PLAQUEMINES PARISH, LOUISIANA
2015 HAZARD MITIGATION PLAN UPDATE

SUBMITTED TO:
LOUISIANA GOVERNOR'S OFFICE OF
HOMELAND SECURITY AND EMERGENCY PREPAREDNESS
FEMA, REGION IV

SUBMITTED BY:
PLAQUEMINES PARISH OFFICE OF
HOMELAND SECURITY AND EMERGENCY PREPAREDNESS

ADOPTED APRIL 9, 2015

PREPARED BY:
GCR, INC.

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Chapter 1 Introduction

As the costs for responding to disasters continued to grow through the 1990s, the federal government recognized the need for pre-disaster hazard mitigation planning. In 2000, Congress passed the Disaster Mitigation Act authorizing pre-disaster mitigation planning to reduce and control the cost of disaster assistance. This Act includes a requirement, that state and local governments have an approved hazard mitigation plan that is updated every five years in order to apply for and/or receive grant funds for any of the hazard mitigation assistance programs.

Hazard mitigation is defined as any sustained action to reduce or eliminate long-term risk to life and property from a hazard event in order to: 1) save lives and reduce property damage, 2) reduce the cost of disasters to property owners and all levels of government, and 3) protect critical facilities and minimize community disruption. Mitigation Plans form the foundation for a community's long-term strategy to reduce disaster losses and break the cycle of disaster damage, reconstruction, and repeated damage.

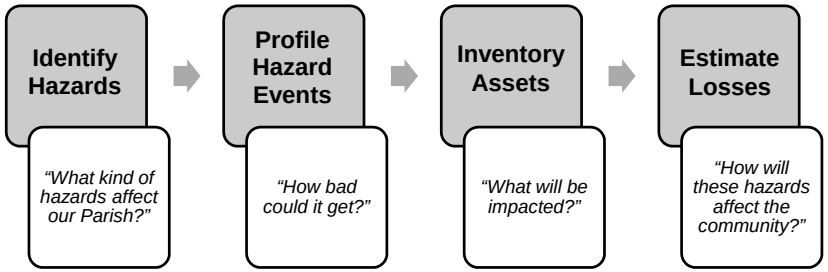
Overview of the 2014 Plan Update

All local governments are required by FEMA to update their Hazard Mitigation Plans every five years. Plaquemines Parish last updated their plan in 2009. Plaquemines Parish's 2009 Hazard Mitigation Plan update expires on March 29, 2015. In June of 2014, the Parish began the Planning Process to update the 2009 Plan. For the 2014 Planning Process, the Parish contracted the services of GCR Incorporated (GCR) as the planning team to assist the Parish's Office of Homeland Security and Emergency Preparedness with the plan update. During this planning process the following were reviewed and confirmed as accurate or were updated to include new information:

- The goals, objectives and actions were reviewed and updated;
- The hazards were reviewed and updated to coordinate with the 2014 State of Louisiana Hazard Mitigation Plan Update;
- The Parish's vulnerability to hazards and a new risk assessment of potential losses from future hazard events were also updated to contain the most recent data;
- The Parish's disaster declarations history was updated to include any events that have occurred since the 2009 plan update;
- Projects from the 2009 plan were reviewed and updated based upon the completion of projects from the 2009 Plan and the Parish's current project needs;
- The Parish's Implementation Strategy and Maintenance Procedures were reviewed and updated to reflect changes to actions and projects as well as any changes since the plan was last reviewed.

Hazard Mitigation Planning Organization and Process

As part of the planning process, the Parish and the planning team focused on the phases below when updating the 2009 plan.



Along with the above steps, a planning process was developed to include the Parish Government, local organizations and businesses, and the public in the development of the plan update. A Steering Committee was formed of key parish officials to represent the different parish departments, including the Fire Department, Sheriff's Department, School District, the Engineering Department and many others. A list of all steering committee members can be found in Appendix E: Louisiana GOHSEP Worksheets. The Steering Committee was used to assist with key decision making and the review of plan sections. Once the Steering Committee met, decisions from these meetings were then

presented to the Civic Committee for review and discussion. The Civic Committee included members of the Steering Committee along with a wider array of businesses and organizations as well as emergency officials from the municipalities surrounding Plaquemines Parish. A list of the Civic Committee representatives can be found in Appendix E: Louisiana GOHSEP Worksheets. As part of the planning process, Plaquemines Parish also held two public meetings to ensure that they advertised the plan update process and to receive feedback from the citizens of the parish. The parish also made the draft plan available to the public for review. The final draft plan was submitted for review by the Parish and then sent to the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) and the Federal Emergency Management Agency (FEMA) for approval before being submitted to the Parish Council for final adoption.

The Plaquemines Parish Office of Homeland Security and Emergency Preparedness along with the planning consultants held three Steering Committee Meetings, three Civic Committee Meetings, and two public meetings throughout the planning process. Below is a list of the meetings:

Steering Committee Meetings:

- June 23, 2014
- August 21, 2014
- November 17, 2014

Civic Committee Meetings:

- July 23, 2014
- September 24, 2014
- November 20, 2014

Public Meetings:

- September 11, 2014
- September 24, 2014

Throughout the planning process the Steering and Civic committee members were kept aware of the plan's progress through email updates with meeting information, materials and summaries of meeting minutes, as well as through a FTP site where documents and maps were uploaded for their review and feedback. The parish advertised the public meetings as well as the fact that the draft plan was available for public review. All meeting minutes, agendas and public meeting advertisements can be found in Appendix B: Meeting Documents.

Parish Background

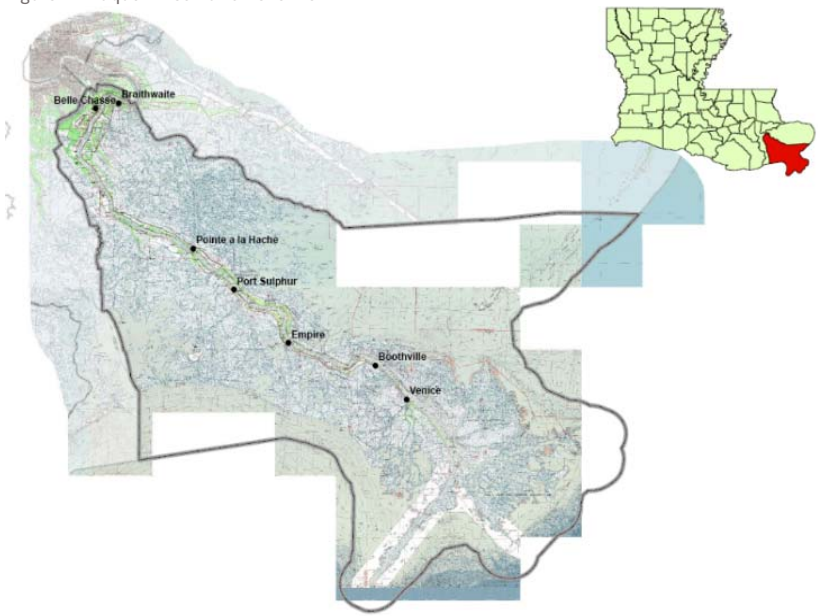
Geographic Setting

Plaquemines Parish is situated in extreme southeast Louisiana along the state's Gulf of Mexico coastline and is essentially bisected from northwest to southeast by the Mississippi River. The parish includes a surface area of approximately 2,386 square miles of which greater than 67% is water. The "high ground" is located in northern most portion of the parish in the vicinity of Belle Chase and extends southeast in a narrow band along the Mississippi River where it terminates in Venice in the southeast portion of the parish. To the northeast is St. Bernard Parish, to the west Jefferson Parish, and to the north is Orleans Parish. Figure 1 below shows communities in Plaquemines Parish, its geographic position in the state, and its large expanse of water and wetlands (light blue and gray).

No municipalities or incorporated areas exist in Plaquemines Parish. Instead, several communities have developed on the natural levee primarily west of the Mississippi River. The locations of the communities are illustrated on the preceding topographic map. The abundance of water features in the parish, places it in a precarious position during times of high water. Developed land in the parish is protected by a series of levees that generally follow the alignment of the Mississippi River.

The levees that surround the communities and protect them from river flooding and storm surge, can also act as barriers that prevent water from draining out when water finds its way over the levees via heavy rainfall or overtopping

Figure 1: Plaquemines Parish Overview



during surge events. As a result, the parish's stormwater drainage system includes seventeen pumping stations to remove stormwater. The parish drainage system can be found in Appendix A, Map 2.

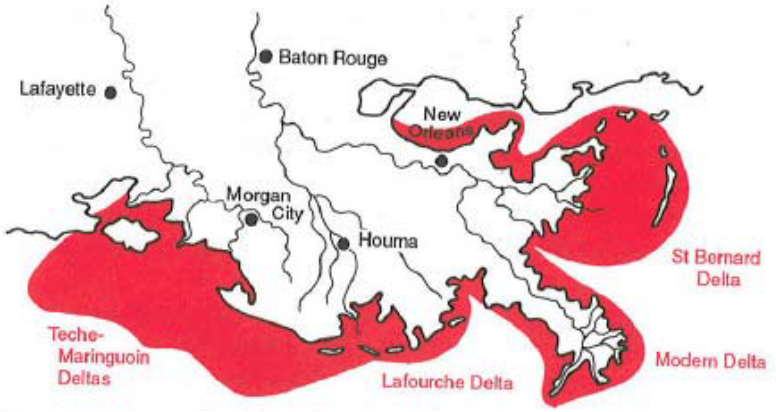
Physical Parameter

The formation of Plaquemines Parish is largely a result of a historic alignment of the Mississippi River delta known as the "modern delta." The following are excerpts from the *Roadside Geology of Louisiana* by Darwin Spearing:

> *The amazing thing about the modern Mississippi delta is how young and dynamic it is. Geologists emphasize the great ages of earth events, and the slowness of natural processes. Here is a major geologic feature that started to form only a few hundred years ago, and is changing from one day to the next.*
>
> *The Mississippi River began to build its modern delta, which geologists call the Balize or Birdfoot delta, about 600 years ago. Early settlers built the first artificial levees along it in the late 1600s, and people have been interacting with it for half its life.*

Figure 2 illustrates the general proximity of historical deltas created by the shifting Mississippi River in southeast Louisiana over the last 7,500 years.

Figure 2: Historic Deltas of Louisiana

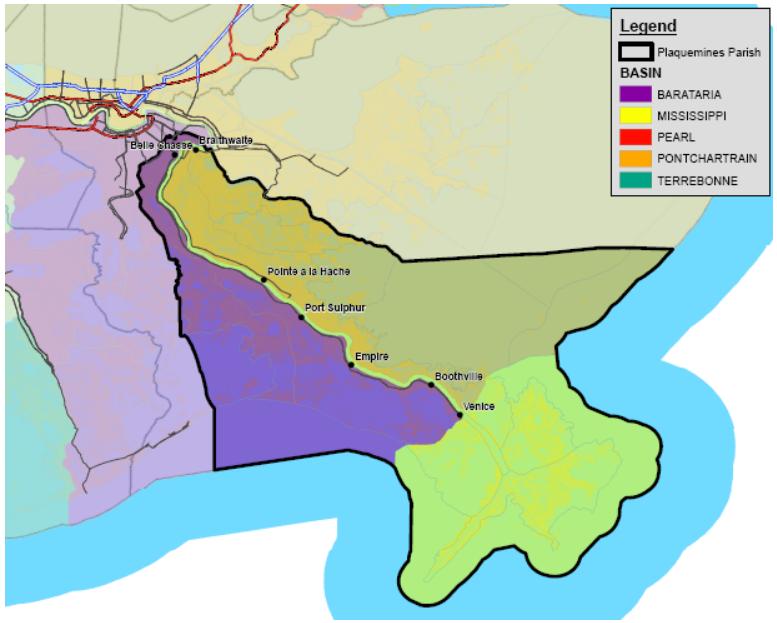


Source: *Roadside Geology of Louisiana*, Darwin Spearing, 1995

The parish is located at the confluence of the Ponchartrain, Mississippi, and Barataria drainage basins. The drainage basins within and in the immediate vicinity of Plaquemines Parish are identified in Figure 3.

A combination of its deltaic creation (the Mississippi River), its proximity to the Gulf of Mexico, and a historical concentration of oil and gas exploration activities (construction of man-made access canals) are responsible for greater than 95% of the parish's total acreage being represented by either water or wetlands. The water and wetlands include marshes east and west of the Mississippi River that are intertwined with hundreds of lakes, bays, bayous, and canals.

Figure 3: Plaquemines Parish Drainage Basins



The Mississippi River is vital to the creation and existence of Plaquemines Parish. The river has historically provided the land-building sediment that created the highest areas of the parish. The sediment was deposited during annual flooding cycles prior to the construction of federal flood protection levees along the Mississippi River. It is upon these natural levees or ridges that all urban and agriculture land exists in the parish today.

The three-foot contour clearly defines the ridges as the "high-ground" of the parish. The depiction of these ridge lines form an image that is repeated in this report as virtually all land area other than these ridge areas is susceptible to frequent flooding of some sort; either stormwater, river flooding, storm surge, or backwater flooding.

Socioeconomic Factors

The U.S. Census Bureau reported a parish population of 23,042 in 2010, down 14% from the 26,757 reported in 2000. The Census estimates a slight increase to 23,550 in 2013. The parish's current population is distributed such that the heaviest concentrations of people are on the west bank of the Mississippi River from the northern parish boundary south to Jesuit Bend. 55% of the parish's population is located in the community of Belle Chasse, on the northern end of the west bank. Belle Chasse is fully surrounded by Federal flood protection levees.

Bureau of Labor Statistics data from 2013 indicates that the top industries in Plaquemines Parish are Transportation/Warehousing, Manufacturing, Mining/Oil & Gas, and Construction, accounting for over half of the Parish's 12,073 jobs. The following table provides a summary of the overall economy based upon employment.

Table 1: Employment by Industry, 2013

Industry	Plaquemines Parish, Louisiana
Agriculture/Fishing/Hunting	0.46%
Mining/Oil & Gas	12.24%
Utilities	3.00%
Construction	8.94%
Manufacturing	15.22%
Wholesale Trade	7.25%
Retail Trade	4.56%
Professional/Technical Services	2.64%
Management	0.11%
Administrative Services	6.47%
Transportation/Warehousing	17.31%
Information	0.14%
Finance/Insurance	0.75%
Real Estate	6.18%
Arts/Entertainment/Recreation	0.66%
Accommodation/Food Service	6.90%
Other Service	2.42%
Unclassified	0.07%

Plan Organization

The Plaquemines Parish 2015 Hazard Mitigation Plan Update is organized into the following sections.

Introduction

Includes information on the background of the Parish, as well as the plan's organization and contact information.

Planning Process

This chapter outlines the process used to involve Parish officials, organizations, businesses, and the general public in the development of the plan update. It also describes the prioritization and decision-making methodology used in the planning process.

Risk Assessment

This chapter contains detailed analysis on the hazards chosen as of most concern the Plaquemines Parish. It also contains data tables on loss estimates and hazard maps.

Mitigation Strategy

This chapter illustrates how the Parish intends to reduce the losses considered in the Risk Assessment chapter. It includes update mitigation goals, objectives, actions and projects that reflect the current needs of the parish. It identifies sources of funding and other resources needed to implement the actions and projects identified in the planning process.

Plan Adoption

This chapter contains adoption documentation from the Plaquemines Parish Council.

Plan Maintenance

This chapter includes an outline of how the Parish intends to monitor and evaluate the plans actions and projects, and a process for reviewing and updating the plan in between the five year update required by FEMA.

Plan Contact Information

This plan incorporated comments from the public, Steering Committee, Civic Committee and other stakeholders. There was a 7-day public comment period on the draft plan, but no comments were received from the public. For questions or comments, please contact:

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Chapter 2 Planning Process

The Planning Processes is a vital part of the plan development. Successful plans include input from government officials, community organizations and businesses, and the general public. It is vital to include the community within the planning process in order to ensure support for the plan as well as full public understanding of the plan components and how the plan was developed. The process Plaquemines Parish used for its 2015 Plan Update incorporated the following FEMA 44 CFR Requirements:

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

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

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

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

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

Planning Team

The Planning Team was the overall coordinator for the planning process and the development of the plan update. The team consisted of three consultants and one GIS specialist from the hired consulting firm, GCR. These consultants assisted the Parish with the development of the project timeline and planning process, meeting coordination, community involvement, and plan development. GCR worked with the Director and Deputy Director of the Plaquemines Parish Office of Homeland Security and Emergency Preparedness to ensure all needed parties within the Parish were involved in the planning process.

Steering Committee

The Steering Committee was developed to include key members of the Parish Government and organizations to assist with the fine details of the plan development. The Steering Committee was the first line of reference for plan decisions as the members will ultimately be responsible for the implementation and management the 2015 Hazard Mitigation Plan Update. The Steering Committee was responsible for attending meetings, reviewing and updating the plan's hazards, goals, objectives, actions and projects, providing subject matter expertise, and reviewing the plan components in detail. The Steering Committee consisted of thirteen members and met three times over the course of the planning process to discuss the plan and make decisions. Below is a description of the meetings and meeting materials can be viewed in Appendix B: Meeting Documents.

Steering Committee Meetings:

- June 23, 2014 – At this meeting the Steering Committee met to discuss the need for the plan update, review an overview of the Planning Process, discuss and decide on the final list of hazards, review and update the goals and objectives, and to begin discussing an updated project list.
- August 21, 2014 – At this meeting the Planning Team reviewed the results of the Risk Assessment with the Steering Committee, reviewed

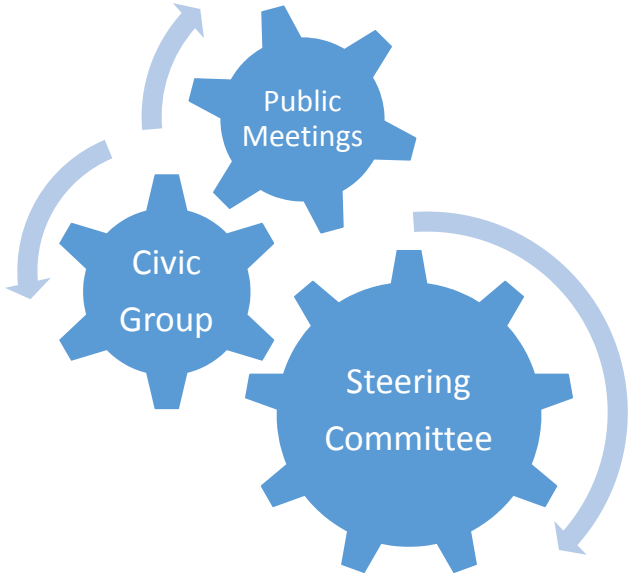
the 2009 Plan's actions and projects, and discussed and evaluated new actions and projects for the 2015 Plan Update.

- November 17, 2014 – At this meeting the Planning Team presented the final draft plan update, as well as the mitigation strategy and plan maintenance procedures for review and approval by the Steering Committee.

The Civic Committee consisted of a much larger group than the Steering Committee in that it had 33 members. The Civic Committee consisted of local officials, businesses, organizations, emergency officials from surrounding parishes, and the 13 Steering Committee Members. The Civic Committee members were identified with the help of parish officials and were invited to participate through email. The Civic Committee provided another line of feedback on the decisions made at the Steering Committee Meetings. The Civic Committee met three times over the course of the planning process, each meeting was held after the Steering Committee Meeting, to review and discuss the results of the planning process. Below is a description of the meetings, and meeting materials can be viewed in Appendix B: Meeting Documents.

Civic Committee Meetings:

- July 23, 2014 - At this meeting the Civic Committee met to review the need for a plan update, an overview of the Planning Process, the final list of hazards, the proposed goals and objectives, and to begin discussing an updated project list that was discussed at the June Steering Committee Meeting.
- September 24, 2014 - At this meeting the Planning Team presented the results of the Risk Assessment with the Civic Committee, and reviewed the proposed 2015 plan's actions and projects that were discussed and agreed upon at the August Steering Committee Meeting.
- November 20, 2014 – At this meeting the Planning Team presented the final draft plan update, as well as the mitigation strategy and plan maintenance procedures as approved by the Steering Committee.



Public Involvement

Two public meetings were held to describe the planning process and to assist with informing the public of the upcoming opportunity to review and comment on the draft plan. These meetings were advertised by the Parish and in the local journal. Descriptions of the two meetings are below and meeting materials and advertisements can be viewed in Appendix B: Meeting Documents.

Public Meetings:

- September 11, 2014 – At the September Parish Council Meeting the Planning Team presented an overview of the planning process and the upcoming opportunity for the public to comment on the draft plan.
- September 24, 2014 – At the general public meeting, the Planning Team and the Parish presented and overview of the need for a Hazard Mitigation Plan Update, the Planning Process, the results of the Risk Assessment, and the upcoming opportunity for public comment on the

draft plan. No public comments which resulted in changes to the plan were received at these meetings. A summary of questions received at these meetings can be found in the meeting minutes in Appendix B.

Public Review

The draft plan was available at the Belle Chasse Library and the Plaquemines Parish Office of Homeland Security and Emergency Preparedness. The plan was made available on November 18, 2014 and the public had 1 week to comment. The Parish publicized the plans availability for review on the Parish's website and within the local journal. Copies of these notifications can be found in Appendix B: Meeting Documents.

Development of the Plan

The two major sections of the plan, the Risk Assessment and the Mitigation Strategy were developed through the process described below:

Review and Incorporation of Existing Plans and Studies

The Planning Team reviewed several local parish plans, FEMA guides, and local and non-local hazard plans in order to develop the 2015 Plan Update. A list of the plans and guides is below.

- 2009 Plaquemines Parish Hazard Mitigation Plan Update
- 2005 Plaquemines Parish Hazard Mitigation Plan
- Coastal Wetlands Planning Protection & Restoration Act (CWPPRA)
- Plaquemines Parish Long Term Recovery Plan (ESF-14)
- Louisiana's Comprehensive Master Plan for a Sustainable Coast (CPRA)
- Louisiana Coastal Impact Assistance Plan (CIAP)
- US Army Corps of Engineers levee risk assessment results
- Hazard mitigation plans from other local Parishes
- State of Louisiana Hazard Mitigation Plan, 2014
- Hazard Mitigation Assistance Digest, May 2014 (FEMA)
- Local Mitigation Planning Handbook, March 2013 (FEMA)

Development of the Risk Assessment

To develop the Risk Assessment section of the plan, the following steps were taken:

Identifying Hazards

To develop the Risk Assessment, the first task was to establish which hazards would be profiled within the Hazard Mitigation Plan Update. At the first Steering Committee Meeting, the 2009 Plan's profiled hazards and the hazards listed within the State's 2014 Plan as significant to Plaquemines Parish were reviewed. The Steering Committee compared the two lists and decided to profile the hazards listed for the Parish in the State's 2014 Plan. The Planning Team then discussed the selected hazards with the Civic Committee. Both committees agreed to the final list, and the Planning Team moved forward with profiling the hazards. Tornadoes were also kept within the priority list of hazards since it was a hazard profiled in the Parish's 2009 Plan Update.

Profiling Hazards

The hazard profiles include a description of the hazard as well as the vulnerability assessment. Vulnerability was assessed based on Parish-specific conditions using current industry standards for modelling each hazard type.

Estimating Potential Losses

Losses were estimated using FEMA HAZUS-MH data to estimate structures and their value, in addition to US Census American Community Survey 2008-12 estimates for population for each hazard and impacted area.

Development of the Mitigation Strategy

In order to develop the Mitigation Strategy for the 2015 Plan Update the following steps were taken:

Establishing Goals and Objectives

At the first Steering Committee Meeting, the goals and objectives from the 2009 Plan Update were reviewed and assessed to see if they were still valid for the Parish. The Steering Committee decided to keep the existing goals from the 2009 Plan Update. Several of the objectives were changed to reflect the updated list of hazards that would be contained in the Risk Assessment and to include additional objectives that further mirrored those of the State's plan. These updated goals and objectives were then presented to the Civic Committee at their first meeting, where they met with approval and were finalized within the plan.

Identifying and Prioritizing Mitigation Actions

At the second Steering Committee Meeting, the committee reviewed the actions and projects from the 2009 Plan Update, an updated project list provided by the Parish's Engineering Department, and draft actions for the new objectives. Once the past actions and projects were reviewed for their relevance, the Planning Team conducted an activity to prioritize the proposed actions and projects, a summary of which is available in the Mitigation Strategy section.

Chapter 3 Risk Assessment

Introduction

Plaquemines Parish is unique in both its geographic proximity to the Gulf of Mexico and how it is bisected by the Mississippi River. This location gives the Parish economic advantages, provides for beautiful natural surroundings and allows for ample recreational opportunities. However, it also leaves the Parish and its residents open to many hazards that threaten the future vitality of the community.

The Risk Assessment Process

To meet FEMA and the Louisiana State Governor's Office of Homeland Security and Emergency Preparedness requirements, the Planning Team used a risk assessment process consistent with the procedures and steps suggested in FEMA's *Local Mitigation Planning Handbook* (2013). The four steps of the risk assessment process are:

- Identify and describe the hazards that affect Plaquemines Parish;
- Identify and describe vulnerable assets and critical facilities in Plaquemines Parish;
- Analyze the areas of Plaquemines Parish that are at greatest risk; and
- Summarize the potential for vulnerability in Plaquemines Parish.

FEMA and GOHSEP Requirements Addressed in This Chapter

The Plaquemines Parish Risk Assessment Chapter was developed consistent with the process and steps presented in the FEMA *Local Mitigation Planning Handbook* (2013). This chapter's presentation of the Risk Assessment satisfies the following FEMA requirements:

FEMA Requirement 44 CFR §201.6(c)(2)(i): [The risk assessment shall include a] description of the type, location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

FEMA Requirement 44 CFR §201.6(c)(2)(ii): [The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community. All plans approved after October 1, 2008 must also address NFIP insured structures that have been repetitively damaged by floods.

The plan should describe vulnerability in terms of:

FEMA Requirement 44 CFR §201.6(c)(2)(ii)(A): The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.

FEMA Requirement 44 CFR §201.6(c)(2)(ii)(B): An estimate of the potential dollar losses to vulnerable structures identified in this section and a description of the methodology used to prepare the estimate.

FEMA Requirement 44 CFR §201.6(c)(2)(ii)(C): Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

Hazard Identification

The first step of the risk assessment is to identify any hazards that pose a threat to Plaquemines Parish. The consultant team began this process by reviewing the *Louisiana State Hazard Mitigation Plan 2014* (State plan) to identify which hazards the State designated as risks for Louisiana.

Potential Hazards

Plaquemines Parish experiences many of the same hazards that several Gulf Coast communities experience. Many of these are related to coastal weather

events and the low-lying nature of the land, but some are also exacerbated by human intervention.

Hazard Selection Process

Since Plaquemines is often affected by the same hazards as neighboring jurisdictions, in addition to a desire to align this plan with the state plan's goals and priorities, the planning team decided to begin with the hazards profiled in the state plan for Plaquemines Parish as a basis for the hazards profiled in the local plan.

The State plan identifies which parishes or areas of the state are at the greatest risk for each of the hazards profiled. Once the team had identified the hazards that pose the highest threat for Plaquemines Parish, the Steering Committee reviewed this list to confirm whether the highest risk hazards for Plaquemines Parish accurately describe the risk experienced locally.

Louisiana State Plan 2014 Hazards

(Plaquemines Parish high risk hazards shown in **bold**)

Droughts
Extreme Heat
Flooding
Thunderstorms
Tornadoes
Tropical Cyclones
Wildfires
Winter Weather
Coastal Hazards
Dam Failures
Earthquakes
Levee Failures
Sinkholes

Eliminated Hazards

For this plan, the Planning Team chose to address only the most prevalent hazards for the area and to align these hazards with those determined to be a high risk hazard for the Parish in the state plan. The following is a summary of eliminated hazards and the justification for not profiling them in this plan update.

Droughts- Although drought does occasionally affect agricultural interests in Plaquemines Parish, it was not identified as a high risk hazard in the state plan. There is also little the parish could do to mitigate agricultural impacts of drought with HMGP funding.

Extreme Heat- The unique coastal climate of Plaquemines Parish serves to help prevent extreme heat events. There have been no recorded excessive heat events in the last 50 years.

Thunderstorms- Although thunderstorms and lightning are common occurrences in Plaquemines Parish, the frequency of these events causing impacts to property or life are so rare that it does not warrant inclusion in this plan update.

Wildfires- No wildfire events have been recorded for Plaquemines Parish.

Winter Weather- Winter weather events were of concern for the Steering Committee members as there was an event in early 2014, but due to the infrequency of these events, it does not warrant inclusion in the plan update.

Dam Failures- There are no dams in or in the remote vicinity of Plaquemines Parish.

Earthquakes- There have been no recorded earthquake events in Plaquemines Parish.

Final List of Plaquemines Parish Hazards

Based on the recommendation of the Steering and Civic Committees and additional analysis by the planning team and GOHSEP, it was decided to retain six natural hazards for analysis in the HMPU. They are as follows:

Flooding

Tropical Cyclones (Hurricanes and Tropical Storms)

Tornadoes

Coastal Hazards (Subsidence, Sea Level Rise, Saltwater Intrusion)

Levee Failures

Sinkholes

Hazard Risk Assessment Organization

The risk assessment portion of the plan update is divided into two primary sections. The first, hazard profile, is a description of the actual risk posed by the hazard. The second, the vulnerability assessment analyzes how susceptible particular parts of the Parish are to each hazard based on the population, structures and facilities, natural resources, and future plans for development.

Hazard Profile

Each hazard profile is made up of five subsections:

- **Hazard Description:** An overview of the hazard
- **Severity:** How the hazard is measured, what impacts it may have
- **Probability:** The chances the hazard will occur
- **Location:** The parts of Plaquemines Parish most at risk to the hazard
- **Historic Occurrences:** Past hazard events that have occurred in Plaquemines Parish

This structure is in accordance with the FEMA requirements for hazard profiles. The planning team has made every effort to provide a complete and accurate profile for each hazard despite a lack of availability of some information for particular hazards.

Vulnerability Assessment

The vulnerability assessments are made up of four subsections:

- **Social:** The potential impacts of the hazard on the population of Plaquemines Parish
- **Structural:** The potential impacts on buildings and facilities in Plaquemines Parish
- **Natural Resources:** The potential impacts on Plaquemines' ecosystem and resources
- **Future:** How future development plans or risks could affect the hazard's impacts

Methodology

In order to complete the vulnerability assessments for each of the identified hazards, meet the requirements of the Disaster Mitigation Act of 2000, and better understand the potential vulnerabilities that exist in Plaquemines Parish, the planning team used a number of tools including the HAZUZ-MH modeling software combined with local, state, federal, and private research data to quantitatively analyze each hazard.

HAZUS-MH

Hazards U.S. Multi-Hazard (HAZUS-MH) is a nationally-applicable standardized methodology and software program, developed by FEMA and under contract with the National Institute of Building Sciences. The program estimates potential losses from earthquakes, hurricane winds, and floods. In HAZUS-MH, current scientific and engineering knowledge is coupled with Geographic Information Systems (GIS) technology to produce estimates of hazard-related damage before or after a disaster occurs.

Potential loss estimates analyzed in HAZUS-MH include:

- **Physical Damage** to residential and commercial buildings, schools, critical facilities, and infrastructure.
- **Economic Loss,** including lost jobs, business interruptions, and repair and reconstruction costs.

For all HAZUS-MH models, the focus is on damage to buildings, quantified as a measure of building damage counts, damage states, and dollar losses. Buildings are assumed to have a lifespan of 50 years. HAZUS-MH uses demographic and general building stock (GBS) data to estimate hazard-related

damage. The GBS data input into HAZUS-MH is a summary of building counts, values, construction types, and uses by census block or tract.

It is important to note that while the HAZUS-MH analyses provide a good starting point for loss and damage estimation, they are approximate predictions. There is uncertainty inherent in any predictive model, and HAZUS-MH is no exception. This software is not meant for site-specific damage estimates. Despite its limitations, the results of the HAZUS-MH analyses help shed light on the expected distribution and level of losses for different areas.

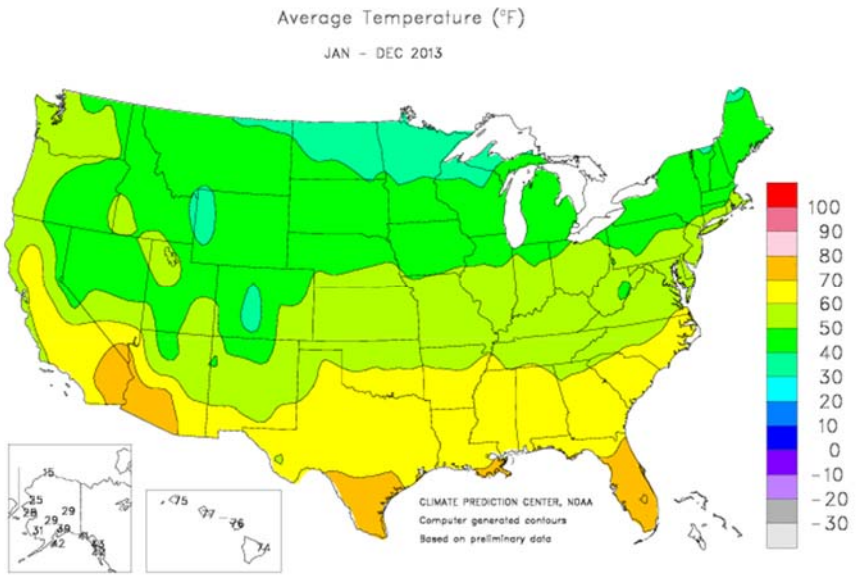
Methodology for Assessing Hazards Not Covered by HAZUS-MH

Hazards included in this plan update that cannot be analyzed using HAZUS-MH are Coastal Hazards (Subsidence, Sea Level Rise, Saltwater Intrusion), Levee Failure, and Sinkholes. Potential impacts on vulnerable populations were evaluated using hazard-specific analysis determined by the planning team to best represent real hazard risks for Plaquemines Parish. These were then compared with US Census data to estimate populations and vulnerability for at-risk areas.

Plaquemines Parish Hazard Environment

Natural Resources

Plaquemines Parish is located at the mouth of the Mississippi River, home to the most combined land and water area in the state of Louisiana and is the State's southernmost parish. The parish is 2,429 square miles, of which 845 square miles is land and 1,584 square miles is water. It is part of the New Orleans Metropolitan area and is thus bordered by Jefferson Parish to the west, Orleans Parish to the north, and St Bernard Parish to the northeast. The remainder of the Parish opens to the Gulf of Mexico. There are no incorporated municipalities in the Parish, but there are a number of named communities. Belle Chasse, in the northern portion of the Parish's west bank contains the majority of the population and has seen healthy population growth over the last decade.



The parish's proximity to the Gulf of Mexico and its vast expanses of freshwater marshes make it popular with commercial and recreational fishermen. The parish produces millions of pounds of shrimp, oysters, crabs, and fish annually. This proximity also makes it a crossroads for many offshore oil and gas interests.

The southern location of the parish means that it enjoys a subtropical climate unique to the region. Temperatures vary from season to season, but are generally warm with the coldest temperatures occurring on average in January when lows can reach the 40s. The warmest months are July and August, with average lows in the 70s and highs in the 90s. Rainfall averages 55-60 inches annually. This subtropical climate makes Plaquemines the top citrus producing community in the State.

As mentioned above, Plaquemines Parish is vulnerable to a number of hazards. Below is a summary of past hazard events in Plaquemines Parish, including damage estimates and injuries.

Table 2: NOAA Climate Data, 1950-2014

	Events	Injuries	Property Damage	Crop Damage	Annual Probability	Damage/ Event
Cold/wind Chill	3		$ -	$ -	5%	$ -
Drought	2		$ -	$ 250,000	3%	$ 125,000
Flash Flood	7		$ 130,000	$ -	11 %	$ 18,571
Flood	1		$ -	$ -	2%	$ -
Funnel Cloud	8		$ -	$ -	13 %	$ -
Hail	16		$ -	$ -	25 %	$ -
Heavy Rain	2		$ -	$ -	3%	$ -
Heavy Snow	1		$ -	$ -	2%	$ -
High Wind	1		$ -	$ -	2%	$ -
Tropical Cyclone	21		$ 1,543,141,000	$ -	33 %	$ 73,482,905
Lightning	1		$ -	$ -	2%	$ -
Storm Surge/tide	6		$ 1,000,105,000	$ -	9%	$ 166,684,167
Thunderst orm Wind	57		$ 579,500	$ -	89 %	$ 10,167
Tornado	30	11	$ 690,000	$ -	47 %	$ 23,000
Winter Storm	1		$ -	$ 50,000	2%	$ 50,000
Grand Total	**157**	**11**	**$ 2,544,645,500**	**$ 300,000**	-	**$ 16,209,525**

NOAA National Climatic Data Center Storm Events Database- Plaquemines Parish 1950-2014

Social Environment

Plaquemines Parish is located within the New Orleans Metropolitan Area, and as such contains some suburban communities such as Belle Chasse, which contain the majority of the Parish's population. The Parish is 29% minority and 71% white, with 11% of the population living in poverty. The rate of population that does not speak English is very low at 3%, and the elderly population is relatively low at 11%. Table 3: Plaquemines Parish Special Needs Populations below is a summary of populations which may need additional assistance during a hazard event.

Table 3: Plaquemines Parish Special Needs Populations

Total		23,220
Under 5 Years	#	1,731
	%	7%
Under 18 Years	#	6,356
	%	27%
18-65 Years	#	14,280
	%	61%
65+ Years	#	2,584
	%	11%
85+ Years	#	243
	%	1%
Language Other Than English at Home	#	1,741
	%	7%
Speaks English Less Than "Very Well"	#	627
	%	3%
Living With a Disability	#	2,584
	%	11%
Living in Poverty	#	2,532
	%	11%
Minority	#	6,728
	%	29%

US Census American Community Survey 2007-2012

Below, Table 4 contains a complete listing of hazard events in Plaquemines Parish from 1960 to 2014 including damage estimates (adjusted for inflation to 2013).

Table 4: Plaquemines Parish Hazard Events 1960-2014

Hazard	Year	Month	Crop Damage[1]	Property Damage[1]	Injuries	Fatalities	Records
Hurricane/Tropical Storm	1960	9	$ 32,792.00	$ 32,792.00	0	0	1
Hurricane/Tropical Storm	1961	9	$ 608,687.00	$ 608,687.00	3	0	1
Flooding	1961	11	$ -	$ 16,937.00	0	0	1
Tornado	1961	11	$ -	$ 3,895.00	0	0	1
Winter Weather	1962	1	$ 602,641.00	$ 6,026,418.00	0	0	2
Hail	1962	4	$ 3,013.00	$ 3,013.00	0	0	1
Wind	1962	4	$ 3,013.00	$ 3,013.00	0	0	1
Lightning	1962	9	$ -	$ 756.00	0	0	1
Tornado	1962	9	$ -	$ 756.00	0	0	1
Wind	1962	9	$ -	$ 756.00	0	0	1
Wind	1963	1	$ -	$ 2,973.00	0	0	1
Winter Weather	1963	1	$ -	$ 2,973.00	0	0	2
Lightning	1963	2	$ -	$ 827.00	0	0	1
Wind	1963	2	$ -	$ 827.00	0	0	1
Heat	1963	5	$ 594,763.00	$ -	0	0	1
Hail	1963	7	$ 198.00	$ 1,982.00	0	0	1
Lightning	1963	7	$ 693.00	$ 4,262.00	0	0	3
Severe Storm/Thunder Storm	1963	7	$ 198.00	$ 1,982.00	0	0	1
Wind	1963	7	$ 693.00	$ 4,262.00	0	0	3
Coastal	1963	9	$ 7,463.00	$ 746.00	0	0	1
Hurricane/Tropical Storm	1963	9	$ 7,463.00	$ 746.00	0	0	1

Hazard	Year	Month	Crop Damage[1]	Property Damage[1]	Injuries	Fatalities	Records
Wind	1963	9	$ 7,463.00	$ 746.00	0	0	1
Severe Storm/Thunder Storm	1963	11	$ 158,603.00	$ 95.00	0	0	2
Wind	1963	11	$ 158,603.00	$ 95.00	0	0	2
Winter Weather	1963	12	$ 5,947.00	$ 29,738.00	0	0	2
Severe Storm/Thunder Storm	1964	3	$ -	$ 24,504.00	0	0	2
Wind	1964	3	$ -	$ 10,673.00	0	0	2
Hail	1964	4	$ 1,467.00	$ 202,545.00	0	0	2
Lightning	1964	4	$ 1,467.00	$ 14,677.00	0	0	1
Severe Storm/Thunder Storm	1964	4	$ 1,467.00	$ 14,677.00	0	0	1
Wind	1964	4	$ 1,467.00	$ 14,677.00	0	0	1
Hurricane/Tropical Storm	1964	10	$ 1,633,639.00	$ 16,336,395.00	217	0	1
Severe Storm/Thunder Storm	1965	1	$ -	$ 2,888.00	0	0	1
Wind	1965	1	$ -	$ 2,888.00	0	0	1
Tornado	1965	3	$ -	$ 36,977.00	1	0	1
Winter Weather	1965	3	$ 5,777.00	$ -	0	0	1
Hail	1965	4	$ 7,395.00	$ 73,954.00	0	0	1
Lightning	1965	6	$ -	$ -	0	1	1
Hurricane/Tropical Storm	1965	9	$ 577,770.00	$ 57,777,034.00	273	0	1
Wind	1966	2	$ -	$ -	0	0	1
Hail	1966	5	$ 3,595.00	$ 359.00	0	0	1
Tornado	1966	5	$ -	$ 359.00	0	0	1
Severe Storm/Thunder Storm	1967	2	$ -	$ 29,061.00	0	0	1

Hazard	Year	Month	Crop Damage[1]	Property Damage[1]	Injuries	Fatalities	Records
Flooding	1967	5	$ -	$ 1,816.00	0	0	1
Severe Storm/Thunder Storm	1967	5	$ -	$ 1,816.00	0	0	1
Wind	1967	5	$ -	$ 1,816.00	0	0	1
Hail	1967	6	$ 1,816.00	$ 1,816.00	0	0	1
Severe Storm/Thunder Storm	1967	6	$ 1,816.00	$ 1,816.00	0	0	1
Wind	1967	6	$ 1,816.00	$ 1,816.00	0	0	1
Hail	1967	7	$ -	$ 1,362.00	0	0	1
Lightning	1967	7	$ -	$ 1,362.00	0	0	1
Severe Storm/Thunder Storm	1967	7	$ -	$ 1,362.00	0	0	1
Wind	1967	7	$ -	$ 1,362.00	0	0	1
Tornado	1967	9	$ -	$ 34,873.00	0	0	1
Severe Storm/Thunder Storm	1967	10	$ -	$ 272.00	0	0	1
Tornado	1967	10	$ -	$ 383,611.00	16	0	2
Wind	1967	10	$ -	$ 272.00	0	0	1
Winter Weather	1968	3	$ 83,677.00	$ -	0	0	2
Hail	1968	5	$ -	$ 17.00	0	0	1
Severe Storm/Thunder Storm	1968	5	$ -	$ 17.00	0	0	1
Wind	1968	5	$ -	$ 17.00	0	0	1
Tornado	1968	6	$ -	$ 33,470.00	0	0	1
Severe Storm/Thunder Storm	1968	12	$ -	$ 2,614.00	0	0	1
Wind	1968	12	$ -	$ 2,614.00	0	0	1
Coastal	1969	2	$ -	$ 622.00	0	0	1

Hazard	Year	Month	Crop Damage[1]	Property Damage[1]	Injuries	Fatalities	Records
Severe Storm/Thunder Storm	1969	2	$ -	$ 622.00	0	0	1
Wind	1969	2	$ -	$ 622.00	0	0	1
Wind	1969	3	$ -	$ 31,738.00	0	0	1
Flooding	1969	4	$ -	$ 6,899.00	0	0	1
Severe Storm/Thunder Storm	1969	4	$ -	$ 6,899.00	0	0	1
Tornado	1969	7	$ -	$ 31,738.00	0	0	1
Wind	1969	7	$ -	$ 31,738.00	0	0	1
Hurricane/Tropical Storm	1969	8	$ 1,094,414.00	$ 10,944,141.00	0	0	1
Severe Storm/Thunder Storm	1970	2	$ -	$ 39,500.00	0	0	1
Wind	1970	2	$ -	$ 39,500.00	0	0	1
Wind	1970	10	$ -	$ 30,020.00	0	1	1
Tornado	1970	12	$ -	$ 1,501.00	0	0	1
Wind	1970	12	$ -	$ 1,501.00	0	0	1
Winter Weather	1971	1	$ -	$ 4,493.00	0	0	1
Hail	1971	2	$ -	$ 28,760.00	0	0	1
Wind	1971	2	$ -	$ 28,760.00	0	0	1
Hail	1971	3	$ -	$ 11,234.00	0	0	1
Severe Storm/Thunder Storm	1971	3	$ -	$ 11,234.00	0	0	1
Tornado	1971	3	$ -	$ 11,234.00	0	0	1
Wind	1971	3	$ -	$ 11,234.00	0	0	1
Hurricane/Tropical Storm	1971	9	$ 1,250,440.00	$ 1,250,440.00	2	0	1
Fog	1972	2	$ -	$ 928.00	0	0	1

Hazard	Year	Month	Crop Damage[1]	Property Damage[1]	Injuries	Fatalities	Records
Hail	1972	3	$ -	$ 3,496.00	0	0	2
Severe Storm/Thunder Storm	1972	3	$ -	$ 2,381.00	0	0	1
Wind	1972	3	$ -	$ 2,381.00	0	0	1
Severe Storm/Thunder Storm	1972	5	$ -	$ 3,572.00	0	0	1
Wind	1972	5	$ -	$ 3,572.00	0	0	1
Hail	1972	11	$ -	$ 1,088.00	0	0	1
Lightning	1972	11	$ -	$ 1,088.00	0	0	1
Severe Storm/Thunder Storm	1972	11	$ -	$ 1,088.00	0	0	1
Wind	1972	11	$ -	$ 1,088.00	0	0	1
Severe Storm/Thunder Storm	1972	12	$ 43,540.00	$ 4,354.00	0	0	1
Winter Weather	1973	1	$ 4,099.00	$ 40,990.00	0	0	1
Winter Weather	1973	2	$ -	$ 11,406.00	0	0	1
Coastal	1973	3	$ -	$ 13,116.00	0	0	1
Wind	1973	3	$ -	$ 13,116.00	0	0	1
Wind	1973	12	$ -	$ 40,990.00	0	0	1
Hail	1974	5	$ -	$ 315.00	0	0	1
Severe Storm/Thunder Storm	1974	5	$ -	$ 315.00	0	0	1
Wind	1974	5	$ -	$ 315.00	0	0	1
Hurricane/Tropical Storm	1974	9	$ 9,844,347.00	$ 984,434.00	0	0	1
Hail	1975	5	$ 112.00	$ 11,276.00	0	0	1
Severe Storm/Thunder Storm	1975	5	$ 112.00	$ 11,276.00	0	0	1
Wind	1975	5	$ 112.00	$ 11,276.00	0	0	1

Hazard	Year	Month	Crop Damage[1]	Property Damage[1]	Injuries	Fatalities	Records
Hurricane/Tropical Storm	1975	9	$ -	$ 3,092.00	0	0	1
Wind	1975	12	$ -	$ 15,464.00	0	0	1
Wind	1976	3	$ -	$ 20,470.00	0	0	1
Winter Weather	1976	11	$ 3,198.00	$ -	0	0	1
Winter Weather	1977	1	$ -	$ 300.00	0	0	1
Severe Storm/Thunder Storm	1977	3	$ -	$ 15,016.00	0	0	1
Wind	1977	3	$ -	$ 15,016.00	0	0	1
Lightning	1977	6	$ -	$ -	0	1	1
Tornado	1977	9	$ 600.00	$ 600,652.00	0	0	1
Severe Storm/Thunder Storm	1978	1	$ -	$ 38,836.00	0	0	1
Wind	1978	1	$ -	$ 38,836.00	0	0	1
Severe Storm/Thunder Storm	1978	5	$ -	$ 7,146,697.00	0	0	2
Severe Storm/Thunder Storm	1978	6	$ 776.00	$ 7,767.00	0	0	1
Hurricane/Tropical Storm	1978	8	$ 279.00	$ 2,791.00	0	0	1
Severe Storm/Thunder Storm	1978	8	$ 812.00	$ 812.00	0	0	1
Wind	1979	4	$ -	$ 534,795.00	1	0	1
Hurricane/Tropical Storm	1979	7	$ -	$ 106,959.00	0	0	1
Hurricane/Tropical Storm	1979	9	$ -	$ 2,673.00	0	0	1
Lightning	1980	2	$ -	$ 14,135.00	0	0	1
Flooding	1980	4	$ -	$ 5,235,454.00	0	0	1
Heat	1980	7	$ 22,087.00	$ -	0	0	1
Hurricane/Tropical Storm	1980	9	$ -	$ 58,898.00	0	0	1

Hazard	Year	Month	Crop Damage[1]	Property Damage[1]	Injuries	Fatalities	Records
Flooding	1981	5	$ -	$ 170.00	0	0	1
Lightning	1981	5	$ -	$ 348.00	0	0	2
Severe Storm/Thunder Storm	1981	5	$ -	$ 177.00	0	0	1
Wind	1981	5	$ -	$ 348.00	0	0	2
Severe Storm/Thunder Storm	1981	6	$ 533.00	$ 53,391.00	0	0	1
Lightning	1981	7	$ -	$ 4.00	0	0	1
Severe Storm/Thunder Storm	1981	7	$ -	$ 53.00	0	0	1
Wind	1981	7	$ -	$ 4.00	0	0	1
Winter Weather	1982	1	$ -	$ 18,858.00	0	0	1
Flooding	1982	12	$ 188,598.00	$ 2,044,805.00	3	0	2
Severe Storm/Thunder Storm	1982	12	$ -	$ 158,819.00	0	0	1
Tornado	1982	12	$ -	$ 12,070.00	0	0	1
Severe Storm/Thunder Storm	1983	1	$ -	$ 2,338,925.00	0	4	1
Flooding	1983	4	$ -	$ 2,923,657.00	0	0	1
Severe Storm/Thunder Storm	1983	4	$ -	$ 2,923,657.00	0	0	1
Severe Storm/Thunder Storm	1983	5	$ -	$ 1,169,462.00	0	0	1
Winter Weather	1983	12	$ 18,272.00	$ 182,728.00	0	0	1
Severe Storm/Thunder Storm	1984	6	$ -	$ 11,210.00	0	0	1
Lightning	1984	8	$ -	$ -	1	1	1
Severe Storm/Thunder Storm	1984	9	$ -	$ 4,671.00	0	0	1
Wind	1984	11	$ -	$ 11,210.00	0	0	1
Winter Weather	1985	1	$ -	$ 1,691.00	0	0	1

Hazard	Year	Month	Crop Damage[1]	Property Damage[1]	Injuries	Fatalities	Records
Severe Storm/Thunder Storm	1985	2	$ -	$ 420,977.00	5	0	2
Hail	1985	5	$ -	$ 1,546.00	0	0	1
Wind	1985	5	$ -	$ 1,546.00	0	0	1
Hurricane/Tropical Storm	1985	8	$ 569,744.00	$ 569,744.00	0	0	1
Hurricane/Tropical Storm	1985	10	$ 15,464,484.00	$ 18,804,813.00	38	1	1
Tornado	1986	3	$ -	$ -	1	0	1
Lightning	1987	8	$ -	$ -	0	1	1
Hurricane/Tropical Storm	1988	8	$ -	$ 3,076.00	0	0	1
Hurricane/Tropical Storm	1988	9	$ -	$ 49,230.00	0	0	1
Severe Storm/Thunder Storm	1989	6	$ -	$ 469.00	0	0	1
Wind	1989	6	$ -	$ 469.00	0	0	1
Hurricane/Tropical Storm	1989	10	$ -	$ 521.00	0	0	1
Flooding	1989	11	$ -	$ 9,393.00	0	0	1
Winter Weather	1989	12	$ -	$ 14,677.00	0	0	1
Flooding	1990	5	$ -	$ 891.00	0	0	1
Fog	1992	5	$ -	$ 33,208.00	4	0	1
Hurricane/Tropical Storm	1992	8	$ 27,673,675.00	$ 27,673,675.00	2	0	1
Lightning	1992	11	$ -	$ 830.00	0	0	1
Wind	1993	3	$ -	$ 2,686.00	0	0	1
Winter Weather	1993	3	$ 224,190.00	$ -	0	0	1
Lightning	1993	8	$ -	$ 26,869.00	0	0	1
Severe Storm/Thunder Storm	1993	8	$ -	$ 26,869.00	0	0	1

Hazard	Year	Month	Crop Damage[1]	Property Damage[1]	Injuries	Fatalities	Records
Wind	1993	8	$ -	$ 26,869.00	0	0	1
Severe Storm/Thunder Storm	1995	5	$ -	$ 152,858,924.00	0	0	1
Severe Storm/Thunder Storm	1995	8	$ -	$ 3,821.00	0	0	1
Wind	1995	8	$ -	$ 3,821.00	0	0	1
Hurricane/Tropical Storm	1995	10	$ -	$ 23,516.00	0	0	1
Winter Weather	1996	2	$ 1,349,771.00	$ -	0	0	1
Wind	1996	3	$ -	$ 33,744.00	0	0	1
Flooding	1996	10	$ -	$ 742,374.00	0	0	1
Hurricane/Tropical Storm	1997	7	$ -	$ 1,209,537.00	0	0	1
Drought	1998	8	$ 5,034,625.00	$ -	0	0	1
Severe Storm/Thunder Storm	1998	8	$ -	$ 1,429.00	0	0	1
Wind	1998	8	$ -	$ 1,429.00	0	0	1
Hurricane/Tropical Storm	1998	9	$ -	$ 8,412,697.00	0	0	2
Severe Storm/Thunder Storm	1999	3	$ -	$ 17,828.00	0	0	1
Tornado	1999	3	$ -	$ 6,991.00	0	0	1
Wind	1999	3	$ -	$ 17,828.00	0	0	1
Severe Storm/Thunder Storm	2000	3	$ -	$ 6,764.00	0	0	1
Wind	2000	3	$ -	$ 6,764.00	0	0	1
Severe Storm/Thunder Storm	2000	7	$ -	$ 13,528.00	0	0	3
Tornado	2000	7	$ -	$ 1,352.00	0	0	1
Wind	2000	7	$ -	$ 13,528.00	0	0	3
Severe Storm/Thunder Storm	2000	8	$ -	$ 338.00	0	0	1

Hazard	Year	Month	Crop Damage[1]	Property Damage[1]	Injuries	Fatalities	Records
Wind	2000	8	$ -	$ 338.00	0	0	1
Severe Storm/Thunder Storm	2000	9	$ -	$ 2,029.00	0	0	1
Wind	2000	9	$ -	$ 2,029.00	0	0	1
Tornado	2000	11	$ -	$ 67,641.00	0	0	1
Severe Storm/Thunder Storm	2001	7	$ -	$ 9,865.00	0	0	1
Wind	2001	7	$ -	$ 9,865.00	0	0	1
Severe Storm/Thunder Storm	2001	10	$ -	$ 3,946.00	0	0	2
Tornado	2001	10	$ -	$ 65,769.00	0	0	2
Wind	2001	10	$ -	$ 3,946.00	0	0	2
Severe Storm/Thunder Storm	2002	4	$ -	$ 1,942.00	0	0	1
Wind	2002	4	$ -	$ 1,942.00	0	0	1
Severe Storm/Thunder Storm	2002	5	$ -	$ 1,294.00	0	0	1
Wind	2002	5	$ -	$ 1,294.00	0	0	1
Hurricane/Tropical Storm	2002	8	$ -	$ 8,093.00	0	0	1
Hurricane/Tropical Storm	2002	9	$ -	$ 10,817,603.00	0	0	1
Hurricane/Tropical Storm	2002	10	$ -	$ 8,805,489.00	0	0	1
Coastal	2003	6	$ -	$ 259,544.00	0	0	1
Flooding	2003	6	$ -	$ 164,589.00	0	0	1
Hurricane/Tropical Storm	2003	6	$ -	$ 3,587,200.00	0	0	1
Wind	2003	6	$ -	$ 259,544.00	0	0	1
Severe Storm/Thunder Storm	2004	4	$ -	$ 1,233.00	0	0	1
Wind	2004	4	$ -	$ 1,233.00	0	0	1

Hazard	Year	Month	Crop Damage[1]	Property Damage[1]	Injuries	Fatalities	Records
Severe Storm/Thunder Storm	2004	6	$ -	$ 308.00	0	0	1
Wind	2004	6	$ -	$ 308.00	0	0	1
Hurricane/Tropical Storm	2004	9	$ -	$ 2,169,627.00	0	0	3
Hurricane/Tropical Storm	2004	10	$ -	$ 16,816.00	0	0	2
Tornado	2004	11	$ -	$ 12,332.00	0	0	1
Severe Storm/Thunder Storm	2004	12	$ -	$ 9,249.00	0	0	1
Wind	2004	12	$ -	$ 9,249.00	0	0	1
Tornado	2005	4	$ -	$ 143,137.00	0	0	2
Hurricane/Tropical Storm	2005	7	$ -	$ 5,914,380.00	0	0	3
Hurricane/Tropical Storm	2005	8	$ -	$ 7,138,824,126.00	0	4	2
Hurricane/Tropical Storm	2005	9	$ -	$ 49,571,581.00	0	0	2
Tornado	2006	11	$ -	$ 11,555.00	0	0	1
Severe Storm/Thunder Storm	2007	6	$ -	$ 561.00	0	0	1
Wind	2007	6	$ -	$ 561.00	0	0	1
Severe Storm/Thunder Storm	2007	11	$ -	$ 561.00	0	0	1
Wind	2007	11	$ -	$ 561.00	0	0	1
Coastal	2008	9	$ -	$ 21,453,031.00	0	0	2
Hurricane/Tropical Storm	2008	9	$ -	$ 6,397,653.00	0	0	2
Hurricane/Tropical Storm	2009	11	$ -	$ -	0	1	1
Wind	2010	1	$ 53,416.00	$ -	0	0	2
Winter Weather	2010	1	$ 53,416.00	$ -	0	0	2
Severe Storm/Thunder Storm	2010	6	$ -	$ 1,068.00	0	0	1

Hazard	Year	Month	Crop Damage[1]	Property Damage[1]	Injuries	Fatalities	Records
Wind	2010	6	$ -	$ 1,068.00	0	0	1
Heat	2010	8	$ -	$ -	0	1	1
Severe Storm/Thunder Storm	2010	11	$ -	$ 534.00	0	0	1
Wind	2010	11	$ -	$ 534.00	0	0	1
Severe Storm/Thunder Storm	2011	3	$ -	$ 26,926.00	0	0	3
Wind	2011	3	$ -	$ 26,926.00	0	0	3
Tornado	2011	5	$ -	$ 1,035.00	0	0	1
Tornado	2012	1	$ -	$ 10,146.00	0	0	1
Flooding[2]	2012	8	$ -	$ 50,529,450.00	0	2	1
Hurricane/Tropical Storm	2012	8	$ -	$ 4,576,060.00	0	0	3
Total			**$ 67,411,054.00**	**$ 7,635,998,620.00**	**$7,703,409,674.00**		

Source: Hazards and Vulnerability Research Institute, University of South Carolina, Special Hazard Events and Losses Database for the United States, 2014

1. All crop and property damage figures adjusted for 2013.
2. Flooding as a result of storm surge during Hurricane Isaac.

As noted earlier, the majority of the population in Plaquemines Parish is located in the northern, Westbank community of Belle Chasse as seen in Figure 6. The remaining majority of the population is spread across the levee protected Westbank communities that line the Mississippi River, particularly Port Sulphur, Buras, Boothville and Venice.

As with overall population density, the majority of children live in the Belle Chasse and Port Sulphur areas. However, the majority of the senior population live in the Eastbank communities of Braithwaite and Pointe a la Hache. Both of these populations are illustrated in Figure 4 and Figure 5 at right.

Figure 6: Plaquemines Parish Population Density

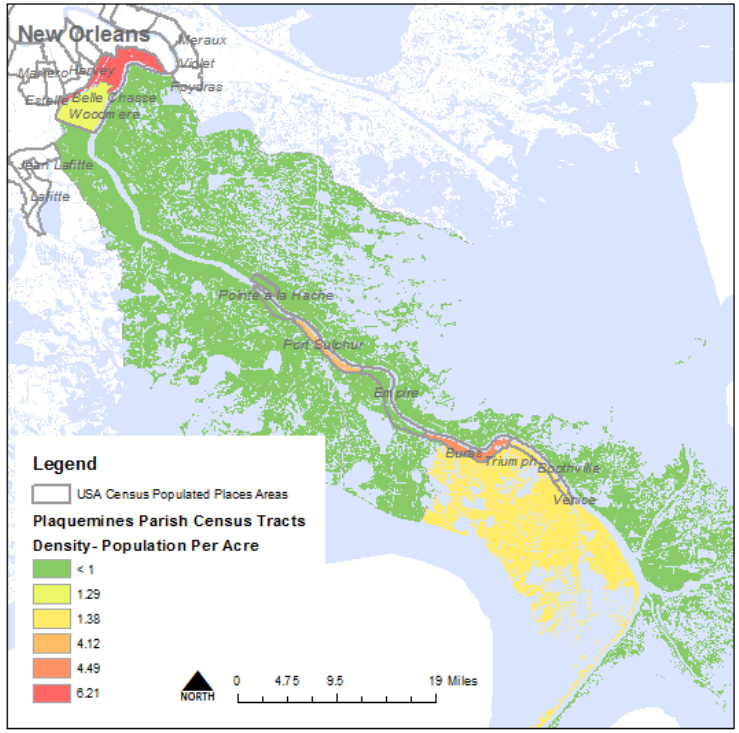


Figure 4: Plaquemines Parish Population Under 5 Years

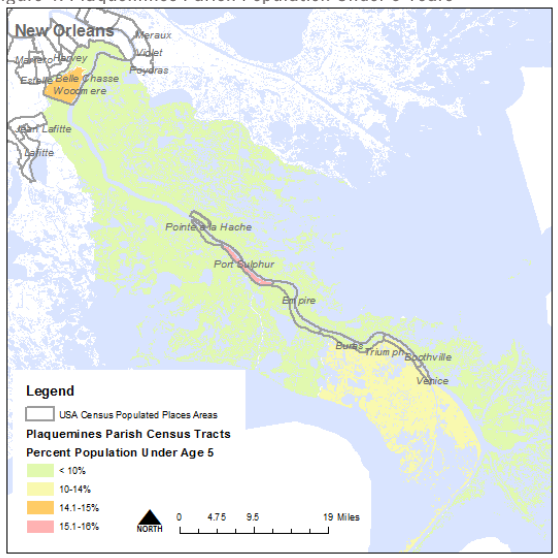
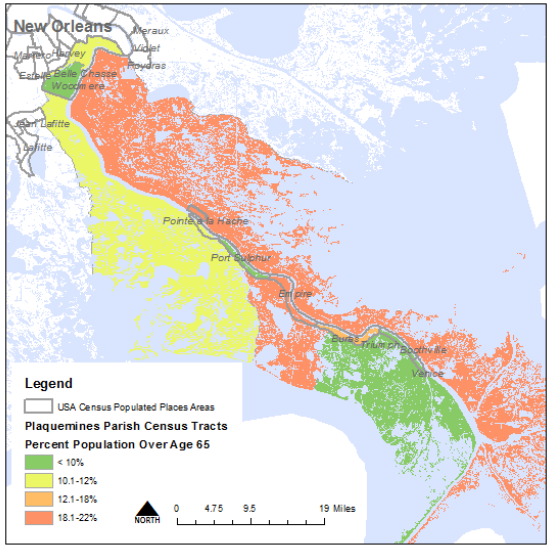


Figure 5: Plaquemines Parish Senior Population

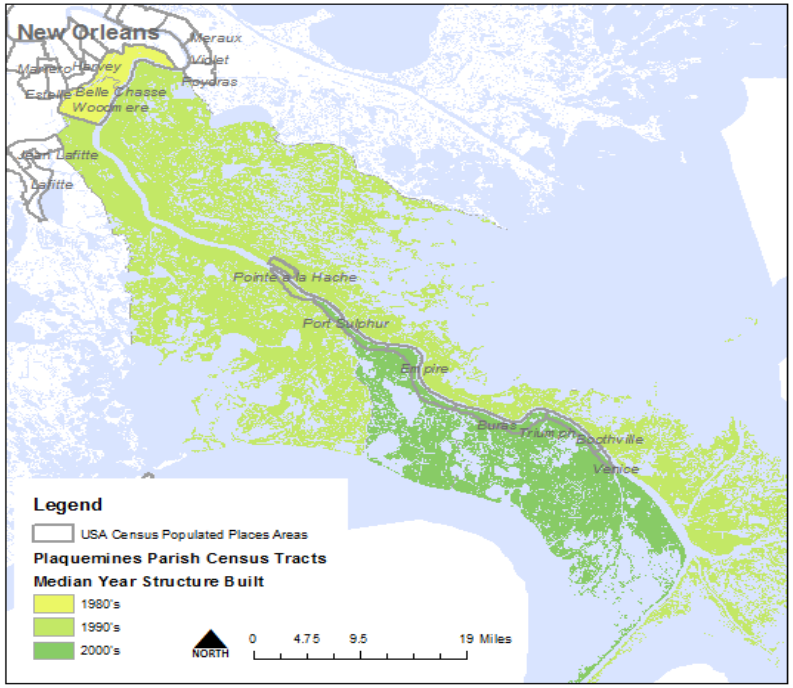


Structures and Facilities

Plaquemines Parish has a number of critical facilities distributed throughout the Parish, maps 11-17 illustrate the locations of each of these facilities by type. Residential structures in the parish tend to be relatively new, on average, particularly compared to the New Orleans Metropolitan Area. The median year built for structures shows that the Belle Chasse area contains the most older homes with a median year built in the 1980s. Homes appear to be of newer construction to the south, likely due to extreme damages faced after Hurricane Katrina in 2005. Homes around the southernmost portion were on average built in the 2000s.

Plaquemines Parish currently has 406 repetitive flood loss properties, of which 359 are residential and 47 are commercial. Maps 9 and 10 in Appendix A summarize where these properties are concentrated.

Figure 8: Plaquemines Parish Structure Age



Plaquemines Parish also has a high proportion of households that are mobile homes, 24% parish wide. This is of particular interest for this planning effort, as mobile homes are typically the most vulnerable to a number of hazards, particularly tornadoes, flooding, tropical cyclones, and storm surge, as they are not constructed in a way that can easily attached to the ground or be elevated above flood levels. The highest proportion of these homes are found in the southernmost portions of the Parish around the Port Sulphur and Venice communities. Homes in these communities are majority mobile homes. Table 5 is a summary of Plaquemines Parish's critical government facilities and a summary of each facility's hazard vulnerability based on the below hazard profiles.

Figure 7: Plaquemines Parish Mobile Home Distribution

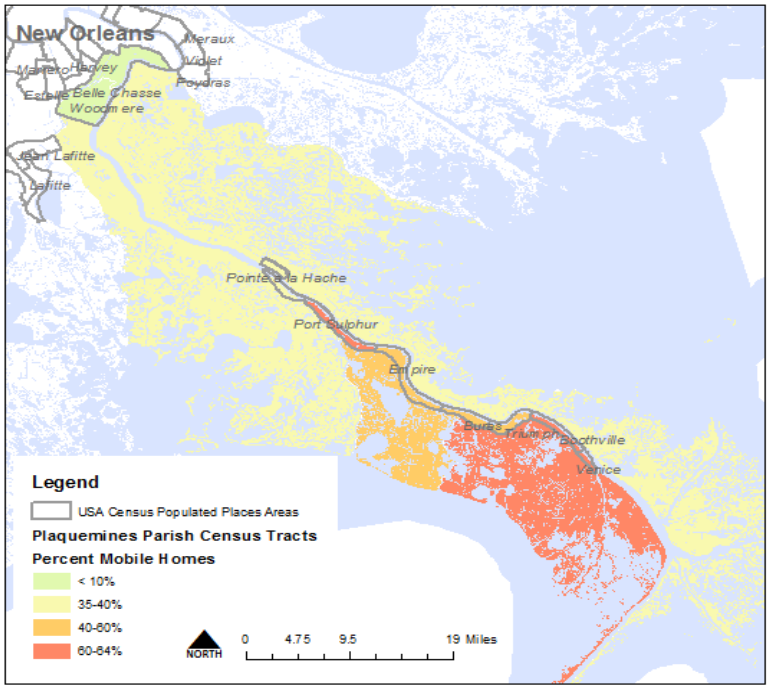


Table 5: Critical Facilities by Hazard Vulnerability

Critical Facility	Type	Hazards								
		Flooding		Tropical Cyclones		Coastal Hazards		Levee Failure	Sinkhole	Tornado
		Effective Zone	Preliminary Zone	NE Scenario	NW Scenario	(Land Loss/ Subsidence)	Saltwater Intrusion			
Annex Building	Sheriff's Office				X		X	X	X	X
Bank Building	Sheriff's Office				X	X	X	X	X	X
Belle Chasse Lockup	Sheriff's Office				X		X	X	X	X
Belle Chasse Academy	School				X	X	X	X	X	X
Belle Chasse Central Fire Station	Fire Department						X	X	X	X
Belle Chasse Family Medical Center	Medical Facility				X	X	X	X	X	X
Belle Chasse Fire Station #2	Fire Department	X				X	X	X	X	X
Belle Chasse Fire Station #3	Fire Department		X	X	X		X	X	X	X
Belle Chasse Fire Station #5	Fire Department				X	X	X	X	X	X
Belle Chasse High School	School				X		X	X	X	X
Belle Chasse Middle School	School		X	X	X	X	X	X	X	X
Belle Chasse Preliminary School	School				X	X	X	X	X	X
Belle Chasse Tower	Communications				X		X	X	X	X
Belle Chasse Wastewater Treatment Plant	Wastewater Facility						X	X	X	X
Belle Chasse Water Treatment Plant	Potable Water Facility			X	X		X	X	X	X
Belle Chasse/Port Sulphur Fire Station	Fire Department		X	X	X	X	X	X	X	X
Boothville Elevated Storage Tank	Potable Water Facility	X	X	X	X	X	X	X	X	X
Boothville Wastewater Treatment Plant	Wastewater Facility	X	X	X	X	X	X	X	X	X
Boothville Water Treatment Plant	Potable Water Facility	X	X	X	X	X	X	X		X
Boothville-Venice Elementary School	School	X	X	X	X	X	X	X		X
Boothville-Venice Fire Station	Fire Department	X	X	X	X	X	X	X	X	X
Braithwaite Elevated Storage Tank	Potable Water Facility		X	X	X		X	X	X	X
Braithwaite Package Plant	Wastewater Facility		X	X	X		X	X	X	X
Braithwaite Water Treatment Plant	Potable Water Facility	X	X	X	X	X	X	X	X	X
Buras Elevated Storage Tank	Potable Water Facility		X	X	X		X	X	X	X

Critical Facility	Type	Hazards								
		Flooding		Tropical Cyclones		Coastal Hazards		Levee Failure	Sinkhole	Tornado
		Effective Zone	Preliminary Zone	NE Scenario	NW Scenario	(Land Loss/ Subsidence)	Saltwater Intrusion			
Buras Fire Station	Fire Department	X	X	X	X		X	X	X	X
Buras Tower-SBA Towers	Communications	X	X	X	X		X	X	X	X
Buras Wastewater Treatment Plant	Wastewater Facility	X	X	X	X		X	X	X	X
Buras Water Tower	Communications	X	X	X	X	X	X	X	X	X
Cedar Grove Booster Station	Potable Water Facility				X		X	X	X	X
Cedar Grove Elevated Storage Tank	Potable Water Facility				X	X	X	X	X	X
Crime Prevention	Sheriff's Office				X		X	X	X	X
Criminal Records/Civil/IT	Sheriff's Office				X		X	X	X	X
Davant Oxidation Ponds	Wastewater Facility		X	X	X	X	X	X	X	X
Detective Bureau	Sheriff's Office				X		X	X	X	X
Diamond Booster Station	Potable Water Facility	X	X	X	X	X	X	X	X	X
District II Trailer	Sheriff's Office	X	X		X	X	X	X	X	X
Diversion Chamber	Wastewater Facility				X	X	X	X	X	X
Domestic Violence Trailer	Sheriff's Office					X	X	X	X	X
Empire Booster Station	Potable Water Facility	X	X	X	X		X	X		X
Engineers Road Elevated Storage Tank	Potable Water Facility	X				X	X	X	X	X
Evidence Room Trailer	Sheriff's Office				X		X	X	X	X
Health Department Package Plant	Wastewater Facility				X	X	X	X	X	X
HealthSouth Medical Clinic	Medical Facility				X	X	X	X	X	X
Holding Cell Trailer	Sheriff's Office	X	X	X	X	X	X	X	X	X
Home Place Elevated Storage Tank	Potable Water Facility	X	X	X	X	X	X	X	X	X
Internal Affairs	Sheriff's Office						X	X	X	X
Ironton Oxidation Ponds	Wastewater Facility	X	X	X	X	X	X	X		X
Lake Hermitage Fire Station	Fire Department	X	X	X	X	X	X	X	X	X
Ironton Tower	Communications	X	X	X	X	X	X	X		X

Critical Facility	Type	Hazards								
		Flooding		Tropical Cyclones		Coastal Hazards		Levee Failure	Sink hole	Tornado
		Effective Zone	Preliminary Zone	NE Scenario	NW Scenario	(Land Loss/ Subsidence)	Saltwater Intrusion			
Medical Trailer at Lock-up	Sheriff's Office		X	X	X		X	X	X	X
Myrtle Grove Range Trailer	Sheriff's Office				X	X	X	X		X
Narcotics	Sheriff's Office				X	X	X	X	X	X
New Prison	Sheriff's Office		X		X	X	X	X	X	X
Our Lady Perpetual Help School	School				X	X	X	X	X	X
Oxidation Pond	Wastewater Facility		X	X	X	X	X	X		X
Phoenix High School	School		X		X	X	X	X		X
Plaquemines Parish Comprehensive Care Center/Hospital	Medical Facility	X	X	X	X	X	X	X	X	X
Plaquemines Parish Learning Center	School	X	X	X	X	X	X	X	X	X
Plaquemines Parish School Board	School			X	X	X	X	X	X	X
Point A La Hache Tower	Communications		X	X	X		X	X	X	X
Pointe A La Hache Elevated Storage Tank	Potable Water Facility		X	X	X	X	X	X	X	X
Pointe A La Hache Water Treatment Plant	Potable Water Facility		X	X	X	X	X	X	X	X
Pointe-a-la-Hache Central Fire Station	Fire Department		X	X	X	X	X	X	X	X
Pointe-a-la-Hache Fire Phoenix Sub-Station	Fire Department		X	X	X		X	X	X	X
Port Sulphur Tower	Communications	X	X	X	X	X	X	X	X	X
Port Sulphur Central Fire Station	Fire Department	X	X	X	X	X	X	X	X	X
Port Sulphur Fire - O'Brien Sub-Station	Fire Department	X	X	X	X	X	X	X	X	X
Port Sulphur Wastewater Treatment Plant	Wastewater Facility	X	X	X	X	X	X	X	X	X
Port Sulphur Water Treatment Plant	Potable Water Facility	X	X	X	X	X	X	X	X	X
South Plaquemines Elementary School	School	X	X	X	X	X	X	X	X	X
South Plaquemines High School	School	X	X	X	X	X	X	X	X	X
Tax Department Storage Trailer	Sheriff's Office				X		X	X	X	X
Tax Department Trailer	Sheriff's Office				X	X	X	X	X	X

Critical Facility	Type	Hazards								
		Flooding		Tropical Cyclones		Coastal Hazards		Levee Failure	Sinkhole	Tornado
		Effective Zone	Preliminary Zone	NE Scenario	NW Scenario	(Land Loss/ Subsidence)	Saltwater Intrusion			
Tidewater Package Plant	Wastewater Facility	X	X	X	X	X	X	X	X	X
Tulane University Research Laboratories	School				X		X	X	X	X
Warehouse	Sheriff's Office					X	X	X	X	X
Woodlawn Central Fire Station	Fire Department		X	X	X		X	X	X	X
Woodlawn Fire - Braithwaite Sub-Station	Fire Department		X	X	X		X	X	X	X
Woodlawn Package Plant	Wastewater Facility		X	X	X		X	X	X	X

Future Developments

Plaquemines Parish saw an approximate 1% increase in population between 2010 and 2012. Much of this small growth amount in this time period is likely attributable to residents continuing to return home after recent hurricane events including Katrina in 2005 and Isaac in 2012, which devastated Plaquemines Parish. This is most pronounced in the southern Westbank communities of Venice, Boothville, and Triumph. Other communities in coastal Plaquemines, particularly all Eastbank communities have lost significant population over the last few years. Additional growth is seen in the northern portion of Belle Chasse, where much of the more suburban newer communities are located within a Federal Flood Protection system.

Figure 10 on the following page includes the un-adopted future land use map as it appears in the Plaquemines Parish Comprehensive Master Plan.

Figure 9: Plaquemines Parish Population Change

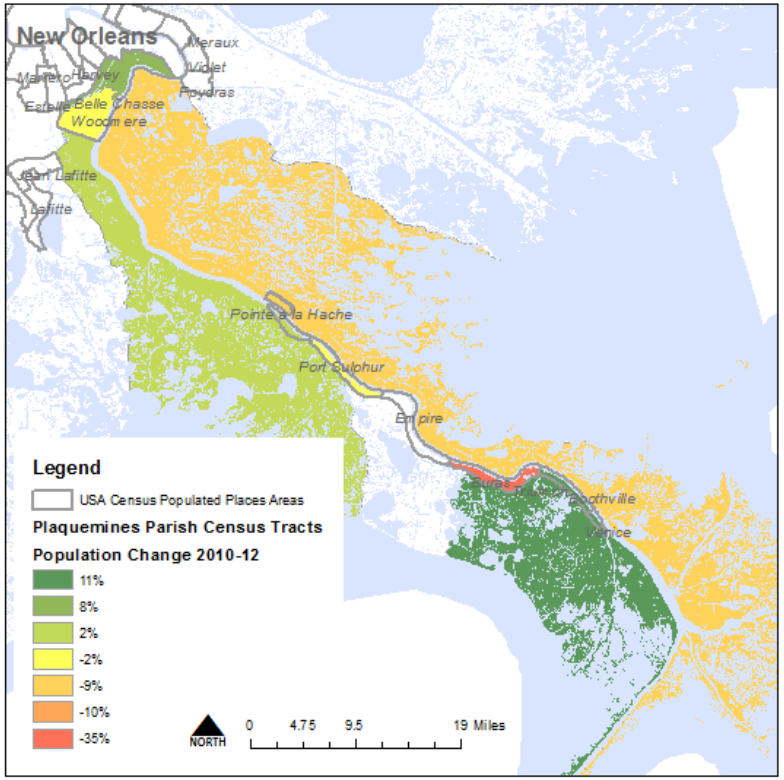
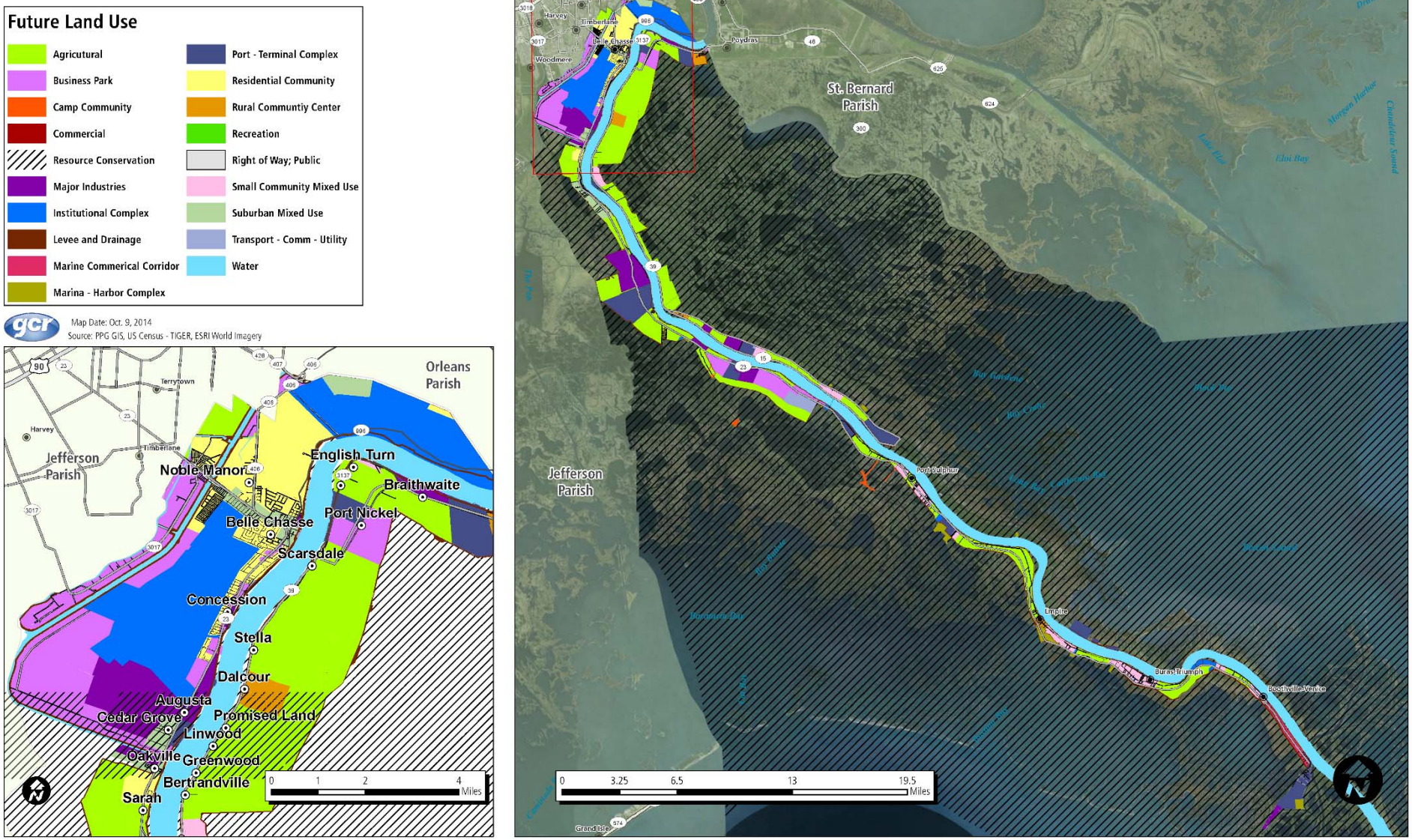


Figure 10: Plaquemines Parish Future Land Use Plan



Tropical Cyclone

Hazard Profile

Tropical cyclones are one of the costliest and most common hazards faced by Plaquemines Parish. Many different hazards occur during a tropical cyclone event including heavy rain, flooding, high winds and tornados. These events are the primary cause for storm surge, a type of flooding discussed later in the plan, that has been a significant threat to many communities in Plaquemines Parish in recent years. Tropical cyclone refers to tropical weather events that include hurricanes, tropical storms and tropical depressions. Tropical cyclones are defined as rapidly rotating storm system characterized by a low-pressure center, strong winds, and a spiral arrangement of thunderstorms that produce heavy rain.

Tropical cyclones are measured using the Saffir-Simpson scale which categorizes tropical cyclones based on sustained wind speed. There are also estimated levels of damage and storm surge that can be expected with each level of tropical cyclone.

Plaquemines Parish has experienced 14 major tropical cyclone events since 1965. Hurricane Katrina has been by far the worst hurricane to affect Plaquemines Parish in recorded history. Katrina's devastation was compounded with Hurricane Rita just days after. Although total damages are much lower for Hurricane Isaac, it was devastating for Plaquemines Parish, causing storm surges between 10 and 17 feet.

Given the number of tropical cyclones that have impacted Plaquemines Parish in the last 49 years, the median probability that such an event will occur in a given year is just under 30%. This roughly means that a hurricane, tropical storm, or tropical depression is likely to impact Plaquemines Parish in some way approximately every 3 years, which also roughly follows the historic occurrences over the last decade.

Table 6: Saffir Simpson Tropical Cyclone Scale

Scale Number (Category)	Sustained Winds (MPH)	Damage	Storm Surge (feet)
1	74-95	Minimal: Damage primarily to shrubbery, trees, foliage, and unanchored homes. No real damage to other structures. Some damage to poorly constructed signs. Low-lying coastal roads inundated, minor pier damage, some small craft in exposed anchorage torn from moorings.	4-5
2	96-110	Moderate: Considerable damage to shrubbery and tree foliage; some trees blown down. Major damage to exposed mobile homes. Extensive damage to poorly constructed signs. Some damage to roofing materials of buildings; some window and door damage. Considerable damage to piers. Marinas flooded. Small craft in unprotected anchorages torn from moorings. Evacuation of some shoreline residences and low-lying areas required.	6-8
3	111-130	Extensive: Foliage torn from trees; large trees blown down. Practically all poorly constructed signs blown down. Some damage to roofing materials of buildings; some wind and door damage. Some structural damage to small buildings. Mobile homes destroyed. Serious flooding at coast and many smaller structures near coast destroyed; larger structures near coast damaged by battering waves and floating debris. Evacuation of low- lying residences near shoreline required.	9-12
4	131-155	Extreme: Shrubs and trees blown down; all signs down. Extensive damage to roofing materials, windows and doors. Complete failures of roofs on many small residences. Complete destruction of mobile homes. Flat terrain 10 feet of less above sea level flooded inland as far as 6 miles. Major damage to lower floors of structures near shore due to flooding and battering by waves and floating debris.	13-18
5	156+	Catastrophic: Shrubs and trees blown down; considerable damage to roofs of buildings; all signs down. Very severe and extensive damage to windows and doors. Complete failure of roofs on many residences and industrial buildings. Extensive shattering of glass in windows and doors. Some complete building failures. Small buildings overturned or blown away. Complete destruction of mobile homes.	19+
Tropical Storm	39-73		0-3
Tropical Depression	0-38		0

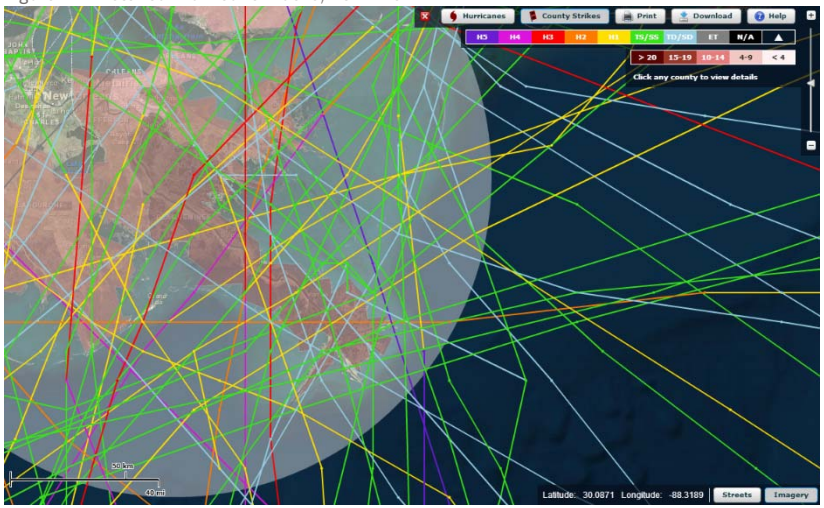
Table 7: Plaquemines Parish Presidential Disaster Declarations 1965-2014

Year	Disaster Recovery #	Storm Name	Category (in Plaquemines Parish)	Damage (Billions)[i]
1965	208	Hurricane Betsy	3	$ 21.9
1969	272	Hurricane Camille	5	$ 22.6
1973	374	Severe Storm and Flooding	-	-
1974	448	Hurricane Carmen	4	$ 1.0
1992	956	Hurricane Andrew	2	$ 56.0
1998	1246	Tropical Storm Frances and Hurricane Georges	4	$ 4.5
2002	1435	Tropical Store Isidore	Tropical Storm	$ 0.4
2002	1437	Hurricane Lilly	4	$ 1.1
2004	1548	Hurricane Ivan	5	$ 15.5
2005	1601	Tropical Storm Cindy	Tropical Storm	$ 0.3
2005	3212 & 1603	Hurricanes Katrina and Rita	5	$ 81.0
2008	3260 & 1607	Hurricanes Gustav and Ike	5	$ 10.0
2011	4041	Tropical Storm Lee	Tropical Storm	$ 0.3[ii]
2012	4080	Hurricane Isaac	1	$ 2.4[iii]

The planning team attempted to model the impacts of storm surge using NOAA's Sea Lake and Overland Surges from Hurricanes (SLOSH) modelling system to show potential impacts on Plaquemines Parish from two hypothetical storms. The planning team chose to model two storms that are relatively average in their strength and size, choosing to model a Category 3 storm. The unique geography of Plaquemines Parish, with the Mississippi River splitting the parish in two, informed the decision to model a storm in the Northwesterly direction and one in the Northeasterly direction. This distinction is important as each direction forces storm surge in vastly different directions and places.

The SLOSH modelling methodology does not take into account levees and therefore is likely to show more severe inundation patterns that would not likely be the actual result. However, these models are important to understanding the areas that are most at risk, despite their levee protection.

Figure 11: Historical Hurricane Tracks, 1842-2014



NOAA Historical Hurricane Tracks Portal, 2014

Determining estimated potential losses for tropical cyclones can be difficult in Plaquemines Parish, primarily because of the breath of the impacts of past occurrences. SHELDUS data accounts for 34 tropical cyclone events over the last 54 years, totaling $7,434,302,253. Of this total, however, nearly 97% are as a result of hurricanes Katrina and Rita in 2009. Estimated potential losses *without* including Katrina total $4,325,824 per year. *Including* Katrina, estimated potential losses from tropical cyclones would total $137,672,263.

Occurrences Since 2009

Tropical Storm Ida

Ida began as a hurricane south of the Mississippi River and then weakened to a tropical storm late on November 9th, 2009 as it encountered increasing wind shear and cooler waters. Ida moved across southeast Louisiana and Mississippi coastal waters as a tropical storm late on the 9th and early on the 10th of November. Ida became extra-tropical on the morning of November 10th and dissipated over the Florida panhandle on November 11th.

Tropical Storm Ida's effects on coastal areas of southeast Louisiana were relatively minor since the storm weakened as it moved across the coastal waters east of the Mississippi River and only brushed the region. One direct fatality occurred in Plaquemines Parish when a man attempting to assist a boat in distress drowned in the Mississippi River near Fort Jackson. The maximum sustained wind recorded in the vicinity of coastal southeast Louisiana was 52 knots at Pilots Station East near the mouth of the Mississippi River. The peak wind gust for the event of 64 knots was recorded at the same location. The storm surge during the event generally ranged from around 2 to 6.5 feet along the southeast Louisiana coast with a maximum of 6.53 feet at Bay Gardene in Plaquemines Parish. Rainfall totals were generally around 1 inch or less. The minimum observed barometric pressure was 1003.9 mb at Pilots Station East in lower Plaquemines Parish.

Tropical Storm Lee

Tropical Storm Lee initially developed as Tropical Depression Thirteen in the middle Gulf of Mexico on Thursday evening September 1st. The depression moved slowly north and gradually strengthened, eventually reaching tropical storm strength just south of Louisiana coast on Friday afternoon September 2nd. Tropical Storm Lee made only slow and haltingly northward progress over the next 24 hours, eventually moving onshore the Louisiana coast Saturday night, September 3rd, with a maximum sustained wind estimated around 60 mph. Lee moved slowly inland to north of Baton Rouge late Sunday September 4th, and eventually weakened to a tropical depression Sunday evening.

Tropical Depression Lee then moved steadily northeast throughout Monday, September 5th, taking on extra-tropical characteristics over the next 24 hours as it interacted with an upper level disturbance moving through the region. No fatalities or injuries were associated with any Tropical Storm Lee hazards.

The main impacts associated with Tropical Storm Lee were associated with storm surge and rainfall. Both of these impacts were related to its slow forward speed as it crossed the region which allowed the circulation to linger over the area for several days. Storm surge associated with Lee caused tide values to be 3 to 5 feet above normal causing low land flooding. Additional detailed information is contained in the storm surge occurrence portion of the Flooding profile in this plan. Impacts to Plaquemines Parish were minimal.

Hurricane Isaac

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

The highest wind gust recorded on land in Louisiana was 75 knots, or 86 mph, measured by a portable weather station (Texas Tech University) near Buras on the evening at August 28. The maximum sustained wind in Louisiana was 65 knots, or 75 mph, at the same portable weather station near Buras on the evening of August 28.

Due to Isaac's very large size, and slow forward speed, tropical storm force winds lasted in excess of 48 hours in many areas of coastal southeast Louisiana. Occasional hurricane gusts of 70 to 85 mph were recorded across southeast Louisiana during the night of the Aug 28th and early on the 29th, especially south of Lake Pontchartrain. Widespread power outages occurred across the area. Local utility companies reported over 700,000 customers were without power at the peak of the storm in southeast Louisiana. Generally, most of the wind damage was limited to downed trees and power lines, and roof damage caused by wind and falling trees and tree limbs.

A storm tide of 8 to 13 feet occurred in eastern Plaquemines Parish and St. Bernard Parish. A representative maximum storm tide of 13.21 ft NAVD88 was measured at a USGS tide gauge near Pointe a la Hache. A local levee was overtopped or breached in the Braithwaite area of Plaquemines Parish early on August 29. A number of people had to be rescued from the flooded area, but a 60 year old woman and 52 year old man drowned in the storm surge.

Storm surge flooding also affected Plaquemines Parish with a storm tide of 4 to 7 feet. Roadways and low lying property were flooded. Local levees around Lafitte and Myrtle Grove were overtopped and/or breached resulting in the flooding of numerous houses and property in this area.

Many areas of southeast Louisiana received 8 to 12 inches of rain with a few locations having 15 inches of rain or more. Maximum storm total rainfall was 20.66 inches at the New Orleans Carrollton gauge on the Mississippi River. Overall impacts of Isaac resulted in at least $600 million in damages in southeast Louisiana, 3 direct fatalities, and 2 indirect fatalities. Storm surge flooding accounted for the bulk of damage, which was estimated around $500 million and for the three direct storm surge fatalities in Louisiana. Winds accounted for a much lesser amount of slightly more than a $100 million in damages.

Northeasterly Storm Model (Figure 12)

The first storm model, a Category 3 hurricane moving in the northeasterly direction greatly impacts the communities on the Eastbank of the Mississippi River. Many of the downriver communities would expect to be inundated with between 12 and 16 feet of storm surge. Some far downriver Westbank communities like Empire could expect to receive as much as 16 feet of storm surge.

Northwesterly Storm Model (Figure 13)

The second storm model, a Category 3 hurricane moving in the northwesterly direction also greatly impacts the communities on the Eastbank of the Mississippi River. In this scenario, however, the communities located further upriver are much more greatly impacted. This scenario estimates storm surges as high as 20 feet in the Braithwaite area, similar to those of Hurricane Isaac. As with the northeasterly scenario, many of the downriver communities on both sides of the river can expect storm surges up to 18 feet.

Figure 12: Plaquemines Parish Tropical Cyclone Surge Model (Northeasterly Event)

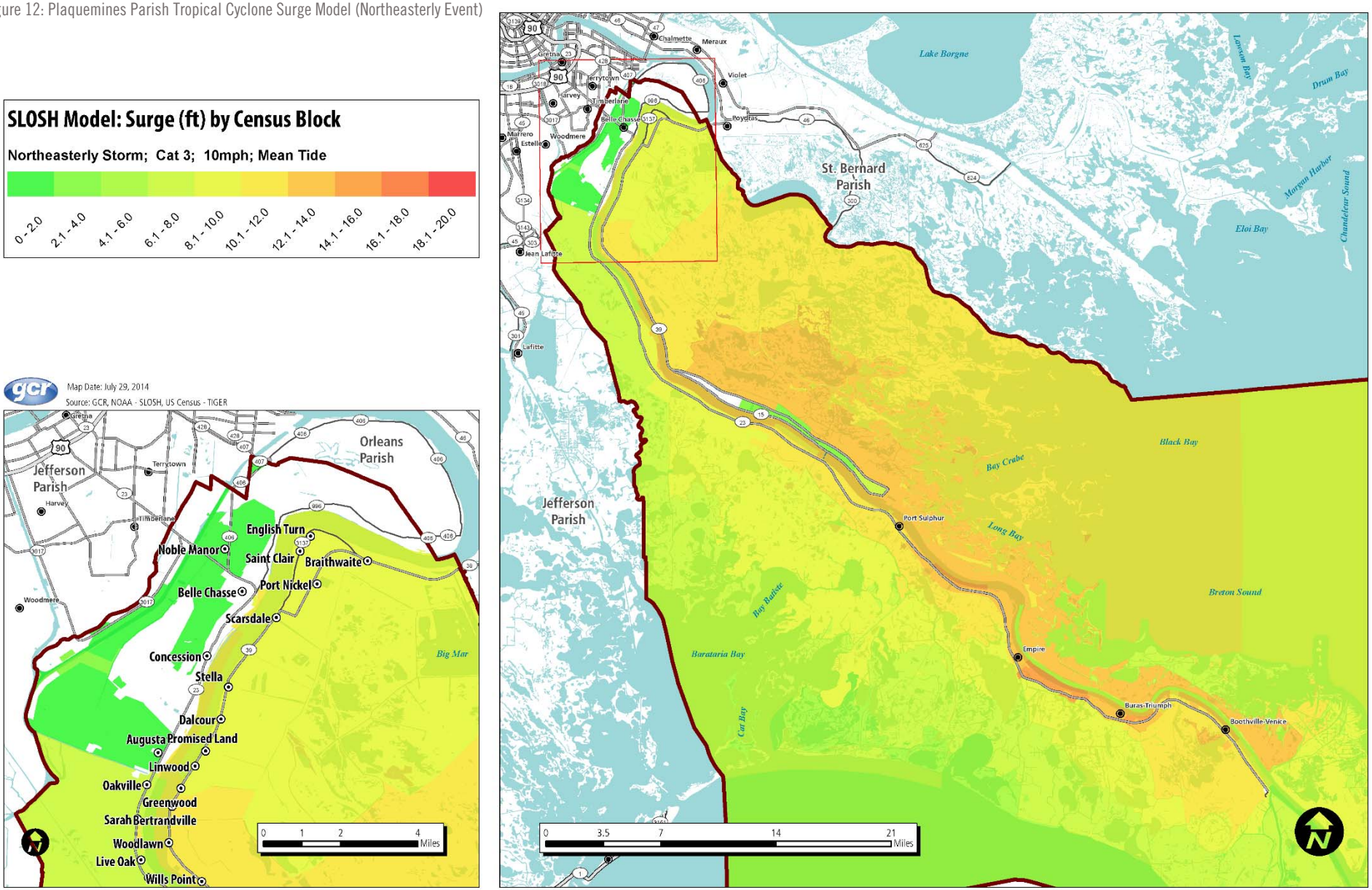
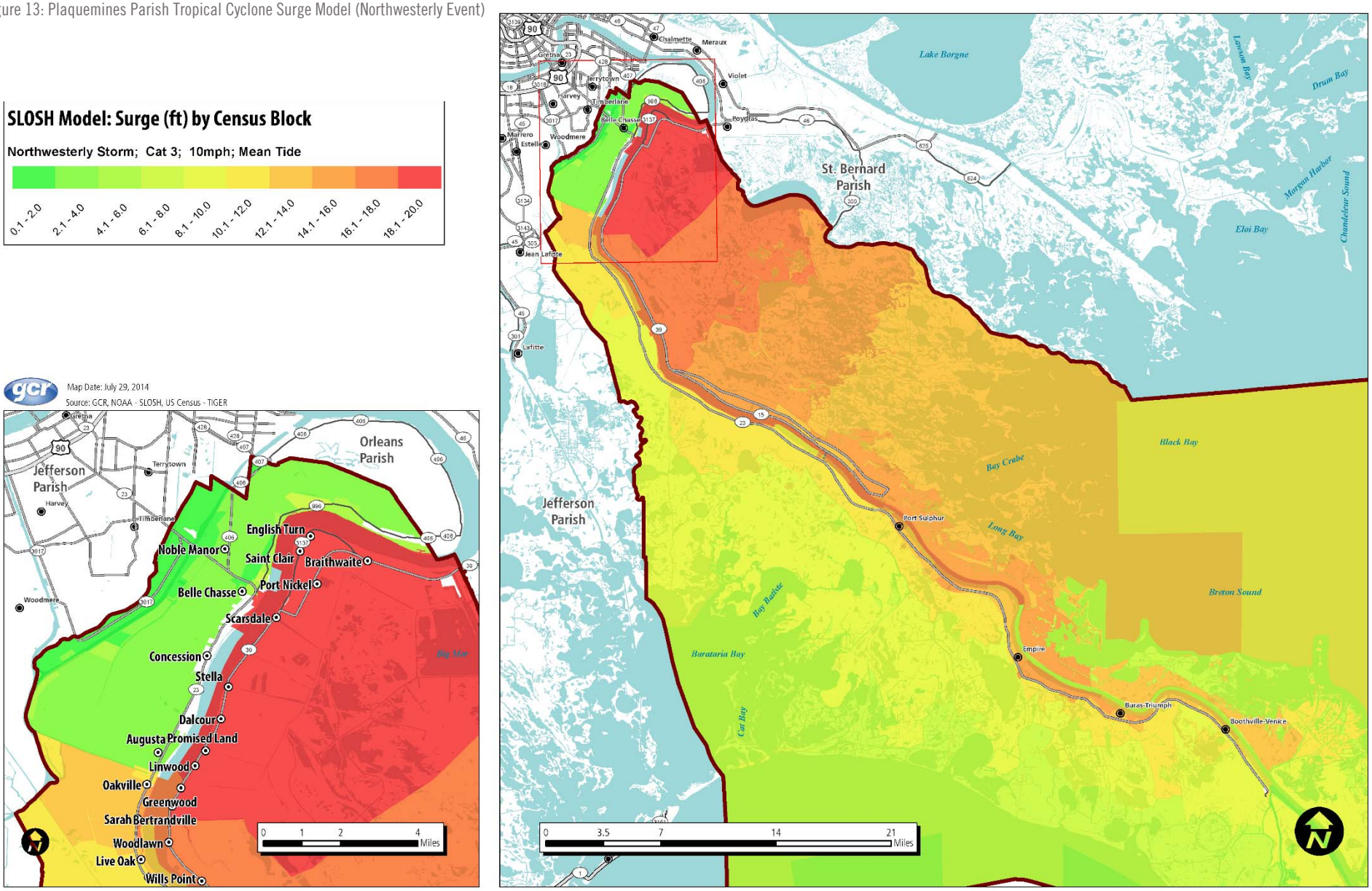


Figure 13: Plaquemines Parish Tropical Cyclone Surge Model (Northwesterly Event)



Vulnerability Assessment

Modeling the future impacts of tropical cyclones on Plaquemines Parish is relatively difficult. While the planning team was able to model potential storms, it is much more difficult to predict when such storms will occur and what the impacts will be. Some sources point to rising sea level and water temperature as signs that damaging coastal storms will become larger and more frequent. As sea levels rise, coastal flooding from tropical cyclones could cause more extensive damage than storms today because the sea level will already be higher to begin with.

While of the whole Parish is vulnerable to the impacts of a tropical cyclone, for the vulnerability assessment the planning team is primarily focused on the impacts from storm surge. Details on wind intensity can be found in Appendix A: Map 5 of the International Residential Code basic wind speeds for Plaquemines Parish. The following charts are divided by each of the two storm scenarios as well as by population impacted and structures impacted, all using HAZUS-MH data.

Northeasterly Storm Model Vulnerability

The Northeasterly storm scenario has a much less severe impact on Plaquemines Parish. The model projects that the overwhelming majority of the population will not receive any flooding as a result of this storm. Table 8 shows that just over 10,000 people would receive storm surge flooding at or above 4 feet, which would likely involve the inundation of older homes not raised to current BFE standards. Among the highest inundation areas, the minority population is high (almost half) as well as a significant number of children, almost a third in the 16' or greater inundation area.

Table 9 illustrates the impact on structures in the Northeasterly storm event. This event would have a significant impact on structures in the Parish with over 7,000 structures taking on 4 or more feet of storm surge, totaling more than $956,300,000 in total structure value.

Northwesterly Storm Model Vulnerability

The Northwesterly scenario has a much more severe impact on the residents and structures of Plaquemines Parish, particularly on the east bank of the Mississippi River. Although the SLOSH model does not take into account the levees located around east bank communities, the map shows significant vulnerabilities of catastrophic proportions particularly in the Northern east bank communities near Braithwaite down to around Dalcour. This scenario shows that up to 81% of the parish's population would receive 4 or more feet of storm surge, 45% would receive 10 or more feet.

Table 11 illustrates the vulnerability of structures in the Northwesterly Scenario. Over 7,000 residential structures and nearly 300 commercial structures are modelled to receive 6 or more feet of water, higher than many structures in the Parish are currently elevated or waterproofed to at present.

Table 8: Vulnerability of Population by Inundation, Northeasterly Scenario

NE	0	2'	4'	6'	8'	10'	12'	14'	16'
Total	12,562	375	539	0	2,617	1,281	2,356	2567	745
White	10,200	345	66	0	1,836	852	1,202	1341	404
Minority	2,362	30	473	0	781	429	1,154	1226	341
	19%	8%	88%	0%	30%	33%	49%	48%	46%
Age 18+	8,895	250	412	0	1,890	1,038	1,784	1909	535
Children	3,667	125	127	0	727	243	572	658	210
	29%	33%	24%	0%	28%	19%	24%	26%	28%
Seniors	1,237	20	63	0	370	203	326	276	82
	10%	5%	12%	0%	14%	16%	14%	11%	11%

Table 9: Vulnerability of Structures by Inundation, Northeasterly Scenario

NE	0'	2'	4'	6'	8'	10'	12'	14'	16'
Residential Structures	3,431	161	299	1	743	683	1,781	2,388	897
Commercial Structures	194	32	10	4	49	35	70	85	26
Total Structure Count	3,758	210	319	7	817	744	1,893	2,519	942
Residential Value	$548,713,000	$ 25,679,000	$ 33,259,000	$ 890,000	$ 91,779,000	$ 84,785,000	$181,583,000	$234,823,000	$ 72,089,000
Commercial Value	$ 86,242,000	$ 19,768,000	$ 2,644,000	$ 4,151,000	$ 46,677,000	$ 16,146,000	$ 30,753,000	$ 34,075,000	$ 15,696,000
Total Structure Value	$700,068,000	$ 58,288,000	$ 47,454,000	$ 6,721,000	$153,895,000	$120,303,000	$228,982,000	$300,618,000	$ 98,374,000

Table 10: Vulnerability of Population by Inundation, Northwesterly Scenario

NW	0	2'	4'	6'	8'	10'	12'	14'	16'	18'	20'
Total	2,668	1,510	7,472	667	235	717	3,202	3373	1,708	580	910
White	2,350	1,339	6,036	602	207	451	2,050	1585	675	324	627
Minority	318	171	1,436	65	28	266	1,152	1788	1,033	256	283
	12%	11%	19%	10%	12%	37%	36%	53%	60%	44%	31%
Age 18+	1,982	1,008	5,229	464	173	561	2,359	2488	1,266	464	719
Children	686	502	2,243	203	62	156	843	885	442	116	191
	26%	33%	30%	30%	26%	22%	26%	26%	26%	20%	21%
Seniors	349	98	652	73	23	79	464	364	216	101	158
	13%	6%	9%	11%	10%	11%	14%	11%	13%	17%	17%

Table 11: Vulnerability of Structures by Inundation, Northwesterly Scenario

NW	0'	2'	4'	6'	8'	10'	12'	14'	16'	18'	20'
Residential Structures	1,048	352	1,704	204	122	568	1,279	2,592	1,836	307	372
Commercial Structures	104	37	73	11	4	38	73	93	49	11	12
Total Structure Count	1,220	410	1,825	222	133	631	1,389	2,747	1,909	328	395
Residential Value	$168,146,000	$ 59,124,000	$288,601,000	$ 32,184,000	$ 15,244,000	$ 49,216,000	$131,610,000	$267,946,000	$169,438,000	$ 37,376,000	$ 54,715,000
Commercial Value	$ 60,795,000	$ 20,563,000	$ 20,452,000	$ 5,508,000	$ 2,516,000	$ 24,369,000	$ 54,388,000	$ 31,541,000	$ 24,887,000	$ 5,589,000	$ 5,544,000
Total Structure Value	$272,934,000	$ 93,011,000	$323,422,000	$ 41,710,000	$ 22,595,000	$ 91,753,000	$207,021,000	$342,393,000	$207,609,000	$ 48,109,000	$ 64,146,000

Flooding

Hazard Profile

Flooding can be defined as the inundation of typically dry land by water. Flooding is one of the primary hazards faced by Plaquemines Parish, and as such there are four types of flooding the parish is most vulnerable to:

Stormwater (urban flooding or ponding)

Stormwater excesses caused by fast and heavy rain events occur frequently in Plaquemines Parish. Below sea level elevations combined with little to no noticeable topography and an extensive levee system that surrounds most developed areas, mean that stormwater has nowhere to go once it falls to the ground and needs to be physically removed from within the levees. This is accomplished with various pump stations located throughout the parish. Generally, the most damaging storm events are a result of tropical cyclones or storms. The primarily low lying areas of the parish frequently experience flooding.

Storm Surge

Storm surge is caused by the winds of tropical cyclones moving water in the direction of the storm causing the inundation of coastal areas. Storm surge is often seen with southerly winds and high tides that rise over and through bayous, canals, marshlands and rivers and over top levees. Plaquemines Parish is especially vulnerable to storm surge due to its coastal location and predominate marshland makeup.

Backwater Flooding

Backwater flooding is the result of slowly rising water from an unexpected location. This type of flooding could be seen in Plaquemines Parish due to its unusual shape in relation to the Gulf of Mexico, particularly with tropical cyclones moving in a northeasterly direction.

Riverine

Riverine flooding occurs along a river or linear body of water like a stream, creek, or bayou. It is typically caused by upriver spring ice melt or heavy rainfall upriver that rushes downstream to inundate downriver communities. The Mississippi River is a very large river with a number of flood protection measures upriver of Plaquemines Parish, like the Bonnet Carre and Atchafalaya spillways, that alleviate pressure on downriver communities. Riverine flooding would only be seen in Plaquemines Parish if the Mississippi River levee system failed or was overtopped by a flood.

Based on stream gauge levels and precipitation forecasts, the National Weather Service posts flood statements, watches, and warnings. The NWS issues the following weather statements with regard to floods:

Flood Categories

- Minor Flooding- minimal or no property damage, but possibly some public threat.
- Moderate Flooding- some inundation of structures and roads near streams. Some evacuations of people and/or transfer of property to higher elevations.
- Major Flooding- extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations.
- Record Flooding- flooding which equals or exceeds the highest stage or discharge at a given site during the period of record keeping.

Flood Warning

- Issued along larger streams when there is a serious threat to life or property.

Flood Watch

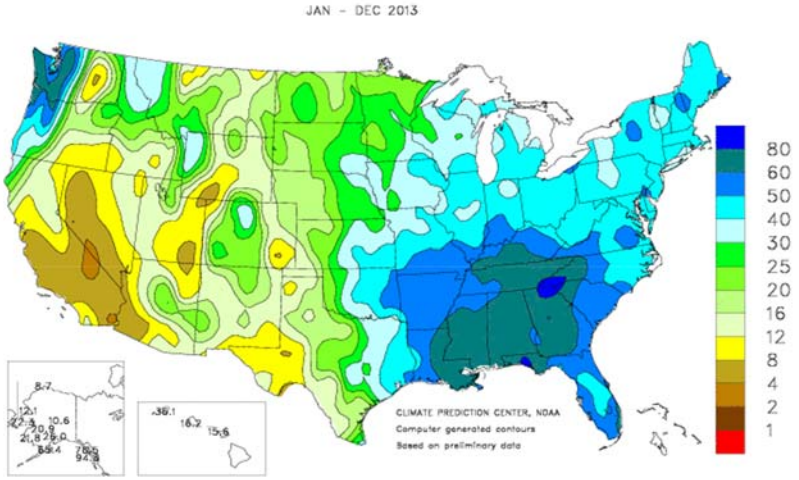
- Issued when current and developing hydrometeorological conditions are such that there is a threat of flooding, but the occurrence is neither certain nor imminent.

The magnitude of flood events is generally measured using probability over a period of years. These are typically broken out into increments like 5 year, 10 year, 50 year, 100 year and 500 year events. This means a 5 year flood event has an annual probability of 20% or would occur about every 5 years over a 100 year period of time. Likewise, a 100 year event has a 1% annual probability and would typically only occur once a century. It should be noted that this naming convention does not dictate that a 5 year event will occur every 5 years and a 10 year event every 10 years, it is merely a way of conveying the average risk over a period of time.

The National Flood Insurance Program (NFIP) uses the 100-year flood event as the regulatory standard for requiring the purchase of flood insurance. The NFIP sets its rates according to flood insurance studies performed by FEMA, that determine which parts of the community fall into "zones" dictated by their annual probability of a flood event. NFIP refers to the Special Flood Hazard Area (SFHA) frequently, which is another naming convention for an area that is at risk of a flood event every 100 years, or the 100-year flood plain. This area also consists of flood zones that begin with A and V and are where NFIP floodplain management regulations apply and the mandatory purchase of flood insurance can be enforced.

The most common forms of flooding in Plaquemines Parish are flash floods

Figure 14: Annual Precipitation in Inches



(stormwater/ponding) caused by large rain events and storm surge caused by tropical cyclones and storms. There have been no recently recorded examples of riverine flooding in Plaquemines Parish. Appendix A: Maps 7 and 8 illustrate the flood risk of the Parish. Table 12 shows recently recorded flood events from NOAA's National Climatic Data Center. There are only flood events recorded for approximately the last decade as the reporting information became more specific with time. It is highly likely that a similar number of events would be recorded for every decade in the Parish's developed history.

Table 12: NCDC Flood Events

Flood Type	Years Occurred (number of occurrences in year)
Flash Flood (stormwater/ponding)	2002[1] 2003[1] 2009[2] 2010[1] 2011[1]
Storm Surge	2003[2] 2004[3] 2005[5] 2008[3] 2011[2] 2012[1]

NOAA National Climatic Data Center, 2014

Based on NCDC data for Plaquemines Parish since 2000, there is roughly a 79% chance that a flooding event occurs in a given year. This includes the above types of flooding, with the highest probability coming from flash floods, generally caused by urban ponding and the inability for drainage infrastructure to dispose of water quickly enough during fast rain events.

In order to model potential flood events, the planning team mapped the 100-year floodplain using FEMA NFIP flood zones. Plaquemines Parish's Effective FIRM was adopted May 1, 1985. This map in addition to Advisory Base Flood Elevation maps released by FEMA in response to Hurricane Katrina are used to rate flood insurance and permit development in Plaquemines Parish. FEMA also released Preliminary flood maps in 2012 based on an updated coastal surge analysis conducted by USACE and FEMA. The Preliminary map for Plaquemines Parish is still under review and has not yet been adopted.

Both maps illustrate that a significant majority of the Parish is in the 100-year floodplain. However, under the effective map, many of the communities that lie along the Mississippi River down to just North of Port Sulphur are included in the 500-year floodplain. In the preliminary map, there are no communities outside of the Belle Chasse Federal flood protection system that are outside the 100-year floodplain. This means the overwhelming majority of the Parish would be inundated during a 100-year flood event. See Figure 15 and Figure 16 on pages 3-38 and 3-39.

Appendix A Maps 9 and 10 illustrate concentrations of Repetitive Flood Loss and Severe Repetitive Flood Loss properties in Plaquemines Parish.

Occurrences Since 2009

December 12, 2009

On December 12, 2009 moderate to heavy rainfall occurred across upper Plaquemines Parish as an upper air disturbance acted on deep moisture in place across the Gulf Coast. Over 4 inches of rain fell on nearly saturated ground, resulting in some flash flooding. Heavy rainfall resulted in widespread and significant street flooding in northern Plaquemines Parish with no listed fatalities or damage to property.

May 29, 2010

On May 29, 2012, scattered thunderstorms produced several severe weather reports during the afternoon hours in Belle Chasse. The storm resulted in 2.95 inches of rain, with water covering Highway 23; there were no listed fatalities or damages to property.

March 29, 2011

On March 29, 2011, upper level disturbances moving over a very warm and unstable air mass produced numerous reports of severe weather, as well as isolated flash flooding in upper Plaquemines Parish. Eight inches of water covered Highway 23 south of Belle Chasse. Moderate to heavy street flooding occurred across northern Plaquemines Parish with no listed fatalities or damages to property.

Tropical Storm Lee

The circulation around Tropical Storm Lee affected southeast Louisiana from late on September 2nd through September 4, 2011 with primarily onshore southeast and south wind flow. Tropical Storm Lee eventually weakened over inland areas later on September 4th and exited the region on September 5, 2011. The slow forward speed and broad circulation caused above normal tides along the southeast Louisiana and south Mississippi coast and tidal Lakes of Pontchartrain and Maurepas. Tides were generally 2 to 5 feet above normal. Higher gauge readings included 6.25 ft NAVD at the Seabrook Bridge at Lake Pontchartain, 5.40 ft MLLW at Shell Beach, St Bernard Parish; 5.28 ft NAVD at Mandeville, and 4.22 ft NAVD at Golden Meadow, Lafourche Parish.

Storm surge flooding was primarily confined to areas near the coast and tidal lakes, and outside of hurricane protection levees. Low lying roadways were flooded in many areas. Impacts to Plaquemines Parish were minimal with no fatalities and little damage to personal property.

Hurricane Isaac

The circulation around Isaac affected Plaquemines Parish from August 26 through the 30th eventually weakening to a tropical depression near Monroe, Louisiana on the evening of the 30th.

A storm tide of 8 to 13 feet occurred in eastern Plaquemines Parish and St. Bernard Parish. A representative maximum storm tide of 13.21 ft NAVD88 was measured at a USGS tide gauge near Pointe a la Hache. A local levee was overtopped or breached in the Braithwaite area of Plaquemines Parish early on August 29. A number of people had to be rescued from the flooded area, but a 60 year old woman and 52 year old man drowned in the storm surge.

Many areas of southeast Louisiana received 8 to 12 inches of rain with a few locations having 15 inches of rain or more. Maximum total rainfall from the storm was 20.66 inches at the New Orleans Carrollton gauge on the Mississippi River.

Overall impacts of Isaac resulted in at least $600 million in damages in southeast Louisiana, 3 direct fatalities, and 2 indirect fatalities. Storm surge flooding accounted for the bulk of damage, estimated around $500 million and the three direct storm surge fatalities in Louisiana. Winds accounted for a much lesser amount of damage, slightly more than a $100 million.

Vulnerability Assessment

Since flooding is a relatively common hazard in Plaquemines Parish it is also possible to predict reasonable vulnerability using FEMA flood maps. As the below maps depict, an overwhelming majority of Plaquemines Parish is located in the 100-year flood zone. However, looking to the tables on page 3-40 it becomes clear that the majority of the population is located in the 500-year flood zone, even under the updated Preliminary map. There are, however, more structures located in the 100-year flood zone. The difference between the Preliminary scenario and Effective scenario amounts to a total of an additional 1,334 structures and an additional 3,459 people in the 100-year flood zone. Of the population in the 100-year flood zone the preliminary scenario contains a larger share of minority and senior residents.

It is difficult to measure the vulnerability of the natural environment to flooding. Much of Plaquemines Parish consists of coastal marshland that is accustomed to inundation during flood and storm events and are generally not likely negatively impacted by flooding.

The inclusion of the Preliminary DFIRM indicates that flood risk may be worsening in Plaquemines Parish. Particularly with other hazards including coastal land loss and subsidence, there could be increasing intensity of flood risk, though the Preliminary maps already show the majority of the Parish located in the 100-year flood zone. This would mean that while the population exposed to flood risk may not increase by much in the future, it may be likely that the intensity would increase for those already living in the 100-year flood zone.

In order to estimate the estimated potential losses for flooding in Plaquemines Parish, SHELDUS records 17 major flooding events over the last 54 years totaling $83,599,555. This accounts for estimated potential losses which could be $1,548,139 per year.

Figure 15: Plaquemines Parish 100-year Flood Event (Effective Scenario)

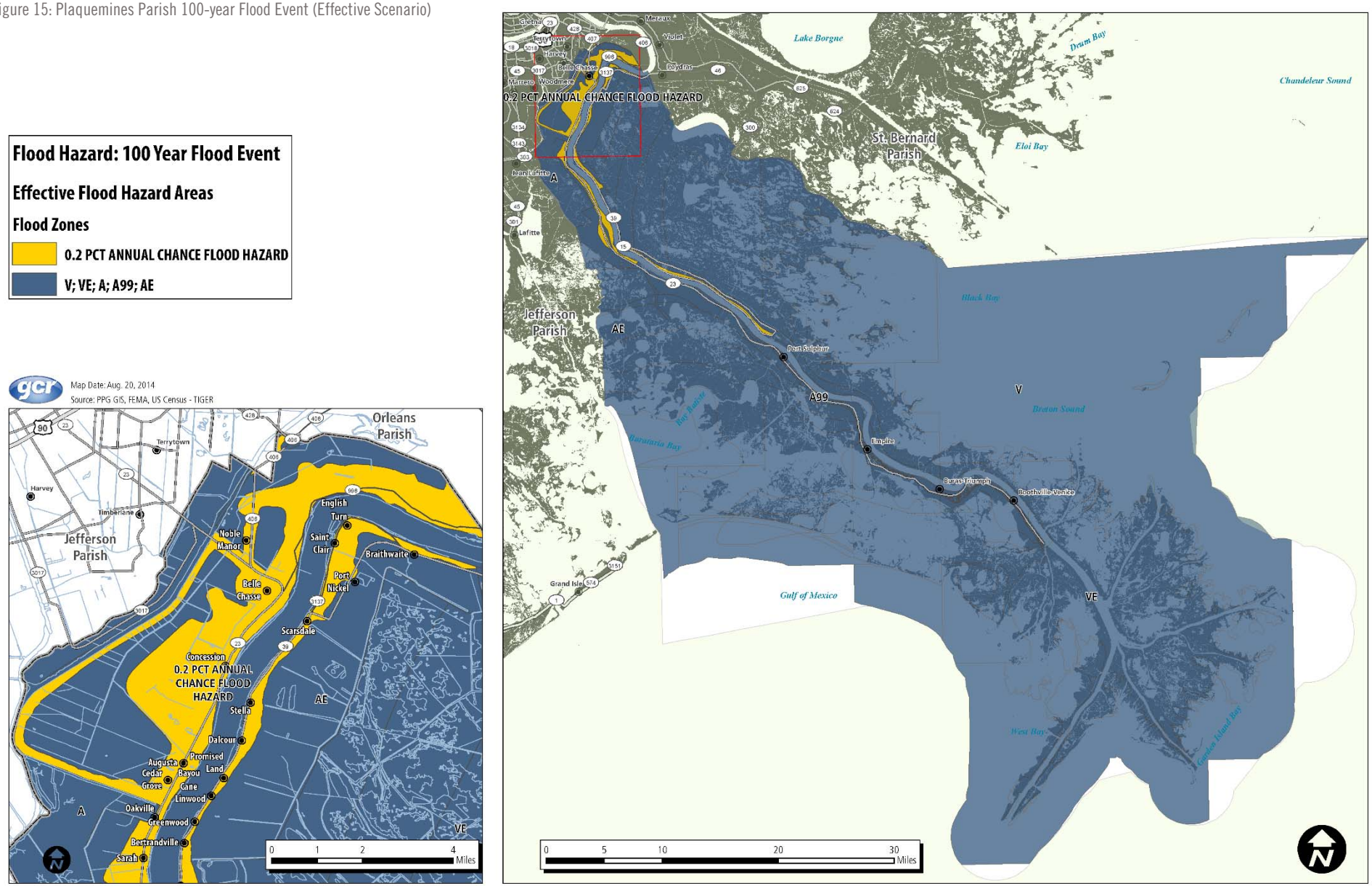


Figure 16: Plaquemines Parish 100-year Flood Event (Preliminary Scenario)

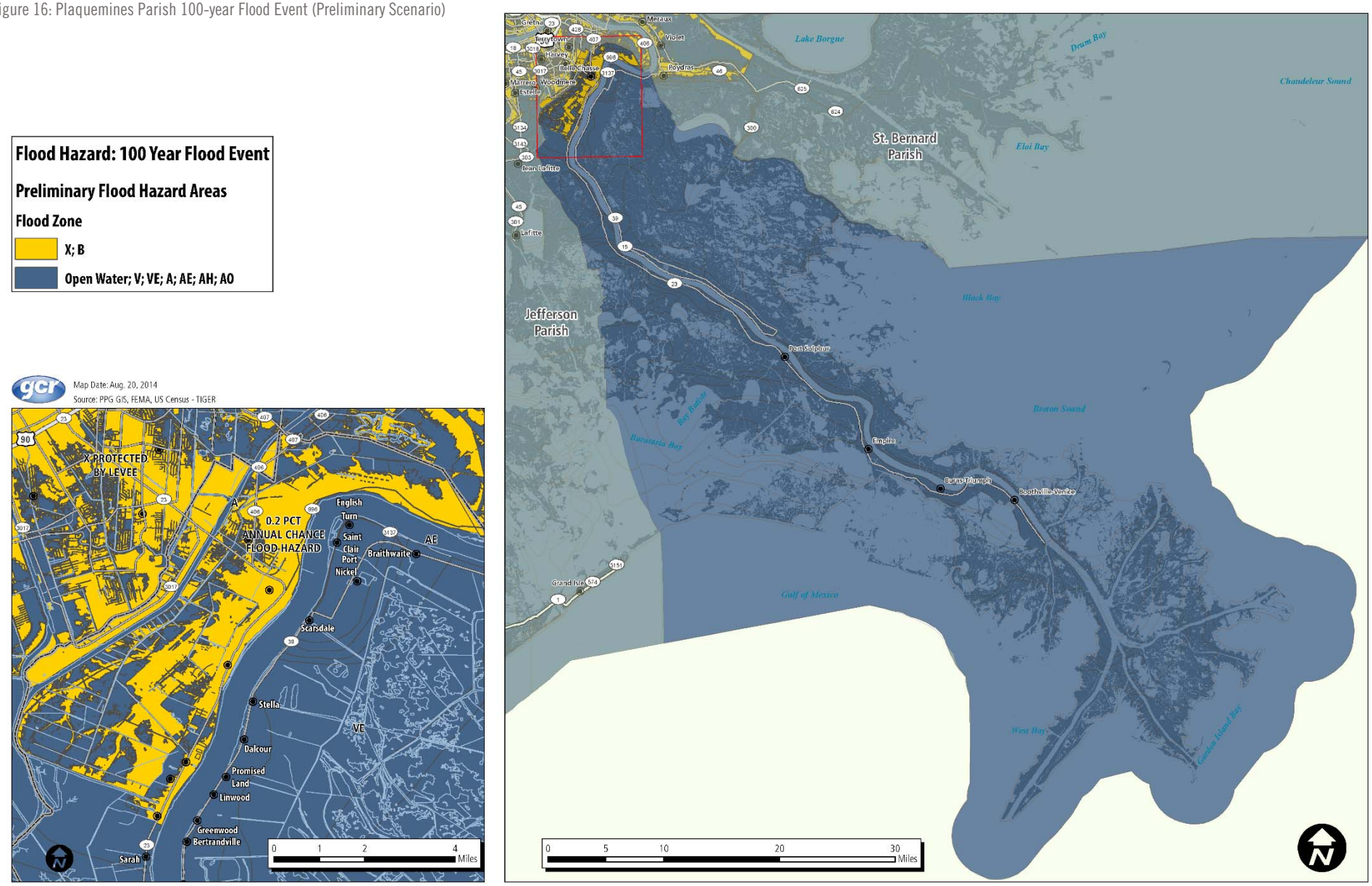


Table 13: Vulnerability by Flood Zone, Effective FIRM

Effective	100 Year Flood Zone	500 Year Flood Zone
Total	6,678	16,364
White	3,940	12,306
Minority	2,738	4,058
	41%	25%
Age 18+	4,967	11,746
Children	1,711	4,618
	26%	28%
Seniors	772	1,805
	12%	11%

Table 14: Vulnerability by Flood Zone, Preliminary DFIRM

Preliminary	100 Year Flood Zone	500 Year Flood Zone
Total	10,137	12,905
White	5,505	10,741
Minority	4,632	2,164
	46%	17%
Age 18+	7,590	9,123
Children	2,547	3,782
	25%	29%
Seniors	1,324	1,253
	13%	10%

Table 15: Vulnerability of Structures by Flood Zone, Effective FIRM

Effective	100 Year Flood Zone	500 Year Flood Zone
Residential Structures	5,553	4,831
Commercial Structures	278	227
Total Structure Count	6,005	5,204
Residential Value	$ 545,561,000	$ 728,039,000
Commercial Value	$ 147,569,000	$ 108,583,000
Total Structure Value	$ 804,546,000	$ 910,157,000

Table 16: Vulnerability of Structures by Flood Zone, Preliminary DFIRM

Preliminary	100 Year Flood Zone	500 Year Flood Zone
Residential Structures	6,885	3,499
Commercial Structures	284	221
Total Structure Count	7,339	3,870
Residential Value	$ 699,722,000	$ 573,878,000
Commercial Value	$ 153,723,000	$ 102,429,000
Total Structure Value	$ 960,784,000	$ 753,919,000

Coastal Hazards

Coastal Hazards in the Louisiana State HMP are a grouping of a number of hazards to which the State's coastal parishes are especially vulnerable. Plaquemines Parish's location on the Gulf Coast and within the Mississippi Delta makes it especially vulnerable to these threats. The plan considered the following hazards in this category:

- Coastal Land Loss
  - Sea Level Rise
  - Subsidence
- Saltwater Intrusion

Each of these hazards were addressed in the 2009 update and are risks the Parish has addressed in a number of coastal restoration and infrastructure projects in the last 5 years.

Hazard Profile (Coastal Land Loss)

Coastal Hazards are primarily caused by coastal land loss, which is the loss of coastal lands due to natural and/or human influences. The hazards that contribute are subsidence and sea level rise. For the purposes of Plaquemines Parish's specific needs, Saltwater Intrusion is discussed later as a different hazard type. The effects of the above hazards are difficult to understand and model because they are often working together in varying ways and fluctuate with climate patterns. Plaquemines Parish is especially vulnerable to coastal hazards because much of the land in the Parish is at or very near current sea level. Appendix A: Map 3, illustrates the land elevation levels in the parish. It is clear that most of the above sea level land is around the Mississippi River with small strips of land bordering the river at or above 4 feet, quickly receding back to sea level on either side. Despite the construction of levees and vegetated ridges, these lands are extremely vulnerable to coastal hazards.

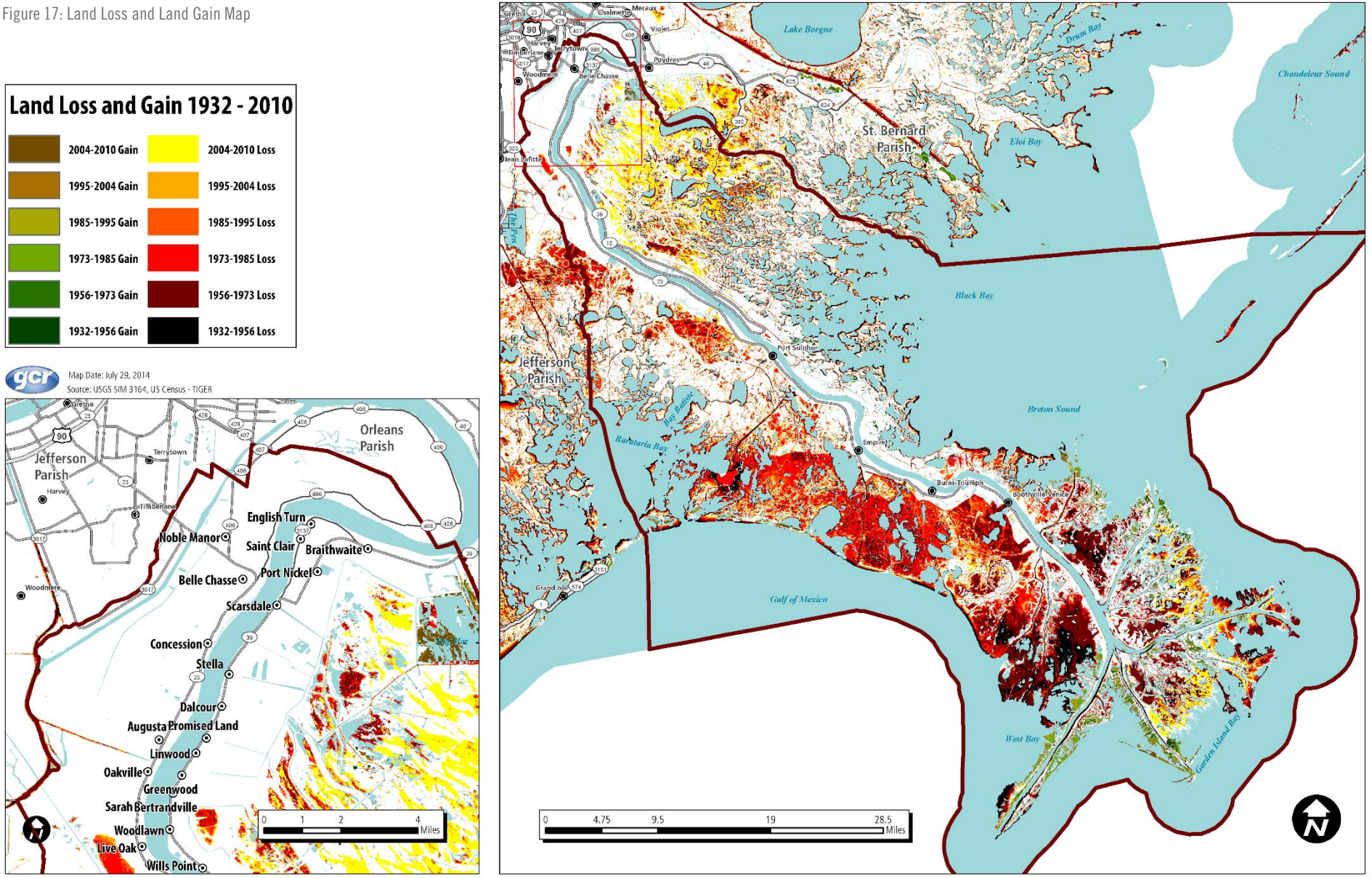
The loss of coastal wetlands also leaves the Parish more vulnerable to other hazards like storm surge and tropical cyclones. The marshes and swamps that surround the high ground are crucial barriers to slow storm surge as it approaches the coast. The loss of these lands could greatly increase the risks faced from these large coastal storms and heighten the risk that levees could be overtopped or fail. The probability of this hazard's occurrence in Plaquemines Parish is 100% as the effects have been seen and are certain to continue even with the mitigation efforts underway. The probability of the speed at which the impacts will be seen is much more difficult to determine.

The Planning Team modelled coastal land loss as a result of subsidence and sea level rise by mapping existing land elevations and illustrating how much land would be lost with each foot of loss/sea level rise. The Planning Team elected to avoid providing predictions or modelling a specific, dated scenario, as many scientific sources disagree on future scenarios for seal level rise. Additionally, Plaquemines Parish's low lying marshland terrain and manmade levees make it difficult to model future patterns for inundation and land loss. For example, the NOAA Sea Level Rise and Coastal Impacts Viewer excludes all of Louisiana and states that due to issues with topography and levees they will not include Louisiana because the model would not be reliable.

Given the above caveats, Figure 17 below illustrates the past loss of land due to sea level rise and subsidence. This roughly shows the areas of the Parish that are most at risk to coastal hazards resulting from sea level rise and subsidence. The displayed scenario shows the areas that would be underwater if three feet of sea level rise occurred. This appears to be a relatively moderate but severe scenario based on multiple sources that suggest levels anywhere from eight inches to six and a half feet over 100 years[iv].

The Louisiana coast has lost 25% of its coastal land area since 1932, or 1,883 square miles. USGS estimates that Plaquemines Parish has lost approximately 248.7 square miles of land since 1956. There are no specific occurrences to document, because land loss is a constant process that has been occurring for several decades as a result of the construction of levees along the Mississippi River and other interventions in the coastal environment.

Figure 17: Land Loss and Land Gain Map



Vulnerability Assessment (Coastal Land Loss)

Coastal land loss is a slow, gradual process that generally does not pose an immediate risk to human life or safety. However, the increased vulnerability of tropical cyclones and storm surge caused by land loss is not insignificant. Table 17 illustrates a summary of the population that lives in areas greater than and less than 5 feet above sea level. The overwhelming majority of the population of Plaquemines Parish is located in areas lower than 5 feet above sea level. Of the population living in areas below 5 feet of elevation, 30% are minority, 28% are under the age of 18, and 10% are elderly. The population living in these areas are most at risk of sea level rise and subsidence over the coming years.

Table 17: Vulnerability by Elevation

	5 feet or Greater	Less than 5 feet
Total	2,338	20,704
White	1,697	14,549
Minority	641	6,155
	27%	30%
Age 18+	1,801	14,912
Children	537	5,792
	23%	28%
Seniors	433	2,144
	19%	10%

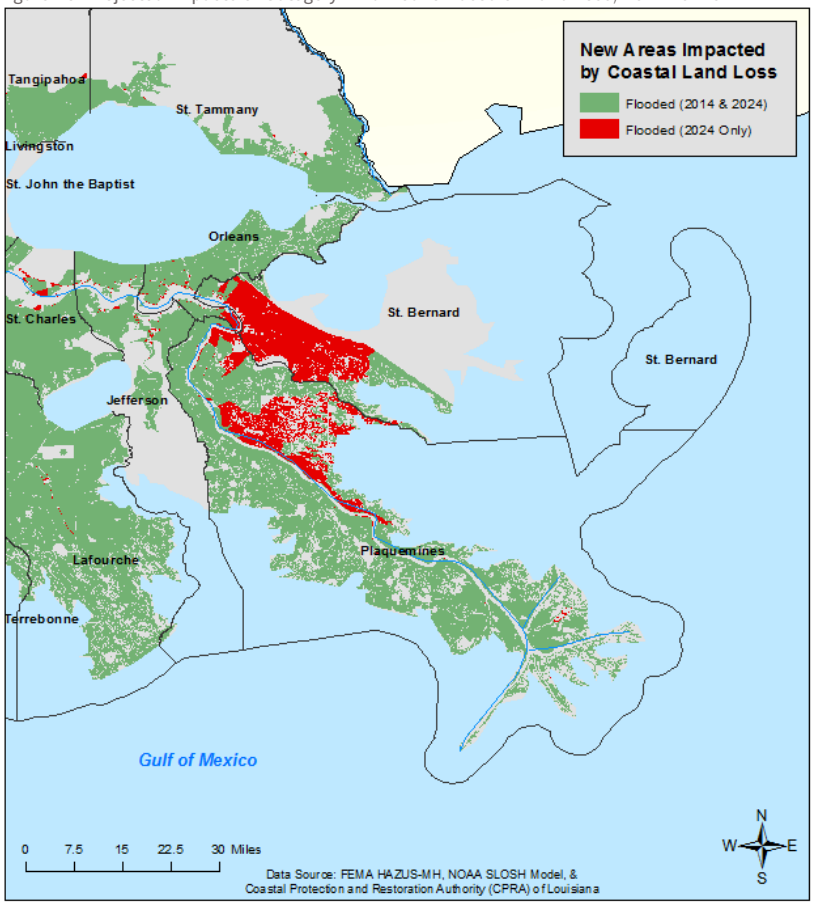
Coastal hazards can cause extensive damage to public and private property by bringing water closer and increasing risks of flooding and storm surge. If the impacts of subsidence and sea level rise are not mitigated, the vulnerable structures could eventually be inundated with no possibility of the water receding, resulting in damage or destruction. Shoreline protection and proper siting of structures in coastal areas are crucial to avoiding the impacts of coastal hazard. Plaquemines Parish currently uses levees, and are constructing vegetated ridges and other coastal restoration projects to help mitigate the impacts of coastal hazards. Table 18 illustrates the potential impacts to buildings of unmitigated coastal hazards. As with population, the vast majority of structures in Plaquemines Parish are located below 5 feet.

Table 18: Vulnerability of Structures by Elevation

	5 feet or Greater	Less than 5 feet
Residential Structures	1,137	9,247
Commercial Structures	55	450
Total Structure Count	1,226	9,983
Residential Value	$ 128,343,000	$ 1,145,257,000
Commercial Value	$ 40,923,000	$ 215,229,000
Total Structure Value	$ 187,082,000	$ 1,527,621,000

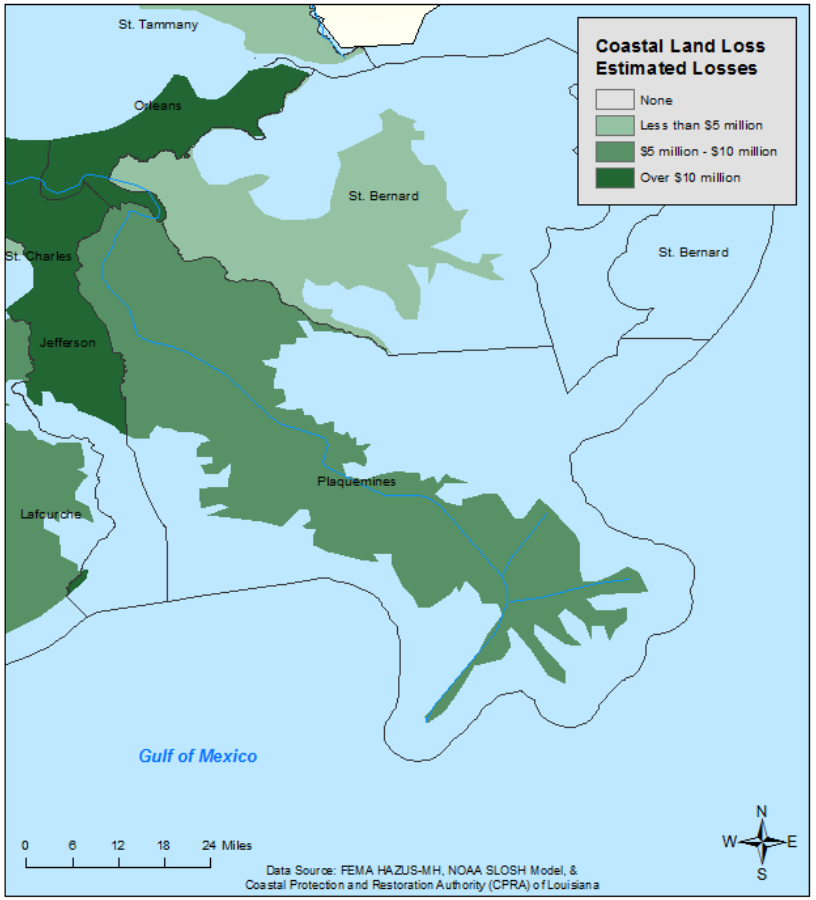
Coastal hazards can cause significant damage to coastal natural resources. Under natural conditions, marshes, barrier islands and other coastal features are dynamic. The shape and location of the coastline changes over time, and erosion and sea level rise are ways by which this occurs. Although these are relatively natural phenomena, human activity may exacerbate it. The construction of hardened structures like levees as well as navigational canals and pipelines for oil and gas have offset the balance of fresh and saltwater, causing massive loss of marsh and wetlands. This, in turn, has left these areas much more vulnerable to coastal erosion and land loss, and therefore sea level rise and the impacts of tropical cyclones and storm surge. Figure 18 illustrates the expected changes in loss estimates by census block group in 2024 based on HAZUS-MH flood models and NOAA SLOSH models and expected land loss. This analysis was conducted as a part of the 2014 Louisiana State Hazard Mitigation Plan Update.

Figure 18: Projected Impacts of Category 1 Hurricane Based on Land Loss, 2014 vs. 2024



As discussed in the Hazard Profile section, it is very difficult to model the future impacts of coastal hazards due to a number of factors. This underscores the importance to increase the amount of baseline data being collected throughout Plaquemines Parish to empower scientists and climatologists to find new ways to model coastal hazards in order to better plan for the future.

Figure 19: Jurisdictional Annualized Losses from Coastal Land Loss



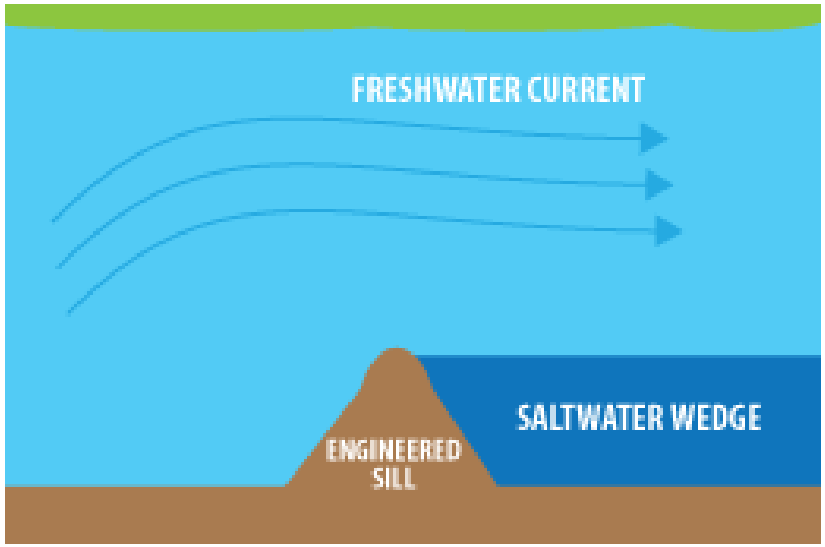
Although it is very difficult to measure the direct impacts of coastal land loss in the future, the 2014 Louisiana State Plan Update provided analysis which estimates potential annualized losses between $5 and $10 million as a result of coastal land loss. Figure 19, from the 2014 Louisiana State Plan illustrates the annualized losses for each Parish in Louisiana, with Plaquemines highlighted.

Hazard Profile (Saltwater Intrusion)

Although saltwater marshland balance was briefly discussed above in reference to coastal land loss, the HMPUSC was more concerned with a specific type of saltwater intrusion unique to Plaquemines Parish which effects the area's potable water during specific events. This hazard is caused when a saltwater wedge moves into the Mississippi River up from the Gulf of Mexico when the outflow of water in the Mississippi is lower and unable to hold back the salt water. This creates a unique problem where the Parish water intakes, which are located along the Mississippi River, would be bringing in salty Gulf water from the river, making the potable water supply unusable.

The riverbed of the Mississippi River is lower in elevation than that of the Gulf at the entry point up to river mile 350 above head of passes[v]. The saltwater of the Gulf is denser than the freshwater coming downstream, therefore the saltwater sinks and stays below the freshwater forming what is referred to as a "wedge." This wedge slowly moves along the riverbed upriver if there is not a high enough volume of water to hold it back. The saltwater wedge always exists in the Mississippi at some point, but is usually very low close to the Head of Passes. However, when drought or low snowfall impact upriver communities, less water comes down the Mississippi, causing lower levels of pressure to hold back saltwater from the Gulf.

Figure 20: USACE Engineered Sill Diagram



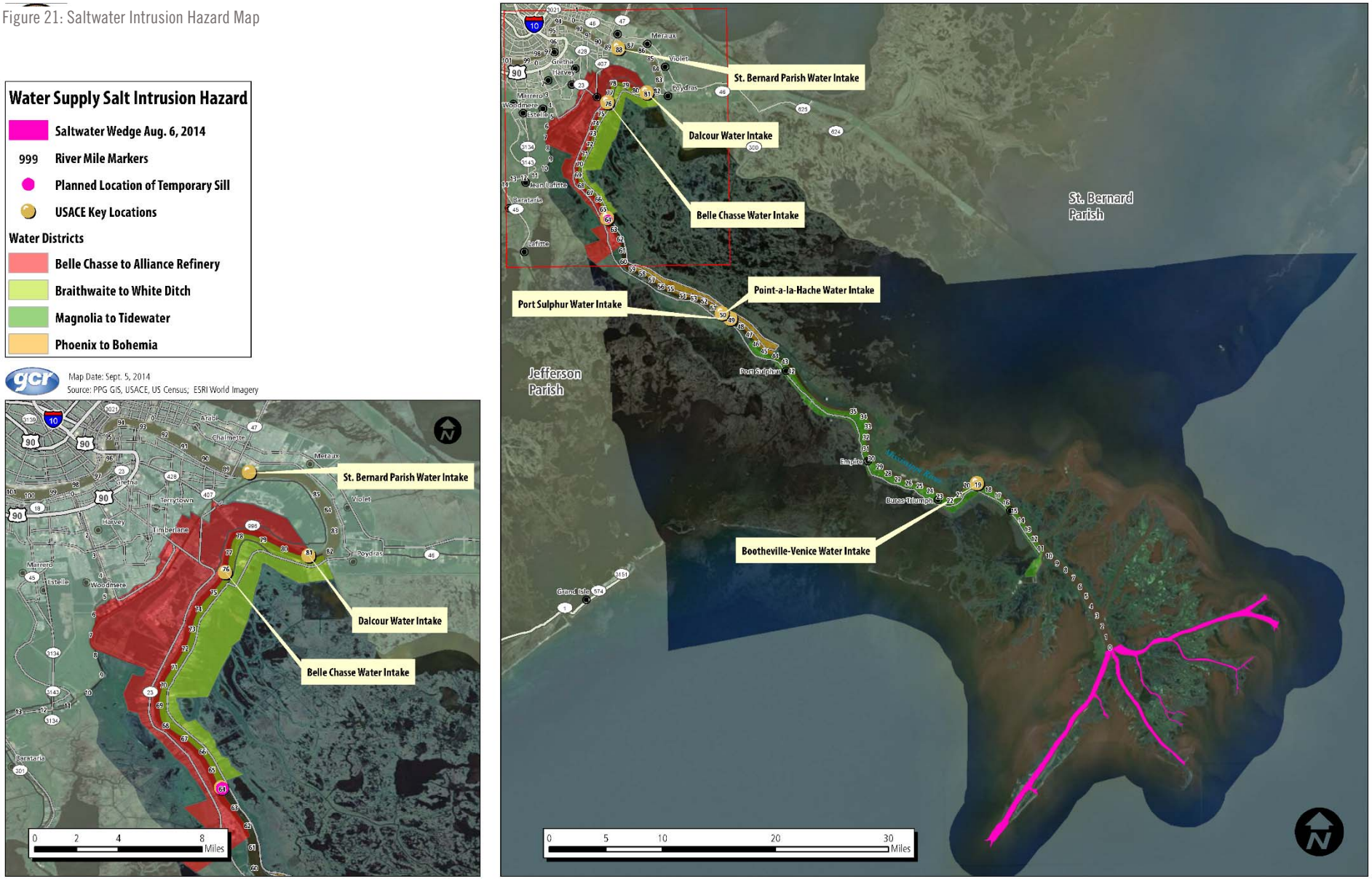
In order to mitigate the impacts of the saltwater wedge, the US Army Corps of Engineers constructs an earthen sill along the riverbed above the wedge to cut off the flow of saltwater upriver. Figure 20 illustrates how the sill works to prevent further intrusion of saltwater. The sill blocks the flow of saltwater, allowing the freshwater current to push the saltwater back and hold it at its current position.

The most notable recent occurrence of this hazard was in the summer of 2012. The Plaquemines Parish President declared a disaster on August 7, 2012[vi], as a saltwater wedge made its way upriver almost reaching the City of New Orleans. The US Army Corps of Engineers had to construct a sill at river mile 64 to prevent further intrusion. In order to ensure clean drinking water for Plaquemines Parish, pipelines were established between the neighboring Jefferson and Orleans parishes to pump in water from their upriver systems. The toe of the wedge during this event reached a high point of mile marker 89 in St Bernard Parish. The Army Corps has had to build similar sills twice before the 2012 event, in 1988 and 1999. The Corps estimates that construction of the sill will need to take place approximately every five years despite the less frequent historic occurrence[vii].

During the event, the maximum chloride detected in drinking water in the Port Sulphur area was 362 milligrams per liter (mg/L), above EPA's secondary maximum contaminant level for chloride of 250 mg/L. Sodium levels in the parish's drinking water ranged from 60 mg/L to 200 mg/L -- far exceeding the EPA recommendation of no more than 20 mg/L for people on very low sodium diets.[viii]

Figure 21 on the next page, illustrates the historic rise of the saltwater wedge over the last 12 months as well as the location the Army Corps uses to build the sill.

Figure 21: Saltwater Intrusion Hazard Map



Vulnerability Assessment (Saltwater Intrusion)

Some reports from the 2012 incident noted that drinking water was still safe to drink, but that those on low sodium diets and others with health problems should avoid it. That said, any compromise of the water supply for the Parish is a major threat to human health. Measures taken in the past to bring water in from neighboring parishes and by barging it from upriver, however, have proved reliable at supplying the Parish with drinkable water until the saltwater wedge recedes.

The intrusion of saltwater into the Mississippi poses no real threat to buildings or structures in Plaquemines Parish. There could be minor maintenance costs associated with flushing the water systems and equipment of saltwater after such an event, but it would not cause significant building or equipment loss or damage.

As with buildings, there is unlikely to be significant impacts of the natural environment in the event of an elevated saltwater wedge in the Mississippi River. Since the wedge remains very low in the river's bed, any wildlife that live in the river can temporarily move higher in the water or further upriver. Since this is a naturally occurring process, the natural environment is likely well adapted to these events.

Future vulnerability could be caused by increased dredging or droughts upriver of Plaquemines Parish. The US Army Corps of Engineers monitors salinity levels in the river to constantly track the position of the wedge and provide forecasts for wedge location.

Table 19: Vulnerability of Structures by Water District

	Belle Chasse to Alliance Refinery	Braithwaite to White Ditch	Magnolia to Tidewater	Phoenix to Bohemia	Outside Water Districts
Residential Structures	4,178	375	4,598	519	714
Commercial Structures	269	14	175	12	35
Total Structure Count	4,624	400	4,871	544	770
Residential Value	$ 661,656,000	$ 56,398,000	$ 433,701,000	$ 50,378,000	$ 71,467,000
Commercial Value	$ 151,514,000	$ 5,698,000	$ 78,040,000	$ 3,109,000	$ 17,791,000
Total Structure Value	$ 912,380,000	$ 65,983,000	$ 567,889,000	$ 67,073,000	$ 101,378,000

The costs of a similar event can be generally determined using figures from the 2012 event which included $29,000 per day in purchased potable water from New Orleans and $5.8 million for the Corps of Engineers to construct the sill. This does not include costs to flush the system after the event is over or to bring in bottled water.[ix] Estimated potential losses for future events could be more than $6 million per event.

Table 20: Vulnerability by Water District

	Belle Chasse to Alliance Refinery	Braithwaite to White Ditch	Magnolia to Tidewater	Phoenix to Bohemia	Outside Water Districts
Total	15,569	1,011	5,016	923	523
White	12,708	700	2,557	39	242
Minority	2,861	311	2,459	884	281
	18%	31%	49%	96%	54%
Age 18+	11,081	800	3,710	694	428
Children	4,488	211	1,306	229	95
	29%	21%	26%	25%	18%
Seniors	1,623	173	564	130	87
	10%	17%	11%	14%	17%

Sinkholes

Hazard Profile

Sinkholes are places where erosion of underground soils or minerals cause the collapse of surface material. The Louisiana State HMP identifies them as a significant hazard and states that the two largest sinkholes in the country exist in Louisiana. Sinkholes in Louisiana are generally manmade and caused by mining, hydraulic fracturing or other underground activity that could weaken or substantially remove surface soils. The original mines on which they are based can range in size from a few hundred feet to a half mile, meaning a sinkhole could grow to even larger than a half mile for larger mines.

Sinkholes of any kind, including those created by salt dome collapses, are usually infrequent in Louisiana and have never occurred in Plaquemines Parish, but potential impacts could be considerable. Sinkholes are disruptive to transportation and commerce, and can also force the evacuation of communities whose homes and businesses are located nearby sinkholes. Sinkhole vulnerability is directly related to distance from a salt dome. Figure 22 illustrates all salt domes located in Plaquemines Parish or nearby as of 1990. This is the same source used in the Louisiana State plan and no more recent source could be identified. When mapping the salt domes, the planning team determined that a 5-mile buffer zone would be an appropriate arbitrary boundary to determine higher risk areas to sinkholes. For perspective, recent reports estimate the Bayou Corne Sinkhole in Assumption Parish at one quarter of a mile in diameter and is expected to double over the next few years. It is likely this would cause impacts for a significant number of homes and business owners within a reasonable drive time of the area.

Vulnerability Assessment

The risk of a sinkhole occurring in Plaquemines Parish is very low and is very difficult to predict but would likely fall below a 1% annual chance of occurring. The planning team determined that it would be reasonable to summarize the population and buildings that are located within the above referenced buffer zones. Table 21 and Table 22 provide a summary of the populations and structures vulnerable to sinkholes in Plaquemines Parish.

Table 21: Sinkhole Vulnerability by Zone

	Outside Zone	Potential Sinkhole Zone
Total	2,340	20,702
White	1,244	15,002
Minority	1,096	5,700
	47%	28%
Age18+	1,787	14,926
Children	553	5,776
	24%	28%
Seniors	299	2,278
	13%	11%

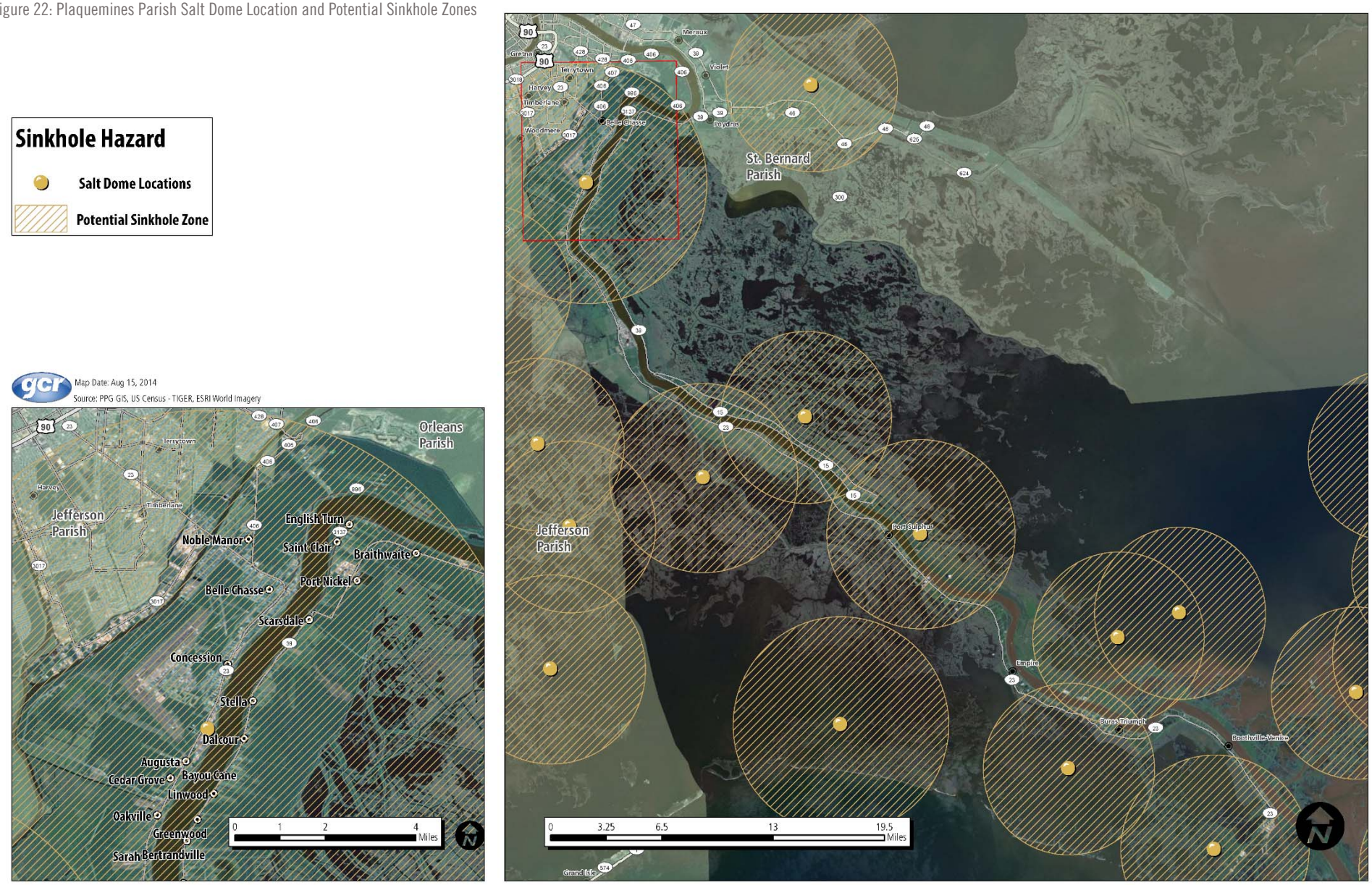
Table 22: Vulnerability of Structures by Sinkhole Zone

	Outside Zone	Potential Sinkhole Zone
Residential Structures	2,078	8,306
Commercial Structures	59	446
Total Structure Count	2,173	9,036
Residential Value	$174,167,000	$1,099,433,000
Commercial Value	$22,423,000	$233,729,000
Total Structure Value	$226,626,000	$1,488,077,000

A sinkhole could cause significant problems for the ecosystems in which they are located by interrupting migratory paths, swallowing vegetation and habitat or interrupting navigable waterways.

The future impact of sinkholes depends upon the future expansion of salt dome mining in Plaquemines Parish. The planning team was unable to gather additional information on active and future salt dome mines. Additionally, estimating the annualized losses from a future sinkhole is impossible as no instance has ever occurred before in Plaquemines Parish. However, the Bayou Corne Sinkhole has thus far accounted for over $125 million in settlement claims.[x] Estimated potential losses for a sinkhole in Plaquemines Parish could be more than $100 million.

Figure 22: Plaquemines Parish Salt Dome Location and Potential Sinkhole Zones



Levee Failure

Hazard Profile

As previously discussed in several sections, levees play a vital role in protecting Plaquemines Parish from flooding, particularly floods caused by tropical cyclones and storm surge, but also rare occasions of Mississippi River flooding. Levees in Plaquemines Parish are located along the entire Westbank and along the Eastbank extending down to Pointe a la Hache. Although levees within the Parish are not always Federal levees designed to withstand 100-year flood events or storm surge. Many were built by local authorities to augment Federal flood protection measures or to protect communities that were not identified to receive Federal funds for flood protection. For this reason there are two main types of levee:

- Federal

  These levees are designed and built by the US Army Corps of Engineers to protect the developed areas of the parish from riverine flooding associated with the Mississippi as well as for protecting the Belle Chasse area from the effects of storm surge. They are primarily located along the banks of the Mississippi River and range from 10-16 feet in height. The federal levees are divided for maintenance between those that are maintained by the US Army Corps and that are maintained by local authorities.

- Non-Federal

  These levees are generally smaller in size and are often referred to as "back levees". They usually represent the border between developed land and the marsh. They range from 2 to 10 feet tall and are generally effective at holding back high tides and slowing storm surge from small tropical storms. However, they have proven inadequate during recent major tropical events and have often required intentional breaching to relieve pressure once they are overtopped. The non-Federal levees are maintained by Plaquemines Parish.

The levees that surround the communities and protect them from river flooding and storm surge can also act as barriers that prevent water from draining out when levees are overtopped or rain events fill basins within the levee protected areas. As a result, the Parish's stormwater management system includes pumping stations to remove stormwater. Appendix A Map 2 shows the various drainage districts and location of pump stations and other facilities.

The failure of levees during a storm event could prove catastrophic, the magnitude of which would be dependent on the location of the break and the flood level involved. Reports of levee failure in Braithwaite as a result of Hurricane Isaac in 2012 brought over 10 feet of water throughout the community. In a future worst case scenario, water could reach up to 20 feet in Eastbank communities as seen in the SLOSH models on pages 3-29 – 3-31. The probability that levees would fail is less than 1% annually. It is nearly impossible for the planning team to model where and how levee failure might affect Plaquemines Parish. The team made the decision to illustrate the various levee types throughout the parish and express vulnerability to all populations located within the various levee basins to predict the vulnerability of each area. This methodology assumes that any basin which experiences levee failure would be devastated, but is the more reliable way to calculate potential impacts. Figure 25 illustrates the various levee basins and their ownership throughout Plaquemines Parish.

Occurrences Since 2009

Hurricane Isaac

As a result of Hurricane Isaac in August of 2012, a storm tide of 8 to 13 feet occurred in eastern Plaquemines Parish and St. Bernard Parish. A representative maximum storm tide of 13.21 ft NAVD88 was measured at a USGS tide gauge near Pointe a la Hache. A local levee was overtopped or breached in the Braithwaite area of Plaquemines Parish early on August 29. A

number of people had to be rescued from the flooded area, but a 60 year old woman and 52 year old man drowned in the storm surge.

Storm surge flooding also affected Plaquemines Parish with a storm tide of 4 to 7 feet. Roadways and low lying property were flooded. Local levees around Lafitte and Myrtle Grove were overtopped and/or breached resulting in the flooding of numerous houses and property in this area.

Figure 23: Flooding as a result of levee failure in Braithwaite, 2012.

Source: http://www.theguardian.com/world/2012/aug/31/hurricane-isaac-louisiana-federal-aid

Determining the annualized losses as a result of levee failure is difficult in Plaquemines Parish as there is little available data on past levee failure events. HAZUS-MH models, however, provide an overview of potential economic losses at the census tract level. Figure 24 illustrates that modelled losses to buildings in the event of a levee failure by census tract. According to this analysis, estimated potential losses could be between $1 million and $3 million for a levee failure event.

Figure 24: Levee Failure Loss Estimation by Census Tract- Building Value

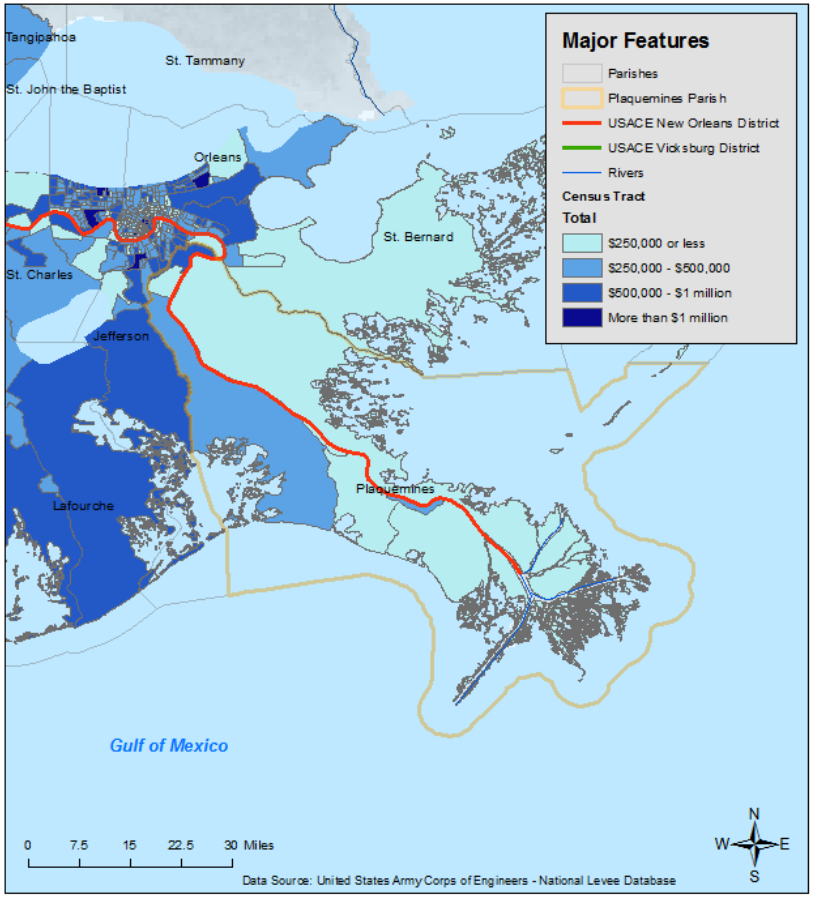
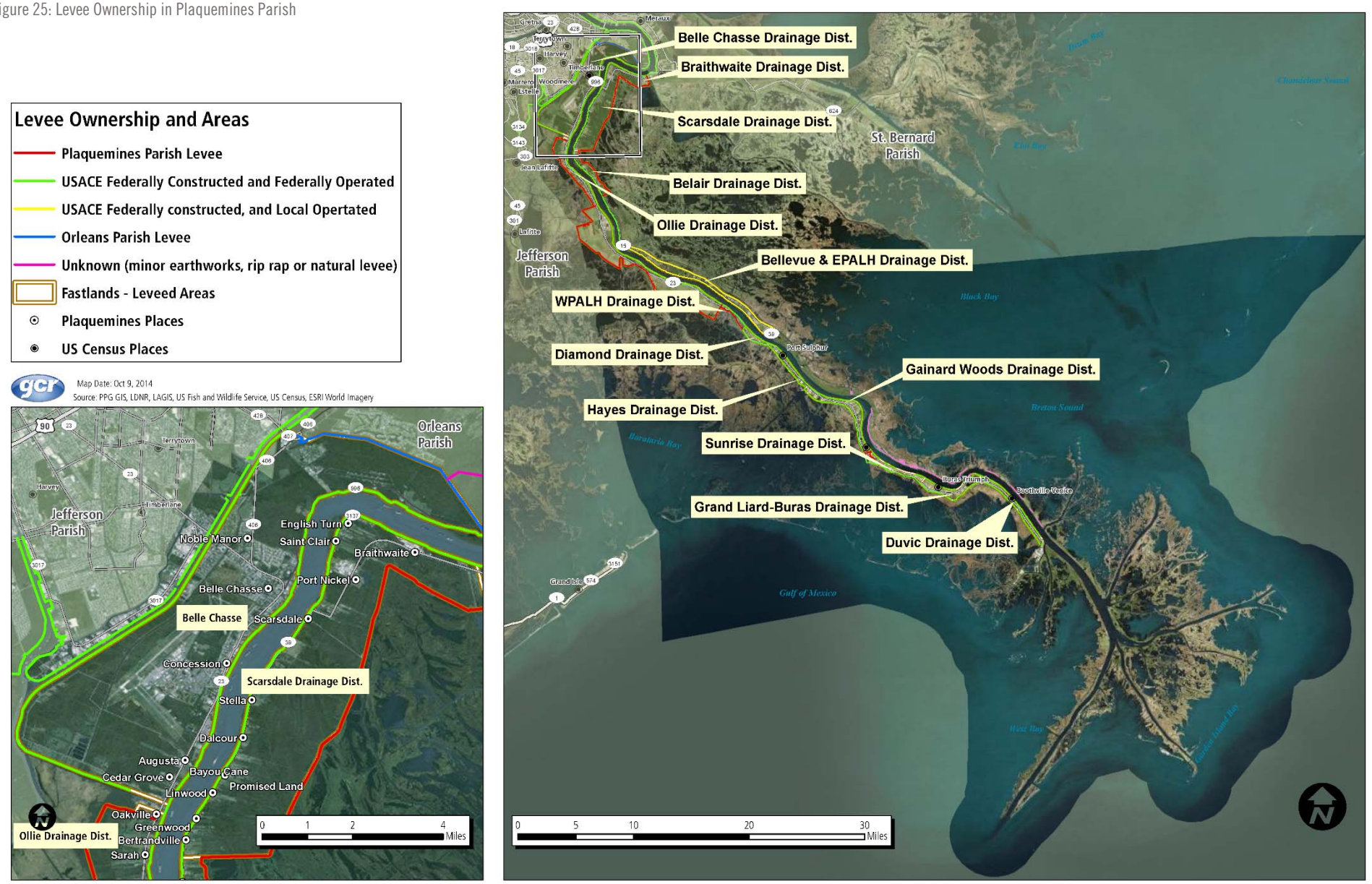


Figure 25: Levee Ownership in Plaquemines Parish



Vulnerability Assessment

The overall vulnerability for Levee Failure is difficult to analyze. As mentioned in the hazard profile, it's impossible for the planning team to predict or model the failure of specific levees. For this reason, the planning team analyzed the population and structures located in each of the below referenced 14 levee basins.

Belle Chasse contains by far the most population and structures of any levee basin and is surrounding by the USACE built and maintained federal levee system upgraded after Hurricane Katrina. This population is the best protected from flooding and storm surge events in the Parish.

There are no known natural environmental vulnerabilities as a result of levee failure. The failure of any levee may pose environmental threats to each basin in a unique way if any. The majority of development in Plaquemines Parish occurs in the Belle Chasse levee basin. The Hazard Environment section above provides details on population growth and future land use showing little growth in the most vulnerable area.

Table 23: Levee Failure Vulnerability by Levee Basin

	Belair	Belle Chasse	Bellevue & East Pointe ala Hache	Braithwaite	Diamond	Duvic	Gainard Woods	Grand Liard-Buras	Hayes	Myrtle Grove to West Pointe ala Hache	Ollie	Scarsdale	Sunrise	Outside Levees
Total	233	11,721	923	145	334	1,033	1,120	733	976	216	2,771	633	670	1,534
White	180	9,813	39	130	43	679	642	468	249	44	1,997	390	363	1,209
Minority	53	1,908	884	15	291	354	478	265	727	172	774	243	307	325
	23%	16%	96%	10%	87%	34%	43%	36%	74%	80%	28%	38%	46%	21%
Age 18+	185	8,250	694	106	235	764	833	525	736	172	2,040	509	495	1,169
Children	48	3,471	229	39	99	269	287	208	240	44	731	124	175	365
	21%	30%	25%	27%	30%	26%	26%	28%	25%	20%	26%	20%	26%	24%
Seniors	43	1,115	130	14	46	125	128	58	118	25	390	116	78	191
	18%	10%	14%	10%	14%	12%	11%	8%	12%	12%	14%	18%	12%	12%

Table 24: Vulnerability of Structures by Levee Basin

	Belair	Belle Chasse	Bellevue & East Pointe ala Hache	Braithwaite	Diamond	Duvic	Gainard Woods	Grand Liard-Buras	Hayes	Myrtle Grove to West Pointe ala Hache	Ollie	Scarsdale	Sunrise	Outside Levees
Residential Structures	43	3,028	519	69	172	954	968	839	714	195	688	260	786	1,149
Commercial Structures	4	144	12	1	-	36	29	40	20	3	46	9	27	134
Total Structure Count	47	3,262	544	72	173	1,002	1,007	902	753	200	762	277	826	1,382
Residential Value	$ 6,442,000	$ 506,750,000	$ 50,378,000	$ 10,257,000	$ 16,187,000	$ 69,889,000	$ 72,746,000	$ 97,703,000	$ 94,512,000	$ 17,196,000	$ 89,709,000	$ 39,350,000	$ 69,980,000	$ 132,501,000
Commercial Value	$ 558,000	$ 47,357,000	$ 3,109,000	$ 219,000	$ -	$ 14,532,000	$ 7,932,000	$ 23,538,000	$ 9,215,000	$ 4,585,000	$ 44,185,000	$ 4,921,000	$ 8,676,000	$ 87,325,000
Total Structure Value	$ 7,000,000	$ 583,860,000	$ 67,073,000	$ 10,703,000	$ 16,423,000	$ 88,724,000	$ 91,153,000	$ 131,935,000	$ 115,816,000	$ 28,626,000	$ 150,053,000	$ 47,160,000	$ 83,590,000	$ 292,587,000

Tornadoes

Hazard Profile

A tornado is a violent storm with winds up to 300 miles per hour. It appears as a rotating funnel-shaped cloud, gray to black in color, extending toward the ground from the base of a thundercloud. The average tornado moves southwest to northeast at a forward speed of 30 miles per hour, but can move in any direction and may vary from stationary to 70 mph. Tornadoes can uproot trees and buildings, and turn harmless objects into deadly missiles in a matter of seconds. Tornadoes are especially dangerous because they appear transparent until they begin to pick up debris and dust. Despite their low frequency within the parish, tornadoes are included as a significant hazard in the plan update due to the high impact in the event that one does occur.

The Enhanced Fujita Scale (EF Scale) is the standard measurement for rating the strength of a tornado. The NWS bases this scale on an analysis of damage after a tornado to infer wind speeds.

Tornadoes pose a significant risk to Plaquemines Parish and can affect the entire planning area. The National Climactic Data Center has recorded 26 tornado events in Plaquemines Parish since 1950 ranging in extent from F0 to F3 under the Fujita Scale which preceded implementation of the Enhanced Fujita Scale in 2007. Since implementation of the EF Scale, Plaquemines Parish has only experienced three EF0 tornado events. Based on NCDC figures, the overall probability of a tornado occurring in Plaquemines Parish is 40% in a given year. Plaquemines Parish could expect future storms up to an EF4 under the Enhanced Fujita Scale (equivalent E3 under the Fujita Scale) during a worst case scenario.

Occurrences Since 2009

May 13, 2011

On May 13, 2011, isolated thunderstorms ahead of a cold front produced several reports of severe weather near the Buras area of Plaquemines Parish. An EF0 tornado was spotted in the Sunrise area. The Parish Sheriff's Office reported that a sign was damaged in front of the South Plaquemines Parish High School in Buras along Highway 23. There were no reported injuries or fatalities and damages totaled $1,000.

Table 25: Enhanced Fujita Scale

EF-Scale	3-Sec. gust speed (mph)	Typical Damage
EF0	65-85	Light damage. Some damage to chimneys, branches from trees. Shallow rooted trees are pushed over, signboards damaged.
EF1	86-109	Moderate damage. Peels surface off roofs. Mobile homes pushed off foundations or overturned. Moving cars blown from roads.
EF2	110-137	Considerable damage. Roofs torn off frame homes. Mobile homes demolished. Large trees snapped or uprooted, cars lifted off the ground.
EF3	138-167	Severe damage. Roofs and some walls torn off well-constructed homes. Most trees in forests uprooted, heavy cars lifted off the ground and thrown.
EF4	168-199	Devastating damage. Well-constructed homes levelled. Structures with weak foundations blown away some distance. Cars thrown and large missiles generated.
EF5	200-234	Incredible damage. Strong frame homes levelled off foundations and swept away. Automobile sized missiles fly through the air in excess of 109 yards. Trees debarked.

January 26, 2012

On January 25, 2012, low pressure moving across the lower Mississippi River Valley pushed a cold front through the area. A line of thunderstorms developed in advance of the front and produced an EF0 tornado over Plaquemines Parish. The tornado ripped siding and a portion of the roof off a metal boat storage

building, snapped a couple small trees, destroyed a storage shed at a residence, and moved a shipping container 30 feet. Maximum wind speed was estimated at 80 mph, path width was 30 yards, and path length was 400 yards. No injuries or fatalities were reported and property damages totaled $10,000.

Vulnerability Assessment

Tornadoes are relatively unpredictable and can appear with little to no warning, leaving all of Plaquemines Parish vulnerable. Remarkably, the Parish may be more prepared for many when it comes to tornadoes because of the risk they face for Tropical Cyclones. Plaquemines Parish building codes require wind hardening and use of wind-rated building materials, making most new buildings resilient to most lower-level tornadoes. However, these codes do not account for the large number of mobile homes distributed throughout the parish, as well as Parish facilities currently located in trailers.

Mobile homes are most at risk during a tornado, as seen in Table 25, above. Even a low-level tornado can rip a mobile home from its foundation, and larger tornadoes will turn them into massive missiles. One quarter of housing units in Plaquemines Parish are mobile homes. The Planning Team did an alternative analysis of permitted mobile home parks in Plaquemines Parish and found a total of 514 spaces for 514 mobile homes, which accounts for about 20% of the 2,660 Census identified mobile homes. Likely the remaining 80% are located on individual parcels or within non-permitted mobile home communities.

In order to determine estimated annualized losses from tornadoes in Plaquemines Parish, the planning team inventoried 22 tornado events in the last 54 years, accounting for nearly $1.5 million in property and crop damage. Estimated potential losses from tornadoes in Plaquemines parish could be $27,253 per year.

Table 26 illustrates the vulnerability of both the total population and also the specific estimated mobile home populations to tornadoes. Both are shown because the entire population of the parish is vulnerable to tornadoes due to their unpredictability, however those living in mobile homes are especially vulnerable. Table 27 summarizes the total vulnerable structures in Plaquemines Parish to Tornadoes.

Figure 26 depicts the density of permitted mobile home parks by number of spaces in Plaquemines Parish.

In order to determine estimated annualized losses from tornadoes in Plaquemines Parish, the planning team inventoried 22 tornado events in the last 54 years, accounting for nearly $1.5 million in property and crop damage. Estimated potential losses from tornadoes in Plaquemines parish could be $27,253 per year.

Table 26: Tornado Vulnerable Populations

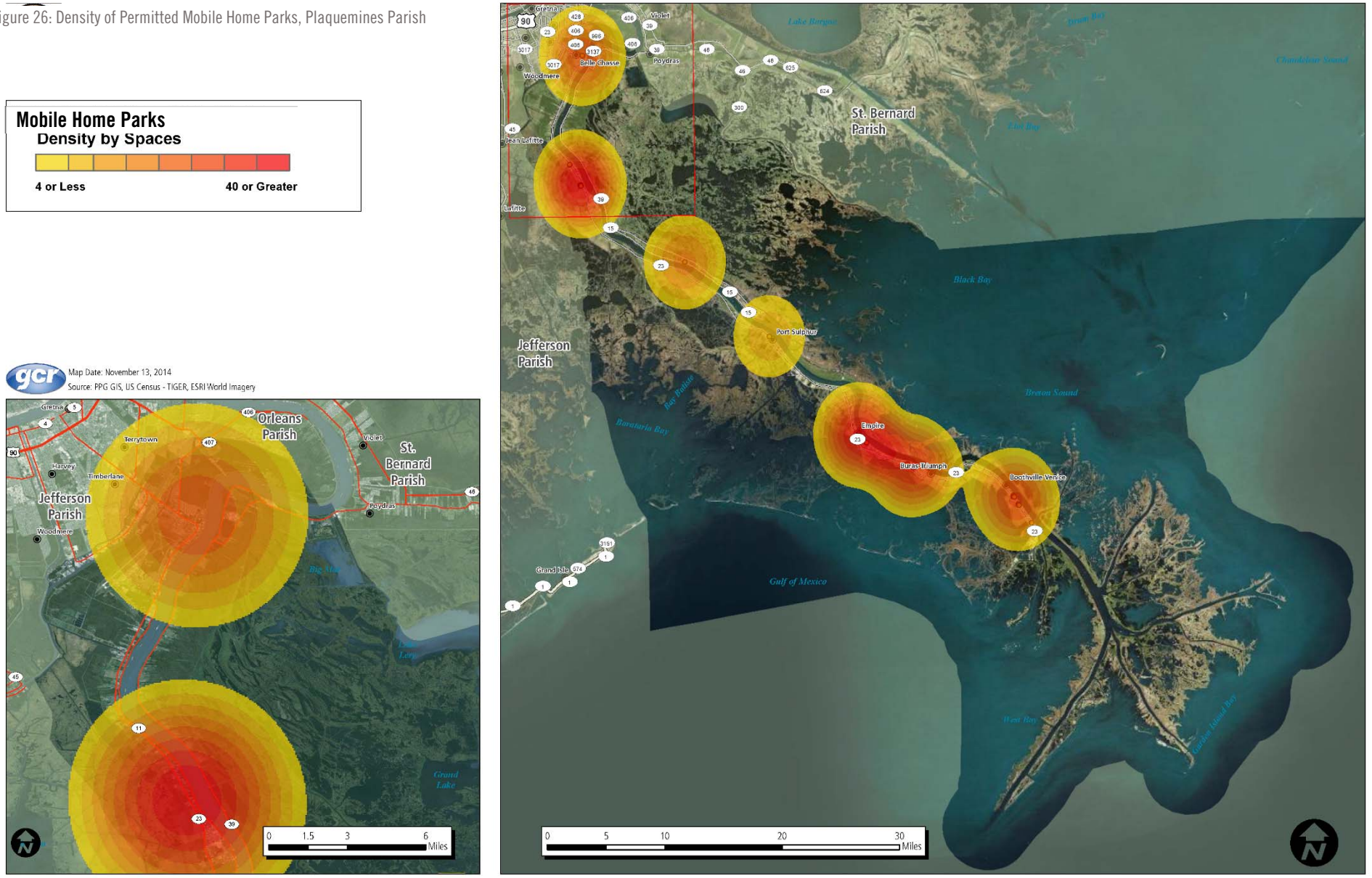
	Total Population	Mobile Home Population
Total	23,042	5,541
White	16,246	4,267
Minority	6,796	1,274[1]
	29%	23%
Seniors	2,577	648
	11%	12%

Table 27: Tornado Vulnerability to Structures

	Total
Residential Structures	10,384
Commercial Structures	505
Total Structure Count	11,209
Residential Value	$ 1,273,600,000.00
Commercial Value	$ 256,152,000.00
Total Structure Value	$ 1,714,703,000.00

[1] Minority and Senior populations were estimated by inventorying permitted mobile home parks in Plaquemines Parish and determining the estimated share of minority and senior populations at the US Census Block Group level for each park using US Census 2010 SF1 data.

Figure 26: Density of Permitted Mobile Home Parks, Plaquemines Parish



Chapter 4 Mitigation Strategy

Introduction

This section of the 2015 Plaquemines Parish Hazard Mitigation Plan Update presents the Mitigation Strategy, which lays out the parish's plans to reduce the potential losses from the hazards analyzed in the Risk Assessment. The Mitigation Strategy contains the Parish's goals and objectives as well as updated actions and projects for the mitigation strategy.

The Plaquemines Parish Mitigation Strategy Chapter was developed consistent with the process and steps presented in the FEMA *Local Mitigation Planning Handbook* (2013). This chapter's presentation of the Mitigation Strategy satisfies the following FEMA requirements:

FEMA 44 CFR Requirement §201.6(c)(3): [The plan *shall* include the following:] A mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs, and resources, and its ability to expand on and improve these existing tools.

FEMA 44 CFR Requirement §201.6(c)(3)(i): [The hazard mitigation strategy *shall* include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

FEMA 44 CFR Requirement §201.6(c)(3)(ii): [The hazard mitigation strategy *shall* include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure. All plans approved by FEMA after October 1, 2008, must also address the jurisdiction's participation in the NFIP, and continued compliance with NFIP requirements, as appropriate.

FEMA 44 CFR Requirement: §201.6(c)(3)(iii): [The hazard mitigation strategy shall include an] action plan, describing how the action identified in paragraph (c)(3)(ii) of this section will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

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

Developing Goals, Objectives, Actions & Projects

The parish developed the updates to the goals, objectives, actions and projects throughout the planning process. The goals in this section reflect the general guidelines the parish and community want to achieve with the plan update. These goals articulate the parish's commitment to protecting people and property, reducing the cost of disaster response and recovery, and diminishing disruption following a disaster. The objectives found in the plan are measureable strategies or implementation steps that will help the community achieve the goals. The actions and projects are the specific steps the parish will take to reduce the risk of hazards.

Since the 2009 Plan there have been no changes in the parish's hazard mitigation priorities. At the first Steering Committee Meeting in July, the goals and objectives from the 2009 Plan were reviewed and updated accordingly based on the hazards that were selected to be evaluated in the Risk Assessment of the plan. At the first Steering Committee Meeting, it was decided that the goals from the 2009 plan did not need to change and therefore the four existing goals were approved. Upon the Committee's review of the objectives it was requested that updates be made to ensure all objectives reflected the updated list of hazards, therefore two new objectives were added in order to better reflect the updated hazards list as well as the goals of the State's 2014 Plan Update.

The Planning Team then presented the proposed goals and objectives to the Civic Committee at their first meeting for their feedback and approval. The

Civic Committee agreed with the proposed goals and objectives, and the Planning Team then moved forward with the analysis for the Risk Assessment section of the plan and the development of the actions and projects.

Plaquemines Parish Hazard Mitigation Plan 2015 Goals & Objectives

After vigorous review of each goal from the 2009 Hazard Mitigation Plan, the Steering Committee for the 2015 plan established a consensus on the validity of the goals.

The goals and agreed upon objectives to reduce or avoid long-term vulnerabilities to the identified hazards are listed below:

Goal 1: Reduce losses to existing and future property due to hazards

- Objective 1.1: Protect all of Plaquemines Parish's citizens from flood events.
- Objective 1.2: Improve existing drainage infrastructure.
- Objective 1.3: Protect Parish infrastructure from tropical cyclone, tornadoes, flooding, coastal hazards, sinkholes, and levee failure.
- Objective 1.4: Encourage the parish to join the FEMA Community Rating System Program.

Goal 2: Protect the health and well-being of the people of Plaquemines Parish from negative effects of hazards

- Objective 2.1: Ensure proper evacuation procedures are followed prior to a hazard event.
- Objective 2.2: Ensure proper procedures are followed in the event of saltwater intrusion into the potable water supply.
- Objective 2.3: Continue to seek CWPPRA, other federal, and state funds for coastal erosion mitigation.
- Objective 2.4: Improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact.

Goal 3: Ensure the abilities of emergency services providers to continue operating during hazardous events

- Objective 3.1: Ensure all critical facilities are adequately prepared for tornadoes, coastal hazards, flooding, and tropical cyclones.

Goal 4: Protect existing public and private infrastructure from damage

- Objective 4.1: Promote and permit commercial and industrial development, including public critical facilities, outside of hazard areas to limit business interruption, property damage, and impairment to critical facilities in strict accordance with the parish zoning, flood management, and other applicable state and federal regulations.
- Objective 4.2: Promote preservation and/or conservation of flood prone areas for parish parks, recreation areas, and general flood plain management.
- Objective 4.3: Promote the protection of historic structures and buildings and archaeological sites from natural and manmade hazards.

Identification and Analysis of Mitigation Actions and Projects

The mitigation actions and projects described in this Plan Update are the result of careful review and analysis from both the Steering Committee and the Civic Committee. The Planning Team presented the Steering Committee with a list of projects and actions, both new and from the 2009 Plan, to review at the September Steering Committee Meeting. The Planning Team began an exercise at this meeting to review and prioritize the actions and projects. After review of the prioritization packet the Steering Committee requested more time to assess the projects based on the evaluation criteria. Following the meeting, the Planning Team updated the analysis and prioritization processes and created an electronic questionnaire that would allow each member of the Steering Committee to fill in their answers online and therefore automatically send the results to the Planning Team. The use of the electronic questionnaire

made the evaluation process much easier for both the Steering Committee and the Planning Team and allowed the Planning Team to access immediate results without having to track down individual respondents.

Mitigation Action Categories

As outlined in the Local Mitigation Planning Handbook the following are eligible types of Mitigation Actions:

Local Plans and Regulations - These actions include government authorities, policies, or codes that influence the way land and buildings are developed and built.

Structure and Infrastructure Projects – These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area, and also includes projects to construct manmade structures to reduce the impact of hazards.

Natural System Protection – These actions minimize the damage and losses and also preserve or restore the functions of natural systems.

Education and Awareness Programs – These actions inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them.

Mitigation Action List

The mitigation actions are as follows:

Action 1.1.1: Maintain and expand existing levee protection to ensure levees do not fail during a storm surge event.
Timeframe: Ongoing
Funding: Local, regional, and federal
Staff: Existing designated full-time personnel in parish administration
Update:

Action 1.1.2: Elevate, acquire, or pilot reconstruct all RL and SRL structures in Plaquemines Parish.
Timeframe: Ongoing
Funding: Local, regional, and federal
Staff: Existing designated full-time personnel in parish administration

Action 1.2.1: Widen drainage ditches and upgrade culverts.
Timeframe: 1-5 years, as funding permits
Funding: HMGP, local, and regional
Staff: Existing designated full-time personnel in parish administration

Action 1.2.2: Upgrade existing pump station capacity and add new pump stations.
Timeframe: 1-5 years, as funding permits
Funding: HMGP, local, and regional
Staff: Existing designated full-time personnel in Parish administration

Action 1.2.3: Upgrade existing pump stations by installing block valves to prevent against backwater flooding.
Timeframe: 1-5 years, as funding permits
Funding: HMGP, local, and regional
Staff: Existing designated full-time personnel in parish administration

Action 1.3.1: Wind Retrofit all Critical Facilities against tornadoes and tropical cyclones.
Timeframe: 1-5 years, as funding permits
Funding: HMGP, local, and regional
Staff: Existing designated full-time personnel in parish administration

Action 1.3.2: Upgrade existing pump station fuel tanks to harden against wind and storm surge damage from tornadoes and tropical cyclones.
Timeframe: 1-5 years, as funding permits
Funding: HMGP, local, and regional
Staff: Existing designated full-time personnel in parish administration

Action 1.3.3: Elevate or flood proof existing pump stations.
Timeframe: 1-5 years, as funding permits
Funding: HMGP, local, and regional
Staff: Existing designated full-time personnel in parish administration

Action 1.4.1: Add new Regulations reducing development density in flood plains.

Timeframe: Ongoing
Funding: No additional funds required
Staff: Parish administrative staff, drainage district personnel

Action 1.4.2: Participate in the Community Rating System (CRS).

Timeframe: Ongoing
Funding: No additional funds required
Staff: Parish administrative staff, drainage district personnel

Action 1.4.3: Continue Parish participation in the NFIP.

Timeframe: Ongoing
Funding: No additional funds required
Staff: Parish administrative staff

Action 1.4.4: Establish a public outreach campaign to ensure all homeowners in floodplains are aware of the various types of coverage options under the NFIP.

Timeframe: Ongoing
Funding: No additional funds required
Staff: Parish administrative staff

Action 1.4.5: Establish homeowner education program on flood mitigation measures.

Timeframe: Ongoing
Funding: No additional funds required
Staff: Parish administrative staff

Action 2.1.1: Elevate roadways that currently flood to allow proper evacuation routes.

Timeframe: 1-5 years, as funding permits
Funding: HMGP, local, and regional
Staff: Existing designated full-time personnel in parish administration

Action 2.1.2: Acquire all-hazard warning system to ensure proper citizen notification of floods, coastal hazards, levee failures, tropical cyclones, tornadoes and sinkholes.

Timeframe: 1-5 years, as funding permits
Funding: HMGP, local, and regional
Staff: Existing designated full-time personnel in parish administration

Action 2.1.3: Develop a parish wide outreach and educational campaign, to provide educational brochures and other materials to libraries, schools, and other public facilities including mitigation measures for all hazards including floods, coastal hazards, levee failure, tropical cyclones, tornadoes and sinkholes.

Timeframe: 1-5 years, as funding permits
Funding: HMGP, local, and regional
Staff: Existing designated full-time personnel in parish administration

Action 2.2.1: Ensure adequate amounts of bottled water are available in the event of total saltwater intrusion.

Timeframe: Ongoing
Funding: Local and regional
Staff: Existing designated full-time personnel in parish administration

Action 2.2.2: Ensure alternative intakes are ready to take over intakes not available for use due to saltwater intrusion and install additional intakes if necessary.

Timeframe: Ongoing
Funding: Local and regional
Staff: Existing designated full-time personnel in parish administration

Action 2.3.1: Restore marshland.

Timeframe: Ongoing
Funding: federal, local, and regional
Staff: Existing designated full-time personnel in parish administration

Action 2.3.2: Create man-made and natural barriers to coastal erosion.

Timeframe: Ongoing
Funding: Federal, local, and regional
Staff: Existing designated full-time personnel in parish administration

Action 2.4.1: Support the creation and implementation of a Community Education and Outreach Program.
Timeframe: Ongoing
Funding: Local, state, federal, HMGP
Staff: Parish administration

Action 3.1.1: Wind Harden and/or install safe rooms in critical facilities against tornadoes and tropical cyclones.
Timeframe: 1-5 years, as funding permits
Funding: HMGP
Staff: Existing designated full-time personnel in parish administration

Action 3.1.2: Install generators in all critical facilities.
Timeframe: 1-5 years, as funding permits
Funding: HMGP
Staff: Existing designated full-time personnel in parish administration

Action 4.1.1: Ensure that future development does not increase hazard losses.
Timeframe: Ongoing
Funding: No additional funds required
Staff: One full-time member of each municipality and the parish planning department

Action 4.1.2: Guide future development away from hazard areas while maintaining other parish goals such as economic development and improving the quality of life.
Timeframe: Ongoing
Funding: No additional funds required
Staff: One full-time member of the parish administration

Action 4.1.3: Enforce the International Building Code requirements for all new construction to strengthen buildings against high wind damage from tornadoes and tropical cyclones.
Timeframe: Ongoing
Funding: No additional funds required
Staff: One current full-time member of the parish administration

Action 4.1.4: Provide safe locations for files, records, and computer equipment.
Timeframe: Ongoing
Funding: HMGP/FMA
Staff: One current full-time member of the parish administration

Action 4.2.1: Participate in existing programs at the state and federal levels oriented to environmental enhancement and conservation.
Timeframe: Ongoing
Funding: Local, regional, and federal
Staff: One current full-time member of the parish administration

Action 4.3.1: Integrate historic cultural resource protection into hazard mitigation planning to improve the ability of resources to withstand impacts of natural and man-made hazards while retaining character-defining architectural features.
Timeframe: Ongoing
Funding: Local, state, federal, HMGP
Staff: Parish administration

Mitigation Project List

The mitigation projects are as follows:
Burmaster Canal Improvement: Fort St. Leon Subdivision Phase I experiences flooding near New Street. In a currently pending legal dispute, property owner intends to give the Parish a servitude to dig new ditch and/or culvert towards Jefferson Parish Pump Station.

Cazalard Canal Sheet Piling: At the present time, there is a section of sheetpile that is failing into the Cazalard Canal and causing stability issues of the canal bank. The Parish has an approved HMGP Project to bore under Engineers Road and add a new pump near the Intracoastal Levee. This project will also provide a better defined channel for the other project.

Belle Chasse #3 Pump Station, Walker Road: Belle Chasse Drainage District has two (2) pump stations (Barriere Road and Chancellor Drive). This project will fulfill a request for an additional pump station to be sited on Parish owned property on Walker Road West of Landfill Road.

Empire Flood Gate Pump Project: This proposed project will add a new pump on the inside of the Empire Flood Gate. When flooding occurs, the gate can be closed and pump from the protected side of the levee to the marsh.

Venice Boat Harbor Road Elevation Project: To date, the Parish has spent upwards of $30 million to raise Tidewater Road in Venice. The Parish has an approved HMGP Project to raise Coast Guard Road. Venice Boat Harbor Road is one of the last remaining roads that has yet to been elevated outside of the levee protection zone area.

Emergency Evacuations Center- F. Edward Hebert Center: This proposed project will develop a building to handle crisis conditions during hurricanes or other emergency events through the renovation of five (5) existing facilities on the 342-acre site. Following project completion, the F. Edward Hebert Government Complex site will provide shelter for evacuees and first responders.

Port Sulphur Station/Office: 114 Civic Drive, Port Sulphur, LA 70083: While there is a generator present at this location, it does not run the building and, as such, first responders are unable to utilize this building during hazard events. Additionally, there are no storm shutters on building. Project updates will include a generator upgrade and structure modification.

Pointe-ala-Hache Station: 18039 Hwy 15, Pointe-ala-Hache, LA 70082: Building has storm shutters and generator in place. Project updates will involve maintaining existing structures and minor modifications to ensure protection and shelter for first responders during hazard events.

Buras Station: 35410 Hwy 11, Lot C, Buras, LA 70041: Trailer needs a generator and hardening.

Woodlawn Station: 6799 Hwy 39, Braithwaite, LA 70040: Trailer needs generator and hardening.

Venice Station: 112 Gilley Lane, Boothville, LA 70038: Trailer needs generator and hardening.

Belle Chasse Station: 3706 Main Street, Lot C, Belle Chasse, LA 70037: Trailer needs generator and hardening.

Belle Chasse EMS Office: 3706 Main Street, Belle Chasse, LA 70037: Building has shutters but no generator. Project updates will include a generator upgrade and structure modification.

Freeport Building Retrofit: Retrofit Port Sulphur Government Building with new doors, windows, and roof.

Table 28: Mitigation Action Summary Table

Action	Category	Goal/Objective	Hazard
1.1.1: Maintain and expand existing levee protection to ensure levees do not fail during a storm surge event.	Structure and Infrastructure Projects	1.1	Storm Surge, Levee Failure

Action	Category	Goal/Objective	Hazard
1.1.2: Elevate, acquire, or pilot reconstruct all RL and SRL structures in Plaquemines Parish.	Structure and Infrastructure Projects	1.1	Flooding, Storm Surge, Levee Failure
1.2.1: Widen drainage ditches and upgrade culverts.	Structure and Infrastructure Projects	1.2	Storm Surge
1.2.2: Upgrade existing pump station capacity and add new pump stations.	Structure and Infrastructure Projects	1.2	Flooding
1.2.3: Upgrade existing pump stations by installing block valves to prevent against backwater flooding.	Structure and Infrastructure Projects	1.2	Flooding
1.3.1: Wind Retrofit all Critical Facilities against tornadoes and tropical storms.	Structure and Infrastructure Projects	1.3	Tornado Tropical Cyclones
1.3.2: Upgrade existing pump station fuel tanks to harden against wind and storm surge damage from tornadoes and tropical storms.	Structure and Infrastructure Projects	1.3	Tornado Storm Surge Tropical Cyclones
1.3.3: Elevate or floodproof existing pump stations.	Structure and Infrastructure Projects	1.3	Flooding
1.4.1: Add new Regulations reducing development density in flood plains.	Local Plans and Regulations	1.4	Flooding
1.4.2: 1.4.2: Participate in the Community Rating System (CRS).	Local Plans and Regulations	1.4	Flooding
1.4.3: Continue Parish participation in the NFIP.	Local Plans and Regulations	1.4	Flooding
1.4.4: Establish a public outreach campaign to ensure all homeowners in floodplains are aware of the various types of coverage options under the NFIP.	Education and Awareness Programs	1.4	Flooding
1.4.5: Establish homeowner education program on flood mitigation measures.	Education and Awareness Programs	1.4	Flooding
2.1.1: Elevate roadways that currently flood to allow proper evacuation routes.	Structure and Infrastructure Projects	2.1	Flooding Tropical Cyclones
2.1.2: Acquire all-hazard warning system to ensure proper citizen notification of sinkholes, levee failure, saltwater intrusion, flooding, tornadoes, and tropical cyclones.	Education and Awareness Programs	2.1	All Hazards
2.1.3: Develop a parish wide outreach and educational campaign, to provide educational brochures to libraries, schools, and other public facilities including mitigation measures for all hazards including floods, costal hazards, levee failure, tornadoes, tropical cyclones, saltwater intrusion, and sinkholes.	Education and Awareness Programs	2.1	All Hazards
2.2.1: Ensure adequate amounts of bottled water are available in the event of total saltwater intrusion.	Local Plans and Regulations	2.2	Saltwater Intrusion

Action	Category	Goal/Objective	Hazard
2.2.2: Ensure alternative intakes are ready to take over intakes not available for use due to saltwater intrusion and install additional intakes if necessary.	Structure and Infrastructure Projects	2.2	Saltwater Intrusion
2.3.1 Restore marshland.	Natural System Protection	2.3	Coastal Land Loss, Sea Level Rise
2.3.2 Create man-made and natural barriers to coastal erosion.	Structure and Infrastructure Projects	2.3	Coastal Land Loss, Sea Level Rise
2.4.1: Support the creation and implementation of a Community Education and Outreach Program.	Education and Awareness Programs	2.4	Flooding, Tropical Cyclone, Tornadoes, Levee Failure, Saltwater Intrusion
3.1.1: Wind Harden and/or install safe rooms in critical facilities from tornadoes and tropical storms.	Structure and Infrastructure Projects	3.1	Tropical Cyclones
3.1.2: Install generators in all critical facilities.	Structure and Infrastructure Projects	3.1	Flooding, Tropical Cyclone, Tornadoes, Levee Failure
4.1.1: Ensure that future development does not increase hazard losses.	Local Plans and Regulations	4.1	Flooding, Tropical Cyclone, Tornadoes, Levee Failure, Coastal Land Loss, Sinkholes, Saltwater Intrusion

Action	Category	Goal/Objective	Hazard
4.1.2: Guide future development away from hazard areas while maintaining other parish goals such as economic development and improving the quality of life.	Local Plans and Regulations	4.1	Flooding, Tropical Cyclone, Tornadoes, Levee Failure, Coastal Land Loss, Sinkholes
4.1.3: Enforce the International Building Code requirements for all new construction to strengthen buildings against high wind damage from tornadoes and tropical storms.	Local Plans and Regulations Structure and Infrastructure Projects	4.1	Tropical Cyclones
4.1.4: Provide safe locations for files, records, and computer equipment.	Local Plans and Regulations Structure and Infrastructure Projects	4.1	Flooding, Tropical Cyclone, Tornadoes, Levee Failure, Coastal Land Loss, Sinkholes
4.2.1: Participate in existing programs at the state and federal levels oriented to environmental enhancement and conservation.	Natural System Protection	4.2	Flooding, Tropical Cyclone, Tornadoes, Levee Failure, Coastal Land Loss, Sinkholes
4.3.1: Integrate historic cultural resource protection into hazard mitigation planning to improve the ability of resources to withstand impacts of natural and man-made hazards while retaining character-defining architectural features.	Natural System Protection	4.3	Flooding, Tropical Cyclone, Tornadoes, Levee Failure, Coastal Land Loss, Sinkholes

Analysis and Prioritization of Mitigation Actions

Continued analysis and prioritization of the Parish's mitigation actions is extremely important with regard to ensuring the continued protection and preservation of the parish's citizens and property. As such, this plan update took calculated steps to ensure than validity of any continued and proposed new actions before proceeding with the Plan Update.

While reviewing the previous plan update, it was noted that the STAPLEE process did not allow for a full analysis of mitigation actions nor did it aid the committees and project firm in effectively prioritizing the selected mitigation actions. This evaluation led the Planning Team to critically assess the current plan's update processes for evaluating and prioritizing mitigation actions to ensure that this process was effective for informing implementation of the

approved plan. Additionally, upon a review of the 2013 Local Mitigation Planning Handbook, the Planning Team observed that elements of the STAPLEE analysis had been incorporated into a new mitigation action evaluation worksheet. After consulting with the Louisiana Governor's Office of Homeland Security and Emergency Preparedness, the planning team created an evaluation and prioritization tool specific to the actions for the 2015 Plan Update which incorporated elements of the STAPLEE process.

For each mitigation action, Steering Committee members were asked to evaluate the potential benefits and/or likelihood of successful implementation and to rank each action by using the following scale:

- *Very Effective or Feasible*: This mitigation action is very capable of producing a desired hazard mitigation result/ this mitigation action is one that can be accomplished very easily, with very little inconvenience.
- *Effective or Feasible*: This mitigation action is capable of producing the desired hazard mitigation goal/objective. This mitigation action is one that can be accomplished somewhat easily, with minimal inconvenience.
- *Neutral/Unsure*: This mitigation action may or may not produce a desired hazard mitigation result. You are not familiar with this type of mitigation action.
- *Ineffective or Not Feasible*: This mitigation action is not capable of producing a desired hazard mitigation result.

Evaluation Criteria:

Life Safety – How effective will the action be at protecting lives and preventing injuries?

Property Protection – How significant will the action be at eliminating or reducing damage to structures and infrastructure?

Technical – Is the mitigation action technically feasible? Is it a long-term solution? Eliminate actions that, from a technical standpoint, will not meet the goals.

Political – Is there overall public support for the mitigation action? Is there the political will to support it?

Legal – Does the community have the authority to implement the action?

Environmental – What are the potential environmental impacts of the action? Will it comply with environmental regulations?

Social – Will the proposed action adversely affect one segment of the population? Will the action disrupt established neighborhoods, break up voting districts, or cause the relocation of lower income people?

Administrative – Does the community have the personnel and administrative capabilities to implement the action and maintain it or will outside help be necessary?

Economic Benefit– Will the benefits of each hazard mitigation actions outweigh the costs of each action?

Local Champion – Is there a strong advocate for the action or project among local departments and agencies that will support the action's implementation?

Other Community Objectives – Does the action advance other community objectives, such as capital improvements, economic development, environmental quality, or open space preservation? Does it support the policies of the comprehensive plan?

Results of the Mitigation Action Scoring Exercise

Steering Committee members were asked to prioritize each mitigation action by ranking each action on a scale of 1 to 29. 1 being the highest priority and 29 being the lowest. In this way, Steering Committee members were able to clearly identify those projects deemed to be of priority based upon their individual areas of expertise. Feasibility scores were then used to prioritize any items whose ranking were not clearly established from the priority ranking results.

For the feasibility scoring and evaluation, Steering Committee members were asked to evaluate each mitigation action and assign a value based on the following scale:

2 = Very effective or feasible

1 = Effective or feasible

0 = Neutral/Unsure

-1 = Ineffective or not feasible

After assigning a score to each mitigation action, the Planning Team determined final feasibility scores by multiplying the number of scores by the assigned values and calculating an average.

Table 29 provides the priority ranking and feasibility scores for each mitigation action. Actions with a feasibility score between 1 and 2 are deemed to be very effective and/or feasible while those with a score of less than 1 are thought to be less effect/feasible than the larger body of mitigation actions.

Table 29: Mitigation Action Evaluation Scoring Results and Priority Rankings

Mitigation Action	Feasibility Score	Priority Rank
1.1.1	1.7	1
1.1.2	1.1	2
1.2.1	1.2	7
1.2.2	1.1	3
1.2.3	0.89	4
1.3.1	1.22	6
1.3.2	1.22	5
1.3.3	1.11	8
1.4.1	0.44	25
1.4.2	0.78	10
1.4.3	1.22	11
1.4.4	0.78	21
1.4.5	1.0	18
2.1.1	1.44	9
2.1.2	1.56	16
2.1.3	0.67	28
2.2.1	0.56	29
2.2.2	1.0	15
2.3.1	1.0	14
2.3.2	1.33	13
2.4.1	1.11	17
3.1.1	1.44	12
3.1.2	1.56	19
4.1.1	1.33	22
4.1.2	1.0	23
4.1.3	1.33	26
4.1.4	1.56	27
4.2.1	1.0	20
4.3.1	1.0	24

Results of the Project Prioritization Exercise

Steering Committee members were also asked to rank all projects on a scale of 1 to 14, 1 being the highest priority project and 14 being the lowest priority project. Table 30 displays the results of this prioritization exercise.

The response percentage indicates the percent of all Steering Committee members assigning the priority rank to each respective mitigation project. Response percentages were somewhat flat for many of the projects as there was no real consensus on project importance for several projects (those with a score of 28.6% received only 2 votes for each corresponding position). However, several projects received higher response percentages which gave them higher/lower priority among the larger list of projects.

All projects with significant scores, those with response percentages above 28.6%, were assigned their priority rankings based on their individual prioritization scores. All remaining projects were then added to the ranking list with priority given to existing projects as these projects are currently underway/near completion.

Table 30: Project Prioritization

Project	Response %	Priority Rank	Project Status
Emergency Evacuations Center- F. Edward Hebert Center	42.9%	1	Existing
Burmaster Canal Improvements	28.6%	2	Existing
Cazalard Canal Sheet Piling	28.6%	3	Existing
Belle Chasse #3 Pump Station, Walker Road	28.6%	4	Existing
Empire Flood Gate Pump Project	28.6%	5	New
Venice Boat Harbor Road Elevation Project	57.2%	6	Existing
Port Sulphur Station/Office	28.6%	7	New
Ponte-ala-Hache Station	42.9%	8	New
Buras Station	28.6%	9	New
Woodlawn Station	28.6%	10	New
Venice Station	28.6%	11	New
Belle Chasse Station	42.9%	12	New
Belle Chasse EMS Office	42.9%	13	New
Freeport Building Retrofit	42.9%	14	Existing

Changes since the 2009 HMP Update

The status of each project from the 2009 Hazard Mitigation Plan Update is detailed below:

Increase Pumping Capacity of Belle Chasse #2 from 990 CFS to 2,400 CFS:
Plaquemines Parish Government has signed a contract using Parish funds for the engineering of the BC#2 pump station expansion which may deem the project ineligible.

Enlarge Barriere Canal South from Belle Chasse 31 to Belle Chasse Highway
This widening project was deemed ineligible during the last application period.

Enlarge Barriere Canal North from Belle Chasse Hwy to Belle Chasse #2
This canal widening project was also deemed ineligible during the last application period.

Improve Industry Canal by lining it with sheet piling from Barriere Canal to 2,800' northward past Woodland Highway Bridge PPG
The Parish has a signed contract for the engineering of the Industry Canal bank stabilization using Parish funds which may deem the project ineligible. However, the current project is using another method other than sheet piling due to the high cost.

Increase Pumping Capacity of Belle Chasse #1 from 3,400 CFS to 4,500 CFS
(And ensure power supply is adequate and reliable for current capacity)
Remains a viable project.

Scarsdale Pump Station
Currently being funded through an approved FEMA project.
Box Culvert or Sheet Piling on Planters Canal Road The majority of the ditch along Planters Canal Road has been culverted/improved. This project is expected to be completed before approval of the 2015 Plan Update.

Sheet Pile Drainage Canal by Engineers Road
Remains a viable project. This project was carried forward into the 2015 HMG Plan Update.

Culvert Upgrade at Jesuit Bend
Currently being funded through an approved HMGP project.

Safe Houses at Pump Stations – East Bank, Belle Chasse, South of West Pointe a La Hache
Remains a viable project if funding from CDBG is insufficient to retrofit all of the pump stations.

Venice Boat Harbor Road
Remains a viable project. This project was carried forward into the 2015 HMG Plan Update.

Benefit-cost Analysis for Specific Projects

Use of HMGP funds requires the completion of a Benefit-Cost Analysis (BCA) to determine the potential positive effects of a specific mitigation action compared to the cost of the action. FEMA has developed a software program including hazard-specific modules. Applications seeking FEMA funds for implementation of these projects must perform a detailed BCA using this software.

Some mitigation projects have quantitatively immeasurable benefits, like education and outreach, training, and facilitation projects. FEMA sets aside specific funds in the form of the 5% Initiative for projects with less quantifiable benefits that cannot be measured through the typical BCA system.

Capability Assessment

The purpose of the Capability Assessment is to understand the unique planning, regulatory, administrative, technical, financial, and education and outreach capabilities present in Plaquemines Parish. This assessment helps the parish identify strengths that could be used to reduce losses and reduce

risks throughout the community. It also identifies areas where mitigation actions might be used to supplement current capabilities and create a more resilient Plaquemines Parish before, during, and after a hazard event. Finally, the Capability Assessment examines the integration of existing planning mechanisms and the HMP, highlighting areas and initiatives in other planning efforts that seek to reduce risk and losses. While the Capability Assessment serves as a good instrument for identifying local capabilities, it also provides a means for recognizing gaps and weaknesses that can be resolved through future mitigation actions.

Plaquemines Parish has several policies, programs, and capabilities, which help to prevent and minimize future damages resulting from hazards. These tools are valuable instruments in pre and post disaster mitigation as they facilitate the implementation of mitigation activities through the current legal and regulatory framework.

Building Codes

After Hurricane Katrina, the Louisiana State Legislature passed legislation requiring all jurisdictions to adopt the International Building Code standards. Plaquemines Parish most recently updated their building code to the International Building Code 2012 standards in January of 2014. These standards ensure that new and renovated structures in the Parish are constructed according to international standards for wind, fire, flooding and other hazard events. These are administered and enforced by the Plaquemines Parish Permits, Planning, and Zoning Department and are set and updated by the Louisiana Uniform Construction Code Council annually.

Flood Protection Ordinance

Plaquemines Parish last updated their Flood Protection Ordinance in 2008, providing for advanced requirements for development in floodplains within the parish. The standards set forth in the Flood Protection Ordinance exceed the minimum requirements of the National Flood Insurance Program.

Administration, enforcement, and revisions are shared by the Plaquemines Parish Engineering and Public Works, Drainage, and Permits, Planning and Zoning departments. Updates and amendments are made by the Parish Council on an as needed basis.

Zoning

The Plaquemines Parish Comprehensive Zoning Ordinance, adopted in April of 1984 includes a zoning district called “Flood Plain District”. The purpose of the district is to, “comprise those areas which are subject to periodic or occasional inundation from stream overflows, storms, and tidal conditions and which are not within publicly owned hurricane protection levees and pump drainage systems.” The Parish is currently in the process of drafting a new comprehensive zoning ordinance. The new ordinance is being reviewed by the Planning and Zoning Board for adoption. Administration and enforcement of the zoning ordinance is through the Permits, Planning, and Zoning department. Periodic amendments are made to update the existing code, but adoption of the new code is forthcoming.

Comprehensive Master Plan

The Plaquemines Parish Comprehensive Master Plan, adopted in 2014 includes specific sections on Drainage and Stormwater Management, Coastal Protection and Restoration, and Water and Wastewater. These sections include specific recommendations and action plans for improving stormwater management and water treatment in the parish, in addition to local plans for coastal restoration. The Permits, Planning, and Zoning Department is responsible for administration and implementation of the Master Plan. The 2014 Master Plan was the first for Plaquemines Parish and will likely not be updated in the near future outside as needed amendments.

Emergency Management

Plaquemines Parish coordinates all emergency preparedness and response activities through the Office of Homeland Security and Emergency Preparedness. The parish maintains an Emergency Operations Center on the

third floor of the Parish Government Building which has been hardened against tropical weather events and includes backup generators. The Plaquemines Parish Office of Homeland Security and Emergency Preparedness is responsible for emergency management and updating all associated protocols annually.

Fiscal Capacity

The capacity to implement mitigation-related activities is often strongly dependent on the presence of local financial resources. Current funding for mitigation is almost exclusively funded by Hazard Mitigation Grant funding. At the time of this update, the Parish does not have the ability to expand their fiscal capabilities to further support mitigation activities. Hazard Mitigation Funds have been used in the past by the parish Engineering and Public Works department, as they are also responsible for the parish Capital Improvements Plan, updated annually.

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Chapter 5 Plan Adoption

Formal adoption of the plan is a FEMA requirement and adoption by the Plaquemines Parish Government illustrates the community's commitment to implementing the Mitigation Strategy.

The formal adoption of the plan by the Plaquemines Parish Government meets the FEMA requirement listed below:

FEMA Requirement 44 CFR §201.6(c)(5): [The local hazard mitigation plan shall include] documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan.

Upon final approval of the plan by GOHSEP and FEMA, the Plaquemines Parish Council approved the plan at their April 9, 2015. The Plan Adoption Documents are contained in Appendix G: Plan Adoption Documentation.

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Chapter 6 Plan Maintenance

This chapter of the 2015 Plaquemines Parish Plan Update describes the plan maintenance process established by the Parish Government to ensure that the plan is continually monitored and updated throughout the five-year period leading up to the 2020 plan update process. It establishes a method to track the plan's implementation and to evaluate, monitor and revise the 2015 Plan Update throughout the five-year process as needed.

The requirements as laid out by FEMA in the Local Mitigation Plan Review Guide are as follows:

FEMA 44 CFR Requirement §201.6(c)(4)(i): [The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

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

FEMA 44 CFR Requirement §201.6(c)(4)(iii): [The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.

FEMA 44 CFR Requirement §201.6(d)(3): A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within 5 years in order to continue to be eligible for mitigation project grant funding.

Monitoring, Evaluating and Updating

The 2015 Plaquemines Parish Hazard Mitigation Plan Update will be monitored on an annual bases to determine the effectiveness of its projects and actions.

Plaquemines Parish has developed a plan maintenance process to ensure that regular review and update of the Hazard Mitigation Plan occurs. The parish has formed a Hazard Mitigation Plan Evaluation Committee that consists of selected members from the Parish, local agencies, and the Steering Committee, which prepared the HMP as included herewith. The HMP Evaluation Committee will consist of the following representation:

- Plaquemines Parish President
- Plaquemines Parish Grant Administrator
- Plaquemines Parish Engineer (responsible for overall coordination of HMP maintenance activities)
- Plaquemines Parish Director of Planning and Zoning
- Plaquemines Parish Director of Economic Development
- Plaquemines Parish OEP Director
- Plaquemines Parish Sheriff

The Parish Engineer will be responsible for contacting each of the committee members during January of every year. Members will have a one month period in which to respond to initiate a meeting if any one member feels that issues need to be addressed. The Parish Engineer will also be responsible for maintaining plan review comments. Members of the evaluation committee will evaluate and monitor the plan on an ongoing basis using phone calls and emails to contact those responsible for implementing the plan's action items and bring the project status reports to the yearly evaluation meetings. Ideas to be discussed will include, but are not limited to, the following:

- Monitoring changes to the committee membership.
    - Does it need to be updated?
- Monitoring recent hazard events.
    - Have any new hazard events occurred?
- Monitoring funding.
    - Has new funding been allotted?
- Monitoring and evaluating the plan's actions and projects.
    - Have any projects or actions been implemented?
    - Have the project or action priorities changed?

    - Were the projects and actions implemented in an acceptable time frame?
    - Were there any problems encountered with their implementation?
    - Was the best suited participating department assigned to the proper actions?
    - Are there any new projects or actions to discuss?
- Monitoring changes to the risk assessment.
    - Are there any changes to land development that affect hazard mitigation priorities?
    - Is there any new data that needs to be incorporated?
- Monitoring the plan's goals, objections, actions and projects.
    - Are they still relevant?

The Steering Committee reviewed all of the above criteria during the planning process. In addition to the yearly evaluations and the questions listed above, additional considerations will be made during the formal update process to be completed and approved by FEMA within a five-year cycle. Updates to the Hazard Mitigation Plan will be made fully utilizing the representation of the HMP Evaluation Committee formed for this purpose. The Parish Engineer will initiate the formal update process one year before the plan expires.

Incorporating Hazard Mitigation into Existing Plans

Members of local and parish departments who interact on planning issues, such as the Parish President, Parish Grant Administrator, Parish Director of Planning and Zoning, Parish Engineer, Parish OEP Director, Sheriff, Chairperson of the drainage district or his engineering representative, will meet on an annual basis to ensure that the Parish incorporates hazard mitigation into its future planning activities and that the relevance of the HMP's risks and vulnerabilities identified, as well as the goals, objectives, and actions for mitigating the risks, will be considered in future updates to the other local planning mechanisms.

When appropriate, Parish Government, by way of the individuals who served on the Steering Committee and the HMP Evaluation Committee, will address the need to incorporate requirements of the mitigation plan into the respective zoning ordinances, comprehensive plans, and/or capital improvement plans if deemed necessary and if not previously included. An effort will be made by all Steering Committee members to ensure consistency in all future planning efforts with the mitigation goals and risk assessment presented in this plan. Consistency between all planning efforts will ensure a decrease in losses related to hazard events within future and existing developments. During the last five year update cycle, the former hazard mitigation plan's (2009) goals were not incorporated into any other planning mechanisms. However, the goals and hazard mitigation priorities were discussed frequently in council meetings at the parish level. If amendments to existing ordinances or new ordinances are required, the Parish Council will be responsible for its respective updates.

Continued Public Involvement

Responsibility for continued public participation will be that of the parish Engineer. Copies of the plan will be kept on file at the parish government office. In this chapter the parish lists the plan evaluation committee that can be contacted. In addition, copies of the plan and any proposed changes will be posted on the parish government website. This website will also have an e-mail address and phone numbers to which the public can direct their comments or concerns. The local newspaper will also be notified if HMP issues arise.

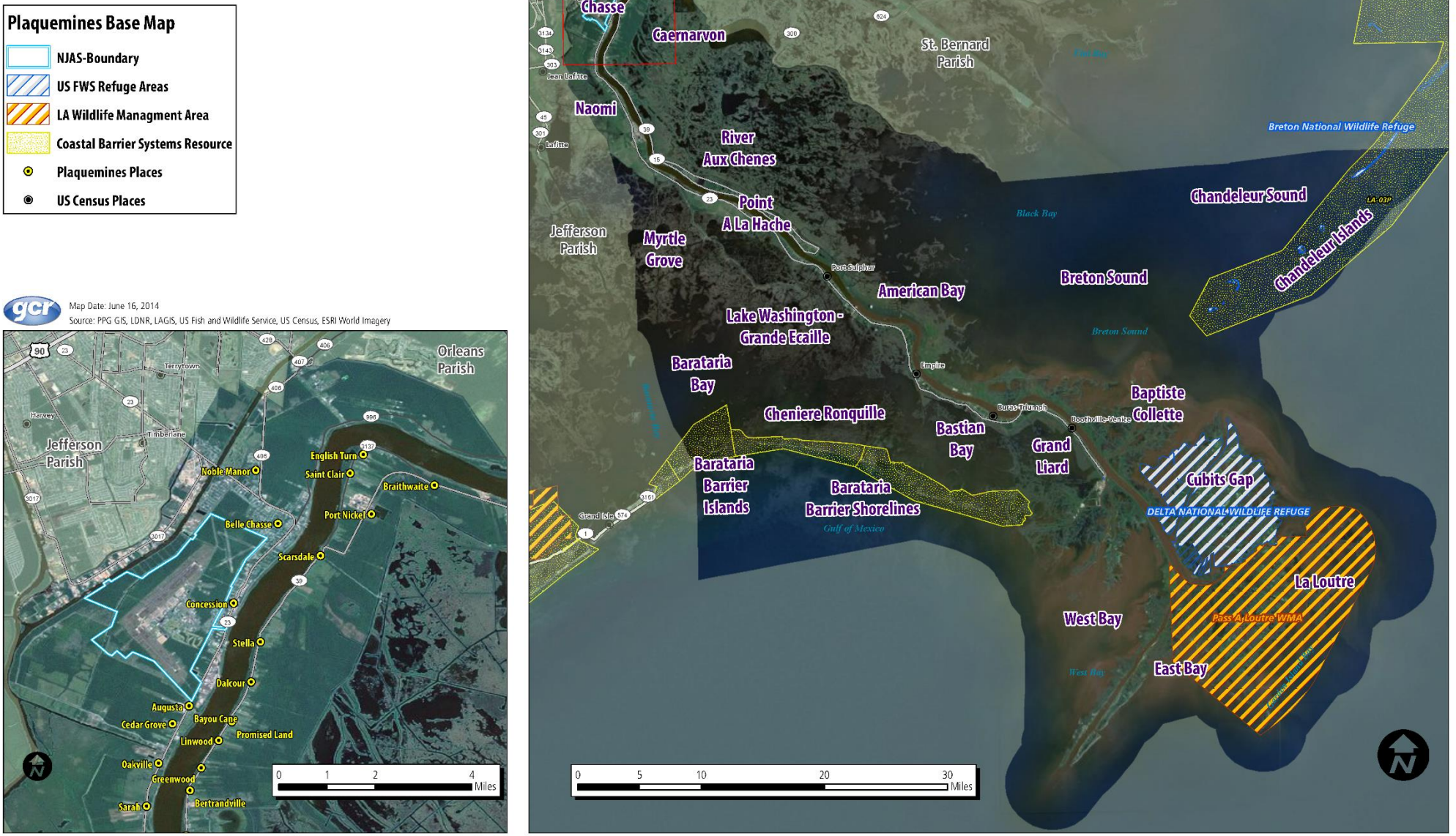
Changes in Development

Plaquemines Parish has not seen any significant change in development patterns since the previous planning process in 2009. The above responsible parties will continue to monitor changes in development in line with HMP Actions 4.1.1 and 4.1.2.

Chapter 7 Appendices

Appendix A: Maps

Plaquemines Parish
Hazard Mitigation Plan Update 2015

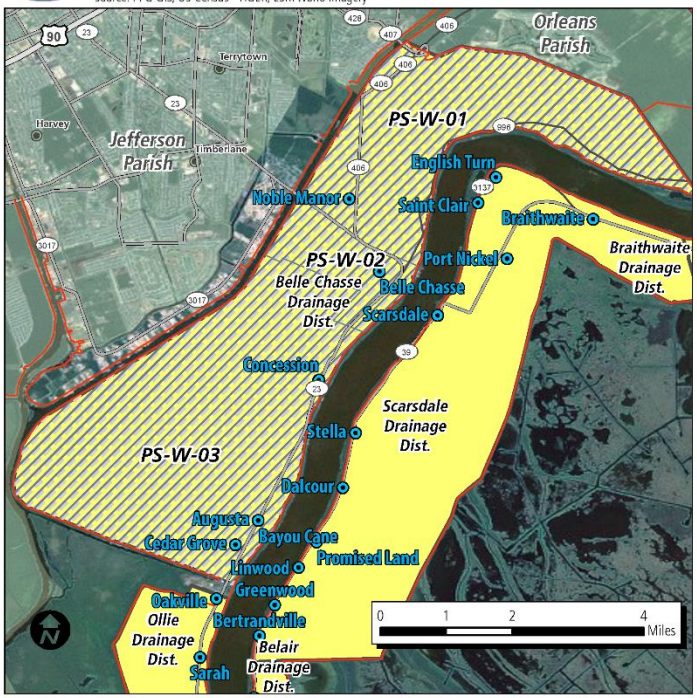


Map 1: Plaquemines Base Map

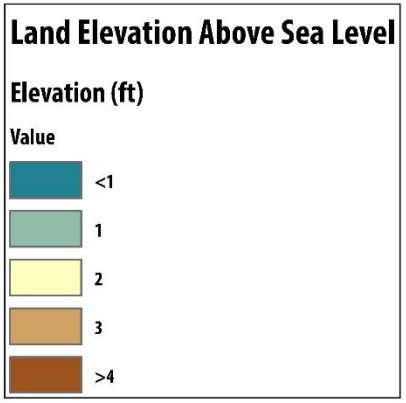
Drainage and Levees: Fastlands

- Basin - Pumping Station
- Drainage Districts
- Levee
- Plaquemines Places

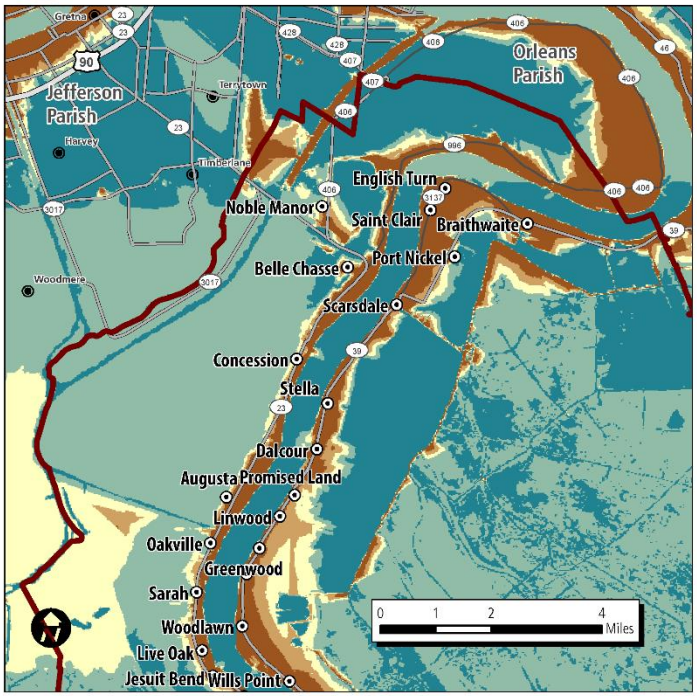
Map Date: July 30, 2014
Source: PPG GIS, US Census - TIGER, ESRI World Imagery

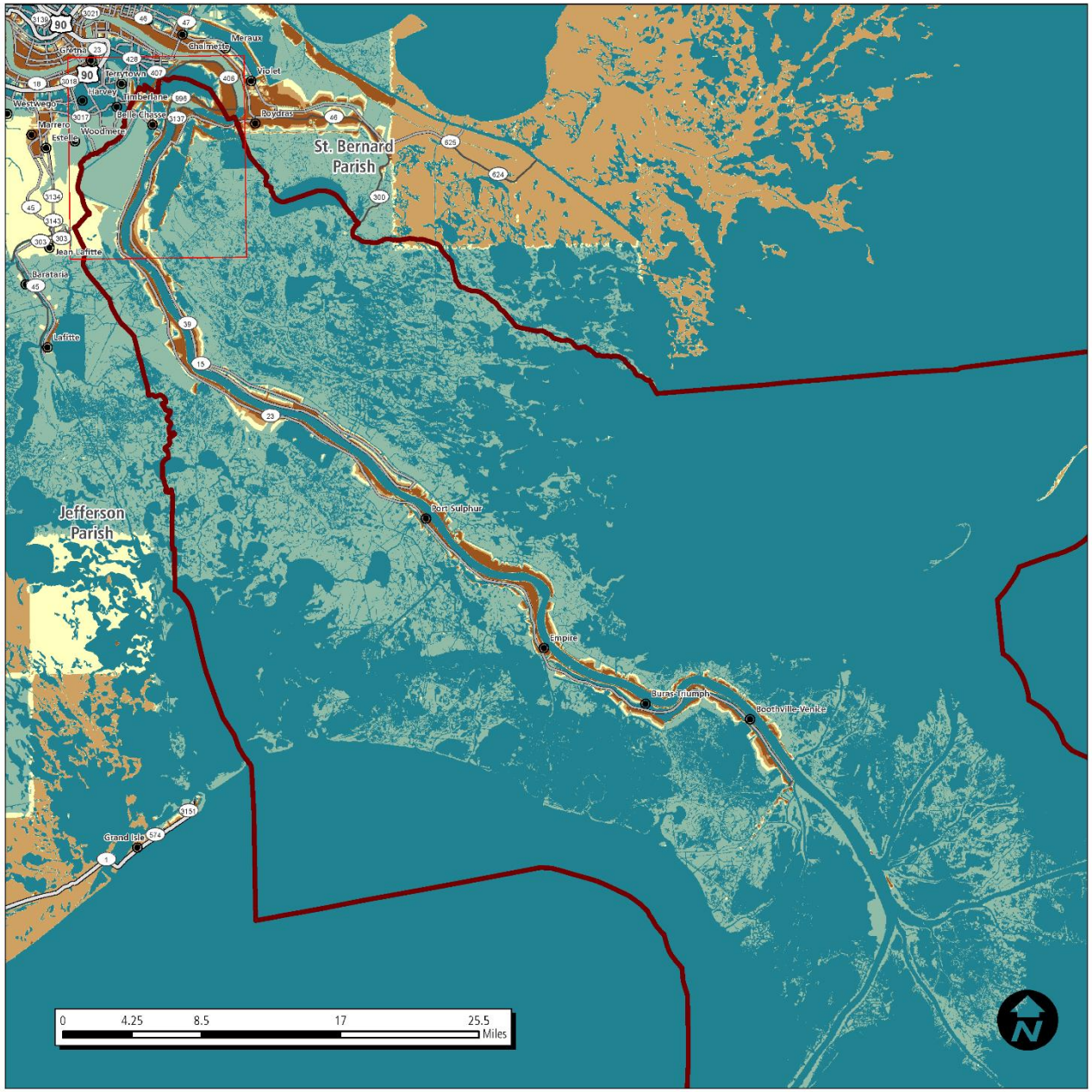


Map 2: Drainage and Levees

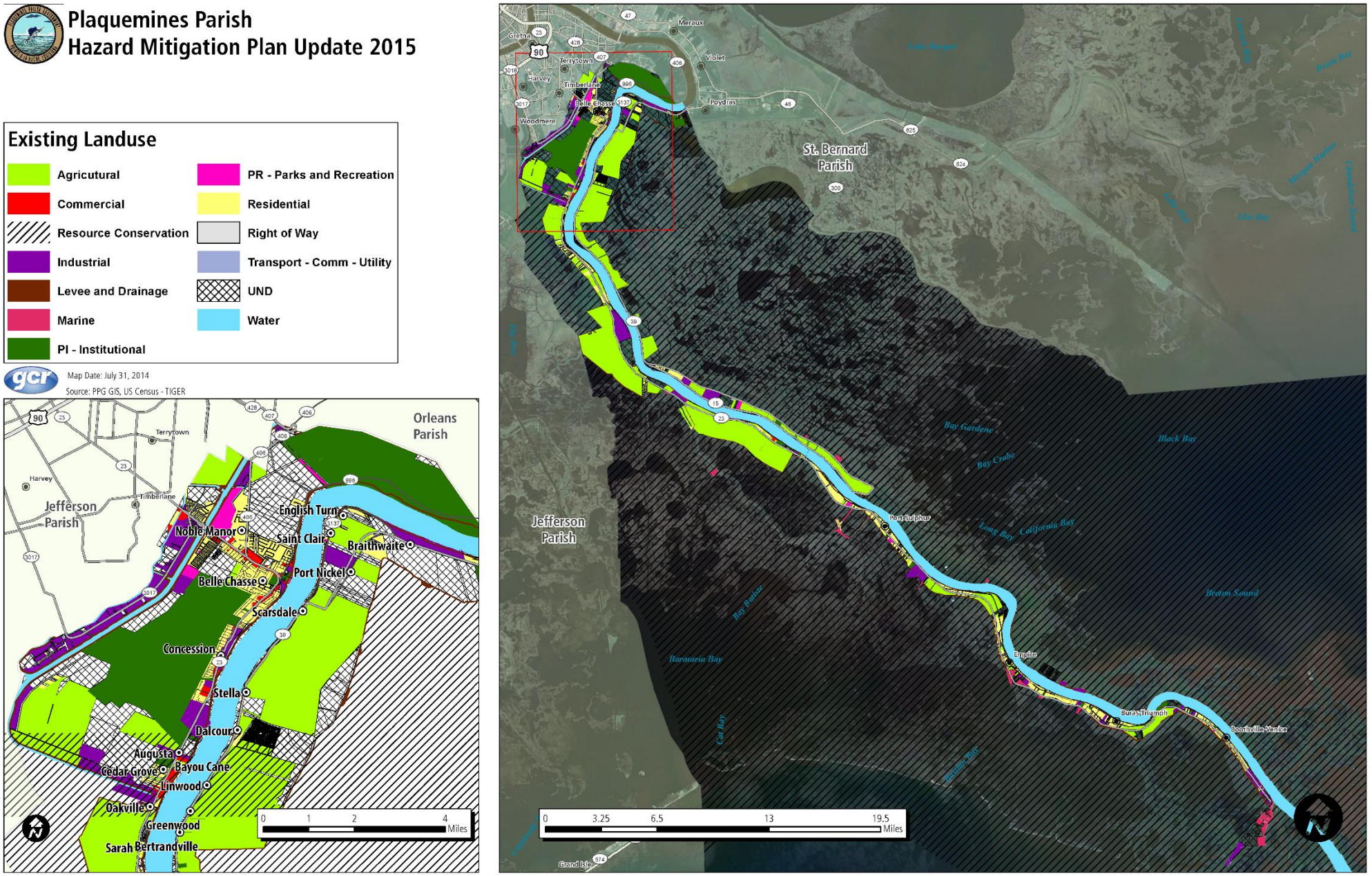


Map Date: June 20, 2014
Source: LSU Lidar, US Census - TIGER



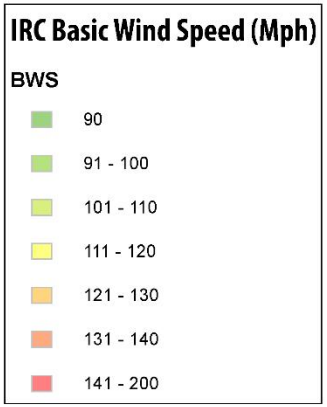


Map 3: Land Elevation Above Sea Level

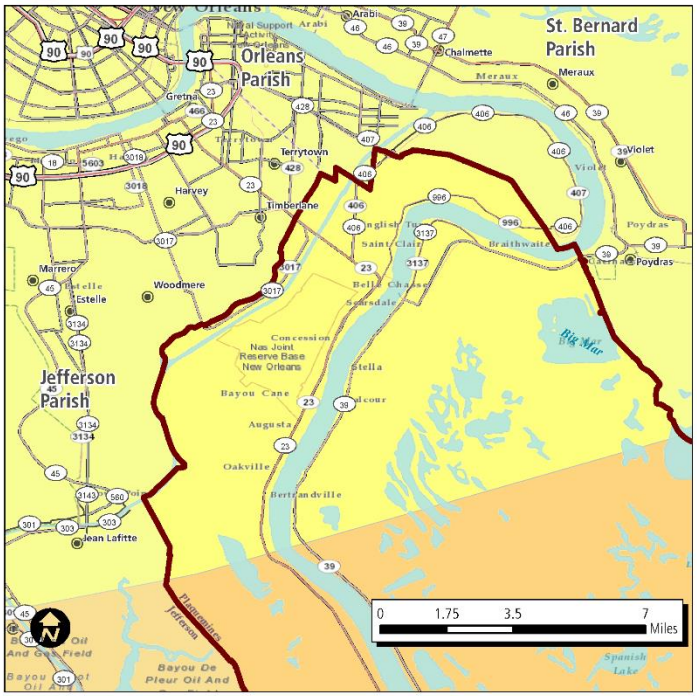


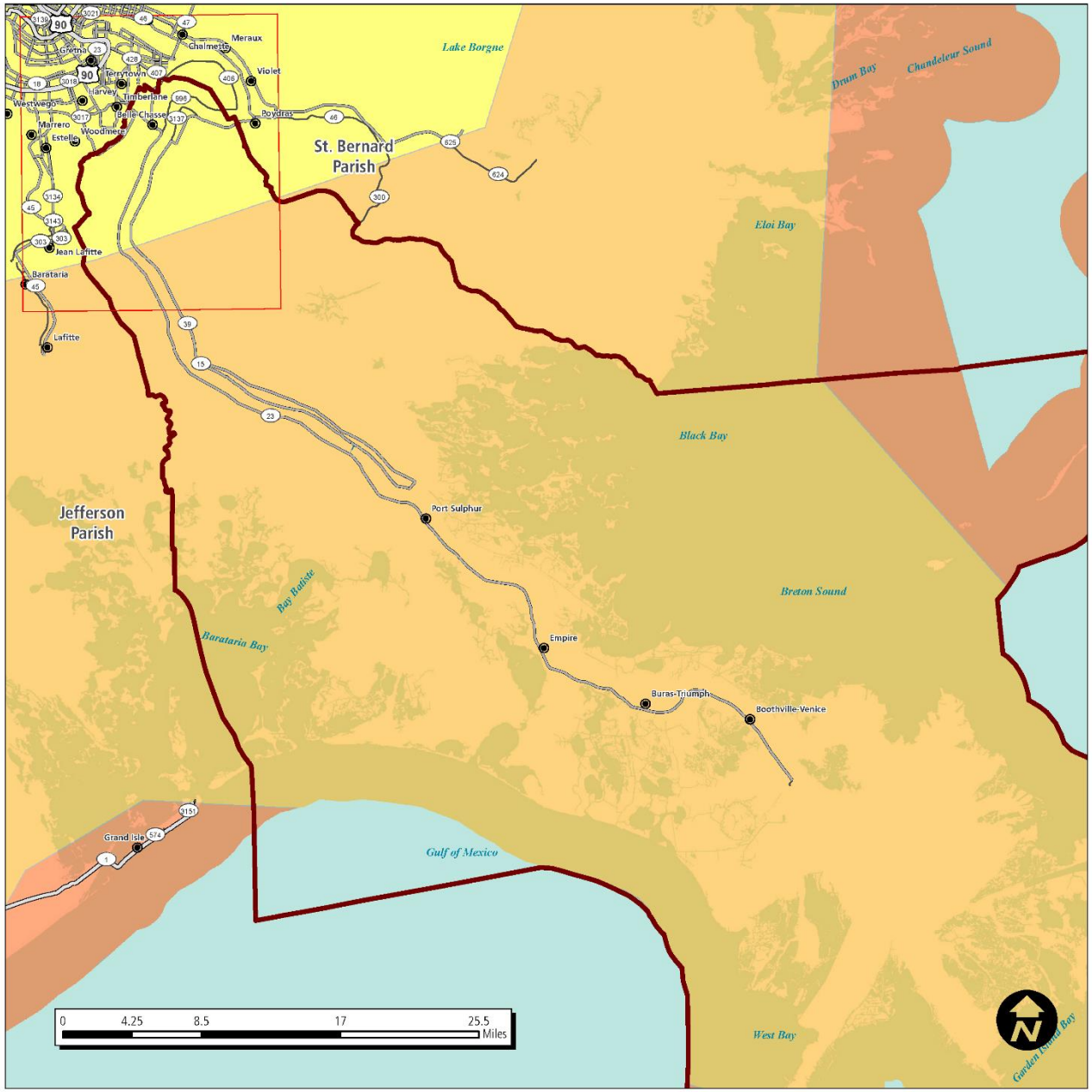
Map 4: Existing Land Use

Plaquemines Parish
Hazard Mitigation Plan Update 2015



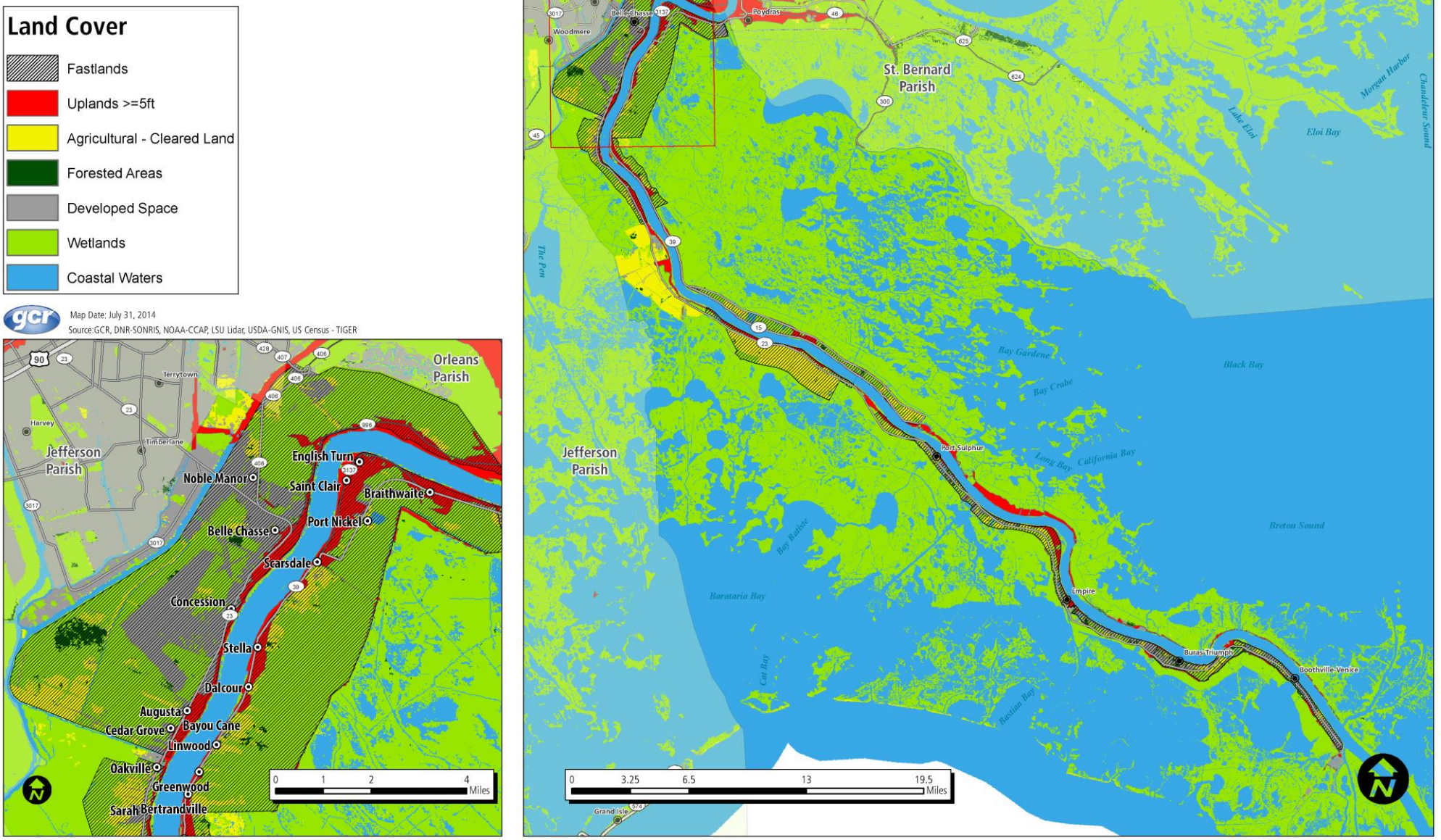
Map Date: June 20, 2014
Source: Louisiana State Uniform Construction Code Council, LSU AgCenter, US Census - TIGER



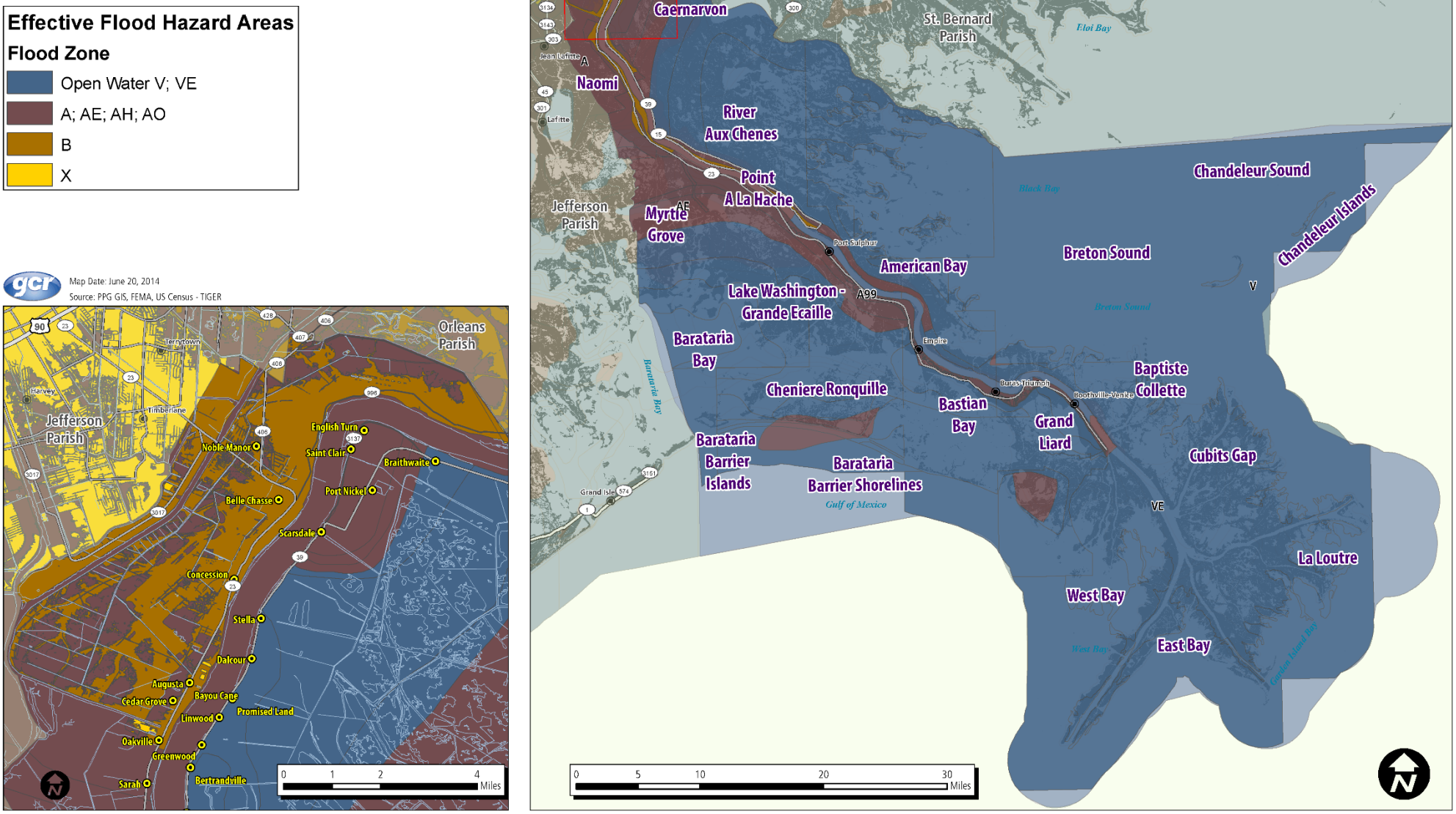


Map 5: IRC Basic Wind Speed

Plaquemines Parish
Hazard Mitigation Plan Update 2015



Map 6: Land Cover



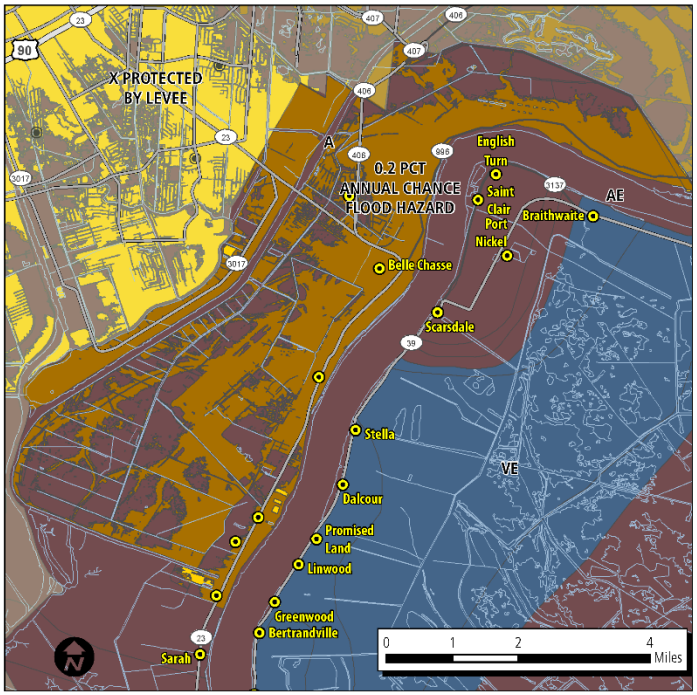
Map 7: Effective Flood Map

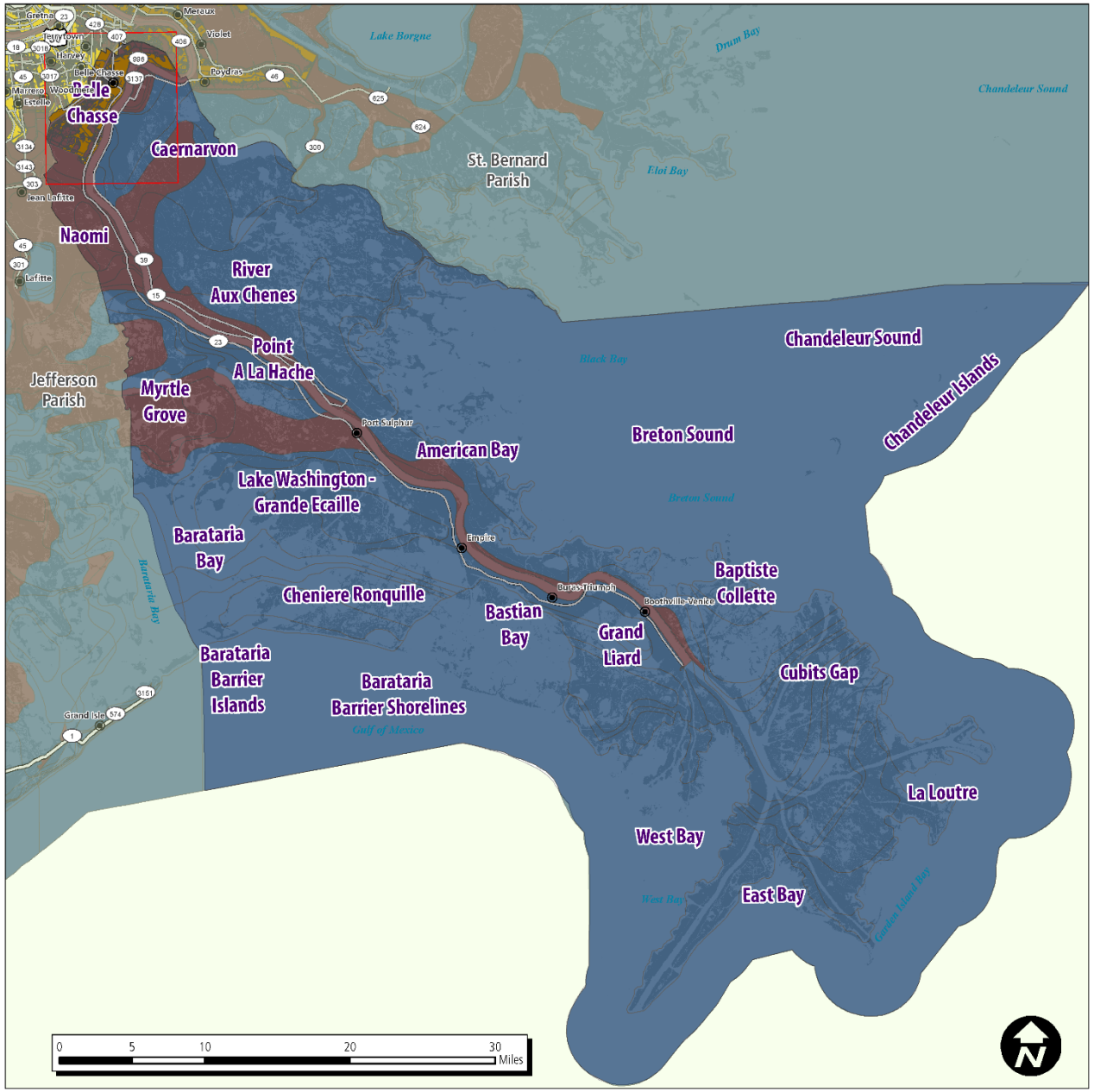
Preliminary Flood Hazard Areas

Flood Zone

- Open Water; V; VE
- A; AE; AH; AO
- B
- X

Map Date: June 20, 2014
Source: PPG GIS, FEMA, US Census - TIGER





Map 8: Preliminary Flood Map

Plaquemines Parish
Hazard Mitigation Plan Update 2015

Repetitive Flood Loss Properties: Uninsured Density

Low — Medium — High

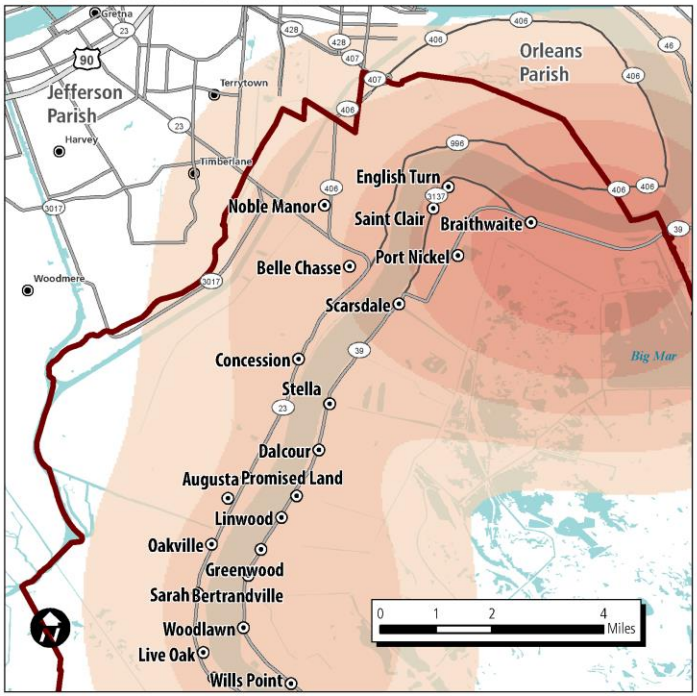
SRL Property Insured Status	
Yes	142
No	232
SDF	32
Total	406

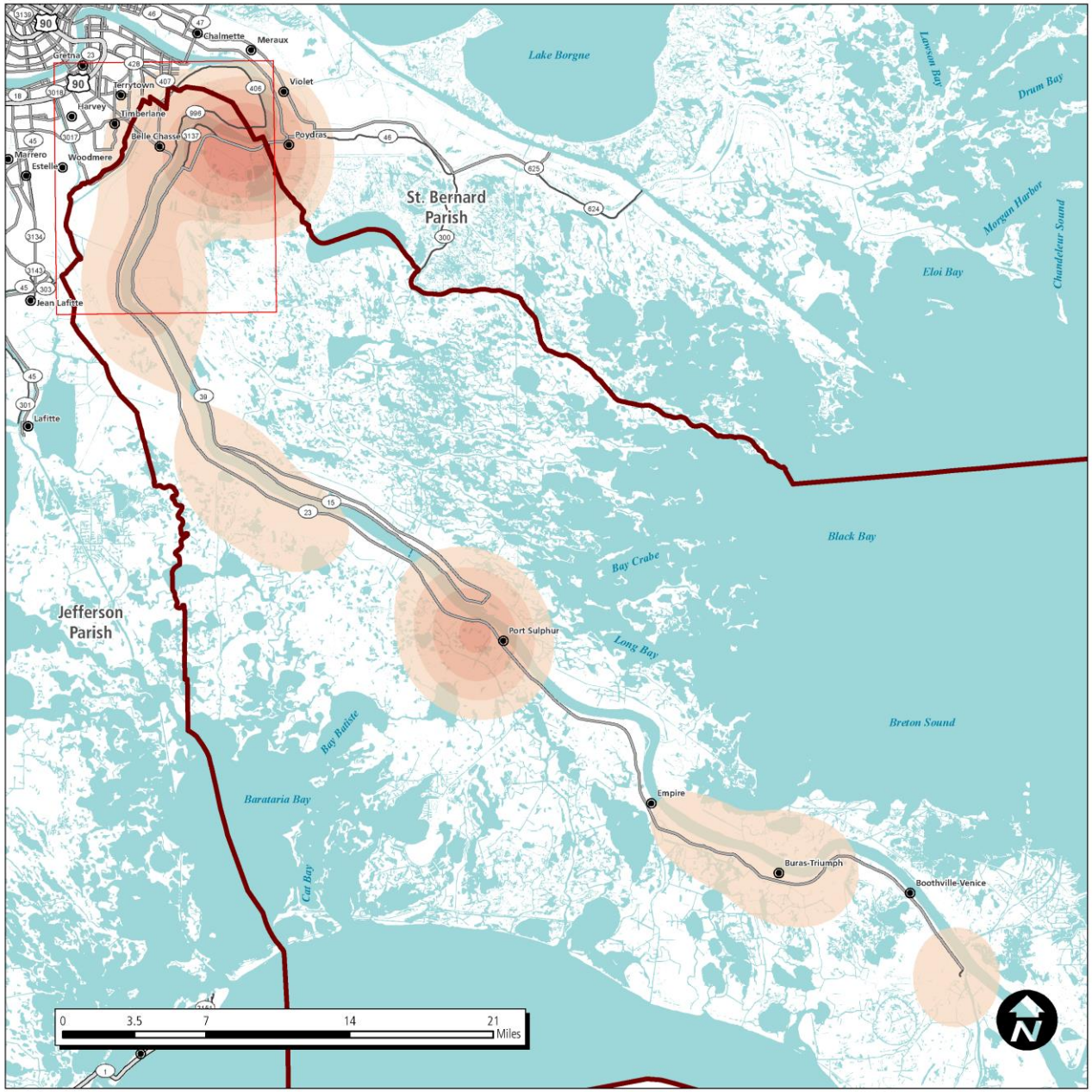
*SDF indicates a property which is a RFL property and has applied for coverage and whose application is currently being processed by the Special Direct Facility or properties whose RFL status is currently being challenged.

gcr

Map Date: July 23, 2014

Source: Plaquemines Parish, FEMA, US Census - TIGER





Map 9: Uninsured Repetitive Flood Loss Properties

Plaquemines Parish
Hazard Mitigation Plan Update 2015

Repetitive Flood Loss Properties: Overall Density

Low — Medium — High

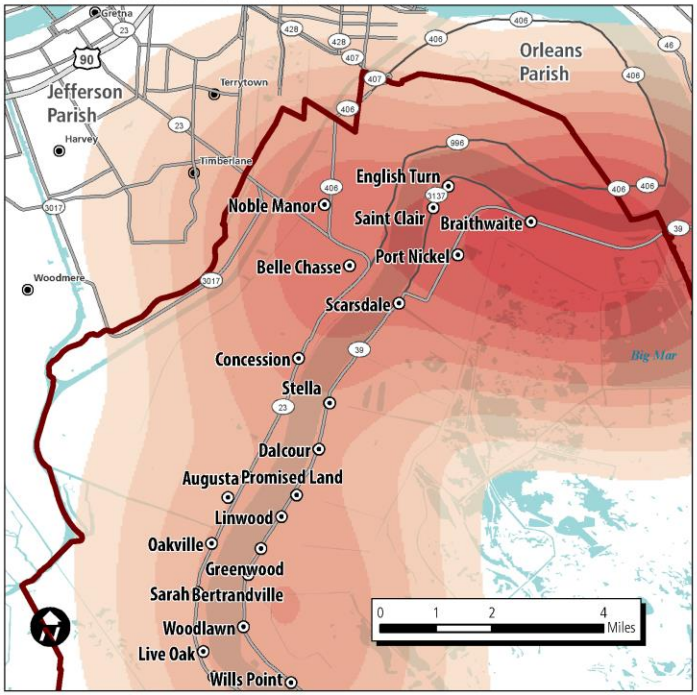
SRL Property Insured Status	
Yes	142
No	232
SDF	32
Total	406

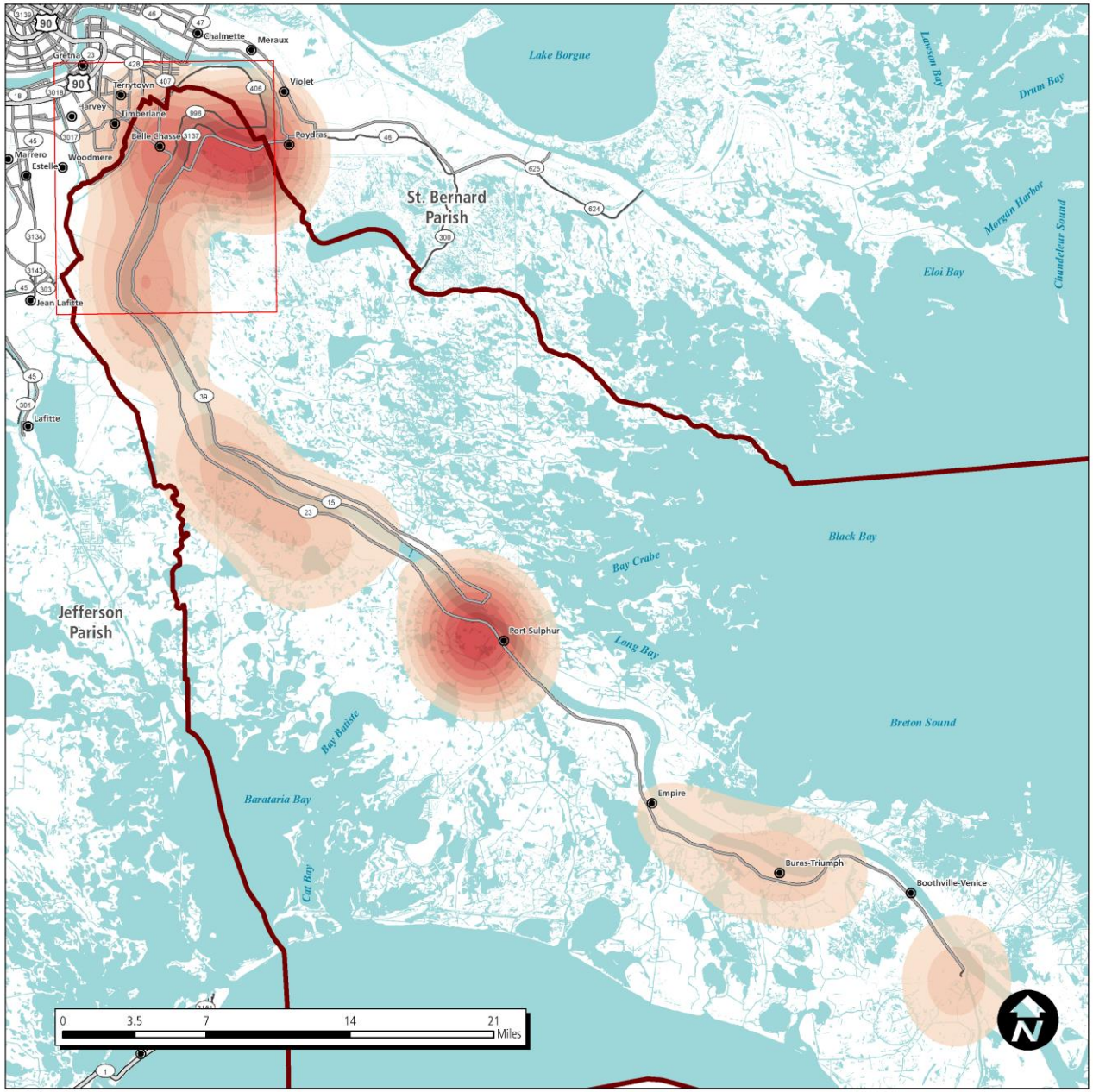
*SDF indicates a property which is a RFL property and has applied for coverage and whose application is currently being processed by the Special Direct Facility or properties whose RFL status is currently being challenged.

gcr

Map Date: July 23, 2014

Source: Plaquemines Parish, FEMA, US Census - TIGER





Map 10: Repetitive Flood Loss Properties

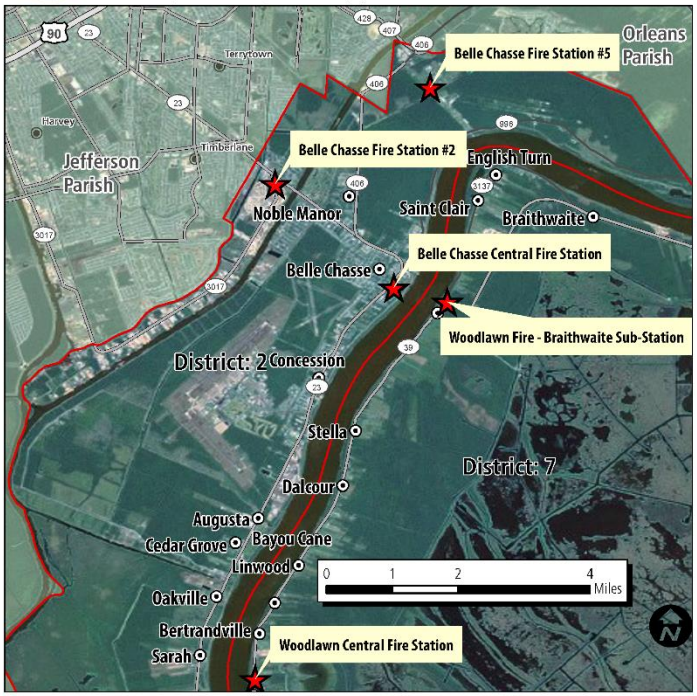
Plaquemines Parish
Hazard Mitigation Plan Update 2015

Critical Facilities: Fire Department

- Fire Stations
- Fire-Districts

NAME
Pointe a la Hache Fire Department - District 1
Belle Chasse 1 - District 2
Port Sulphur Fire Department - District 3
Buras Volunteer Fire Department - District 4
Boothville-Venice Volunteer Fire Department - District 5
Lake Hermitage Volunteer Fire Department - District 6
Braithwaite Volunteer Fire Department - District 7
Scottville Fire Station - Volunteer
Belle Chasse 2 Fire Department
Myrtle Grove Fire Station

gcr Map Date: July 30, 2014
Source: PPG GIS, US Census - TIGER, ESRI World Imagery



Map 11: Fire Department Facilities

Plaquemines Parish
Hazard Mitigation Plan Update 2015

Critical Facilities:
Hospitals and Medical Services

H Health Centers

Map ID	NAME
HM1	Plaquemines Parish Comprehensive Care Center/Hospital
HM4	Belle Chasse Family Medical Center
HM5	HealthSouth Medical Clinic

gcr Map Date: July 30, 2014
Source: PPG GIS, US Census - TIGER, ESRI World Imagery

Map 12: Medical Facilities

Plaquemines Parish
Hazard Mitigation Plan Update 2015

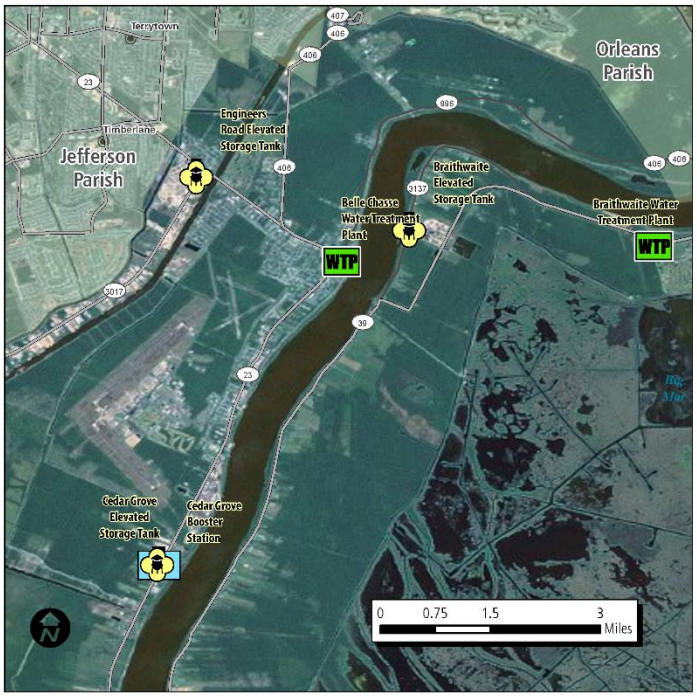
Potable Water

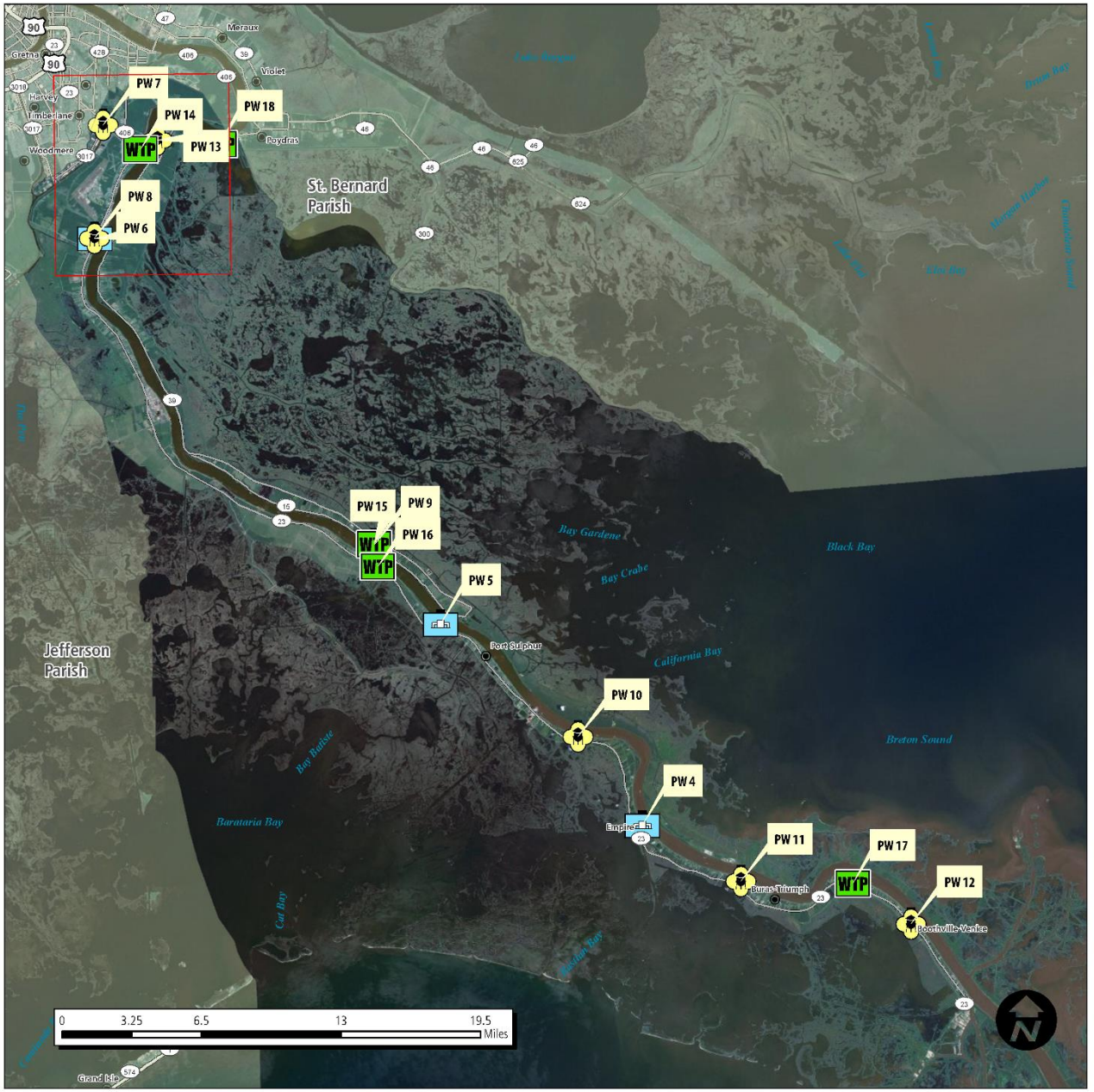
- Enclosed Storage Facility
- Pump Station
- Treatment Plant

Map ID	Location - Description
PW 4	Empire Booster Station
PW 5	Diamond Booster Station
PW 6	Cedar Grove Booster Station
PW 7	Engineers Road Elevated Storage Tank
PW 8	Cedar Grove Elevated Storage Tank
PW 9	Pointe A La Hache Elevated Storage Tank
PW 10	Home Place Elevated Storage Tank
PW 11	Buras Elevated Storage Tank
PW 12	Boothville Elevated Storage Tank
PW 13	Braithwaite Elevated Storage Tank
PW 14	Belle Chasse Water Treatment Plant
PW 15	Pointe A La Hache Water Treatment Plant
PW 16	Port Sulphur Water Treatment Plant
PW 17	Boothville Water Treatment Plant
PW 18	Braithwaite Water Treatment Plant

gcr

Map Date: June 16, 2014
Source: PPG GIS, US Census - TIGER, ESRI World Imagery





Map 13: Potable Water Facilities

Plaquemines Parish
Hazard Mitigation Plan Update 2015

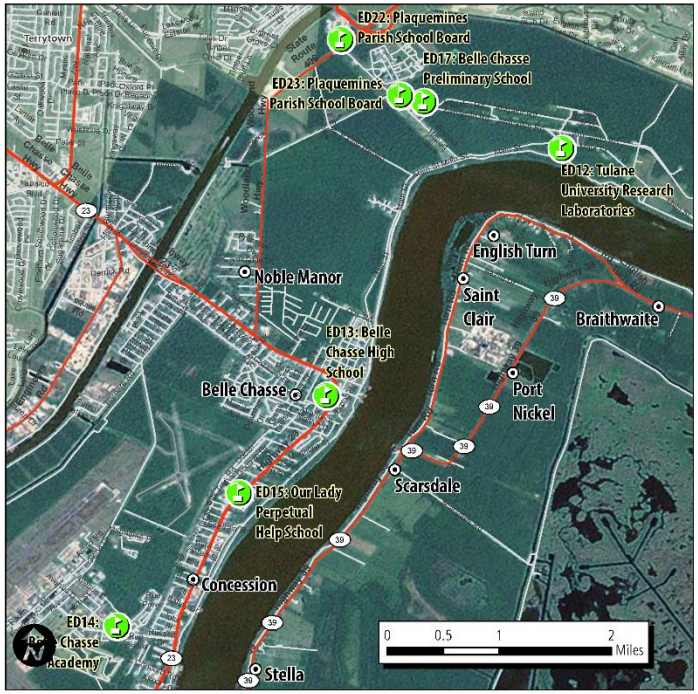
Critical Facilities: Schools

Schools

Map ID	NAME
ED14	Belle Chasse Academy
ED13	Belle Chasse High School
ED1	Belle Chasse Middle School
ED17	Belle Chasse Preliminary School
ED3	Boothville-Venice Elementary School
ED15	Our Lady Perpetual Help School
ED7	Phoenix High School
ED21	Plaquemines Parish Learning Center
ED22	Plaquemines Parish School Board
ED23	Plaquemines Parish School Board
ED19	South Plaquemines Elementary School
ED5	South Plaquemines High School
ED12	Tulane University Research Laboratories

gcr

Map Date: July 29, 2014
Source: PPG GIS, Plaquemines Parish School Board, US Census - TIGER, Esri World Imagery



Map 14: School Facilities

Plaquemines Parish
Hazard Mitigation Plan Update 2015

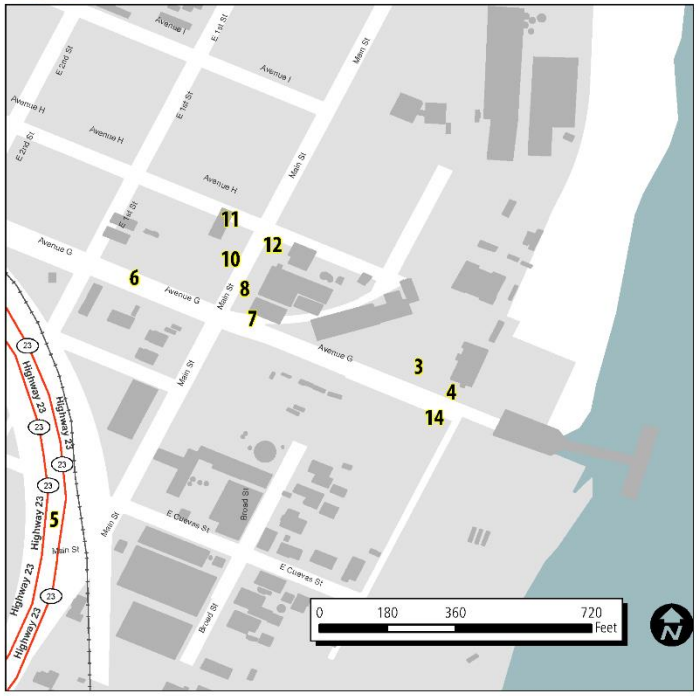
MapID	Name
PPSO 1	holding cell trailer
PPSO 2	WAREHOUSE
PPSO 3	Medical Trailer at Lock-up
PPSO 4	BC LOCKUP
PPSO 5	CRIME PREVENTION
PPSO 6	DETECTIVE BUREAU
PPSO 7	ANNEX BLDG
PPSO 8	CRIMINAL RECORDS/CIVIL/IT
PPSO 9	DIST II TRAILER
PPSO 10	TAX DEPT TRAILER
PPSO 11	Tax Dept Storage Trailer
PPSO 12	DOMESTIC VIOLENCE TRAILER
PPSO 13	Myrtle Grove Range Trailer
PPSO 14	Evidence Room Trailer
PPSO 15	NEW PRISON
PPSO 16	Bank Bldg
PPSO 17	DIST III SUB-OFFICE
PPSO 18	NARCOTICS
PPSO 19	INTERNAL AFFAIRS

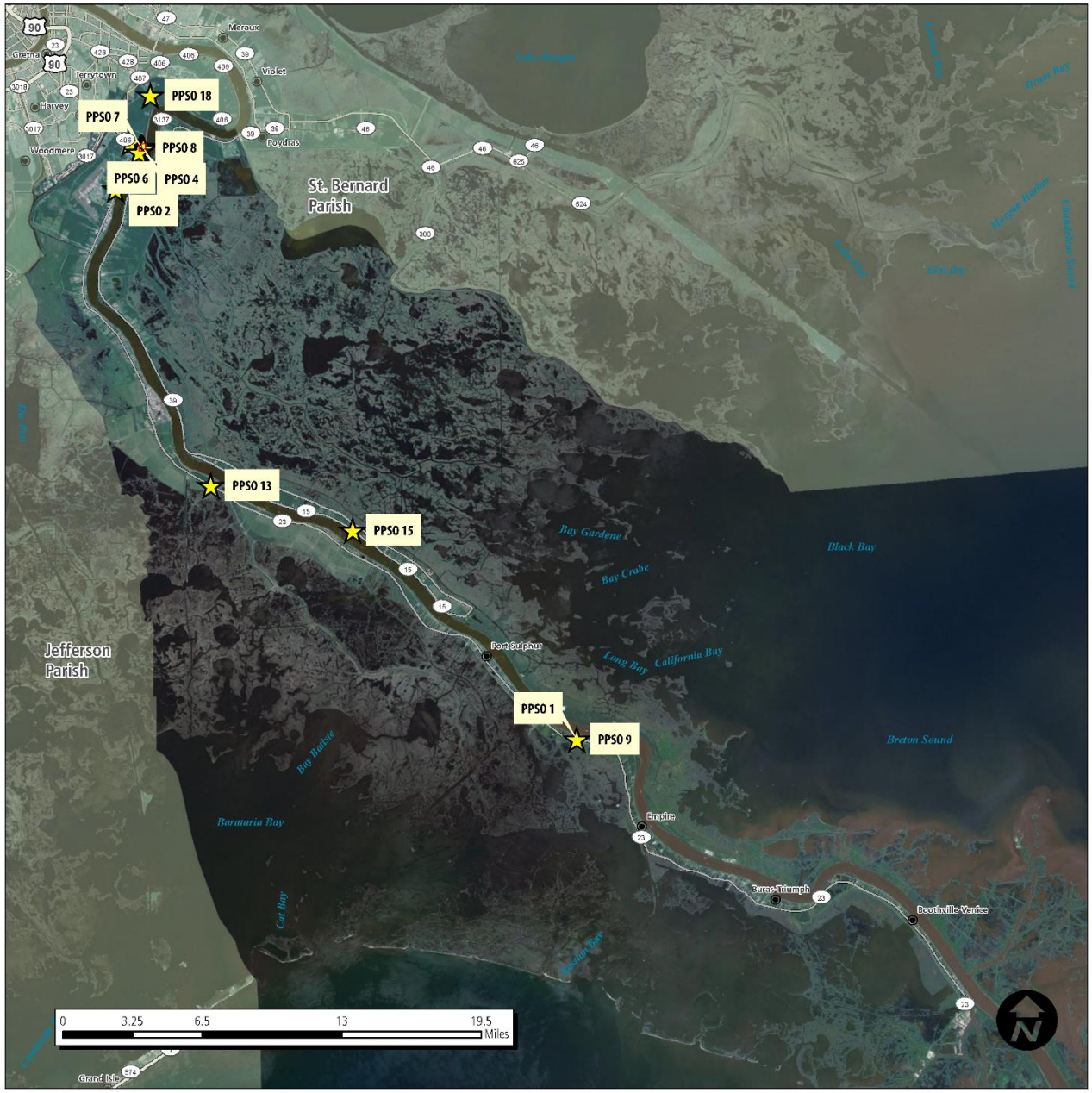
Critical Facilities: Sheriff's Department

- Sheriffs Dept
- Buildings
- Parcels

gcr

Map Date: June 16, 2014
PG GIS, US Census - TIGER, ESRI World Imagery





Map 15: Sheriff's Department Facilities

Plaquemines Parish
Hazard Mitigation Plan Update 2015

Waste Water

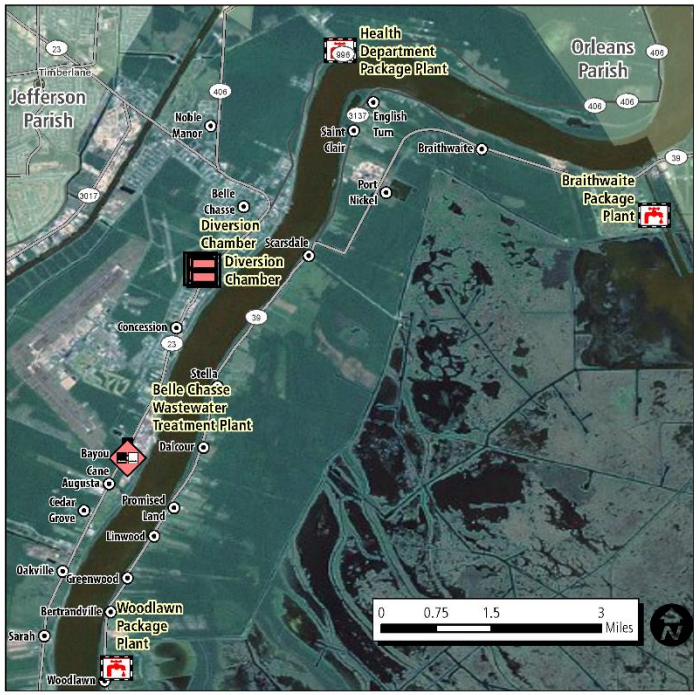
Network Structure - WW

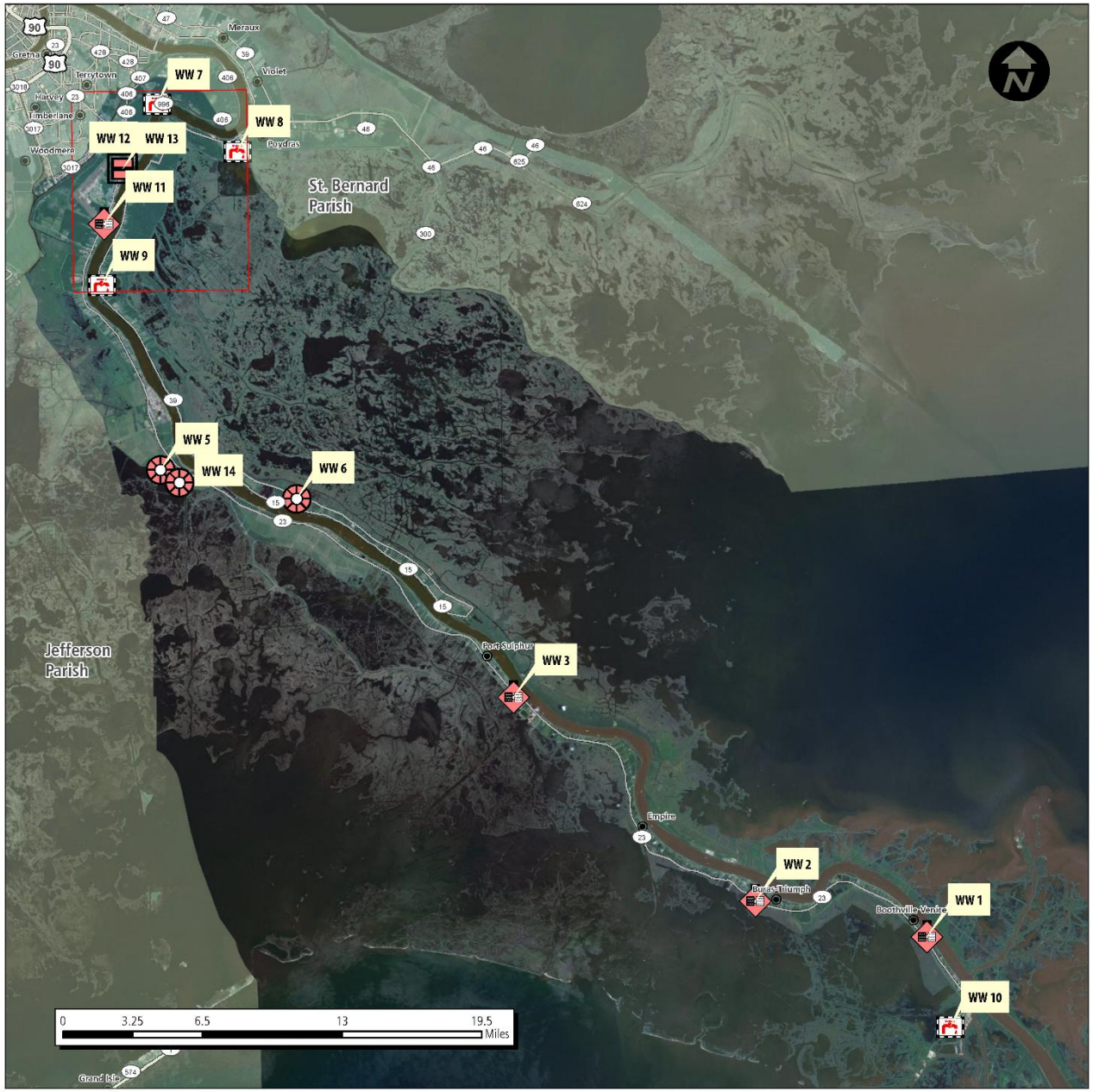
- DiversionChamber
- OxidationPond
- PackagePlant
- TreatmentPlant

Map ID	Description - Location
WW 1	Boothville Wastewater Treatment Plant
WW 2	Buras Wastewater Treatment Plant
WW 3	Port Sulphur Wastewater Treatment Plant
WW 5	Ironton Oxidation Ponds
WW 6	Davant Oxidation Ponds
WW 7	Health Department Package Plant
WW 8	Braithwaite Package Plant
WW 9	Woodlawn Package Plant
WW 10	Tidewater Package Plant
WW 11	Belle Chasse Wastewater Treatment Plant
WW 12	Diversion Chamber
WW 13	Diversion Chamber
WW 14	Oxidation Pond

gcr

Map Date: June 16, 2014
Source: PPG GIS, US Census - TIGER, ESRI World Imagery





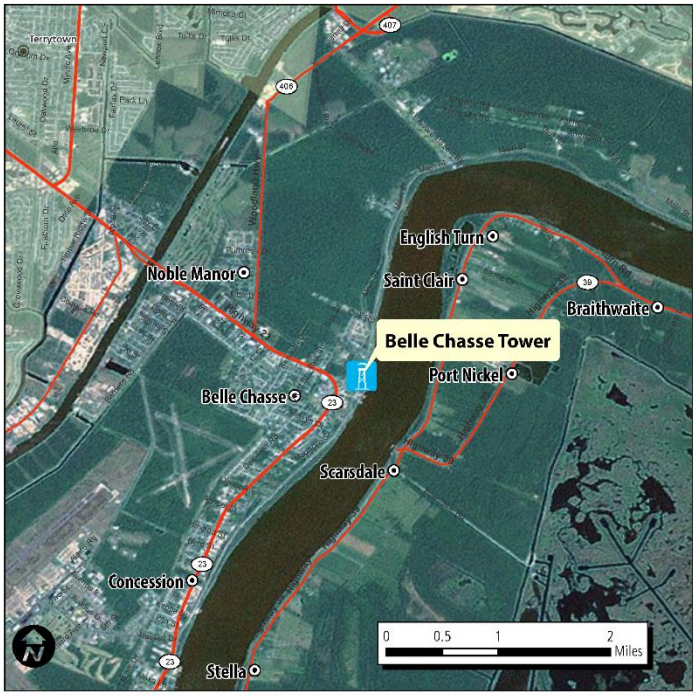
Map 16: Waste Water Facilities

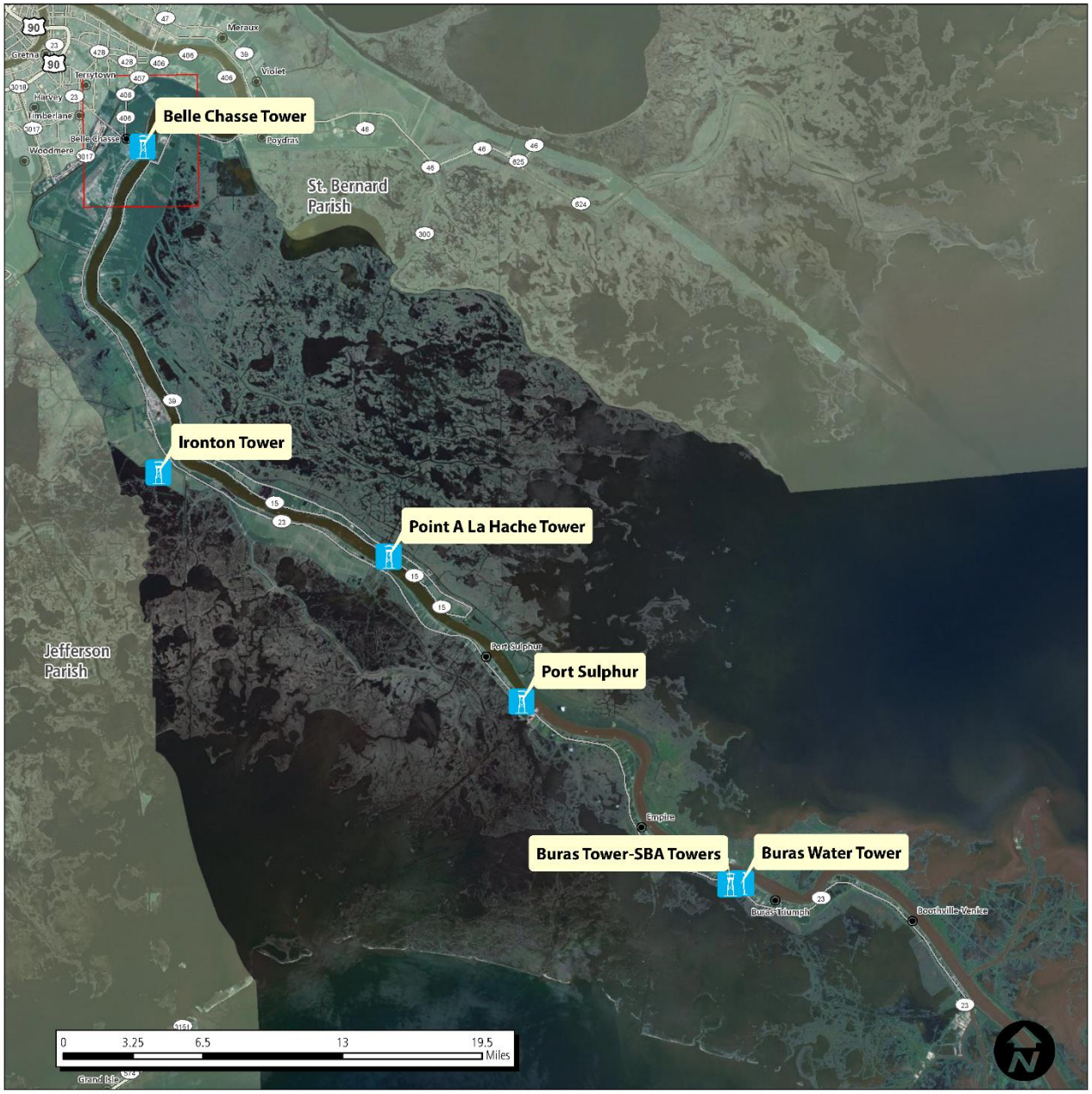
Critical Facilities: Backhaul Commnication Network

Towers

*Note: The East Point ala Hache Tower is pending a move to a location to be determined.

Map Date: August 11, 2014
Source: PPG GIS, US Census - TIGER, ESRI World Imagery



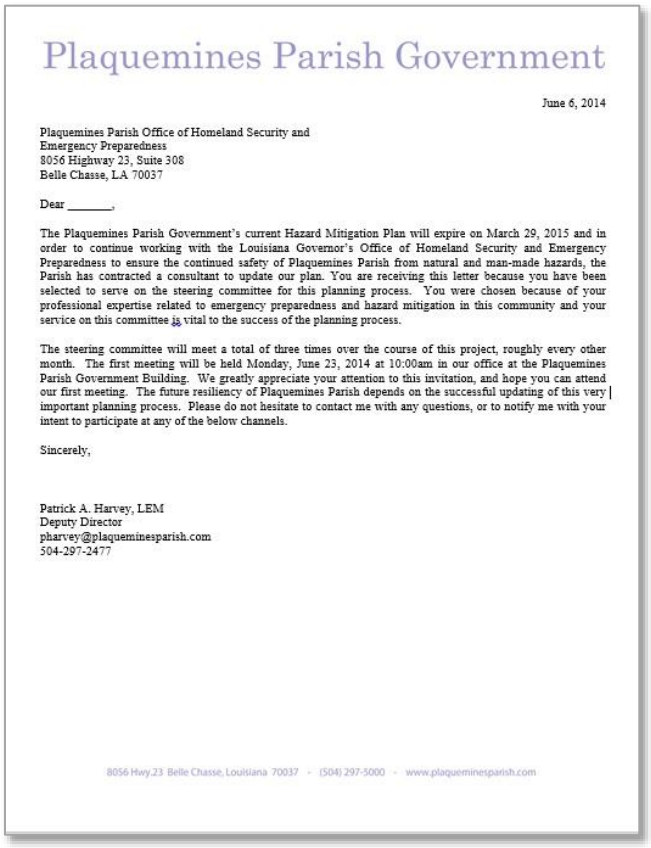


Map 17: Communications Facilities

Appendix B: Meeting Documents

Steering Committee Meeting 1

The Hazard Mitigation Planning Team met with the members of the Steering Committee for the first time on June 24, 2014 at the Plaquemines Parish Emergency Operations Center, Plaquemines Parish Government Building. The purpose of the meeting was to introduce the committee to the HMPU process and set expectations. The committee was also asked to select the hazards for the plan update and review the goals set forth in the 2009 plan and suggest edits or new goals for the update.



Plaquemines Parish Government

June 6, 2014

Plaquemines Parish Office of Homeland Security and
Emergency Preparedness
8056 Highway 23, Suite 308
Belle Chasse, LA 70037

Dear _____,

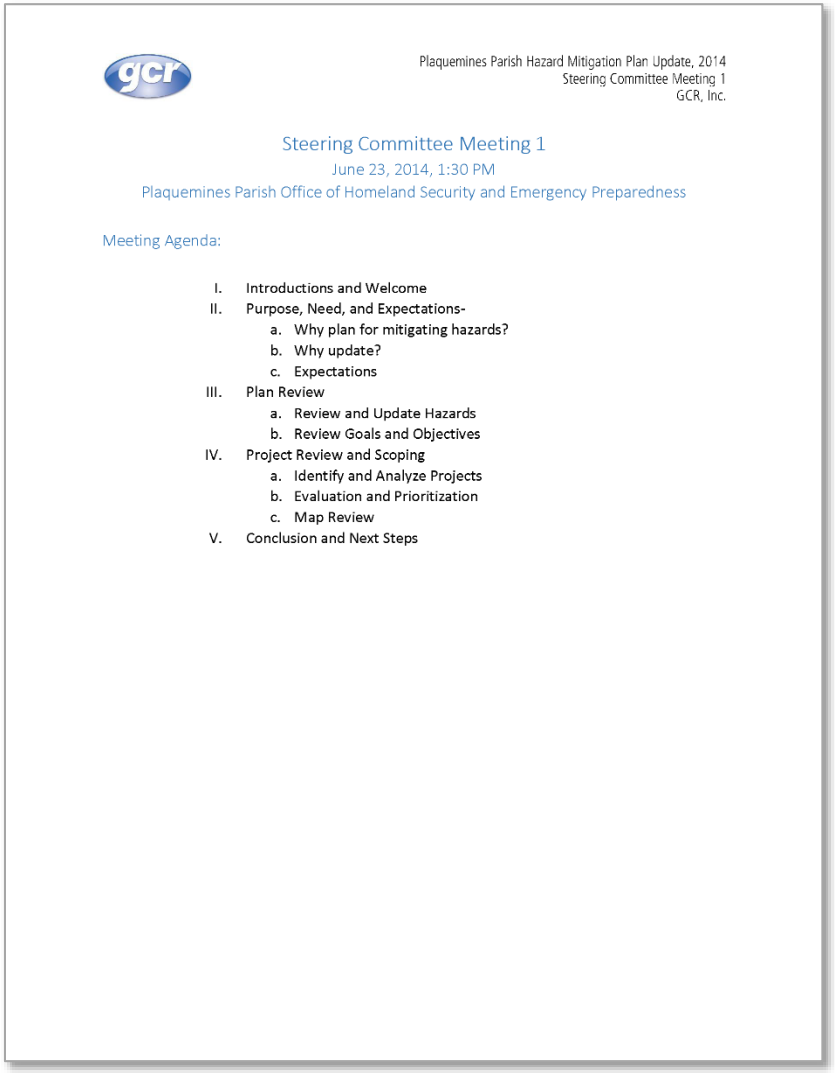
The Plaquemines Parish Government's current Hazard Mitigation Plan will expire on March 29, 2015 and in order to continue working with the Louisiana Governor's Office of Homeland Security and Emergency Preparedness to ensure the continued safety of Plaquemines Parish from natural and man-made hazards, the Parish has contracted a consultant to update our plan. You are receiving this letter because you have been selected to serve on the steering committee for this planning process. You were chosen because of your professional expertise related to emergency preparedness and hazard mitigation in this community and your service on this committee is vital to the success of the planning process.

The steering committee will meet a total of three times over the course of this project, roughly every other month. The first meeting will be held Monday, June 23, 2014 at 10:00am in our office at the Plaquemines Parish Government Building. We greatly appreciate your attention to this invitation, and hope you can attend our first meeting. The future resiliency of Plaquemines Parish depends on the successful updating of this very important planning process. Please do not hesitate to contact me with any questions, or to notify me with your intent to participate at any of the below channels.

Sincerely,

Patrick A. Harvey, LEM
Deputy Director
pharvey@plaqueminesparish.com
504-297-2477

8056 Hwy.23 Belle Chasse, Louisiana 70037 • (504) 297-5000 • www.plaqueminesparish.com



Plaquemines Parish Hazard Mitigation Plan Update, 2014
Steering Committee Meeting 1
GCR, Inc.

Steering Committee Meeting 1
June 23, 2014, 1:30 PM
Plaquemines Parish Office of Homeland Security and Emergency Preparedness

Meeting Agenda:

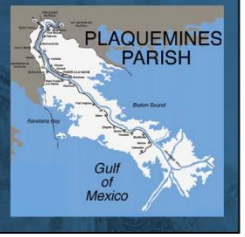
I. Introductions and Welcome
II. Purpose, Need, and Expectations-
    a. Why plan for mitigating hazards?
    b. Why update?
    c. Expectations
III. Plan Review
    a. Review and Update Hazards
    b. Review Goals and Objectives
IV. Project Review and Scoping
    a. Identify and Analyze Projects
    b. Evaluation and Prioritization
    c. Map Review
V. Conclusion and Next Steps

PLAQUEMINES PARISH HAZARD MITIGATION PLAN: STEERING COMMITTEE MEETING
Plaquemines Government Building 8056 Hwy 23 Ste. 308 Belle Chasse, LA 70037
JUNE 23, 2014
1:30PM

Name	Organization	Email
Elizabeth Griffith	GCR Inc.	egriffith@gcrincorporated.com
Tyler Antrup	GCR INC	tantrup@gcrincorporated.com
Francinia M. Henry	GCR INC.	fhenry@gcrincorporated.com
Kelly DiMarco	PPSB	kdimarco@ppsbof
Greg Simpson	PPG Drainage	greg_Simpson@Plaquemines Parish.com
Ray Robichaux JR.	PPFD	ERobichaux@
Patrick A. Harvey	PPG- OHSEP	pharvey@plaquemines parish.com
Guy Lapeyre	PPG	guy@ppgov.
Jonah Arceneaux	PPG Engineering	jarceneaux@plaquemines parish.com

Plaquemines Parish Hazard Mitigation Plan Update

Steering Committee Meeting: Meeting #1
June 23,2014
1:30 PM
Location:



SECTION I: INTRODUCTIONS & WELCOME

- Introductions
- Process and Funding Overview

PRESENTATION AGENDA

I. **Introductions and Welcome**
II. Purpose, Need, and Expectations
III. Plan Review
IV. Project Review and Scoping
V. Conclusion

PROCESS

SECTION II: PURPOSE, NEED, AND EXPECTATIONS

I. Introductions and Welcome
II. **Purpose, Need, and Expectations**
III. Plan Review
IV. Project Review and Scoping
V. Conclusion

Purpose, Need, and Expectations: Why Plan for Mitigating Hazards?

Hazard Mitigation:

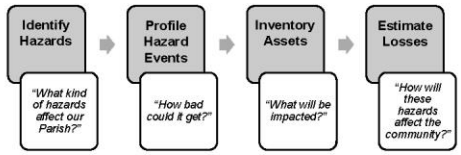
Sustained actions taken to reduce or eliminate long term risks from hazards and their effects

MITIGATION = PREVENTION

Purpose, Need, and Expectations: Definitions

- **Hazard**– *a source of potential danger*
- **Vulnerability**– *Degree of exposure or susceptibility to damage of an asset*
- **Vulnerability Assessment**– *The extent of damage that may result from a hazard event of a given intensity*
- **Risk**– *The estimated impact that a hazard would have on people, services, facilities and structures*
- **Risk Assessment**– *The process of measuring the potential loss of life, personal injury, economic injury, and property damage*

Purpose, Need, and Expectations: Risk Assessment Methodology



Purpose, Need, and Expectations: Why Update?

- Review hazards list
- Identify any hazard events since the 2009 plan
- Review current projects and identify new projects
- Draft new maps
- Review State Hazard Mitigation Plan Update

Purpose, Need, and Expectations: Expectations

- Two more Steering Committee meetings
  - September & November 2014
- Three Civic Committee meetings
  - July, August, November 2014
- Two Public Meeting presentations
  - August 14 or 28, 2014
  - September 2014

Section III: Plan Review

I. Introductions and Welcome
II. Purpose, Need, and Expectations
III. Plan Review
IV. Project Review and Scoping
V. Conclusion

Section III: Plan Review

- Review Hazards:
  - Review and Re-Identify Hazards
  - Profile Hazard Events
- Review Mitigation Goals and Objectives

Section III: Plan Review

2009 Plaquemines Parish Hazards List

- Avalanche
- **Coastal Erosion**
- **Coastal (Tropical) Storm**
- Dam Failure
- Drought
- Earthquake
- Expansive Soils
- Extreme Heat
- **Flood**
- Hail Storm
- **Hurricane**
- Land Subsidence
- Landslide
- **Levee Failure**
- **Saltwater Intrusion**
- Severe Winter Storm
- Thunderstorm/Lightening
- **Tornado**
- Tsunami
- Volcano
- Wildfire

Section III: Plan Review

2009 Hazard Mitigation Plan Update
Goals and Objectives

- Goal 1: Reduce losses to existing and future property due to hazards
- Goal 2: Protect the health and well-being of the people of Plaquemines Parish from negative effects of hazards
- Goal 3: Ensure the abilities of emergency services providers to continue operating during hazardous events
- Goal 4: Protect existing public and private infrastructure from damage

Section IV: Project Review and Scoping

I. Introductions and Welcome
II. Purpose, Need, and Expectations
III. Plan Review
IV. Project Review and Scoping
V. Conclusion

Section IV: Project Review and Scoping

- Identify and Analyze Projects
- Evaluation & Prioritization
- Map Review

Section IV: Project Review and Scoping

Types of Eligible Hazard Mitigation Projects





- » Hardening or Retrofitting of Critical Facilities
- » Drainage: Improvements to Existing Facilities
- » Elevation
- » Safe Rooms
- » 5% Initiatives (Public Education, Warning Systems, Generators, etc.)

Section V: Conclusion & Next Steps

I. Introductions and Welcome
II. Purpose, Need, and Expectations
III. Plan Review
IV. Project Review and Scoping
V. **Conclusion & Next Steps**

Section V: Conclusion and Next Steps

- Civic Group Meeting
  - July
- Steering Committee Meeting
  - September

Steering Committee Meeting #1

Plaquemines Government Building
8056 Hwy 23 Ste. 308 Belle Chasse, LA 70037
June 23, 2014
1:30PM

Meeting Attendees:

Elizabeth Griffith	Patrick A. Harvey	Roy Robichaux Jr.
Francinia Henry	Kelli Dimarco	Guy Laigast
Tyler Antrup	Greg Simpson	Jonah Arceneaux

Meeting Minutes:

I. Introductions and Welcome:

a. Introductions-- GCR, FEMA/GOHSEP, Parish Representatives:
   i. E. Griffith introduced herself and members of the GCR TEAM.
   ii. E. Griffith then asked everyone with the Steering Committee to go around the room and introduce themselves.

b. Purpose of the HMPU Steering Committee:
   i. E. Griffith began with the purpose of the HMPU Steering committee, explaining that members have been called together as a group to assist with the update of the 2009 Plaquemines Parish Hazard Mitigation Plan. All members having been selected due to their role in Parish Government/involvement in organizations with the insight to assist with the key details of the plan development and also with the future approval and implementation of the plan update.
   ii. E. Griffith also shared expectations of all Steering Committee Members: Assisting with the development and review of the draft plan update, creating the mitigation strategy, and submitting the final plan for local adoption.

c. Process Overview:
   i. E. Griffith provided an explanation of the Plan Update Process:
   ii. Plaquemines Parish has begun this process as the current plan expires on March 29th.
   iii. In order to give GOHSEP and FEMA enough time to approve the plan update, the Parish needs to have the updated plan to GOHSEP by January 1st.
   iv. Parish will send to GOSHEP and FEMA after Steering Committee reviews.

Plaquemines Parish Hazard Mitigation Plan Update, 2014
Steering Committee Kickoff Meeting #1: Minutes
GCR, Inc.

d. Committee and Civic List Feedback:
   i. Suggested Names & Organizations (Pat will send these to GCR).
      1. Conoco Phillips
      2. Chevron
      3. YMCA
      4. Stolthaven

II. Purpose, Need, and Expectations:
   a. Why plan for mitigating hazards?
      i. E. Griffith provide an overview of hazard definitions:
         1. **Hazard**– *a source of potential danger*
         2. **Vulnerability**– *Degree of exposure or susceptibility to damage of an asset*
         3. **Vulnerability Assessment**– *The extent of damage that may result from a hazard event of a given intensity*
         4. **Risk**– *The estimated impact that a hazard would have on people, services, facilities and structures*
         5. **Risk Assessment**– *The process of measuring the potential loss of life, personal injury, economic injury, and property damage*
      ii. E. Griffith then provided an explanation of the plan's risk assessment methodology:
         1. *Identify Hazards*—specifically, those hazards that affect Plaquemines Parish.
         2. *Profile Hazard Events*—determine the potential impact of various hazards.
         3. *Inventory Assets*—identify parish assets that would be affected by various hazards.
         4. *Estimate Losses*—determine the extent to which the community would be affected by identified hazards.

   b. Why update?
      i. E. Griffith went on to stress the importance of a plan update. A community must review and revise an existing plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities and resubmit for approval every five years to continue to be eligible for FEMA mitigation project grant funds.
         1. By completing a plan update, the Plaquemines community will be able to:
            - Plan for new hazards
            - Additional scoping of projects
            - New draft FIRMS
         2. In this plan update process we will:

- Review all existing hazards to ensure the Parish list covers any new issues that have occurred since the 2009 plan update;
- Identify any new hazard events that have occurred since the 2009 plan; and
- Review the 2009 plan update list of projects to assess their status as well as their relevance to the Parish's current conditions and needs and assess any new projects that need to be added.
- Draft new maps with current data and information including
- Review the State's 2014 plan and how it affects the Parish.

c. Project Milestones & Expectations:
   i. Two more Steering Committee meetings—to take place in September and November of 2014.
   ii. Three Civic Committee meetings—first will take place in July, followed by meetings in August, and November of 2014.
   iii. Two public meeting presentations—scheduled to take place in August and September of this year.

III. Plan Review:
   a. Update Issues:
      i. Review and re-identify hazards:
         1. *Hurricane/Tropical Storm*: Determines that the Parish would use the Tropical Cyclone terminology used in the State's plan that include both Hurricanes and Tropical Storms.
         2. *Coastal Hazards and Stormwater Intrusion:*
            a. It was discussed that the State's plan includes Coastal Hazards (which includes coastal erosion, saltwater intrusion, sea level rise and subsidence)
            b. Comment from G. Laigast of saltwater intrusion—there are two types. One affects the marsh and the second shuts down our water systems. Also need to stress that in PP this refers to water from the river and not the Gulf.
            c. G. Simpson added—this really only affects Plaquemines Parish.
            d. Group agreed that all were comfortable going forth with the state's designation as long as the specifics are spelled out underneath the Coastal Hazards section.
         3. *Tornado - Safe Rooms*:
            a. It was decided to drop tornado from the list of high risk hazards.
            b. Clarification from G. Laigast—PP's safe rooms are built to Hurricane standards, not tornadoes.

Plaquemines Parish Hazard Mitigation Plan Update, 2014
Steering Committee Kickoff Meeting #1: Minutes
GCR, Inc.

         4. *Flood Gates/Dam Failure*:
            a. Question from P. Harvey—would flood gates be considered dams?
            b. T. Antrup responds—No, they would be included under Levee Failure.
         5. *Sinkholes*:
            a. Group agreed to add sinkholes based on the State's hazards list for Plaquemines Parish.
         6. *Winter Weather*:
            a. Question from G. Laigast—should we include Winter Weather?
            b. Members of the group respond. G. Simpson points out that the occurrence is rare, once every 10 years. Group agrees to exclude this hazard from Parish's list.
         7. Decision made to focus on 5 hazard types:
            1. Floods
            2. Costal Hazards
            3. Levee Failure
            4. Tropical Cyclones
            5. Sinkholes
      ii. Profile hazard events: GCR will come back at the next meeting with the draft hazard profile.
   b. Review Goals:
      i. E. Griffith led the groups through the process of reviewing the goals and objectives from the 2009 plan to assess any changes and to take into account any new goals and objectives the committee would like to work toward in this planning process.
      ii. Group agreed on keeping the current list of goals.
      iii. Additional comments during the document review:
         1. From K. Dimarco:
            a. Goal 2: Objective 2.4: Cross reference state goal of educating the public (from Goal 1).
            b. Goal 3: Cross check goal 4 with goal 3 for possible duplication (Seems that goal 4 is already achieved in goal 3).
         2. From G. Laigast:
            a. G. Laigast was interested in the Parish's current CRS status and asked GCR to look into this issue in more depth.
            b. Goal 4.1 is ok
            c. Goal 4.2— Add archeological sites (Change language to be consistent with State goals) and include Fort Jackson.

IV. Scoping

a. T. Antrup went on to lead the group through a discussion of projects and project scoping by reviewing the 2009 plan projects.
b. Identify and Analyze Projects, Evaluation and Prioritization

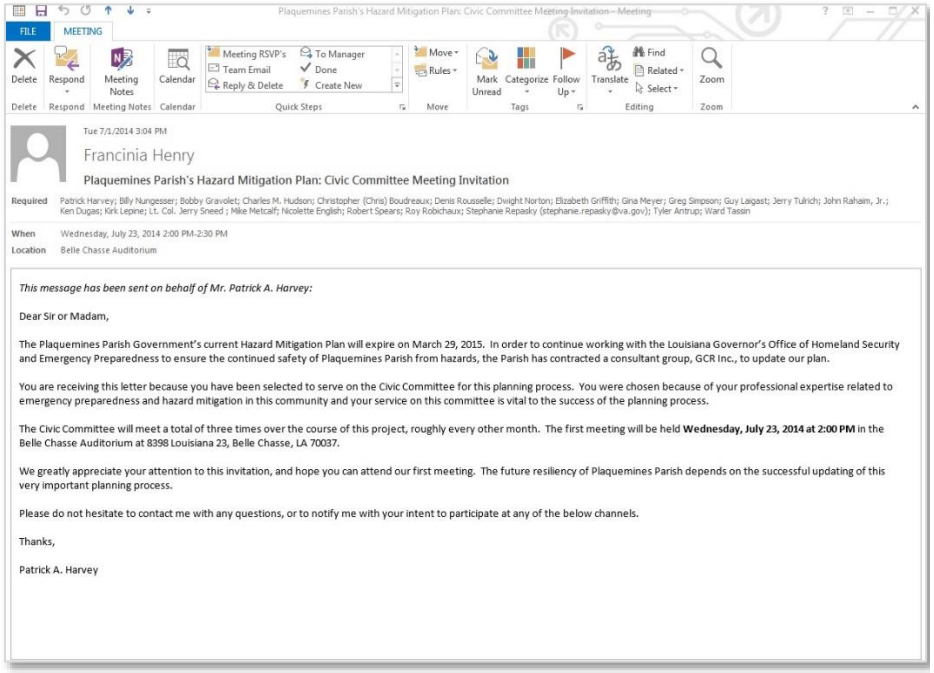
1. Comments from J. Arceneaux:
   a. Canal Widening is an ineligible activity – so enlarging the Barriere Canal North from Belle Chasse Hwy to Belle Chasse #2 is not eligible for HMG funds.
   b. Flood Protection – Increase Pumping Capacity of Belle Chasse #2 is under design by the Parish but not funded.
   c. Drainage Improvement – enlarge Barriere Canal south from Belle Chasse 31 to Belle Chasse highway – Parish is working on this but it is not funded.
   d. Scarsdale Pump Station – Elevation or Flood Proofing Upgrade (Berg done by FEMA).
   e. Belle Chasse #3 – New Project - Parish needs brand new construction.
   f. Many of the projects were discussed and it was decided that the Engineering Department would send a complete list of new eligible projects for the Steering Committee to review.
   g. To follow up with T. Antrup to send new, complete list of Parish's priority projects.
2. Disaster Declarations Review:
   a. Missing disaster declarations for Hurricane Danny in 1997
   b. Hurricane Gustav 2012—Parish took a direct hit.
   c. 2012 Saltwater Intrusion disaster.
   d. Winter Storm Leon – January 2014.
   e. 2007 Hurricanes Gustav and Ike were in the same week and under the same disaster declaration.

c. Map review:
   i. GCR will send G. Laigast and P. Harvey electronic copes to send out to certain members of the Parish to review.
   ii. Schools list (to come from K. Dimarco).
   iii. Hospitals and Facilities List (to come from R. Robichaux /G. Simpson /Greg).
   iv. Fire Stations (updates to come from – complete list of addresses to come from R. Robichaux).
   v. Drainage districts—labels not included.

V. Conclusion and Next Steps:
   a. Next Meeting Date and Location to be determined.
   b. Meeting adjourned @ 2:30 pm.

Civic Committee Meeting 1

The Hazard Mitigation Planning Team met with the members of the Civic Committee for the first time on July 23, 2014 at the Belle Chasse Auditorium. The purpose of the meeting was to introduce the committee to the HMPU process and set expectations. The committee was also asked to confirm the hazards for the plan update and review the goals set forth by the Steering Committee and suggest edits or new goals for the update.



Plaquemines Parish's Hazard Mitigation Plan: Civic Committee Meeting Invitation - Meeting

FILE | MEETING

Delete | Respond | Meeting Notes | Calendar | Meeting RSVP's | Team Email | Reply & Delete | To Manager | Done | Create New | Move | Rules | Mark Unread | Categorize | Follow Up | Translate | Find | Related | Select | Zoom

Tue 7/1/2014 3:04 PM

Francinia Henry

Plaquemines Parish's Hazard Mitigation Plan: Civic Committee Meeting Invitation

Required: Patrick Harvey; Billy Nungesser; Bobby Gravolet; Charles M. Hudson; Christopher (Chris) Boudreaux; Denis Rousselle; Dwight Norton; Elizabeth Griffith; Gina Meyer; Greg Simpson; Guy Laigast; Jerry Tulrich; John Rahaim, Jr.; Ken Dugas; Kirk Lepine; Lt. Col. Jerry Sneed ; Mike Metcalf; Nicolette English; Robert Spears; Roy Robichaux; Stephanie Repasky (stephanie.repasky@va.gov); Tyler Antrup; Ward Tassin

When: Wednesday, July 23, 2014 2:00 PM-2:30 PM

Location: Belle Chasse Auditorium

This message has been sent on behalf of Mr. Patrick A. Harvey:

Dear Sir or Madam,

The Plaquemines Parish Government's current Hazard Mitigation Plan will expire on March 29, 2015. In order to continue working with the Louisiana Governor's Office of Homeland Security and Emergency Preparedness to ensure the continued safety of Plaquemines Parish from hazards, the Parish has contracted a consultant group, GCR Inc., to update our plan.

You are receiving this letter because you have been selected to serve on the Civic Committee for this planning process. You were chosen because of your professional expertise related to emergency preparedness and hazard mitigation in this community and your service on this committee is vital to the success of the planning process.

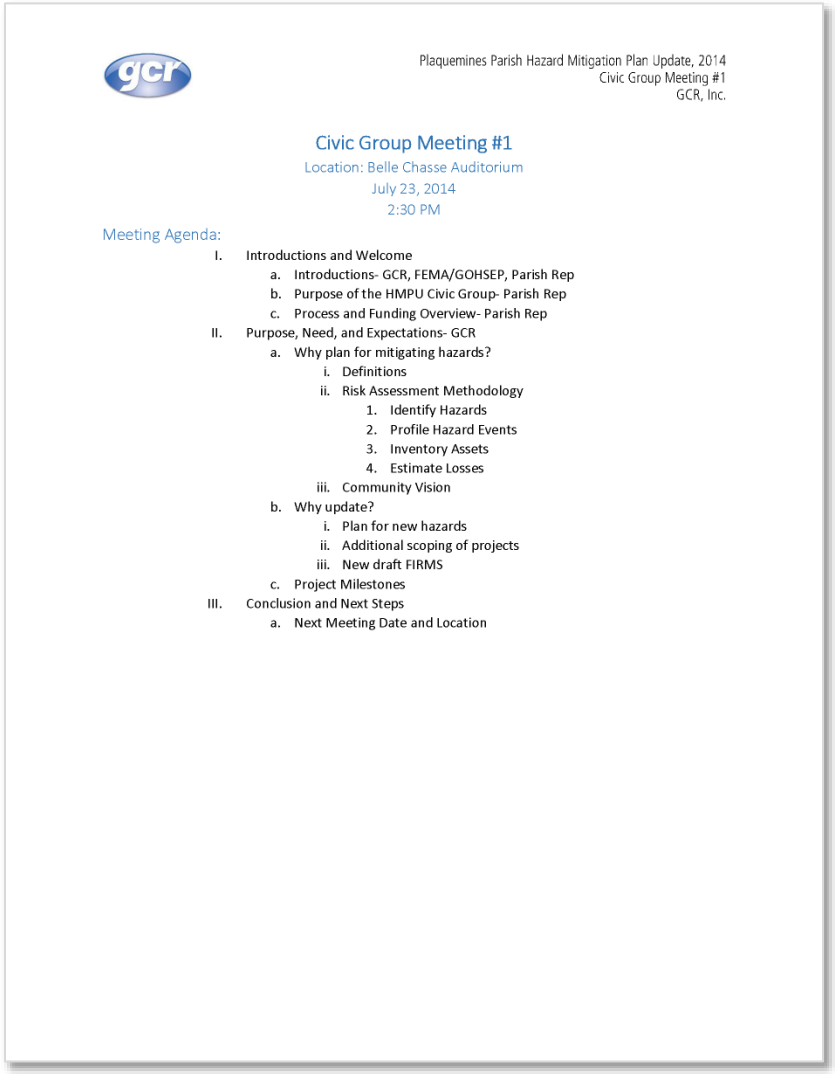
The Civic Committee will meet a total of three times over the course of this project, roughly every other month. The first meeting will be held **Wednesday, July 23, 2014 at 2:00 PM** in the Belle Chasse Auditorium at 8398 Louisiana 23, Belle Chasse, LA 70037.

We greatly appreciate your attention to this invitation, and hope you can attend our first meeting. The future resiliency of Plaquemines Parish depends on the successful updating of this very important planning process.

Please do not hesitate to contact me with any questions, or to notify me with your intent to participate at any of the below channels.

Thanks,

Patrick A. Harvey



gcr

Plaquemines Parish Hazard Mitigation Plan Update, 2014
Civic Group Meeting #1
GCR, Inc.

Civic Group Meeting #1

Location: Belle Chasse Auditorium
July 23, 2014
2:30 PM

Meeting Agenda:

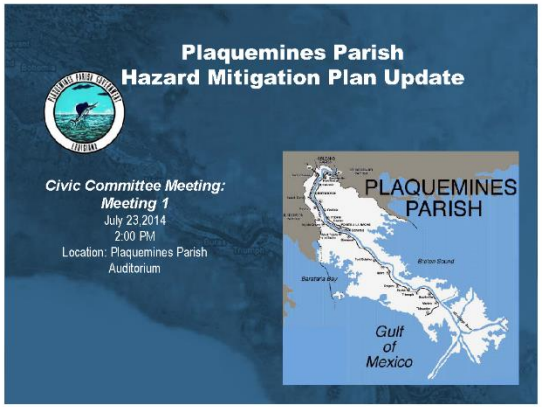
I. Introductions and Welcome
   a. Introductions- GCR, FEMA/GOHSEP, Parish Rep
   b. Purpose of the HMPU Civic Group- Parish Rep
   c. Process and Funding Overview- Parish Rep
II. Purpose, Need, and Expectations- GCR
   a. Why plan for mitigating hazards?
      i. Definitions
      ii. Risk Assessment Methodology
         1. Identify Hazards
         2. Profile Hazard Events
         3. Inventory Assets
         4. Estimate Losses
      iii. Community Vision
   b. Why update?
      i. Plan for new hazards
      ii. Additional scoping of projects
      iii. New draft FIRMS
   c. Project Milestones
III. Conclusion and Next Steps
   a. Next Meeting Date and Location

PLAQUEMINES PARISH HAZARD MITIGATION PLAN: CIVIC GROUP MEEETING #1
Belle Chasse Auditorium 8398 Hwy. 23, Belle Chasse, LA 70037
July 23, 2014
2:00 PM

Name	Organization	Email	Phone Number
Bobby Thomas	PABI	RThomas985@aol.com	458-6167
Kelly Dimarco	PPSB	kdimarco@ppsb.net	644-7901
Roy Robichaux Jr.	PPFD	Roy@ppgov.net	415-8098
SANDY SANDERS	PPHTD	sandy sanders@pphtd	345-6389
Robert J. Morgan Jr.	PP Severn Trent Services	Robert.Morgan@STservicesus.com	322-0183
MIKE METCALF	PPG	MMETCALF@PPG.GOV	934-6202
Jonah Arceneaux	PPG- Engineering	jonah@ppgov.net	934-6116

PLAQUEMINES PARISH HAZARD MITIGATION PLAN: CIVIC GROUP MEEETING #1
Belle Chasse Auditorium 8398 Hwy. 23, Belle Chasse, LA 70037
July 23, 2014
2:00 PM

Name	Organization	Email	Phone Number
Francinica Henry	GCR, Inc.	fhenry@gcrincorporated.com	504-616-6282
Tyler Antoon	GCR	tantoon@gcrl.com	5043042500
Elizabeth Griffith	GCR	egriffith@gcrl.com	504-304-9783
DARRYL DELATTE	GOHSEP	DARRYL.DELATTE@LA.GOV	225.485.7452
JOHN RAHAIM, JR	SBAG/OHSEP	jrahaim@sbag.net	504-442-1040
Guy Lajoie	PPC	guyl@ppgov.net	274-2476
Patrick A. Harvey	PPG-OHSEP	pharvey@ppgov.net	297-2477
Tim Potter	Chevron	TAPO@Chevron.com	391-6201
Hilda Hott	PPG	hhott@ppgov.net	297-5642
GINA Meyer	PPG-EMS	gmeyer@ppgov.net	912-5285
BLAIR ROTTINGHAUS	PPG-LAND	BLAIR@PPGOV.NET	(504) 297-5577
Vanessa Fisher	PMC	VFisher@plaquemines medicalcenter.com	504 564-2214
Jerry Turlich	PPSO	jturlich@ppso.net	(504) 329-5257
Robert Beverly	NOLA VA	Robert.Beverly2@VA.GOV	
Melissa Ory	Phillips 66	Melissa.r.ory@p66.com	504-656-3987
BRAD CASE	City of New Orleans	bwcase@nola.gov	504.658.8743
Gene Fox	Severn Trent Service	gfox@stes.com	504-392-4477
MONICA MARTIN	PMC	mmartin@plaquemines medicalcenter.com	504-564-3844
KEN DUGAS	PPG-ENG	KDUGAS@PPGOV.NET	504-934-6116



SECTION I: INTRODUCTIONS & WELCOME

- Introductions
- Process Overview

PRESENTATION AGENDA

I. **Introductions and Welcome**
II. Purpose, Need, and Expectations
III. Plan Review
IV. Project Review and Scoping
V. Conclusion

PROCESS

SECTION II: PURPOSE, NEED, AND EXPECTATIONS

I. Introductions and Welcome
II. Purpose, Need, and Expectations
III. Plan Review
IV. Project Review and Scoping
V. Conclusion

Purpose, Need, and Expectations: Definitions

- **Hazard**– *a source of potential danger*
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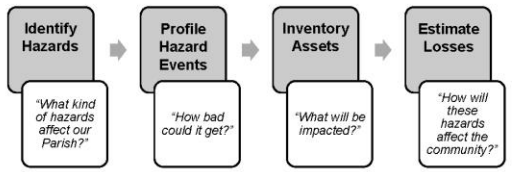
Purpose, Need, and Expectations: Why Plan for Mitigating Hazards?

Hazard Mitigation:

Sustained actions taken to reduce or eliminate long term risks from hazards and their effects

MITIGATION = PREVENTION

Purpose, Need, and Expectations: Risk Assessment Methodology



Purpose, Need, and Expectations: Why Update?

- Reasons for Updating the Parish's Plan:
  - To review the Parish's 2009 hazards list
  - To identify any hazard events since the Parish's 2009 plan
  - To review current projects and identify new projects in the Parish
  - To draft new maps for the Parish
  - To comply with the State's Hazard Mitigation Plan Update

Purpose, Need, and Expectations: Expectations

- Two more Steering Committee meetings
  - August 21, 2014
  - November 17, 2014
- Two more Civic Committee meetings
  - September 24, 2014
  - November 20, 2014
- Two Public Meeting presentations
  - September 11, 2014 – City Council Meeting
  - September 30, 2014 – General Public Meeting

Section III: Plan Review

I. Introductions and Welcome
II. Purpose, Need, and Expectations
III. Plan Review
IV. Project Review and Scoping
V. Conclusion

Section III: Plan Review

- Review Hazards
- Review Mitigation Goals and Objectives

Section III: Plan Review - Proposed Hazards List for Plan Update

- Droughts
- Extreme Heat
- **Flooding**
- Thunderstorms
- **Tropical Cyclones**
- Wildfires
- Winter Weather
- **Coastal Hazards**
- Dam Failures
- Earthquakes
- **Levee Failures**
- **Sinkholes**

Section IV: Project Review and Scoping

I. Introductions and Welcome
II. Purpose, Need, and Expectations
III. Plan Review
IV. Project Review and Scoping
V. Conclusion

Section III: Plan Review

2015 Hazard Mitigation Plan Update Goals and Objectives

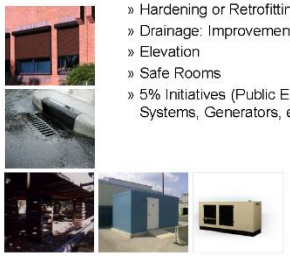
- Goal 1: Reduce losses to existing and future property due to hazards
- Goal 2: Protect the health and well-being of the people of Plaquemines Parish from negative effects of hazards
- Goal 3: Ensure the abilities of emergency services providers to continue operating during hazardous events
- Goal 4: Protect existing public and private infrastructure from damage

Section IV: Project Review and Scoping

- Identify and Analyze Projects
- Evaluation & Prioritization
- Map and Risk Assessment Review

Section IV: Project Review and Scoping

Types of Eligible Hazard Mitigation Projects



- » Hardening or Retrofitting of Critical Facilities
- » Drainage: Improvements to Existing Facilities
- » Elevation
- » Safe Rooms
- » 5% Initiatives (Public Education, Warning Systems, Generators, etc.)

Hazard Mitigation Plan Update FTP Site

ftp.gcrincorporated.com

Username: PPHMGP

Password: IYrW7w1G

Section V: Conclusion & Next Steps

I. Introductions and Welcome

II. Purpose, Need, and Expectations

III. Plan Review

IV. Project Review and Scoping

V. Conclusion & Next Steps

Section V: Conclusion and Next Steps

Contact information:

Patrick A. Harvey, LEM
Deputy Director-Office of Homeland Security & Emergency Preparedness
Plaquemines Parish Government
pharvey@ppgov.net
504-297-2477

Elizabeth Griffith, Senior Planner
GCR, Inc.
egriffith@gcrincorporated.com
504-304-0731

Civic Committee Meeting #1

Belle Chasse Auditorium
8398 Louisiana 23, Belle Chasse, LA 70037
July 23, 2014
2:00 PM

Meeting Attendees:

Civic Committee Members:

1. Jonah Arceneaux
2. Robert Beverly
3. Brad Case
4. Darryl Delatte
5. Kelli Dimarco
6. Ken Dugas
7. Vanessa Fisher
8. Gene Fox
9. Patrick A. Harvey
10. Guy Laigast
11. Hilda Lott
12. Monica Martin
13. Mike Metcalf
14. Robert Morgan
15. Gina Meyer
16. Melissa Ory
17. Tim Potter
18. Roy Robichaux Jr.
19. John Rahaim, Jr.
20. Blair Rittner
21. Sandy Sanders
22. Jerry Turlich
23. Robert Thomas

Consultants:

Elizabeth Griffith Francinia Henry Tyler Antrup

Meeting Minutes:

I. Introductions and Welcome:
   a. Introductions-- GCR, FEMA/GOHSEP, Parish Representatives:
      i. E. Griffith introduced herself and members of the GCR TEAM.
      ii. E. Griffith then asked the present Civic Committee members to go around the room and introduce themselves.
   b. Purpose of the HMPU Civic Committee:
      i. E. Griffith began with the purpose of the HMPU Civic committee, explaining that members have been called together as a group, working along with the HMPU Steering Committee to assist with the update of the 2009 Plaquemines Parish Hazard Mitigation Plan. All members having been selected due to their role in Parish Government/involvement in organizations with the insight to assist with the key details of the plan development and also with the future approval and implementation of the plan update.
   c. Process Overview:
      i. E. Griffith provided an explanation of the Plan Update Process:
      ii. Plaquemines Parish has begun this process as the current plan expires on March 29th.

Plaquemines Parish Hazard Mitigation Plan Update
Civic Committee Meeting #1: Minutes
GCR, Inc.

      iii. In order to give GOHSEP and FEMA enough time to approve the plan update, the Parish needs to have the updated plan to GOHSEP by January 1st.
      iv. Parish will send to GOSHEP and FEMA after public review.

II. Purpose, Need, and Expectations:
   a. Why plan for mitigating hazards?
      i. E. Griffith provide an overview of hazard definitions:
         1. **Hazard**– *a source of potential danger*
         2. **Vulnerability**– *Degree of exposure or susceptibility to damage of an asset*
         3. **Vulnerability Assessment**– *The extent of damage that may result from a hazard event of a given intensity*
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         4. *Estimate Losses*—determine the extent to which the community would be affected by identified hazards.
   b. Why update?
      i. E. Griffith went on to stress the importance of a plan update. A community must review and revise an existing plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities and resubmit for approval every five years to continue to be eligible for FEMA mitigation project grant funds.
         1. By completing a plan update, the Plaquemines community will be able to update sections pertaining to:
            - Planning for new hazards
            - Additional scoping of projects
            - New draft FIRMS
         2. In this plan update process we will:
            - Review all existing hazards to ensure the Parish list covers any new issues that have occurred since the 2009 plan update;

- Identify any new hazard events that have occurred since the 2009 plan; and
- Review the 2009 plan update list of projects to assess their status as well as their relevance to the Parish's current conditions and needs and assess any new projects that need to be added.
- Draft new maps with current data and information.
- Review the State's 2014 plan and how it affects the Parish.

c. Project Milestones & Expectations:
   i. Two additional Civic Committee meetings—in August, and November of 2014.
   ii. Two more Steering Committee meetings—to take place in September and November of 2014.
   iii. Two public meeting presentations—scheduled to take place in September of this year.

III. Plan Review:
   a. Update Issues:
      i. Review and re-identify hazards:
         1. *Hurricane/Tropical Storm*: Committee agreed with Steering Committee's determination that the Parish would use the Tropical Cyclone terminology used in the State's plan that include both Hurricanes and Tropical Storms.
         2. *Coastal Hazards and Storm Water Intrusion:*
            a. It was discussed that the State's plan includes Coastal Hazards (which includes coastal erosion, saltwater intrusion, sea level rise and subsidence)
            b. Group agreed that all were comfortable going forth with the state's designation as long as the specifics are spelled out underneath the Coastal Hazards section, as requested by the Steering Committee.
         3. *Sinkholes*: Included because they are also listed in the State's plan as a hazard for Plaquemines Parish.
         4. *Winter Weather*:
            a. Question from Gina M.: Why is Winter Weather not included?
            b. Elizabeth G. responds. Points out that this question was also raised by the Steering Committee. Since the occurrence is rare, once every 10 years the group agreed to exclude this hazard from Parish's list.
            c. Francinia H. also responds. Made note that Winter Weather was also excluded from the State's list of identified hazards for the Plaquemines Parish.

Plaquemines Parish Hazard Mitigation Plan Update
Civic Committee Meeting #1: Minutes
GCR, Inc.

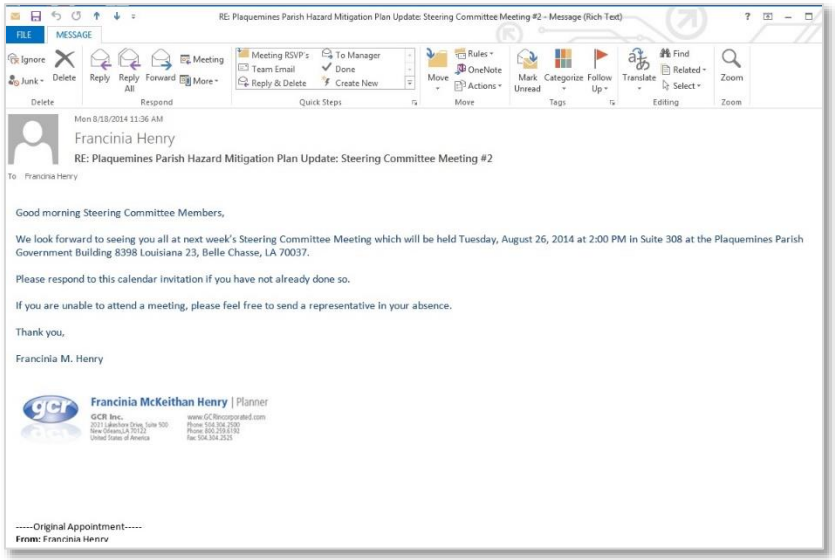
            d. Additional question from Darryl D.: Why are chemical spills not included on this list?
            e. Response from Elizabeth G.: Our list is based on items identified by FEMA and the State Hazard Mitigation program.
            f. Additional response from Tyler A.: Chemical spills are a man-made hazard. The hazards mitigation plan does not account for man-made hazards.
         5. Decision made to focus on 5 hazard types:
            1. Floods
            2. Costal Hazards
            3. Levee Failure
            4. Tropical Cyclones
            5. Sinkholes
      ii. Profile hazard events: GCR will come back at the next meeting with the draft hazard profile.
   b. Review Goals:
      i. E. Griffith led the groups through the process of reviewing the goals and objectives from the 2009 plan to assess any changes and to take into account any new goals and objectives the committee would like to work toward in this planning process.
      ii. Group agreed on keeping the list of goals as revised by the Steering Committee.

IV. Project Review & Scoping
   a. T. Antrup went on to lead the group through a discussion of projects and project scoping by reviewing the 2009 plan projects.
   b. Identify and Analyze Projects, Evaluation and Prioritization
   c. Map review: New maps will be placed on the ftp site for review as they are finalized with the Parish.

V. Conclusion and Next Steps:
   a. Project Website Access:
      ftp.gcrincorporated.com
      Username: PPHMGP
      Password: IYrW7w1G
   b. Meeting adjourned @ 2:45 pm.

Steering Committee Meeting 2

The Hazard Mitigation Planning Team met with the members of the Steering Committee for the second time on August 26, 2014 at the Plaquemines Parish Office of Homeland Security and Emergency Preparedness, Plaquemines Parish Government Building. The purpose of the meeting was to present the draft risk assessment to the committee and gather input on prioritizing mitigation goals, objectives, and actions.



RE: Plaquemines Parish Hazard Mitigation Plan Update: Steering Committee Meeting #2 - Message (Rich Text)

FILE MESSAGE

Ignore Junk Delete | Reply Reply All Forward Meeting More | Meeting RSVP's Team Email Reply & Delete To Manager Done Create New | Move Rules OneNote Actions | Mark Unread Categorize Follow Up | Translate Find Related Select | Zoom

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Mon 8/18/2014 11:36 AM

Francinia Henry

RE: Plaquemines Parish Hazard Mitigation Plan Update: Steering Committee Meeting #2

To Francinia Henry

Good morning Steering Committee Members,

We look forward to seeing you all at next week's Steering Committee Meeting which will be held Tuesday, August 26, 2014 at 2:00 PM in Suite 308 at the Plaquemines Parish Government Building 8398 Louisiana 23, Belle Chasse, LA 70037.

Please respond to this calendar invitation if you have not already done so.

If you are unable to attend a meeting, please feel free to send a representative in your absence.

Thank you,

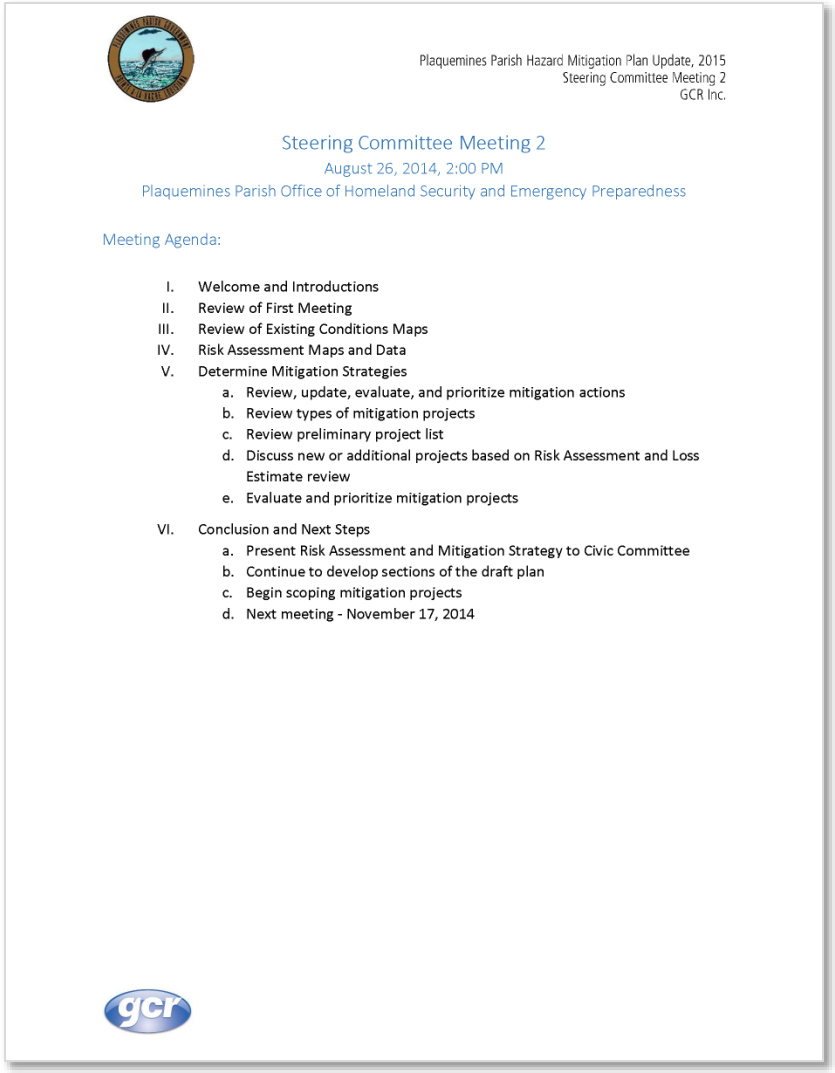
Francinia M. Henry

Francinia McKeithan Henry | Planner

GCR Inc.

-----Original Appointment-----

From: Francinia Henry



Plaquemines Parish Hazard Mitigation Plan Update, 2015
Steering Committee Meeting 2
GCR Inc.

Steering Committee Meeting 2

August 26, 2014, 2:00 PM

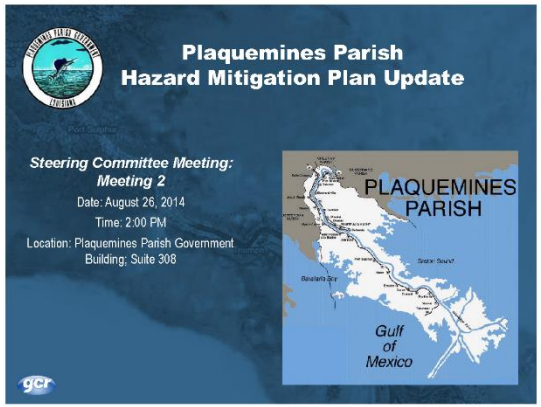
Plaquemines Parish Office of Homeland Security and Emergency Preparedness

Meeting Agenda:

I. Welcome and Introductions
II. Review of First Meeting
III. Review of Existing Conditions Maps
IV. Risk Assessment Maps and Data
V. Determine Mitigation Strategies
    a. Review, update, evaluate, and prioritize mitigation actions
    b. Review types of mitigation projects
    c. Review preliminary project list
    d. Discuss new or additional projects based on Risk Assessment and Loss Estimate review
    e. Evaluate and prioritize mitigation projects
VI. Conclusion and Next Steps
    a. Present Risk Assessment and Mitigation Strategy to Civic Committee
    b. Continue to develop sections of the draft plan
    c. Begin scoping mitigation projects
    d. Next meeting - November 17, 2014

PLAQUEMINES PARISH HAZARD MITIGATION PLAN:STEERING COMMITTEE MEEETING #2
Plaquemines Government Building 8056 Hwy 23 Ste. 308 Belle Chasse, LA 70037
August 26, 2014
2:00 PM

Name	Organization	Email	Phone Number
Elizabeth Griffith	GCR	egriffith@gcrl.com	581-304
Nicki English	GOHSEP	nicolette.english@la.gov	225-267-2607
Tyler Anstup	GCR	tanstup@gcrl.com	504 304 2581
Patrick A. Harvey	PPG-OHSEP	pharvey@ppgov.net	297-2477
Jerry Turlich	P.P.S.O.	jturlich@ppso.net	669-0877
KEN DUGAS	PPG-ENG	KDUGAS@PPGOV.NET	504 934-6115
MIKE METCALF	PPG-PERMITS	MMETCALF@PPGOV.NET	934-6202
Benny Puckett	PPG Electric	bpuckett@ppgov.net	297-2237
Greg Simpson	PPG Drainage		504-722-8501
GINA Meyer	PPG EMS	gmeyer@ppgov.net	504-912-5285
Hilda Lott	PPG Grants		



II. Review of Previous Meetings

First Steering Committee Meeting:

- Reviewed purpose and planning process.
- Reviewed and updated the list of hazards and the goals and objectives from the 2009 Plan Update.
- Discussed eligible projects and reviewed existing condition maps.

First Civic Meeting:

- Reviewed purpose and planning process.
- Discussed the proposed final list of hazards.
- Discussed the proposed final goal and objectives.
- Discussed eligible projects.

III. Review of Existing Conditions Maps

- Base Map
- Existing Land Use
- Flood Zones
- Basic Wind Speed
- Land Cover
- Elevation
- Drainage
- Facilities
  - Fire
  - Hospitals
  - Schools
  - Potable Water
  - Waste Water
  - Sheriff
  - Telecommunications

IV. Risk Assessment

Event Type	Events	Injuries	Property Damage	Crop Damage	Annual Probability	Damage/Event
Cold/Wind Chill	3		$ -	$ -	5%	$ -
Drought	2		$ -	$ 250,000	5%	$ 125,000
Flash Flood	7		$ 130,000	$ -	11%	$ 18,571
Flood	1		$ -	$ -	2%	$ -
Funnel Cloud	8		$ -	$ -	13%	$ -
Hail	16		$ -	$ -	25%	$ -
Heavy Rain	2		$ -	$ -	3%	$ -
Heavy Snow	1		$ -	$ -	2%	$ -
High Wind	1		$ -	$ -	2%	$ -
Tropical Cyclone	21		$ 1,543,148,000	$ -	33%	$ 73,482,900
Lightning	1		$ -	$ -	2%	$ -
Storm Surge/tide	5		$ 1,303,105,000	$ -	8%	$ 165,684,107
Thunderstorm Wind	57		$ 579,000	$ -	89%	$ 10,107
Tornado	30	11	$ 690,000	$ -	47%	$ 23,000
Winter Storm	1		$ -	$ 50,000	2%	$ 50,000
Grand Total	157	11	$ 3,544,943,500	$ 250,000	-	$ 16,269,525

NOAA National Climatic Data Center Storm Events Database- Plaquemines Parish 1950-2014

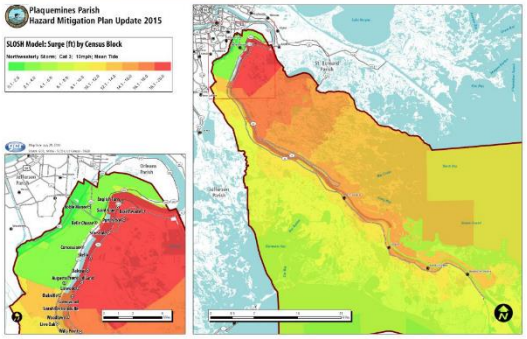
IV. Risk Assessment

Tropical Cyclone

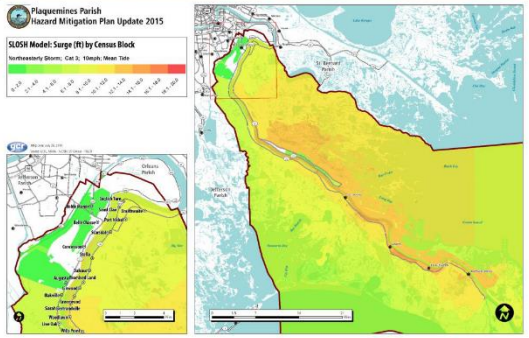
- Identified as one of the biggest hazards
- Includes hurricanes, tropical storms, depressions and storm surge

Year	Disaster Number #	Storm Name	Category (in Plaquemines Parish)	Damage (Billions)
1965	208	Hurricane Betsy	3	$ 21.9
1969	272	Hurricane Camille	5	$ 22.6
1973	376	Severe Storm and Flooding	-	-
1974	448	Hurricane Carmen	4	$ 1.0
1992	956	Hurricane Andrew	3	$ 56.0
1998	1248	Tropical Storm Frances and Hurricane Georges	4	$ 4.5
2002	1423	Tropical Storm Isidore	Tropical Storm	$ 0.4
2002	1437	Hurricane Lilli	4	$ 1.1
2004	1548	Hurricane Ivan	3	$ 15.5
2005	1601	Tropical Storm Cindy	Tropical Storm	$ 0.3
2005	1602 & 1603	Hurricane Katrina	3	$ 81.0
2008	1769 & 1607	Hurricane Ike	2	$ 18.0
2011	4081	Tropical Storm Lee	Tropical Storm	$ 0.3
2012	4085	Hurricane Isaac	1	$ 2.4

IV. Risk Assessment



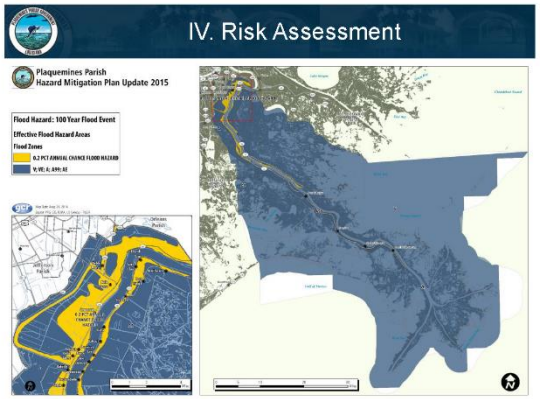
IV. Risk Assessment



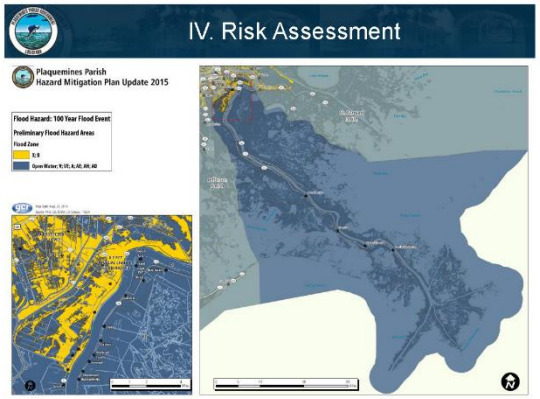
IV. Risk Assessment

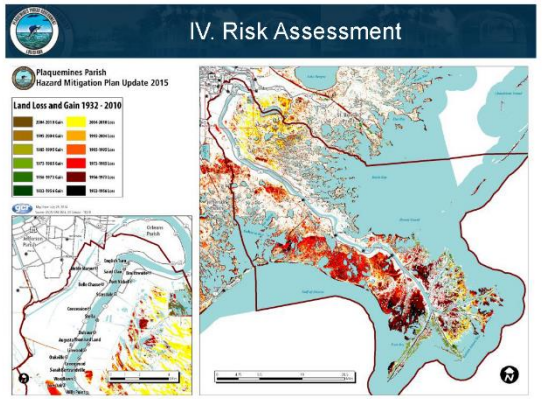
Flooding

- Also one of the biggest hazards
- Majority from flash flooding (urban ponding)
- Area of impact 100-year floodplain
  - This geography is currently contested

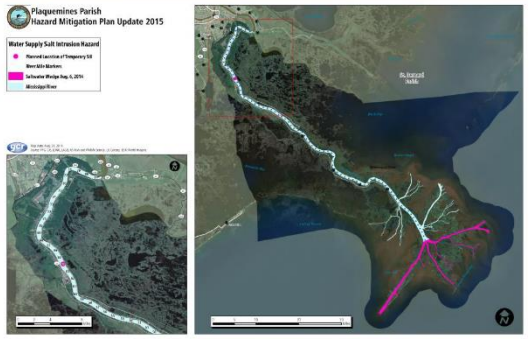

IV. Risk Assessment
Plaquemines Parish
Hazard Mitigation Plan Update 2015
Flood Hazard: 100 Year Flood Event
Effective Flood Hazard Areas
Flood Zones


IV. Risk Assessment
Coastal Hazards
– Coastal Land Loss
• Sea Level Rise
• Subsidence
– Saltwater Intrusion
• Potable Water Supply

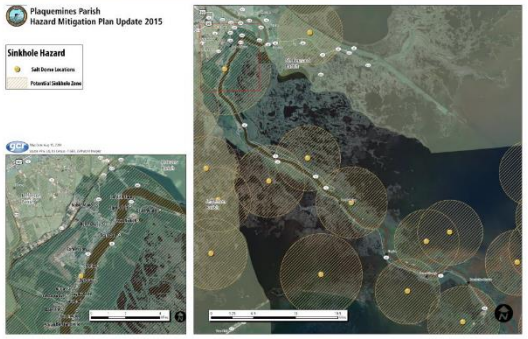

IV. Risk Assessment
Plaquemines Parish
Hazard Mitigation Plan Update 2015
Flood Hazard: 100 Year Flood Event
Preliminary Flood Hazard Areas
Flood Zone


IV. Risk Assessment
Plaquemines Parish
Hazard Mitigation Plan Update 2015
Land Loss and Gain 1932 - 2010

IV. Risk Assessment



IV. Risk Assessment



IV. Risk Assessment

Sinkholes

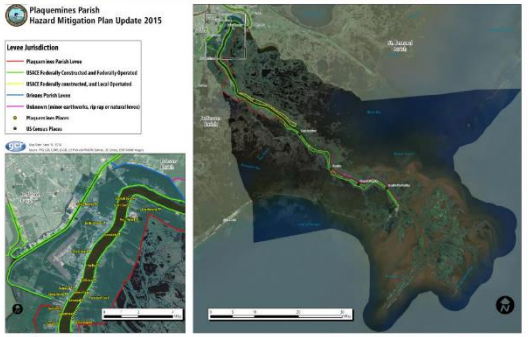
- Primarily located at salt dome sites
- Chose a 5 mile buffer to measure fully impacts populations
- Generally considered a low risk

IV. Risk Assessment

Levee Failure

- No history of Federal levee failure in Plaquemines.
- Levees divided by Federal and Non-Federal.
- Some Federal levees now maintained by local authorities.
- Vulnerability was determined by assuming breach of a levee would cause devastation of the impacted basin.

IV. Risk Assessment



V. Determine Mitigation Strategies

Review, Update, Evaluate, and Prioritize Mitigation Actions

- 2015 List of Goals, Objectives, Actions and Projects
- Review new actions
- Complete Mitigation Action Evaluation Worksheet

V. Determine Mitigation Strategies

- Review, update, evaluate, and prioritize mitigation actions
- Review types of mitigation projects
- Review preliminary project list
- Discuss new or additional projects based on Risk Assessment and Loss Estimate review
- Evaluate and prioritize mitigation projects

V. Determine Mitigation Strategies

New Actions:

- Action 2.4.1
- Action 4.3.1

Criteria to Consider:

- *Timeframe*
- *Funding*
- *Staff*

V. Determine Mitigation Strategies

Mitigation Action Evaluation

Criteria to Consider:

- Life Safety
- Property Protection
- Technical
- Political
- Legal
- Environmental
- Social
- Administrative
- Economic Benefit
- Local Champion
- Other Community Objectives

V. Determine Mitigation Strategies

Types of Eligible Hazard Mitigation Projects





» Hardening or Retrofitting of Critical Facilities
» Drainage: Improvements to Existing Facilities
» Elevation
» Safe Rooms
» 5% Initiatives (Public Education, Warning Systems, Generators, etc.)

VI. Conclusion and Next Steps

Conclusion and Next Steps

- Present Risk Assessment and Mitigation Strategy to Civic Committee
- Continue to develop sections of the draft plan
- Begin scoping mitigation projects
- Next meeting - November 17, 2014

Hazard Mitigation Plan Update FTP Site

ftp.gcrincorporated.com
Username: PPHMGP
Password: IYrW7w1G

Steering Committee Meeting 2

August 26, 2014, 2:00 PM

Plaquemines Parish Office of Homeland Security and Emergency Preparedness

Meeting Attendees:

Steering Committee Members: Ken Dugas, Patrick A. Harvey, Hilda Lott, Mike Metcalf, Gina Meyer, Nici English, Jerry Turlich, Benny Puckett, Greg Simpson
Consultants: Elizabeth Griffith, Tyler Antrup, Francinia Henry

I. Welcome and Introductions
II. Review of First Meeting
    a. E. Griffith gave an introduction and reviewed the events that have occurred since the last Steering Committee Meeting. These include the first Civic Meeting and the development of the Risk Assessment section of the plan.
III. Review of Existing Conditions Maps
    a. It was noted that all of the existing conditions maps are now loaded to the ftp site and available for the committee's review.
IV. Risk Assessment Maps and Data
    a. T. Antrup presented the slides on the Risk Assessment section of the plan. These included the Risk Assessment maps and tables with data on the hazards identified by the Steering Committee at the last meeting. Comments from the Steering Committee on this information is below:
        i. For the table on Tropical Cyclones is was noted that Gustav and Ike needed to be added to the list of past events.
        ii. Hazards List Discussion - G. Meyer questioned not including Winter Storms in the list of hazards to profile. N. English noted that plans typically profile all hazards that can affect an area, but when you move into the Risk Assessment section of the plan you do not mitigate against all of those hazards. You have to distinguish where you want to spend your money since you can't do everything. K. Dugas noted that for a hazard to be in the Risk Assessment the Parish would have to be able to put dollars towards the mitigation. B. Puckett noted that when the Administration takes the plan to the Council, we can show projects that need approval are in the plan
        iii. Flood Map Discussions – P. Harvey noted that the current flood maps still show Belle Chasse as flooding and do not take into account the 22 foot levees. T. Antrup – anecdotally we will talk about Belle Chasse and will take into account the Federal levees. T. Antrup stated that maps for both the preliminary DFIRMS and Effective DFIRMS which have not been adopted by the Parish. B. Puckett noted that the plan needed to make sure rain fall events are taken into account for grant purposes.
        iv. Water Supply Salt Intrusion Hazard – G. Meyer requested that the name be changed to Mississippi Saltwater Intrusion.
        v. Sinkholes – Committee discussed whether to keep this as a hazard in the plan. N. English from GOHSEP noted that if the State Plan has this as a significant hazard it should be included as it will be a big fight with FEMA to discount it. The Committee decided to keep this as a hazard.
        vi. Levee Failure – The Committee questioned the notation that there was no history of Federal levee failure within the Parish. This note came from the 2009 plan and Committee agreed with was a failure due to loading from the inside which was not what the levee was built for. T. Antrup will note this as an occurrence within the plan.

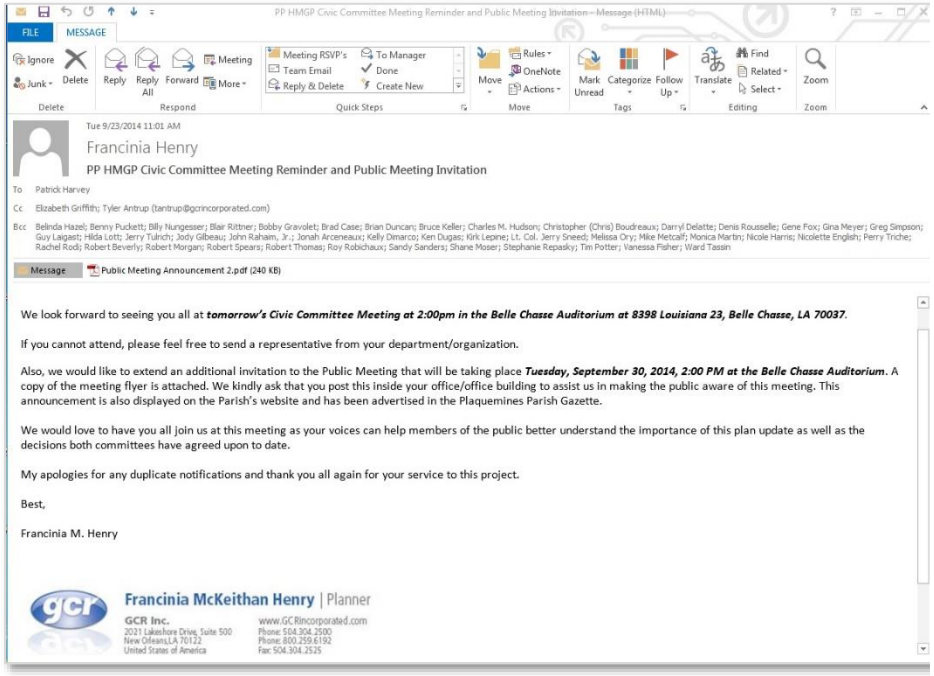
V. Determine Mitigation Strategies
    a. Review, update, evaluate, and prioritize mitigation actions, review types of mitigation projects, review preliminary project list, Discuss new or additional projects based on Risk Assessment and Loss Estimate review.
        i. F. Henry reviewed the proposed mitigation actions with the Committee. It was discussed that the plan needs two actions per each hazard to get through the approval process. G. Meyer requested that the "modeled after the State's Community Education Outreach (CEO) program" be deleted from action 2.4.1. B. Puckett agreed with this request. G. Meyer also wanted to change the language on the project for action 3.1.1 to include construction and build. N. English noted that as long as the plan states critical facilities the Parish is covered. K. Dugas noted that we can't use the word construction or build because it will get kicked out. G. Meyer and Sheriff will send consultants a list of areas facilities that need to be hardened to include in the plan.
    b. Evaluate and prioritize mitigation projects

i. F. Henry presented the Mitigation Action Evaluation Worksheet to the Committee. After much discussion the Committee requested that they have a chance to take it home and review in more depth and requested that the criteria be cut down to make it easier to evaluate. F. Henry noted that she would make the requested updates and email the entire Committee with the survey that reflected the requested changes.

VI. Conclusion and Next Steps – E. Griffith discussed the next steps listed below and the meeting was adjourned.
   a. Present Risk Assessment and Mitigation Strategy to Civic Committee
   b. Continue to develop sections of the draft plan
   c. Begin scoping mitigation projects
   d. Next meeting - November 17, 2014

Civic Committee Meeting 2

The Hazard Mitigation Planning Team met with the members of the Civic Committee for the second time on September 24, 2014 at the Belle Chasse Auditorium. The purpose of the meeting was to review the mitigation goals and actions that the steering committee had prioritized and gather input on the draft risk assessment.



PP HMGP Civic Committee Meeting Reminder and Public Meeting Invitation – Message (HTML)

FILE MESSAGE

Ignore Junk Delete Reply Reply All Forward Meeting More Respond

Meeting RSVP's Team Email Reply & Delete To Manager Done Create New Quick Steps

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Mark Unread Categorize Follow Up Tags

Translate Find Related Select Editing

Zoom Zoom

Tue 9/23/2014 11:01 AM

Francinia Henry

PP HMGP Civic Committee Meeting Reminder and Public Meeting Invitation

To Patrick Harvey

Cc Elizabeth Griffith; Tyler Antrup (tantrup@gcrincorporated.com)

Bcc Belinda Hazel; Benny Puckett; Billy Nungesser; Blair Rittner; Bobby Gravolet; Brad Case; Brian Duncan; Bruce Keller; Charles M. Hudson; Christopher (Chris) Boudreaux; Darryl Delatte; Denis Rousselle; Gene Fox; Gina Meyer; Greg Simpson; Guy Laigast; Hilda Lott; Jerry Tulrich; Jody Gibeau; John Rahaim, Jr.; Jonah Arceneaux; Kelly Dimarco; Ken Dugas; Kirk Lepine; Lt. Col. Jerry Sneed; Melissa Ory; Mike Metcalf; Monica Martin; Nicole Harris; Nicolette English; Perry Triche; Rachel Rodi; Robert Beverly; Robert Morgan; Robert Spears; Robert Thomas; Roy Robichaux; Sandy Sanders; Shane Moser; Stephanie Repasky; Tim Potter; Vanessa Fisher; Ward Tassin

Message Public Meeting Announcement 2.pdf (240 KB)

We look forward to seeing you all at ***tomorrow's Civic Committee Meeting at 2:00pm in the Belle Chasse Auditorium at 8398 Louisiana 23, Belle Chasse, LA 70037***.

If you cannot attend, please feel free to send a representative from your department/organization.

Also, we would like to extend an additional invitation to the Public Meeting that will be taking place ***Tuesday, September 30, 2014, 2:00 PM at the Belle Chasse Auditorium***. A copy of the meeting flyer is attached. We kindly ask that you post this inside your office/office building to assist us in making the public aware of this meeting. This announcement is also displayed on the Parish's website and has been advertised in the Plaquemines Parish Gazette.

We would love to have you all join us at this meeting as your voices can help members of the public better understand the importance of this plan update as well as the decisions both committees have agreed upon to date.

My apologies for any duplicate notifications and thank you all again for your service to this project.

Best,

Francinia M. Henry

gcr **Francinia McKeithan Henry** | Planner

GCR Inc.
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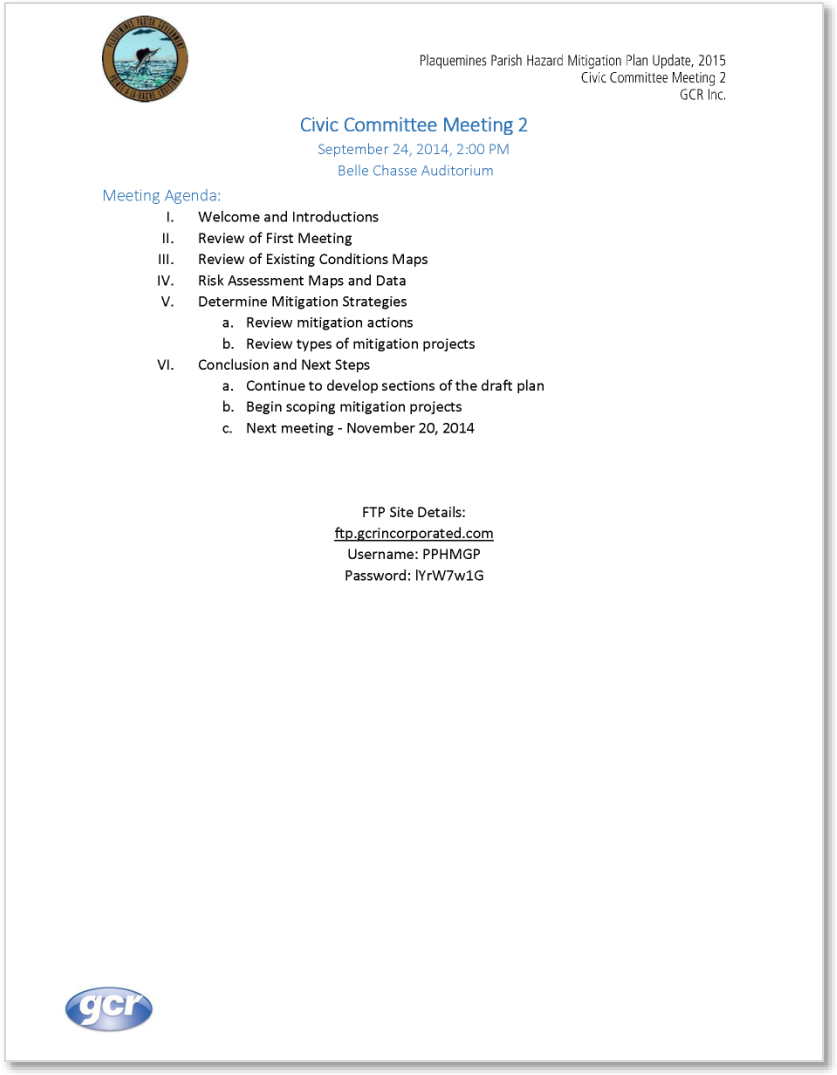
New Orleans,LA 70122
United States of America

www.GCRincorporated.com
Phone: 504.304.2500
Phone: 800.259.6192
Fax: 504.304.2525



Plaquemines Parish Hazard Mitigation Plan Update, 2015
Civic Committee Meeting 2
GCR Inc.

Civic Committee Meeting 2

September 24, 2014, 2:00 PM

Belle Chasse Auditorium

Meeting Agenda:

I. Welcome and Introductions
II. Review of First Meeting
III. Review of Existing Conditions Maps
IV. Risk Assessment Maps and Data
V. Determine Mitigation Strategies
    a. Review mitigation actions
    b. Review types of mitigation projects
VI. Conclusion and Next Steps
    a. Continue to develop sections of the draft plan
    b. Begin scoping mitigation projects
    c. Next meeting - November 20, 2014

FTP Site Details:
ftp.gcrincorporated.com
Username: PPHMGP
Password: lYrW7w1G

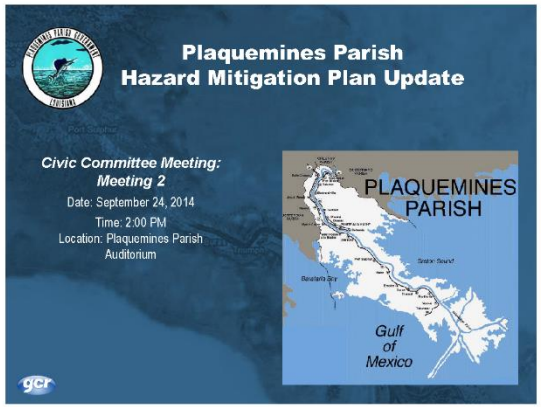
gcr

PLAQUEMINES PARISH HAZARD MITIGATION PLAN: CIVIC GROUP MEEETING #2
Belle Chasse Auditorium 8398 Hwy. 23, Belle Chasse, LA 70037
September 24, 2014
2:00PM

Name	Organization	Email
Robert Beverly	VA MED CENTER	Robert.Beverly2@VA.GOV
Tim Potter	Chevron Oroniter	Tapo@chevron.com
Benny Puckett	PPG	bpuckett@ppgov.net

PLAQUEMINES PARISH HAZARD MITIGATION PLAN: CIVIC GROUP MEEETING #2
Belle Chasse Auditorium 8398 Hwy. 23, Belle Chasse, LA 70037
September 24, 2014
2:00PM

Name	Organization	Email
Elizabeth Griffin	GCR	egriffith@gcrl.com
Tyler antrup	GCR	TAntrup@gcrl.com
Patrick A. Harvey	PPG-OHSEP	pharvey@ppgov.net
Belinda Hazel	PP Assessor office	bhazel@plaqpao.com
Helen Lott	PPG	hlott@ppgov.net
Gina Meyer	PPG-EMG	gmeyer@ppgov.net



II. Review of First Meeting

First Civic Meeting:

- Reviewed purpose and planning process.
- Discussed the proposed final list of hazards.
- Discussed the proposed final goal and objectives.
- Discussed eligible projects.

III. Review of Existing Conditions Maps

- Base Map
- Existing Land Use
- Flood Zones
- Basic Wind Speed
- Land Cover
- Elevation
- Drainage
- Facilities
  - Fire
  - Hospitals
  - Schools
  - Potable Water
  - Waste Water
  - Sheriff
  - Telecommunications

IV. Risk Assessment

Event Type	Events	Injuries	Property Damage	Crop Damage	Annual Probability	Damage/Event
Cold/Wind Chill	3		$ -	$ -	5%	$ -
Drought	2		$ -	$ 250,000	5%	$ 125,000
Flash Flood	7		$ 130,000	$ -	11%	$ 18,571
Flood	1		$ -	$ -	2%	$ -
Funnel Cloud	8		$ -	$ -	13%	$ -
Hail	16		$ -	$ -	25%	$ -
Heavy Rain	2		$ -	$ -	3%	$ -
Heavy Snow	1		$ -	$ -	2%	$ -
High Wind	1		$ -	$ -	2%	$ -
Tropical Cyclone	21		$ 1,543,148,000	$ -	33%	$ 73,482,900
Lightning	1		$ -	$ -	2%	$ -
Storm Surge/tide	6		$ 1,303,105,000	$ -	9%	$ 165,684,167
Thunderstorm Wind	57		$ 579,300	$ -	89%	$ 10,167
Tornado	30	11	$ 690,000	$ -	47%	$ 23,000
Winter Storm	1		$ -	$ 50,000	2%	$ 50,000
Grand Total	157	11	$ 3,544,845,300	$ 250,000	-	$ 16,269,525

NOAA National Climatic Data Center Storm Events Database- Plaquemines Parish 1950-2014

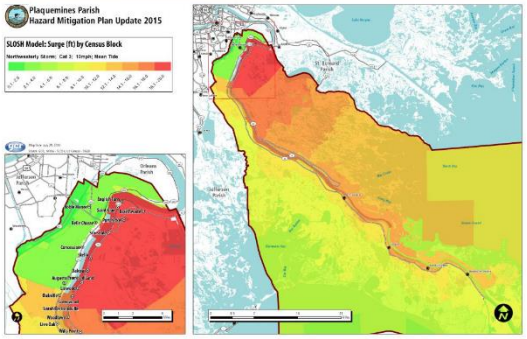
IV. Risk Assessment

Tropical Cyclone

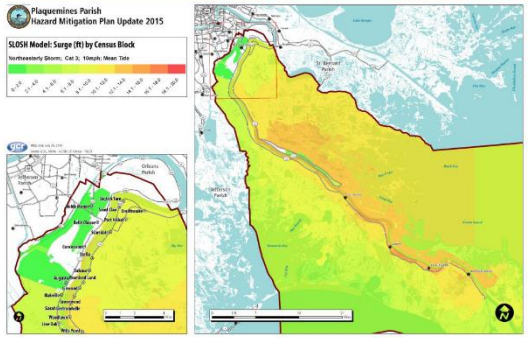
- Identified as one of the biggest hazards
- Includes hurricanes, tropical storms, depressions and storm surge

Year	Disaster Number	Storm Name	Category (in Plaquemines Parish)	Damage (Billions)
1965	208	Hurricane Betsy	3	$ 21.9
1969	272	Hurricane Camille	5	$ 22.6
1973	376	Severe Storm and Flooding	-	-
1974	448	Hurricane Carmen	4	$ 1.0
1992	956	Hurricane Andrew	3	$ 56.0
1998	1248	Tropical Storm Frances and Hurricane Georges	4	$ 4.5
2002	1423	Tropical Storm Isidore	Tropical Storm	$ 0.4
2002	1437	Hurricane Lilli	4	$ 1.1
2004	1548	Hurricane Ivan	3	$ 15.5
2005	1601	Tropical Storm Cindy	Tropical Storm	$ 0.3
2005	1602 & 1603	Hurricane Katrina and Rita	3	$ 81.0
2008	1769 & 1607	Hurricanes Gustav and Ike	2	$ 10.0
2011	4001	Tropical Storm Lee	Tropical Storm	$ 0.3
2012	4085	Hurricane Isaac	1	$ 2.4

IV. Risk Assessment



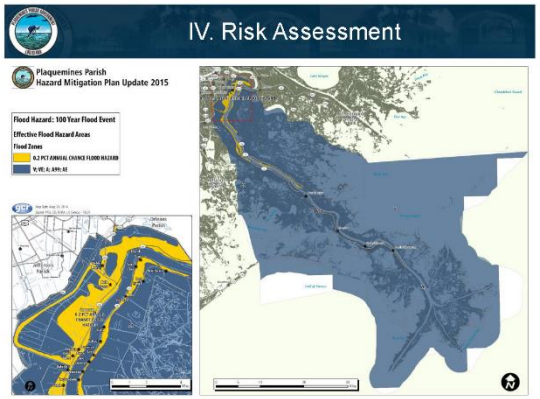
IV. Risk Assessment



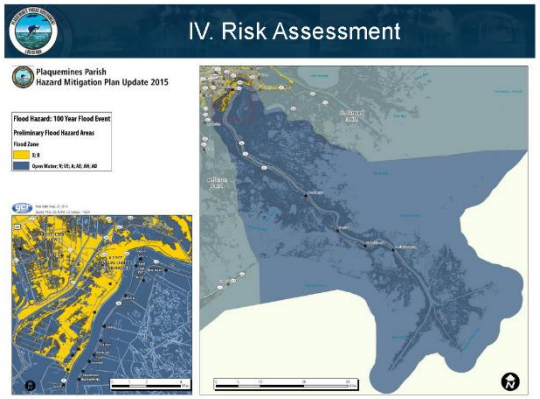
IV. Risk Assessment

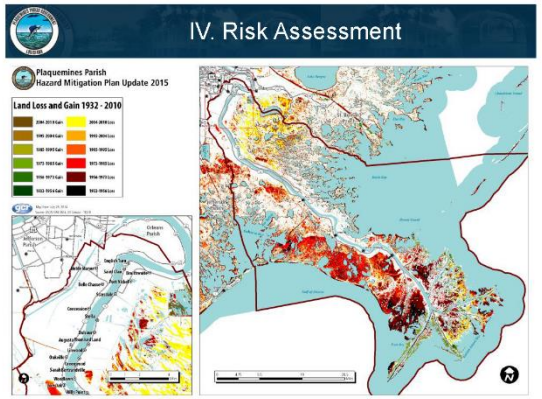
Flooding

- Also one of the biggest hazards
- Majority from flash flooding (urban ponding)
- Area of impact 100-year floodplain
  - This geography is currently contested

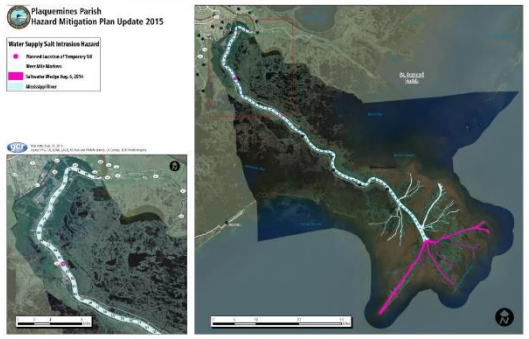

IV. Risk Assessment
Plaquemines Parish
Hazard Mitigation Plan Update 2015
Flood Hazard: 100 Year Flood Event
Effective Flood Hazard Areas
Flood Zones


IV. Risk Assessment
Coastal Hazards
– Coastal Land Loss
• Sea Level Rise
• Subsidence
– Saltwater Intrusion
• Potable Water Supply

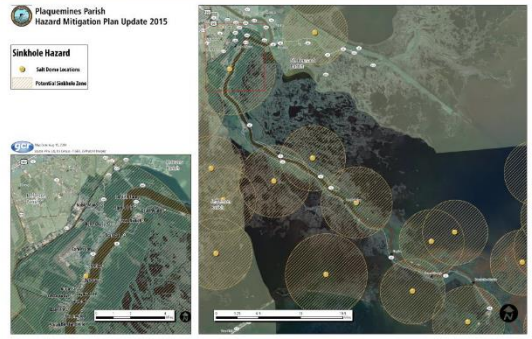

IV. Risk Assessment
Plaquemines Parish
Hazard Mitigation Plan Update 2015
Flood Hazard: 100 Year Flood Event
Preliminary Flood Hazard Areas
Flood Zone


IV. Risk Assessment
Plaquemines Parish
Hazard Mitigation Plan Update 2015
Land Loss and Gain 1932 - 2010

IV. Risk Assessment



IV. Risk Assessment



IV. Risk Assessment

Sinkholes

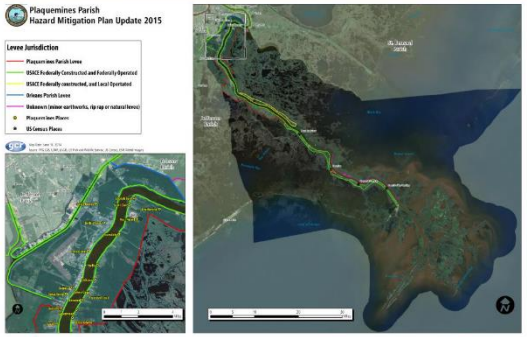
- Primarily located at salt dome sites
- Chose a 5 mile buffer to measure fully impacts populations
- Generally considered a low risk

IV. Risk Assessment

Levee Failure

- Levees divided by Federal and Non-Federal.
- Some Federal levees now maintained by local authorities.
- Vulnerability was determined by assuming breach of a levee would cause devastation of the impacted basin.

IV. Risk Assessment



V. Determining Mitigation Strategies

Mitigation Action Evaluation

- Survey currently underway
- Steering Committee will complete in October
- Final survey results at our next meeting

V. Determine Mitigation Strategies

– Review New Actions:

- Action 2.4.1:

  Support the creation and implementation of a Community Education and Outreach Program.

- Action 4.3.1:

  Integrate historic cultural resource protection into hazard mitigation planning to improve the ability of resources to withstand impacts of natural and man-made hazards while retaining character-defining architectural features.

V. Determining Mitigation Strategies

Types of Eligible Hazard Mitigation Projects





» Hardening or Retrofitting of Critical Facilities
» Drainage: Improvements to Existing Facilities
» Elevation
» Safe Rooms
» 5% Initiatives (Public Education, Warning Systems, Generators, etc.)

VI. Conclusion and Next Steps

Conclusion and Next Steps

- Continue to develop sections of the draft plan
- Begin scoping mitigation projects
- Next meeting - November 20, 2014

Hazard Mitigation Plan Update FTP Site

ftp.gcrincorporated.com
Username: PPHMGP
Password: IYrW7w1G

Civic Committee Meeting 2 Minutes

September 24, 2014, 2:00 PM
Belle Chasse Auditorium
8398 Louisiana 23, Belle Chasse, LA 70037

Meeting Attendees:

Civic Committee Members:

1. Robert Beverly
2. Patrick A. Harvey
3. Hilda Lott
4. Gina Meyer
5. Tim Potter
6. Benny Puckett
7. Belinda Hazel

Consultants:

1. Elizabeth Griffith
2. Tyler Antrup

Meeting Minutes:

I. Introductions and Welcome:
   a. Introductions-- GCR, FEMA/GOHSEP, Parish Representatives:
      i. E. Griffith introduced herself and members of the GCR TEAM.
      ii. E. Griffith then asked those individuals present to go around the room and introduce themselves.

II. Review of First Meeting – E. Griffith reviewed the events of past Steering and Civic committee meetings.

III. Review of Existing Conditions Maps – It was discussed that the Existing Conditions Maps were up on the FTP site for the committee to review.

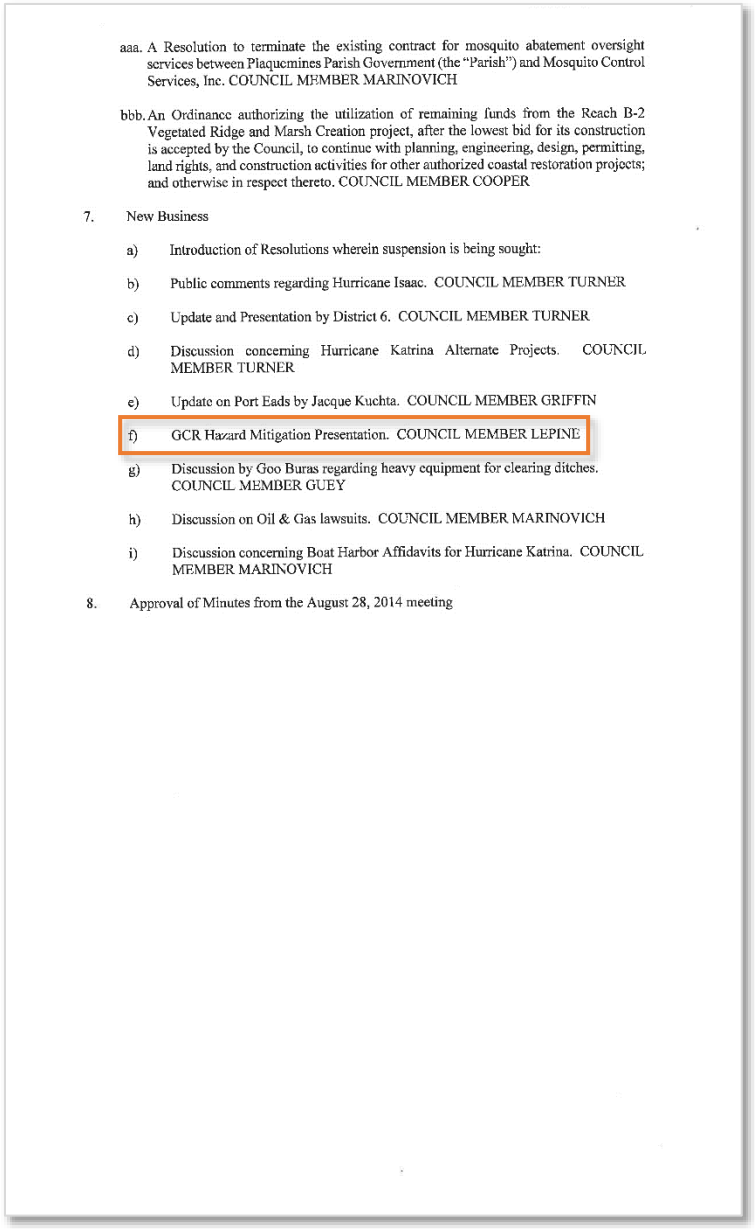
IV. Risk Assessment Maps and Data – T. Antrup reviewed the sections and maps of the Risk Assessment with the committee.

V. Determine Mitigation Strategies – E. Griffith discussed the mitigation strategy process and how the Steering Committee is currently reviewing the actions and projects and ranking them for the plan's Mitigation Strategy chapter.

VI. Conclusion and Next Steps
   a. Continue to develop sections of the draft plan
   b. Begin scoping mitigation projects
   c. Next meeting - November 20, 2014

Public Meeting 1

The Hazard Mitigation Planning Team held the first of two public meetings at a Plaquemines Parish Council Meeting on September 11, 2014 located in the Temporary Courthouse Building in Belle Chasse. The purpose of the presentation was to make the council and public aware of the planning process, timeline, and process for public input on the draft version. No comments or input was received from the attendees at this meeting.



aaa. A Resolution to terminate the existing contract for mosquito abatement oversight services between Plaquemines Parish Government (the "Parish") and Mosquito Control Services, Inc. COUNCIL MEMBER MARINOVICH

bbb. An Ordinance authorizing the utilization of remaining funds from the Reach B-2 Vegetated Ridge and Marsh Creation project, after the lowest bid for its construction is accepted by the Council, to continue with planning, engineering, design, permitting, land rights, and construction activities for other authorized coastal restoration projects; and otherwise in respect thereto. COUNCIL MEMBER COOPER

7. New Business

a) Introduction of Resolutions wherein suspension is being sought:

b) Public comments regarding Hurricane Isaac. COUNCIL MEMBER TURNER

c) Update and Presentation by District 6. COUNCIL MEMBER TURNER

d) Discussion concerning Hurricane Katrina Alternate Projects. COUNCIL MEMBER TURNER

e) Update on Port Eads by Jacque Kuchta. COUNCIL MEMBER GRIFFIN

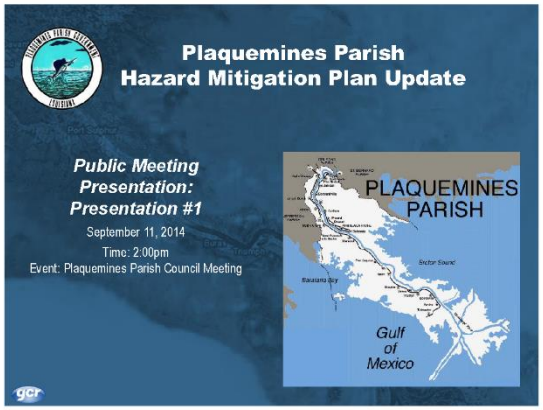
f) GCR Hazard Mitigation Presentation. COUNCIL MEMBER LEPINE

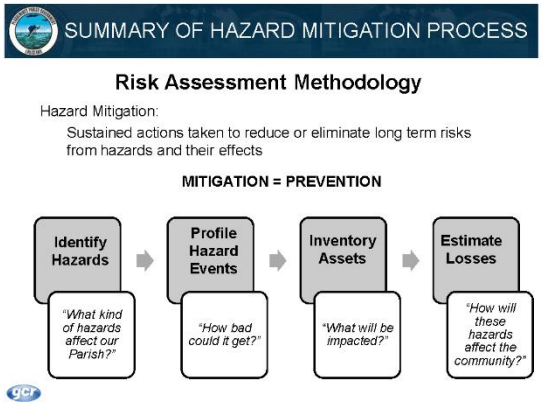
g) Discussion by Goo Buras regarding heavy equipment for clearing ditches. COUNCIL MEMBER GUEY

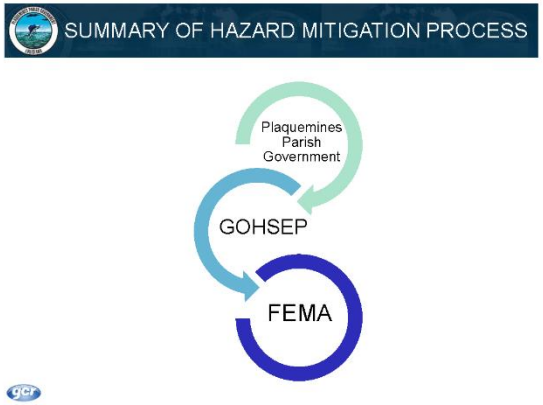
h) Discussion on Oil & Gas lawsuits. COUNCIL MEMBER MARINOVICH

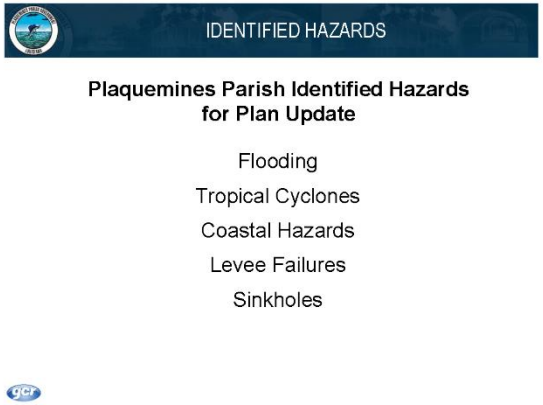
i) Discussion concerning Boat Harbor Affidavits for Hurricane Katrina. COUNCIL MEMBER MARINOVICH

8. Approval of Minutes from the August 28, 2014 meeting


Plaquemines Parish
Hazard Mitigation Plan Update
Public Meeting
Presentation:
Presentation #1
September 11, 2014
Time: 2:00pm
Event: Plaquemines Parish Council Meeting
PLAQUEMINES PARISH
Gulf of Mexico


SUMMARY OF HAZARD MITIGATION PROCESS
Risk Assessment Methodology
Hazard Mitigation:
Sustained actions taken to reduce or eliminate long term risks from hazards and their effects
MITIGATION = PREVENTION
Identify Hazards
"What kind of hazards affect our Parish?"
Profile Hazard Events
"How bad could it get?"
Inventory Assets
"What will be impacted?"
Estimate Losses
"How will these hazards affect the community?"


SUMMARY OF HAZARD MITIGATION PROCESS
Plaquemines Parish Government
GOHSEP
FEMA


IDENTIFIED HAZARDS
Plaquemines Parish Identified Hazards for Plan Update
Flooding
Tropical Cyclones
Coastal Hazards
Levee Failures
Sinkholes

MITIGATION GOALS AND OBJECTIVES

Hazard Mitigation Plan Update Goals

- Goal 1: Reduce losses to existing and future property due to hazards
- Goal 2: Protect the health and well-being of the people of Plaquemines Parish from negative effects of hazards
- Goal 3: Ensure the abilities of emergency services providers to continue operating during hazardous events
- Goal 4: Protect existing public and private infrastructure from damage

UPCOMING MEETINGS

- One more Steering Committee meeting
  - November 17, 2014
- Two more Civic Committee meetings
  - September 24, 2014 and November 20, 2014
- Public Meeting
  - September 30, 2014

PROJECT OPPORTUNITIES

Types of Eligible Hazard Mitigation Projects





» Hardening or Retrofitting of Critical Facilities
» Drainage: Improvements to Existing Facilities
» Elevation
» Safe Rooms
» 5% Initiatives (Public Education, Warning Systems, Generators, etc.)

CONTACT DETAILS

Elizabeth Griffith
egriffith@gcrincorporated.com
504-304-0731

Public Meeting 2

The Hazard Mitigation Planning Team held the second of two public meetings at on September 30, 2014 located in the Belle Chasse Auditorium. The purpose of the presentation was to make the public aware of the planning process, timeline, and process for public input on the draft version. The Planning Team also presented the draft risk assessment and received input. No input received affected the content of the plan, and a summary can be found below in the minutes.

The Facts vs. Misunderstandings

I want to thank The Gazette for running a story about the intended survey by the School Board. You published a Commentary in the September 9, 2014 issue about the survey that was not allowed to be circulated due to 7 of the 9 School Board Members voting to defer the issue. The 2 members voting to allow the survey were Anthony St. Philip and Nancy LeHaye. Our survey included the raises along with the renovation or building of a new BCHS.

The proponents of the survey could not tell you why the administration, superintendent or other board members were against the survey from the beginning. We only received negativity from those involved. We kept asking, "What's wrong with asking the public if they want to spend the money or how they want to spend it?" We kept hearing that it was political suicide. If this is considered political suicide then this is how I want my representation to end; asking the voters what to do with their money. The School Board has done an excellent job of managing its money, educating our children and earning the trust of the public. We would never violate that trust and have spent every dollar to the best of our ability and I must say, having new money coming in would be a god send with this board producing another state of the art facility or renovation that would produce top quality education for years to come.

Our intentions were to keep the public informed and allow them the opportunity to have a say in the matter. We were looking for a direction to forward to the Construction Committee. If the voters decided not to pass a tax or millage, then we would have followed their wishes. We did not want to cram a tax or millage down the throats of our constituents if they did not want a major renovation or build a new school. Likewise, if they chose to do so then the direction chosen would have been backed by the majority of the parish and the board would have followed those wishes as well. This is a parish wide decision. The School Board just completed 3 state of the art school facilities paid for by FEMA that turned out beautiful.

These are the facts as I know them and hope this clears up any misunderstandings about the intended survey by the Board.

Anthony St. Philip - President
Plaquemines Parish School Board
District 3 Representative

SEND "LETTERS TO THE EDITOR" TO COPY@PLAQUEMINESGAZETTE.COM

www.readtothem.org/index.php.

The One Community, One School, One Book "Kickoff" event will be on READ Night which is on Wednesday, September 24 from 5 p.m. to 6:30 p.m. The goal is to spark a community of life-long lovers of readers and learners.

Our staff, parents, and students are "Soaring to New Heights!" Everyone in our community will have a copy of the book which will be revealed at READ Night. We like to say, "New School, New Attitude, New Heights."

Please join SPES for an exciting month of reading and learning! We hope to see you at READ Night on September 24!

September 26, 27 & 28
OLPH Fair

OLPH Parish invites everyone in the community to this year's fair, OLPH Rocks This Town. The fair features food, games, live music, and other entertainment. The hours of the fair are: Friday, 7 p.m. – 11 p.m., Saturday, 11 a.m. – 11 p.m., and Sunday, 11 a.m. – 9 p.m. Come out and have a great time!

September 27
Voter Registration

Not registered to vote? The forms and instructions will be available in front of Plaquemines Pharmacy, 8443 Hwy 23, Belle Chasse on Saturday, September 27 from 10 a.m. to 2 p.m. Be sure to register to be eligible to vote in the November 4 election!

September 30
Meeting for Plaquemines Parish Hazard Mitigation Plan Update

In order to continue working with the Louisiana Governor's Office of Homeland Security and Emergency Preparedness to ensure the continued safety of Plaquemines Parish from natural and man-made hazards, Parish Government is updating the Parish's current Hazard Mitigation Plan. At this meeting, there will be a review of the planning process and current plan progress. The public is encouraged to attend this meeting on September 30 at 2 p.m. in the Belle Chase Auditorium, 8398 Highway 23, Belle Chasse. Please direct any questions about the meeting to Patrick A. Harvey at 504.297.2477.

Lincoln 504.455.8577.

October 18
BCVFD Ladies Auxiliary Annual Craft Sale

The BCVFD Ladies Auxiliary is holding their annual craft sale on Saturday, October 18, in the Belle Chasse Auditorium from 9 a.m. to 3 p.m. If you are interested in renting a table for $40, or need additional information, please call Joyce at 504.394.7495 to reserve your spot.

October 18
Louisiana Mega Match

Jefferson SPCA is a recipient of grant funding to participate in the 2014 ASPCA Mega Match-a-thon, presented by Subaru. With a focus on community involvement, Jefferson SPCA is partnering with the The Louisiana SPCA, PAWS and CAA for one of the largest cross adoption promotions this area has ever seen, covering an almost 200 mile radius. With a combined goal of 175 adoptions on Saturday, October 18, all four animal shelters– Louisiana SPCA, Jefferson SPCA, Companion Animal Alliance in Baton Rouge, and PAWS in Belle Chasse - are coming together to offer a reduced adoption fee of only $25. Plaquemines Animal Welfare Society (PAWS) will host the adoptions from 11 a.m. to 5 p.m.

For more information about Louisiana Mega Match and to learn how you can help find homes for 175 animals on Saturday, October 18, please visit www.louisianamegamatch.com.

October 20
Richie Kernion Memorial Golf Fore Life tournament

The Richie Kernion Memorial Golf Fore Life tournament will be held Monday, Oct. 20, at English Turn Golf Club.

The four-person scramble is held annually and benefits the life-saving efforts of Louisiana Right to Life.

Registration opens at 10 a.m., lunch begins at 11 a.m. and a shotgun start is set for noon. An awards presentation and post-tournament reception will be held immediately following the event.

Cost is $125 per golfer and $500 per team. Registration costs include food, beverages and a gift bag. Cost to sponsor a hole is $150. Other sponsorship levels are also available.

"Kickin' Cancer" Breast Cancer ... The event will take place Octob... from 10 a.m. to 7 p.m. at Cy... Park located at 499 East Edward... bert Blvd. Belle Chasse.

The "Kickin' Cancer" Breast ...cer Walk is a family oriented ... aimed at bringing people togeth... their support of breast cancer ...vors. At the event, participant... walk or run on a track style rela... 10 hours in honor of their loved ... who have been affected by thi... ease. Participants can camp ar... the track, as well as, take part in ...tional fun activities.

Proceeds from the "Kickin' ...cer" Breast Cancer Walk will be ... to assist her sister with expense... curred during medical treatmen... to provide breast cancer awar... to all women. A portion of the ...ceeds will also be donated to ... breast cancer survivors.

For contact information re...ing this event please contact, K...nna Prout (Host/Event Planne...) 504.941.0585 or email kickinth... kawanna@gmail.com

NOVEMBER

November 1
Relay for Life of Plaquemines Parish

Join the fight against cancer ... the movement to create a world ... more birthdays, by participatin... the American Cancer Society ...lay For Life on November 1 at ... Chasse High School, from 2 p.... 10 p.m. This inspiring fundra... event unites the entire comm... in celebrating those who have ... cancer, remembering loved ones ... and providing an opportunity ... fight back against the disease in a ...tival-style atmosphere free to at... and open to the public.

Pick up a $5 raffle ticket ... chance to win a beautiful pain... by renowned artist Christy W... Boutte! All proceeds go to our R... and supports team Fleur de Cu... Mississippi River Bank! Pick up ... ticket at either Mississippi River ... location in Belle Chasse or Port ...phal!

To donate to the event, sign ... team, or find out more, please ... www.relayforlife.org/Plaquemi... LA, call Britta at 504.219.2291 ... e-mail britta.ehnebuske@cancer...

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PLAQUEMINES PARISH HAZARD MITIGATION PLAN: PUBLIC MEETING PRESENTATION #2

Belle Chasse Auditorium 8398 Hwy. 23, Belle Chasse, LA 70037

September 30, 2014

2:00PM

Name	Organization	Email
Nici English	GOHSEP	nicolette.english@la.gov
Elizabeth Griffith	GCR	egriffith@gcrl.com
Benny Rousselle		
Eddie DeRouen		
Al Cheloox		
Patrick A. Harvey	PPG-OHSEP	pharvey@ppgov.net
Alex Galbraith	Plaq. Gazette	[illegible] @ plaqueminesgazette.com
Monica Martin	PMC	mmartin@plaqueminesmedicalcenter.com

PLAQUEMINES PARISH HAZARD MITIGATION PLAN: PUBLIC MEETING PRESENTATION #2
Belle Chasse Auditorium 8398 Hwy. 23, Belle Chasse, LA 70037
September 30, 2014
2:00PM

Name	Organization	Email
Francinia M. Henry	GCR, Inc.	fhenry@gcrincorporated.com
LAUREL MCCLURE	USN	LAUREL.MCCLURE@NAVY.MIL
Dixie Andrews	SDMI, LSU	ddandrews1@lsu.edu
Audrey T. Saluant	Plag. Parish Govt Dist 6	district6@PPG.Net
Hilda Lott	PPG	hlott@ppgov.net

PLAQUEMINES PARISH HAZARD MITIGATION PLAN: PUBLIC MEETING PRESENTATION #2
Belle Chasse Auditorium 8398 Hwy. 23, Belle Chasse, LA 70037
September 30, 2014
2:00PM

Name	Organization	Email
Tyler Antrup	OCR INC.	tantrup@ocrincorporated.com
Burghart H. Turner	P.P. Gov; Councilman, District 6	gal-6-9@msn.com

Public Meeting 2 Minutes

September 30, 2014, 2:00 PM
Belle Chasse Auditorium
8398 Louisiana 23, Belle Chasse, LA 70037

Meeting Attendees:

Public Meeting Participants:

1. Nici English
2. Benny Rousselle
3. Eddie Derouer
4. M. Wilcox
5. Patrick A. Harvey
6. F. Galbraith
7. Monica Martin
8. Lauren McClure
9. Lexie Andrews
10. Audrey T. Salvant
11. Hilda Lott
12. Burghart H. Turner

Consultants:

Elizabeth Griffith Tyler Antrup Francinia M. Henry

Meeting Minutes:

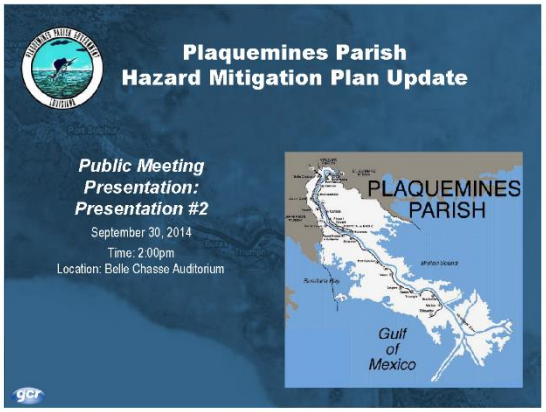
I. Introductions: GCR, FEMA/GOHSEP, Parish Representatives:
   i. E. Griffith introduced herself and members of the GCR Team.
II. Summary of the Hazard Mitigation Process and Project Timeline:
   i. E. Griffith provided an explanation of the Plan Update Process:
      - Structure and roles of steering and civic committees
      - Current project timeline:
        - Plaquemines Parish has begun this process as the current plan expires on March 29th.
        - In order to give GOHSEP and FEMA enough time to approve the plan update, the Parish needs to have the updated plan to GOHSEP by January 1st.
        - Parish will send to GOSHEP and FEMA after public review.
   ii. Member of the public raised a question concerning the schedule of the public meetings and whether or not committee meetings were open to the public.
      a. E. Griffith explained that steering and civic committee meetings were not open to the public. Also provided detail on structure of Civic Committee—to include individuals outside of Plaquemines Parish Government, Subject Mater Experts, and regional leadership from surrounding parishes.
      b. F. Henry added detail regarding the considerations made for timing and location of all public meetings and future plans for public involvement in the draft plan review (copies to be made available at the local public library).
   iii. Question raised by public member regarding how committees were created.
      a. E. Griffith Responded. GCR team worked with the parish to identify persons to serve on each respective committee. The Steering Committee being composed of representatives from Plaquemines Parish while the Civic Committee is a larger group including steering committee representatives, leadership from surrounding

Plaquemines Parish Hazard Mitigation Plan Update
Public Meeting 2: Meeting Minutes
GCR Inc.

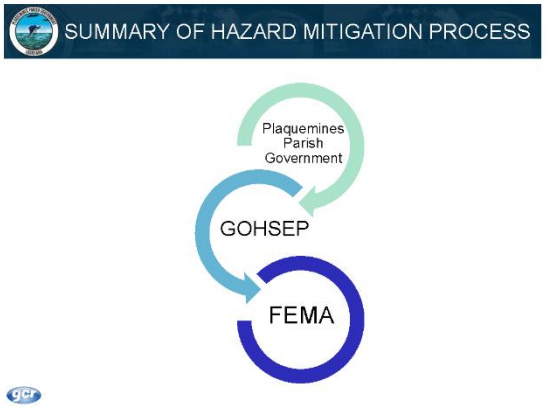
parishes, and business organizations, some of whom participated in the planning process from 2009.

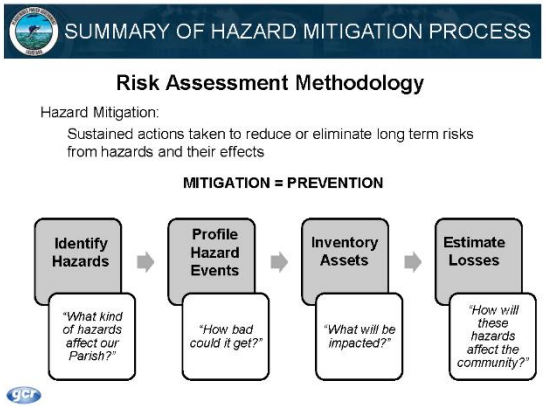
III. Review of Identified Hazards:
   1. Decision made to focus on 5 hazard types:
      i. Floods, Costal Hazards, Levee Failure, Tropical Cyclones, Sinkholes
IV. Risk Assessment Maps and Data – T. Antrup reviewed the sections and maps of the Risk Assessment with meeting participants.
   a. Member of the public raised a question regarding the modeling of flooding in maps.
      i. T. Antrup responded, noting that the FEMA flood models changed between the effective and preliminary maps, showing more detail.
   b. Question posed on storm surge modeling and whether or not levees were included in the storm surge models.
      i. T. Antrup responded: No, this is strictly LIDAR elevation data, it does not incorporate flood protection structures.
   c. Public member asked for clarification on the program being used.
      i. T. Antrup responded: Yes, NOAA's (National Oceanic and Atmospheric Administration) SLOSH (Sea, Lake, and Overland Surges from Hurricanes) is the modelling program which is what other states, like New York use.
V. Review of Mitigation Plan Goals and Objectives—F. Henry led meeting participants through a review of the plan's goals and objectives. Provided update of current process of Mitigation Action Evaluation and Project Prioritization scoring exercise being completed by the Steering Committee.
   a. Goal 1: Reduce losses to existing and future property due to hazards
   b. Goal 2: Protect the health and well-being of the people of Plaquemines Parish from negative effects of hazards
   c. Goal 3: Ensure the abilities of emergency services providers to continue operating during hazardous events
   d. Goal 4: Protect existing public and private infrastructure from damage
VI. Discussion of Project Opportunities:
   a. Hardening or Retrofitting of Critical Facilities
   b. Drainage: Improvements to Existing Facilities
   c. Elevation
   d. Safe Rooms
   e. 5% Initiatives (Public Education, Warning Systems, Generators, etc.)
VII. Conclusion and Next Steps:
   a. Upcoming meetings:
      i. Steering: November 17, 2014
      ii. Civic: November 20, 2014
   b. Draft Plan scheduled to be available in early December.
      i. Question was raised about draft plan and how it would be made available.
         1. E. Griffith responded: Public was invited to review draft plan once released and made aware of future channels through which the draft plan will be made available (Belle Chasse Library).

ii. Meeting adjourned @ 2:45 pm.


Plaquemines Parish
Hazard Mitigation Plan Update
Public Meeting
Presentation:
Presentation #2
September 30, 2014
Time: 2:00pm
Location: Belle Chasse Auditorium
PLAQUEMINES PARISH
Gulf of Mexico
gcr


PROJECT TIMELINE
Review Previous Plan & Draft Updates
Risk Assessment
Mitigation Action Evaluation & Project Prioritization
Draft Plan


SUMMARY OF HAZARD MITIGATION PROCESS
Plaquemines Parish Government
GOHSEP
FEMA
gcr


SUMMARY OF HAZARD MITIGATION PROCESS
Risk Assessment Methodology
Hazard Mitigation:
Sustained actions taken to reduce or eliminate long term risks from hazards and their effects
MITIGATION = PREVENTION
Identify Hazards
"What kind of hazards affect our Parish?"
Profile Hazard Events
"How bad could it get?"
Inventory Assets
"What will be impacted?"
Estimate Losses
"How will these hazards affect the community?"
gcr

IDENTIFIED HAZARDS

Plaquemines Parish Identified Hazards for Plan Update

Flooding

Tropical Cyclones

Coastal Hazards

Levee Failures

Sinkholes

IV. Risk Assessment

Tropical Cyclone

- Identified as one of the biggest hazards
- Includes hurricanes, tropical storms, depressions and storm surge

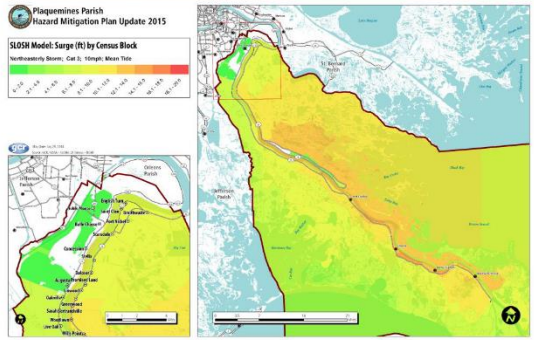
Year	Disaster Recovery #	Storm Name	Category (in Plaquemines Parish)	Damage (Billions)
1965	188	Hurricane Betsy	3	$ 21.9
1969	272	Hurricane Camille	5	$ 22.6
1973	374	Severe Storm and Flooding	-	-
1974	448	Hurricane Carmen	4	$ 1.0
1992	950	Hurricane Andrew	2	$ 56.0
1998	1246	Tropical Storm Frances and Hurricane Georges	4	$ 4.5
2002	1435	Tropical Storm Isidore	Tropical Storm	$ 0.4
2002	1437	Hurricane Lilli	4	$ 1.1
2004	1548	Hurricane Ivan	3	$ 15.5
2005	1601	Tropical Storm Cindy	Tropical Storm	$ 0.3
2005	3252 & 3033	Hurricanes Katrina and Rita	3	$ 81.9
2008	3268 & 3037	Hurricanes Gustav and Ike	3	$ 10.9
2011	4044	Tropical Storm Lee	Tropical Storm	$ 0.3
2012	4080	Hurricane Isaac	1	$ 2.4

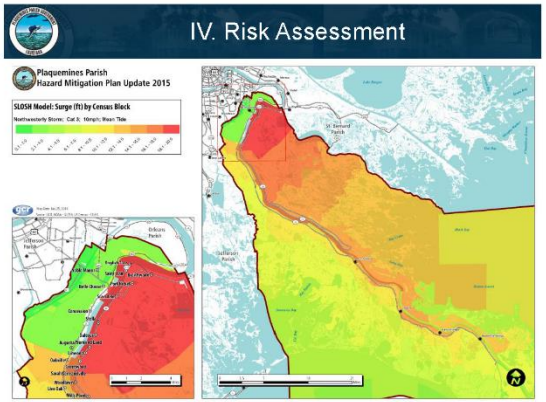
IV. Risk Assessment

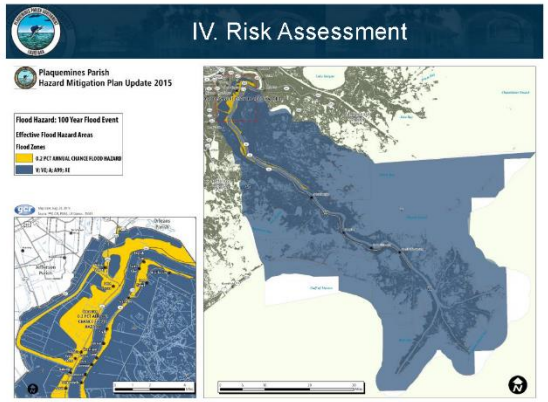
Event Type	Events	Injuries	Property Damage	Crop Damage	Annual Probability	Damage/Event
Cold/wind Chill	3		$ -	$ -	5%	$ -
Drought	2		$ -	$ 250,000	5%	$ 125,000
Flash Flood	7		$ 130,000	$ -	11%	$ 18,571
Flood	1		$ -	$ -	2%	$ -
Funnel Cloud	8		$ -	$ -	12%	$ -
Hail	16		$ -	$ -	25%	$ -
Heavy Rain	2		$ -	$ -	3%	$ -
Heavy Surf	1		$ -	$ -	2%	$ -
High Wind	1		$ -	$ -	2%	$ -
Tropical Cyclone	21		$ 1,543,141,000	$ -	33%	$ 73,482,905
Lightning	1		$ -	$ -	2%	$ -
Storm Surge/tide	6		$ 1,000,100,000	$ -	9%	$ 166,684,167
Thunderstorm Wind	27		$ 379,300	$ -	86%	$ 14,167
Tornado	30	11	$ 490,300	$ -	47%	$ 22,000
Winter Storm	1		$ -	$ 30,000	2%	$ 30,000
Grand Total	157	11	$ 2,544,645,500	$ 280,000	-	$ 16,209,525

NOAA National Climatic Data Center Storm Events Database- Plaquemines Parish 1950-2014

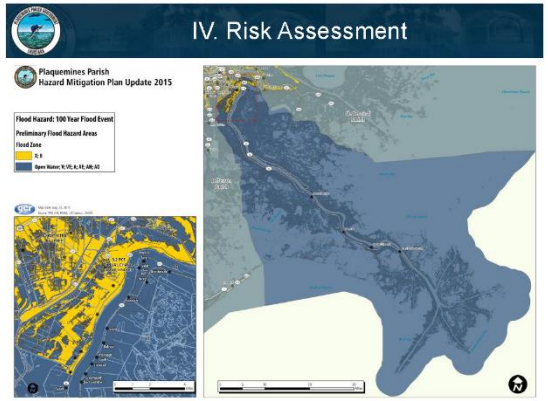
IV. Risk Assessment







Flooding
- Also one of the biggest hazards
- Majority from flash flooding (urban ponding)
- Area of impact 100-year floodplain
  - This geography is currently contested

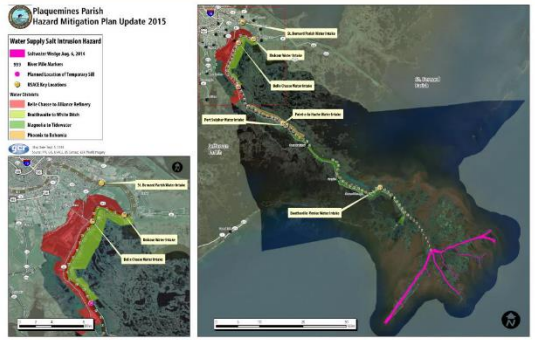


IV. Risk Assessment

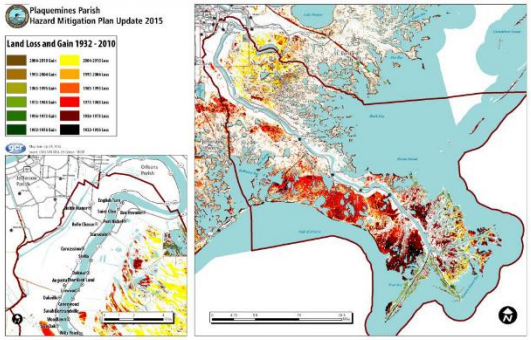
Coastal Hazards

- Coastal Land Loss
  - Sea Level Rise
  - Subsidence
- Saltwater Intrusion
  - Potable Water Supply

IV. Risk Assessment



IV. Risk Assessment

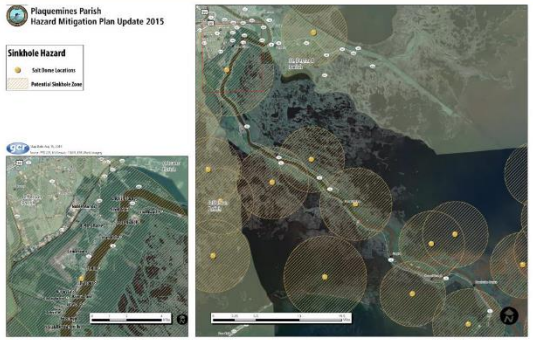


IV. Risk Assessment

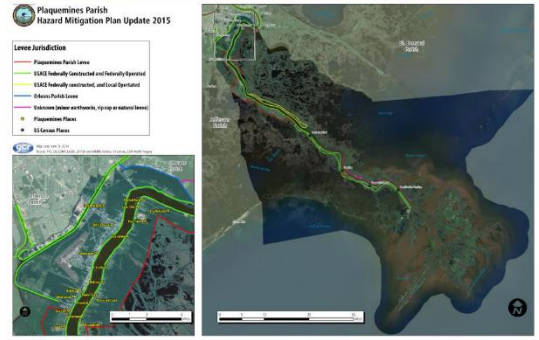
Sinkholes

- Primarily located at salt dome sites
- Chose a 5 mile buffer to measure fully impacts populations
- Generally considered a low risk

IV. Risk Assessment



IV. Risk Assessment



IV. Risk Assessment

Levee Failure

- Levees divided by Federal and Non-Federal.
- Some Federal levees now maintained by local authorities.
- Vulnerability was determined by assuming breach of a levee would cause devastation of the impacted basin.

MITIGATION GOALS AND OBJECTIVES

Hazard Mitigation Plan Update Goals

- Goal 1: Reduce losses to existing and future property due to hazards
- Goal 2: Protect the health and well-being of the people of Plaquemines Parish from negative effects of hazards
- Goal 3: Ensure the abilities of emergency services providers to continue operating during hazardous events
- Goal 4: Protect existing public and private infrastructure from damage

PROJECT OPPORTUNITIES

Types of Eligible Hazard Mitigation Projects





- » Hardening or Retrofitting of Critical Facilities
- » Drainage: Improvements to Existing Facilities
- » Elevation
- » Safe Rooms
- » 5% Initiatives (Public Education, Warning Systems, Generators, etc.)

UPCOMING MEETINGS

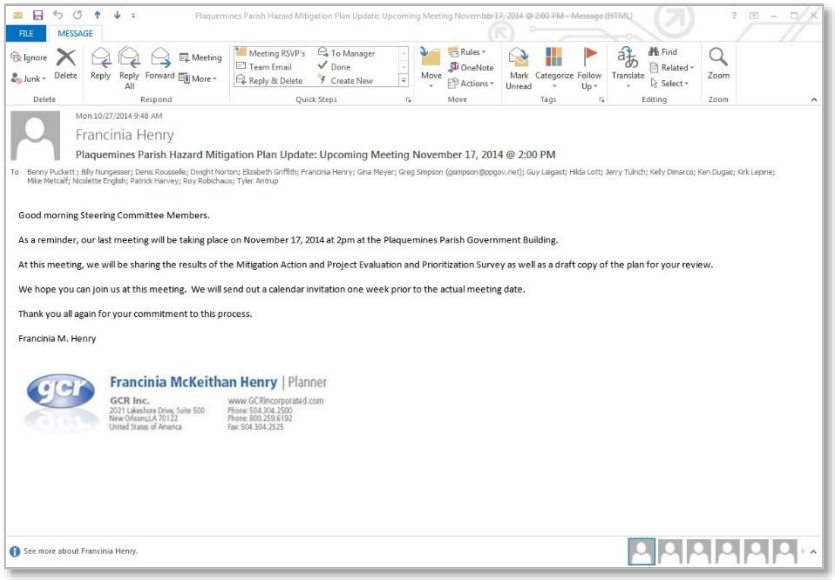
- One more Steering Committee meeting
  - November 17, 2014
- One more Civic Committee meeting
  - November 20, 2014
- Draft plan available in early December

CONTACT DETAILS

Elizabeth Griffith
egriffith@gcrincorporated.com
504-304-0731

Steering Committee Meeting 3

The Hazard Mitigation Planning Team met with the members of the Steering Committee for the third time on November 17, 2014 at the Plaquemines Parish Government Building. The purpose of the meeting was to present the final draft plan and discuss the public review process.



Mon 10/27/2014 9:48 AM

Francinia Henry

Plaquemines Parish Hazard Mitigation Plan Update: Upcoming Meeting November 17, 2014 @ 2:00 PM

To Benny Puckett ; Billy Nungesser; Denis Rousselle; Dwight Norton; Elizabeth Griffith; Francinia Henry; Gina Meyer; Greg Simpson (gsimpson@ppgov.net); Guy Laigast; Hilda Lott; Jerry Tulich; Kelly Dimarco; Ken Dugas; Kirk Lepine; Mike Metcalf; Nicolette English; Patrick Harvey; Roy Robichaux; Tyler Antrup

Good morning Steering Committee Members.

As a reminder, our last meeting will be taking place on November 17, 2014 at 2pm at the Plaquemines Parish Government Building.

At this meeting, we will be sharing the results of the Mitigation Action and Project Evaluation and Prioritization Survey as well as a draft copy of the plan for your review.

We hope you can join us at this meeting. We will send out a calendar invitation one week prior to the actual meeting date.

Thank you all again for your commitment to this process.

Francinia M. Henry

Francinia McKeithan Henry | Planner

GCR Inc.
2021 Lakeshore Drive, Suite 500
New Orleans,LA 70122
United States of America

www.GCRincorporated.com
Phone: 504.304.2500
Phone: 800.259.6192
Fax: 504.304.2525

See more about Francinia Henry.

Steering Committee Meeting 3
November 17, 2014, 2:00 PM
Plaquemines Parish Government Building
8056 Hwy. 23, Suite 200
Belle Chasse, LA 70037

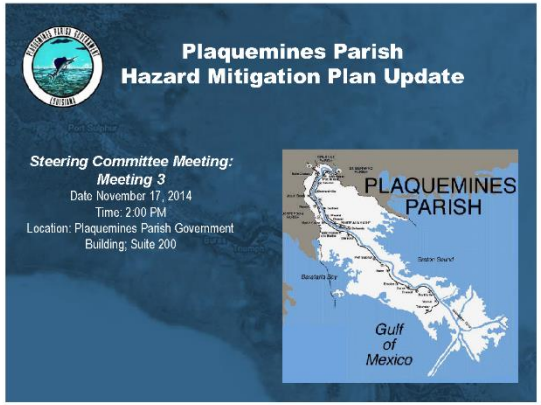
Meeting Agenda:

I. Welcome and Introductions
II. Review of Previous Meetings
III. Review of Mitigation Strategies
    a. Review final evaluation and prioritization of mitigation actions
    b. Review prioritized project list
IV. Review of Plan Maintenance Procedures
    a. Monitoring, Evaluating and Updating
    b. Public involvement and incorporating hazard mitigation into existing plans
V. Conclusion and Next Steps
    a. Draft Plan Period of Public Review: November 18th – November 25, 2014
    b. Submit draft plan to GOHSEP on or before December 4, 2014

FTP Site Details:
ftp.gcrincorporated.com
Username: PPHMGP
Password: lYrW7w1G

PLAQUEMINES PARISH HAZARD MITIGATION PLAN: STEERING COMMITTEE MEETING #3
Plaquemines Government Building 8056 Hwy 23 Ste. 200 Belle Chasse, LA 70037
November 17, 2014
2:00PM

Name	Organization	Email
Patrick A. Harvey	PPG - OHSEP	pharvey@ppgov.net
Elizabeth Griffith	GCR Inc.	egriffith@gcrincorporated.net
Tyler Antrop	GCR Inc.	tantrop@gcrincorporated.com
Benny Puckett	PPG Grants	bpuckett@ppgov.net
Jonah Arceneaux	PPG Engineering	jonah@ppgov.net



II. Review of Previous Meetings

Previous Steering Committee Meetings:

- Reviewed purpose and planning process.
- Reviewed and updated the list of hazards and the goals and objectives from the 2009 Plan Update.
- Discussed eligible projects and reviewed existing condition maps.
- Reviewed the Risk Assessment elements
- Evaluated the actions and projects

III. Mitigation Action Evaluation Survey Results

Mitigation Action	Feasibility Score	Priority Rank
1.1.1	1.7	1
1.1.2	1.1	2
1.2.1	1.2	7
1.2.2	1.1	3
1.2.3	0.89	4
1.3.1	1.22	6
1.3.2	1.22	5
1.3.3	1.11	8
1.4.1	0.44	25
1.4.2	0.78	10
1.4.3	1.22	11
1.4.4	0.78	21
1.4.5	1.0	18
2.1.1	1.44	9
2.1.2	1.56	16
2.1.3	0.67	28
2.2.1	0.56	29
2.2.2	1.0	15
2.3.1	1.0	14
2.3.2	1.33	13
2.4.1	1.11	17
3.1.1	1.44	12
3.1.2	1.56	19
4.1.1	1.33	22
4.1.2	1.0	23
4.1.3	1.33	26
4.1.4	1.56	27
4.2.1	1.0	20
4.3.1	1.0	24

III. Project Prioritization Survey Results

Project	Priority Rank	Response Percentage	Project Status
Emergency Evacuations Center- F. Edward Hebert Center	1	42.9%	Existing
Burmaster Canal Improvements	2	28.6%	Existing
Cazalard Canal Sheet Piling	3	28.6%	Existing
Belle Chasse #3 Pump Station, Walker Road	4	28.6%	Existing
Empire Flood Gate Pump Project	5	28.6%	New
Venice Boat Harbor Road Elevation Project	6	57.2%	Existing
Port Sulphur Station/Office	7	28.6%	New
Ponte-ala-Hache Station	8	42.9%	New
Buras Station	9	28.6%	New
Woodlawn Station	10	28.6%	New
Venice Station	11	28.6%	New
Belle Chasse Station	12	42.9%	New
Belle Chasse EMS Office	13	42.9%	New
Freeport Building Retrofit	14	42.9%	Existing

IV. Plan Maintenance

- Monitoring, Evaluating, Updating
  - Plan must be monitored on an annual basis
  - Hazard Mitigation Plan Evaluation Committee
    - Parish President
    - Grant Administrator
    - Chief Engineer (responsible for overall coordination of HMP maintenance activities)
    - Director of Planning and Zoning
    - Director of Economic Development
    - OEP Director
    - Parish Sheriff
  - The Parish Engineer will be responsible for contacting each of the committee members during January of every year.

IV. Public Involvement and Incorporating Hazard Mitigation into Existing Plans

- Public Involvement
  - Responsibility for continued public participation will be that of the parish Engineer.
  - Copies of the plan will be kept on file at the parish government office.
  - Copies of the plan and any proposed changes will be posted on the parish government website.
- Incorporating Hazard Mitigation into Existing Plans
  - Members of the Plan Evaluation Committee will meet on an annual basis to ensure the Parish incorporates hazard mitigation into future planning activities and updates to other local plans.

V. Next Steps

- Plan will be available for public review November 18th through November 25th.
- Plan will officially go to GOSHEP after the public review process is complete and comments are incorporated.

V. Hazard Mitigation Plan Update FTP Site

Draft Plan is Available for Committee Review

ftp.gcrincorporated.com
Username: PPHMGP
Password: IYrW7w1G

Steering Committee Meeting 3

November 17, 2014, 2:00 PM
Plaquemines Parish Government Building
8056 Hwy. 23, Suite 200
Belle Chasse, LA 70037

Meeting Attendees:

Steering Committee Members: Patrick A. Harvey, Benny Puckett, Jonah Arceneaux

Consultants: *Elizabeth Griffith, Tyler Antrup*

I. Welcome and Introductions
II. Review of Previous Meetings
    a. E. Griffith gave a synopsis of past meeting actions.
III. Review of Mitigation Strategies
    a. Review final evaluation and prioritization of mitigation actions
        i. E. Griffith reviewed the results of the mitigation action evaluation exercise and highlighted the five actions that were ranked as most important by the Steering Committee.
    b. Review prioritized project list
        i. E. Griffith reviewed the results of the project evaluation and prioritization and discussed the projects that were deemed most important.
IV. Review of Plan Maintenance Procedures
    a. Monitoring, Evaluating and Updating
        i. E. Griffith reviewed the proposed maintenance procedures and reviewed the Parish Governmental Officials that would be responsible for the annual maintenance tasks.
    b. Public involvement and incorporating hazard mitigation into existing plans
        i. E. Griffith reviewed the plan details for continued public involvement and incorporation into existing and future Parish Plans.
V. Conclusion and Next Steps
    a. Draft Plan Period of Public Review: November 18th – November 25, 2014
        i. E. Griffith informed the committee that the draft plan was available for their review on the ftp site, and that the Planning Team had received some changes from GOHSEP's preliminary

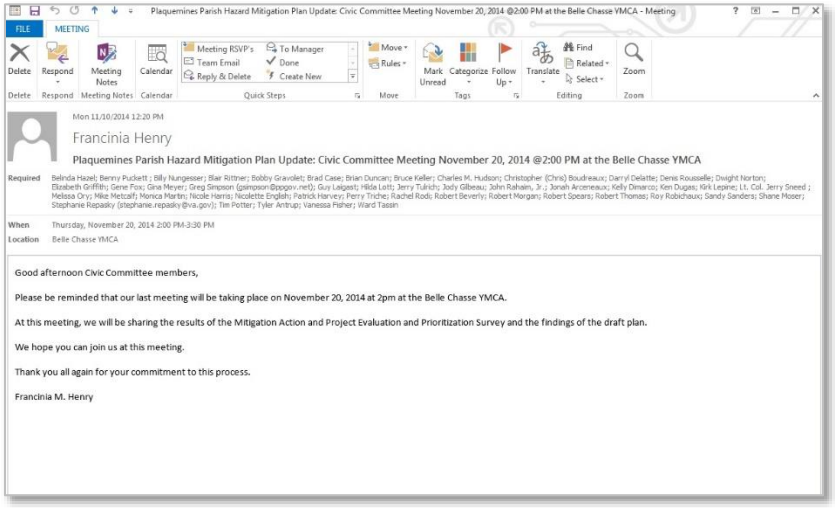
Plaquemines Parish Hazard Mitigation Plan Update, 2015
Steering Committee Meeting 3
GCR Inc.

review, but that the changes were minor and many had already been added to the plan.
    b. Submit draft plan to GOHSEP on or before December 4, 2014

FTP Site Details:
ftp.gcrincorporated.com
Username: PPHMGP
Password: lYrW7w1G

Civic Committee Meeting 3

The Hazard Mitigation Planning Team met with the members of the Civic Committee for the third time on November 20, 2014 at the Belle Chasse YMCA. The purpose of the meeting was to present the final draft plan and discuss the public review process.



Plaquemines Parish Hazard Mitigation Plan Update: Civic Committee Meeting November 20, 2014 @2:00 PM at the Belle Chasse YMCA - Meeting

FILE | MEETING

Delete | Respond | Meeting Notes | Calendar | Meeting RSVP's | Team Email | Reply & Delete | To Manager | Done | Create New | Move | Rules | Mark Unread | Categorize | Follow Up | Translate | Find | Related | Select | Zoom

Mon 11/10/2014 12:20 PM

Francinia Henry

Plaquemines Parish Hazard Mitigation Plan Update: Civic Committee Meeting November 20, 2014 @2:00 PM at the Belle Chasse YMCA

Required: Belinda Hazel; Benny Puckett ; Billy Nungesser; Blair Rittner; Bobby Gravolet; Brad Case; Brian Duncan; Bruce Keller; Charles M. Hudson; Christopher (Chris) Boudreaux; Darryl Delatte; Denis Rousselle; Dwight Norton; Elizabeth Griffith; Gene Fox; Gina Meyer; Greg Simpson (gsimpson@ppgov.net); Guy Laigast; Hilda Lott; Jerry Tulrich; Jody Gibeau; John Rahaim, Jr.; Jonah Arceneaux; Kelly Dimarco; Ken Duges; Kirk Lepine; Lt. Col. Jerry Sneed ; Melissa Ory; Mike Metcalf; Monica Martin; Nicole Harris; Nicolette English; Patrick Harvey; Perry Triche; Rachel Rodi; Robert Beverly; Robert Morgan; Robert Spears; Robert Thomas; Roy Robichaux; Sandy Sanders; Shane Moser; Stephanie Repasky (stephanie.repasky@va.gov); Tim Potter; Tyler Antrup; Vanessa Fisher; Ward Tassin

When: Thursday, November 20, 2014 2:00 PM-3:30 PM

Location: Belle Chasse YMCA

Good afternoon Civic Committee members,

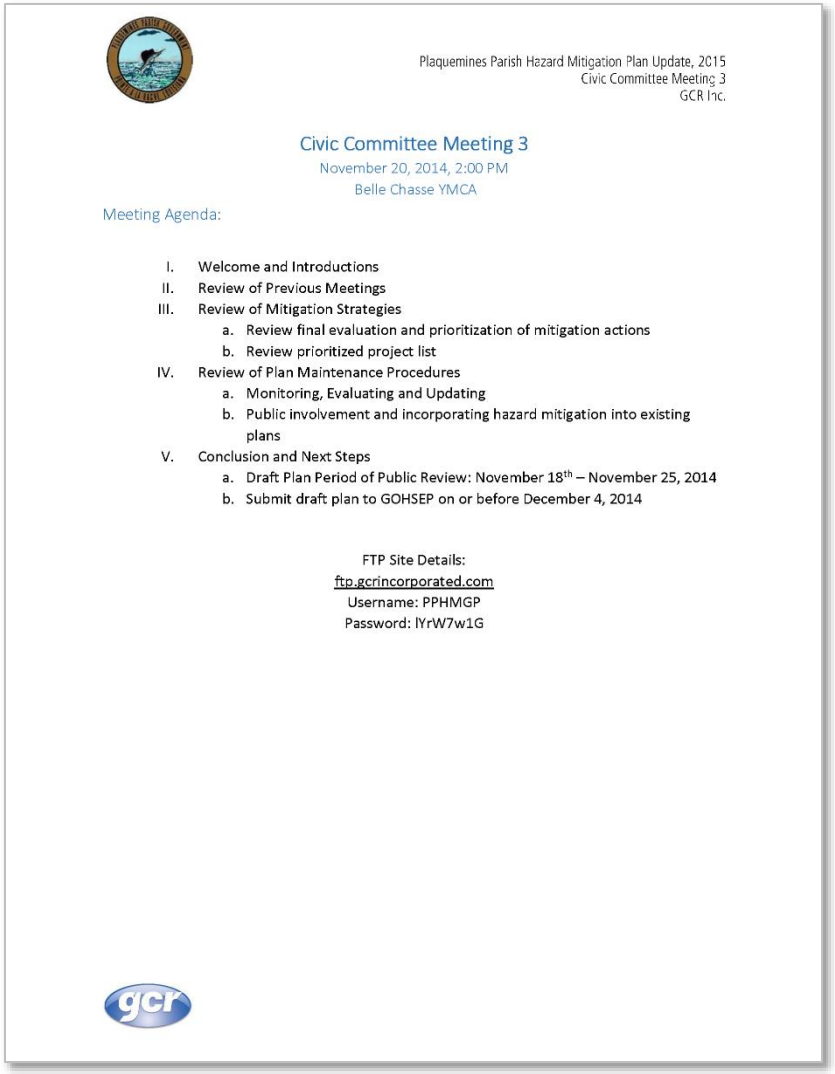
Please be reminded that our last meeting will be taking place on November 20, 2014 at 2pm at the Belle Chasse YMCA.

At this meeting, we will be sharing the results of the Mitigation Action and Project Evaluation and Prioritization Survey and the findings of the draft plan.

We hope you can join us at this meeting.

Thank you all again for your commitment to this process.

Francinia M. Henry



Plaquemines Parish Hazard Mitigation Plan Update, 2015
Civic Committee Meeting 3
GCR Inc.

Civic Committee Meeting 3

November 20, 2014, 2:00 PM
Belle Chasse YMCA

Meeting Agenda:

I. Welcome and Introductions
II. Review of Previous Meetings
III. Review of Mitigation Strategies
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FTP Site Details:
ftp.gcrincorporated.com
Username: PPHMGP
Password: lYrW7w1G

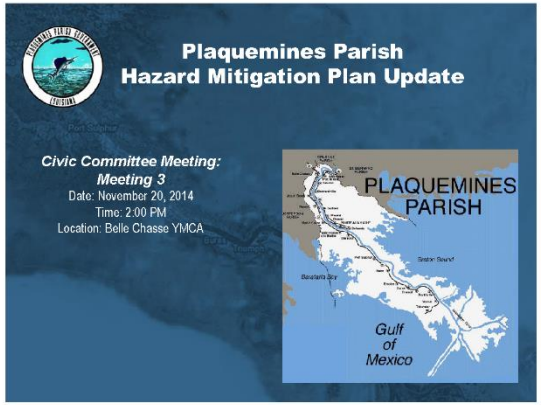
PLAQUEMINES PARISH HAZARD MITIGATION PLAN: CIVIC GROUP MEEETING #3

Belle Chasse YMCA

November 20, 2014

2:00 PM

Name	Organization	Email
DONALd DURR	PLAQUEMINES PORT	ddURR@PPHTD.COM
Patrick A. Harvey	PPG-OHSEP	pharvey@ppgov.net
RACHEL ROPI	YMCA	rachelr@ymcanewOrleans.gov
MIKE METCALF	PPG - PERMITS	MMETCALF@PPG.NET
Belinda Hazel	PP Assessors Office	bhazel@[redacted]plaqpao.com
Hilda Hoff	PPG Grants	hloff@ppgov.net
Nici English	GOHSEP	nicolette.english@la.gov
Gerald Tyrlich	PPSO	jtyrlich@ppso.net
Benny Puckett	PPG	bpuckett@ppgov.net
KEN DUGAS	PPG-ENG	KDUGAS@PPGOV.NET
Melissa R. Ory	Phillips 66 Alliance Refinery	melissa.r.ory@p66.com
MONICA MARTIN	PMC	MMARTIN@PLAQUEMINESMEDICALCENTER.COM
Francisca Heany	GCR INC.	fheany@gcrincorporated.com
Tyler Antrup	GCR	tantrup@gcrincorporated.com



II. Review of Previous Meetings

Previous Steering Committee Meetings:

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- Reviewed the Risk Assessment elements
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III. Mitigation Action Evaluation Survey Results

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4.1.4	1.56	27
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4.3.1	1.0	24

III. Project Prioritization Survey Results

Project	Priority Rank	Response Percentage	Project Status
Emergency Evacuations Center- F. Edward Hebert Center	1	42.9%	Existing
Burmaster Canal Improvements	2	28.6%	Existing
Cazalard Canal Sheet Piling	3	28.6%	Existing
Belle Chasse #3 Pump Station, Walker Road	4	28.6%	Existing
Empire Flood Gate Pump Project	5	28.6%	New
Venice Boat Harbor Road Elevation Project	6	57.2%	Existing
Port Sulphur Station/Office	7	28.6%	New
Ponte-ala-Hache Station	8	42.9%	New
Buras Station	9	28.6%	New
Woodlawn Station	10	28.6%	New
Venice Station	11	28.6%	New
Belle Chasse Station	12	42.9%	New
Belle Chasse EMS Office	13	42.9%	New
Freeport Building Retrofit	14	42.9%	Existing

IV. Plan Maintenance

- Monitoring, Evaluating, Updating
  - Plan must be monitored on an annual basis
  - Hazard Mitigation Plan Evaluation Committee
    - Parish President
    - Grant Administrator
    - Chief Engineer (responsible for overall coordination of HMP maintenance activities)
    - Director of Planning and Zoning
    - Director of Economic Development
    - OEP Director
    - Parish Sheriff
  - The Parish Engineer will be responsible for contacting each of the committee members during January of every year.

IV. Public Involvement and Incorporating Hazard Mitigation into Existing Plans

- Public Involvement
  - Responsibility for continued public participation will be that of the parish Engineer.
  - Copies of the plan will be kept on file at the parish government office.
  - Copies of the plan and any proposed changes will be posted on the parish government website.
- Incorporating Hazard Mitigation into Existing Plans
  - Members of the Plan Evaluation Committee will meet on an annual basis to ensure the Parish incorporates hazard mitigation into future planning activities and updates to other local plans.

V. Next Steps

- Plan will be available for public review November 18th through November 25th.
- Plan will officially go to GOSHEP after the public review process is complete and comments are incorporated.

V. Hazard Mitigation Plan Update FTP Site

Draft Plan is Available for Committee Review

ftp.gcrincorporated.com
Username: PPHMGP
Password: IYrW7w1G

Civic Committee Meeting 3 Minutes

November 20, 2014, 2:00 PM
Belle Chasse YMCA

Meeting Attendees:

Civic Committee Members: Patrick A. Harvey, Benny Puckett, Donald Durr, Rachel Ropi, Mike Metcalf, Belinda Hazel, Hilda Lott, Nici English, Gerald Turlich, Ken Dugas, Melissa Ory, Monica Martin

Consultants: *Elizabeth Griffith, Tyler Antrup, Francinia Henry*

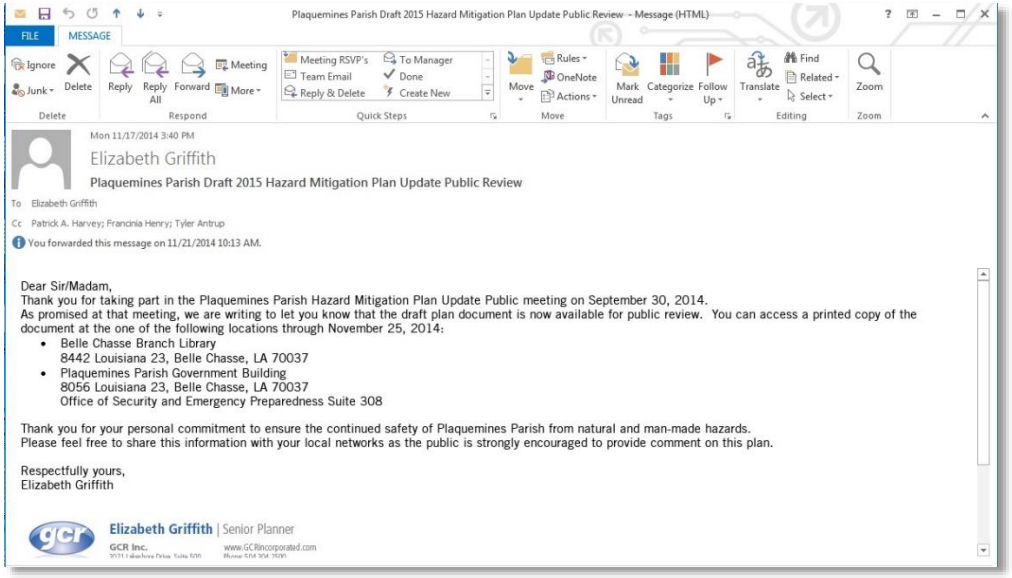
I. Welcome and Introductions
II. Review of Previous Meetings
    a. E. Griffith gave a synopsis of past meeting actions.
III. Review of Mitigation Strategies
    a. Review final evaluation and prioritization of mitigation actions
        i. E. Griffith reviewed the results of the mitigation action evaluation exercise and highlighted the five actions that were ranked as most important by the Steering Committee.
    b. Review prioritized project list
        i. E. Griffith reviewed the results of the project evaluation and prioritization and discussed the projects that were deemed most important.
IV. Review of Plan Maintenance Procedures
    a. Monitoring, Evaluating and Updating
        i. E. Griffith reviewed the proposed maintenance procedures and reviewed the Parish Governmental Officials that would be responsible for the annual maintenance tasks.
    b. Public involvement and incorporating hazard mitigation into existing plans
        i. E. Griffith reviewed the plan details for continued public involvement and incorporation into existing and future Parish Plans.
V. Conclusion and Next Steps
    a. Draft Plan Period of Public Review: November 18th – November 25, 2014
        i. E. Griffith informed the committee that the draft plan was available for their review on the ftp site, and that the Planning Team had received some changes from GOHSEP's preliminary review, but that the changes were minor and many had already been added to the plan.

Plaquemines Parish Hazard Mitigation Plan Update, 2015
Civic Committee Meeting 3
GCR Inc.

b. Submit draft plan to GOHSEP on or before December 4, 2014

FTP Site Details:
ftp.gcrincorporated.com
Username: PPHMGP
Password: lYrW7w1G

Draft Plan Public Notifications



COUNCIL

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"When I voted for the lawsuit, I never in any way shape or form intended to hurt anyone in this room or in the parish," Marinovich said. "I've been asked overwhelmingly to stop this lawsuit. They feel threatened by this lawsuit and whether that threat is perceived or real, I have to represent them."

Marinovich went on to discuss the planned mass layoffs of oil rig workers by Hercules Offshore.

"Is this a scare tactic on their part? I don't know. But it's real to the people who live and work in these oil fields," he said.

Though she agreed with Marinovich's push to end the lawsuits, District 9 representative Marla Cooper questioned Marinovich's intent. Marinovich is facing challenger Nicole Williams in the run-off elections on December 6. Williams had a four point lead over Marinovich in the primary elections, grabbing 40% of the vote to Marinovich's 36%. Cooper argued that the move to kill the lawsuits was a ploy on Marinovich's part to secure more votes.

"Why are your bringing this up today? Why is this coming up two weeks after the elections?" Cooper asked. "I think you do have ulterior motives. You were gung ho about these lawsuits before."

Marinovich countered that he had no political reason for bringing the motion. He added that he feels he "has a responsibility to do this."

"Even the people who supported me in the election came to me and said 'Byron, I voted for you but, I'm worried about this lawsuit," he said.

District 4 representative Stuart Guey, Jr. who brought the lawsuit to the table in the first place, stated his reasoning for voting to continue the lawsuit.

"I brought this lawsuit for one reason and one reason alone, to validate our permitting process. These companies did not meet the requirements of the permits that they were granted," said Guey. "If we decide to drop this lawsuit, it will be perceived by many that we allowed these violations and then turned our backs on it."

Several audience members agreed with Guey.

Warren Lawrence of Myrtle Grove asked that the council "let the judge decide" whether the oil companies named violated their permits.

"These companies should not be allowed to violate their permits because we are scared to call them on it," Lawrence said.

Eastbank resident Danny Demolle agreed that the oil companies should be held accountable for any potential damages.

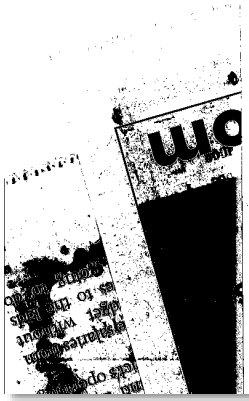
"If you leased your property to someone, wouldn't you want it back in the same condition?" Demolle asked the council. "We know who damaged it and they should fix it."

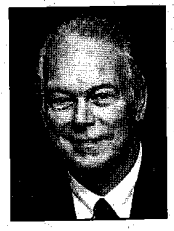
Nick Kohnke of Madere Towing, who has been speaking out against the lawsuit throughout the parish, said that the lawsuit was unnecessary until the parish fixes the way it checks permit obligations. Currently, oil companies self-report that they have fulfilled permit obligations.

"We have the same reporting system. And you're issuing more permits today. Nothing has changed," Kohnke argued. "If you don't learn from history, you're doomed to repeat it."

After the decision was reached to continue with the lawsuit, attorney Philip Cossich –who is representing the parish in the suit- called the entire spectacle "unfortunate."

"Byron is feeling a lot of pressure both politically and financially," said Cossich, referring to a boycott of his Black Velvet restaurant. "It's unfortunate that they can intimidate political officials into not upholding the laws of the parish and the state."





Draft plan document available for public review

In order to continue working with the Louisiana Governor's Office of Homeland Security and Emergency Preparedness to ensure the continued safety of Plaquemines Parish from natural and man-made hazards, the Parish Government has updated the Parish's 2009 Hazard Mitigation Plan. The draft plan will be available for review from Nov. 18-25.

Copies of the document can be found at the Belle Chasse Public Library and the Office of Homeland Security and Emergency Preparedness in Suite 308 of the Plaquemines Parish Government Building.

The public is encouraged to provide comment regarding this draft.

Please direct any questions about the draft plan to Patrick A. Harvey at 504.297.2477.

DEBATES

CONTINUED FROM FRONT PAGE

all citizens to view. Oyestermen of Plaquemines Parish is sponsoring the event.

You can visit the website www.ppdebates.com to view the candidates and submit questions for the debate by filling out the questionnaire form behind the red "question" button. Short questions (to the point) may also be mailed to PPDebates 115 Noble Drive, Belle Chasse, LA 70037. Please provide a brief background to the question and state the intended recipient of the question. Jeff Crouere will receive all questions and select the wording and content of the questions.

The debates are produced by Patricia McCarty, a resident of Plaquemines Parish. For more information, call 504.394.2100 or 504.920.6625; e-mail patty@ppdebates.com

ARTIST

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Hunter College and I was really impressed with him. I come back, it was fellow Plaqueminians who helped him break into the New Orleans scene.

"Jolie Gasquet from Jesuit Bend had a gallery on Julia and surrounding areas with images of the death, decay and poverty experienced by the area's less fortunate.

Duncan sources his references from Louisiana-based

Appendix C: Acronym List

BCA: Benefit-Cost Analysis
BCR: Benefit-Cost Ratio
CBRA: Coastal Barrier Resources Act
CBRS: Coastal Barrier Resources System
CDBG: Community Development Block Grant
CDC: Centers for Disease Control and Prevention
CEHA: Coastal Erosion Hazard Area
CEMP: Comprehensive Emergency Management Plan
CFR: Code of Federal Regulations
CMP: Coastal Management Program
CRS: Community Rating System
DMA: Disaster Mitigation Act of 2000 (Federal)
DOD: Degree of Damage (high wind)
EF Scale: Enhanced Fujita Scale
EMAP: Emergency Management Accreditation Program
EMS: Emergency Medical Services
EOC: Emergency Operations Center
FEMA: Federal Emergency Management Agency
FMA: Flood Mitigation Assistance Program
GBS: General Building Stock
GOHSEP: Louisiana Governor's Office of Homeland Security and Emergency Preparedness
GIS: Geographical Information System
HAZUS-MH: Hazards U.S. - Multi-Hazard
HI: Heat Index
HIRA: Hazard Identification and Risk Assessment
HMA: Unified Hazard Mitigation Assistance Program
HMGP: Hazard Mitigation Grant Program
HMP: Hazard Mitigation Plan
IA: Individual Assistance (Federal disaster recovery assistance program)
LHMP: Local Hazard Mitigation Program
LiDAR: Light Detection and Ranging
NAVD88: North American Vertical Datum of 1988
NCDC: National Climatic Data Center
NDMC: National Drought Monitoring Center
NFIP: National Flood Insurance Program
NHC: National Hurricane Center
NOAA: National Oceanic and Atmospheric Administration
NSSL: National Severe Storms Laboratory
NWS: National Weather Service
PA: Public Assistance (Federal disaster assistance program)
PDD: Presidentially Declared Disaster
PPG: Plaquemines Parish Government
RL: Repetitive Loss
SBA: Small Business Administration
SHELDUS: Spatial Hazard Events and Losses Database United States
SLOSH: Sea, Lake and Overland Surge Heights (hurricane)
SRL: Severe Repetitive Loss
STAPLEE: An acronym standing for the following evaluation criteria: Social, Technical, Administrative, Political, Legal, Economic, Environmental (*See glossary for definition*)
UBC: Uniform Building Code
USACE: U.S. Army Corps of Engineers
USDA: U.S. Department of Agriculture
USGS: U.S. Geological Survey

Appendix D: Glossary

Applicant - State agency, local government, or any political subdivision of the State, including Indian tribes and Alaskan native villages, that applies for FEMA post-disaster assistance. Also, private nonprofit organizations that include medical, emergency (fire and rescue), utility, educational, custodial care, zoos, community centers, libraries, homeless shelters, senior citizens centers, and sheltered workshops.

Hazard Mitigation Planning Team - A local hazard mitigation planning team composed of government and private-sector individuals with a variety of skills and areas of expertise, usually appointed by the city or town manager, or chief elected official. The group uses these skills to find solutions to community hazard mitigation needs and gain community acceptance of those plans.

Community Rating System (CRS) - An NFIP program that provides incentives for NFIP communities to complete activities that reduce flood hazard risk. The insurance premiums of these communities are reduced when the community completes specified activities.

Declaration - Presidential finding that a jurisdiction of the United States may receive Federal aid as a result of damages from a major disaster or emergency.

Department of Homeland Security (DHS) – A cabinet-level department established in 2002 by merging 22 separate agencies into a cohesive department with a primary mission of protecting the homeland.

Disaster Mitigation Act 2000 (DMA 2000) - Amends the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act). The purpose of DMA 2000 is to reduce loss of life and property, human suffering, economic disruption, and disaster assistance costs.

Emergency - Any hurricane, tornado, storm, flood, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, drought, fire, explosion, or other catastrophe in any part of the United States that requires Federal emergency assistance to supplement State and local efforts to save lives and protect property, public health, and safety, or to avert or lessen the threat of a disaster. Defined in Title V of Public Law 93-288, Section 102(1).

Existing Construction - As used in reference to the NFIP, any structure already existing or on which construction or substantial improvement was started prior to the effective date of a community's floodplain management regulations.

Federal Emergency Management Agency (FEMA) - The lead Federal agency with responsibility for responding to Presidential emergencies and major disasters. FEMA's mission is to reduce loss of life and property and protect our Nation's critical infrastructure from all types of hazards through a comprehensive, risk-based, emergency management program of hazard mitigation, preparedness, response, and recovery.

Flood Insurance Rate Maps (FIRMS) - The official map of a community prepared by FEMA, showing base flood elevations along with the special hazard areas and the risk premium zones.

Flood Mitigation Assistance Program (FMA) - Provides pre-disaster grants to State and local governments for both planning and implementation of hazard mitigation strategies. Each State is awarded a minimum level of funding that may be increased depending upon the number of NFIP policies in force and repetitive claims paid. Grant funds are made available from NFIP insurance premiums, and therefore are only available to communities participating in the NFIP.

Louisiana Governor's Office of Homeland Security (GOHSEP) – Louisiana State Department charged with leading a supporting preparation for, response to, and recovery from emergencies and disasters.

Hazard Mitigation - Sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects.

Hazard Mitigation Grant Program (HMGP) - Authorized under Section 404 of the Stafford Act; provides funding for cost-effective hazard mitigation projects in

conformance with the post-disaster hazard mitigation plan required under Section 409 of the Stafford Act.

Hazard Mitigation Plan - The plan resulting from a systematic evaluation of the nature and extent of vulnerability to the effects of natural hazards present in society that includes the actions needed to minimize future vulnerability to hazards.

HAZUS-MH - FEMA's software program for estimating potential losses from disasters.

Human Services - Supplementary Federal assistance provided under the Stafford Act to individuals and families adversely affected by a major disaster or emergency. Also known as Individual Assistance, Temporary Housing Assistance, Unemployment Assistance, and Individual and Family grants.

Infrastructure Support - Federal financial assistance provided under the Stafford Act to State and local governments or to eligible private nonprofit organizations for disaster-related requirements. Also known as Public Assistance (PA).

Major Disaster - Any hurricane, tornado, storm, flood, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, drought, fire, explosion, or other catastrophe in any part of the United States that, in the determination of the President, causes damage of sufficient severity and magnitude to warrant major disaster assistance under the Stafford Act, above and beyond emergency services by the Federal Government, to supplement the efforts and available resources of States, local governments, and disaster relief organizations in alleviating the damage, loss, hardship, or suffering caused thereby defined under Public Law 93-288.

Mitigation Assessment Team (MAT) Program - works to increase damage resistance through improvements in construction codes and standards, designs, methods, and materials used for new construction and post-disaster repair and recovery.

National Flood Insurance Program (NFIP) - Provides the availability of flood insurance in exchange for the adoption and enforcement of a minimum local floodplain management ordinance. The ordinance regulates new and substantially damaged or improved development in identified flood hazard areas.

Preparedness - Activities to ensure that people are ready for a disaster and respond to it effectively. Preparedness requires figuring out what will be done if essential services break down, developing a plan for contingencies, and practicing the plan.

Recovery - Activities necessary to rebuild after a disaster. Recovery activities include rebuilding homes, businesses, and public facilities; clearing debris; repairing roads and bridges; and restoring water, sewer, and other essential services.

Repetitive Loss Property - A Repetitive loss property is any insurable building for which two or more claims of more than $1,000 were paid by the National Flood Insurance Program within any rolling ten-year period, since 1978. A RL property may or may not be currently insured by the NFIP.

Severe Repetitive Loss Property – A Severe Repetitive Loss property is defined as a residential property that is covered under an NFIP flood insurance policy and that (a) has at least four NFIP claim payments (including building and contents) over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or (b) for which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building. For both cases (a) and (b), at least two of the referenced claims must have occurred within any ten-year period, and must be greater than 10 days apart.

STAPLEE: The STAPLEE method is one of many methods by which hazard risk management teams can assess the mitigation options they have generated for each hazard risk.

Appendix E: Louisiana GOHSEP Worksheets

Mitigation Planning Team

Planning Team/Steering Committee (T): The core group responsible for making decisions, guiding the planning process and agreeing upon the final contents of the plan.

Stakeholder (S): Individuals or groups that affect or can be effected by a mitigation agency or group.

Organization	T	S	Name	Title	Email	Phone	Address
Local Agencies							
Building Code Enforcement		X	Mike Metcalf	Superintendent	mmetcalf@ppgov.net	5049346202	
City Management/Parish Administration	X		Benny Puckett	Grants Administrator	bpuckett@ppgov.net		8056 Highway 23, Suite 308 Belle Chasse, LA 70037
Emergency Management	X		Guy Laigast	Director PPOHSEP	oep@ppgov.net	5042742476	8056 Highway 23, Suite 308 Belle Chasse, LA 70037
Fire Department	X		Roy Robichaux	Superintendent	ppfd@plaqueminesparish.com	5043944070	333 F. Edward Hebert Blvd., Bldg. 800 Belle Chasse, LA 70037
Floodplain Manager		X	Mike Metcalf				
GIS		X	Robert Spears	GIS	rspears@ppgov.net	5042975343	102 Ave. G. Belle Chasse, LA 70037
Parks and Recreation			N/A				
Planning/Community Development							
Public Works	X		Ken Dugas	Parish Engineer	ken_dugas@ppgov.net	5042975343	102 Ave. G Belle Chasse, LA 70037
Stormwater Management	X		Greg Simpson	Drainage Superintendent	greg_simpson@ppgov.net	5043943290	206 Pump Station Rd, Belle Chasse, LA 70037
Transportation (Roads & Bridges)	X		Ken Dugas				
City Council / Police Jury	X		Kirk Lepine	Parish Council Chairman	district3@plaqueminesparish.com	5042975303	106 Avenue G Belle Chasse, La 70037
City / Parish Attorney's Office							
Economic Development Agency	X		Jody Gilbeau	PABI		5045642521	
Police / Sheriff's Department	X		Jerry Tulrich	PP Sherriff's Office	jturlich@ppso.net	5042975120	302 Main Street Belle Chasse, Louisiana 70037

Tax Assessor's Office	X		Bobby Gravolet	Assessor	assessor@plaqpao.com	5042975256	301 Main St Suites 210-213, Belle Chasse, LA 70037
Non-Governmental Organizations							
American Red Cross							
Chamber of Commerce							
Community Organizations		X	Rachel Rodi	YMCA Manager	rachelr@ymcaneworleans.org	5043929622	8101 Louisiana 23, Belle Chasse, LA 70037
Faith Based Organizations							
Homeowners Associations							
Utility Companies		X	Robert Morgan	SevernTrent (Water)	rmorgan@stes.com	5043912386	203 Main Street Belle Chasse, LA 70037
State Agencies							
Coastal Protection & Restoration Authority							
Department of Ag & Forestry							
Department of Corrections							
Department of Culture, Recreation & Tourism							
Department of Environmental Quality							
Department of Health & Human Services							
Department of Historic Preservation							
Department of Natural Resources							
Department of Public Safety							
Department of Transportation and Development							
Department of Wildlife and Fisheries							
Division of Administration							
Homeland Security and Emergency Preparedness	X		Nicolette English	Mitigation Planner GOHSEP	nicolette.english@la.gov	5046588700	

Office of Community Development							
Federal Agencies							
Army Corps of Engineers		X	Nicole Harris	USACE- Levvee District	nicole.m.harris@usace.army.mil	5048622201	
Environmental Protection Agency							
Federal Emergency Management Agency							
Housing & Urban Development (HUD)							
Land Management Agencies (USFS/NPS/BLM)							
National Weather Service							
Other							
Colleges / Universities	X		Denis Rouselle	PPG Schools Superintendent	drousselle@ppsb.org	5045956400	557 F. Edward Hebert Blvd Belle Chasse, LA 70037
Land Developers / Real Estate Agencies							
Neighboring Jurisdictions		X	Chris Boudreaux	Lafourche HSEP	boudreauxcl@lafourchegov.org	5954936921	
		X	Charles Hudson	Jefferson Parish EM	jpeoc@jeffparish.net	5043495360	910 3rd Street Gretna, LA 70053
		X	John Rahaim	St Bernard HSEP	jrahaim@sbpg.net	5042784267	
		X	Lt.Col. Jerry Sneed	NOHSEP	jwsneed@nola.gov	5046588700	
Professional Associations							
Levee District	X		Blair Rittner	Levee Manager			
Navy Base Representative		X	Bruce Keller	Community Planning Liason	bruce.keller1@navy.mil	5046782162	301 Russell Dr, Belle Chasse, LA 70037
Medical Representative	X		Gina Meyer	PPG EMS	gmeyer@ppgov.net	5049125285	3706 Main Street Lot A Belle Chasse, LA 70037
Major Employers & Businesses		X	Ward Tassin	Stolthaven	w.tassin@stolt.com	5046829989	2444 English Turn Rd, Braithwaite, LA 70040

		X	Perry Triche	United Bulk Terminal	perry.triche@unitedbulkterminals.com		Hwy 15, LA 70083
		X	Tim Potter	Chevron-Oronite	timpotter@chevron.com	5043923309	10285 Louisiana 23, Belle Chasse, LA 70037
		X	Brian Duncan	Phillips 66	brian.l.duncan@p66.com	5046567711	15551 Highway 23, Belle Chasse, LA 70037
Ports, Terminals, Harbor		X	Sandy Sanders	PPG Port	sandysanders@pphtd.com	5046827920	9063 Highway 23 Belle Chasse, Louisiana 70037

Appendix F: Element F State Requirement Worksheets

List of Parish Owned Buildings

Vulnerable Population Worksheet

Name	Street	City	Zip Code	GPS Coordinate (if available)
All Hospitals (Private or Public)				
Plaquemines Parish Comprehensive Care Center/Hospital	26851 LA 23	Port Sulphur	70083	
Belle Chasse Family Medical Center	8200 LA 23	Belle Chasse	70037	
Healthsouth Medical Clinic	7772 LA 23	Belle Chasse	70037	
All Nursing Homes (Private or Public)				
Riverbend Nursing and Rehab Center	13735 LA 23	Belle Chasse	70037	
Mobile Home Parks				
United Bulk Terminals	14537 Highway 15	Davant		29°36'24.55"N 89°50'39.81"W
Southern Oaks Mobile Home Community	East 3rd Street, Belle Chasse, LA	Belle Chasse		29°51'42.38"N 89°59'7.91"W
Belle Chasse Mobile Home Park	River Oaks & Burt Drive	Belle Chasse	70037	29°47'58.96"N 90° 1'25.88"W
Shady Oaks Trailer Park	241 Shady Oaks Lane, Belle Chasse, LA	Belle Chasse		29°43'41.10"N 90° 0'19.72"W
Windmill Mobile Home Park				29°42'12.04"N 89°59'25.21"W
Live Oak Properties	11822 LA 23	Belle Chasse	70037	29°46'8.55"N 90° 1'49.09"W
Naomi Mobile Home Community				29°42'6.92"N 89°59'22.93"W
C&H Mobile Home Park				29°30'52.00"N 89°43'34.22"W
Morel's Gulf Coast Park & Campground				29°21'17.73"N 89°32'2.43"W
Minh-Nguyen Trailer Park	164 Elizabeth Lane, Empire, LA	Empire		29°22'56.21"N 89°35'27.45"W
Falcon Crest Trailer Park				29°23'36.72"N 89°36'6.87"W
J-Bar Sportsman's Lodge	32798 Highway 11, Buras, LA	Buras		29°23'29.89"N 89°36'7.93"W

Sochenda Khin Trailer Park	178 Chouest Lane, Buras, LA	Buras		29°21'2.02"N 89°31'31.03"W
Sokhom Srey Trailer Park	220 Perry Lane, Buras, LA	Buras		29°21'6.71"N 89°31'35.47"W
Emmett's Trailer Park #2				29°18'46.70"N 89°23'4.53"W
Riverside Trailer Park				29°18'50.92"N 89°23'8.27"W
Jim's RV Park	Shadow Lane	Boothville		
Emmett's Trailer Park #1				29°18'46.41"N 89°23'7.70"W
Kimberly's Kourt, LLC	37772 Highway 11, Buras, LA	Buras		29°20'35.65"N 89°28'0.54"W
Satsuma RV Park	42101 Louisiana 23, Venice, LA 70091	Venice		29°16'50.75"N 89°21'36.38"W
Adams Trailer Park				29°18'45.16"N 89°23'2.41"W
Gladys Trailer Park				29°18'12.58"N 89°22'43.76"W
Finn and Feather Cabins				29°18'7.52"N 89°22'40.22"W

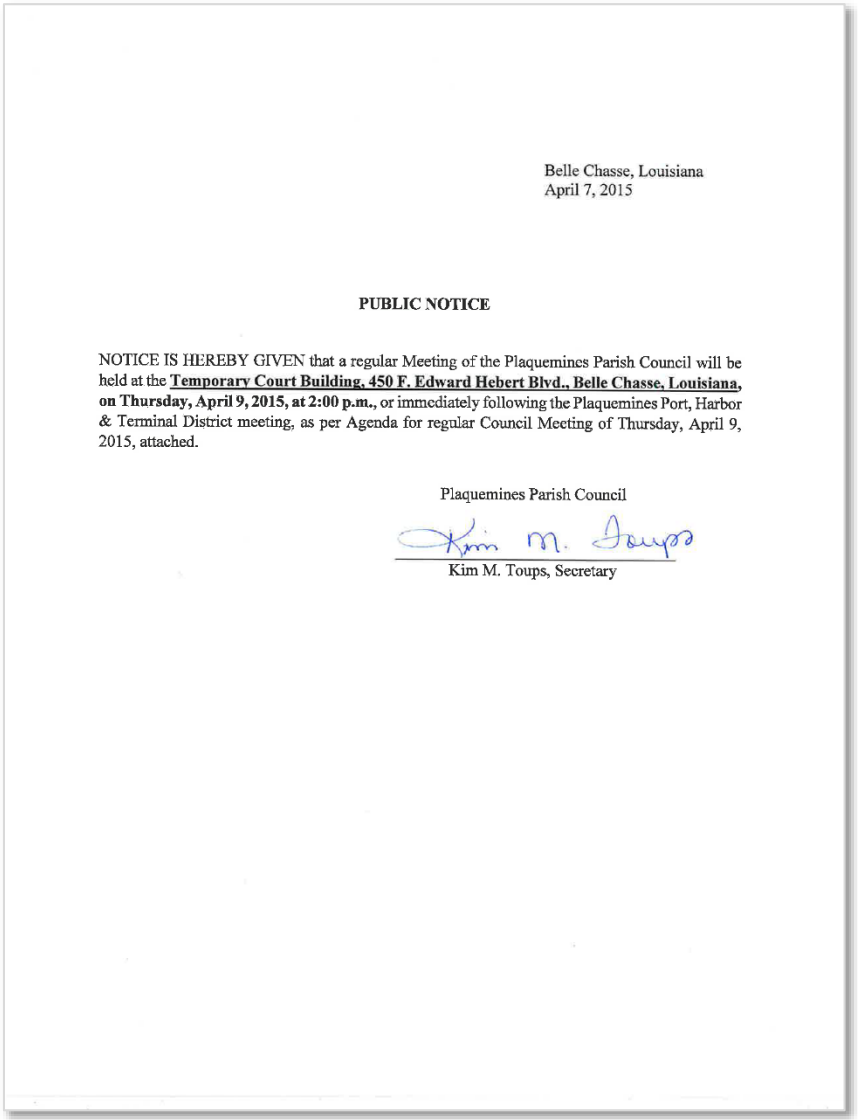
NFIP Statistics

Insurance Summary	Comments
How many NFIP polices are in the community? What is the total premium and coverage?	There are 5,783 policies in force accounting for $1,532,364,100 in coverage with annual premiums of $4,967,103.
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	Plaquemines parish has experienced 5,696 losses with 4,600 paid a total of $359,824,797.67.
How many structures are exposed to flood risk with in the community?	11,209
Describe any areas of flood risk with limited NFIP policy coverage.	N/A
Staff Resources	
Is the Community FPA or NFIP Coordinator certified?	Yes, Mike Metcalf is a Certified Floodplain Manager.
Is flood plain management an auxiliary function?	No.
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	Plaquemines Parish provides all of the examples given as a participating NFIP community.
What are the barriers to running an effective NFIP program in the community, if any?	None.

Compliance History	
Is the community in good standing with the NFIP?	Yes.
Are there any outstanding compliance issues (i.e., current violations)?	No.
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	2009
Is a CAV or CAC scheduled or needed? If so when?	A CAV or CAC is not scheduled or needed.
Regulation	
When did the community enter the NFIP?	1-May-85
Are the FIRMs digital or paper?	Paper
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	Plaquemines Parish is a compliant participating NFIP community, meeting all requirements of the NFIP program.
Community Rating System (CRS)	
Does the community participate in CRS?	No.
What is the community's CRS Class Ranking?	N/A
Does the plan include CRS planning requirements?	No requirements, but CRS is included in the mitigation actions.

Appendix G: Plan Adoption Documentation

The Plaquemines Parish Council adopted the Plaquemines Parish Hazard Mitigation Plan Update- 2015 at their April 9, 2015 meeting.



Belle Chasse, Louisiana
April 7, 2015

PUBLIC NOTICE

NOTICE IS HEREBY GIVEN that a regular Meeting of the Plaquemines Parish Council will be held at the **Temporary Court Building, 450 F. Edward Hebert Blvd., Belle Chasse, Louisiana, on Thursday, April 9, 2015, at 2:00 p.m.**, or immediately following the Plaquemines Port, Harbor & Terminal District meeting, as per Agenda for regular Council Meeting of Thursday, April 9, 2015, attached.

Plaquemines Parish Council

Kim M. Toups

Kim M. Toups, Secretary

RESOLUTION NO. 15-138

On motion of Council Member Rousselle, seconded by Council Member Juneau, and on roll call all members present and voting "Yes", except Council Members Lepine and Burt, who were "Absent", the following Resolution was adopted:

> A Resolution of the Plaquemines Parish Council that with concurrence of the Parish President to adopt the Plaquemines Parish Hazard Mitigation Plan update dated March, 2015.

WHEREAS, on October 30, 2000, the President signed into law the Disaster Mitigation Act of 2000 (DMA 2000); and

WHEREAS, DMA 2000 amends the Robert T. Stafford Disaster Relief and Emergency Assistance Act by, among other things, adding a new section, 322- Mitigation Planning-which places new emphasis on local mitigation planning; and

WHEREAS, Section 322 requires local governments to develop and submit mitigation plans as a condition of receiving Hazard Mitigation Grant Program (HMGP) project grants; and

WHEREAS, an Interim Final Rule (the Rule) for implementing Section 322 was published in the Federal Register, 44 CFR Parts 201 and 206, on February 26, 2002, with requirements for Local Plans found in Part 201.6; and

WHEREAS, in Louisiana, the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) local mitigation planning initiative is focused at the parish level; and

WHEREAS, all Federal Emergency Management Agency (FEMA) and GOHSEP procedures have been adhered to and approvals obtained; and

WHEREAS, the Plaquemines Parish Government participated in preparation of the plan update and supports the plan as it pertains to the entire parish;

NOW, THEREFORE:

BE IT RESOLVED by the Plaquemines Parish Council that with the concurrence of the Parish President, it does hereby adopt the overall Hazard Mitigation Plan Update dated March, 2015, a copy of which is on file with the Grant Administrator's office and the Council Secretary's Office.

I hereby certify the above and foregoing to be a true and correct copy of a Resolution adopted by the Plaquemines Parish Council at a meeting held in the Temporary Courthouse Building, 450 F. Edward Hebert Boulevard, Belle Chasse, Louisiana, on Thursday, April 9, 2015.

Kim M. Soupy

Secretary

Chapter 8 Endnotes

[i] http://www.nhc.noaa.gov/pdf/NormalizedHurricane2008.pdf
[ii] http://www.nhc.noaa.gov/data/tcr/AL132011_Lee.pdf
[iii] http://www.nhc.noaa.gov/data/tcr/AL092012_Isaac.pdf
[iv] http://thelensnola.org/2013/02/21/new-research-louisiana-coast-faces-highest-rate-of-sea-level-rise-on-the-planet/
[v] http://www2.mvn.usace.army.mil/eng/saltwater/wedge_overview.asp
[vi] http://www.plaqueminesparish.com/news1.php?newsID=45
[vii] http://www2.mvn.usace.army.mil/eng/saltwater/wedge_overview.asp
[viii] http://www.cnn.com/2012/08/15/us/louisiana-drinking-water/
[ix] http://www.nola.com/politics/index.ssf/2012/08/saltwater_wedge_reaches_chalme.html
[x] http://www.theadvertiser.com/story/news/local/louisiana/2014/10/03/bayou-corne-sinkhole-insurance-fight/16636551/