

Jefferson Parish Repetitive Loss Area Analysis



Adopted by Council May 16, 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 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.



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

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>



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 (convective 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 parish⁵.

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

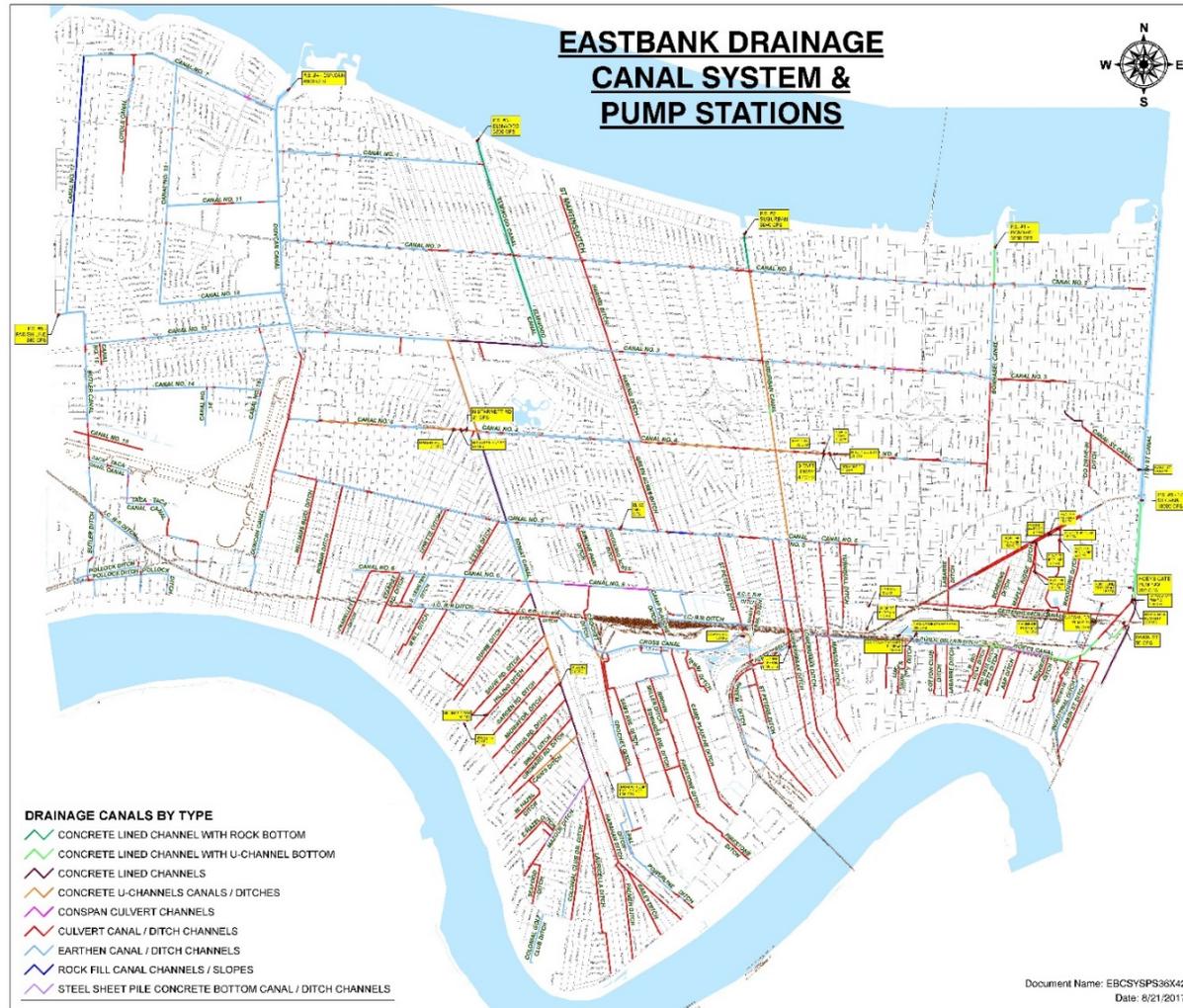


Figure 2

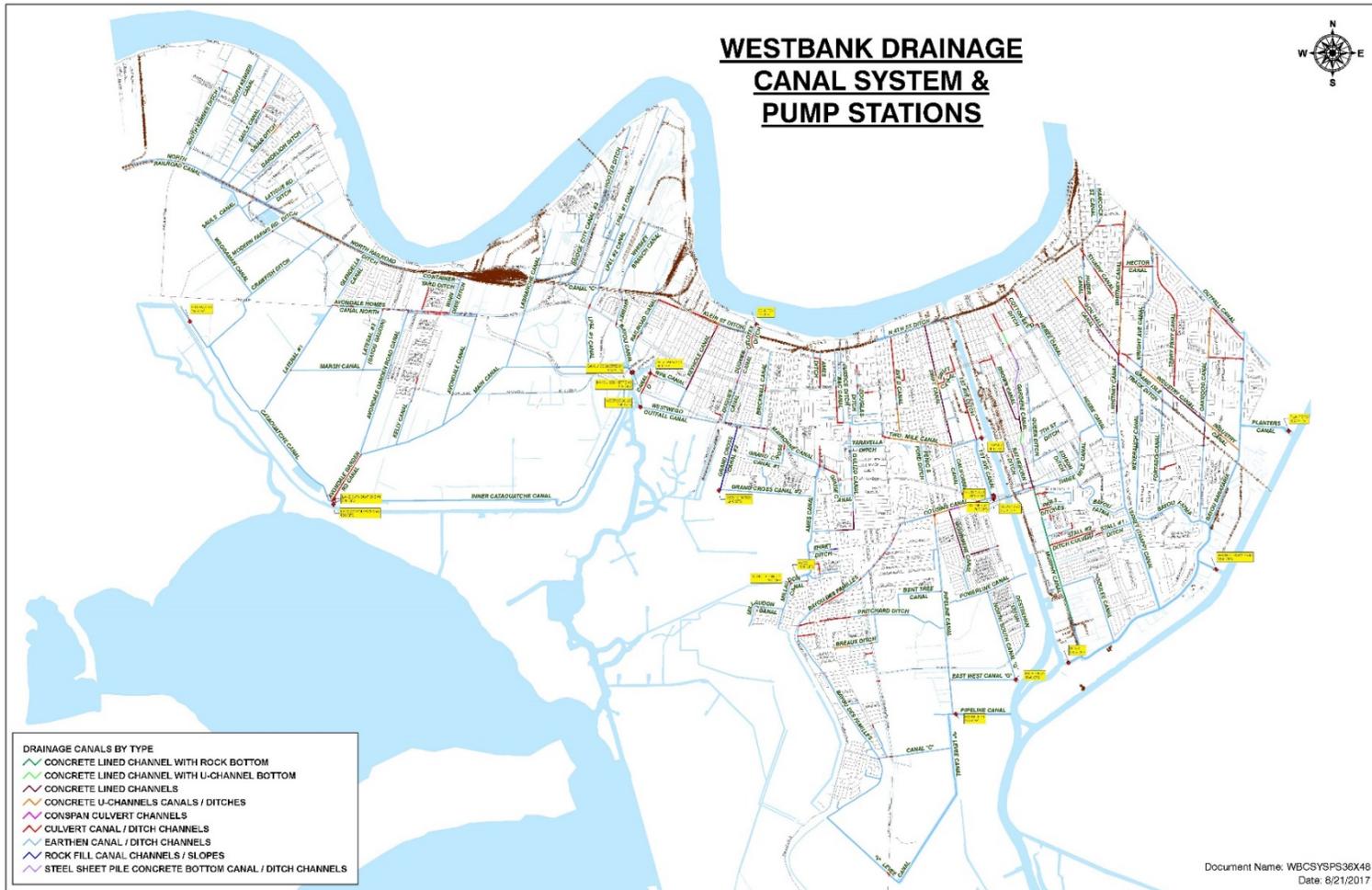


Figure 3



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

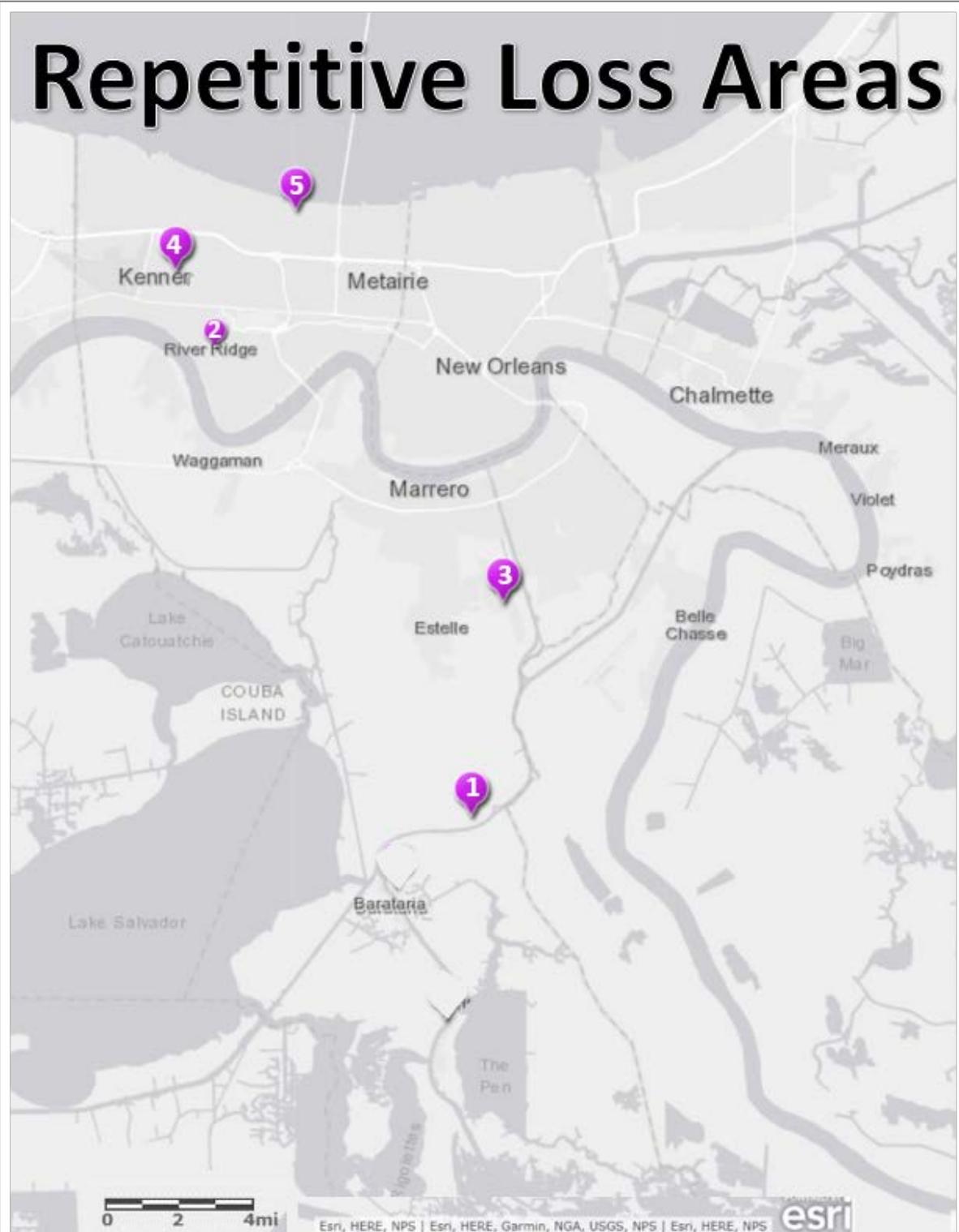


Figure 4



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

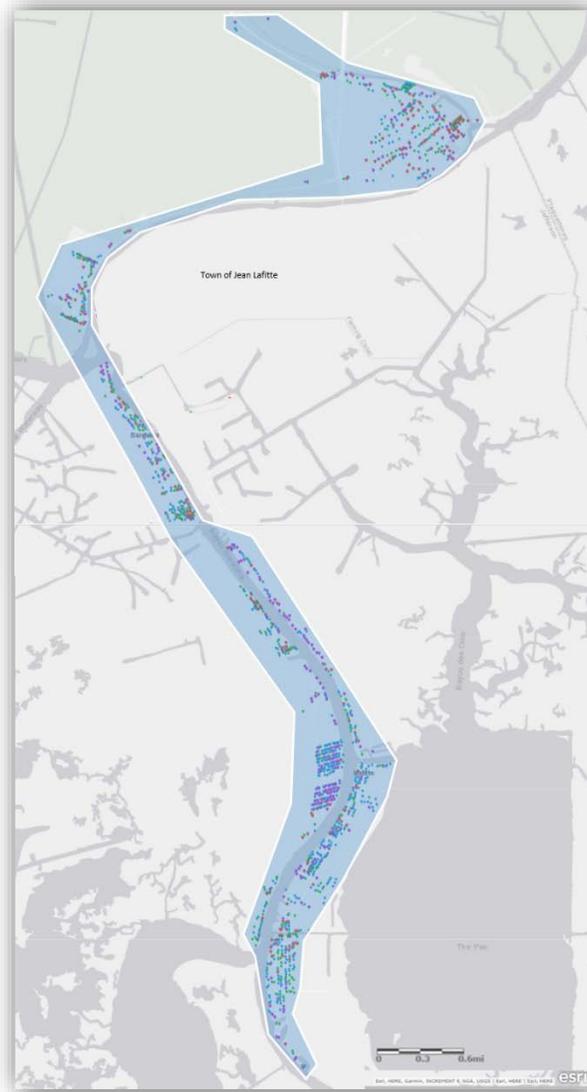


Figure 1- 1 Outline of Subarea 1



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...

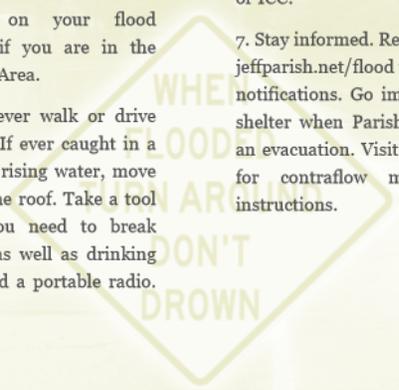
Is your family prepared & property protected?

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 JPAAlert—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 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

Cut Here



Figure 1- 3 Back of Notice with Questionnaire

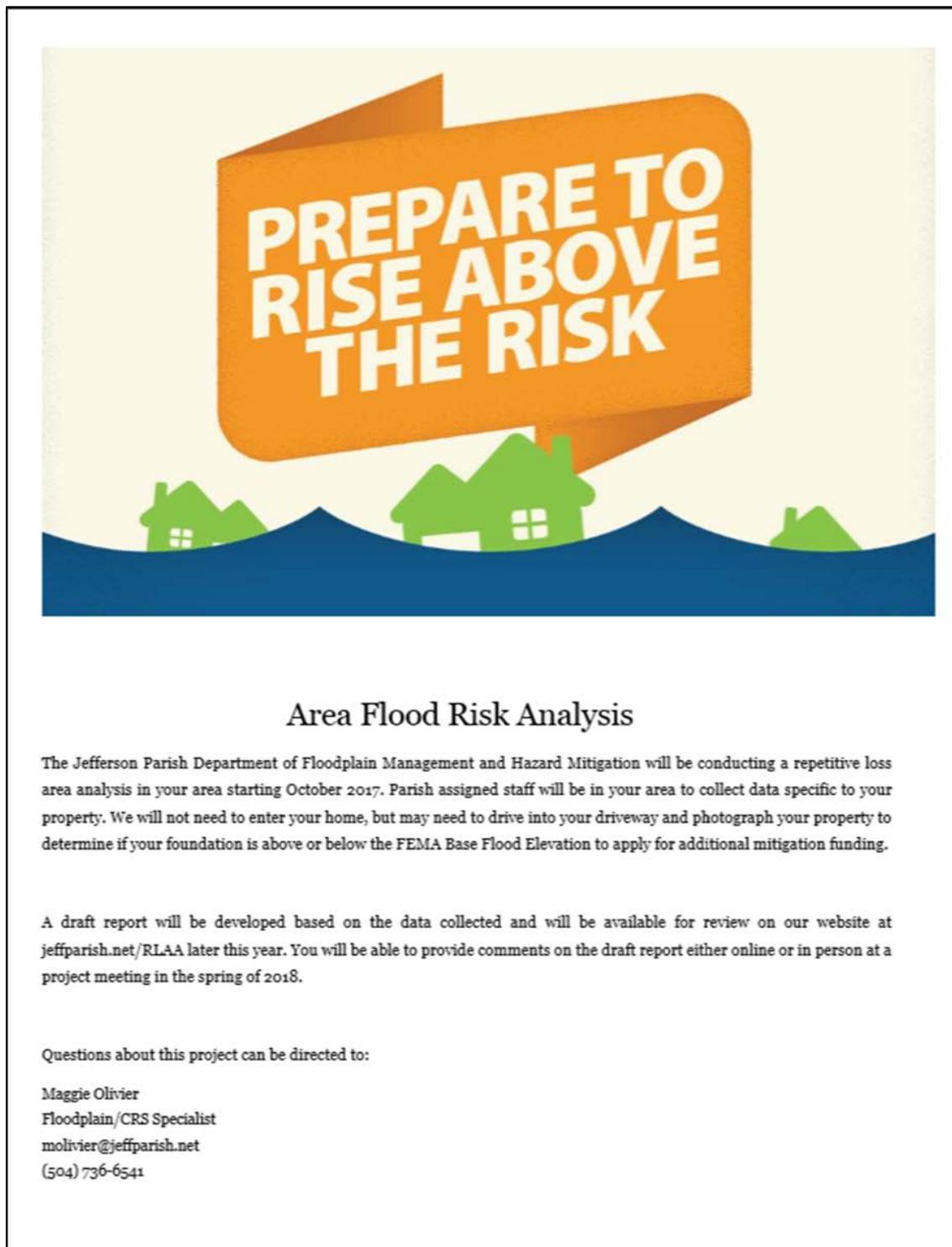


Figure 1-4 Posting at Town Hall and Library



IF THE WATER RISES . . .

Is your family prepared & property protected?

1. Is the property you own or rent located in a flood zone? Yes No Unsure
2. If required to evacuate today, do you know your evacuation route? Yes No Unsure
3. 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
4. Have you registered with JPAAlert—the Jefferson Parish multi-hazard warning system? Yes No Unsure
5. Do you have flood insurance for the property(ies) you own or rent? Yes No
6. Have you floodproofed your home? Yes No Unsure
7. After answering questions 1-6: Is your family prepared & property covered if the water rises? Very Somewhat Need to Prepare

Learn more at jeffparish.net/flood
to determine your flood zone, access contraflow maps and register for JP Alert.

You are receiving this postcard because your property is in an area that has flooded several times. Flooding in your area is commonly due to rain, but hurricanes and their tidal surges can also pose serious threats. Most of Jefferson Parish lies at or below sea level, and flooding can happen during any season of the year.

Here are some things you can do to prepare and rise above the risk.

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 the Floodplain Management and Hazard Mitigation Department at (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.

**Register for JP Alert and determine
your Flood Zone at jeffparish.net/flood**

Figure 1- 2 Inside of Follow-up Mailer

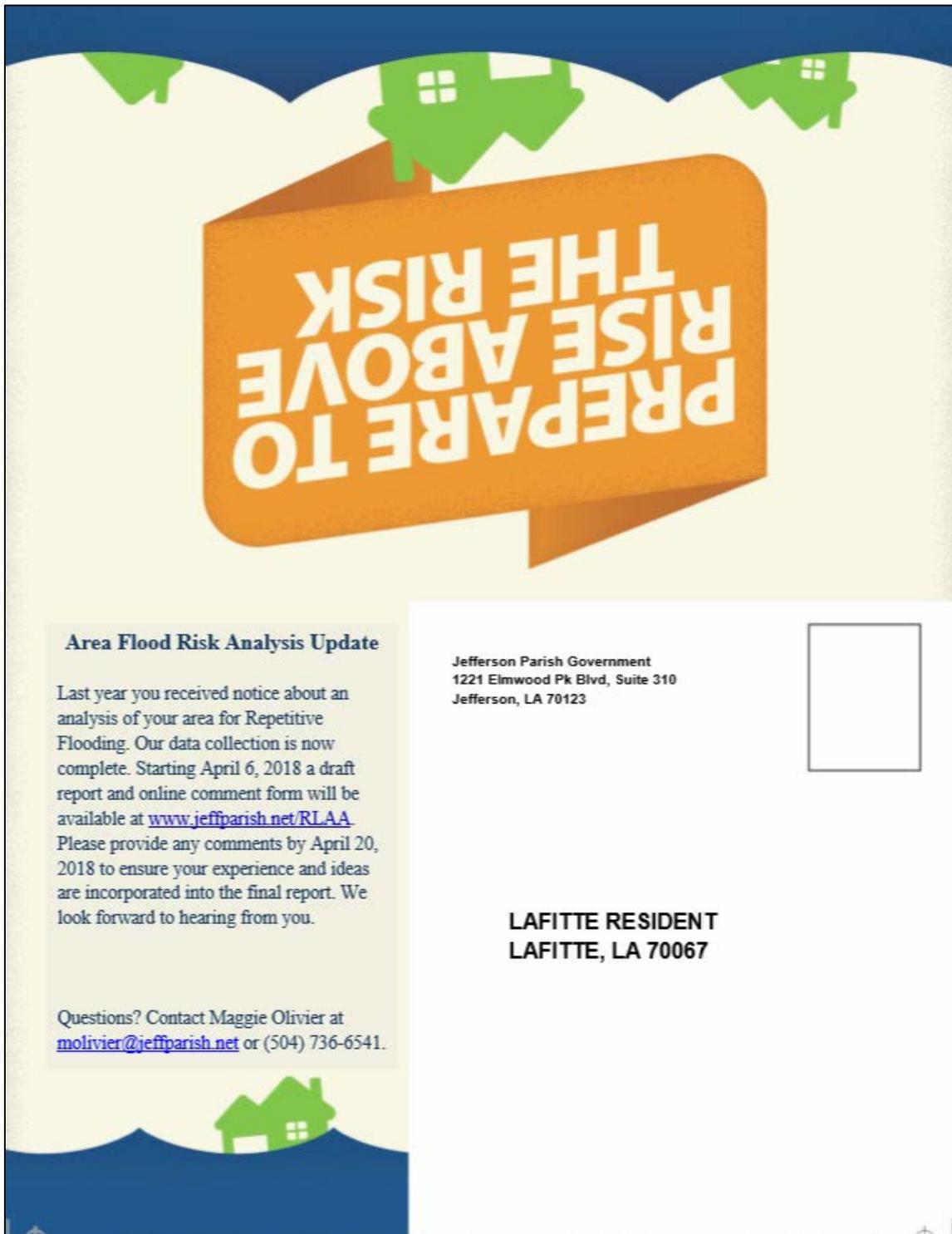


Figure 1- 3 Outside of Follow-up Mailer



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
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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
Occupied	1465	Low (less than 2ft.)
Vacant	121	Medium
		High
		508
		311
		729
		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.

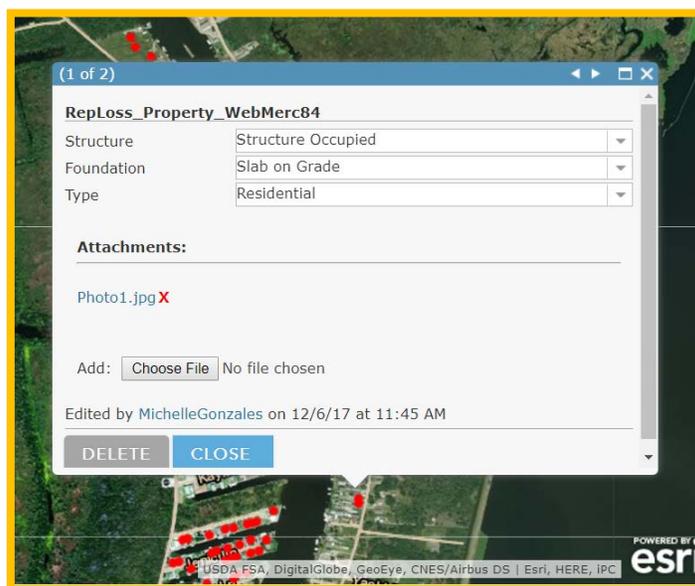


Figure 1- 4 Collector Application Sample

PROBLEM STATEMENT



SUBAREA 1- CROWN POINT, LAFITTE, BARATARIA

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.

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

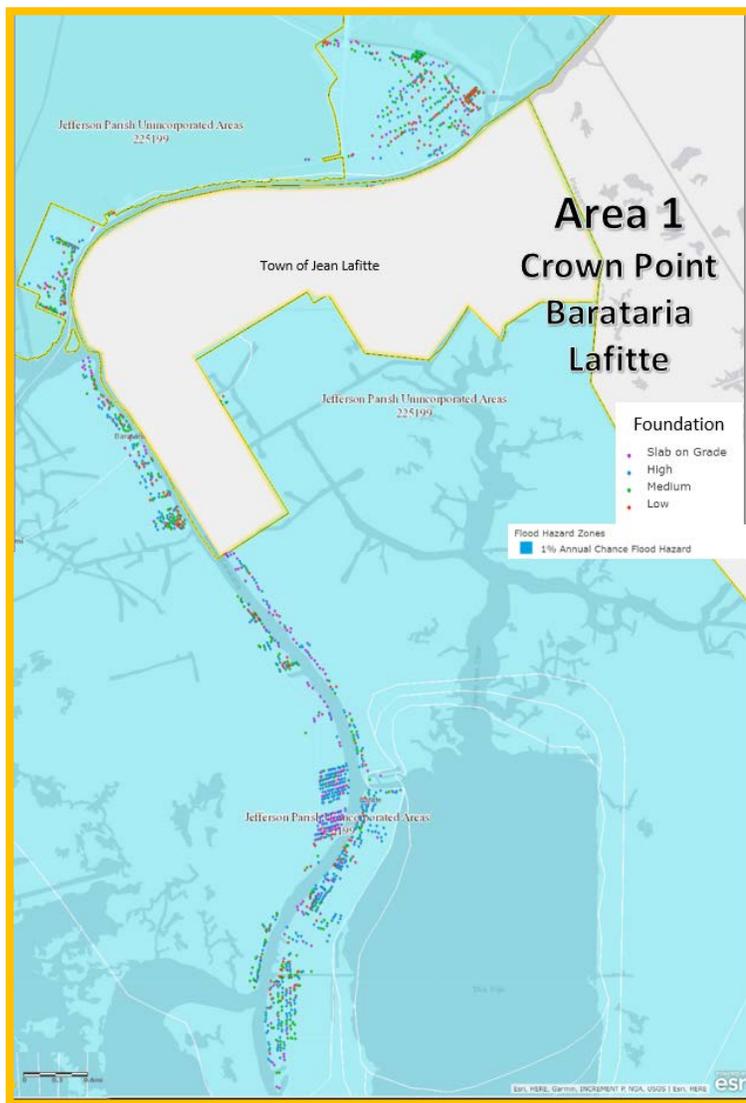


Figure 1- 5 2018 Effective FIRM

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

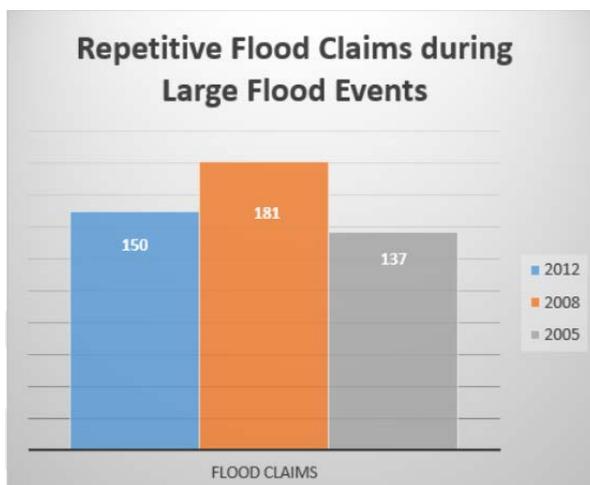


CLAIMS DATA:

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.

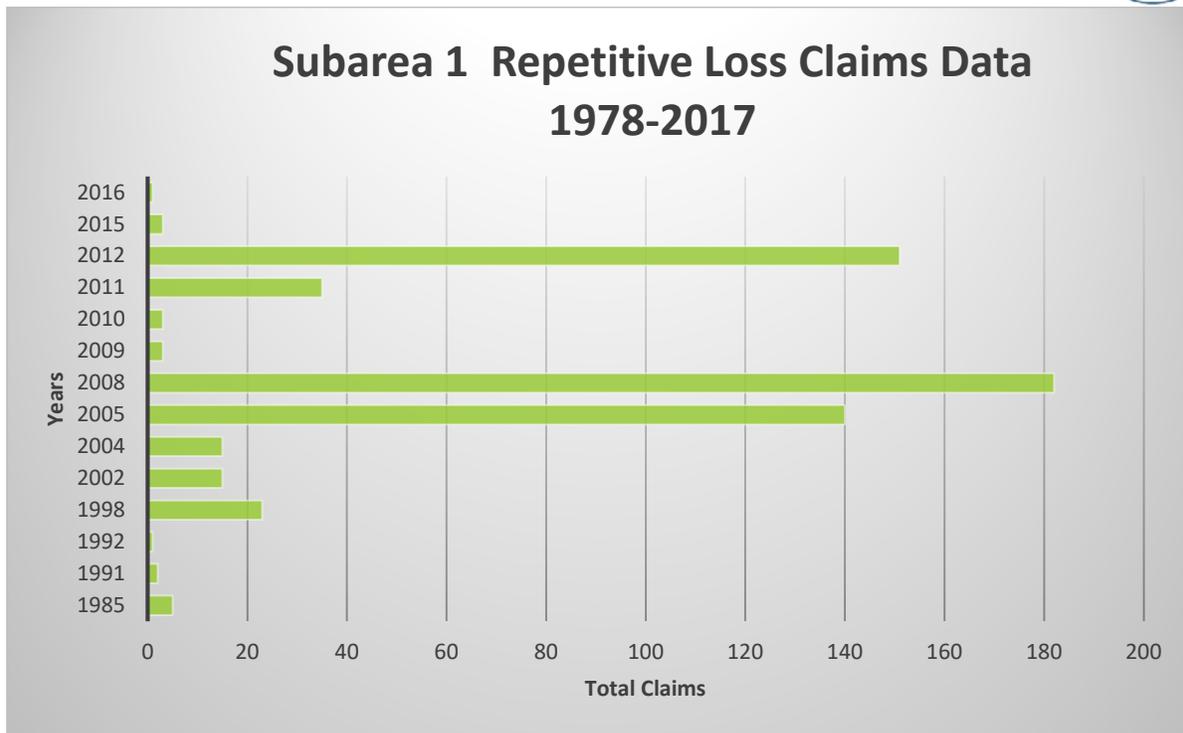


Table 1-3

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

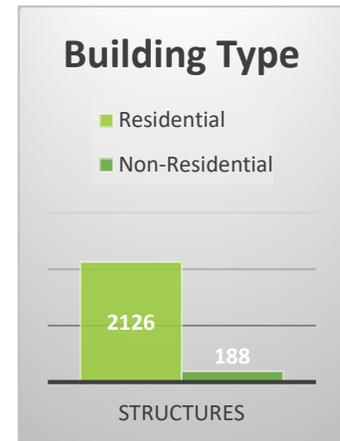


Table 1- 6

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.

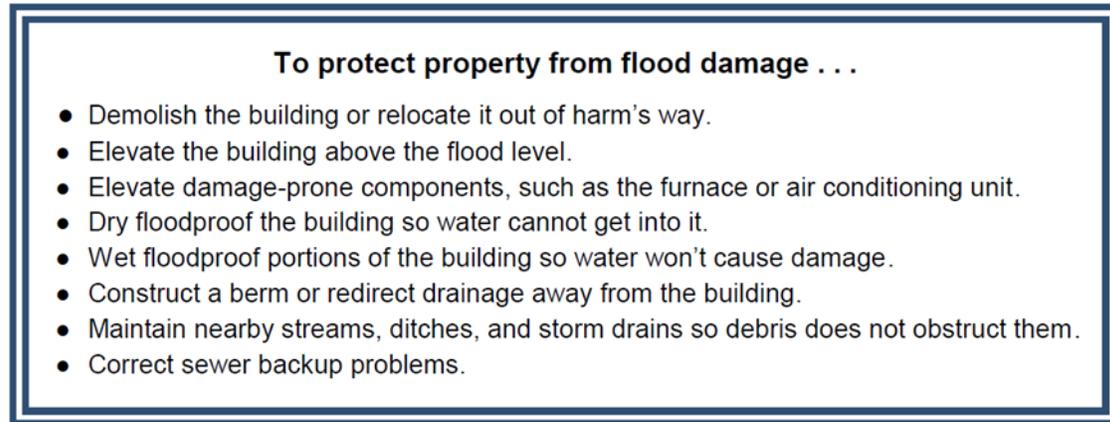


Figure 1- 9

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
<ul style="list-style-type: none"> ● 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. 	<ul style="list-style-type: none"> ● 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
<ul style="list-style-type: none"> ● 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. 	<ul style="list-style-type: none"> ● 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
<ul style="list-style-type: none"> ● Often less costly than other mitigation measures. ● Allows internal and external hydrostatic pressures to equalize, lessening the loads on walls and floors. 	<ul style="list-style-type: none"> ● 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
<ul style="list-style-type: none"> • Often less costly than other retrofitting methods • Does not require additional land. • May not be funded by a FEMA mitigation grant program. 	<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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

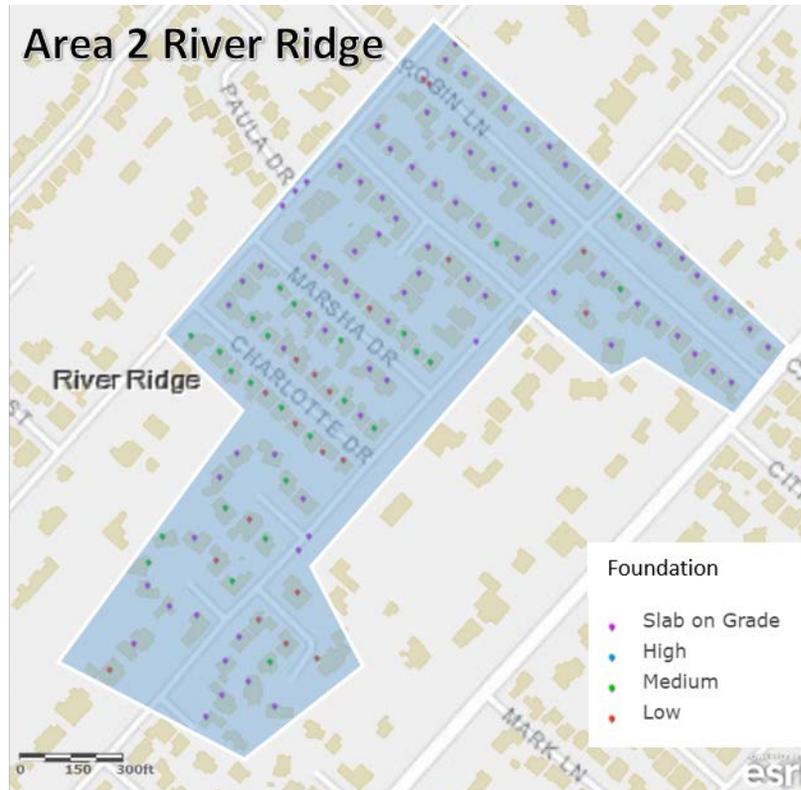


Figure 2- 1 Outline of Subarea 2



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.

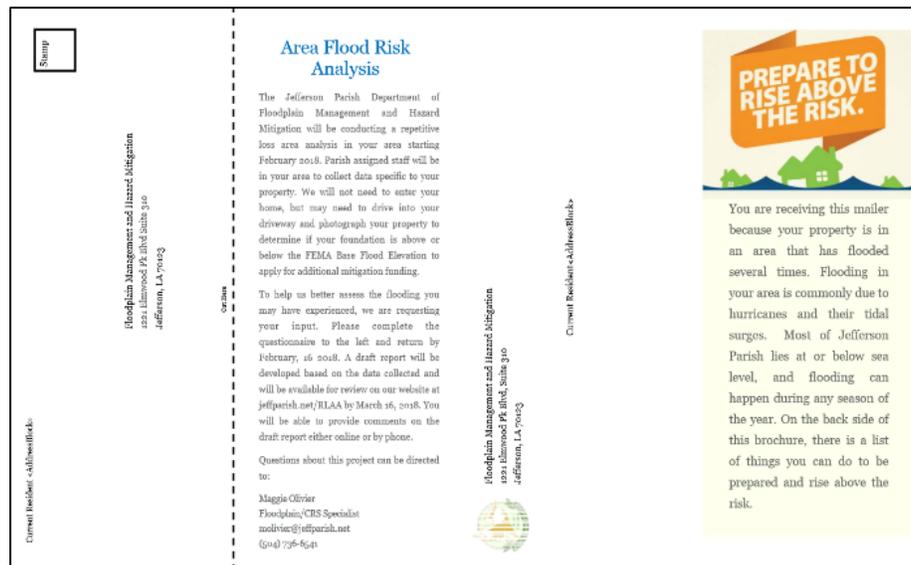


Figure 2- 2 Front of Notice

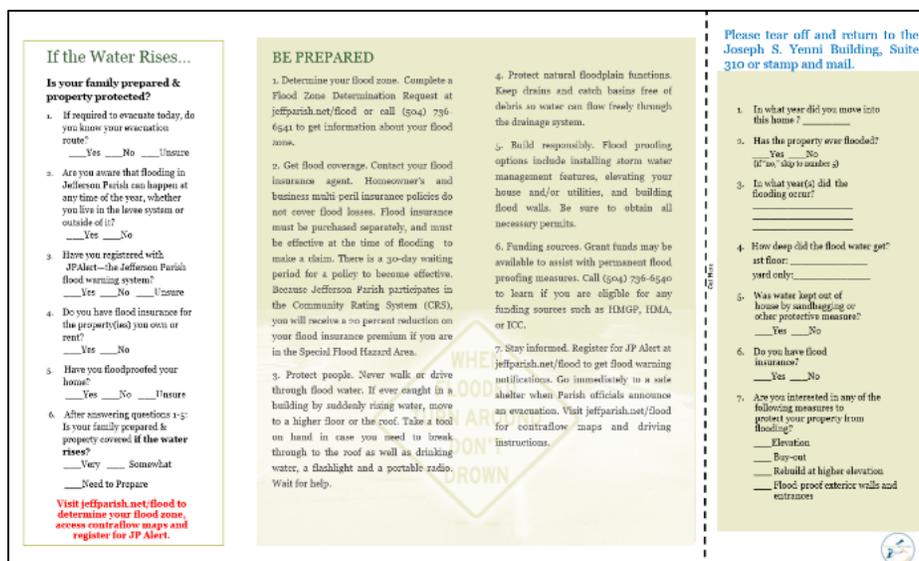


Figure 2- 3 Back of Notice with Questionnaire



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 Nacaise, 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.

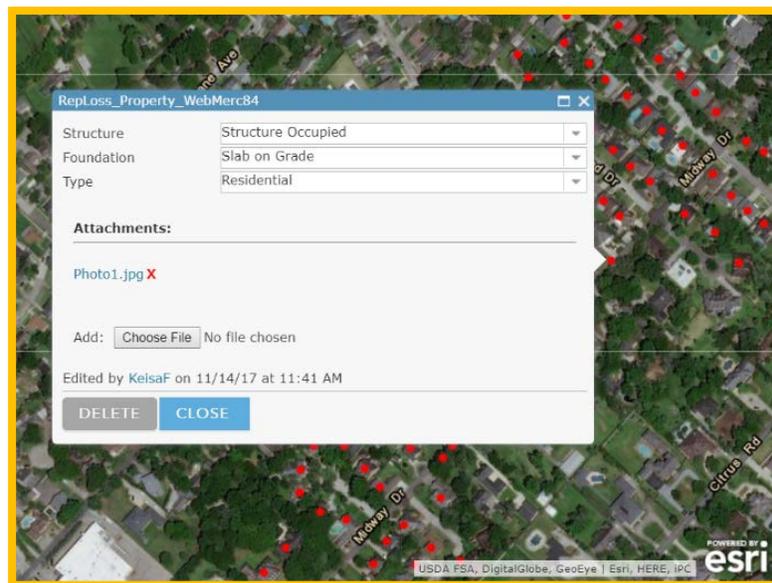


Figure 2- 4 Collector Application Sample

PROBLEM STATEMENT



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)

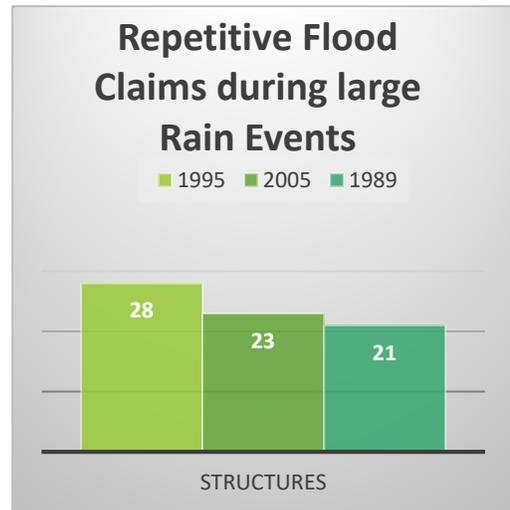


Table 2- 2

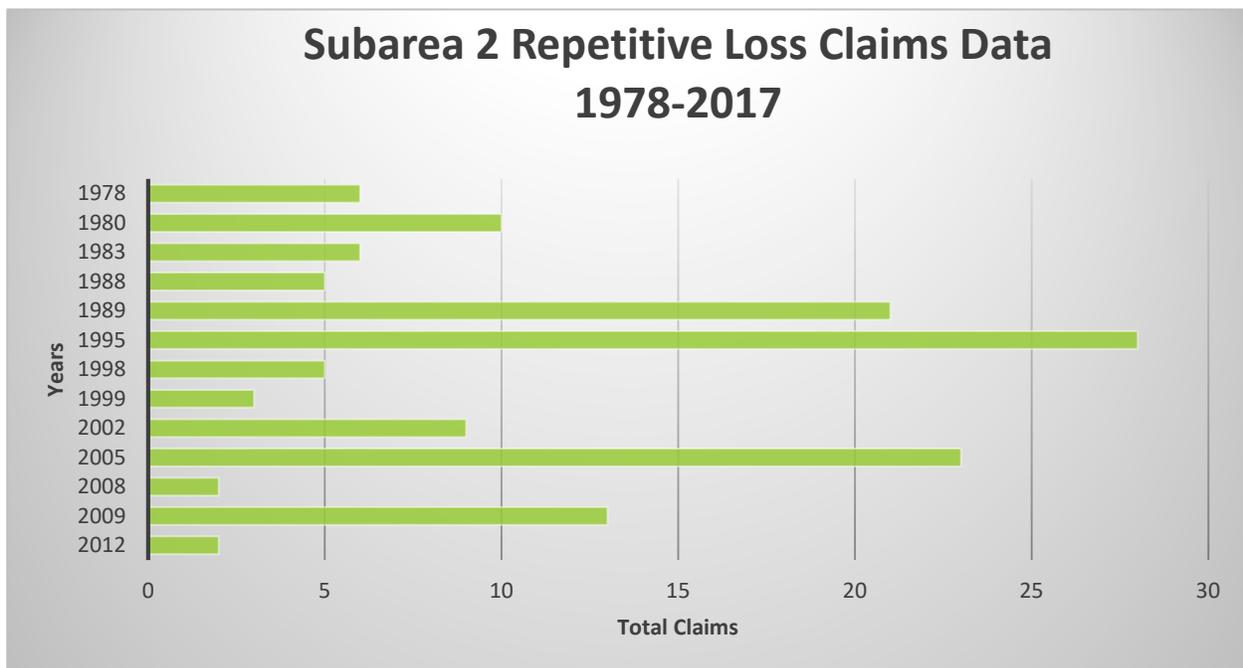


Table 2- 3



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 from 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

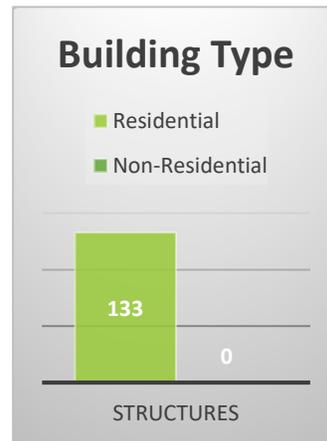


Table 2- 6

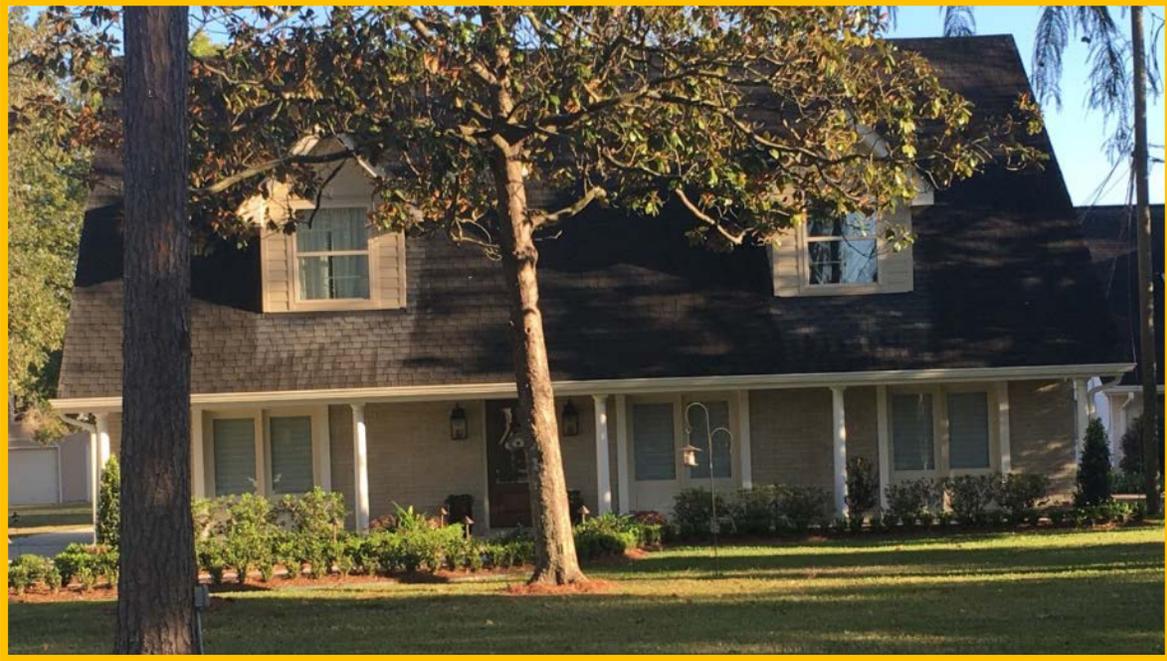


Figure 2- 6 Example property in Subarea 2



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.

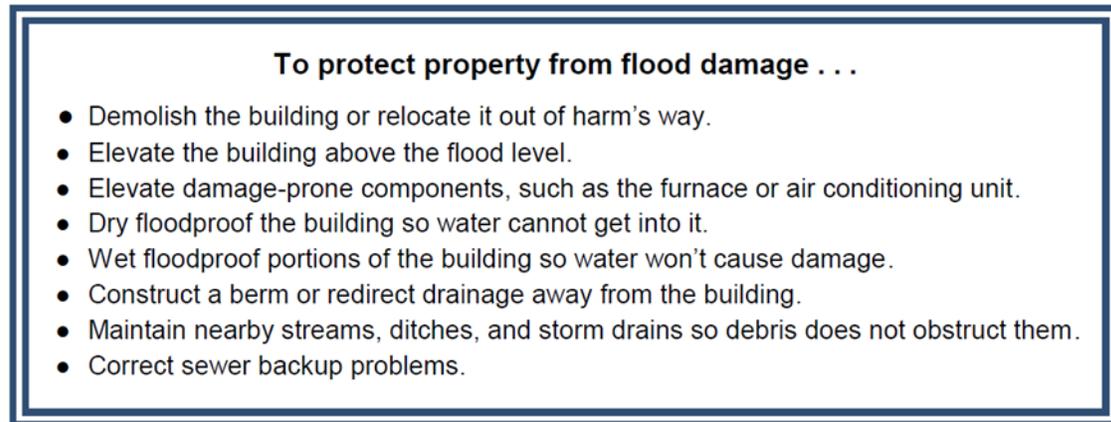


Figure 2- 8 Typical Property Protection Measures

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 improvements** 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
<ul style="list-style-type: none"> ● 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. 	<ul style="list-style-type: none"> ● 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
<ul style="list-style-type: none"> ● 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. 	<ul style="list-style-type: none"> ● 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
<ul style="list-style-type: none"> • Often less costly than other mitigation measures. • Allows internal and external hydrostatic pressures to equalize, lessening the loads on walls and floors. 	<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • Often less costly than other retrofitting methods • Does not require additional land. • Maybe funded by a FEMA mitigation grant program. 	<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none">• 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.	<ul style="list-style-type: none">• 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

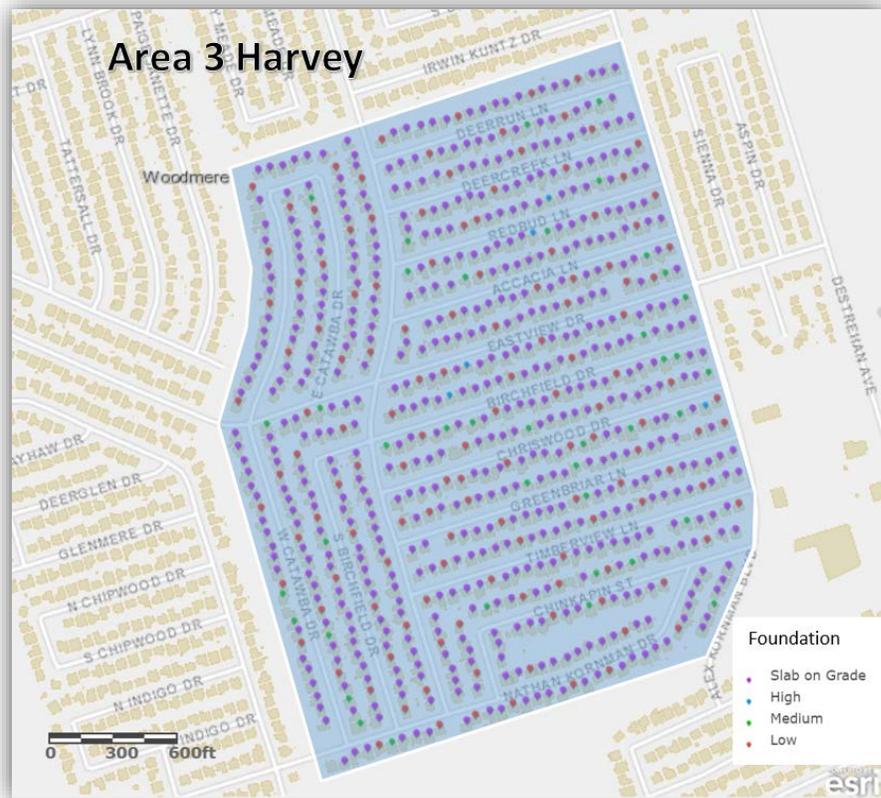


Figure 3- 1 Outline of Subarea 3



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.

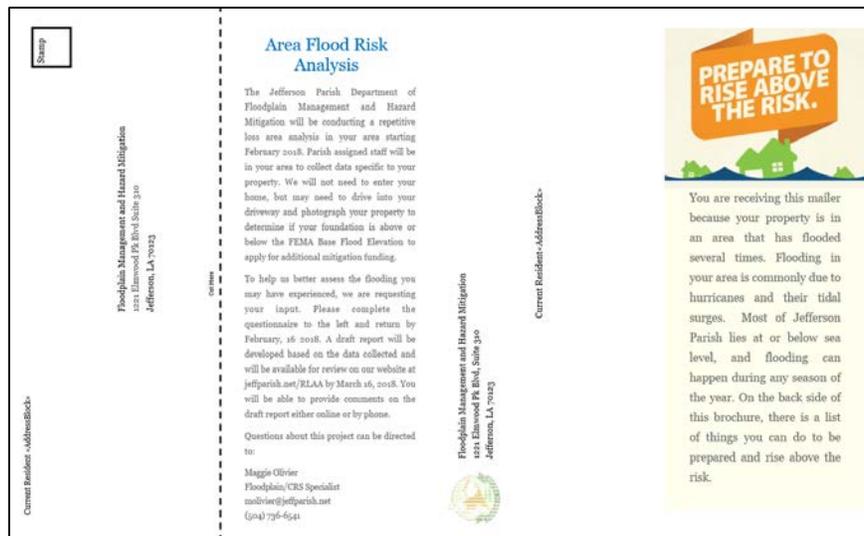


Figure 3- 2 Front of Notice

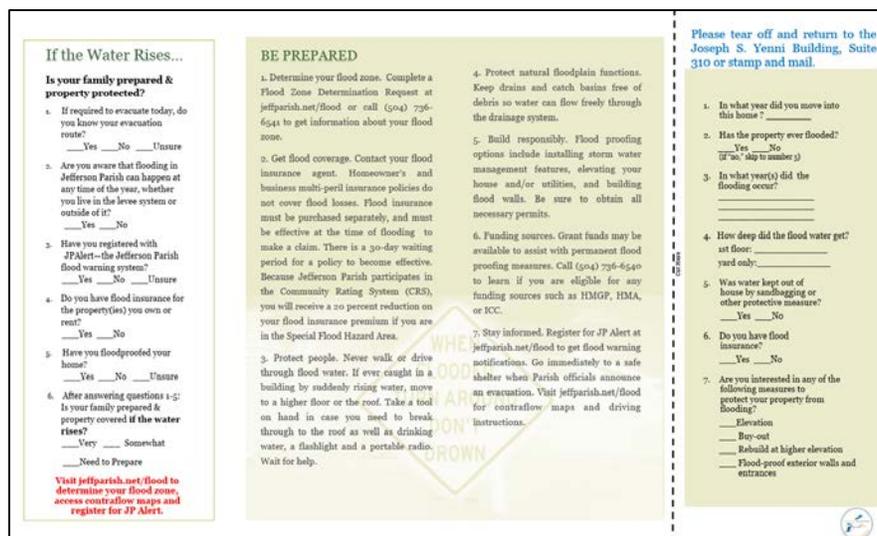


Figure 3- 3 Back of Notice with Questionnaire



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.



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 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:

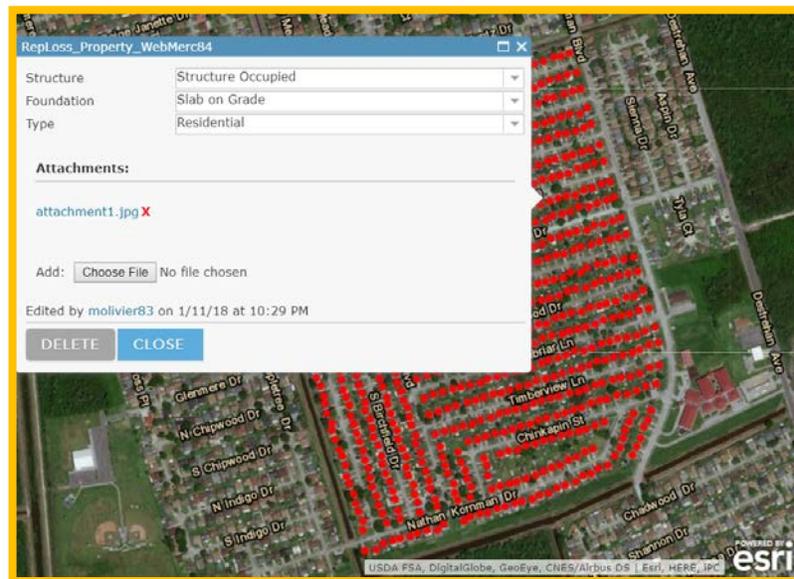
Table 3 - 1

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.

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.



Figure 3- 5 2018 Effective FIRM in Subarea 3

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.

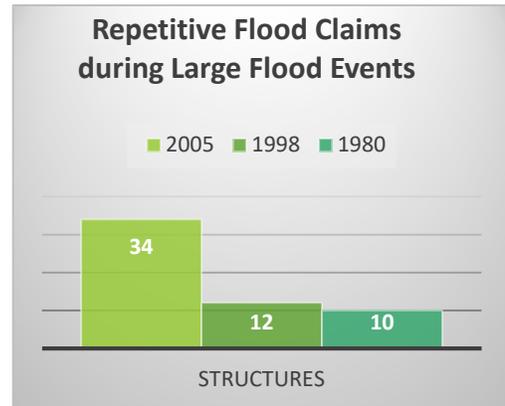


Table 3 - 2

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.

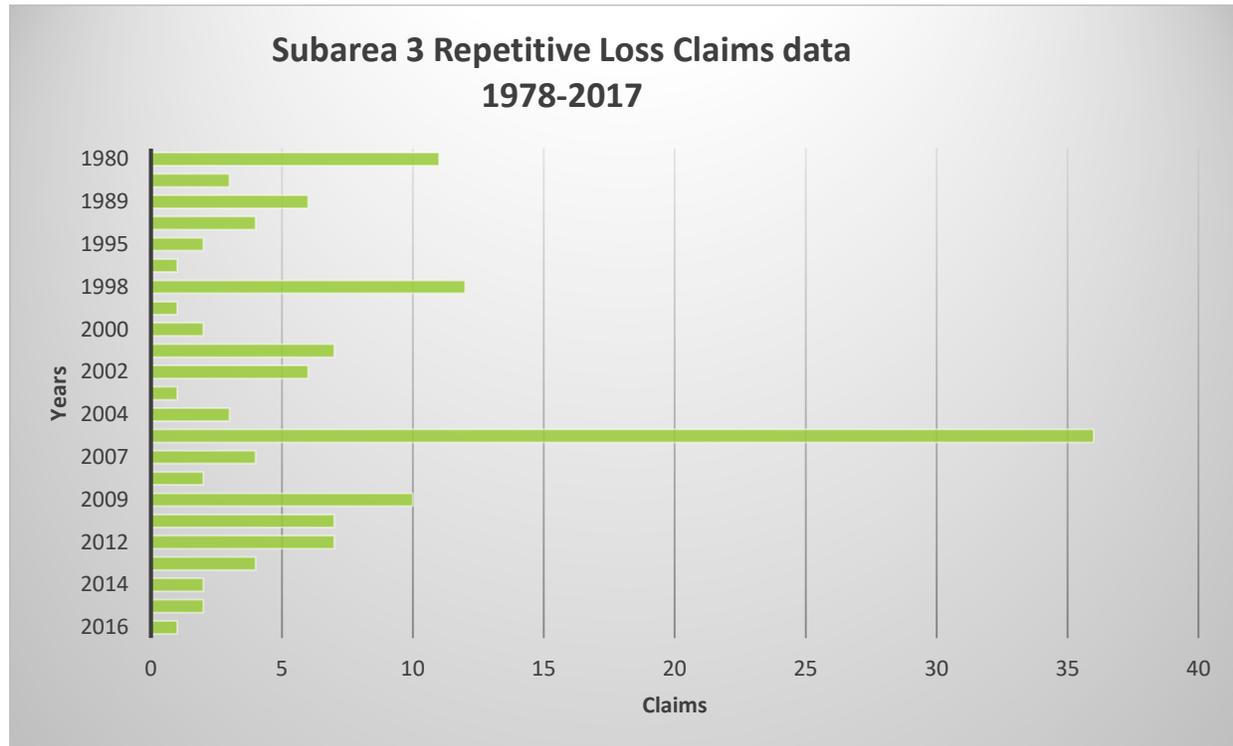


Table 3 - 3

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 from several hurricane and rain events.

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.

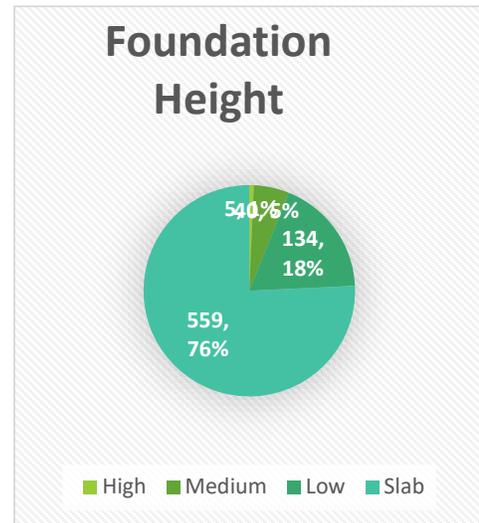


Table 3 - 4



Table 3 - 5

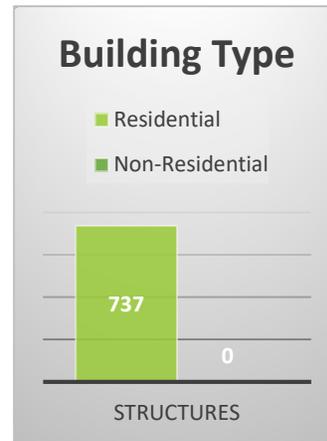


Table 3 - 6



Figure 3- 6 Example of Slab on Grade Structure in Subarea 3



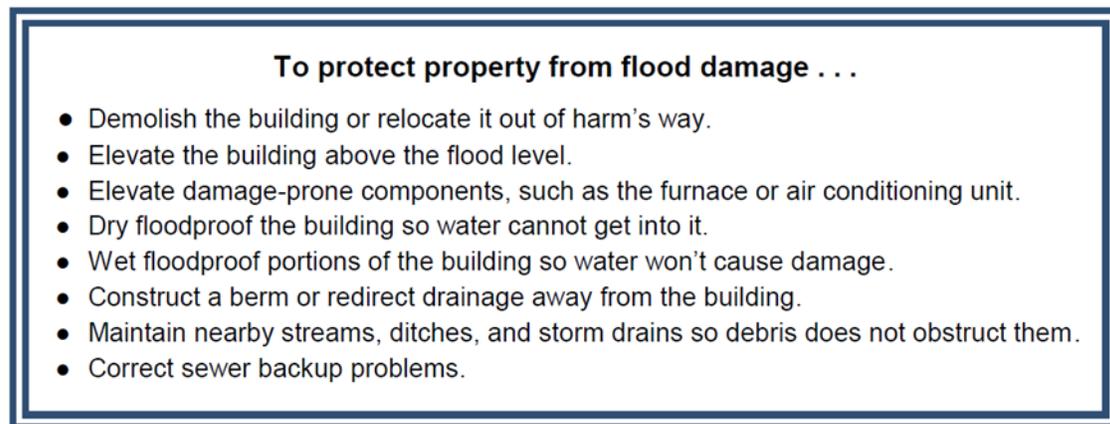
Figure 3- 7 Example of Medium Foundation in Subarea 3



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



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 improvements** 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
<ul style="list-style-type: none"> ● 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. 	<ul style="list-style-type: none"> ● 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
<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • Often less costly than other mitigation measures. • Allows internal and external hydrostatic pressures to equalize, lessening the loads on walls and floors. 	<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • Often less costly than other retrofitting methods • Does not require additional land. • Maybe funded by a FEMA mitigation grant program. 	<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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

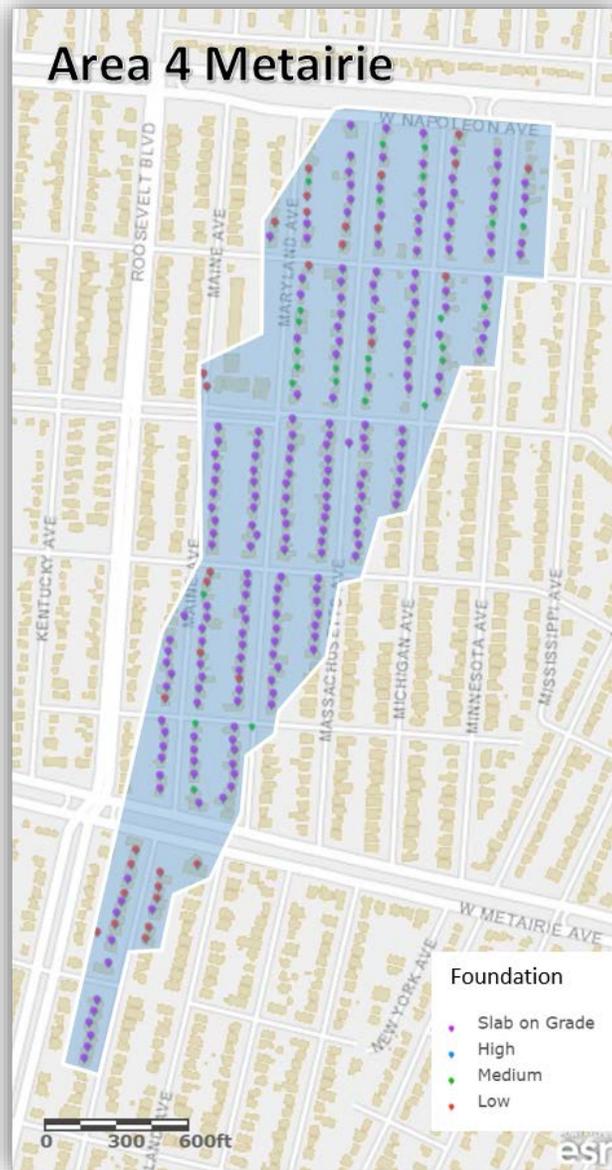


Figure 4- 1 Outline of Subarea 4



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.

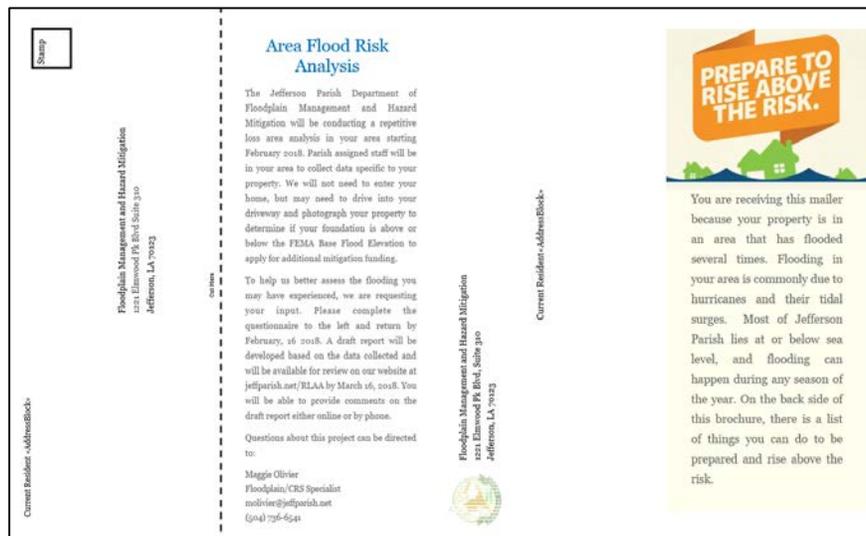


Figure 4- 2 Front of Notice

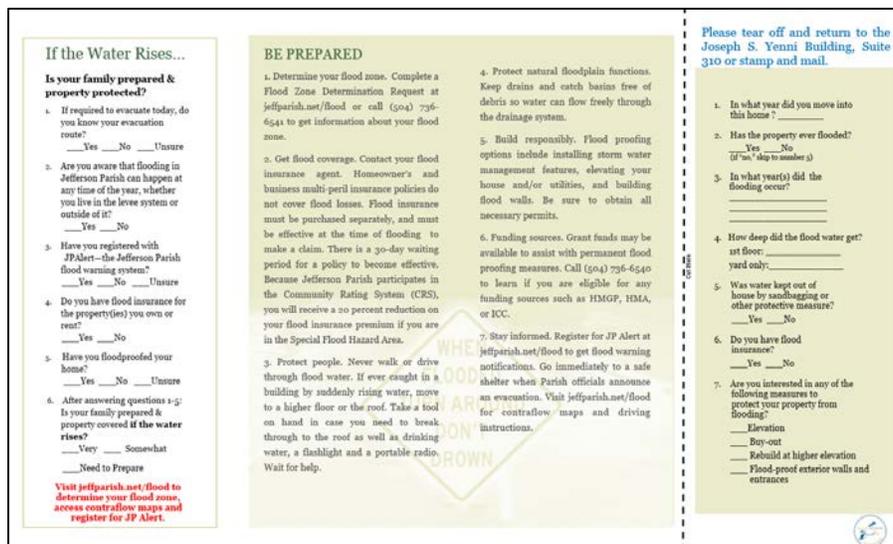


Figure 4- 3 Back of Notice with Questionnaire



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 Nacaise, 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.

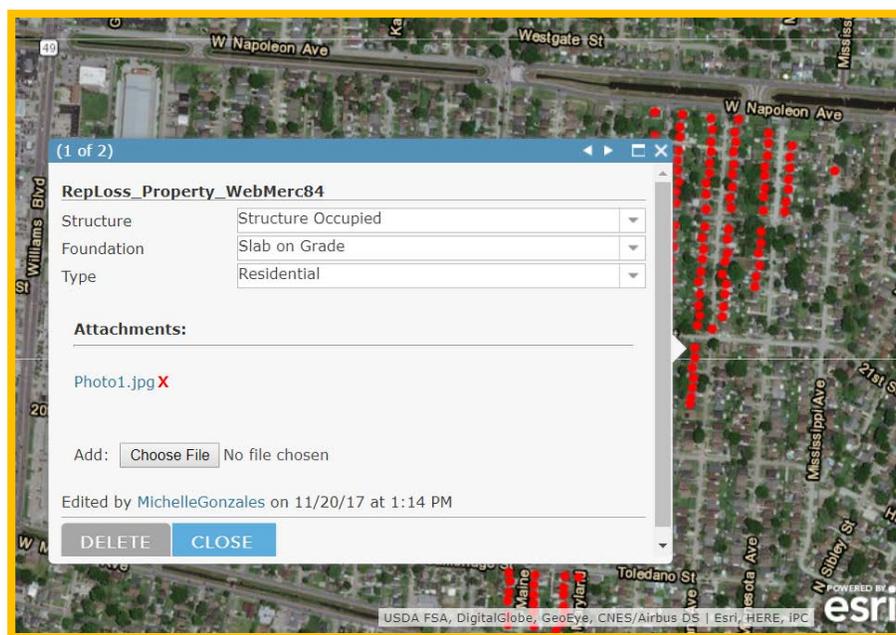


Figure 4- 4 Collector Application Sample



PROBLEM STATEMENT

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.

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.

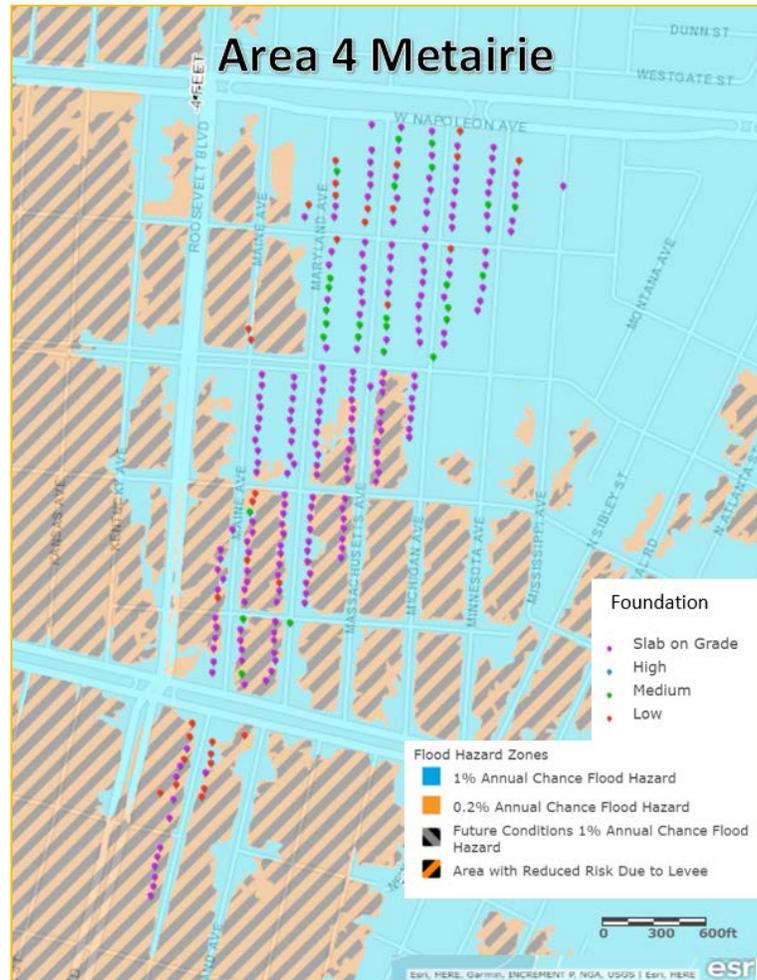


Figure 4- 5 2018 Effective FIRM in Subarea 4



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.

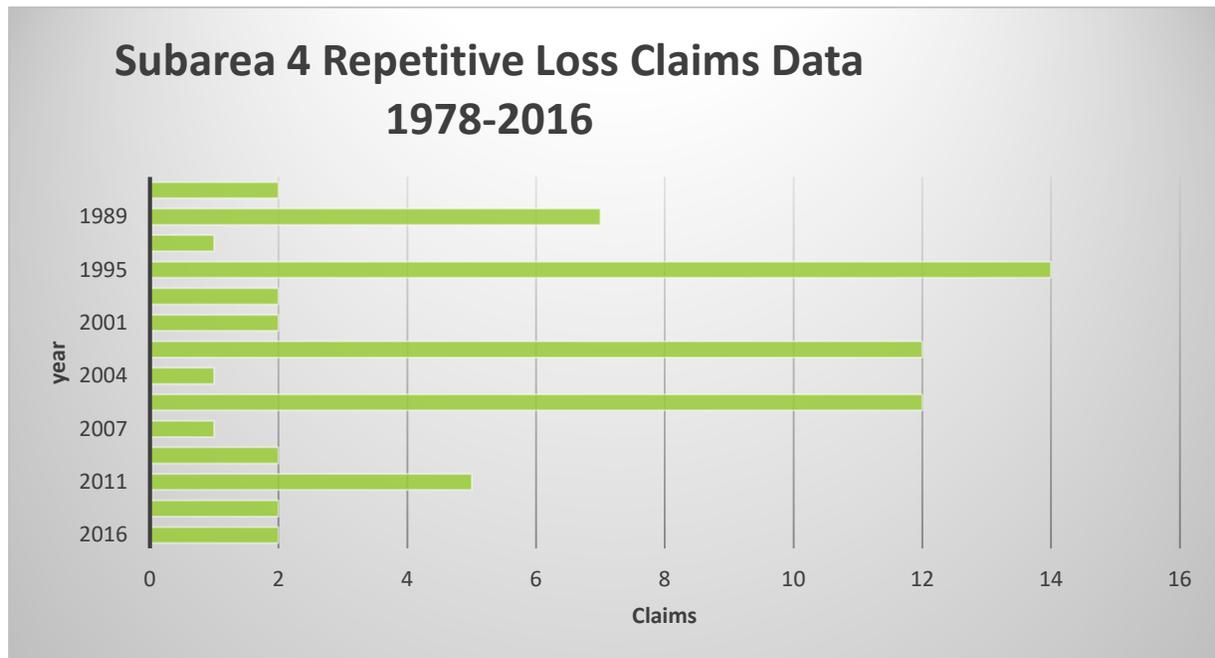


Table 4- 2



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 from 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.

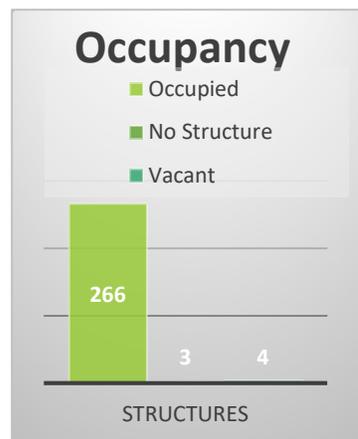


Table 4- 4



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.

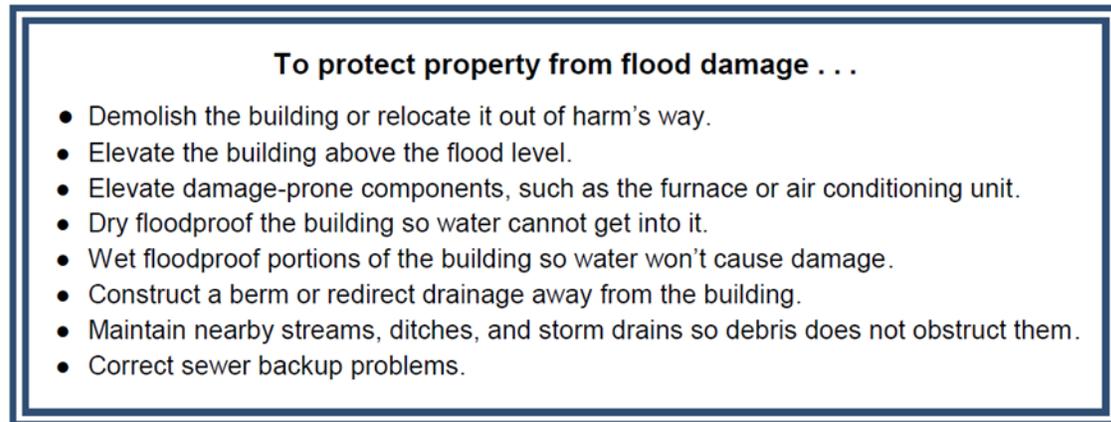


Figure 4- 9 Typical Property Protection Methods

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 improvements** 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
<ul style="list-style-type: none"> ● 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. 	<ul style="list-style-type: none"> ● 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
<ul style="list-style-type: none"> ● 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. 	<ul style="list-style-type: none"> ● 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
<ul style="list-style-type: none"> • Often less costly than other mitigation measures. • Allows internal and external hydrostatic pressures to equalize, lessening the loads on walls and floors. 	<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • Often less costly than other retrofitting methods • Does not require additional land. • May not be funded by a FEMA mitigation grant program. 	<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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

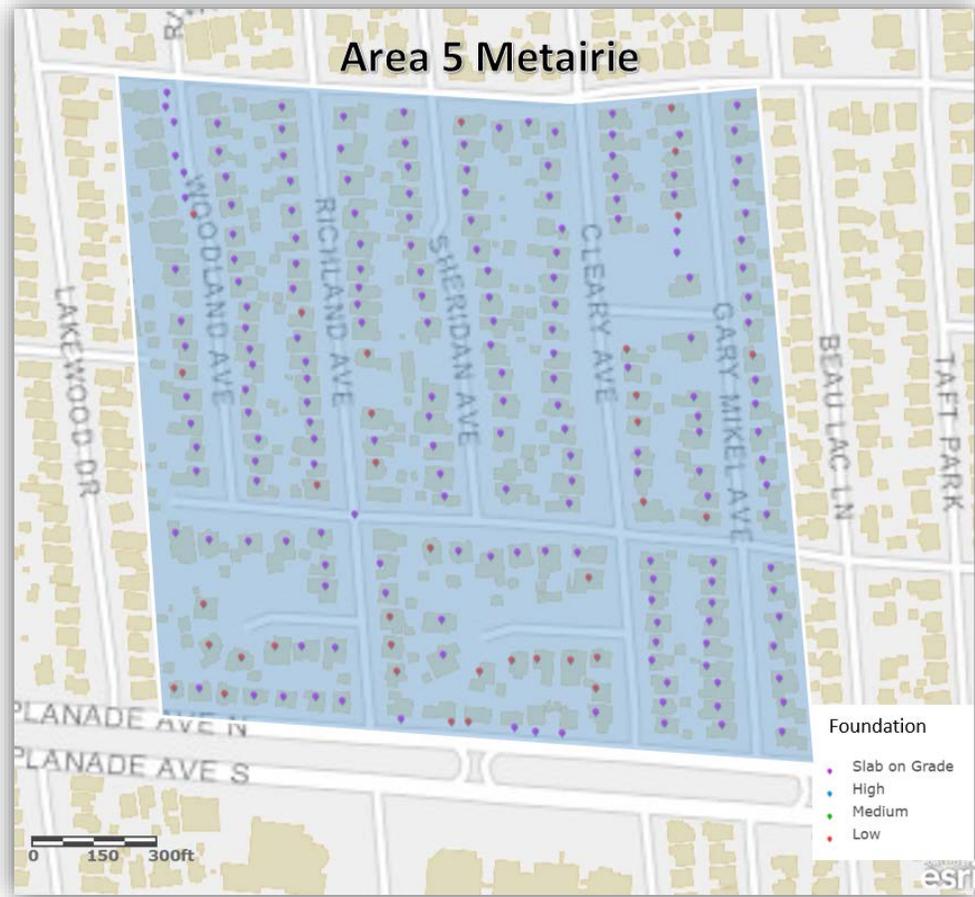


Figure 5- 1 Outline of Subarea 5



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.

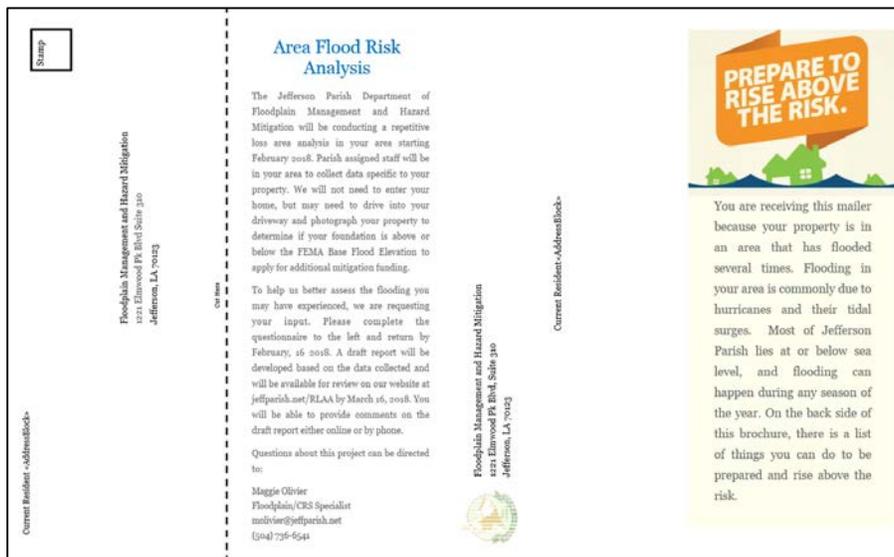


Figure 5- 2 Front of Notice

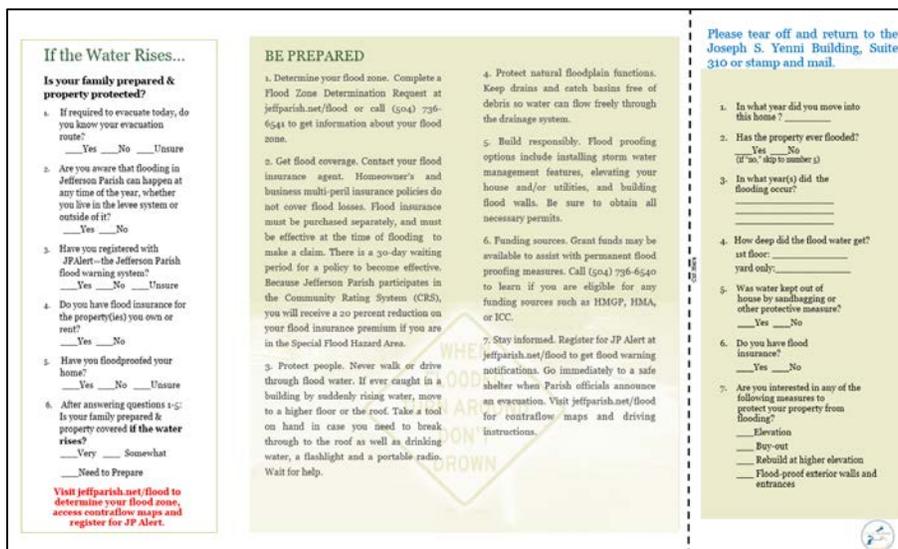


Figure 5- 3 Back of Notice with Questionnaire



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
Occupied	223 Low (less than 2ft.)	36 Non-residential
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.

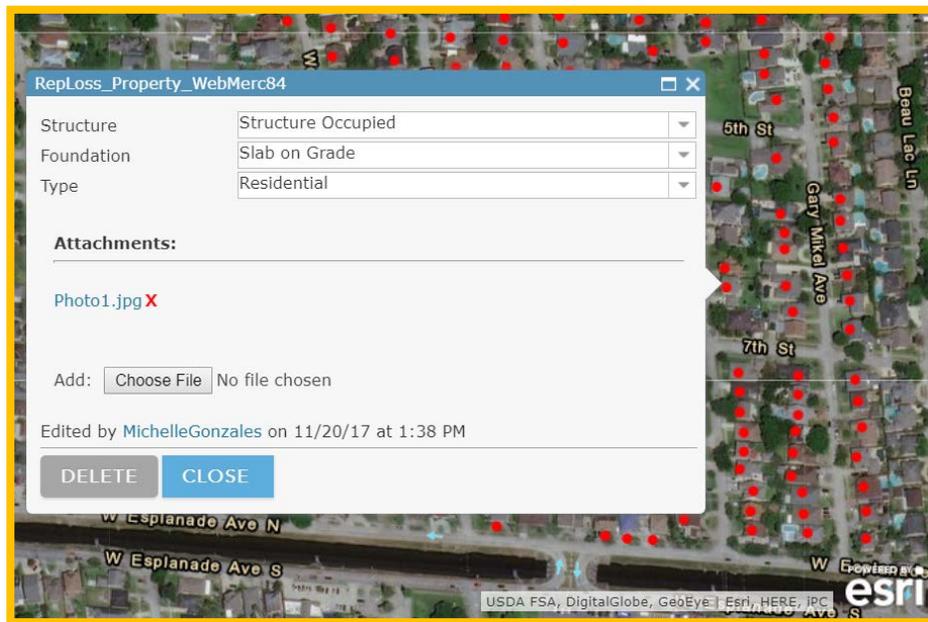


Figure 5- 4 Collector Application Sample



PROBLEM STATEMENT

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.

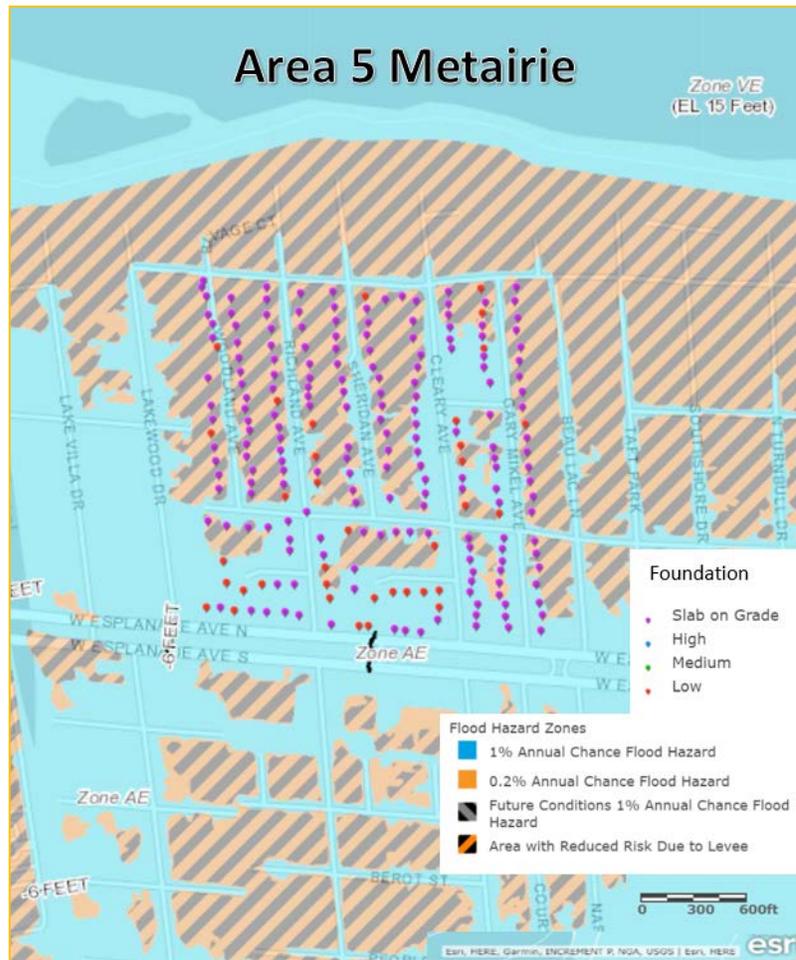


Figure 5- 5 2018 Effective FIRM for Subarea 5

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.

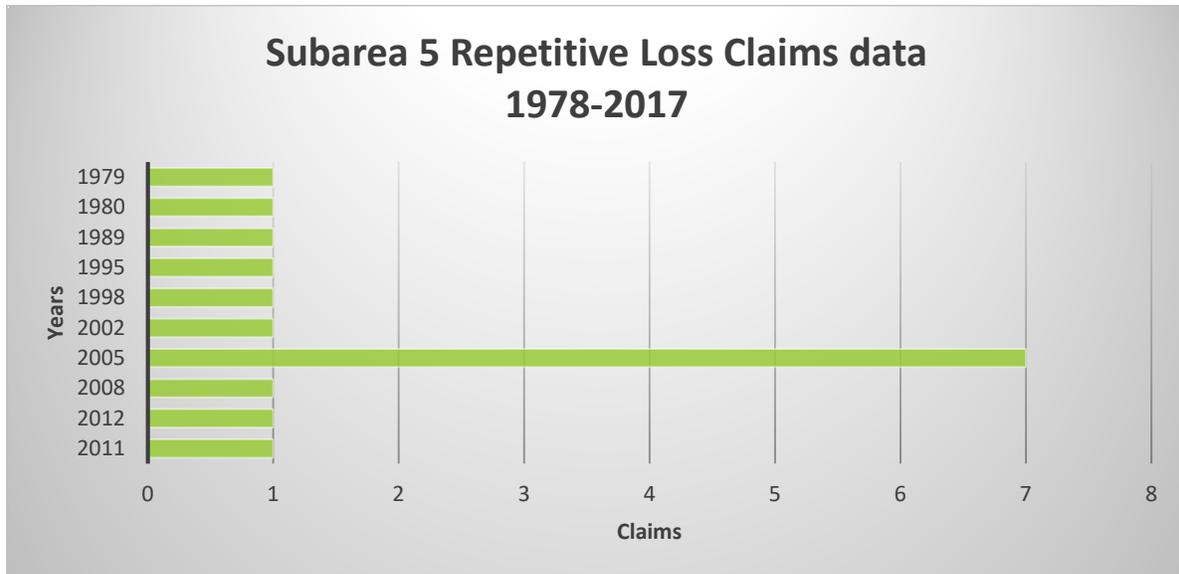


Table 5- 2

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 from 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

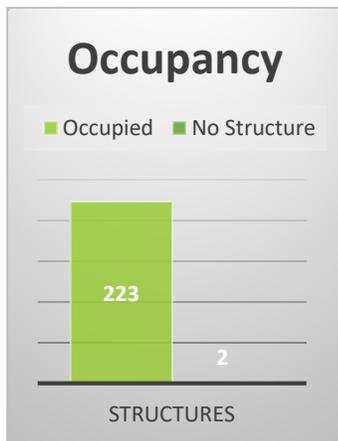


Table 5- 4

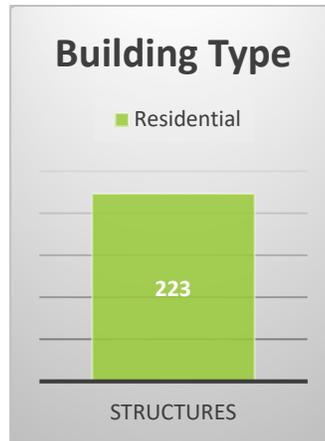


Table 5- 4



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.

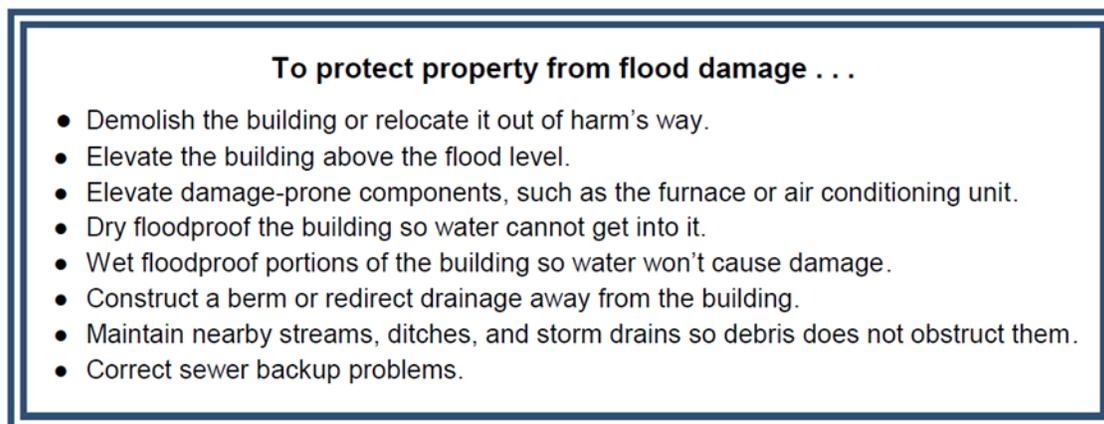


Figure 5- 8 Typical Property Protection Measures

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 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 improvements** 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
<ul style="list-style-type: none"> ● 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. 	<ul style="list-style-type: none"> ● 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
<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • Often less costly than other mitigation measures. • Allows internal and external hydrostatic pressures to equalize, lessening the loads on walls and floors. 	<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • Often less costly than other retrofitting methods • Does not require additional land. • May be funded by a FEMA mitigation grant program. 	<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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.