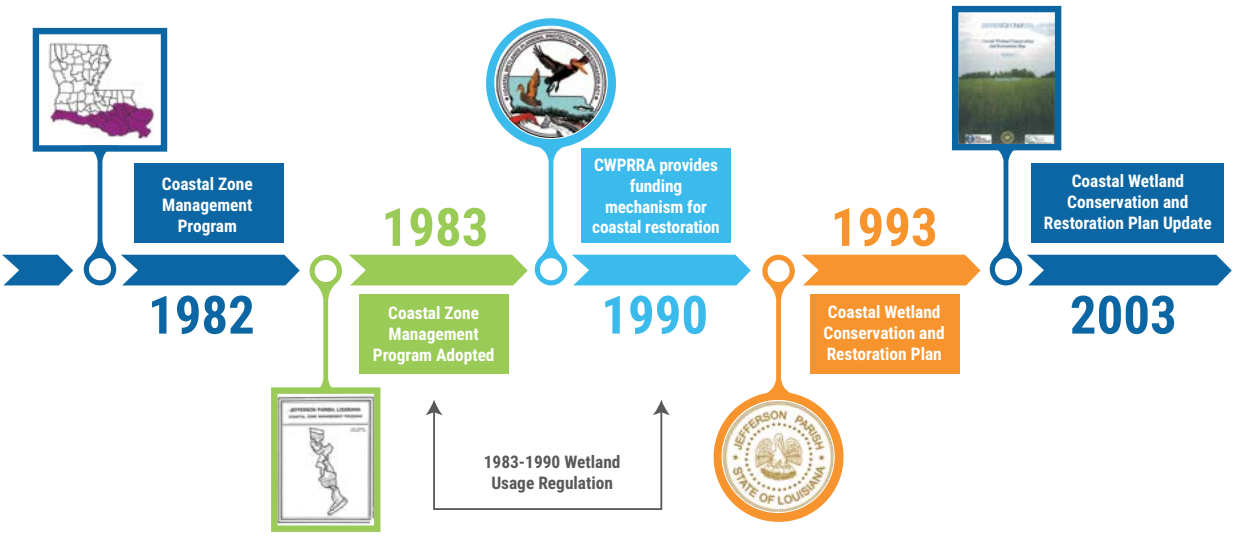
4 PREVIOUS JEFFERSON PARISH COASTAL INITIATIVES

MISSION STATEMENT

To aid in the management and restoration of Jefferson Parish's coastal resources through coordination with local, state, federal governments, and nongovernmental organization entities by reviewing proposed development, advocating for project funding, and educating stakeholders about regional ecosystem issues.

In response to the Louisiana and Local Coastal Resource Management Act of 1978 (Act 361), the first steps were initiated toward developing a coastal zone management program by identifying and studying the various issues and problems plaguing the coastline. Insight and information resulting from the Coastal Zone Management studies were used to compile a workable inventory of coastal resources, issues, problems, possible solutions and program guidelines, and an implementation plan (Jefferson Parish, 1982).

In May 1983, the Parish's first Coastal Zone Management Program was created and formally adopted (Jefferson Parish, 1982). This process identified the need for a Coastal Zone Administrator (Ordinance Nos. 15529, 15530, 15528) to lead all coastal-related efforts for the Parish. Over the next seven years, the Jefferson Parish Coastal Zone Management Program focused on wetland usage regulation through local coastal use permitting



under the Louisiana State and Local Coastal Resources Management Act of 1978 (Act 361, Louisiana Revised Statute 49:214.21 et seq). The passage of the Coastal Wetland Planning, Protection, and Restoration Act (CWPPRA), or "Breaux Act," in 1990 created a competitive source of funding for the implementation of coastal restoration projects in Louisiana, allowing the opportunity to address wetland loss within the Parish on a larger scale. Subsequently, in pursuit of aligning its coastal wetland standards with CWPPRA, the Parish developed a Jefferson Parish-wide Coastal Wetland Conservation and Restoration Plan (1993). This plan worked as a means of identifying, organizing, and prioritizing Jefferson Parish's coastal restoration goals and objectives. It was updated in 2003 and identified 26 projects focused on the creation, conservation restoration, enhancement, and management of coastal resources (Jefferson Parish, 2003).

In 2003, the Coastal Wetland Conservation and Restoration Plan was revised as the Jefferson Parish Coastal Protection and Restoration Plan (2015) to include new projects that may be eligible for funding through the Deepwater Horizon settlements, state surplus, Gulf of Mexico Energy Security Act (GOMESA) and CWPPRA (refer to Section 8.0, Funding). These projects focused on areas of greatest impacts and maximized funding opportunities for priority projects. Over the following years, the applicable requirements for the new funding sources became more clear and more defined, leading the way for an updated JP-CSAP to identify the best projects for the Parish to undertake or support, as well as applicable funding sources to utilize for implementation.

Since the 2015 plan's publication, many projects in the plan have been implemented through increased funding opportunities. Additional studies and plans have also been conducted by local communities that have been reviewed and incorporated into this document. These studies and plans are listed below:

- Town of Jean Lafitte Resiliency Plan (2012)
- Jefferson Parish Lakefront Restoration (2006)
- Louisiana's Strategic Adaptations for Future Environments (LA SAFE) Resiliency Plan (Jefferson Parish 2019)
- Bucktown Harbor Vision Book (Jefferson Parish 2018a)
- 2018 State of Jefferson Parish Coastal Protection and Restoration (2018)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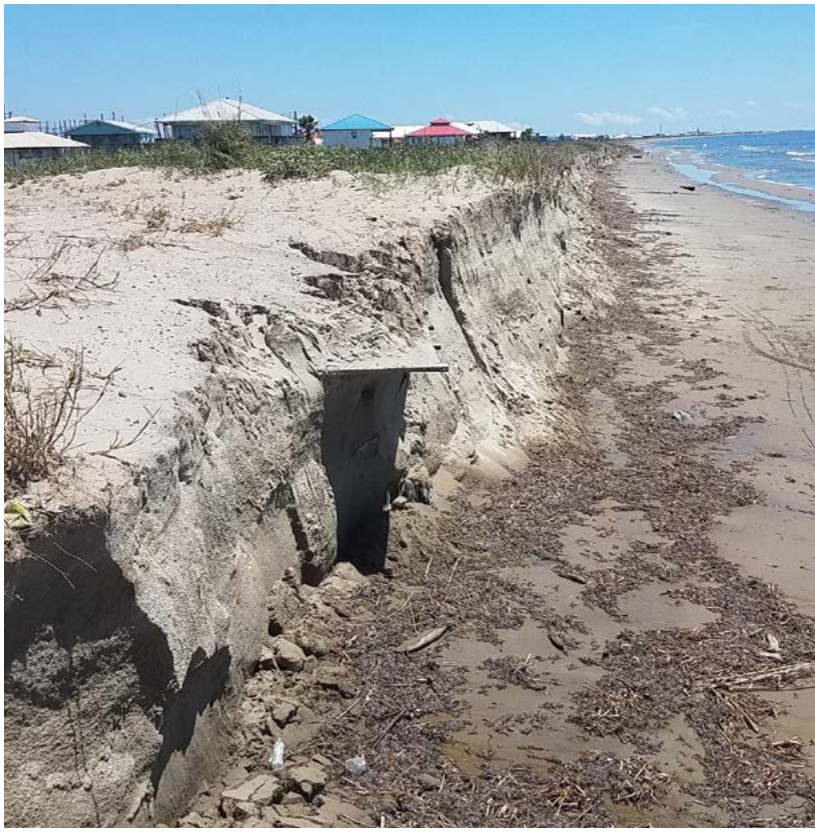
CHAPTER 5

LOUISIANA COASTAL MASTER PLAN

- History
- 2017 Louisiana Coastal Master Plan
- 2023 Louisiana Coastal Master Plan and Jefferson Parish Submittals

5 LOUISIANA COASTAL MASTER PLAN

Following the impacts to coastal Louisiana caused by Hurricanes Katrina and Rita, it became important to integrate approaches to coastal restoration and hurricane protection under a new singular authority with a mission and emphasis on coordinating restoration and protection efforts to reduce storm flood risks and ensure a safe, sustainable, and working coast (CPRA, 2017a).



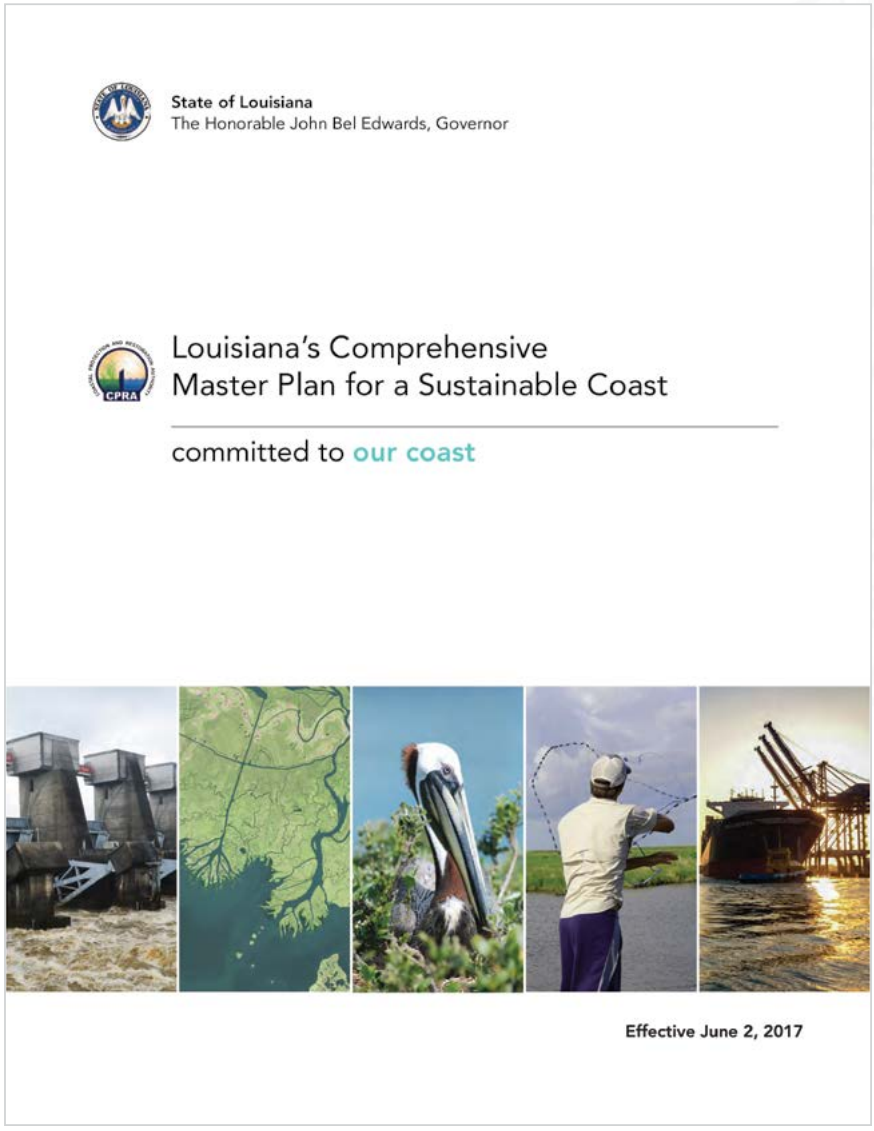
5.1 HISTORY

In 2005 the Louisiana Legislature passed Act 8, which created CPRA. Act 8 directed CPRA to lead efforts regarding hurricane protection and the protection, conservation, restoration, and enhancement of coastal wetlands and barrier shorelines or reefs and further defined the "coastal area" as the Louisiana Coastal Zone and contiguous areas that are subject to storm or tidal surge. It also charged CPRA with developing and implementing a Louisiana Coastal Master Plan that would be updated every 5 (now 6) years. This Louisiana Coastal Master Plan provides a long-term vision for coastal Louisiana and is the vehicle for coordinating Louisiana's local, state, and federal level responses to land loss and potential threats from hurricanes and storm surge events. It provides a 50-year horizon list of projects that build/maintain land and reduce risk to our communities by seeking to improve flood protection, harness the natural processes that built Louisiana's coastal landscape, sustain our unique cultural heritage, and ensure that our coast continues to be both a Sportsman's Paradise and a hub for commerce and industry (CPRA, 2017a).

The first Louisiana Coastal Master Plan, the 2007 "Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast," was unanimously passed by the Louisiana Legislature. The 2007 and subsequent 2012 Louisiana Coastal Master Plans established the foundation of the Louisiana's overarching principles and objectives, serving as the policy and implementation guide to focus Louisiana restoration and protection efforts (CPRA, 2007, 2012). The 2012 version provided for a 50-year, $50 billion vision, which CPRA would concentrate on implementing, that would identify specific structural, non-structural, and restoration projects that had the greatest potential to reduce storm-induced flood risk (CPRA 2012). The JP-CSAP seeks to serve as a guide for Parish actions that will be consistent with the objectives of the Louisiana Coastal Master Plan, understanding the relationship and common goals and objectives to maximize funding opportunities for projects identified in the JP-CSAP.

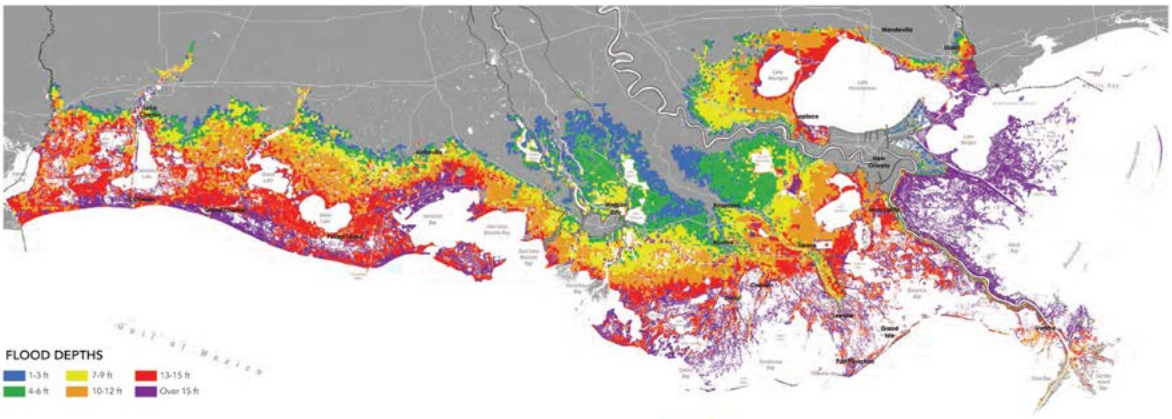
5.2 2017 LOUISIANA COASTAL MASTER PLAN

The 2017 Louisiana Coastal Master Plan, Louisiana's Comprehensive Master Plan for a Sustainable Coast, includes 124 projects that build or maintain more than 800 square miles of land and projects to reduce expected damages by $8.3 billion annually by year 50, totaling more than $150 billion over the plan's 50-year horizon. Six of the 124 projects are included wholly or partially in Jefferson Parish, which include structural and non-structural risk reduction as well as restoration initiatives (Table 1 and Figure 3).



FLOOD RISK TO OUR COMMUNITIES

PREDICTED FUTURE RISK FROM A 100-YEAR FLOOD EVENT WITH NO ADDITIONAL ACTION



▲ FIGURE ES.3
Estimated flood depths for a 100-year flood 50 years from now under the Medium Environmental Scenario with a degraded landscape and no additional flood protection.

LOUISIANA IS DEVELOPING A BLUEPRINT FOR SUCCESS

In response to continued land loss and increasing flood risk and to improve the sustainability of our coastal landscape, communities, and economic future, Louisiana relies on the master plan process to identify and implement robust solutions to counter and address known and anticipated threats. Working in partnership with our local, state, regional, and federal partners, we are building our future together.

The intrinsic value of our coast as home to millions of f… vibr… the… The… to f…

implementing strategic measures to reduce and mitigate risk and to improve the sustainability of the coast. By doing so, we improve the resilience of our economies, increase protection for Louisiana homes and businesses, improve the health of our coastal ecosystem, and support the future of our unique culture and communities.

The master plan approach that was implemented with our first plan in 2007 and the technical tools we have developed can be used as a framework

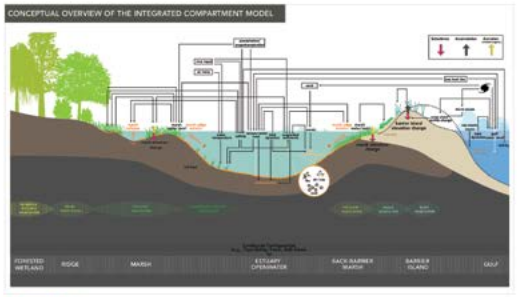
OUR CHALLENGES

Every day, the lives and livelihoods of our residents are affected by the challenges and consequences of land loss in coastal areas. A family may be compelled to leave a community their family has called home for generations to move out of harm's way. A local business or individual may have trouble obtaining insurance, or an investment may lose value because of uncertainty about the future of our ever-changing landscape.

Photo courtesy of Louisiana Sea Grant

ENVISIONING OUR FUTURE COAST

PREDICTIVE MODELS ANALYZE PROCESSES DRIVING COASTAL LAND AND ECOSYSTEM CHANGE AND ESTIMATE DIRECT ECONOMIC DAMAGE FROM COASTAL FLOODING

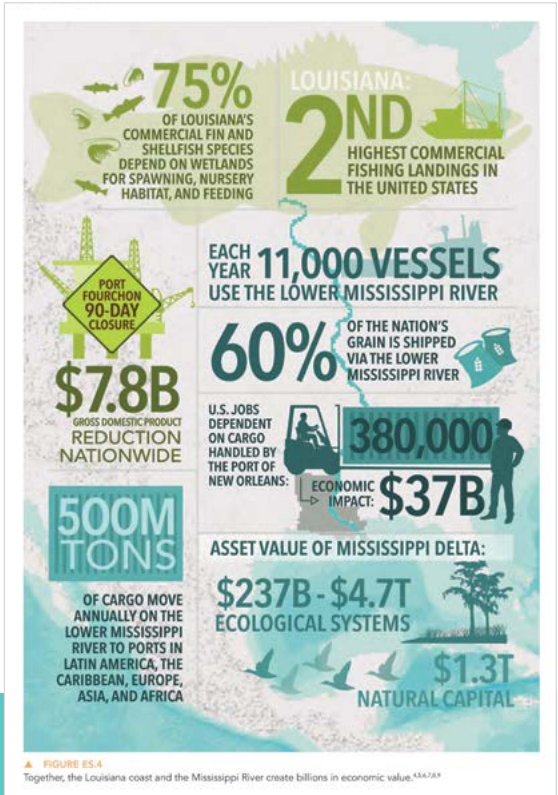


▲ FIGURE 3.5
This cross section conceptually illustrates the physical and vegetative processes represented in the model.

The Integrated Compartment Model (ICM) illustrated above represents natural processes that drive coastal land and ecosystem change. The model analyzes hydrodynamic variables such as salinity and water level, water quality, changes in land area and elevation (including the barrier islands), changes in vegetation location and type, and habitat suitability and community dynamics for various species. Simply put, the ICM predicts future landscape and ecosystem conditions and the effects restoration and risk reduction projects have on those conditions.

The Risk Assessment Models evaluate the effects of projects on storm surge and wave heights from tropical events of different sizes and intensities and identify flood depths associated with different frequencies of inundation across the coast (for example, the depth expected for a 100-year flood event). The models then predict how future coastal changes could lead to increased risk of damage from storm surge based flooding to residential buildings, vehicles, agricultural crops, ports, transportation infrastructure, and commercial assets (including heavy industrial). The possible failure of structural protection systems is also factored in. Further, the models provide an estimate of direct economic damage from coastal flooding and assess the degree to which potential master plan projects could reduce this type of risk.

We used Predictive Model outputs to evaluate individual restoration and risk reduction projects as well as alternatives (or groups of projects) under multiple environmental scenarios. The analysis helped CPRA understand project effects on land loss and land gain and how those landscape changes affect coastal habitats and fish and shellfish biomass across the coast over time. The analysis also helped CPRA estimate the effects of projects on flood depths and direct economic damage. Predictive Models work together to provide a holistic view of our coastal environment today and the changes we can expect over the next 50 years.



▲ FIGURE ES.4
Together, the Louisiana coast and the Mississippi River create billions in economic value.[4,5,6,7,8,9]

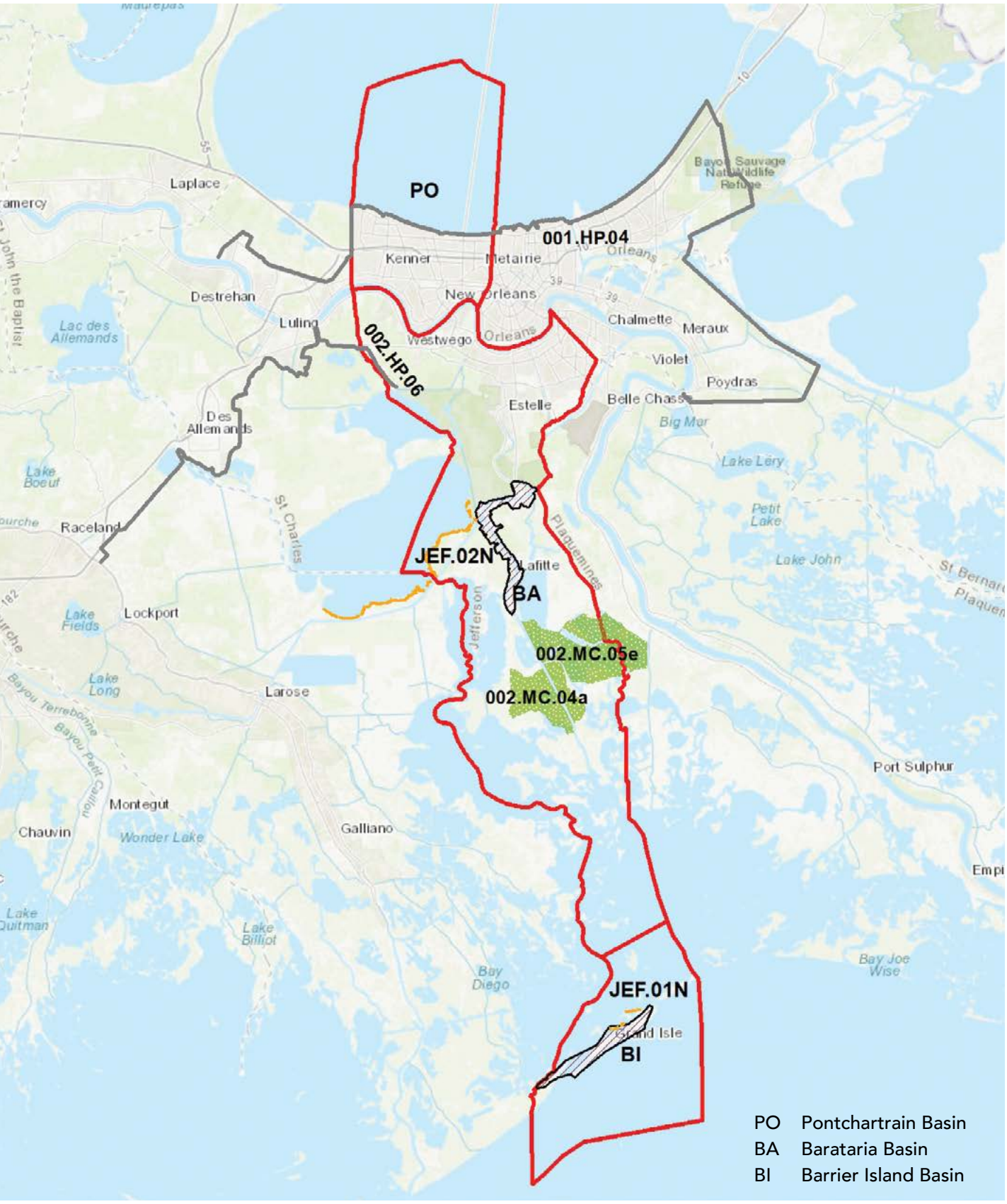
80,601 Acres of Land Loss in Jefferson Parish without the 2017 Louisiana Coastal Master Plan

Jefferson Parish 2017 Louisiana Coastal Master Plan Projects

Project Type: CPRA Project ID	Project Name	Description	Implementation Period	Cost
Structural Risk Reduction: 002.HP.06	Upper Barataria Risk Reduction	Construction of a levee to an elevation between 12.5 and 15 feet along Highway 90 be-tween the West Bank and Larose. Project includes earthen levees, T-wall, sluice gates, barge gate, swing gates, and pump stations.	Years 1-30	$940.9M
Non-structural Risk Reduction: JEF.01N	Grand Isle Non-structural Risk Reduction	Project includes floodproofing non-residential properties, elevating residential properties, and acquiring residential properties.	Years 1-30	$98.2M
Non-structural Risk Reduction: JEF.02N	Lafitte/Barataria Non-structural Risk Reduction	Project includes floodproofing non-residential properties, elevating residential properties, and acquiring residential properties.	Years 1-30	$200.8M
Structural Risk Reduction: 001.HP.04	Greater New Orleans High Level	Improvements of existing Hurricane and Storm Damage Risk Reduction System levees surrounding the East Bank of Greater New Orleans to elevations between 19 and 35 feet. Project features include earthen levee and T-wall.	Years 31-50	$2,222.7M
Marsh Creation: 002.MC.05e	Large-Scale Barataria Marsh Creation - Component E	Creation of approximately 12,900 acres of marsh in the Barataria Basin south of the Pen to the Barataria Landbridge to create new wetland habitat and restore degraded marsh.	Years 11-30	$674.5M
Marsh Creation: 002.MC.04a	Lower Barataria Marsh Creation	Creation of approximately 7,400 acres of marsh in Jefferson Parish on the east shore of Little Lake and Turtle Bay to create new wetland habitat and restore degraded marsh.	Years 31-50	$709.5M

HP Hurricane Protection.
M Million.
MC Marsh Creation.

▲ TABLE 1



▲ **FIGURE 3:** Jefferson Parish 2017 Louisiana Coastal Master Plan Projects

Photo courtesy of PJ Hahn Photography

5.3 2023 LOUISIANA COASTAL MASTER PLAN & JEFFERSON PARISH SUBMITTALS

As with preceding master plans, the 2023 Louisiana Coastal Master Plan will build upon previous efforts to ensure that projects build and/or sustain land and provide storm sure-based flood risk reduction. Future modeled environmental conditions dictate that investments must have effects at the sub-basin to regional scale to be considered for evaluation under the 2023 Louisiana Coastal Master Plan.

As a result, in March 2019 the Parish submitted their proposed projects to CPRA for evaluation and inclusion in the 2023 Louisiana Coastal Master Plan (Table 2 and Figure 4). These projects represent a potential total investment of $2.5 billion to the region and were developed in conjunction with Plaquemines and Lafourche Parishes to ensure that the projects provide basin- to regional-scale benefits.

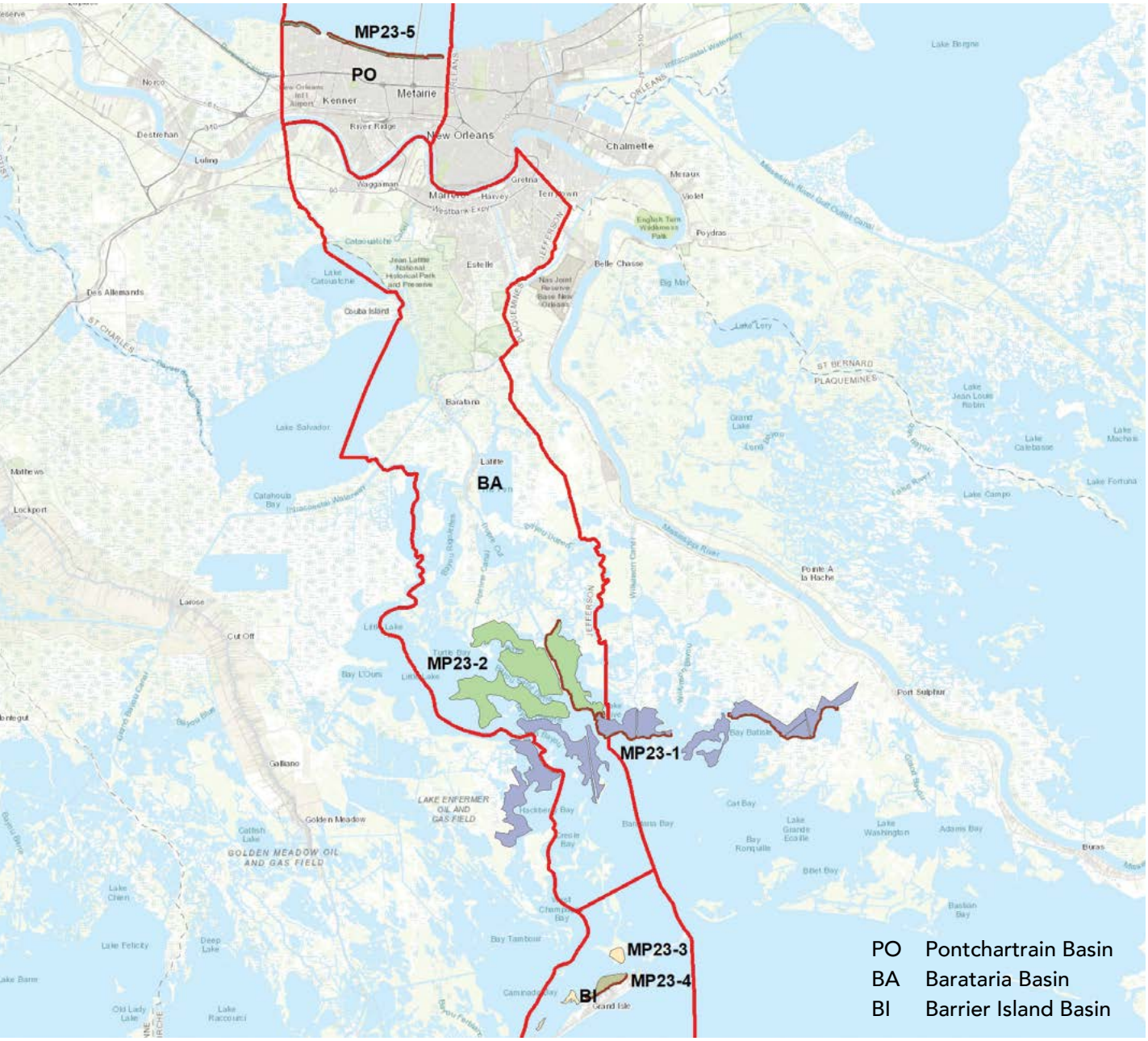
Photo courtesy of PJ Hahn Photography

Jefferson Parish 2023 Louisiana Coastal Master Plan Project Submittals

Project Type: Project ID	Project Name	Description	Cost
Marsh Creation/ Ridge Restoration: MP23-1	Barataria Bay Headland and Marsh Creation	The objective of the Barataria Bay Headland and Marsh Creation project is to create a system of ridges and marsh at the Barataria Bay Headland to protect Lafourche, Jefferson, and Plaquemines Parishes. The marsh and ridges connect Bayou L'Ours in Lafourche Parish to Grand Bayou and Bayou Grand Chenier in Plaquemines Parish. The project entails the sequenced construction of 15,160 acres of marsh and 134 acres of ridge (72,967 feet) to protect Lafourche, Jefferson, and Plaquemines Parishes.	$1,149M
Marsh Creation/ Ridge Restoration: MP23-2	Bayou Barataria Ridge and Marsh Creation	The objective of the Bayou Barataria Ridge and Marsh Creation project is to restore a portion of the historical ridge and marshes that occurred along Bayou Barataria. The project calls for the construction of 13,960 acres of marsh and 77 acres of ridge (41,889 feet).	$1,043M
Marsh Creation: MP23-3	Caminada Bay Marsh Creation	The objective of the Caminada Bay Marsh Creation project is to protect the Barrier Islands, including Grand Isle and Caminada Headland, through the construction of 1,585 acres of bayside marsh.	$120M
Marsh Creation/ Ridge Restoration: MP23-4	Fifi Island Ridge and Marsh Creation	The objective of the Fifi Island Ridge and Marsh Creation project is to protect the Barrier Islands, particularly Grand Isle, through the construction of 638 acres of marsh and 26 acres of ridge (14,491 feet).	$53M
Marsh Creation: MP23-5	Lake Pontchartrain Marsh Protection	The objective of the Lake Pontchartrain Marsh Protection project is to create 491 acres of marsh with breakwaters to reduce storm induced wave conditions on the Hurricane and Storm Damage Risk Reduction System, Lake Pontchartrain and Vicinity hurricane protection project and its protected communities	$135M

M Million.
MP23 2023 Louisiana Coastal Master Plan.

▲ TABLE 2



▲ **FIGURE 4:** Jefferson Parish 2023 Louisiana Coastal Master Plan Project Submittals

CHAPTER 6

JEFFERSON PARISH EXISTING CONDITIONS

- Environment
- Coastal and Jefferson Parish Basins
- Geology
- Subsidence and Sea Level Rise
- Land Loss Rates

6.1 | ENVIRONMENT

Jefferson Parish is a diverse community extending from the southern shore of Lake Pontchartrain 55 miles south to the beaches along the Gulf of Mexico. The Parish lies in southeastern Louisiana and is also bordered by Orleans and Plaquemines Parishes to the east and Lafourche and St. Charles Parishes to the west (Figure 5).

The northern areas of the Parish are highly populated and surrounded by the HSDRRS. This area of the Parish is mostly urbanized and is part of the New Orleans Metropolitan Area with a variety of established land uses including residential, commercial, industrial, institutional, transportation, and other public infrastructure uses.

The southern part of the Parish, outside the HSDRRS, is less populated and is characterized by estuarine systems that lead to the Gulf of Mexico with the major coastal incorporated communities being the Town of Lafitte and the Town of Grand Isle. The coastal marshes, wetlands, and estuaries contain numerous bodies of shallow water. These bodies of water and wetlands make up more than 85 percent of Jefferson Parish and provide 234,320 acres of beneficial natural floodplain function.

6.2 COASTAL AND JEFFERSON PARISH BASINS

The State of Louisiana is organized in nine Coastal Basins, and Jefferson Parish lies within the Barataria and Pontchartrain Coastal Basins (Figure 5). These Coastal Basins correspond to the watersheds in Jefferson Parish and are separated by the Mississippi River. The descriptions of the Coastal Basins below are taken from CWPPRA (2020).

▲ **FIGURE 5:** Louisiana Coastal Basins

PONTCHARTRAIN COASTAL BASIN

The Pontchartrain Coastal Basin in Jefferson Parish consists of the area from Lake Pontchartrain south to the Mississippi River. This Coastal Basin is an abandoned delta that extends east to Chandeleur Sound and is bounded by the Mississippi River and the Mississippi River Gulf Outlet on the south. All or portions of 10 parishes lie within the Pontchartrain Coastal Basin: Ascension, Jefferson, Livingston, Orleans, St. Bernard, St. Charles, St. James, St. John the Baptist, St. Tammany, and Tangipahoa.

The Mississippi River and Tributaries Levee System significantly restricts the input of fresh water, sediment, and nutrients input into the Pontchartrain Coastal Basin. This reduction in fresh water input plays a part in one of the major critical problems related to erosion in the Pontchartrain Coastal Basin, increasing salinity and subsidence.

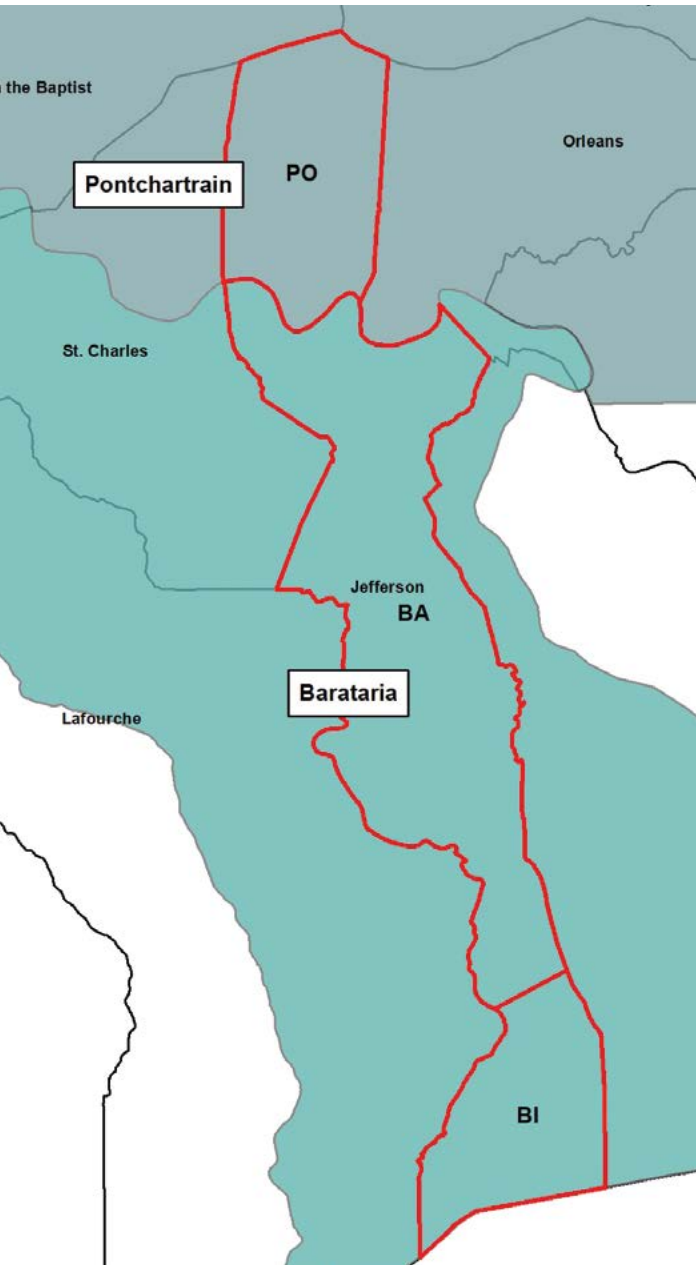
BARATARIA COASTAL BASIN

The Barataria Coastal Basin in Jefferson Parish consists of those areas south of the Mississippi River. It is bounded on the north and east by the Mississippi River, to the south by the Gulf of Mexico, and on the west by Bayou Lafourche. The Barataria Coastal Basin is bounded on each side by a distributary ridge formed by present and former channels of the Mississippi River. A chain of barrier islands including Grand Isle separates the Barataria Coastal Basin from the Gulf of Mexico. Portions of nine parishes occur in the Barataria Coastal Basin: Assumption, Ascension, St. James, Lafourche, St. John the Baptist, St. Charles, Jefferson, Plaquemines, and Orleans.

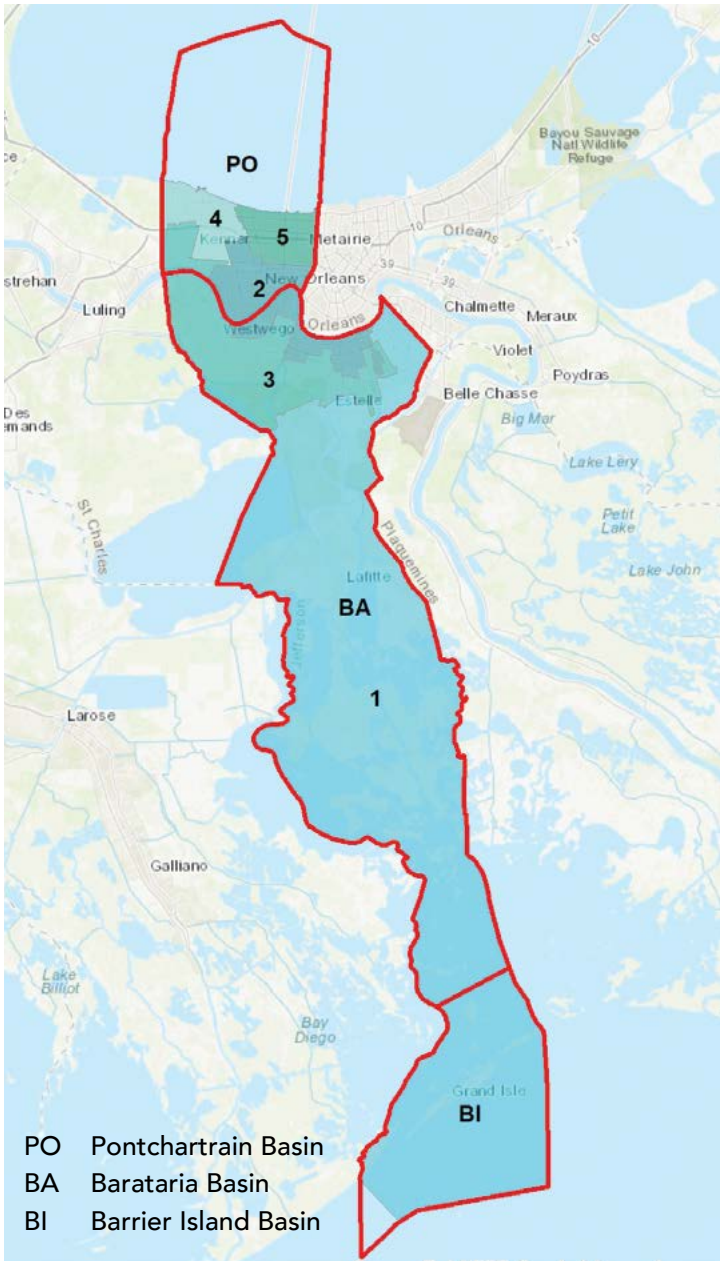
Fresh water and sediment input to the Barataria Coastal Basin was almost eliminated by the construction of the Mississippi River and Tributaries Levee System and the closure of Bayou Lafourche at Donaldsonville, which haves contributed to erosion and subsidence within the basin. On the north side of the basin, fresh water from the Mississippi River is introduced at the Davis Pond Diversion in St. Charles Parish, with a discharge capacity of 10,650 cubic feet per second (Mississippiriverdelta.org, 2020a), and on the east side in Plaquemines Parish through the Naomi and West Point a la Hache siphons, each with a capacity of 1,500 cubic feet per second. CPRA is currently in the permitting process for construction of the Mid-Barataria Sediment Diversion near Myrtle Grove, Louisiana, in Plaquemines Parish, which is expected to provide a flow up to 75,000 cubic feet per second.

JEFFERSON PARISH BASINS

The JP-CSAP generally follows the CPRA and CWPPRA delineations of the Coastal Basins (see Figure 5). For this Plan, the Barataria Coastal Basin is further divided into two distinct basins as shown in Figure 6, creating three basins in Jefferson Parish: the Pontchartrain Basin, Barataria Basin and Barrier Islands Basin. The Barataria Basin is further delineated based on the unique challenges, needs, and projects associated with the different geological makeup of the Barataria and Barrier Island (Basins. Figure 7 shows the JP-CSAP Basins overlaid with the Jefferson Parish Council Districts.



▲ **FIGURE 6:** Pontchartrain and Barataria Coastal Basins and JP-CSAP Basins



▲ **FIGURE 7:** Jefferson Parish Basins and Council Districts

Photo courtesy of PJ Hahn Photography

PONTCHARTRAIN BASIN MAJOR INITIATIVES

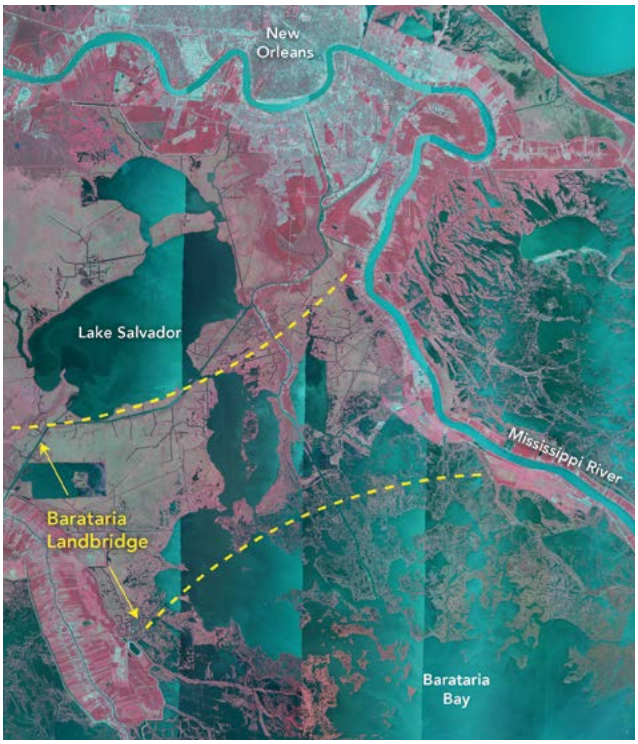
The Pontchartrain Basin, from Lake Pontchartrain south to the Mississippi River and from the St. Charles Parish line to the Orleans Parish line, includes portions of Council Districts 2 and 3 north of the Mississippi River as well as Council Districts 4 and 5 (see Figure 7). This basin includes the incorporated areas of Kenner and Harahan and the unincorporated areas of Kenner, Jefferson, Metairie, and River Ridge.

Within Jefferson Parish, the Pontchartrain Basin is unique because the vast majority of the basin is encapsulated by the HSDRRS and drainage is almost completely controlled mechanically by pumping stations. The area within the HSDRRS is experiencing subsidence that will be addressed through the 2020 Hazard Mitigation Plan and other smaller restoration projects.

Major initiatives outside the HSDRRS are focused on the Lake Pontchartrain Lakefront for the purpose of shoreline protection, recreation, and economic development. With the success of the Bucktown Boardwalk Marsh Creation and Living Shoreline, the objective is to continue to evaluate implementation of this strategy west to the St. Charles Parish boundary.

BARATARIA BASIN MAJOR INITIATIVES

The Barataria Basin spans from the Mississippi River to a point in Barataria Bay just north of Mendicant Island. This includes the portion of Council District 2 south of the Mississippi River, Council District 3, and Council District 1, including the incorporated areas of Westwego, Gretna, and Town of Lafitte and the unincorporated areas of Avondale, Marrero, and Harvey (see Figure 7).



Outside the HSDRRS, the Barataria Basin is experiencing the greatest loss of wetlands as a result of subsidence, surficial erosion, and saltwater intrusion due to reduced river input and increased natural and man-made channelization, which are the greatest factors associated with the loss of wetlands. Unmitigated wetland loss in this basin will increase the storm surge flood risk for the areas of Lafitte and in the southern area of Jefferson Parish.

Major initiatives outside the HSDRRS are focused on marsh creation, recreation, economic development, and structural protection for the Town of Lafitte. The major areas of focus for restoration projects are the completion of the Barataria Landbridge and Barataria Bay Rim. The Barataria Basin serves in the Multiple Lines of Defense Strategy to protect the Pontchartrain Basin and the HSDRRS to the north.

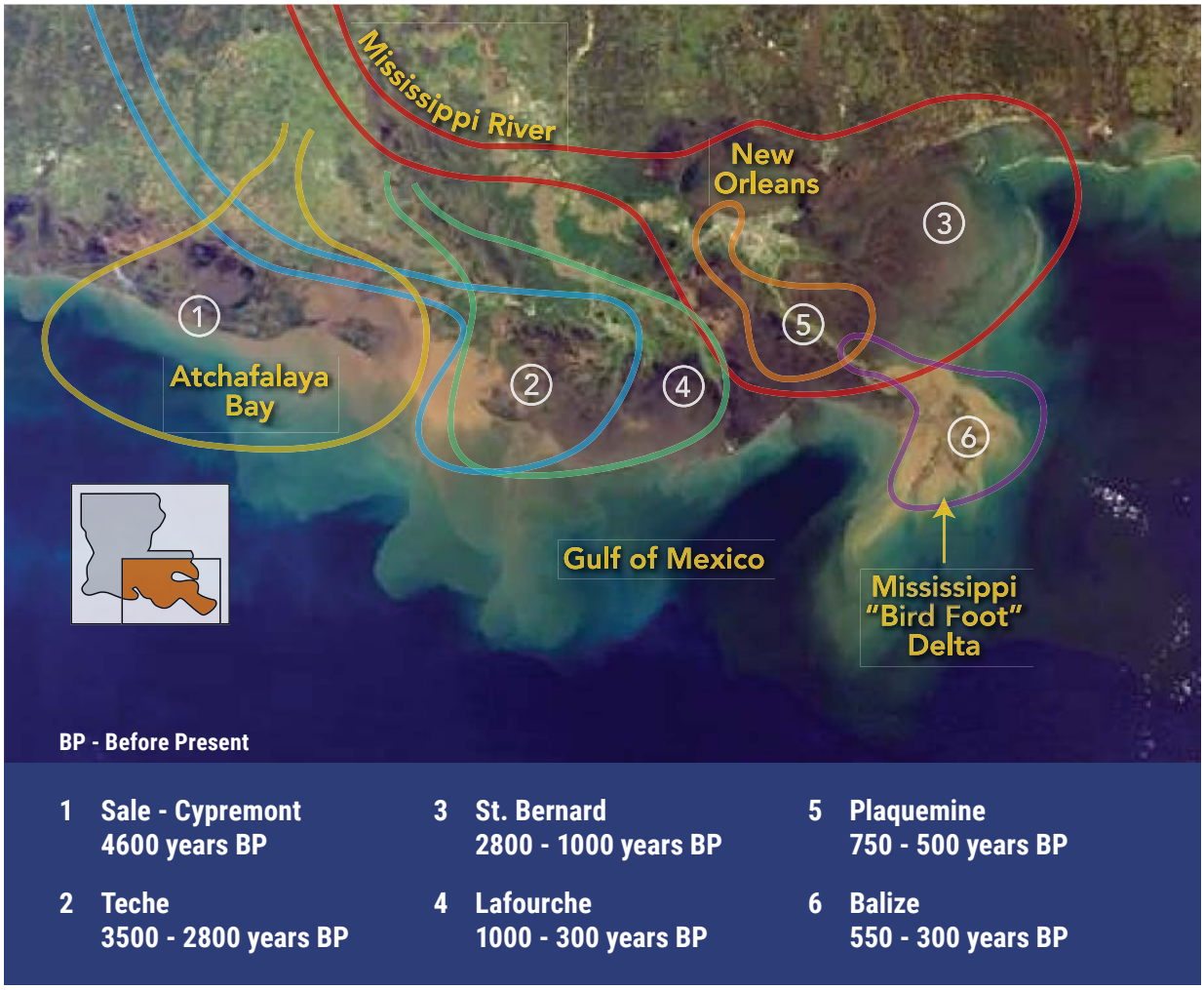
BARRIER ISLANDS BASIN MAJOR INITIATIVES

The Barrier Islands Basin, from just north of Mendicant Island to the Gulf of Mexico, includes Council District 1. District 1 includes the incorporated municipality of the Town of Grand Isle, Louisiana's only inhabited barrier island (see Figure 7).

The greatest factor for wetlands loss within this basin is subsidence, surficial erosion, and storm-related high surge and wave events. Major initiatives include marsh creation, barrier island restoration, shoreline protection, economic development, recreation, and structural protection for the Town of Grand Isle. The Barrier Islands Basin serves as the first line in the Multiple Lines of Defense Strategy to protect populated areas to the north.

6.3 GEOLOGY

The geologic development of the Louisiana coast was the result of an active delta cycle, a process by which a river naturally changes course, depositing material as part of the natural delta building process. In this process, the river continues to build a section of land called a "delta lobe." As each delta lobe is created, the natural land mass begins to restrict river flows, causing the river to change course by abandoning the older lobe for a shorter route to the Gulf of Mexico (Mississippiriverdelta.org, 2020b). The formation of the Barataria Basin in Jefferson Parish was part of the Lafourche Delta, which was active 1,000 to 300 years Before Present (Figure 8).

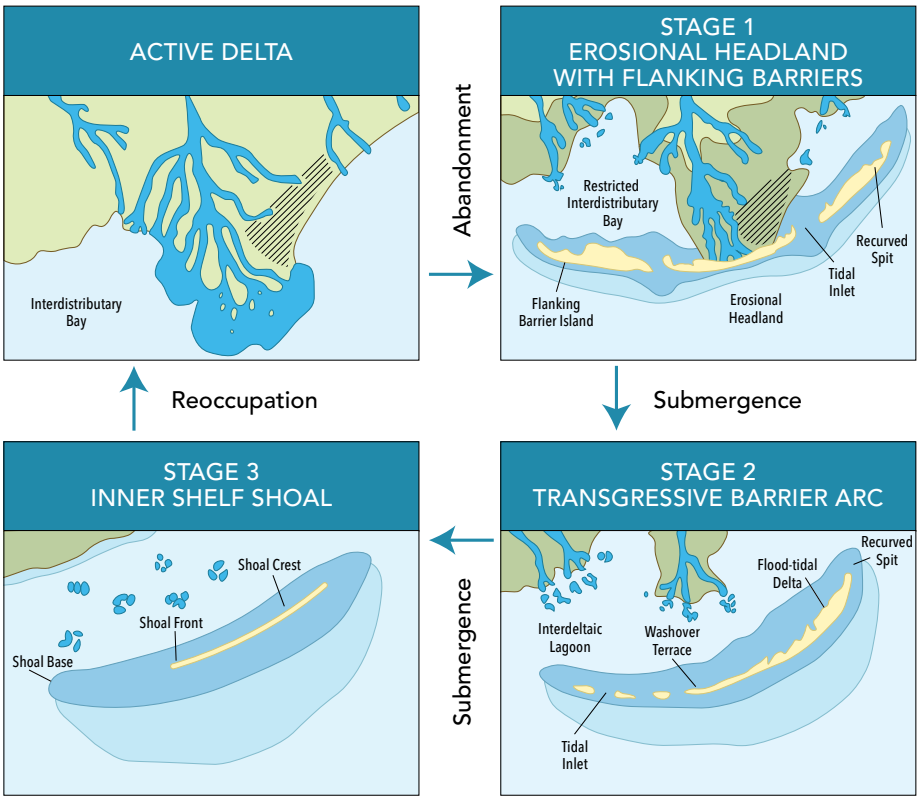


▲ **FIGURE 8:** Historic Mississippi River Delta Lobes (courtesy mississippiriverdelta.org)
Source: (Mississippiriverdelta.org, 2020b)

Extensive research and studies have been done on the evolution of the and the Barataria Basin as well as barrier island formation (Roberts, 1997) (Coleman, 1998) (Fitzgerald, 2004) (Penland and Boyd, 1981) (Penland et al., 1988).

As shown in Figure 9, the abandoned delta stages contribute to land loss within the basin.

Stage 1	Once the natural river delta land building is abandoned, and in the case of the Barataria Basin, which was artificially restricted with the construction of the Mississippi River and Tributaries Levee System, the "delta retreat" phase begins. During this phase, waves and tides continue to pull sediment out of the system, while the new geologic feature continues to settle and slowly submerge over time (subsidence) (Louisiana Department of Natural Resources, 2007). As part of the Lafourche Delta, the Barataria Basin (including Grand Isle) is in the Erosional Headland with Flanking Barriers phase of the Transgressive Mississippi Delta Barrier Model.
Stage 2	With the new interface of fresh water and saltwater, these subsiding abandoned deltas become highly productive estuaries. The geologic process after the natural delta of the river is abandoned is known as the Transgressive Mississippi Delta Barrier Model and has been detailed extensively by Penland and Boyd (1981) and Penland et al., (1988) and is shown in Figure 9. As part of the Lafourche Delta, the Barataria Basin in Jefferson Parish (including Grand Isle) is in the Erosional Headland with Flanking Barriers Stage.
Stage 3	The Inner Shelf Shoal Stage occurs when The Transgressive Barrier Arc (Stage 2) retreats landward and is being submerged due to sea level rise and, coupled with the retreating mainland shoreline, results in submergence of the land.



▶ **FIGURE 9:** Transgressive Mississippi Delta Barrier Model and the Evolution of the Abandoned Mississippi River Delta (from Penland et al., 1988).

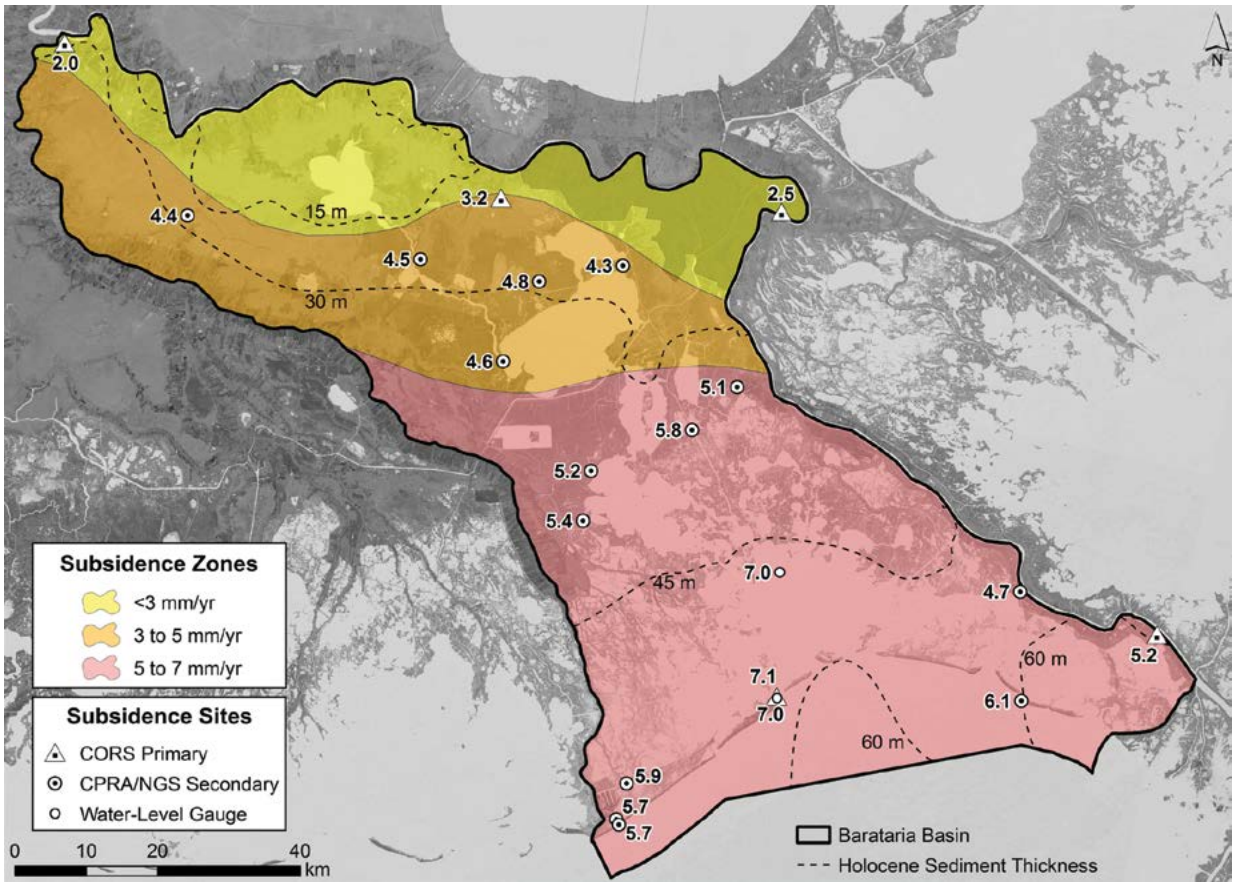
6.4 SUBSIDENCE & SEA LEVEL RISE

Subsidence and Sea Level Rise are summarized below to provide a better understanding of their importance in coastal restoration.

SUBSIDENCE

Regional subsidence is attributed to the abandoned delta geologic process. During this process, the new land formation created by the delta lobe continues to settle over time in the absence of new material being deposited by the river into the system. Localized subsidence can be accelerated by the removal of groundwater or gases and fluids from oil and gas activity. Land loss associated with subsidence occurs when the water level threshold for native intertidal plant species is exceeded, causing a collapse of the intertidal vegetation and the conversion of marsh to open water.

Land loss from subsidence occurs when the water level threshold for native intertidal plant species is exceeded, causing a collapse of the vegetation and conversion of marsh to open water.



▲ **FIGURE 10:** Recent Subsidence Rates for Barataria Basin (Byrnes, 2019).

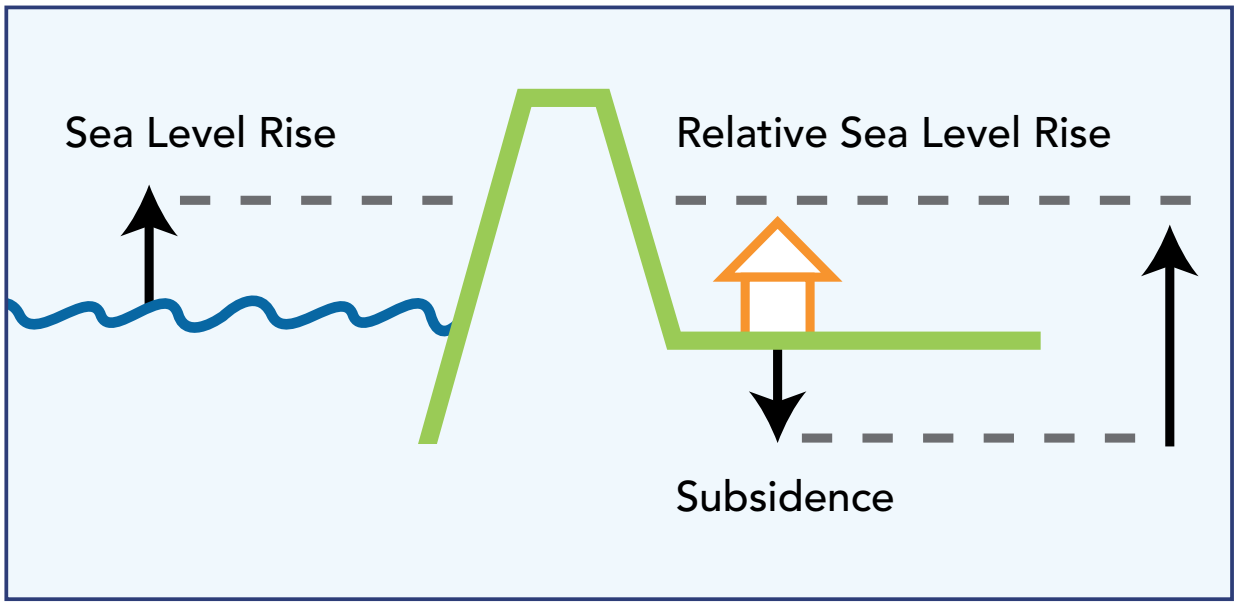
The 2017 Louisiana Coastal Master Plan estimated that the rate of subsidence ranges from 0 to 35 millimeters (0 to 1.4 inches) per year. Recent studies to assess the rate of subsidence in the Barataria Coastal Basin includes a study that measured subsidence rates at 21 locations throughout the basin (Byrnes, 2019). Resulting subsidence rates throughout the basin ranged from 2 to 7 millimeters (0.08 to 0.28 inch) per year, with the subsidence rates highest in the southern portion of the Barataria Coastal Basin near the area identified in this Plan as the Barrier Island Basin. Figure 10 shows the regional subsidence rates measured across the basin.

SEA LEVEL RISE

Sea level rise is caused by the warming of the ocean, causing sea water to expand in volume and the melting of continental ice shelves increasing the amount of water in the oceans. Eustatic sea level changes are global sea level changes related either to changes in the volume of glacial ice on land or to changes in the shape of the sea floor caused by plate tectonic processes.

Sea levels have been increasing around the world over the past century, and in recent decades the rate of rise has also increased. According to the National Oceanic and Atmospheric Administration (NOAA), the 2014 global sea level was 2.6 inches above the 1993 average, and sea levels are continuing to rise at a rate of about one-eighth inch per year (NOAA, 2020). For the purposes of the JP-CSAP, the 2017 Louisiana Coastal Master Plan estimates that, under the Medium Environmental Scenario, eustatic sea level rise would be 2.07 feet (0.63 meter) over the next 50 years (from 2015 to 2065) (CPRA, 2017b).

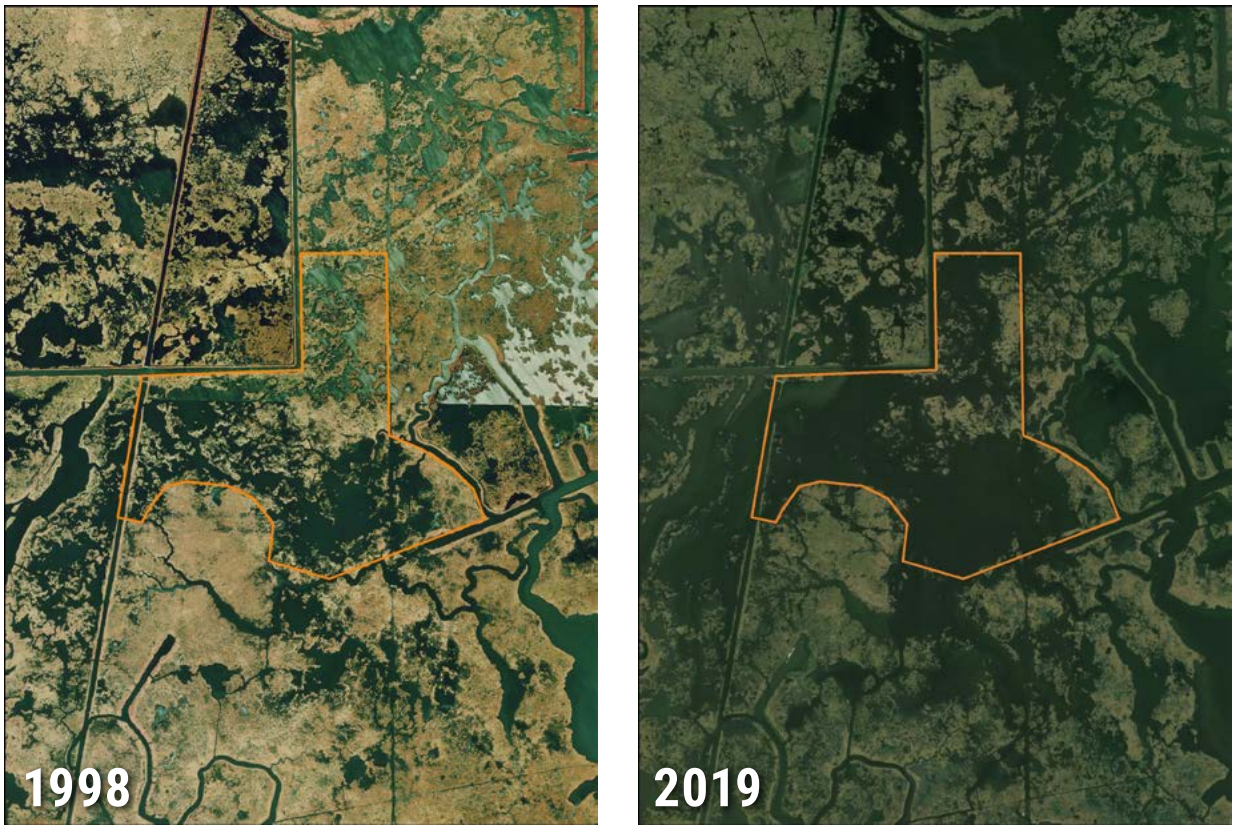
Relative sea level rise is the combination of sea level rise and subsidence. Relative sea level rise contributes to the loss of coastal wetlands, which provide protective buffers from flood events, beach erosion, impacts on population and property in low-lying areas, and disruption of coastal habitats and species. Further, flooding and hurricane events are more severe and affect a greater area.



6.5 LAND LOSS RATES

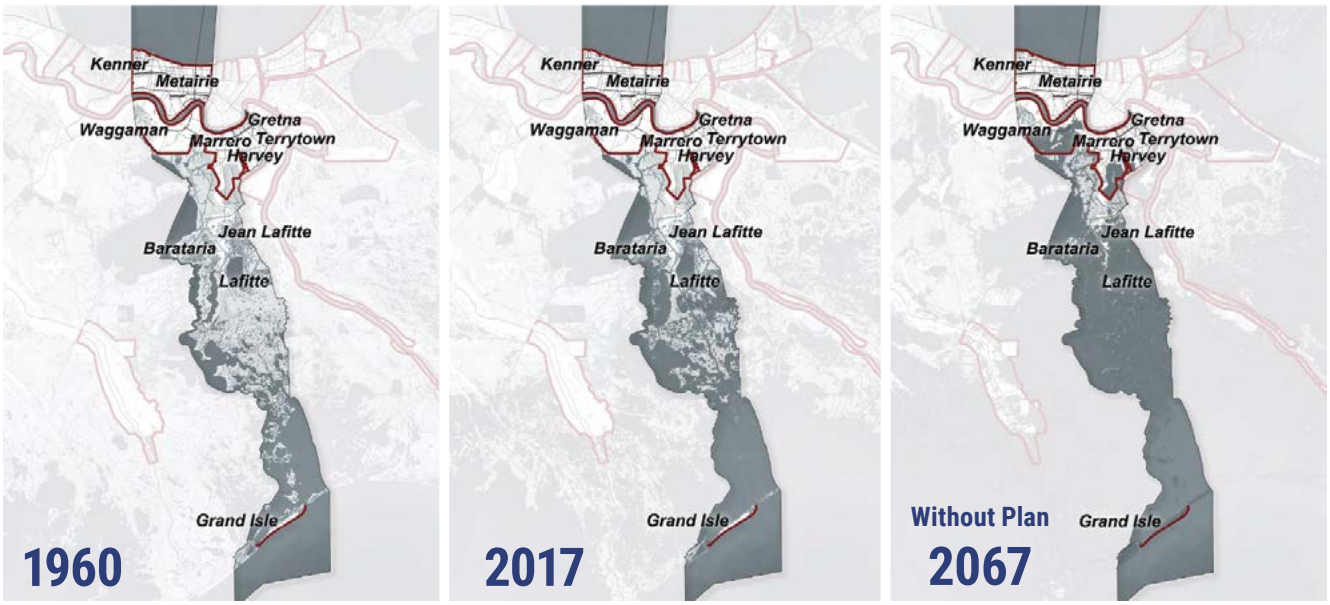
According to summary data from Louisiana's Comprehensive Master Plan For a Sustainable Coast (CPRA, 2017a), Louisiana's coast lost more than 1,800 square miles of land between 1932 and 2010 (USGS, 2011). From 2004 through 2008, more than 300 square miles of marshland were lost to Hurricanes Katrina, Rita, Gustav, and Ike. The major causes of this land loss include the effects of sea level rise, subsidence, hurricanes, storm surges, disconnection of the Mississippi River from coastal marshes, oil and gas activity, and other human impacts.

Jefferson Parish faces significantly increased wetland loss in the southern areas outside the HSDRRS over the next 50 years. With no further coastal protection or restoration actions, an additional 112 square miles, or 42 percent of the land area, could be lost in the next 50 years (Figure 11) (CPRA, 2018; Jefferson Parish, 2018). Likewise, with no further action, there is a severely increased future storm surge-based flood risk in areas outside the HSDRRS.



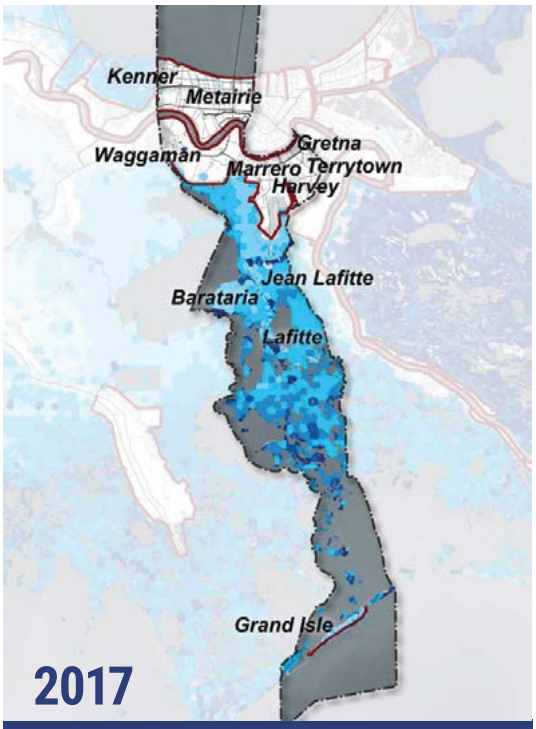
Land loss in the area around BA-04 Northeast Turtle Bay Extension between 1998 and 2019

LAND LOSS

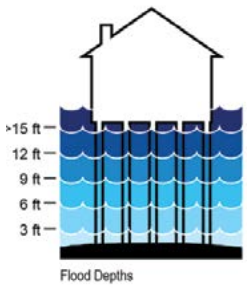


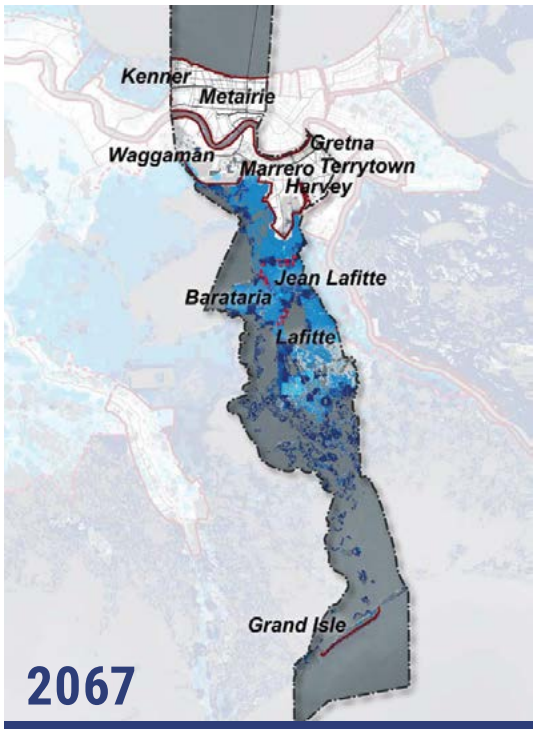
▲ **FIGURE 11:** Jefferson Parish Land Loss 1960 to 2067. Source: (CPRA, 2018; Jefferson Parish, 2018)

FLOOD RISK



Flood depth for 100-year storm for initial conditions.





Flood depths from a 100-year storm event for year 50 under the medium environmental scenario with the Coastal Master Plan.

CHAPTER 7
PROJECT SELECTION

- History of Engagement
- Methodology and Project Screening
- Project Types
- Prioritized Project Lists
- Projects For Future Consideration

7.1 HISTORY OF ENGAGEMENT

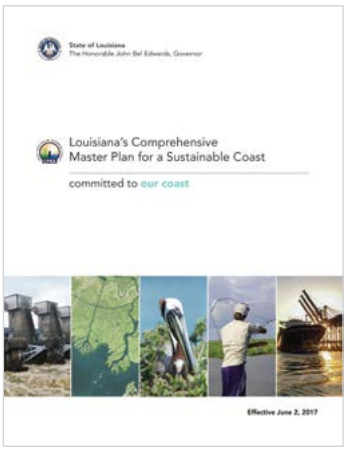
The development of the JP-CSAP was initiated in January 2019 and involved a collection of existing project information, including all previous plans and studies. In February 2019, the project team held meetings to engage leadership within the incorporated municipalities of the Town of Grand Isle and the Jean Lafitte to identify previous project concepts and new potential projects. Meetings with these community leaders led to the development of a comprehensive list of projects to be evaluated in and near these communities. Once the lists of projects were developed and initially screened, Parish Council briefings occurred in February and March 2020 to present a list of projects for prioritization by Parish leadership. Additional meetings were scheduled with the leaders of the Town of Grand Isle and the Town of Jean Lafitte in April 2020; however, due to the COVID-19 pandemic, briefings were held virtually and feedback received by email.

7.2 METHODOLOGY AND PROJECT SCREENING

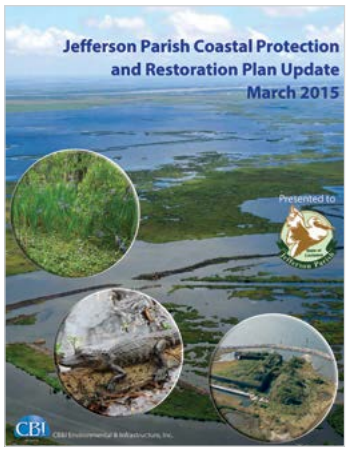
Sources for project ideas evaluated for consideration in the JP-CSAP included, but were not limited to, the following:

2023 Louisiana Coastal Master Plan New Project Development Submittal

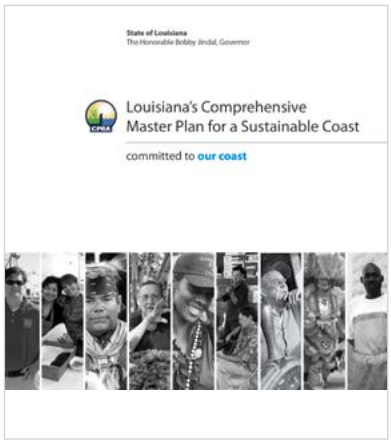
Louisiana's Comprehensive Master Plan for a Sustainable Coast (CPRA, 2017a)



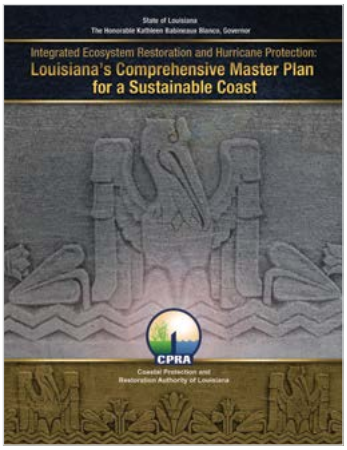
Jefferson Parish Coastal Protection and Restoration Plan (2015)



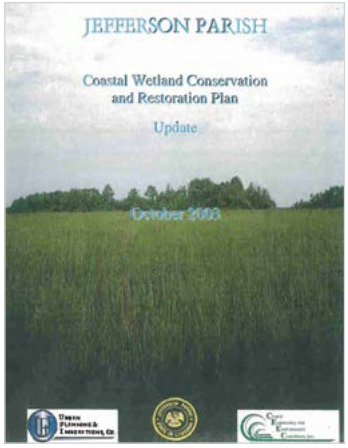
Louisiana's Comprehensive Master Plan for a Sustainable Coast (CPRA, 2012)



Louisiana's 2007 Comprehensive Master Plan for a Sustainable Coast (CPRA, 2007)



Jefferson Parish Coastal Wetland Conservation and Restoration Plan (2003)



Additional Sources:

Coastal Wetlands Planning, Protection and Restoration Act projects

Coast 2050: Toward a Sustainable Coastal Louisiana (Louisiana Department of Natural Resources, 1998)

The Louisiana Coastal Area (LCA) Ecosystem Restoration Study (USACE, 2004)

The initial project evaluation process identified projects from previous plans that would not be further analyzed including

1. Projects that were not completely located within the Parish boundaries. Although these regional projects have recognized environmental benefits, they were considered beyond the scope of the JP-CSAP with a low likelihood of being funded by Jefferson Parish. The Parish maintains a list of these projects and will continue to advocate for implementation of these projects at the state and federal level and in support of neighboring parishes.
2. Previously constructed projects as well as projects at a conceptual level without sufficient details (location, cost, material type) were also removed from further consideration in this Plan. The Parish is maintaining a list of these projects identified as "Projects For Future Consideration" (see Section 7.5).
3. Active projects in construction were also removed from this Plan. The Parish Department of Ecosystem and Coastal Management maintains a list of active projects that are fully funded and are under construction or will be under construction in the near future.

METHODOLOGY

Approximately 50 new projects were developed and a standard data set determined for each project including:

Strategy	Type Location Scope and Size
Estimated Cost	Previous Cost Estimates - Inflated to November 2019 using Consumer Price Index Inflation Calculator (US Inflation Calculator 2019) When Costs were not available - rough costs were developed based on similar completed projects
Progress to Date	Most current state of the project
Project Origin	Original developer of the project
Project Category	Projects were identified as Large-Scale, Regional, Local, or Non-traditional projects
Project Lead	Who is or would be the most likely party responsible for fostering the project to the next phase of work
Funding Source	What is the most likely avenue for funding the potential project
GIS Files	Mapped in a Geographic Information System (GIS) database

PROJECT SCREENING

A project screening process was developed to evaluate the projects. Projects were screened based on the following:

Viable	Is the project acceptable to permitting and reviewing agencies
Jurisdiction	Is the project located entirely within Jefferson Parish
Status	Is the project already constructed

In order to assist in reviewing the project list, the projects were categorized into separate lists including active projects, reviewed projects, constructed projects, projects for future consideration, Louisiana Coastal Master Plan projects, and structural protection projects. Those projects not separated into one of the lists above were included on the Project Priority List provided to Jefferson Parish Leadership for consideration in the JP-CSAP. In all, more than 109 projects were developed, evaluated, and screened with the remaining Project Priority List of projects submitted to Parish leadership for prioritaization as described in Section 7.4.

7.3 PROJECT TYPES

For the purposes of the JP-CSAP, projects were separated into two project categories: Restoration and Structural Protection Projects. Restoration and Structural Protection Projects were broken down further as described below.

RESTORATION PROJECTS

Restoration projects are those projects whose features restore degraded components of the Parish's coastal ecosystem by re-establishing natural processes or protecting existing natural features. Restoration projects are grouped into the following general categories:

MARSH CREATION – Restoration of wetlands in open water or areas of degraded marsh through placement of dredged material to restore marsh and provide additional storm-surge reduction. Marsh creation projects also include terracing projects and vegetative plantings. Common limitations of marsh creation projects are availability of sediment sources, water depths, and natural containment among other factors. Marsh creation projects usually have a 20-year life cycle due to long-term settlement and subsidence and require future maintenance to restore marsh elevations. Marsh creation projects offer increased longevity when not subjected to wind and wave erosional forces, such as those adjacent to large open bodies of water. Marsh creation projects are commonly built in open shallow water areas with naturally occurring containment.

RIDGE RESTORATION – Re-establishment of historical ridges through sediment placement and vegetative plantings to restore maritime forested habitat. Forested ridges provide additional storm-surge reduction and are a key part of the Multiple Lines of Defense Strategy. Ridges are most commonly built on the footprint of historical ridges because they often have suitable soils to support ridge construction. Like marsh creation projects, a common limitation of ridge restoration projects is the availability of sediment sources because they often require large volumes of suitable sediment. Ridge restoration projects are often paired with a marsh component in order to capture sediment that over washes the ridge during storm events.

SHORELINE PROTECTION – Hardened rock shoreline protection and nearshore rock breakwaters to reduce wave energies on shorelines in open bays, lakes, and natural and navigation channels. Some shoreline protection techniques, such as rock berms, are applied directly to the eroding shorelines to decrease erosion. Other techniques, such as segmented breakwaters and living shorelines, are placed in the adjacent open water in order to decrease a wave's energy before it hits the shoreline and to promote the deposition of sediment along the shoreline. Common limitations of shoreline protection are geotechnical concerns (sinking and subsiding) due to soils not supporting the weight of the rocks, cost, depth of water, construction access, and induced erosion in certain areas.

OTHER – Projects that do not fit one of the previously discussed project types including:

- Recreational and Educational – These projects include boardwalks, boat launches, nature centers, and other coastal education centers. Recreational and educational features are important to the Parish in promoting the use of coastal resources and educating the public on the importance of coastal restoration.
- Other restoration projects, new restoration concepts and ideas, including feasibility studies and vegetative plantings.

STRUCTURAL PROTECTION

Structural protection or hurricane protection projects reduce hurricane flood risk in coastal communities by acting as a physical barrier against storm surge. Although structural protection projects are not a primary focus of the JP-CSAP, they are integral to an integrated protections system and were evaluated on a limited basis. In the Parish, the HSDRRS is under the jurisdiction of the U.S. Army Corps of Engineers (USACE, the Southeast Louisiana Flood Protection Authority-West and Southeast Louisiana Flood Protection Authority-East were not evaluated in the JP-CSAP. Structural protection projects identified in the JP-CSAP are under the jurisdiction of the Grand Isle Independent Levee District (GILD) and Lafitte Area Independent Levee District (LILD). The structural protection projects evaluated include earthen levees, floodwalls, floodgates, and pumps.

7.4 PRIORITIZED PROJECT LISTS

All projects were categorized based upon type, size, priority, funding source, sponsoring agency, Parish role, and potential cost-share matching. These categories will allow Parish stakeholders to effectively prioritize funding and resources, as well as track progress. The Prioritized Project Lists were categorized as Large-Scale, Regional, Local, or Non-Traditional and are described in the subsections below. The category assigned for each project is based on all factors including type, cost, complexity, funding source, Parish role, and most likely route for implementation.

LARGE-SCALE PROJECTS

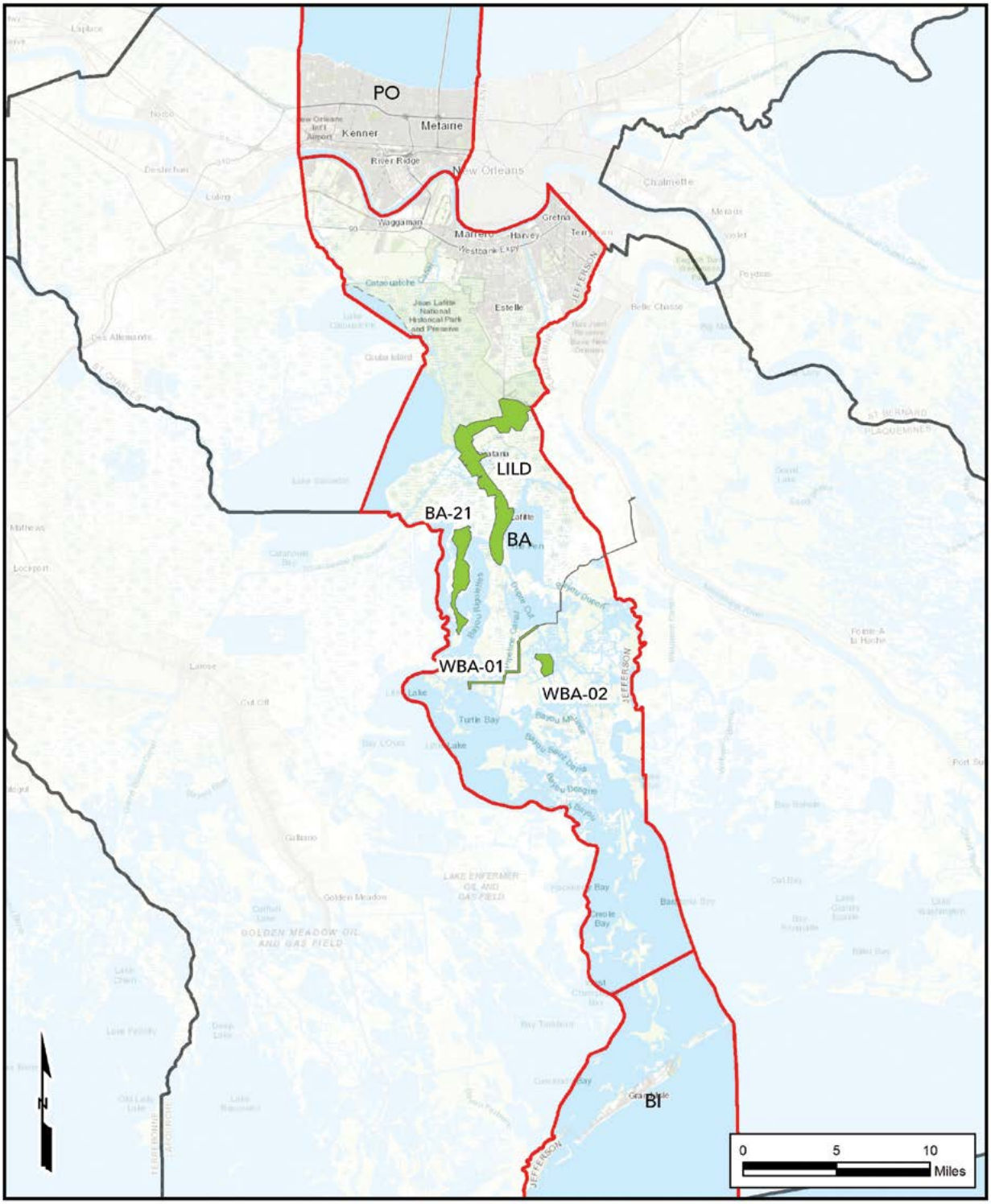
These projects are a high priority for the Parish, but due to their size, cost, complexity, or authorization, the projects would be implemented in partnership with another federal agency or CPRA and would require unified advocacy and a strategic partnership with Jefferson Parish (Table 3 and Figure 12). Detailed Project Fact Sheets describing these projects are presented in Appendix A-1.

Jefferson Parish Large-Scale Projects

Basin	Project Type: Project ID	Project Name	Description
BA	Marsh Creation: WBA-01	West Barataria Marsh Creation Corridor Project	Proposed project is part of the Barataria Landbridge, along the original Long Distance Sediment Pipeline corridor. The project will extend the existing corridor an additional 12.6 miles, stretching from the Barataria Waterway west towards Lafourche Parish. The purpose of the project is to obtain renewable sediment resources, establish an adequate access corridor that supports equipment mobilization for long distance sediment conveyance, and allow for marsh restoration projects. The area has experienced significant wetland loss due to oil and gas activity-induced subsidence and surficial erosion. This project would restore approximately 465 acres of marsh with Mississippi River borrow material for an estimated project cost between $90M and $95M.
BA	Marsh Creation: WBA-02	West Barataria Waterway Marsh Restoration	Proposed project is part of the Barataria Landbridge, located to the west and adjacent to the Barataria Waterway and south of the Pen. This project would restore approximately 481 acres of marsh with Mississippi River borrow material for an estimated project cost between $45M and $50M.
BA	Marsh Creation: BA-21	Bayou Perot and Bayou Rigolettes Peninsula Restoration	Proposed project is located approximately 2 miles west of Lower Lafitte between Bayou Perot and Bayou Rigolettes. The project would restore approximately 2,000 acres of wetlands and 22,000 feet of shoreline to reconnect remaining landmasses of the historical peninsula for an estimated cost between $140M and $200M.
BA	Hurricane Protection: LILD	Lafitte Levees	Proposed project surrounds Barataria, Crown Point, Lower Lafitte, and the Town of Lafitte. This project would construct a levee system around the Town of Lafitte for an estimated project cost between $100M and $150M. Fischer School and Goose Bayou Basin construction is complete. Rosethorn, Lower Lafitte, Pailet, Crown Point, Lower Barataria, Upper LA 45, Lower LA 45, and Jones Point Basins are in the design phase.

▲ TABLE 3

BA Barataria Basin.
LILD Lafitte Area Independent Levee District.
M Million.



▲ **FIGURE 12:** Large-Scale Projects Overview Map

REGIONAL PROJECTS

These projects are large-scale, high-priority projects that, due to their size, cost, complexity, or authorization, would be implemented through partnerships with other entities such as the USACE or CPRA but would require Parish funding to initiate the project or for cost-share matching through direct funding or work-in-kind credits (Table 4 and Figure 13). Detailed Project Fact Sheets describing these projects are presented in Appendix A-2.

Jefferson Parish Regional Projects

Basin	Project Type: Project ID	Project Name	Description
BA	Marsh Creation: BA-195	Barataria Bay Rim Marsh Creation	Proposed project is part of the Barataria Bay Rim, located on the north shore of Barataria Bay and east and adjacent to the Barataria Waterway. This project would restore approximately 251 acres and nourish an additional 266 acres of marsh for an estimated project cost between $25M and $30M.
BA	Marsh Creation: JP-15	Bay Dosgris Marsh Creation	Proposed project is part of the Barataria Bay Rim, located on the south shore of Turtle Bay and west of the Barataria Waterway. This project would restore approximately 213 acres and nourish an additional 441 acres of marsh for an estimated project cost between $40M and $45M.
BA	Marsh Creation: JP-07	Bayou Dupont Sediment Delivery #4	Proposed project is part of the Barataria Landbridge, located south of the Cheniere Traverse Bayou and northeast of Bayou Dupont along the Long Distance Sediment Pipeline corridor. This project would restore and nourish approximately 300 acres of marsh for an estimated project cost between $25M and $30M.
BA	Shoreline Protection: BA-15	Goose Bayou Ridge Creation and Shoreline Protection	Project is located east of the Town of Lafitte, along the northwestern shore of the Pen, at the outlet of Goose Bayou and northward to its intersection with Cypress Bayou. This project would construct approximately 8,000 linear feet of rock shoreline protection and create approximately 50 acres of wooded ridge habitat along the western shoreline of Goose Bayou for an estimated cost of $15M.
BA	Marsh Creation: BA-04	Northeast Turtle Bay Extension	Proposed project is part of the Barataria Landbridge, located to the west and adjacent to the Barataria Waterway and south of the Pen. This project would restore approximately 610 acres of marsh for an estimated project cost between $25M and $30M.
BA	Marsh Creation: JP-14	South Cheniere Traverse Bayou Marsh Creation	Proposed project is part of the Barataria Landbridge, located south of the Cheniere Traverse Bayou and northeast of Bayou Dupont along the Long Distance Sediment Pipeline corridor. This project would restore approximately 342 acres of marsh for an estimated project cost between $25M and $30M.

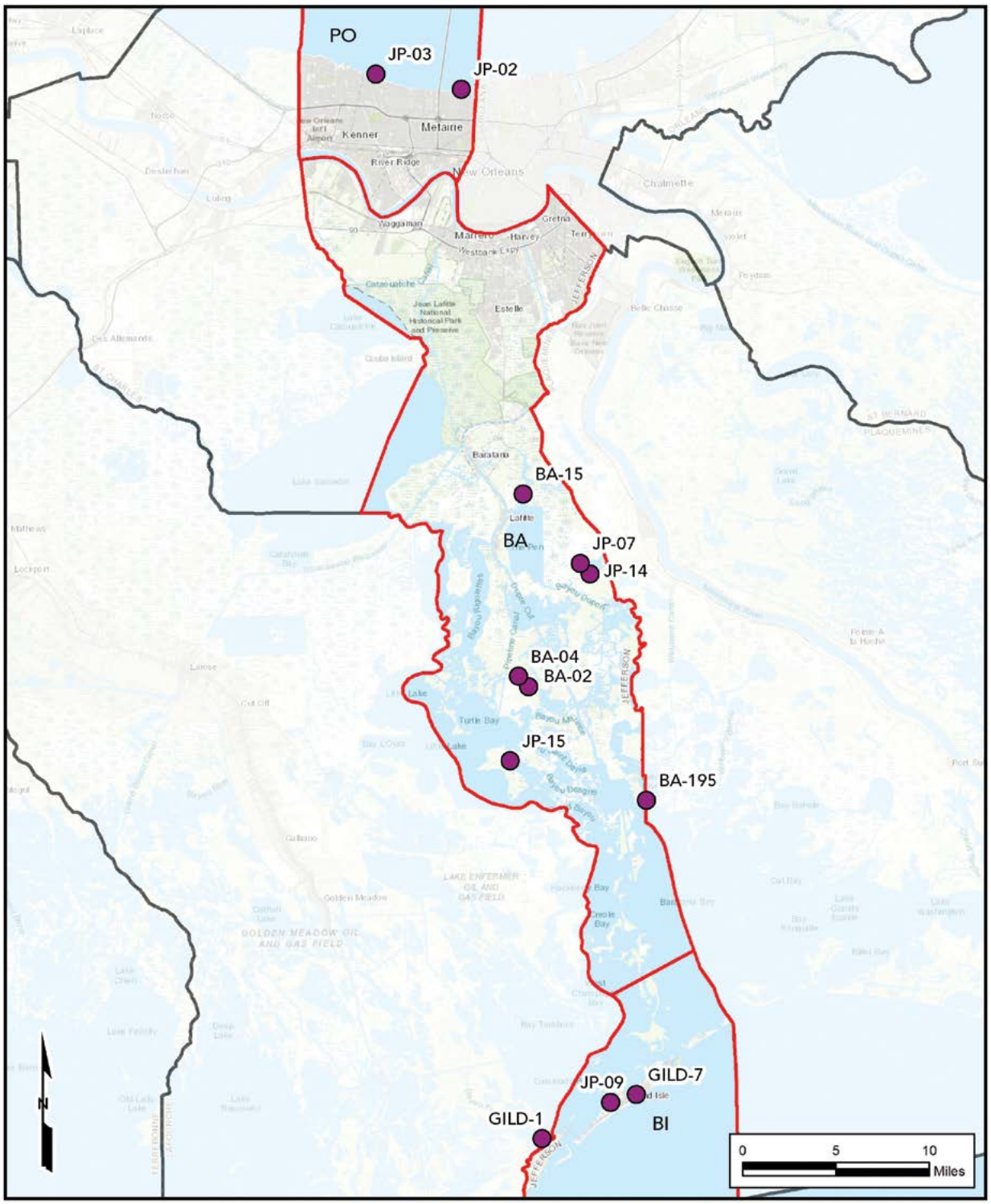
▲ TABLE 4

Jefferson Parish Regional Projects - continued

Basin	Project Type: Project ID	Project Name	Description
BA	Marsh Creation: BA-02	Three Bayou Bay Marsh Creation	Proposed project is part of the Barataria Landbridge, located adjacent to and west of the Barataria Waterway and south of the Pen. This project would restore approximately 638 acres of marsh for an estimated project cost between $25M and $30M.
BI	Shoreline Protection: GILD-1	Chenier Caminada Breakwaters	Proposed project is located on the Caminada Headland approximately 9 miles northeast of Port Fourchon and 2 miles southwest of Grand Isle along the north side of Cheniere Caminada. The project would construct 2.5 miles of breakwaters along Caminada extending west from the existing breakwaters for an estimated cost between $21M and $25M.
BI	Hurricane Protection: GILD-7	Grand Isle Back Levee	The project will construct levees on Grand Isle in two phases. Phase I is the repair and lifting of 2.7 miles of levee between Cherry Lane and Walnut Street Pump Station to an elevation of 5.0' NAVD88 for an estimated cost between $6M and $8M. Phase 2A is the installation of 1.5 miles of levee to an elevation of 5.0' NAVD88 between Walnut Street Pump Station and Humble Road for an estimated cost between $4M and $6M.
BI	Marsh Creation: JP-09	Grand Isle Bayside Marsh Creation	Proposed project is on the norths side of Grand Isle. The project is the proposed restoration of 196 acres of bayside marsh to protect the eroding narrow western end of Grand Isle for an estimated cost between $15M and $20M.
PO	Marsh Creation: JP-02	Bucktown Marsh Restoration and Living Shoreline	Proposed project is on the south shore of Lake Pontchartrain between the Bonnabel Park and Boat Launch to the west and the Bucktown Boat Harbor along the Lake Pontchartrain and Vicinity Hurricane and Storm Damage Risk Reduction System (HSDRRS). The project would create approximately 39 acres of living shoreline for a 1-mile stretch for an estimated project cost between $8M and $12M.
PO	Other: JP-03	Lake Pontchartrain Marsh Protection Feasibility Study West	Proposed project is on the south shore of Lake Pontchartrain west of the Bonnabel Park and Boat Launch and along the Lake Pontchartrain and Vicinity Hurricane and Storm Damage Risk Reduction System (HSDRRS). The project would create living shoreline for a 2-mile stretch. The Feasibility Study is estimated to cost between $1M and $2M.

▲ TABLE 4 - CONTINUED

BA	Barataria Basin.
BI	Barrier Islands Basin.
GILD	Grand Isle Independent Levee District.
HSDRRS	Hurricane and Storm Damage Risk Reduction System.
NAVD88	North American Vertical Datum of 1988.
PO	Pontchartrain Basin.



▲ **FIGURE 13:** Regional Projects Overview Map

LOCAL PROJECTS

These projects are smaller scale, localized traditional restoration and structural protection projects authorized and implemented by/led at the local level (Table 5 and Figure 14). Detailed Project Fact Sheets describing these projects are presented in Appendix A-3.

Jefferson Parish Local Projects

Basin	Project Type: Project ID	Project Name	Description
BA	Other: JP-42	Bayou Villars Channel Management	Proposed project is located on the eastern shore of Lake Salvador near the intersection of the Gulf Intracoastal Waterway (GIWW) and the Barataria Waterway. This channel has increased in size due to wave energy across Lake Salvador and in the GIWW. Estimated cost has not yet been determined.
BA	Other: JP-41	Lake Salvador / Bayou Perot Channel Management	Proposed project is located at the natural channel intersection joining Bayou Perot and Lake Salvador. This natural channel has increased in size due to bank erosion from tidal exchange between two large bodies of water. Estimated cost has not yet been determined.
BA	Marsh Creation: JP-16	Northeast Lake Cataouatche Marsh Creation	Proposed project is adjacent to the West Bank and Vicinity (WBV) Hurricane and Storm Damage Risk Reduction System (HSDRRS) located approximately 3 miles south of Bayou Segnette State Park with Marcello Canal to the north, Lake Cataouatche to the southwest, Yankee Pond to the southeast, and Labranche Canal to the west. The project would create a terrace field within an open water area for an estimated project cost between $15M and $20M.
BA	Marsh Creation: JP-23	Upper Barataria Terracing Project	Proposed project is part of the Barataria Landbridge, located east of the Barataria Waterway and south of The Pen. The project would create a terrace field with in-situ borrow within an open water area for an estimated project cost between $1M and $2M.
BI	Shoreline Protection: GILD-2	Bayou Thunder Rock Dike Project	Proposed project is located on the Caminada Headland approximately 9 miles northeast of Port Fourchon and 2 miles southwest of Grand Isle along the north side of Cheniere Caminada. The proposed breakwaters along Bayou Thunder would be approximately 0.9 mile long and be located along the northern bank of the bayou. The project will include the dredging of Bayou Thunder and nourishment of 50 acres of marsh for an estimated cost between $13M and $16M.
BI	Marsh Creation: GILD-3	Cheniere Caminada Marsh Restoration	Proposed project is located on the Caminada Headland approximately 9 miles northeast of Port Fourchon and 2 miles southwest of Grand Isle along the north side of Cheniere Caminada. The project will include the restoration of approximately 250 acres of marsh for an estimated cost between $9M and $11M.

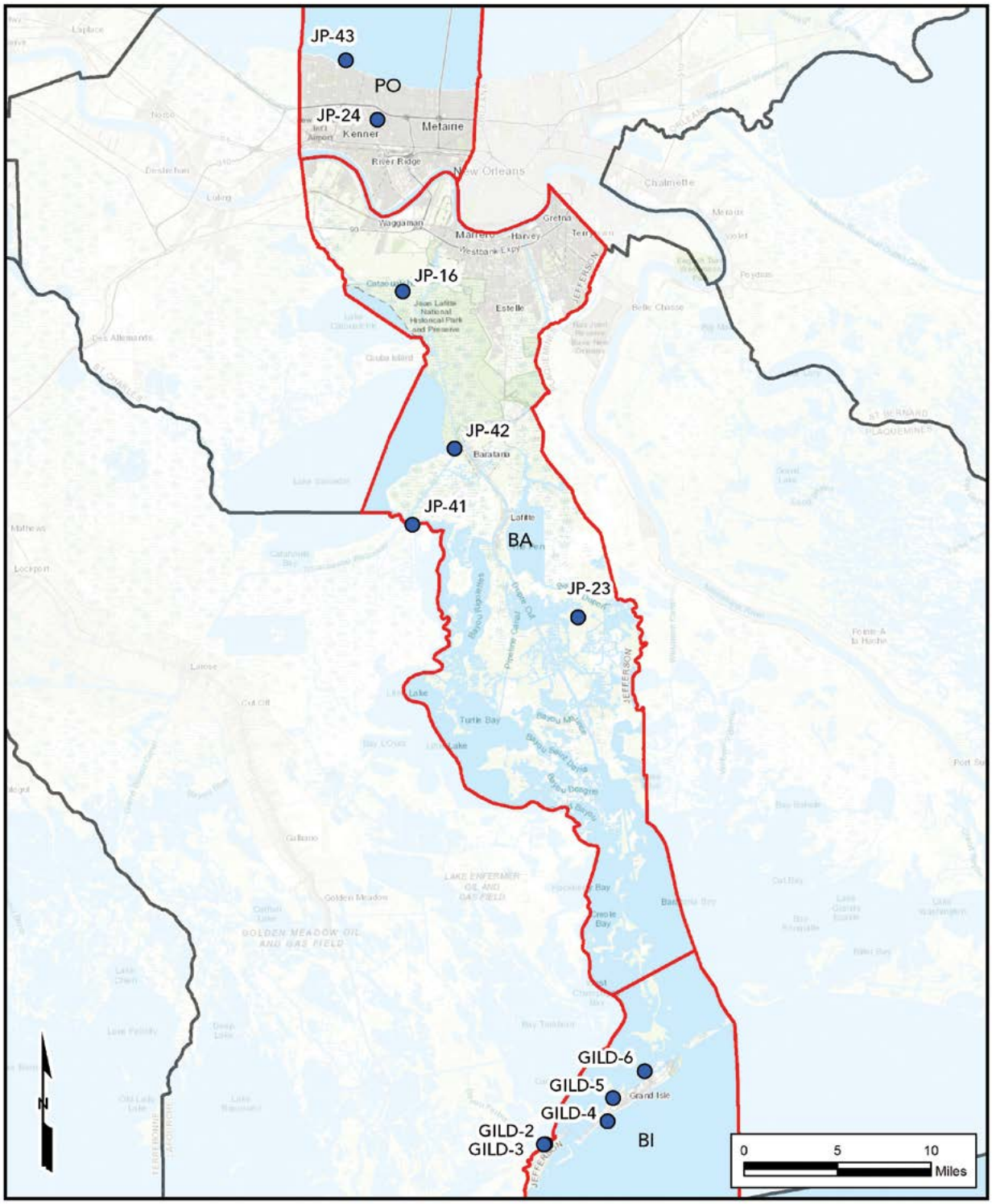
▲ TABLE 5

Jefferson Parish Local Projects - continued

Basin	Project Type: Project ID	Project Name	Description
BI	Marsh Creation: GILD-6	Fifi Island Restoration	Proposed project is located on Fifi Island adjacent to the north side of Grand Isle. The project will include construction of 2,100 feet of rock dike and restoration of 325 acres of marsh for an estimated cost between $25M and $30M.
BI	Shoreline Protection: GILD-5	Grand Isle Bayside Segmented Breakwaters Completion	Proposed project is located on the bayside of Grand Isle. The proposed breakwaters would reduce erosion on the bayside of Grand Isle by construction of two approximately 350-foot breakwaters on the bayside of Grand Isle. The proposed project will connect existing breakwaters to the east and west and create a continuous line of protection on the bayside of Grand Isle for an estimated cost between $1M and $2M.
BI	Shoreline Protection: GILD-4	Grand Isle Gulfside Segmented Breakwaters	Proposed project is located on the Gulf side of Grand Isle. The proposed breakwaters would reduce erosion on the Gulfside of Grand Isle by construction of approximately 45 breakwaters just off the beach. The proposed project will connect existing breakwaters to the east and west and create a continuous line of protection on the bayside of Grand Isle for an estimated cost between $28M and $30M.
PO	Marsh Creation: JP-24	Lafreniere Marsh Restoration	Proposed project is within Lafreniere Park in Metairie. The marsh island within the lagoon of Lafreniere Park has experienced land loss due to settlement and shoreline erosion. This project would restore the island to its original shape with borrow from the lagoon for an approximate cost between $1M and $2M.
PO	Marsh Creation: JP-43	Laketown Breakwaters / Living Shoreline	Proposed project is located at Laketown in Kenner on the south shore of Lake Pontchartrain. The project includes dredging of the harbor and beneficial use of the material to restore approximately 3.5 acres of marsh and the addition of recreational features. This project would construct a rock breakwater system totaling approximately 2,000 feet for an estimated cost between $5M and $10M.

▲ TABLE 5 - CONTINUED

BA Barataria Basin.
BI Barrier Islands Basin.
GILD Grand Isle Independent Levee District.
GIWW Gulf Intracoastal Waterway.
HSDRRS Hurricane and Storm Damage Risk Reduction System.
PO Pontchartrain Basin.
WBV West Bank and Vicinity.



▲ **FIGURE 14:** Local Projects Overview Map

NON-TRADITIONAL PROJECTS

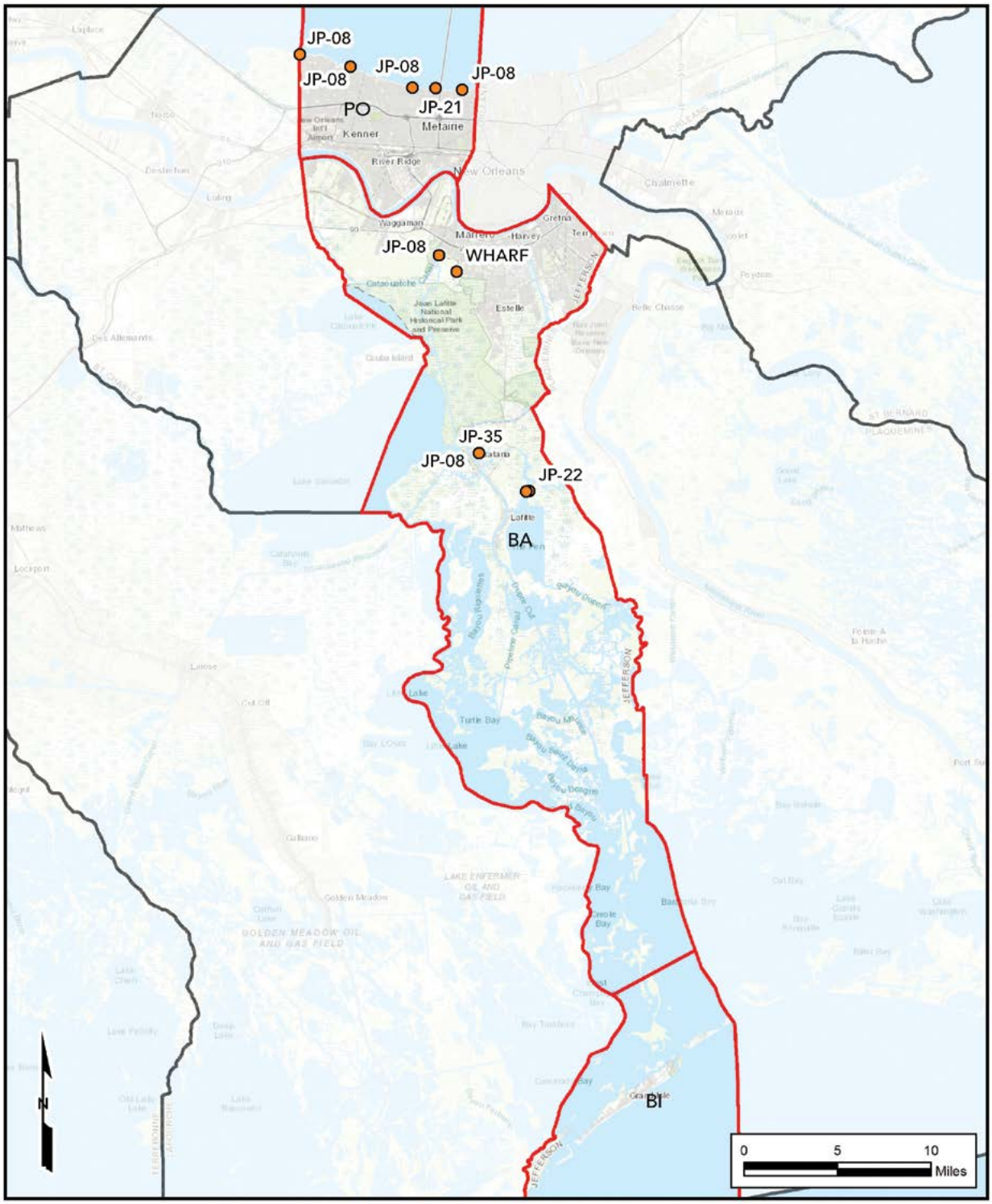
These projects include non-structural and non-traditional programs and projects that focus on important socioeconomic drivers such as fisheries, fish and bird habitats, workforce development, recreation, and community resilience (Table 6 and Figure 15). These projects will also take advantage of private partnerships that arise periodically and require local support. Detailed Project Fact Sheets describing these projects are presented in Appendix A-4.

Jefferson Parish Non-traditional Projects

Basin	Project Type: Project ID	Project Name	Description
BA	Shoreline Protection: JP-22	Northeast Pen Shoreline Protection	Proposed project is on the eastern shore of Goose Bayou and north of the Pen. The project would add shoreline protection to the shoreline of Goose Bayou. Cost not yet determined.
BA	Other: JP-35	The Wetlands Center	The Louisiana Wetland Education Center is a public services/education project located in the southern area of the Parish in the Town of Lafitte. Total cost for all phases is estimated between $12M and $15M.
BA	Other: WHARF	Wetland Harbor Activities Recreational Facility	Proposed project is located within the City of Westwego, south of Lapalco Boulevard, just outside the Hurricane and Storm Damage Risk Reduction System (HSDRRS). The proposed project would develop the property into a multi-use wetlands park with handicap access for an estimated cost between $2M and $3M.
BA, BI, PO	Other: JP-08	Jefferson Tree Planting	Annual education and outreach program that utilizes volunteers to grow and plant trees in areas conducive to their growth throughout the Parish. The planting of native tree species improves water quality as well as reduces shoreline erosion and provide storm protection. Current year funded through a USEPA Gulf of Mexico Grant.
PO	Other: JP-21	Severn Lakefront Restoration	New project idea under development to evaluate shoreline restoration near the intersection of Severn Avenue and Lake Pontchartrain. This project is currently in the conceptual level with potential cost and funding sources being identified.

▲ TABLE 6

BA Barataria Basin.
BI Barrier Islands Basin.
HSDRRS Hurricane and Storm Damage Risk Reduction System.
PO Pontchartrain Basin.
USEPA U.S. Environmental Protection Agency.



▲ **FIGURE 15:** Non-traditional Projects Overview Map

7.5 PROJECTS FOR FUTURE CONSIDERATION

PROJECTS NEAR PROPOSED MID-BARATARIA DIVERSION

Continued engagement with CPRA and the USACE's Environmental Impact Statement being prepared to disclose and analyze all significant environmental impacts of the proposed Mid-Barataria Diversion is needed. As a stakeholder in the process, it is important to understand the mitigation of impacts to natural resources, socioeconomics, and other impacts. When constructed, the diversion will be a valuable source of fresh water and sediment in the Barataria Basin to aid with erosion and subsidence. Synergistic projects could be evaluated to work with the proposed diversion in creating and improving habitat.

NEW RECREATIONAL OPPORTUNITIES

Additional recreational opportunities and projects that are applicable to receive future funding should be identified. Examples of recreational opportunities to be identified include boardwalks, fishing piers, boat ramps, and associated facilities. Examples of funding include U.S. Fish and Wildlife Service's Wallup Breaux grant award for fishing piers, ramps, and other amenities to provide access to the water and recreational opportunities for residents.

BIRD HABITAT RESTORATION

Identification of future projects that are applicable for upcoming North American Wetlands Conservation Act grant opportunities is needed. These grants increase bird populations and wetland habitat, while supporting local economies through recreation activities such as hunting, fishing, bird watching, and other activities. Wetlands protected by this Act provide valuable benefits such as controlling floods, reducing coastal erosion, improving water and air quality, and recharging ground water.

HYDROLOGIC MODELING TO EVALUATE PROJECTS

Engagement in a feasibility-level hydrologic study to conduct modeling and environmental analysis to determine benefits and locations where channel restrictions, the closure of oil and gas canals, weirs, diversions, hydrologic structures, and other measures would be beneficial. Many of these projects were eliminated from further consideration at this time because the impacts and benefits of such projects are unclear. Some of the projects to be evaluated could include:

- Barataria Bay Waterway Channel Restrictions
- Bayou Dupont, Bayou Perot, and Harvey Cut Channel Management
- Lower Barataria Sediment Diversion
- Hero Canal Diversion

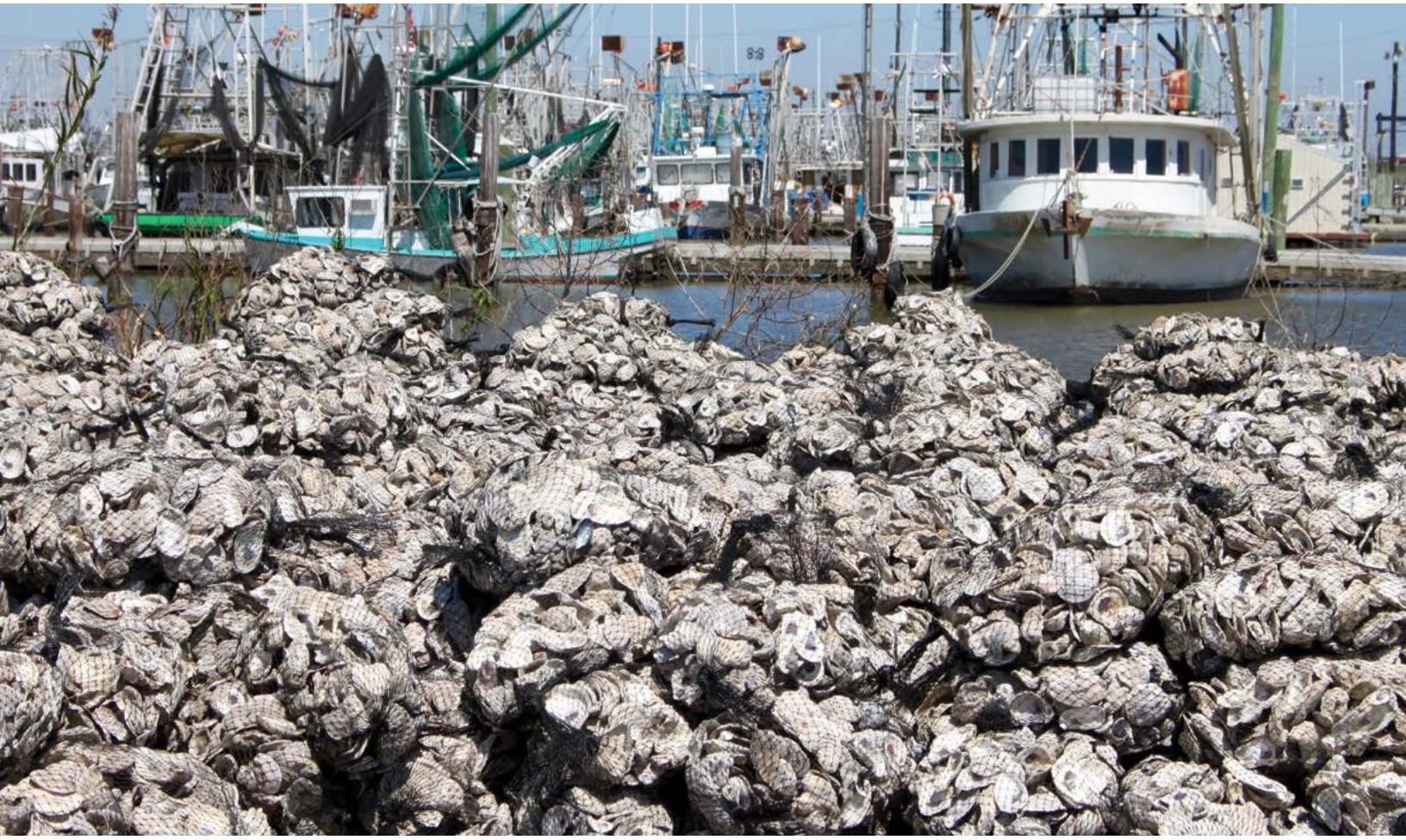


Photo courtesy of Restore the Mississippi River Delta

OYSTER HABITAT RESTORATION

Continuing to identify opportunities for Barataria Basin oyster habitat restoration projects is needed. Oyster reefs help improve water quality, create fishing habitat, protect shorelines from incoming wave action, and provide an economic commodity for the seafood industry.

In conjunction with Louisiana Department of Wildlife and Fisheries (LDWF) and its Oyster Task Force, there is a need to investigate contributing to the following initiatives presented by LDWF/Oyster Task Forces' Oyster Management and Rehabilitation Strategic Plan, which includes the following:

- Cultch mapping and planting, whether traditionally set or remotely set, in historical or forecasted oyster seeding grounds.
- Water-bottom mapping on hard-bottom substrates in areas with salinity conducive to oysters.
- Identification and conflict resolution with other coastal zone user group interests.
- Identification and development of new public oyster areas where conditions better suit a healthy oyster population.

As the Oyster Management and Rehabilitation Strategic Plan is further developed, there is a need to support the effort and identify and evaluate the applicability and its contribution to these programs.

OYSTER LEASE MANAGEMENT

The LDWF is charged with the management of oyster leases on approximately 400,000 acres of state-owned, public water bottoms throughout coastal Louisiana. Implementation of coastal restoration and protection projects can pose a conflict with some of those located directly in or in the near vicinity of a project area, as well as inhibit the maintenance dredging of the Barataria Bay Waterway between the Towns of Lafitte and Grand Isle with oyster leases directly located within the federally authorized channel.

LDWF requires a water bottom assessment for all projects occurring on or near oyster leases to determine area productivity, potential impacts, and estimated value. Resolution can then be achieved by:

- Compensation of productive leases.
- Modification of lease boundaries to avoid future disputes with planned maintenance dredging or restoration activities.
- Extinguishment of conflicting or non-productive leases.

For each of the above, the Parish may consider taking the lead or collaborating with CPRA to perform those assessments, compensating oyster leaseholders for impacts to productive areas, and/or working with LDWF on their extinguishment or modification.

SEAFOOD INDUSTRY ADAPTATION PROGRAM

Land loss, hurricanes, oil spills, foreign import-driven commodity pricing, and coastal restoration/protection projects have all impacted the Louisiana seafood industry. These conditions have mandated that the industry must adapt to ensure a positive outlook for a livelihood that is the heart of Louisiana's coastal economy and cultural identity. Initiatives such as the Louisiana Seafood Future have highlighted adaptation strategies created by the fishermen, dockworkers, and processors themselves, focusing on increasing fisheries production, equipment upgrades, marketing, country of origin labeling, and direct boat-to-table activities.

Supporting efforts are needed to assist with these fisheries adaptation efforts, whether by marketing support for locally caught seafood or Gulf-to-plate direct market activities, general outreach and communications, or advocating for or contributing to improvements for safe harbors.

DEVELOPING A PROGRAM TO FILL ABANDONED OIL AND GAS CANALS

Throughout the Parish, marshes have been adversely impacted by oil and gas production wells and access canals. Canals have turned marsh to open water and the resulting spoil banks have drastically altered the flow of water through the marsh. The altered hydrology promotes tidally induced erosion and saltwater intrusion to the interior wetlands. Evaluating the feasibility of plugging and backfilling abandoned oil and gas canals may be an opportunity for cooperation with oil and gas companies to identify, fund, and start evaluating the most critical canals restoring habitat, reducing erosion, and reducing saltwater intrusion.

CHAPTER 8
FUNDING

- RESTORE Act
- Gulf of Mexico Energy Security Act
- Coastal Wetlands Planning, Protection and Restoration Act
- Louisiana Coastal Area
- National Fish and Wildlife Foundation (NFWF)
- Water Resource Development Act
- Additional Funding Sources

As previously stated, programs and funding sources have significantly increased since the initial coastal plan was developed, allowing local governments to initiate and actively participate in coastal restoration and protection initiatives. Projects included in the JP-CSAP should be continually evaluated and advocated for funding sources and programs focusing on coastal restoration and protection. In addition to the funding sources identified in this section, additional disaster response funding and potential stimulus funds should be evaluated because funding sources often become available in a short period of time and often require "shovel ready" projects that can quickly proceed to construction. Below is a summary of potential sources of funding that the Parish may utilize and leverage to execute on many of its coastal goals and objectives.

8.1 RESTORE ACT

The Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States Act of 2012 (RESTORE Act) dedicates 80 percent of the administrative and civil penalties paid by responsible parties as a result of the Deepwater Horizon oil spill. The RESTORE Act contains five different funding components or "buckets." One of these, the Direct Component, distributes funding directly to coastal parishes. Funds received by the Parish can be utilized for authorized purposes such as coastal restoration, coastal protection, workforce development/job creation, tourism, and promotion of consumption of locally caught seafood.

As part of the Direct Component, the Parish is eligible to receive approximately $13.4 million over the life of the 15-year payout. These funds can then be utilized to implement the Parish's priority projects and, in some cases, to leverage with other sources and programs such as the CPRA-Parish Matching Program. Each activity must be first approved in the Parish's Multiyear Implementation Plan, which requires public input prior to approval by the Department of Treasury.

8.2 GULF OF MEXICO ENERGY SECURITY ACT

GOMESA of 2006 provides revenues from Outer Continental Shelf activities to the Gulf Coast producing states of Alabama, Louisiana, Mississippi, and Texas and their coastal political subdivisions (parishes/counties). GOMESA's Phase II began in fiscal year 2017, which expanded the revenue sharing cap to $500 million per year for these entities.

Coastal Political Subdivisions, such as Jefferson Parish, can utilize funds for initiatives such as coastal protection, including conservation, coastal restoration, hurricane protection, and infrastructure directly affected by coastal wetland losses. Annual distributions are based upon leasing and oil production within the Gulf of Mexico, with the Parish receiving approximately $1.5 million to $3.0 million per year. As a result, in 2019, the Parish authorized the issuance of a $23.5 million bond, secured by future GOMESA revenues.

8.3 COASTAL WETLANDS PLANNING, PROTECTION AND RESTORATION ACT

The CWPPRA (or Breaux Act) was the first federal program dedicated to providing targeted funds for planning and implementing projects that create, protect, restore, and enhance wetlands in coastal Louisiana with an average annual budget of $50 million. The CWPPRA program is managed by the federal CWPPRA Task Force comprised of five federal agencies and the State of Louisiana, represented by the Governor's Office of Coastal Activities/CPRA.

8.4 LOUISIANA COASTAL AREA

Authorized in the Water Resources Development Act of 2007 (USACE, 2020), the LCA Program is a systematic approach to coastal restoration using critical near-term ecosystem restoration projects and large-scale, long-term studies and programs to restore natural features and ecosystem processes. Several restoration techniques are studied/employed, including river diversions, marsh creation, barrier island restoration, LCA Demonstration Projects, and beneficial use of dredged material (BUDMAT). LCA BUDMAT seeks to cost effectively increase the beneficial use of material dredged from federally maintained waterways by ensuring that sediment for operations and maintenance dredging operations, which otherwise would be discarded in the least costly manner, is utilized to restore/create new habitat.

8.5 NATIONAL FISH AND WILDLIFE FOUNDATION (NFWF)

The NFWF's National Coastal Resilience Fund restores, increases, and strengthens natural infrastructure to protect coastal communities while also enhancing habitats for fish and wildlife. It invests in conservation projects that restore or expand natural features such as coastal marshes and wetlands, oyster reefs, coastal rivers and floodplains, and barrier islands that minimize the impacts of storms and other naturally occurring events on nearby communities.

8.6 WATER RESOURCES DEVELOPMENT ACT

Water Resource Development Act bills authorize water resources studies and projects and set policies for navigation, flood control, recreation, and emergency management for the USACE. This legislation is usually passed on a biennial basis and early planning would position the Parish to potentially receive future funding for projects such as a Barataria Basin Landbridge Feasibility Study.

8.7 ADDITIONAL FUNDING SOURCES

Additional sources for potential partnership and utilization include:

- USACE's Continuing Authorities Program (CAP): a group of nine legislative authorities under which the USACE can plan, design, and implement certain types of water resources projects without additional project-specific congressional authorization. The purpose of the CAP is to plan and implement projects of limited size, cost, scope, and complexity.
- NOAA Coastal and Marine Habitat Restoration Grants: habitat protection and restoration grants that assist in achieving sustainable commercial and recreational fisheries.
- Public-Private Partnerships: the Parish should seek to continue building on public-private partnerships to leverage and increase sustainable and successful outcomes with funding coastal restoration projects.
- Mitigation Banks: these banks can address mitigation requirements associated with Parish-initiated infrastructure and/or development activities. Banks established within the Parish could provide a localized "in-basin" option for other public (primarily the federal government) and private development that are required to address/offset unavoidable environmental impacts.
- Non-Governmental Organizations (NGOs)/Non-Profits: NGOs and non-profit organizations are integral to providing a strategic link for public education and communication as well as leverage of limited resources.
- Corporate Sponsors: the business community has a vested interest in the coast's sustainability. Corporate partnerships should be sought out for protection, restoration, outreach/communication, and education initiatives.
- Disaster Relief Funding: disaster funding sources such as Community Development Block Grant (CDBG) - Disaster Recovery, CDBG National Disaster Resilience Competition, and the Federal Emergency Management Agency's Hazard Mitigation Grant Program can potentially be used for restoration, protection, and mitigation efforts.
- State Surplus Funding: when available, state surplus funds have routinely been allocated to fund a variety of coastal protection and restoration efforts led by CPRA.

CHAPTER 9

STRATEGIC ACTIONS

FOR IMPLEMENTATION OF THE JP-CSAP

- CPRA Engagement
- Annual CWPPRA Engagement
- RESTORE Act Processing
- GOMESA Funding Expansion Engagement
- Coastal Zone Advisory Board
- Local Outreach and Engagement
- Integration of Non-structural Program Into The JP-CSAP

These strategic actions provide a path forward to the Department of Ecosystem and Coastal Management, ensuring department staff efforts are in line with the strategy for the greatest opportunity to successfully implement the JP-CSAP.

9.1 CPRA ENGAGEMENT

The Parish should continue to develop relationships with CPRA at both the Executive Level (Executive Assistant to the Governor, Executive Director, and CPRA Board) and the Technical Level (Engineering, Operations, Planning and Research, and Project Management Divisions).

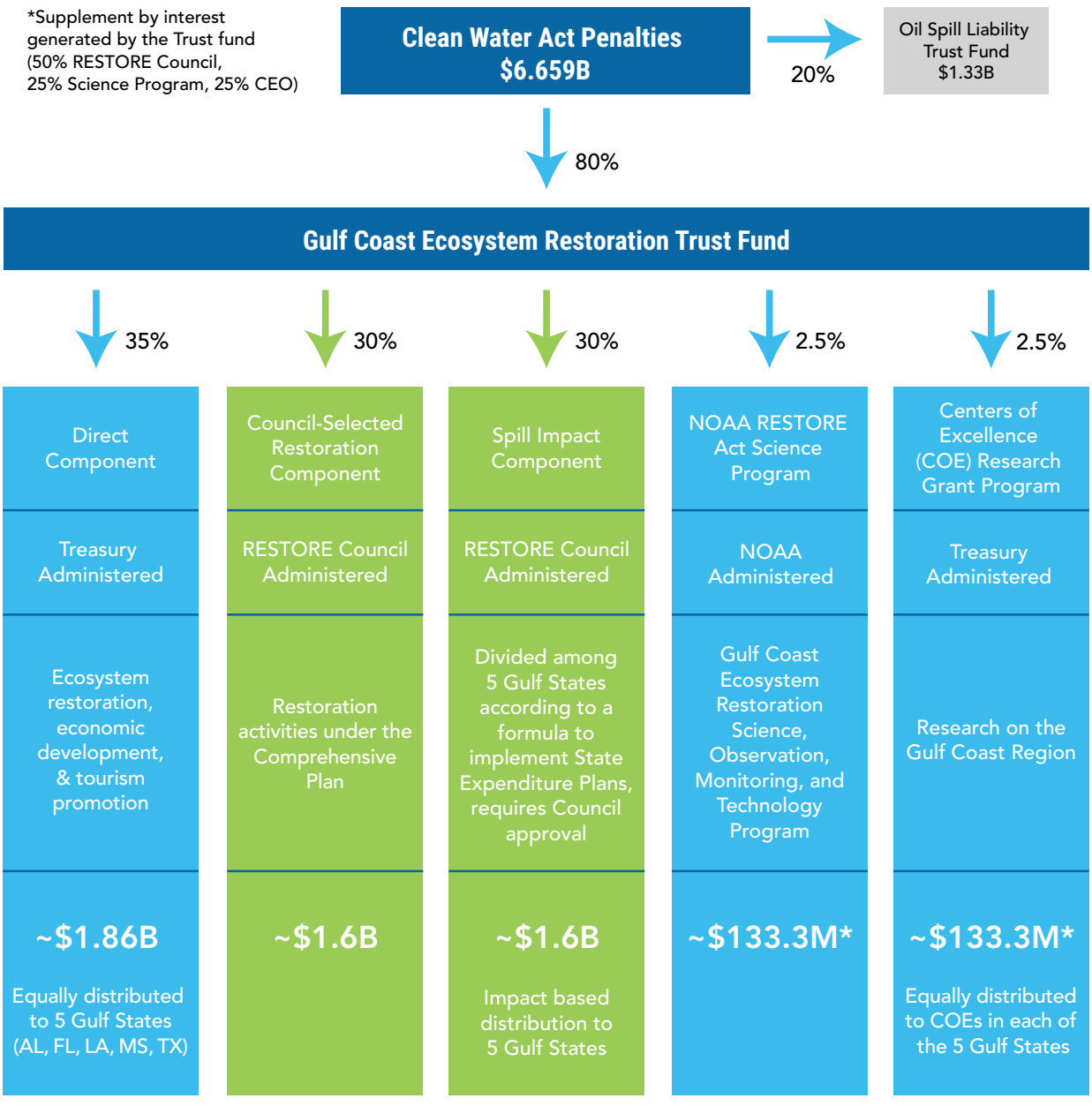
Monthly board meetings should be attended to further establish relationships with the board members, CPRA staff, and stakeholders in attendance to identify potential opportunities for project partnership and collaboration in the Parish. Active participation with the 2023 Louisiana Coastal Master Plan Regional Working Groups to promote and advocate for projects being developed in the Parish should continue.

9.2 ANNUAL CWPPRA ENGAGEMENT

Each year, the CWPPRA program solicits local input for the nomination of potential coastal restoration projects. The Parish should continue to be proactively engaged with the federal CWPPRA Task Force members, including the U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, Natural Resources Conservation Service, NOAA-Fisheries, and USACE, to encourage collaboration and nomination of eligible projects in the JP-CSAP

9.3 RESTORE ACT PROCESSING

The Parish should advocate for projects and programs available through the other funding buckets such as the Council-Selected Restoration Component or Spill Impact Component, both of which require coordination, communication, and advocacy with members of the RESTORE Council. Figure 16 illustrates the RESTORE Act process.



▲ **FIGURE 16:** RESTORE Act Processing (Source: www.restorethegulf.gov)

9.4 GOMESA FUNDING EXPANSION ENGAGEMENT

Since 2019, the Parish has participated in the GOMESA Revenue Sharing Coalition (GRSC). This multi-state group is comprised of the offshore energy producing Gulf states and seeks to increase their share of Outer Continental Shelf revenues to be sent back to the states and their coastal parishes/counties, as currently authorized via the GOMESA of 2006.

The GRSC seeks to:

- Lift the $375 million collective cap currently applied to Gulf States and their Coastal Political Subdivisions (parishes/counties).
- Increase Gulf States' share of Outer Continental Shelf revenues from 37.5 to 50 percent.
- Expand the lease areas from which revenues are derived.

These increased revenues could further augment ongoing restoration and protection efforts that the Parish has initiated through its current GOMESA funding. The Parish should continue to be an active participant and advocate for increased funding through the GRSC.

9.5 COASTAL ZONE ADVISORY BOARD

Coastal Management Programs allow local coastal parishes permitting authority for coastal uses of local concern. Jefferson Parish is currently one of 12 coastal parishes that has an approved Local Coastal Management Program; however, its governance does not include utilization of a local Coastal Zone Management Advisory Board.

These advisory boards are established through the parish government and usually consist of representatives from coastal communities, elected officials, state and federal government agencies, levee districts, landowners and managers, NGOs, commercial fisheries, and others. These advisory boards can be of tremendous value to the Department of Ecosystem and Coastal Management by providing unique perspectives and expertise from different parties, thus enhancing collaboration, public input, and successful program implementation.

"Marsha" - Jefferson Parish Coastal Mascot

9.6 LOCAL OUTREACH AND ENGAGEMENT

Solicitation of new ideas from local representatives and stakeholders throughout the Parish is needed to identify new projects as well as receive updates for implemented projects. The Parish strives to expand its outreach and engagement efforts with parish residents, NGOs, and state and federal partners to accomplish the goals and objectives of this Plan.

OUTREACH PROGRAM

There are less than 5,000 residents of the Parish that are permanent residents in the coastal communities of Grand Isle, Crown Point, Barataria, and Town of Lafitte, with the remaining 99 percent of Jefferson Parish residents living behind floodwalls and the HSDRRS, yet impacts from coastal land loss affect everyone. Specific targeted outreach to coastal communities about flood risk, project identification, economic opportunities versus hardships, and long-range land use planning is critical for the longevity of these communities. Additionally, outreach to more protected communities such as Gretna, Westwego, Metairie, and Kenner is needed to ensure residents understand that today's coastal areas provide specific protection against storm surge and economic benefits for our hospitality industry. Working with local and regional partners, an outreach strategy needs to be developed to establish specific, measurable goals.

EDUCATION PROGRAM

In the spring of 2019, the Department of Ecosystem and Coastal Management, reached out to coastal educators, programs, and NGOs to gather as much information as possible to understand the current coastal education programs that exist and how the Parish could tap into these resources. Meetings were held with:

Governor's Office of Coastal Activities

Sea Grant Louisiana

LSU AgCenter Research · Extension · Teaching

The Joe W. and Dorothy Dorsett Brown Foundation

Pontchartrain Conservancy

LSU Center for River Studies

Flood Protection Authority–East
Your flood defense system

Hurst Middle School Wetland Watchers
Education · Service · Awareness

Jefferson Parish Schools
Chief Strategist & Head of Science Curriculum

St. Angela Merici School
STEM Coordinator

Principal of the Patrick Taylor School

This Coastal Education Program is two phased and needs to continue to meet with our curriculum strategy team and develop granting ideas

Phase I - Classroom Presentations and Wetland Field Trips; and

Phase II - Coastal Curriculum Development and Grant funding.

For continued success, the Department of Ecosystem and Coastal Management needs to work with local and regional partners to create a strategy that defines the target audience for education programs and create messages that are formulated for those audiences.

PARISHES ADVOCATING FOR COASTAL ENDURANCE ADMINISTRATION (PACE)

PACE formed in 2003 with the goal of uniting and organizing Louisiana's 20 coastal parishes to assist their individual efforts and raise awareness to state and federal agencies and legislators of the important issue of coastal land loss. The Parish should continue active participation with PACE, coordinating with other coastal parishes advocating for increased funding for coastal projects.

9.7 INTEGRATION OF NON-STRUCTURAL PROGRAM INTO THE JP-CSAP

According to the Parish's newly restructured Department of Ecosystem and Management, the integration of non-structural projects into resiliency coastal protection planning is a priority. The Parish has previously partnered with CPRA to review Flood Risk and Resilience Program-related documents and the application packages as a pilot program to ensure the non-structural application process allowed and considered more detailed local feedback. The Jefferson Parish Floodplain and Hazard Mitigation Department manages the resiliency and non-structural projects. No specific non-structural projects were evaluated as part of the JP-CSAP.

CHAPTER 10
REFERENCES

Photo courtesy of PJ Hahn Photography

10 REFERENCES

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NOTES

Cover and Table of Contents image provided by PJ Hahn Photography

Unless otherwise noted, all photos and drawings were produced by the JP-CSAP project team.

Additional Map Sources – These additional sources were used to create the maps throughout the JP-CSAP:

Atlas: The Louisiana Statewide GIS, https://atlas.ga.lsu.edu/ accessed 2020
(CPRA, 2017)

All Basemaps provided by Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, US Geological Survey, FAO, NPS, NRCAN, Geobase, IGN, Kadaster NL, Ordnance
(USGS, 2011)

CHAPTER 11
APPENDICES

- Appendix A: Project Fact Sheets
  - Appendix A-1: Large-Scale Projects
  - Appendix A-2: Regional Projects
  - Appendix A-3: Local Projects
  - Appendix A-4: Non-traditional Projects

Photo courtesy of PJ Hahn Photography

APPENDIX A

LARGE-SCALE PROJECTS

- WBA-01 West Barataria Marsh Creation Corridor Project
- WBA-02 West Barataria Waterway Marsh Restoration
- BA-21 Bayou Perot and Bayou Rigolettes Peninsula Restoration
- LILD Lafitte Levees

WEST BARATARIA MARSH CREATION CORRIDOR PROJECT

WBA-01

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

Proposed project is part of the Barataria Landbridge, along the original Long Distance Sediment Pipeline corridor. The project will extend the existing corridor an additional 12.6 miles, stretching from the Barataria Waterway west towards Lafourche Parish. The purpose of the project is to obtain renewable sediment resources, establish an adequate access corridor that supports equipment mobilization for long-distance sediment conveyance, and allow for marsh restoration projects. The area has experienced significant wetland loss due to oil and gas activity-induced subsidence and surficial erosion. This project would restore approximately 465 acres of marsh with Mississippi River borrow material for an estimated project cost between $90M and $95M.

STRATEGY

The project establishes an initial foundation for the programmatic wetland restoration of the Barataria Basin. The project is needed to create and restore marsh in an area that is rapidly deteriorating. The project will provide a linkage between renewable sediment sources in the Mississippi River and the sediment-starved Barataria Basin. The permanent corridor component of the project is needed to reduce the cost and overall environmental impact associated with future coastal restoration projects.

PROGRESS TO DATE

The project is in the engineering & design phase and currently being evaluated by the permitting agencies. Potential funding for construction through GOMESA.

PROJECT MAGNITUDE

NON-TRADITIONAL | LOCAL | REGIONAL | **LARGE**

ESTIMATED COST

≤1M | 50M | **100M** | ≥150M

ACRES

1 | 100 | **500** | 1000 | ≥ 2000

PROJECT LEAD

CPRA | **JEFF PARISH** | GILD | LILD | OTHER

STATUS

CONCEPTUAL | PLANNING | **DESIGN** | CONSTRUCTION

BARATARIA BASIN (BA)
Council District 1

WEST BARATARIA MARSH CREATION CORRIDOR PROJECT

WBA-01

BARATARIA BASIN (BA)

Council District 1

WEST BARATARIA WATERWAY MARSH RESTORATION

WBA-02

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

Proposed project is part of the Barataria Landbridge, located to the west and adjacent to the Barataria Waterway and south of the Pen. The area has experienced significant wetland loss due to oil and gas activity-induced subsidence and surficial erosion. This project would restore approximately 481 acres of marsh with Mississippi River borrow material for an estimated project cost between $45M and $50M. Alternative locations are shown as WBA-02a and WBA-02b.

STRATEGY

Historical land loss within the Barataria Landbridge north of the Barataria Bay Rim has increased the effects and risks associated with storm-induced surge. Restoration of marsh in the landbridge would decrease the effects and risks of storm-induced surge for the Town of Lafitte and unprotected areas in the southern portion of Jefferson Parish. The project footprint is within the 2017 CPRA Coastal Master Plan project footprint for 002.MC.04a-Lower Barataria Marsh Creation and is adjacent to BA 27, BA 36, BA 48, BA 43, BA 39, BA 164 (which have been constructed), BA 125 (which is in construction), and BA 206 (which is in planning, engineering, and design).

PROGRESS TO DATE

This project would be constructed in future increments of the Mississippi River Long Distance Sediment Pipeline project.

PROJECT MAGNITUDE

NON-TRADITIONAL | LOCAL | REGIONAL | **LARGE**

ESTIMATED COST

≤1M | **50M** | 100M | ≥150M

ACRES

1 | 100 | **500** | 1000 | ≥ 2000

PROJECT LEAD

CPRA | **JEFF PARISH** | GILD | LILD | OTHER

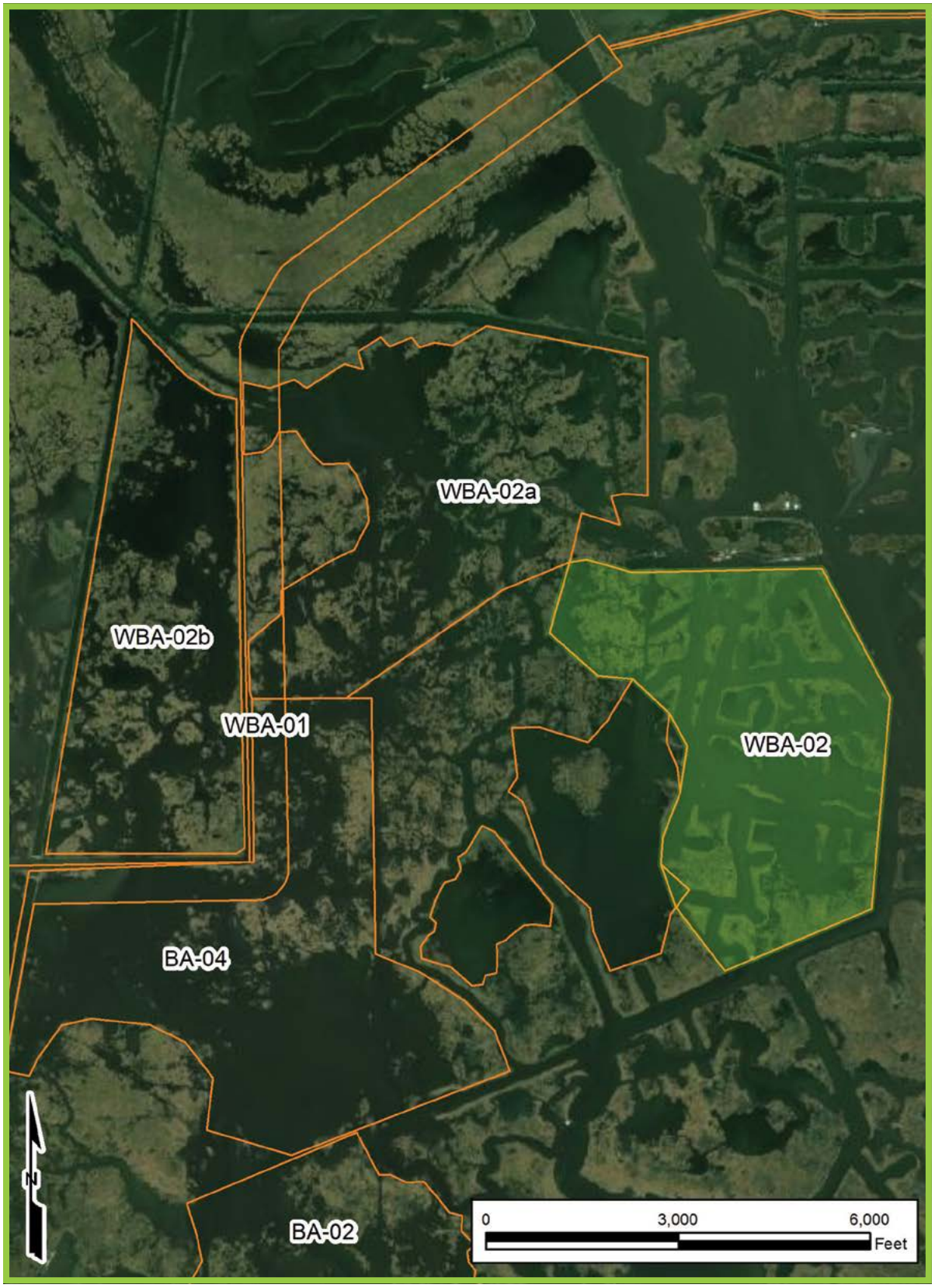
STATUS

CONCEPTUAL | PLANNING | **DESIGN** | CONSTRUCTION

BARATARIA BASIN (BA)
Council District 1

WEST BARATARIA WATERWAY MARSH RESTORATION

WBA-02



BARATARIA BASIN (BA)

Council District 1

BAYOU PEROT & BAYOU RIGOLETTES PENINSULA RESTORATION

BA-21

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

Proposed project is located approximately 2 miles west of Lower Lafitte between Bayou Perot and Bayou Rigolettes. The area has experienced significant wetland loss due to oil and gas activity-induced subsidence and wave-induced shoreline erosion due to wind-driven wave energy across Bayou Perot and Bayou Rigolettes. The project would restore approximately 2,000 acres of wetlands and 22,000 feet of shoreline to reconnect remaining landmasses of the historical peninsula with borrow material from Bayou Perot and Bayou Rigolettes or the Mississippi River for an estimated cost between $140M and $200M.

STRATEGY

Historical land loss of the landbridge between Bayou Perot and Bayou Rigolettes has increased the effects of wave energy across Bayou Perot and Bayou Rigolettes. Restoration of the landbridge would decrease the effects of wave energy and reduce storm-induced surge for areas to the north.

PROGRESS TO DATE

This project was originally authorized for funding through CWPPRA PPL 3, but was deauthorized in 1998 due to concerns with construction feasibility and wetland benefits. Potential funding for construction could come through CPRA and/or the LCA BUDMAT Program.

PROJECT MAGNITUDE

NON-TRADITIONAL | LOCAL | REGIONAL | **LARGE**

ESTIMATED COST

≤1M | 50M | 100M | **≥150M**

ACRES

1 | 100 | 500 | 1000 | **≥ 2000**

PROJECT LEAD

CPRA | JEFF PARISH | GILD | LILD | OTHER

STATUS

CONCEPTUAL | PLANNING | DESIGN | CONSTRUCTION

BARATARIA BASIN (BA)
Council District 1

BAYOU PEROT & BAYOU RIGOLETTES PENINSULA RESTORATION

BA-21

BARATARIA BASIN (BA)

Council District 1

LAFITTE LEVEES

LILD

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

Proposed project surrounds Barataria, Crown Point, Lower Lafitte, and Lafitte. This area has experienced an increase of storm surge due to wetland loss north or Barataria Bay. This project would construct levees around these communities for an estimated project cost between $100M and $150M.

STRATEGY

The Lafitte Levees project would reduce the risk of flooding to the Lafitte area from tropical storms and hurricanes. This project is in the CPRA Coastal Master Plan project 002.HP.07 - Lafitte Ring Levee.

PROGRESS TO DATE

Fischer School and Goose Bayou Basin construction is complete. Rosethorn, Lower Lafitte, Pailet, Crown Point, Lower Barataria, Upper LA 45, Lower LA 45, and Jones Point Basins are in the design phase. Potential funding for construction through GOMESA and Capital Outlay.

PROJECT MAGNITUDE

NON-TRADITIONAL | LOCAL | REGIONAL | **LARGE**

ESTIMATED COST

≤1M | 50M | 100M | **≥150M**

ACRES

1 | 100 | 500 | 1000 | **≥ 2000**

PROJECT LEAD

CPRA | JEFF PARISH | GILD | **LILD** | OTHER

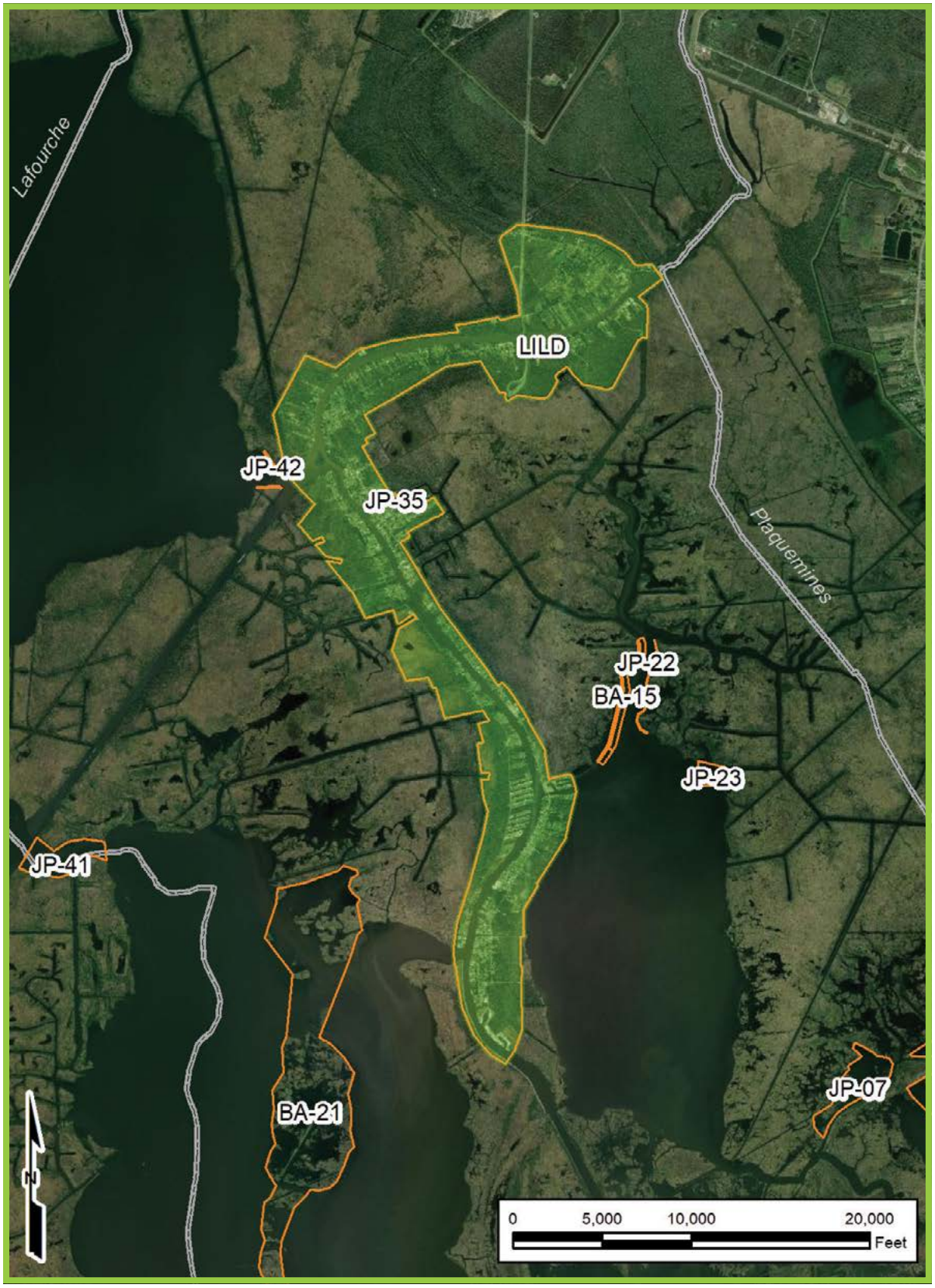
STATUS

CONCEPTUAL | **PLANNING** | **DESIGN** | **CONSTRUCTION**

BARATARIA BASIN (BA)
Council District 1

LAFITTE LEVEES

LILD

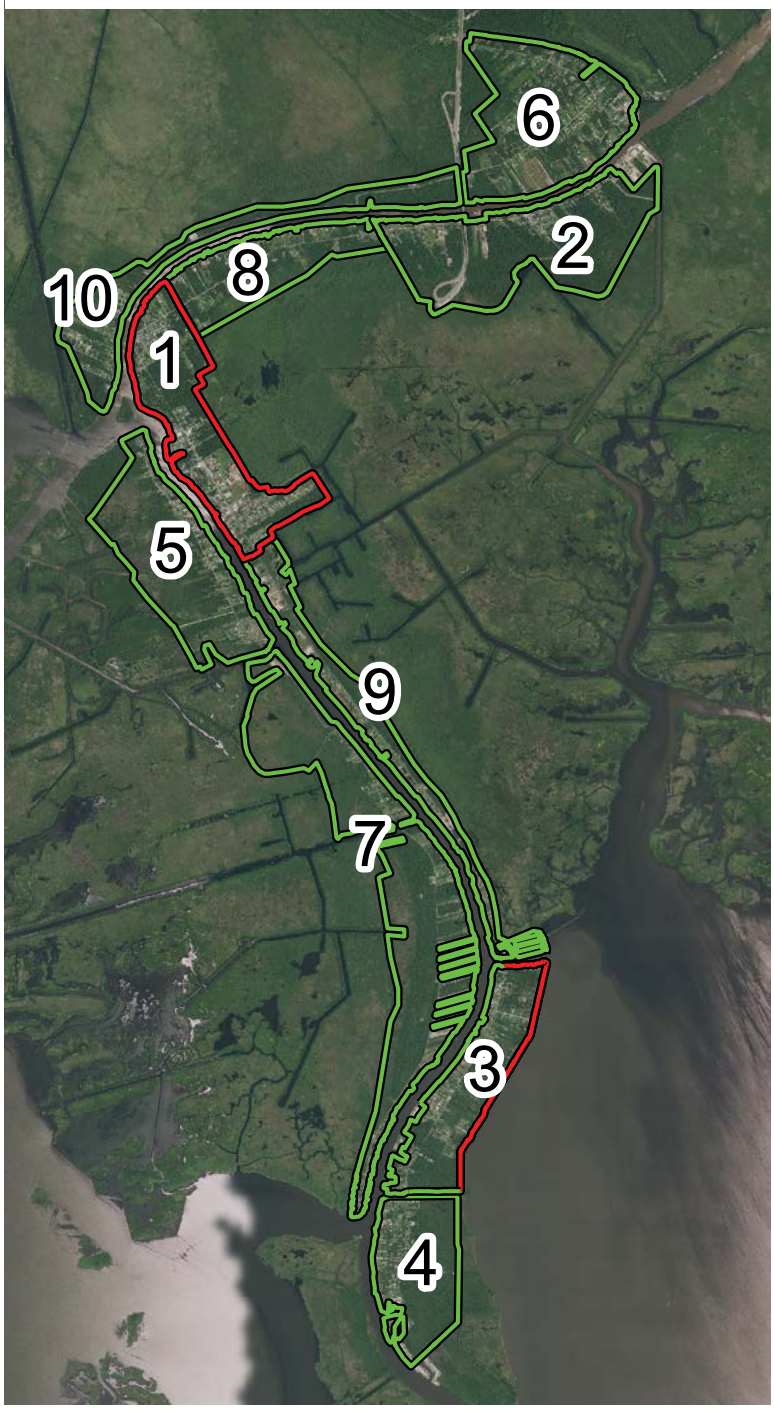


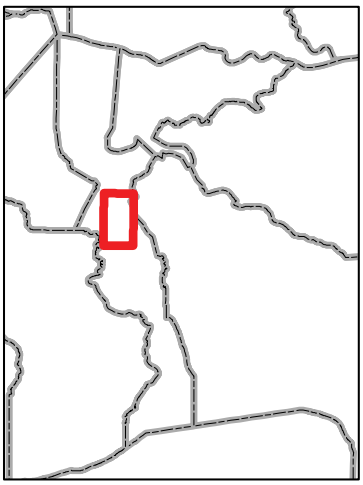
BARATARIA BASIN (BA)

Council District 1

TIDAL LEVEE PROTECTION SYSTEM

For Lafitte, Lower Lafitte, Barataria, and Crown Point





Overview - Louisiana Parishes (GOHSEP 2006)

- Completed
- Construction Phase
- Design Phase
- Planning Phase

1) Fisher School Basin
2) Rosethorne Basin
3) Goose Bayou (Pen Levee) Basin
4) Lower Lafitte (Orange St.) Basin
5) Pailet Basin
6) Crown Point Basin
7) Lower Barataria Basin (LA 302 - Privateer Dr.)
8) Upper LA 45 Evacuation Route
9) Lower LA 45 Evacuation Route
10) Jones Point Basin

N W E S

0 12.5 25 50 Miles

REFERENCE/PROJECTION:
NAD83 State Plane Louisiana South Feet

APTIM

BARATARIA BASIN (BA)
Council District 1

APPENDIX A

REGIONAL PROJECTS

- BA-195 Barataria Bay Rim Marsh Creation
- JP-15 Bay Dosgris Marsh Creation
- JP-07 Bayou Dupont Sediment Delivery #4
- BA-15 Goose Bayou Ridge Creation and Shoreline Protection
- BA-04 Northeast Turtle Bay Extension
- JP-14 South Cheniere Traverse Bayou Marsh Creation
- BA-02 Three Bayou Bay Marsh Creation
- GILD-1 Cheniere Caminada Breakwaters
- GILD-7 Hurricane Protection Grand Isle Back Levee
- JP-09 Grand Isle Bayside Marsh Creation
- JP-02 Bucktown Marsh Restoration and Living Shoreline
- JP-03 Lake Pontchartrain Marsh Protection Feasibility Study West

BARATARIA BAY RIM MARSH CREATION

BA-195

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

Proposed project is part of the Barataria Bay Rim, located on the north shore of Barataria Bay and east and adjacent to the Barataria Waterway. The area has experienced shoreline erosion due to wind-driven wave energy across the Barataria Bay. This project would restore approximately 251 acres and nourish an additional 266 acres of marsh with in system borrow material from Barataria Bay for an estimated project cost between $25M and $30M.

STRATEGY

Historical land loss within the Barataria Bay Rim has increased the effects and risks associated with storm-induced surge. Restoration of marsh in the Barataria Bay Rim would decrease the effects and risks of storm induced-surge for the Town of Lafitte and unprotected areas in the southern portion of Jefferson Parish.

PROGRESS TO DATE

This project was selected in the CWPPRA PPL 25 and approved for Phase I for planning, engineering, and design in January 2016. Phase II Authorization and Approval, which includes real estate acquisition, construction, operation and maintenance, and post-construction monitoring, was received in January 2019.

PROJECT MAGNITUDE

NON-TRADITIONAL | LOCAL | **REGIONAL** | LARGE

ESTIMATED COST

≤1M | **50M** | 100M | ≥150M

ACRES

1 | **100** | 500 | 1000 | ≥ 2000

PROJECT LEAD

CPRA | JEFF PARISH | GILD | LILD | **OTHER**

STATUS

CONCEPTUAL | PLANNING | **DESIGN** | CONSTRUCTION

BARATARIA BASIN (BA)
Council District 1

BARATARIA BAY RIM MARSH CREATION

BA-195

BARATARIA BASIN (BA)

Council District 1

BAY DOSGRIS MARSH CREATION

JP-15

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

Proposed project is part of the Barataria Bay Rim, located on the south shore of Turtle Bay and west of the Barataria Waterway. The area has experienced shoreline erosion due to wind-driven wave energy across Turtle Bay and Little Lake. This project would restore approximately 213 acres and nourish an additional 441 acres of marsh with in-system borrow material from Barataria Bay for an estimated project cost between $40M and $45M.

STRATEGY

Historical land loss within the Barataria Bay Rim has increased the effects and risks associated with storm-induced surge. Restoration of marsh in the Barataria Bay Rim would decrease the effects and risks of storm-induced surge for the Town of Lafitte and unprotected areas in the southern portion of Jefferson Parish. The project is adjacent to the Barataria Waterway LCA BUDMAT footprint, which is in engineering and design.

PROGRESS TO DATE

This project was submitted by the NRCS for consideration as a candidate project for CWPPRA PPL 23 and was not selected for further analysis.

PROJECT MAGNITUDE

NON-TRADITIONAL | LOCAL | **REGIONAL** | LARGE

ESTIMATED COST

≤1M | **50M** | 100M | ≥150M

ACRES

1 | 100 | **500** | 1000 | ≥ 2000

PROJECT LEAD

CPRA | **JEFF PARISH** | GILD | LILD | OTHER

STATUS

CONCEPTUAL | PLANNING | DESIGN | CONSTRUCTION

BARATARIA BASIN (BA)
Council District 1

BAY DOSGRIS MARSH CREATION

JP-15

BARATARIA BASIN (BA)

Council District 1

BAYOU DUPONT SEDIMENT DELIVERY #4

JP-07

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

Proposed project is part of the Barataria Landbridge, located south of the Cheniere Traverse Bayou and northeast of Bayou Dupont along the Long Distance Sediment Pipeline corridor. The area has experienced significant wetland loss due to oil and gas activity-induced subsidence and surficial erosion. This project would restore and nourish approximately 300 acres of marsh with Mississippi River borrow material for an estimated project cost between $25M and $30M.

STRATEGY

Historical land loss within the Barataria Landbridge north of the Barataria Bay Rim has increased the effects and risks associated with storm-induced surge. Restoration of marsh in the landbridge would decrease the effects and risks of storm-induced surge for the Town of Lafitte and unprotected areas in the southern portion of Jefferson Parish. The project footprint is within the 2017 CPRA Coastal Master Plan project footprint for 002.MC.04a-Lower Barataria Marsh Creation and would tie into the previously constructed BA-39 Bayou Dupont Sediment Delivery System.

PROGRESS TO DATE

This project was originally proposed for CWPPRA PPL 23 and was proposed again in PPL 24. Good location for future LDSP. Potential construction would be through future increments of the Mississippi River Long Distance Sediment Pipeline project.

PROJECT MAGNITUDE

NON-TRADITIONAL | LOCAL | **REGIONAL** | LARGE

ESTIMATED COST

≤1M | **50M** | 100M | ≥150M

ACRES

1 | 100 | **500** | 1000 | ≥ 2000

PROJECT LEAD

CPRA | JEFF PARISH | GILD | LILD | OTHER

STATUS

CONCEPTUAL | PLANNING | DESIGN | CONSTRUCTION

BARATARIA BASIN (BA)
Council District 1

BAYOU DUPONT SEDIMENT DELIVERY #4

JP-07

BARATARIA BASIN (BA)

Council District 1

GOOSE BAYOU RIDGE CREATION & SHORELINE PROTECTION

BA-15

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

Project is located east of the Town of Lafitte, along the northwestern shore of the Pen, at the outlet of Goose Bayou and northward to its intersection with Cypress Bayou. The area has experienced shoreline erosion due to wind-driven wave energy across the Pen. This project, as proposed in the Louisiana State CIAP plan, would construct approximately 8,000 linear feet of rock shoreline protection and create approximately 50 acres of wooded ridge habitat along the western shoreline of Goose Bayou for an estimated cost of $15M.

STRATEGY

Historical land loss and channel widening/deepening have increased the effects and risks associated with storm-induced surge. Restoration and protection of the shoreline and historical ridge would stabilize the channel of Goose Bayou and reduce the risks of storm-induced surge for the Town of Lafitte.

PROGRESS TO DATE

Preliminary Design was completed in 2011 by Jefferson Parish through the CIAP plan. The geotechnical data presented concerns with soil conditions and extensive dredging would be necessary to access the site, which raised concerns about the constructability of the project. Future funding through Capital Outlay or CPRA could be used to complete the design and construction of the project.

PROJECT MAGNITUDE

NON-TRADITIONAL | LOCAL | **REGIONAL** | LARGE

ESTIMATED COST

≤1M | 50M | 100M | ≥150M

LINEAR FEET

≤1000 | 2000 | 4000 | 6000 | **≥ 8000**

PROJECT LEAD

CPRA | **JEFF PARISH** | GILD | LILD | OTHER

STATUS

CONCEPTUAL | PLANNING | DESIGN | CONSTRUCTION

BARATARIA BASIN (BA)
Council District 1

GOOSE BAYOU RIDGE CREATION & SHORELINE PROTECTION

BA-15

BARATARIA BASIN (BA)

Council District 1

NORTHEAST TURTLE BAY EXTENSION MARSH CREATION

BA-04

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

Proposed project is part of the Barataria Landbridge, located to the west and adjacent to the Barataria Waterway and south of the Pen. The area has experienced significant wetland loss due to oil and gas activity-induced subsidence and surficial erosion. This project would restore approximately 610 acres of marsh with in-system borrow material from Little Lake for an estimated project cost between $25M and $30M.

STRATEGY

Historical land loss within the Barataria Landbridge north of the Barataria Bay Rim has increased the effects and risks associated with storm-induced surge. Restoration of marsh in the landbridge would decrease the effects and risks of storm-induced surge for the Town of Lafitte and unprotected areas in the southern portion of Jefferson Parish. The project footprint is within the 2017 CPRA Coastal Master Plan project footprint for 002.MC.04a-Lower Barataria Marsh Creation and is adjacent to BA-27, BA-36, BA-48, BA-43, BA-39, BA-164 (which have been constructed), BA-125 (which is in construction), and BA-206 (which is in planning, engineering, and design).

PROGRESS TO DATE

This project was submitted by the U.S. Environmental Protection Agency for consideration as a candidate project for CWPPRA PPL 30 and has advanced to the 2nd phase of the CWPPRA Evaluation Process.

PROJECT MAGNITUDE

NON-TRADITIONAL | LOCAL | **REGIONAL** | LARGE

ESTIMATED COST

≤1M | **50M** | 100M | ≥150M

ACRES

1 | 100 | **500** | 1000 | ≥ 2000

PROJECT LEAD

CPRA | JEFF PARISH | GILD | LILD | **OTHER**

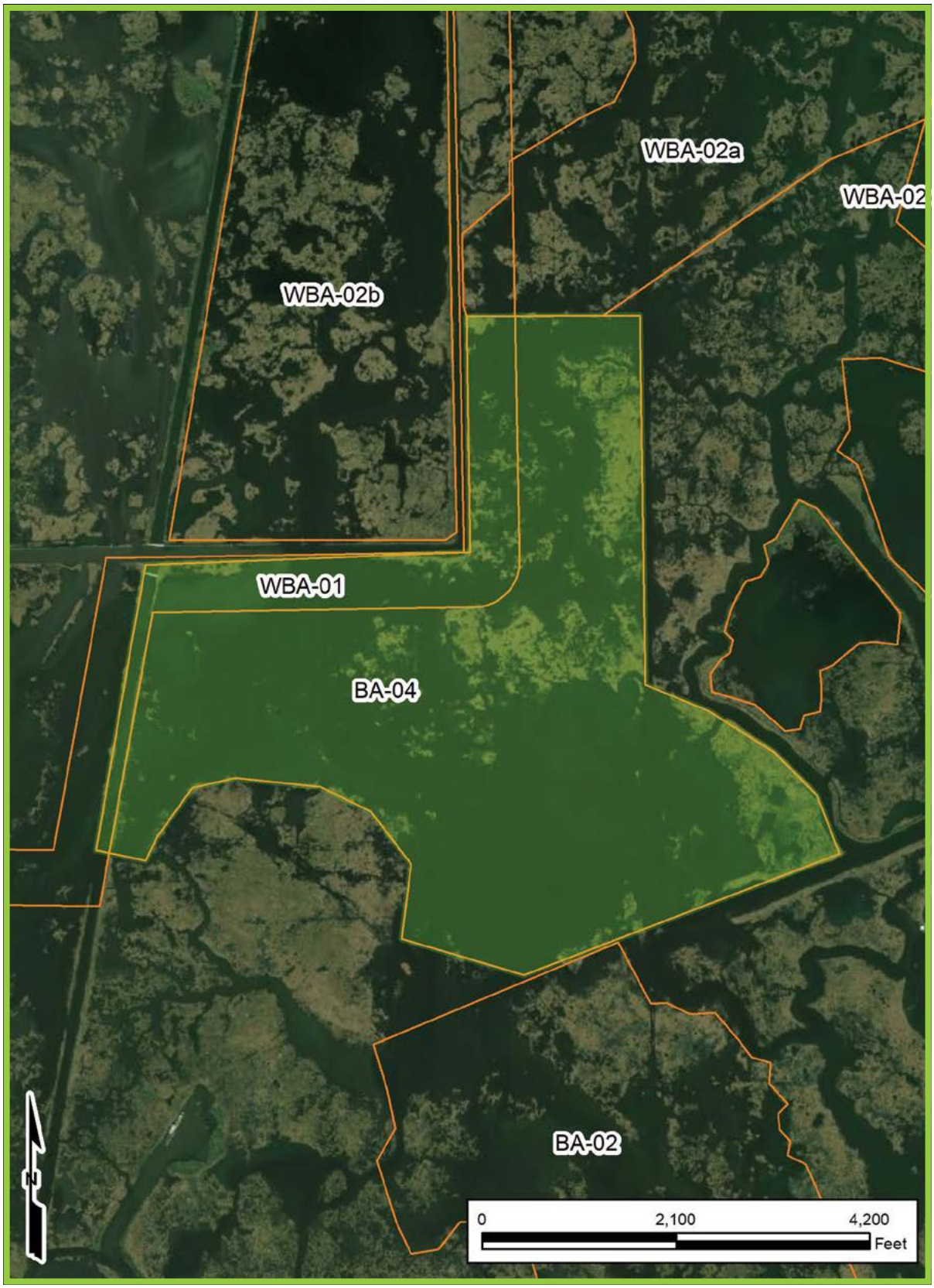
STATUS

CONCEPTUAL | PLANNING | **DESIGN** | CONSTRUCTION

BARATARIA BASIN (BA)
Council District 1

NORTHEAST TURTLE BAY EXTENSION MARSH CREATION

BA-04



BARATARIA BASIN (BA)

Council District 1

SOUTH CHENIERE TRAVERSE BAYOU MARSH CREATION

JP-14

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

Proposed project is part of the Barataria Landbridge, located south of the Cheniere Traverse Bayou and northeast of Bayou Dupont along the Long Distance Sediment Pipeline corridor. The area has experienced significant wetland loss due to oil and gas activity-induced subsidence and surficial erosion. This project would restore approximately 342 acres of marsh with Mississippi River borrow material for an estimated project cost between $25M and $30M.

STRATEGY

Historical land loss within the Barataria Landbridge north of the Barataria Bay Rim has increased the effects and risks associated with storm-induced surge. Restoration of marsh in the landbridge would decrease the effects and risks of storm-induced surge for the Town of Lafitte and unprotected areas in the southern portion of Jefferson Parish. The project footprint is within the 2017 CPRA Coastal Master Plan project footprint for 002.MC.04a - Lower Barataria Marsh Creation.

PROGRESS TO DATE

Potential construction would be through future increments of the Mississippi River Long Distance Sediment Pipeline project.

PROJECT MAGNITUDE

NON-TRADITIONAL LOCAL **REGIONAL** LARGE

ESTIMATED COST

≤1M **50M** 100M ≥150M

ACRES

1 100 **500** 1000 ≥ 2000

PROJECT LEAD

CPRA **JEFF PARISH** GILD LILD OTHER

STATUS

CONCEPTUAL PLANNING DESIGN CONSTRUCTION

BARATARIA BASIN (BA)
Council District 1

SOUTH CHENIERE TRAVERSE BAYOU MARSH CREATION

JP-14

BARATARIA BASIN (BA)

Council District 1

THREE BAYOU BAY MARSH CREATION

BA-02

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

Proposed project is part of the Barataria Landbridge, located adjacent to and west of the Barataria Waterway and south of the Pen. The area has experienced significant wetland loss due to oil and gas activity induced subsidence and surficial erosion. This project would restore approximately 638 acres of marsh with in-system borrow material from Little Lake for an estimated project cost between $25M and $30M.

STRATEGY

Historical land loss within the Barataria Landbridge north of the Barataria Bay Rim has increased the effects and risks associated with storm-induced surge. Restoration of marsh in the landbridge would decrease the effects and risks of storm-induced surge for the Town of Lafitte and unprotected areas in the southern portion of Jefferson Parish. The project footprint is within the 2017 CPRA Coastal Master Plan project footprint for 002.MC.04a - Lower Barataria Marsh Creation and is adjacent to BA-27, BA-36, BA-48, BA-43, BA-39, BA-164 (which have been constructed), BA-125 (which is in construction), and BA-206 (which is in planning, engineering, and design).

PROGRESS TO DATE

This project was submitted by the U.S. Environmental Protection Agency for consideration as a candidate project for CWPPRA PPL 30 but did not advance to the 2nd phase of the CWPPRA Evaluation Process. The project may be resubmitted for future consideration under CWPPRA.

PROJECT MAGNITUDE

NON-TRADITIONAL | LOCAL | **REGIONAL** | LARGE

ESTIMATED COST

≤1M | **50M** | 100M | ≥150M

ACRES

1 | 100 | **500** | 1000 | ≥ 2000

PROJECT LEAD

CPRA | JEFF PARISH | GILD | LILD | **OTHER**

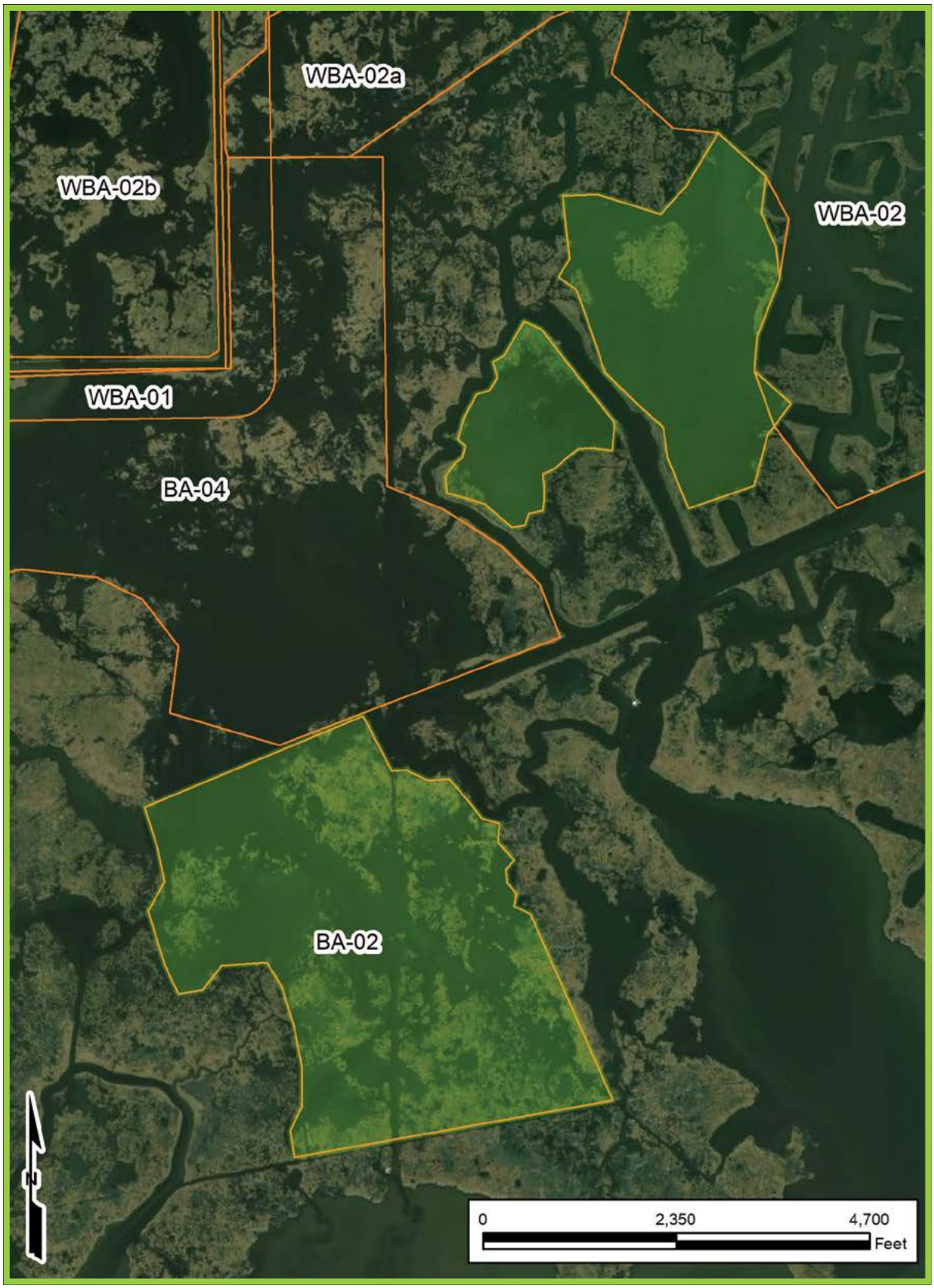
STATUS

CONCEPTUAL | PLANNING | DESIGN | CONSTRUCTION

BARATARIA BASIN (BA)
Council District 1

THREE BAYOU BAY MARSH CREATION

BA-02



BARATARIA BASIN (BA)

Council District 1

CHENIER CAMINADA BREAKWATERS GILD-1

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

Proposed project is located on the Caminada Headland approximately 9 miles northeast of Port Fourchon and 2 miles southwest of Grand Isle along the north side of Cheniere Caminada. The project would construct 2.5 miles of breakwaters along Caminada extending west from the existing breakwaters for an estimated cost between $21M and $25M.

STRATEGY

The Caminada Headland has experienced significant shoreline erosion and land loss as a result of storms overtopping and breaching, wave-erosion, sea level rise, and subsidence. The Grand Isle Independent Levee District proposes to continue rock breakwaters along Caminada Bay in an effort to reduce land loss along the north side of Louisiana Highway 1 on Cheniere Caminada caused by heavy wave action from north winds in Caminada Bay.

PROGRESS TO DATE

The project is in the engineering & design phase and currently being evaluated by the permitting agencies.

PROJECT MAGNITUDE

NON-TRADITIONAL | LOCAL | **REGIONAL** | LARGE

ESTIMATED COST

≤1M | 50M | 100M | ≥150M

MILES

≤1 | **2** | 4 | 6 | 8 | ≥ 10

PROJECT LEAD

CPRA | JEFF PARISH | **GILD** | LILD | OTHER

STATUS

CONCEPTUAL | PLANNING | **DESIGN** | CONSTRUCTION

BARRIER ISLAND (BI)
Council District 1

CHENIER CAMINADA BREAKWATERS

GILD-1

BARRIER ISLAND (BI)

Council District 1

GRAND ISLE BACK LEVEES GILD-7

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

The project will construct levees on Grand Isle in two phases.

Phase I is the repair and lifting of 2.7 miles of levee between Cherry Lane and Walnut Street Pump Station to an elevation of 5.0' NAVD88 for an estimated cost between $6M and $8M.

Phase 2A is the installation of 1.5 miles of levee to an elevation of 5.0' NAVD88 between Walnut Street Pump Station and Humble Road for an estimated cost between $4M and $6M.

STRATEGY

The Grand Isle Independent Levee District proposes to construct back levees to mitigate the potential flood hazards caused by severe thunderstorms, tropical storms, and hurricanes. Recent hurricanes and tropical storms have caused storm surge and waves to inundate Grand Isle resulting in flooding and substantial damage. Phase I would protect approximately 413 acres of Grand Isle and Phase 2A would protect approximately 205 acres.

PROGRESS TO DATE

The Grand Isle Independent Levee District is currently in the design stage for Phase I and the planning stage for Phase 2A.

PROJECT MAGNITUDE

NON-TRADITIONAL | LOCAL | **REGIONAL** | LARGE

ESTIMATED COST

1M | 50M | 100M | ≥150M

ACRES

1 | 100 | **500** | 1000 | ≥ 2000

PROJECT LEAD

CPRA | JEFF PARISH | **GILD** | LILD | OTHER

STATUS

CONCEPTUAL | **PLANNING** | **DESIGN** | CONSTRUCTION

BARRIER ISLAND (BI)
Council District 1

GRAND ISLE BACK LEVEES GILD-7

BARRIER ISLAND (BI)
Council District 1

GRAND ISLE BACK LEVEES GILD-7

BARRIER ISLAND (BI)
Council District 1

GRAND ISLE BACK LEVEES GILD-7

BARRIER ISLAND (BI)
Council District 1

GRAND ISLE BAYSIDE MARSH CREATION

JP-09

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

Proposed project is on the north side of Grand Isle. The project is the proposed restoration of 196 acres of bayside marsh to protect the eroding narrow western end of Grand Isle. The project would use sediment from the dredging of Bayou Rigaud, Barataria Bay Waterway Bar Channel, or an offshore borrow site. Estimated cost is between $15M and $20M.

STRATEGY

The bayside marsh will function as a barrier to reduce the impacts on Louisiana's only accessible and inhabited barrier island from storm-induced surge and capture sediment overwashed from the beach during storm events. Sediment will be placed between the rock breakwaters and the existing marsh for a length of approximately 7,600 linear feet.

PROGRESS TO DATE

Potential CWPPRA candidate project for consideration. A CWPPRA agency sponsor would have to be identified.

PROJECT MAGNITUDE

NON-TRADITIONAL | LOCAL | **REGIONAL** | LARGE

ESTIMATED COST

≤1M | 50M | 100M | ≥150M

ACRES

1 | **100** | 500 | 1000 | ≥ 2000

PROJECT LEAD

CPRA | **JEFF PARISH** | GILD | LILD | OTHER

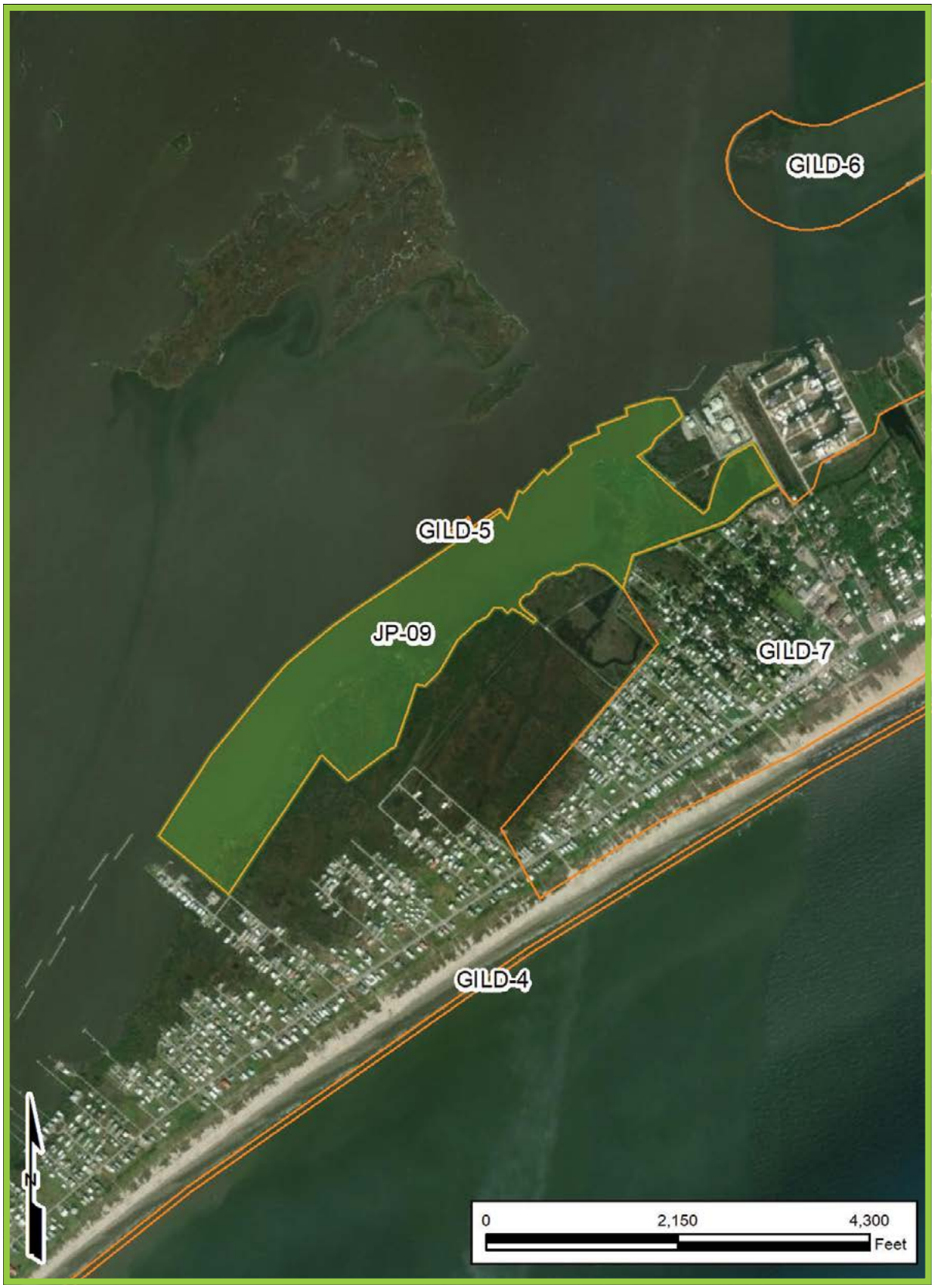
STATUS

CONCEPTUAL | PLANNING | DESIGN | CONSTRUCTION

BARRIER ISLAND (BI)
Council District 1

GRAND ISLE BAYSIDE MARSH CREATION

JP-09



BARATARIA BASIN (BA)

Council District 1

BUCKTOWN MARSH RESTORATION & LIVING SHORELINE

JP-02

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

Proposed project is on the south shore of Lake Pontchartrain between the Bonnabel Park and Boat Launch to the west and the Bucktown Boat Harbor along the Lake Pontchartrain and Vicinity Hurricane and Storm Damage Risk Reduction System (HSDDRS). The project would create approximately 39 acres of living shoreline for a 1-mile stretch for an estimated project cost between $8M and $12M.

STRATEGY

Living shorelines add multiple project benefits including fish and wildlife habitat, recreational benefits, and protection to the Lake Pontchartrain HSDRRS.

PROGRESS TO DATE

This project is currently in the planning, engineering, and design phase with funding for the first phase coming from NFWF and the Coastal Resilience Fund. Construction funding will be $2.4M from NFWF and matched with $2.6M from Jefferson Parish.

PROJECT MAGNITUDE

NON-TRADITIONAL | LOCAL | **REGIONAL** | LARGE

ESTIMATED COST

≤1M | 50M | 100M | ≥150M

ACRES

1 | 100 | 500 | 1000 | ≥ 2000

PROJECT LEAD

CPRA | **JEFF PARISH** | GILD | LILD | OTHER

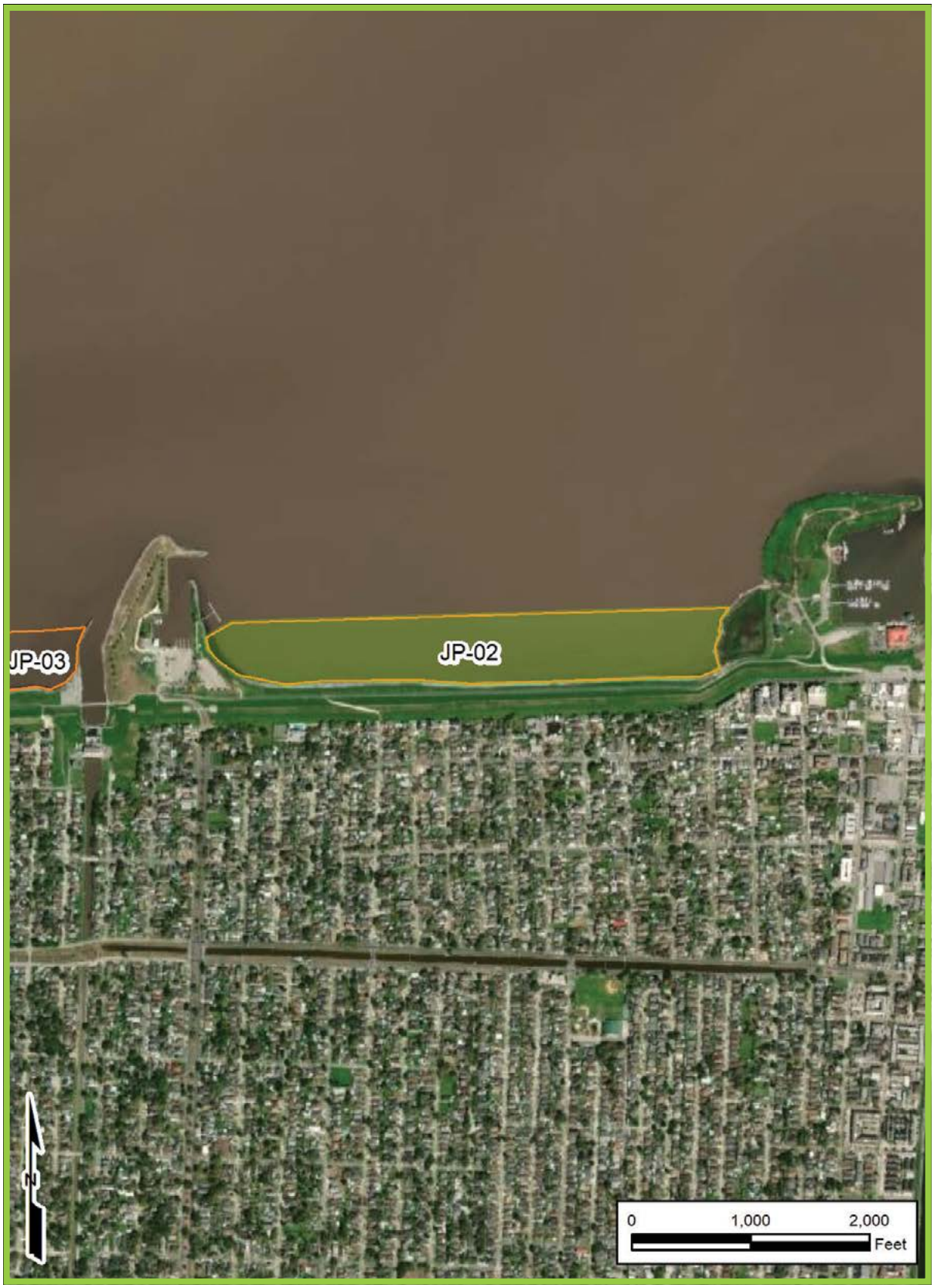
STATUS

CONCEPTUAL | PLANNING | **DESIGN** | CONSTRUCTION

PONTCHARTRAIN BASIN (PO)
Council District 5

BUCKTOWN MARSH RESTORATION & LIVING SHORELINE

JP-02



PONTCHARTRAIN BASIN (PO)

Council District 5

BUCKTOWN MARSH RESTORATION & LIVING SHORELINE

JP-02

MASTER PLAN - CONCEPT 2 - ALTERNATIVE B

BUCKTOWN LIVING SHORELINE

JEFFERSON PARISH, LOUISIANA

moffatt & nichol | 08.12.2019 | MASTER PLAN - CONCEPT 2 - ALTERNATIVE A - MAXIMUM MARSH ACREAGE

GRAPHIC SCALE IN FEET
RATIO 1":250' @ 22x34

0 125 250 500 1000

PONTCHARTRAIN BASIN (PO)

Council District 5

LAKE PONTCHARTRAIN MARSH PROTECTION FEASIBILITY STUDY WEST JP-03

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

Proposed project is on the south shore of Lake Pontchartrain west of the Bonnabel Park and Boat Launch and along the Lake Pontchartrain and Vicinity Hurricane and Storm Damage Risk Reduction System (HSDRRS). The project would create living shoreline for a 2-mile stretch. The Feasibility Study is estimated to cost between $1M and $2M.

STRATEGY

Living shorelines add multiple project benefits including fish and wildlife habitat, recreational benefits, and protection to the Lake Pontchartrain HSDRRS.

PROGRESS TO DATE

This project is currently in the conceptual phase with potential funding through GOMESA.

PROJECT MAGNITUDE

NON-TRADITIONAL | LOCAL | **REGIONAL** | LARGE

ESTIMATED COST

≤1M | 50M | 100M | ≥150M

MILES

≤1 | **2** | 4 | 6 | 8 | ≥ 10

PROJECT LEAD

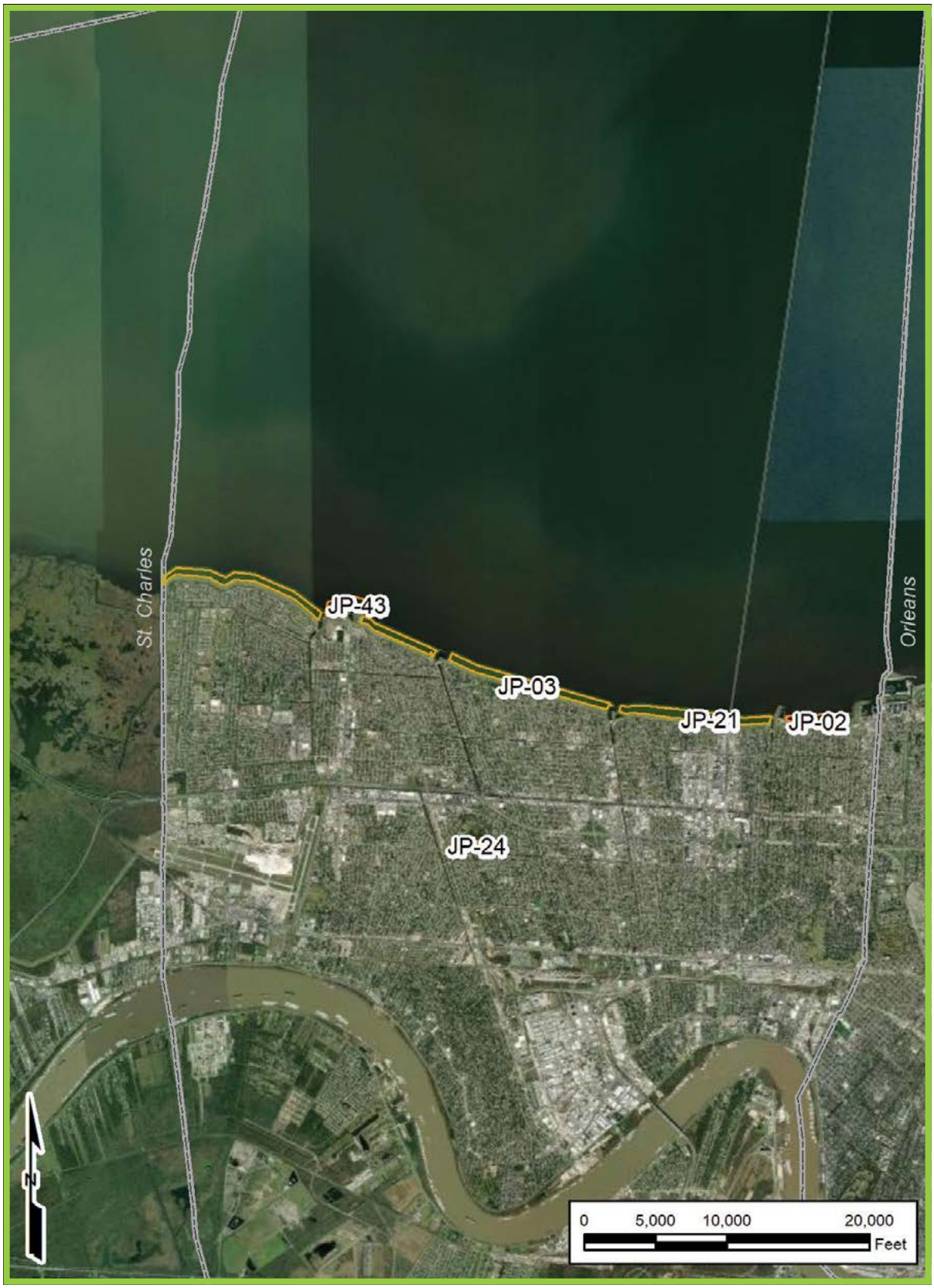
CPRA | **JEFF PARISH** | GILD | LILD | OTHER

STATUS

CONCEPTUAL | PLANNING | DESIGN | CONSTRUCTION

PONTCHARTRAIN BASIN (PO)
Council District 4

LAKE PONTCHARTRAIN MARSH PROTECTION FEASIBILITY STUDY WEST JP-03



PONTCHARTRAIN BASIN (PO)
Council District 4

APPENDIX A

LOCAL PROJECTS

- JP-42 Bayou Villars Channel Management
- JP-41 Lake Salvador / Bayou Perot Channel Management
- JP-16 Northeast Lake Cataouatche Marsh Creation
- JP-23 Upper Barataria Terracing Project
- GILD-2 Bayou Thunder Rock Dike Project
- GILD-3 Cheniere Caminada Marsh Restoration
- GILD-6 Fifi Island Restoration
- GILD-5 Grand Isle Bayside Segmented Breakwaters Completion
- GILD-4 Grand Isle Gulfside Segmented Breakwaters
- JP-24 Lafreniere Marsh Restoration
- JP-43 Laketown Breakwaters / Living Shoreline

BAYOU VILLARS CHANNEL MANAGEMENT

JP-42

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

Proposed project is located on the eastern shore of Lake Salvador near the intersection of the Gulf Intracoastal Waterway (GIWW) and the Barataria Waterway. This channel has increased in size due to wave energy across Lake Salvador and in the GIWW. Estimated cost has not yet been determined.

STRATEGY

Historical land loss on the banks of the channel has caused the channel to increase in size with the potential to further open Lake Salvador to the GIWW. This project would evaluate potential alternatives to stabilize the channel between the GIWW and Lake Salvador.

PROGRESS TO DATE

This project is currently in the conceptual phase with potential funding sources being identified.

PROJECT MAGNITUDE

NON-TRADITIONAL **LOCAL** REGIONAL LARGE

ACRES

1 100 500 1000 ≥ 2000

PROJECT LEAD

CPRA **JEFF PARISH** GILD LILD OTHER

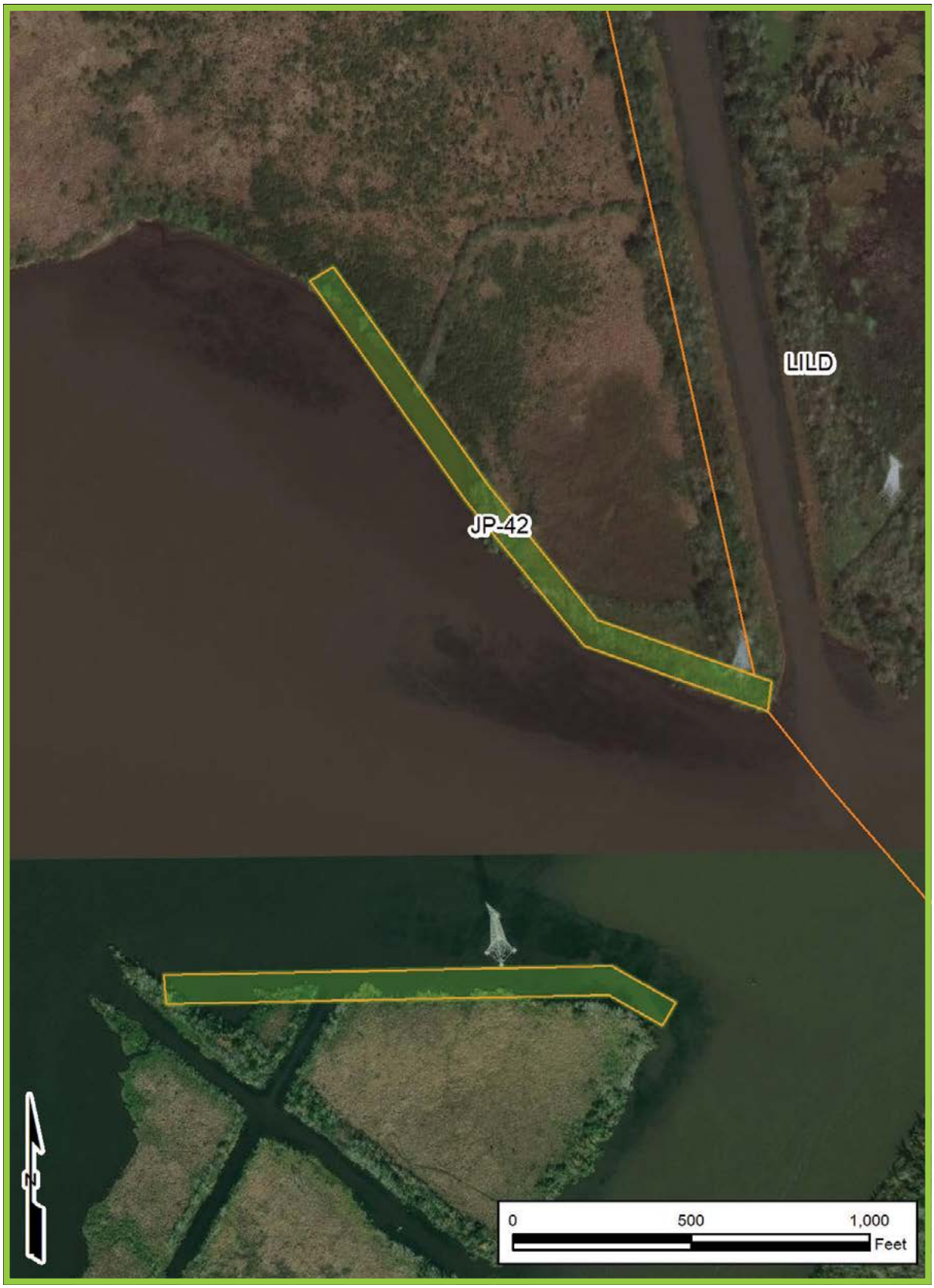
STATUS

CONCEPTUAL PLANNING DESIGN CONSTRUCTION

BARATARIA BASIN (BA)
Council District 1

BAYOU VILLARS
CHANNEL MANAGEMENT

JP-42



BARATARIA BASIN (BA)

Council District 1

LAKE SALVADOR / BAYOU PEROT CHANNEL MANAGEMENT

JP-41

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

Proposed project is located at the natural channel intersection joining Bayou Perot and Lake Salvador. This natural channel has increased in size due to bank erosion from tidal exchange between two large bodies of water. Estimated cost has not yet been determined.

STRATEGY

Historical land loss on the banks of the channel has caused the channel to increase in size with the potential to lose the land bridge separating the two bodies of water, adversely affecting the natural salinities of Lake Salvador and Lake Cataouatche. This project would evaluate potential alternatives to stabilize the channel between Bayou Perot and Lake Salvador.

PROGRESS TO DATE

This project is currently in the conceptual phase with potential funding sources being identified.

PROJECT MAGNITUDE

NON-TRADITIONAL **LOCAL** REGIONAL LARGE

ACRES

1 100 500 1000 ≥ 2000

PROJECT LEAD

CPRA **JEFF PARISH** GILD LILD OTHER

STATUS

CONCEPTUAL PLANNING DESIGN CONSTRUCTION

BARATARIA BASIN (BA)
Council District 1

LAKE SALVADOR / BAYOU PEROT CHANNEL MANAGEMENT

JP-41

BARATARIA BASIN (BA)

Council District 1

NORTHEAST LAKE CATAOUATCHE MARSH CREATION

JP-16

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

Proposed project is adjacent to the West Bank and Vicinity (WBV) Hurricane and Storm Damage Risk Reduction System (HSDRRS) located approximately 3 miles south of Bayou Segnette State Park with Marcello Canal to the north, Lake Cataouatche to the southwest, Yankee Pond to the southeast, and Labranche Canal to the west. The project would create a terrace field with in-situ borrow within an open water area for an estimated project cost between $15M and $20M.

STRATEGY

Terraces are a cost-effective option to create wetland habitat while reducing shoreline and interior marsh erosion due to wind-driven waves against the HSDRRS.

PROGRESS TO DATE

This project is currently in the conceptual phase with potential funding sources being identified.

PROJECT MAGNITUDE

NON-TRADITIONAL **LOCAL** REGIONAL LARGE

ESTIMATED COST

≤1M 50M 100M ≥150M

ACRES

1 **100** 500 1000 ≥ 2000

PROJECT LEAD

CPRA **JEFF PARISH** GILD LILD OTHER

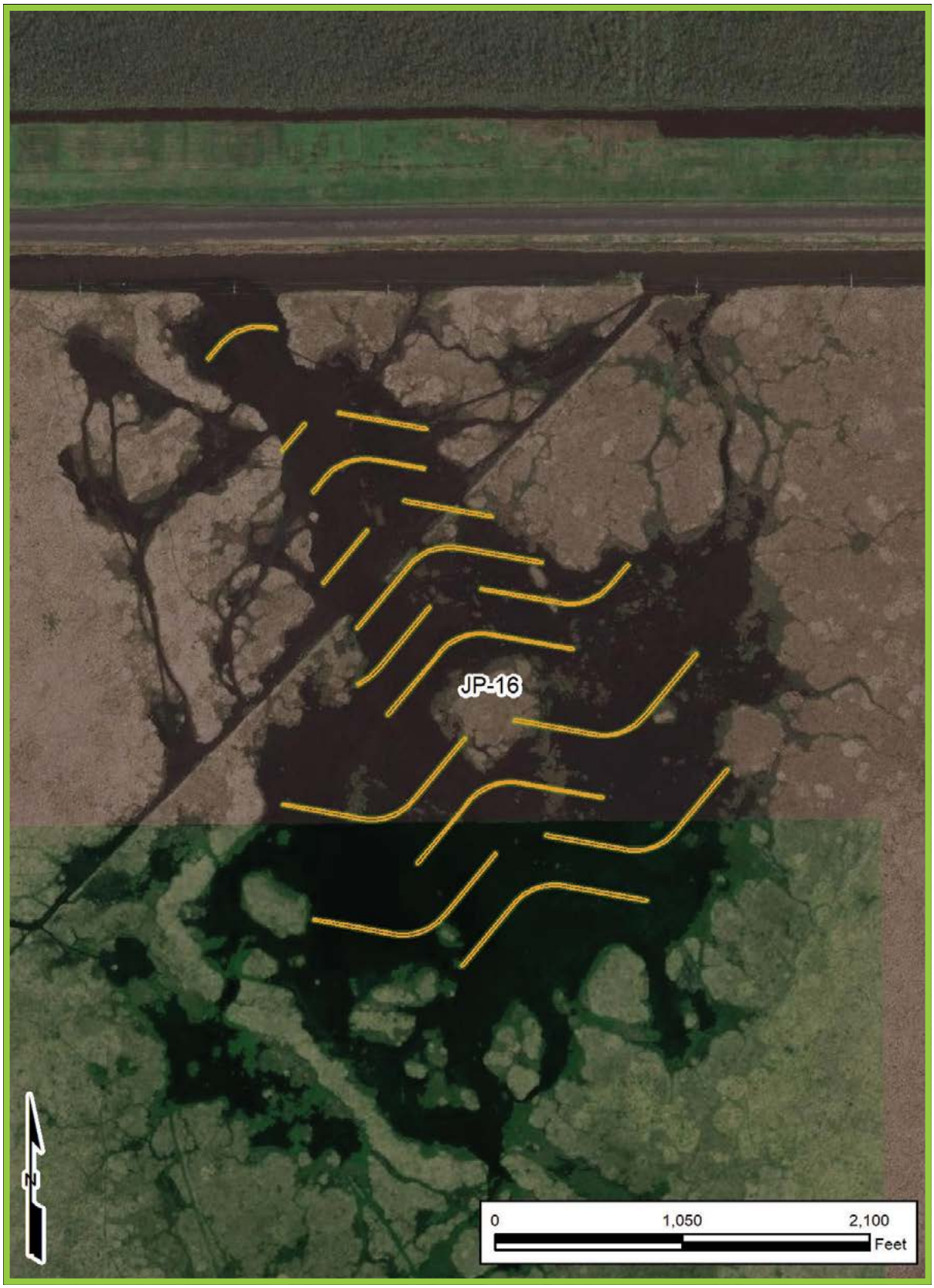
STATUS

CONCEPTUAL PLANNING DESIGN CONSTRUCTION

BARATARIA BASIN (BA)
Council District 3

NORTHEAST LAKE CATAOUATCHE MARSH CREATION

JP-16



BARATARIA BASIN (BA)

Council District 3

UPPER BARATARIA TERRACING PROJECT

JP-23

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

Proposed project is part of the Barataria Landbridge, located east of the Barataria Waterway and south of The Pen. The project would create a terrace field with in-situ borrow within an open water area for an estimated project cost between $1M and $2M.

STRATEGY

Terraces are a cost-effective option to create wetland habitat while reducing shoreline and interior marsh erosion due to wind-driven waves against the hurricane protection system.

PROGRESS TO DATE

This project is currently in the planning phase. Jefferson Parish has applied for a North American Wetlands Conservation Act Grant.

PROJECT MAGNITUDE

NON-TRADITIONAL **LOCAL** REGIONAL LARGE

ESTIMATED COST

≤1M 50M 100M ≥150M

ACRES

1 100 500 1000 ≥ 2000

PROJECT LEAD

CPRA JEFF PARISH GILD LILD **OTHER**

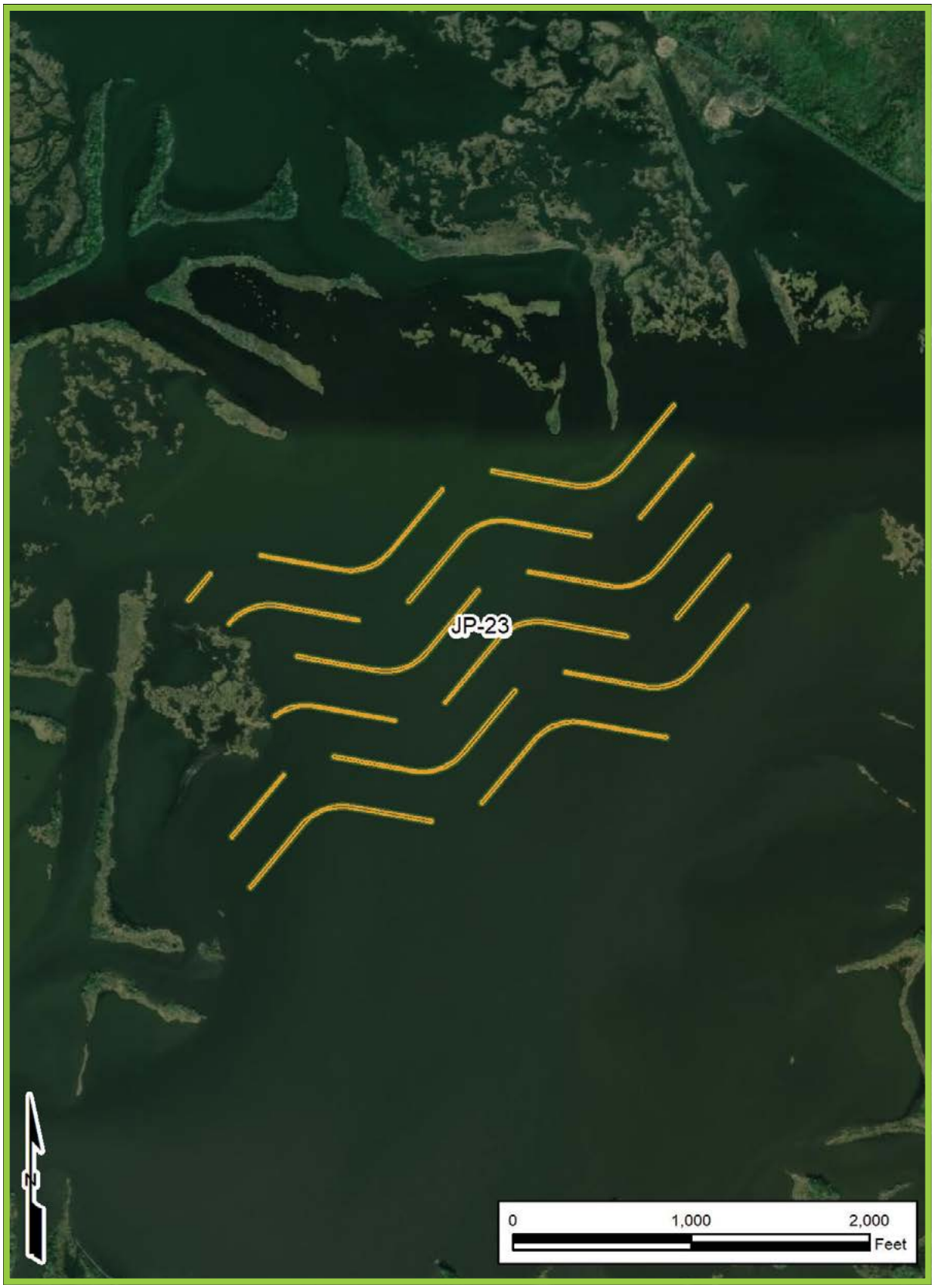
STATUS

CONCEPTUAL PLANNING DESIGN CONSTRUCTION

BARATARIA BASIN (BA)
Council District 1

UPPER BARATARIA TERRACING PROJECT

JP-23



BARATARIA BASIN (BA)

Council District 1

BAYOU THUNDER ROCK DIKE

GILD-2

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

Proposed project is located on the Caminada Headland approximately 9 miles northeast of Port Fourchon and 2 miles southwest of Grand Isle along the north side of Cheniere Caminada. The proposed breakwaters along Bayou Thunder would be approximately 0.9 mile long and be located along the northern bank of the bayou. The project will include the dredging of Bayou Thunder and nourishment of 50 acres of marsh for an estimated cost between $13M and $16M.

STRATEGY

The Grand Isle Independent Levee District proposes to continue rock breakwaters along Bayou Thunder in an effort to reduce land loss along the north side of Louisiana Highway 1 on Cheniere Caminada caused by heavy wave action from north winds in Caminada Bay.

PROGRESS TO DATE

The project is in the engineering & design phase and currently being evaluated by the permitting agencies.

PROJECT MAGNITUDE

NON-TRADITIONAL **LOCAL** REGIONAL LARGE

ESTIMATED COST

≤1M 50M 100M ≥150M

MILES

≤1 2 4 6 8 ≥ 10

PROJECT LEAD

CPRA JEFF PARISH **GILD** LILD OTHER

STATUS

CONCEPTUAL PLANNING **DESIGN** CONSTRUCTION

BARRIER ISLAND (BI)
Council District 1

BAYOU THUNDER ROCK DIKE

GILD-2

BARRIER ISLAND (BI)

Council District 1

CHENIERE CAMINADA MARSH RESTORATION

GILD-3

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

Proposed project is located on the Caminada Headland approximately 9 miles northeast of Port Fourchon and 2 miles southwest of Grand Isle along the north side of Cheniere Caminada. The project will include the restoration of approximately 250 acres of marsh for an estimated cost between $9M and $11M.

STRATEGY

The Grand Isle Independent Levee District proposes to restore marsh between the proposed rock breakwaters along Bayou Thunder and proposed breakwaters along Caminada Bay in an effort to reduce land loss along the north side of Louisiana Highway 1 on Cheniere Caminada caused by heavy wave action from north winds in Caminada Bay.

PROGRESS TO DATE

The project is in the engineering & design phase and currently being evaluated by the permitting agencies.

PROJECT MAGNITUDE

NON-TRADITIONAL **LOCAL** REGIONAL LARGE

ESTIMATED COST

≤1M 50M 100M ≥150M

ACRES

1 **100** 500 1000 ≥ 2000

PROJECT LEAD

CPRA JEFF PARISH **GILD** LILD OTHER

STATUS

CONCEPTUAL PLANNING **DESIGN** CONSTRUCTION

BARRIER ISLAND (BI)
Council District 1

CHENIERE CAMINADA MARSH RESTORATION

GILD-3

BARRIER ISLAND (BI)

Council District 1

GRAND ISLE BAYSIDE SEGMENTED BREAKWATERS COMPLETION

GILD-5

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

Proposed project is located on the bayside of Grand Isle. The proposed breakwaters would reduce erosion on the bayside of Grand Isle by construction of two approximately 350-foot breakwaters on the bayside of Grand Isle for an estimated cost between $1M and $2M.

STRATEGY

The proposed project will connect existing breakwaters to the east and west and create a continuous line of protection on the bayside of Grand Isle. Proposed project is located on the bayside of Grand Isle where storms cause wave-induced erosion. The Grand Isle Independent Levee District proposes to complete the rock breakwaters in an effort to provide hurricane protection.

PROGRESS TO DATE

The remaining two breakwaters are designed and permitted and ready for construction.

PROJECT MAGNITUDE

NON-TRADITIONAL **LOCAL** REGIONAL LARGE

ESTIMATED COST

1M 50M 100M ≥150M

ACRES

1 100 500 1000 ≥ 2000

PROJECT LEAD

CPRA JEFF PARISH **GILD** LILD OTHER

STATUS

CONCEPTUAL PLANNING **DESIGN** CONSTRUCTION

BARRIER ISLAND (BI)
Council District 1

GRAND ISLE BAYSIDE SEGMENTED BREAKWATERS COMPLETION

GILD-5

BARRIER ISLAND (BI)
Council District 1

GRAND ISLE GULFSIDE SEGMENTED BREAKWATERS GILD-4

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

The proposed breakwaters would reduce erosion on the Gulfside of Grand Isle by construction of approximately 45 breakwaters just off the beach. The proposed project will connect existing breakwaters to the east and west and create a continuous line of protection on the Gulfside of Grand Isle for an estimated cost between $28M and $30M.

STRATEGY

Proposed project is located on the Gulfside of Grand Isle where significant shoreline erosion and land loss resulted from storm overtopping and breaching, wave-induced erosion, and sea level rise. The Grand Isle Independent Levee District proposes to continue rock breakwaters along the Gulf in an effort to reduce land loss and provide hurricane protection. Breakwaters exist both to the east and west and this project would complete the Gulfside breakwaters.

PROGRESS TO DATE

The project is currently in the engineering & design phase.

PROJECT MAGNITUDE

NON-TRADITIONAL **LOCAL** REGIONAL LARGE

ESTIMATED COST

≤1M **50M** 100M ≥150M

MILES

1 50 100 150 ≥ 200

PROJECT LEAD

CPRA JEFF PARISH **GILD** LILD OTHER

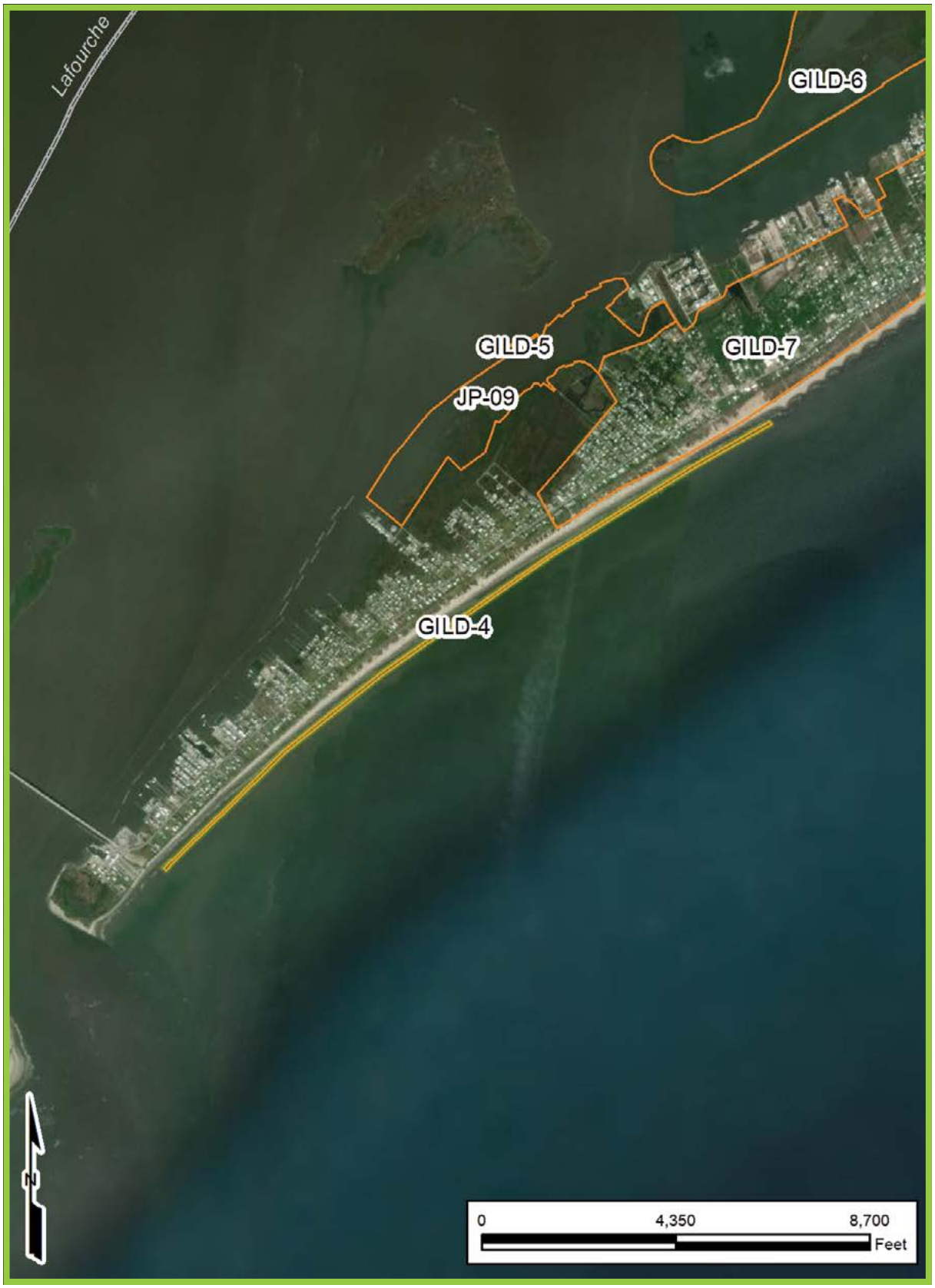
STATUS

CONCEPTUAL PLANNING **DESIGN** CONSTRUCTION

BARRIER ISLAND (BI)
Council District 1

GRAND ISLE GULFSIDE SEGMENTED BREAKWATERS

GILD-4



BARRIER ISLAND (BI)

Council District 1

LAFRIENIERE MARSH RESTORATION

JP-24

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

Proposed project is within Lafreniere Park in Metairie. The marsh island within the lagoon of Lafreniere Park has experienced land loss due to settlement and shoreline erosion. This project would restore the island to its original shape with borrow from the lagoon for an approximate cost between $1M and $2M.

STRATEGY

Historical land loss of the island has decreased the habitat of wildlife species using the island. Restoring the island would increase habitat for wildlife, and the addition of aeration equipment would increase the water quality in the lagoon.

PROGRESS TO DATE

A preliminary design report on restoring the island and enhancing the water quality of the lagoon was completed in 2012. Jefferson Parish is in the process of identifying grant opportunities to construct the project.

PROJECT MAGNITUDE

NON-TRADITIONAL **LOCAL** REGIONAL LARGE

ESTIMATED COST

≤1M 50M 100M ≥150M

ACRES

1 100 500 1000 ≥ 2000

PROJECT LEAD

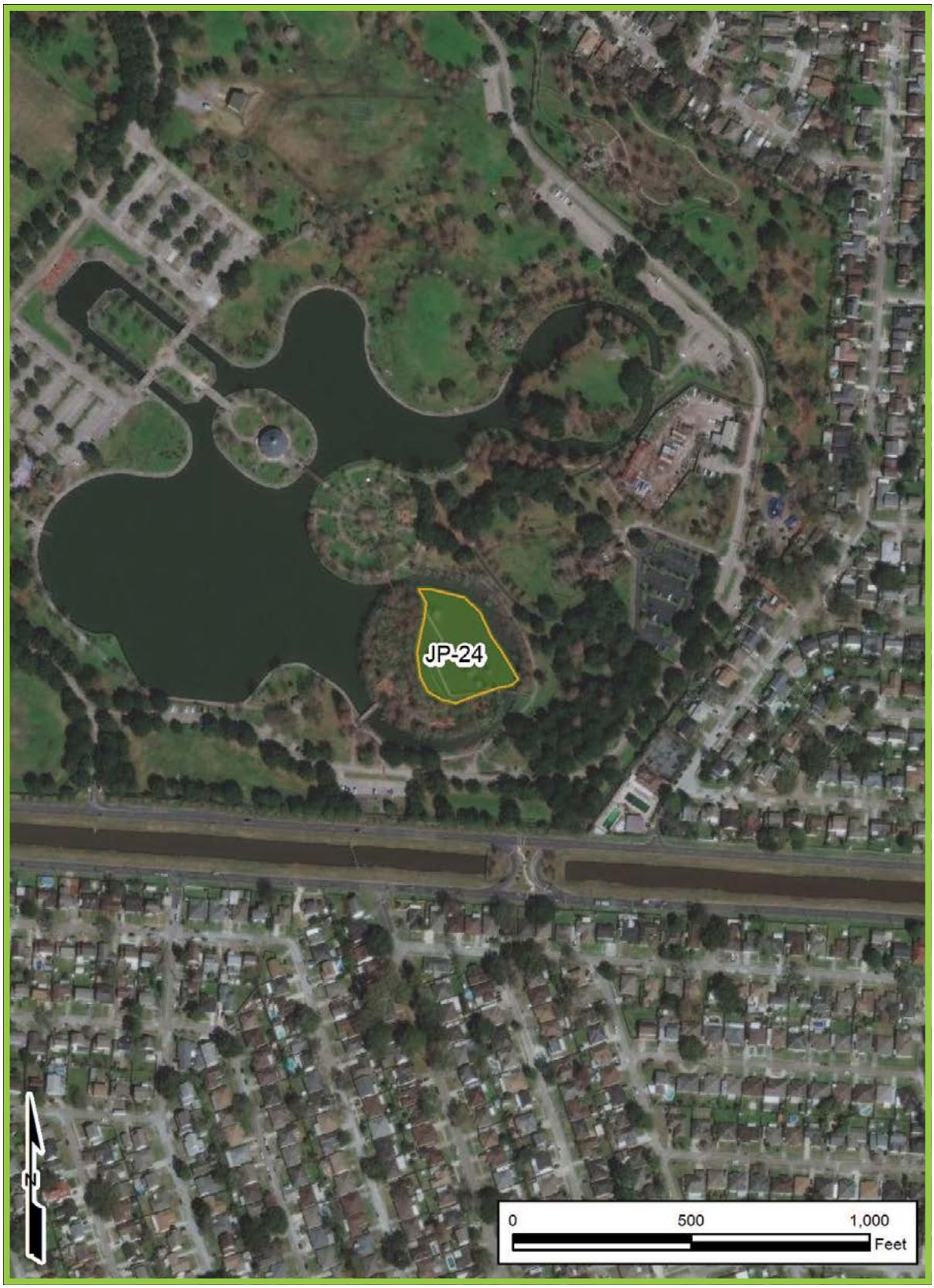
CPRA **JEFF PARISH** GILD LILD OTHER

STATUS

CONCEPTUAL **PLANNING** DESIGN CONSTRUCTION

PONTCHARTRAIN BASIN (PO)
Council District 4

LAFRIENIERE MARSH RESTORATION JP-24



PONTCHARTRAIN BASIN (PO)
Council District 4

LAKETOWN BREAKWATERS / LIVING SHORELINE

JP-43

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

Proposed project is located at Laketown in Kenner on the south shore of Lake Pontchartrain. The Laketown Boat Harbor experiences significant effects of wave energy from strong north winds across the lake. The project includes dredging of the harbor and beneficial use of the material to restore approximately 3.5 acres of marsh and the addition of recreational features. This project would construct a breakwater system totaling approximately 2,000 feet for an estimated cost between $5M and $10M.

STRATEGY

This project is in cooperation between Jefferson Parish and the City of Kenner. High wave energy for strong north winds make the harbor unsafe for boats using the harbor. The rock breakwaters would reduce wind-driven waves entering the boat harbor, reducing the risk of damage to the harbor and boats using the harbor.

PROGRESS TO DATE

This project is in the preliminary planning phase with funding for the project requested from CPRA for GOMESA funding.

PROJECT MAGNITUDE

NON-TRADITIONAL **LOCAL** REGIONAL LARGE

ESTIMATED COST

≤1M 50M 100M ≥150M

ACRES

1 100 500 1000 ≥ 2000

PROJECT LEAD

CPRA **JEFF PARISH** GILD LILD OTHER

STATUS

CONCEPTUAL **PLANNING** DESIGN CONSTRUCTION

PONTCHARTRAIN BASIN (PO)
Council District 4

LAKETOWN BREAKWATERS / LIVING SHORELINE

JP-43

PONTCHARTRAIN BASIN (PO)

Council District 4

FIFI ISLAND RESTORATION

GILD-6

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

Proposed project is located on Fifi Island adjacent to the north side of Grand Isle. The project will include construction of 2,100 feet of rock dike and restoration of 325 acres of marsh for an estimated cost between $25M and $30M.

STRATEGY

The proposed project will complete the rock dike around Fifi Island. Proposed project is located on the bayside of Grand Isle where storms cause wave-induced erosion. The Grand Isle Independent Levee District proposes to complete the rock dike and restore the marsh in an effort to provide hurricane protection to Grand Isle.

PROGRESS TO DATE

The project is currently in the engineering & design phase.

PROJECT MAGNITUDE

NON-TRADITIONAL **LOCAL** REGIONAL LARGE

ESTIMATED COST

≤1M **50M** 100M ≥150M

ACRES

1 100 **500** 1000 ≥ 2000

PROJECT LEAD

CPRA JEFF PARISH **GILD** LILD OTHER

STATUS

CONCEPTUAL PLANNING **DESIGN** CONSTRUCTION

BARRIER ISLAND (BI)
Council District 1

FIFI ISLAND RESTORATION

GILD-6

BARRIER ISLAND (BI)

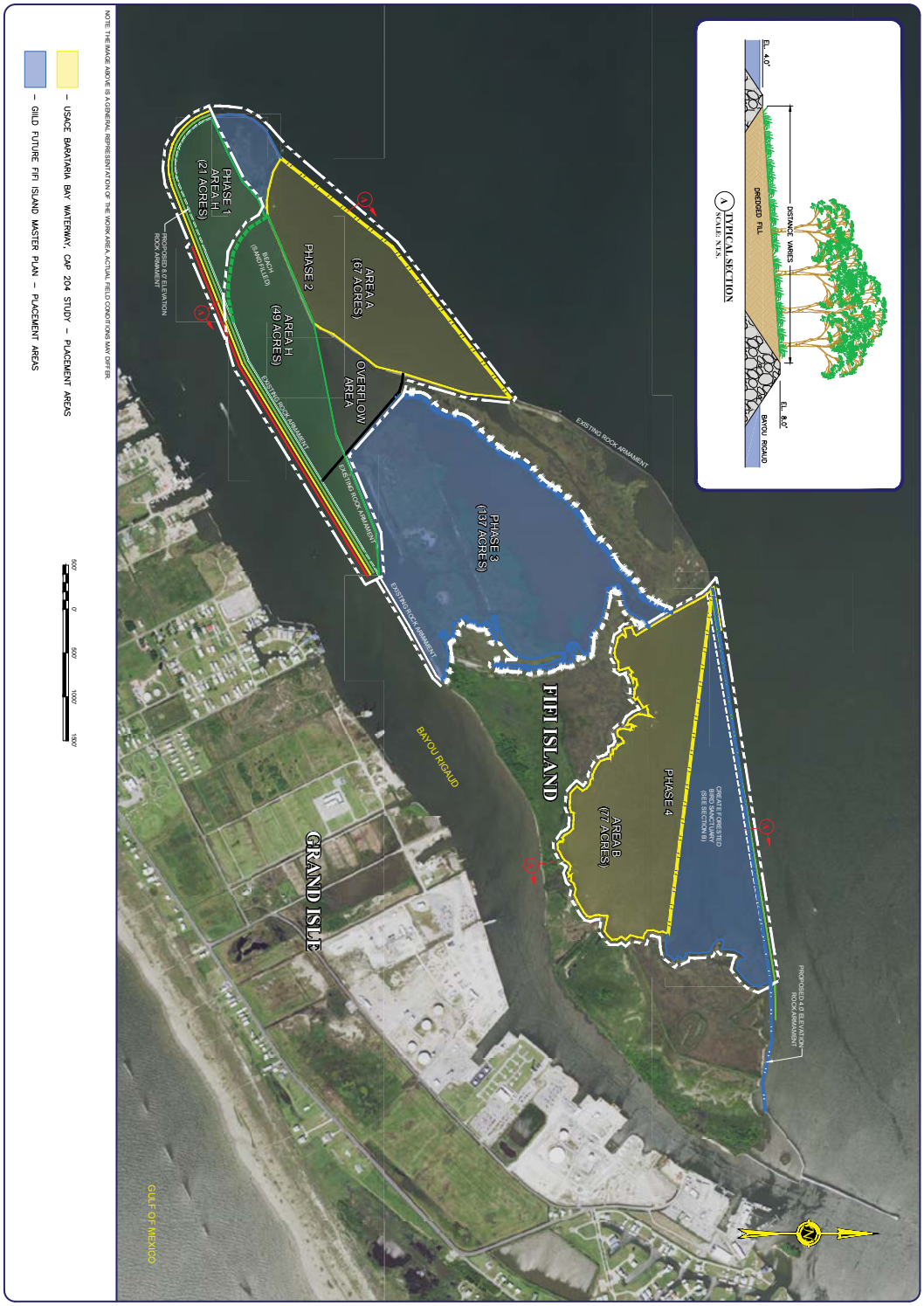
Council District 1

FIFI ISLAND RESTORATION

GILD-6

BARRIER ISLAND (BI)

Council District 1



GRAND ISLE INDEPENDENT LEVEE DISTRICT

FIFI ISLAND RESTORATION MASTER PLAN

01

PRELIMINARY

THIS DRAWING HAS BEEN REDUCED TO ONE HALF SIZE

APPENDIX A

NON-TRADITIONAL PROJECTS

- JP-22 Northeast Pen Shoreline Protection
- JP-35 The Wetlands Center
- WHARF Wetland Harbor Activities Recreational Facility
- JP-08 Jefferson Tree Planting
- JP-21 Severn Lakefront Restoration

NORTHEAST PEN SHORELINE PROTECTION

JP-22

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

Proposed project is on the eastern shore of Goose Bayou and north of the Pen. The project would add rock shoreline protection to the shoreline of Goose Bayou. Cost not yet determined.

STRATEGY

Historical land loss and channel widening/deepening have increased the effects and risks associated with storm-induced surge. Restoration and protection of the shoreline would stabilize the channel of Goose Bayou and reduce the risks of storm-induced surge for the Town of Lafitte.

PROGRESS TO DATE

This project is currently in the conceptual phase with potential funding through Capital Outlay.

PROJECT MAGNITUDE

NON-TRADITIONAL LOCAL REGIONAL LARGE

PROJECT LEAD

CPRA **JEFF PARISH** GILD LILD OTHER

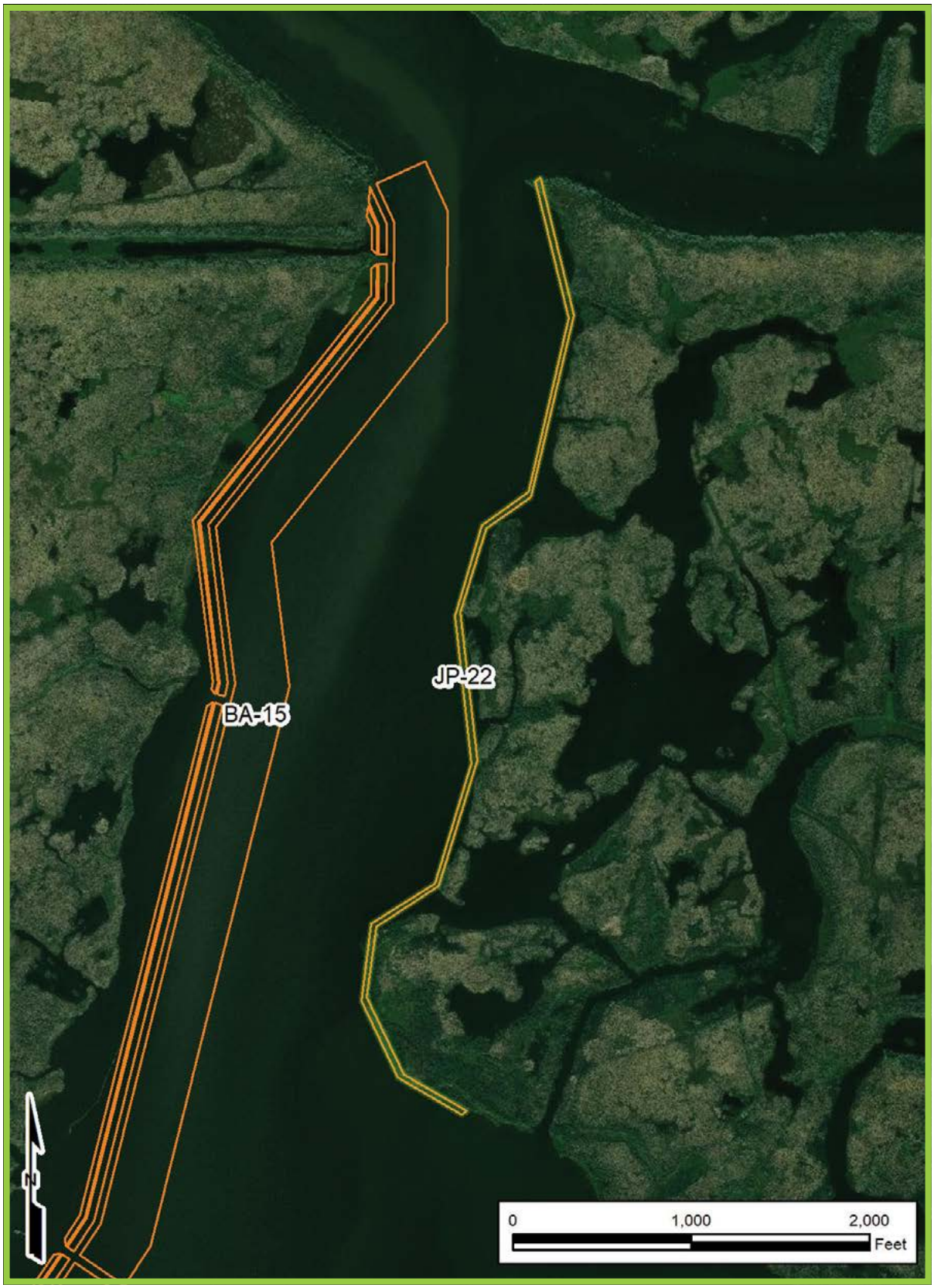
STATUS

CONCEPTUAL PLANNING DESIGN CONSTRUCTION

BARATARIA BASIN (BA)
Council District 1

NORTHEAST PEN SHORELINE PROTECTION

JP-22



BARATARIA BASIN (BA)

Council District 1

THE WETLANDS CENTER JP-35

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

The Louisiana Wetland Education Center is a public services/education project located in the southern area of the Parish in the Town of Lafitte. Total cost for all phases is estimated between $12M and $15M.

STRATEGY

The Louisiana Wetlands Education Center will be an educational asset serving students and families in the region, with programming for all ages, including a research outpost and meeting location for agencies and institutions. The Center will promote preservation, conservation, and adaptation related to wetland ecosystems, using its location in the Jean Lafitte area as an outdoor classroom. Future phases would include an expanded fishing village to teach visitors about coastal community traditions, a treetop ropes course, water taxis to Grand Isle, kayak and canoe rental, and overnight cabins. The Center is complementary to the existing Jean Lafitte Fisheries Market and adjacent to the Auditorium, Nature Trail, and Multi-Purpose Facility and Museum.

PROGRESS TO DATE

$2M has been awarded through NRDA for recreation projects . Phase I creation of the Multipurpose Resource Facility is complete. LA SAFE has estimated their investment of up to $6.5M for the Wetland Center with the remainder of potential funding sources to be identified.

PROJECT MAGNITUDE

NON-TRADITIONAL LOCAL REGIONAL LARGE

ESTIMATED COST

≤1M 50M 100M ≥150M

ACRES

1 100 500 1000 ≥ 2000

PROJECT LEAD

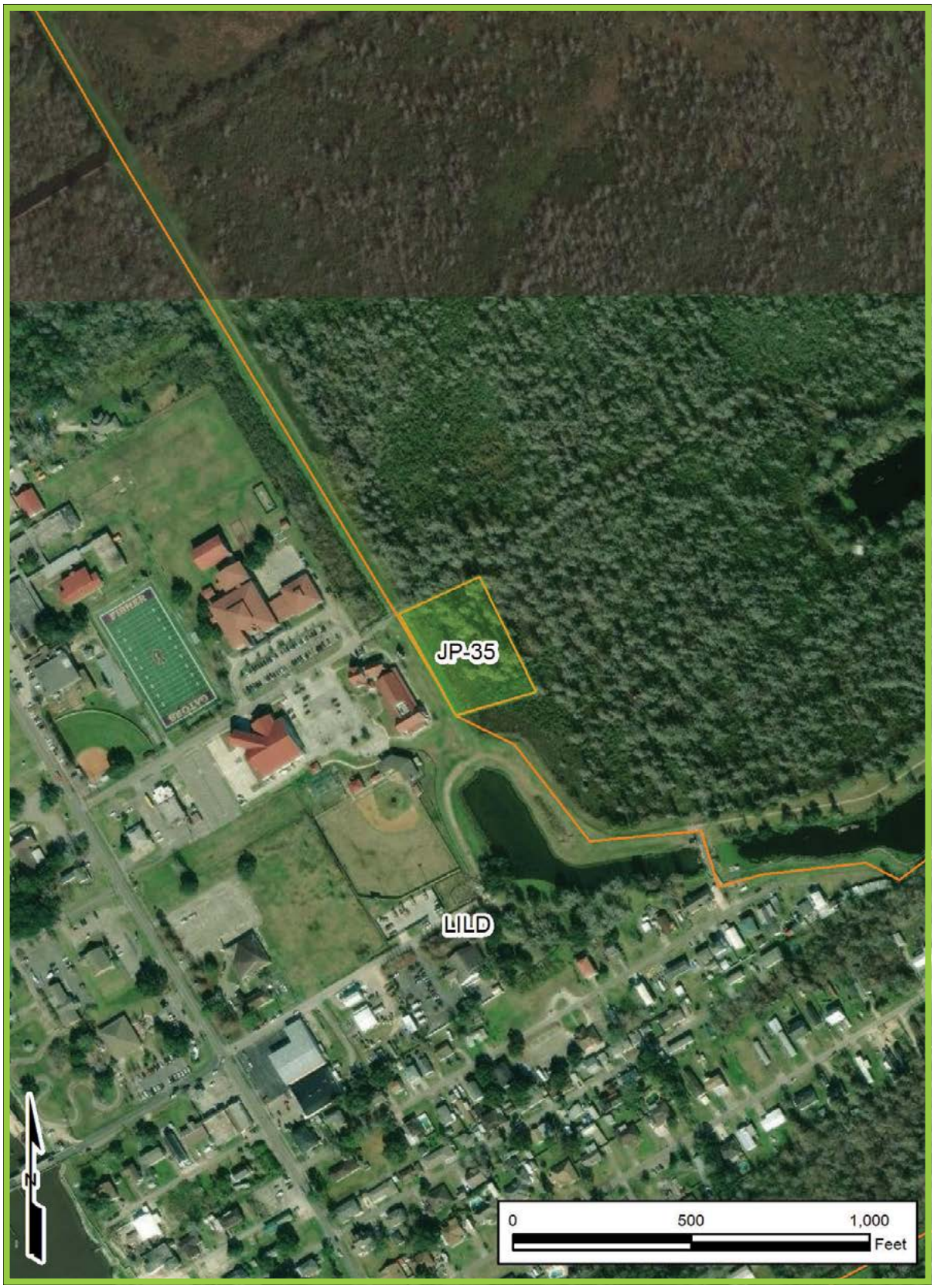
CPRA JEFF PARISH GILD **LILD** OTHER

STATUS

CONCEPTUAL PLANNING **DESIGN** CONSTRUCTION

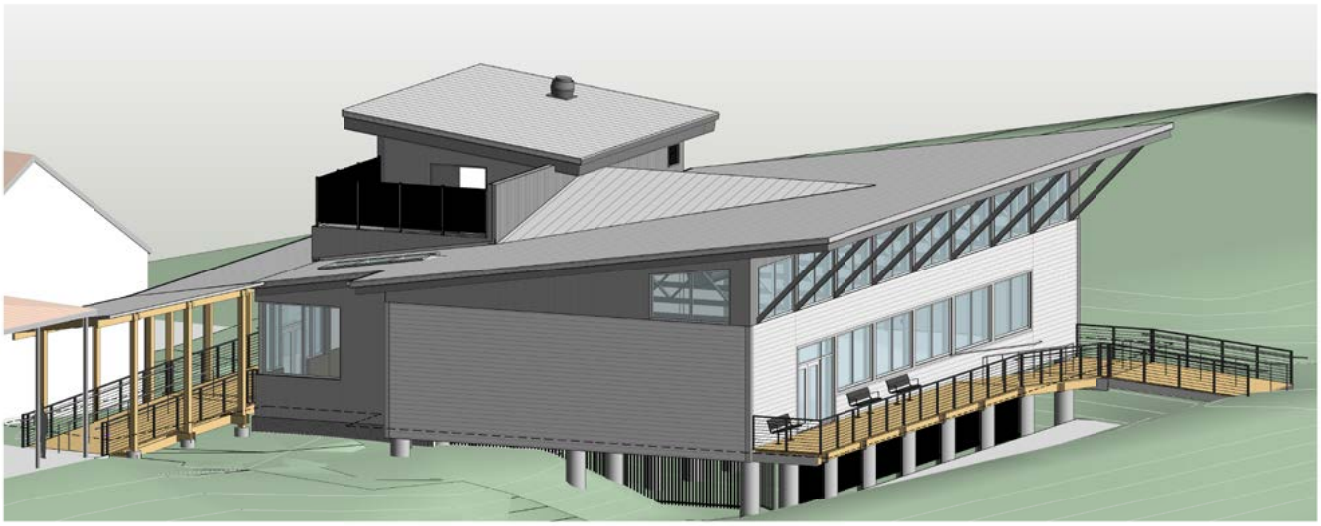
BARATARIA BASIN (BA)
Council District 1

THE WETLANDS CENTER JP-35

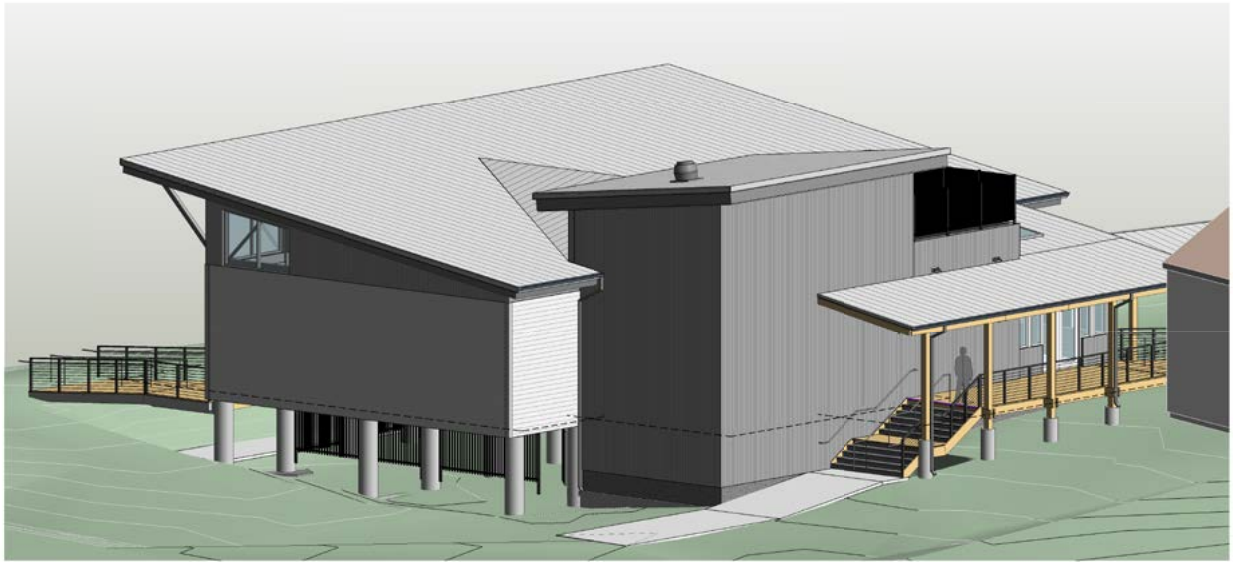


BARATARIA BASIN (BA)
Council District 1

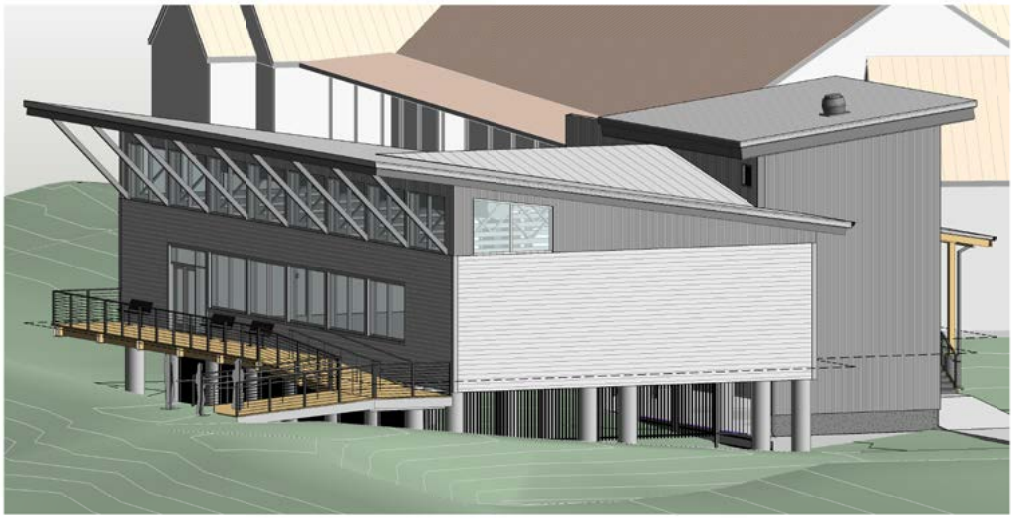
THE WETLANDS CENTER



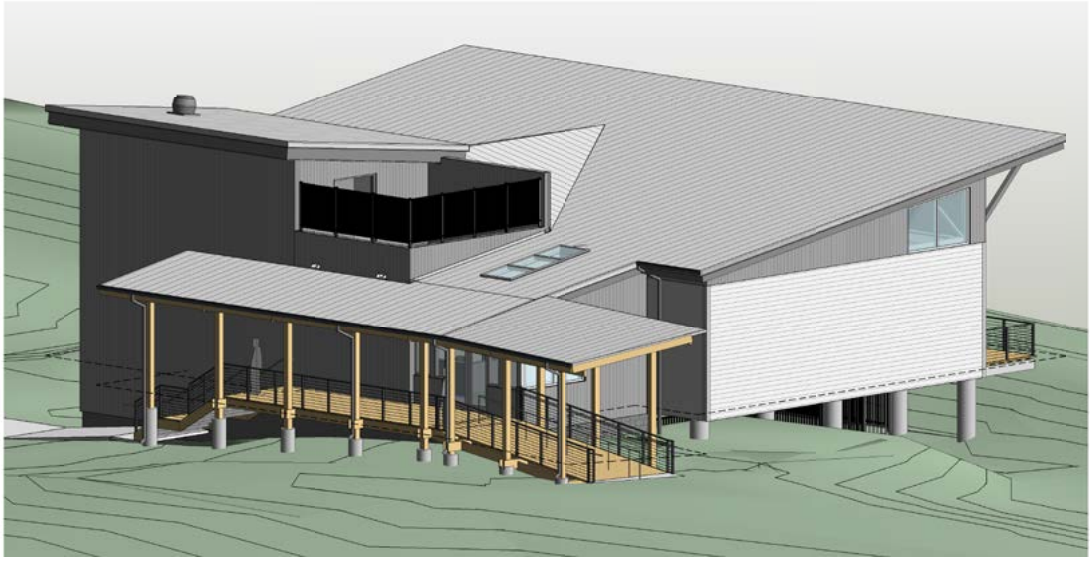
1 WEST AXONOMETRIC
SCALE:



3 EAST AXONOMETRIC
SCALE:



2 NORTH AXONOMETRIC
SCALE:



4 SOUTH AXONOMETRIC
SCALE:

WHLC ARCHITECTURE

CITY OF JEAN LAFITTE

LOUISIANA WETLAND EDUCATION CENTER

4917 City Park Dr.
JEAN LAFITTE, 70067

MICHAEL HILL Reg No 28511 STATE OF LOUISIANA REGISTERED ARCHITECT

washer hill lipscomb cabaniss architecture, llc

1744 oakdale dr baton rouge, la
t. 225.767.1530 f. 225.767.0018
www.whlcarchitecture.com

CONSTRUCTION DOCUMENTS
03/20/20
WHLC 18-090

ISOMETRIC VIEWS

A0.1

BARATARIA BASIN (BA)
Council District 1

WETLAND HARBOR ACTIVITIES RECREATIONAL FACILITY

WHARF

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

Proposed project is located within the City of Westwego, south of Lapalco Boulevard, just outside the HSDRRS. The proposed project would develop the property into a multi-use wetlands park with handicap access for an estimated cost between $2M and $3M.

STRATEGY

The first phase of the project would include construction of a concession pavilion with restrooms, an access road, paved parking area, and 1,200 linear feet of wooden boardwalks and fishing piers. Future phases would add additional fishing piers, provide boat and canoe/kayak launches, cabins, and campsites.

PROGRESS TO DATE

This project is in the planning, engineering, and design phase with $2M in funding through CPRA; the property was purchased using a NOAA Grant. Additional potential funding for construction through USFWS/LDWF Sportfish Restoration Fund, CPRA, and NRDA.

PROJECT MAGNITUDE

NON-TRADITIONAL LOCAL REGIONAL LARGE

ESTIMATED COST

≤1M 50M 100M ≥150M

ACRES

1 100 500 1000 ≥ 2000

PROJECT LEAD

CPRA **JEFF PARISH** GILD LILD OTHER

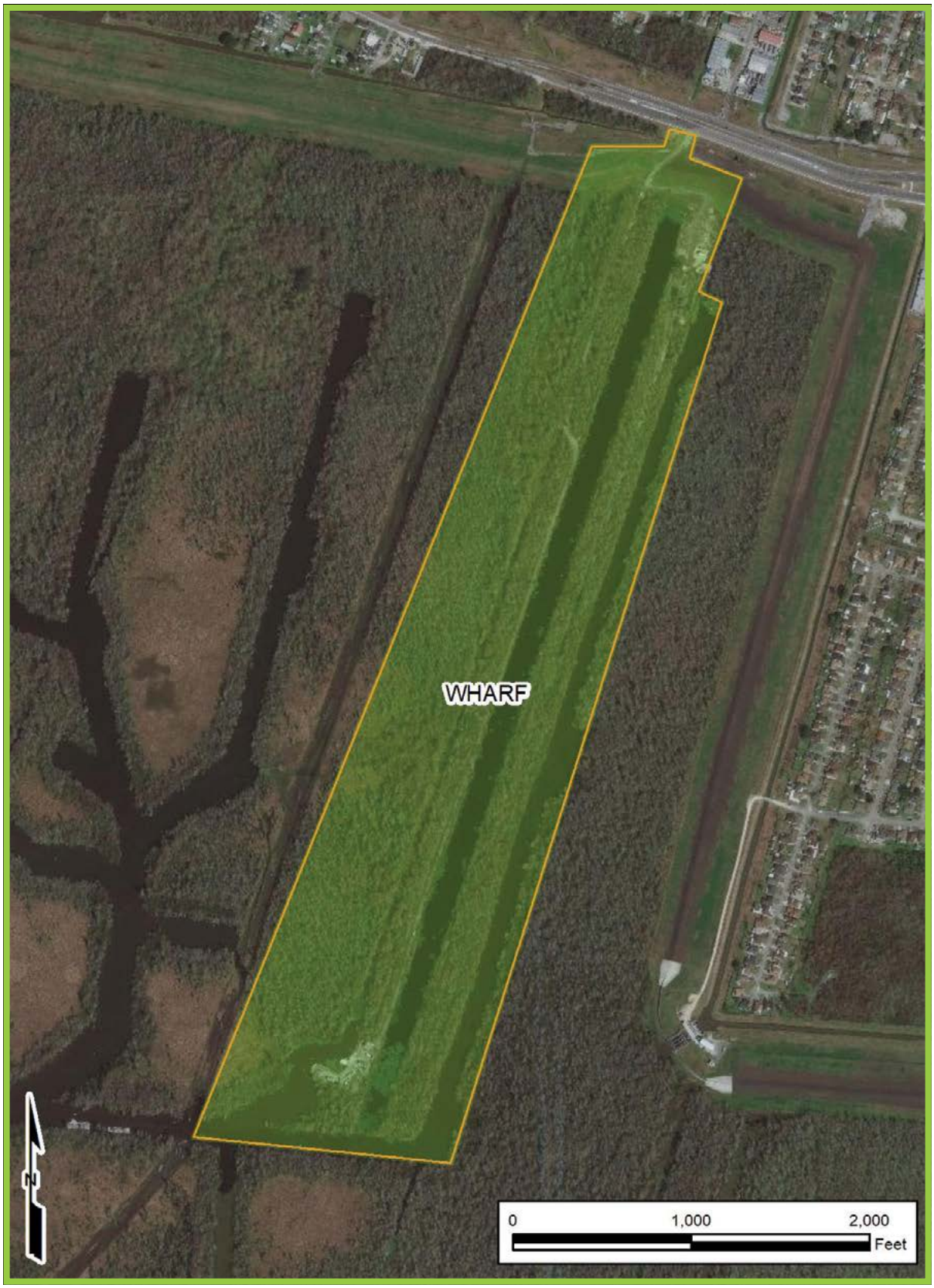
STATUS

CONCEPTUAL PLANNING **DESIGN** CONSTRUCTION

BARATARIA BASIN (BA)
Council District 3

WETLAND HARBOR ACTIVITIES RECREATIONAL FACILITY

WHARF



BARATARIA BASIN (BA)

Council District 3

JEFFERSON TREE PLANTING

JP-08

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

Annual education and outreach program that utilizes volunteers to grow and plant trees in areas conducive to their growth throughout the Parish. The planting of native tree species improves water quality and habitat as well as reduces shoreline erosion and provides storm protection.

STRATEGY

Previous tree planting opportunities have been successful in engaging the pubic. Trees and other materials were provided at a minimal cost to Jefferson Parish. The Parish should continue to explore the next phase of this project. Locations where plantings may occur have been identified in all five Council Districts.

PROGRESS TO DATE

Current year funded through a $17,790 USEPA Gulf of Mexico Grant that will be used to improve the grow-out pens and install an irrigation system and plant a 250-acre site near the Town of Lafitte.

PROJECT MAGNITUDE

NON-TRADITIONAL LOCAL REGIONAL LARGE

PROJECT LEAD

CPRA **JEFF PARISH** GILD LILD OTHER

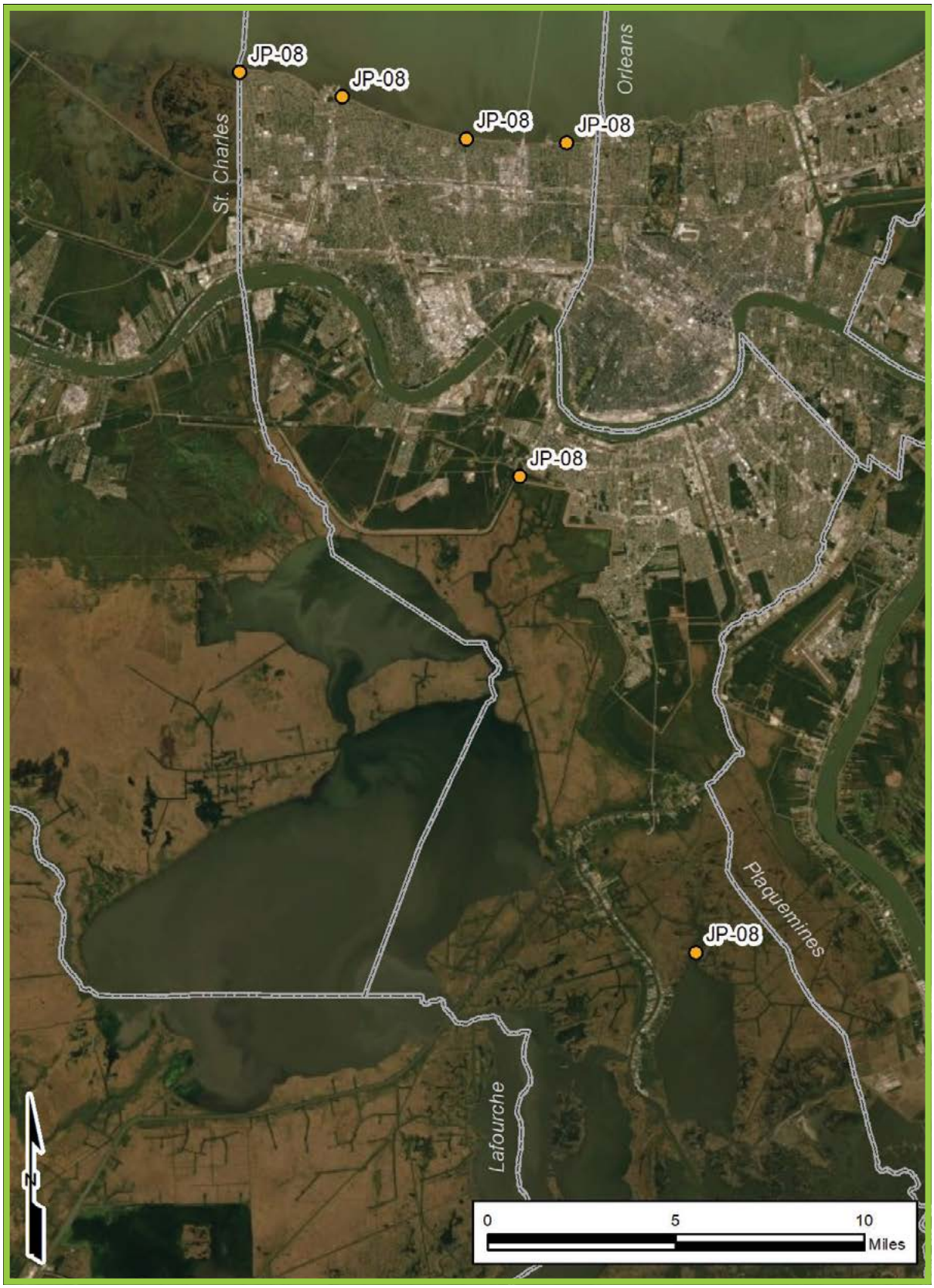
STATUS

CONCEPTUAL PLANNING **DESIGN** **CONSTRUCTION**

BARATARIA BASIN (BA) - PONTCHARTRAIN BASIN (PO) - BARATARIA BASIN (BA)

Council District 1, 2, 3, 4, 5

JEFFERSON
TREE PLANTING JP-08



BARATARIA BASIN (BA) - PONTCHARTRAIN BASIN (PO) - BARATARIA BASIN (BA)

Council District 1, 2, 3, 4, 5

SEVERN LAKEFRONT RESTORATION JP-21

Department of Ecosystem & Coastal Management
Jefferson Parish Government
(504) 736-6719
JPCoastalZone@jeffparish.net

OVERVIEW

New project idea under development to evaluate shoreline restoration near the intersection of Severn Avenue and Lake Pontchartrain. Cost not yet determined.

STRATEGY

Living shorelines add multiple project benefits including fish and wildlife habitat, recreational opportunities, and protection to the Lake Pontchartrain Hurricane and Storm Damage Risk Reduction System (HSDRRS).

PROGRESS TO DATE

This project is currently in the conceptual phase with potential funding sources being identified.

PROJECT MAGNITUDE

NON-TRADITIONAL LOCAL REGIONAL LARGE

PROJECT LEAD

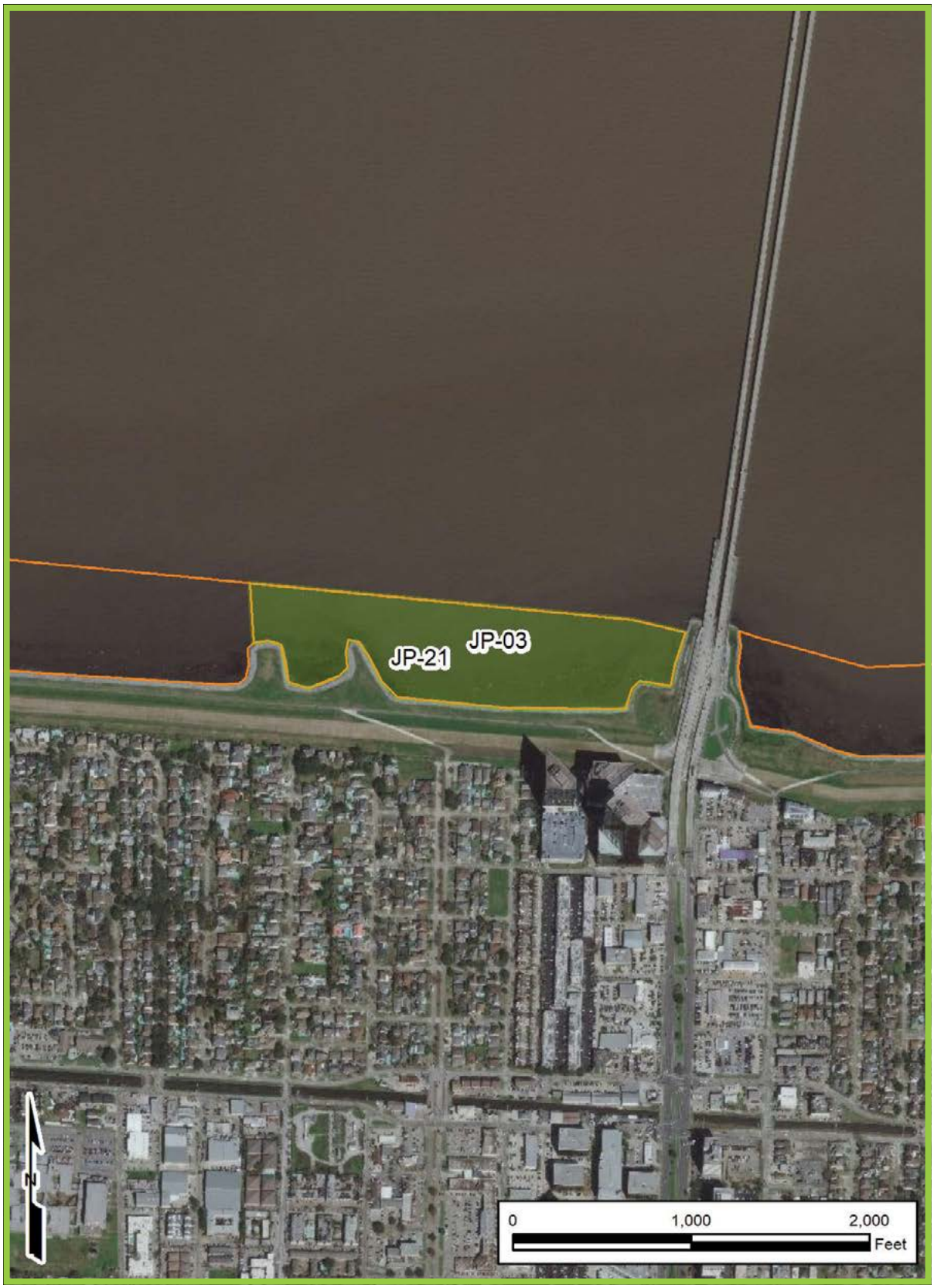
CPRA **JEFF PARISH** GILD LILD OTHER

STATUS

CONCEPTUAL PLANNING DESIGN CONSTRUCTION

PONTCHARTRAIN BASIN (PO)
Council District 5

SEVERN LAKEFRONT RESTORATION JP-21



PONTCHARTRAIN BASIN (PO)
Council District 5

Department of Ecosystem & Coastal Management

Jefferson Parish Government

(504) 736-6719

JPCoastalZone@jeffparish.net