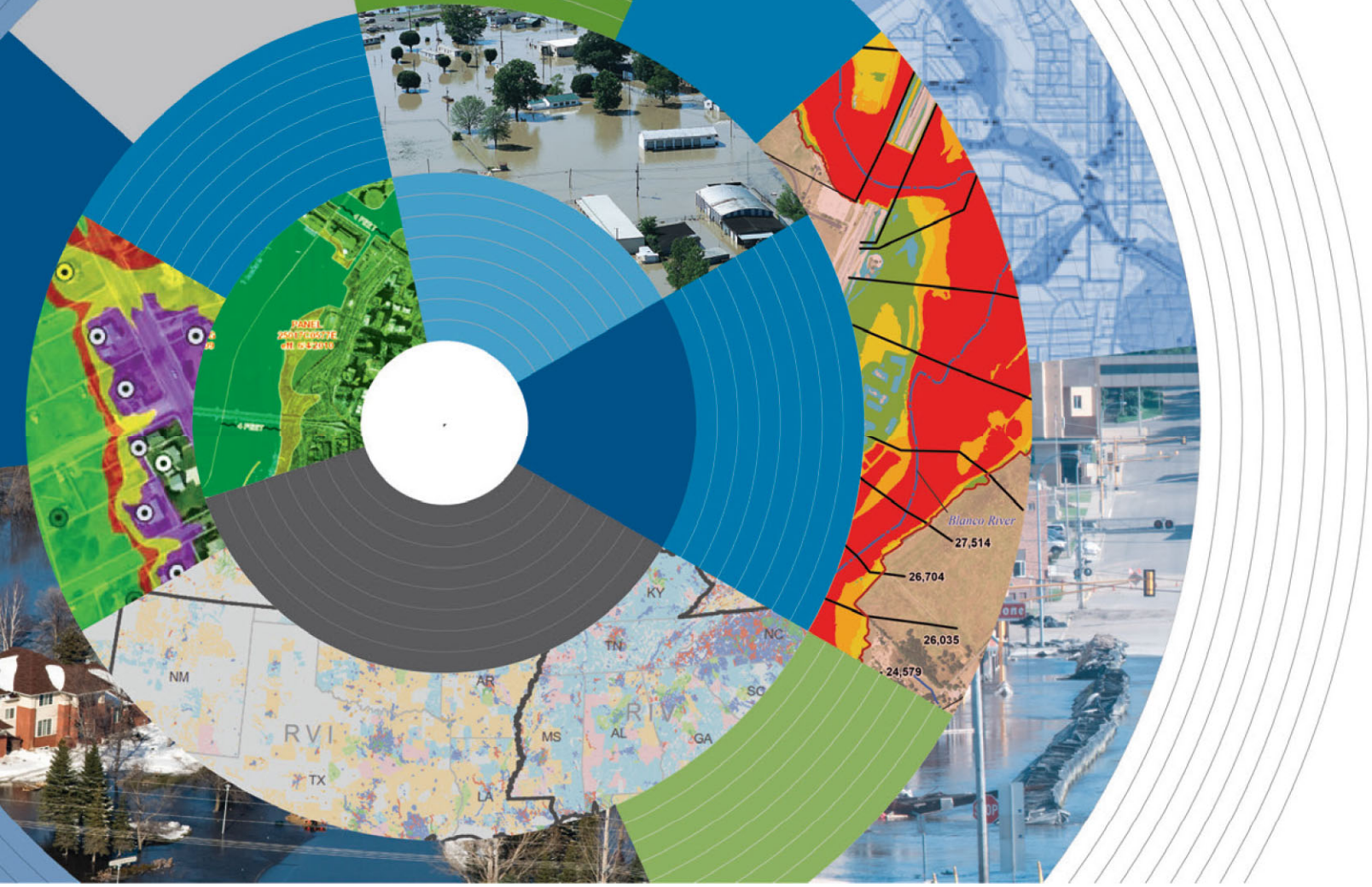


Flood Risk Report

Bayou Teche Watershed

HUC8 08080102

Post-Discovery - November 2018

FEMA

Flood Risk Report History

Version Number	Version Date	Summary
1	August 2018	Pre-Discovery Report
2	November 2018	Post-Discovery Report

Preface

The Department of Homeland Security, Federal Emergency Management Agency's (FEMA) Risk Mapping, Assessment, and Planning (Risk MAP) program provides States, tribes, and local communities with flood risk information, datasets, risk assessments, and tools that they can use to increase their resilience to flooding and better protect their residents. By pairing accurate floodplain maps with risk assessment tools and planning and outreach support, Risk MAP transforms the traditional flood mapping efforts into an integrated process of identifying, assessing, communicating, planning for, and mitigating flood-related risks.

This Flood and Natural Hazard Risk Report provides datasets for floods and other natural hazards to help local or tribal officials, floodplain managers, planners, emergency managers, and others better understand their flood risk, take steps to mitigate those risks, and communicate those risks to their residents and local businesses. Flood risk often extends beyond community limits. This report provides flood risk data for the Bayou Teche Watershed.

Flood risk is always changing, and studies, reports, or other sources may be available that provide more comprehensive information. This report is not intended to be regulatory or the final authoritative source of all flood risk data in the project area. Rather, it should be used in conjunction with other data sources to provide a comprehensive picture of flood risk within the project area.

Contents

Executive Summary **5**
About the Bayou Teche Watershed 5
About the Risk MAP Project 5
Introduction **3**
Flood Risk 3
Watershed Basics 4
Table 1: Community Population Characteristics 5
Project Phases and Map Maintenance **10**
Background 10
How are FEMA's Flood Hazard Maps Maintained? **11**
General Flood Risk Project Phases **12**
Phase Zero: Investment 12
Phase One: Discovery 13
Phase Two: Risk Identification and Assessment 14
Phase Three: Regulatory Products Update 14
Phase Zero: Investment **15**
Area of Interest Selection Factors 16
Base-Level Engineering 20
Phase One: Discovery **24**
Overview 24
Watershed Information and Review 24
Future Investments for Refinement 54
Bibliography **55**
Appendix [1]: Community-Specific Reports **56**
Appendix II: Resources **59**
State Partners 59
Watershed Follow Up Points of Contact 59
Governor's Office of Homeland Security and Emergency Preparedness 60
Louisiana Department of Transportation and Development 60
Louisiana Floodplain Management Association 61
Certified Floodplain Manager (CFM) Certification 61
Estimated Base Flood Elevation (BFE) Viewer 62

FEMA Flood Map Service Center (MSC) 62

Figures

Figure 1: 1927 New Iberia Bayou Teche, Mississippi Flood. 5
Figure 2: Overview map for the Bayou Teche Watershed 4
Figure 3: Parishes and sub-watersheds of the Bayou Teche Watershed 16
Figure 4: Current status of stream studies in the Bayou Teche Watershed 19
Figure 5: Changes between Effective SFHA and BLE Flood Mapping 23
Figure 7: Map of concerns collected at the Discovery Meeting 51

Tables

Table 1: Community Population Characteristics 5
Table 2: Population and Area Characteristics 8
Table 3: Bayou Teche Watershed NFIP and CRS Participation 9
Table 4: Risk MAP Project Dam Characteristics 9
Table 5: CNMS NVUE Report 18
Table 6: Changes to SFHA (Effective SFHA vs. BLE Flood Mapping) 21
Table 7: NFIP Information 25
Table 8: NFIP Policy Information 26
Table 9: NFIP Claims Information 27
Table 10: Repetitive Loss Property Information 29
Table 11: Disaster Declarations in the Watershed 30
Table 12: Hazard Mitigation Plan Status 32
Table 13: Letters of Map Change 41
Table 14: Effective Hydrology and Hydraulic Modeling 45
Table 15: Issues and Concerns Collected During the Discovery Process 52

Executive Summary

The Federal Emergency Management Agency's (FEMA) Risk Mapping, Assessment, and Planning (Risk MAP) program provides communities with flood information to help them understand their current flood risk and make informed decisions about taking action to become stronger and more resilient in the face of future risk. The Risk MAP process provides communities with new or improved information about their flood risk based on watershed models that use information from local, regional, State, and Federal sources. Communities can use the resulting tools and data to enhance mitigation plans and better protect their residents.

This report is one such tool for communities impacted by an updated flood hazard analysis of the Bayou Teche Watershed. The Flood Risk Report has two goals: (1) **inform communities of their risks** related to certain natural hazards, and (2) **enable communities to act** to reduce their risk. It is intended to assist Federal, State, and local officials with the following:

- Updating local hazard mitigation plans (HMPs) and community comprehensive plans;
- Updating emergency operations and response plans;
- Communicating risk;
- Informing the modification of development standards; and
- Identifying mitigation projects.

During this phase of the process, communities are encouraged to review the flood hazard changes closely and provide feedback to FEMA Region 6, based on their local knowledge and any additional data available.

About the Bayou Teche Watershed

The Bayou Teche study area is wholly within the State of Louisiana and covers eight Parishes including Allen, Avoyelles, Evangeline, Iberia, Rapides, St. Landry, St. Martin, and St. Mary including thirty four communities within those Parishes that intersects this watershed. Also it should be noted that the Chitimacha Tribe of Louisiana and Tunica-Biloxi Indians of Louisiana have jurisdiction of lands within the Bayou Teche Watershed. The first FEMA flood hazard mapping for the Bayou Teche Watershed was released over 40 years ago. Since that time, several communities in the watershed have received updating mapping, the most recent being in 2017.

Figure 1: 1927 New Iberia Bayou Teche, Mississippi Flood.

About the Risk MAP Project

Through coordination and data sharing, the communities in the watershed will work as partners in the mapping process. In addition to providing data, the communities will also provide insight into flooding issues and flood prevention within their areas.

FEMA, through its contractor Compass, completed the collection and creation of Base Level Engineering (BLE) for the Bayou Teche Watershed in June 2018. The Base Level Engineering analysis was performed to support the overall Risk MAP program and to perform a validation of the effective Zone A Special Flood Hazard Areas (SFHAs) in the watershed. Additional information specific to the BLE analysis for the watershed can be found in the "Phase Zero: Investment" section of this report.

In April 2018 the Louisiana Department of Transportation and Development (LADOTD) with support from FEMA Region 6, initiated the Phase 1 Discovery phase of this project. The goal of Discovery is to gain a more holistic picture of the flood hazards within a watershed, to collect data to validate the flood risks, identify opportunities to facilitate mitigation planning, and aid local communities in identifying further actions to reduce flood risk. Furthermore, because flood risks change over time, this Discovery project will help identify areas for future flood risk identification and assessment. The Discovery process is designed to open lines of communication and relies on local involvement for productive discussions. For additional information on the Discovery portion of this project see the section of this report titled "Phase 1: Discovery."

Introduction

Flood Risk

Floods are naturally occurring phenomena that can and do happen almost anywhere. In its most basic form, a flood is an accumulation of water over normally dry areas. Floods become hazardous to people and property when they inundate an area where development has occurred, causing losses. Mild flood losses may have little impact on people or property, such as damage to landscaping or the accumulation of unwanted debris. Severe flood losses can destroy buildings and crops and cause severe injuries or death.

Calculating Flood Risk

It is not enough to simply identify where flooding may occur. Even if people know where a flood might occur, they may not know the risk of flooding in that area. The most common method for determining flood risk, also referred to as vulnerability, is to identify both the probability and the consequences of flooding:

> **Flood Risk** (or Vulnerability) **= Probability x Consequences**, where:
>
> **Probability** = the likelihood of occurrence
>
> **Consequences** = the **estimated** impacts associated with the occurrence

The probability of a flood is the likelihood that it will occur. The probability of flooding can change based on physical, environmental, and/or engineering factors. Factors affecting the probability that a flood will have an impact on an area range from changing weather patterns to the existence of mitigation projects. The ability to assess the probability of a flood, and the level of accuracy for that assessment, are also influenced by modeling methodology advancements, better knowledge, and longer periods of record for the body of water in question.

The consequences of a flood are the estimated impacts associated with its occurrence. Consequences relate to human activities within an area and how a flood affects the natural and built environment.

The Flood Risk Report has two goals: (1) inform communities of their risks related to certain natural hazards, and (2) enable communities to act to reduce their risk. The information within this Risk Report is intended to assist Federal, State and local officials to:

- **Communicate risk** – Local officials can use the information in this report to communicate with property owners, business owners, and other residents about risks and areas of mitigation interest.
- **Update local HMPs and community comprehensive plans** – Planners can use risk information to develop and/or update HMPs, comprehensive plans, future land use maps, and zoning regulations. For example, zoning codes can be changed to provide for more appropriate land uses in high-hazard areas.
- **Update emergency operations and response plans** – Emergency managers can identify high-risk areas for potential evacuation and low-risk areas for sheltering. Risk assessment information may show vulnerable areas, facilities, and infrastructure for which continuity of operations plans, continuity of government plans, and emergency operations plans would be essential.

- **Inform the modification of development standards –** Planners and public works officials can use information in this report to support the adjustment of development standards for certain locations.
- **Identify mitigation projects –** Planners and emergency managers can use this risk assessment to determine specific mitigation projects of interest. For example, a floodplain manager may identify critical facilities that need to be elevated or removed from the floodplain.

This report showcases risk assessments, which analyze how a hazard affects the built environment, population, and local economy. They help to identify mitigation actions and develop mitigation strategies.

The information in this report should be used to identify areas for mitigation projects as well as for additional efforts to educate residents on the hazards that may affect them. The areas of greatest hazard impact are identified in the Areas of Mitigation Interest section of this report, which can serve as a starting point for identifying and prioritizing actions a community can take to reduce its risks.

Watershed Basics

Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) (USGS NWRC, 2018) summarizes the Bayou Teche watershed:

> The principal hydrologic features of the watershed is the 125 miles Bayou Teche. Unlike other basins in the Chenier Plain, the Bayou Teche watershed has direct riverine inputs. This watershed is experiencing an increase in riverine conditions because of sediment-laden freshwater flow from the Atchafalaya River (DeLaune et al. 1987). Water and sediment from the Atchafalaya River enter the basin from the east, flow westward, and dominate hydrological conditions in East and West Cote Blanche bays, which are gradually filling with sediment.

Like many watersheds in the Mississippi Delta, the Bayou Teche Watershed represents a complex network of small ponds, creeks, and shallow pools that connect to form the larger whole. Bayou Teche is a 125 mile long waterway that drains approximately 2,213 square miles in Louisiana. Bayou Teche was the Mississippi River's main course when it developed a delta about 2,800 to 4,500 years ago. Through a natural process known as deltaic switching, the river's deposits of silt and sediment cause the Mississippi to change its course every thousand years or so (Friedley, 2014).

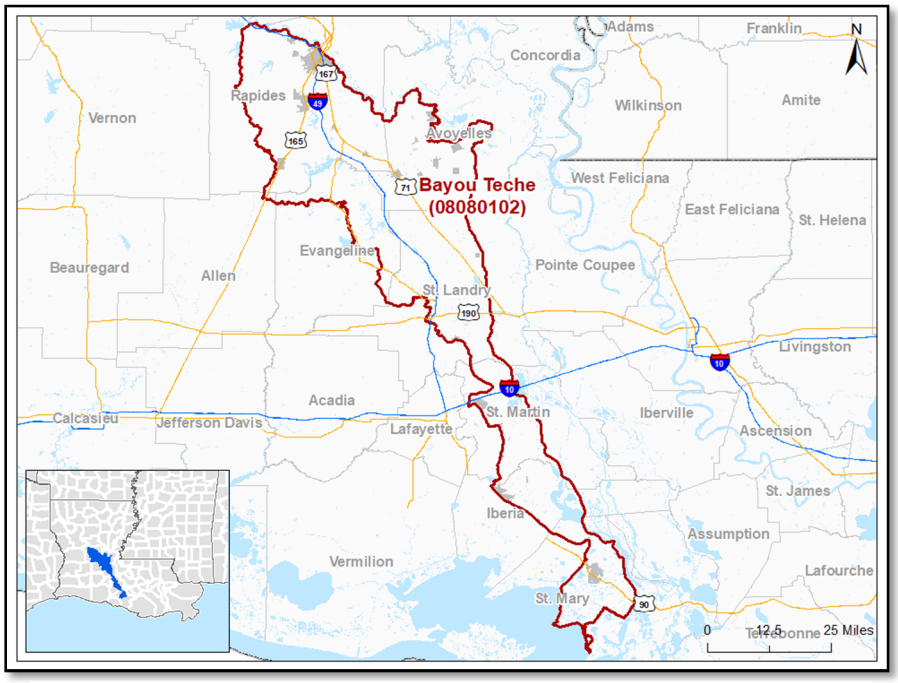


Figure 2: Overview map for the Bayou Teche Watershed

Relatively narrow the watershed drains an area north to south from southwest Alexandria, LA in Rapides Parish draining into Cote Blanche bay at the Gulf of Mexico near Franklin, LA in St. Mary Parish. Bound to the east by the Atchafalaya River and the west by Interstate 49 east of Lafayette and New Iberia Louisiana. The Bayou Teche watershed has a state management area of forest known as Alexander State Forest, the nearly 8,000-acre forest is Louisiana's only state forest. The Office of Forestry, part of the Department of Agriculture and Forestry, is responsible for its operation and maintenance. Bayou Teche has substantial flood control and prevention structure by use of levees. Within the watershed are 99 miles of accredited levees and 140 miles of non-accredited levees for a total of 239 miles of levees. This watershed has by far more levee miles than most other watersheds in south Louisiana.

Typically, the area is most suceptible to flooding in the spring. Because of its proximity to the Gulf of Mexico, the Bayou Teche Watershed experiences annual rainfall that is above the national average. This rainfall is the primary contributor to flooding in the area.

Between 2010 and 2016, the population of the Bayou Teche Watershed remained relatively static, experiencing an overall growth rate of 0.67 percent. However, this low overall growth rate conceals a wide variation in the population growth in individual localities. The table below ranks population change in order by these factors population change, population change as a percentage, population by land area weighted 50% of the later factors.

Table 1: Community Population Characteristics [1]

Community Name	Total Population (2010)	Total Population (2016)	Population Change (2010-2016)	Population Change % (2010-2016)
St. Landry Parish	18,843	19,757	914	4.6%
Town of Breaux Bridge	3,424	3,897	473	12.1%
Iberia Parish	14,152	14,730	578	3.9%
City of New Iberia	10,884	11,256	372	3.3%
Evangeline Parish	6,083	6,275	192	3.1%
St. Martin Parish	24,266	24,623	358	1.5%
Rapides Parish	32,110	32,365	255	0.8%
Town of Henderson	332	377	45	11.9%
Town of Boyce	229	321	93	28.8%
Town of Mansura	138	177	40	22.3%
City of Alexandria	40,438	40,614	175	0.4%
Village of Woodworth	1,096	1,109	13	1.2%

[1] Information for the portion of the community within the Bayou Teche Watershed

Community Name	Total Population (2010)	Total Population (2016)	Population Change (2010-2016)	Population Change % (2010-2016)
Village of McNary	209	214	5	2.3%
Town of Port Barre	2,088	2,119	31	1.5%
Town of Baldwin	198	213	15	7.2%
City of Jeanerette	1,745	1,779	35	1.9%
Town of Arnaudville	22	25	3	11.4%
Town of Glenmora	1,346	1,354	8	0.6%
Village of Loreauville	886	893	7	0.8%
Village of Forest Hill	816	803	-13	-1.6%
Village of Palmetto	164	162	-2	-1.2%
Town of Washington	962	953	-9	-0.9%
Avoyelles Parish	23,156	22,778	-378	-1.7%
Village of Moreauville	929	906	-23	-2.5%
Town of Evergreen	310	301	-9	-3.0%
Village of Plaucheville	248	239	-9	-3.8%
Village of Turkey Creek	21	20	-1	-5.1%
Town of Cottonport	2,006	1,954	-52	-2.7%
Town of Leonville	122	114	-8	-7.0%
Town of Cheneyville	625	607	-18	-3.0%
City of Bunkie	4,179	4,064	-115	-2.8%
Tunica-Biloxi Indians of Louisiana	108	0	-108	0.0%
Village of Hessmer	802	781	-21	-2.7%
Allen Parish	165	146	-20	-13.6%
City of St. Martinville	895	860	-34	-4.0%
Town of Lecompte	1,227	1,186	-41	-3.5%

Community Name	Total Population (2010)	Total Population (2016)	Population Change (2010-2016)	Population Change % (2010-2016)
City of Franklin	7,641	7,182	-459	-6.4%
City of Marksville	1,876	1,728	-148	-8.6%
St. Mary Parish	5,516	4,960	-557	-11.2%
Village of Parks	124	110	-14	-13.0%
Chitimacha Tribe of Louisiana	65	55	-10	-17.4%
City of Opelousas	4,435	3,996	-440	-11.0%

While population totals in several municipalities, declined, the unincorporated areas within the Bayou Teche Watershed are experiencing net population growth with the exception of Avoyelles and St. Mary. St. Landry Parish is experiencing more net growth than other Parish's in the watershed. The towns of Boyce, Mansura, Breaux Bridge, Henderson, Arnaudville, and Baldwin have experienced notable increases and rank in the top 10 for population growth within the watershed. Notable decline are Allen and St. Mary Parish, Village of Parks, Cities of Opelousas, Marksville, and Franklin, and Town of Leonville. Development creates a greater risk of increased flooding and opportunity for targeted mitigation efforts. A more concentrated population could result in more concentrated flood damage in the event of a disaster. Land use changes in otherwise undeveloped areas of the Parish through development has the potential to increase runoff and change the rate and flow of water throughout the watershed. These changes can exacerbate already flood prone areas and create new ones.

Table 2: Population and Area Characteristics [2]

Risk MAP Project	Total Population in Deployed Area	Average % Population Growth/Yr. (2010-2016)	Predicted Population (by 2023)	Land Area (sq. mile)	Developed Area	Open Water
Bayou Teche	203,488	0.66%	211,234	2,213	8.08%	2.40%

To help mitigate the risk to areas where increased population and development are expected, communities can adopt (or exceed) the minimum standards of the National Flood Insurance Program (NFIP). This is recommended as a proactive strategy to manage construction within the floodplain and avoid negative impacts to existing and future development.

To increase mitigation efforts and community flood awareness through potentially discounted premium rates, an NFIP community that has adopted more stringent ordinances or is actively completing mitigation and outreach activities is encouraged to consider joining the Community Rating System (CRS). The CRS is a voluntary incentive-based program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. Flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions.

Allen Parish has adopted a regulations suitable for managing floodplains with Base (1-percent-annual-chance) Flood Elevations (44 CFR 60.3c). The Parishes of Evangeline, Iberia, St. Landry, St. Martin, and St. Mary have adopted a further level of regulation suitable for managing floodplains with mapped regulatory floodways and Base (1-percent-annual-chance) Flood Elevations (44 CFR 60.3d). Avoyelles Parish Unincorporated Areas has adopted a regulations suitable for managing floodplains without Base (1-percent-annual-chance) Flood Elevations (44 CFR 60.3b). Within Avoyelles Parish the Town of Mansura adopted regulation meeting (44 CFR 60.3a) no Special Flood Hazard Area identified. City of Bunkie, Villages of Moreauville and Plaucheville have adopted a regulations suitable for managing floodplains without Base (1-percent-annual-chance) Flood Elevations (44 CFR 60.3b) also within Avoyelles Parish. Also within Avoyelles Parish the City of Marksville has adopted a regulations suitable for managing floodplains with Base (1-percent-annual-chance) Flood Elevations (44 CFR 60.3c). While Rapides Parish Unincorporated Areas have adopted a further level of regulation suitable for managing floodplains with mapped regulatory floodways and Base (1-percent-annual-chance) Flood Elevations (44 CFR 60.3d). Within Rapides Parish City of Alexandria, Towns of Glenmora and Lecompte have adopted a further level of regulation suitable for managing floodplains with mapped regulatory floodways and Base (1-percent-annual-chance) Flood Elevations (44 CFR 60.3d). Town of Cheneyville and Village of Woodworth has adopted a regulations suitable for managing floodplains with Base (1-percent-annual-chance) Flood Elevations (44 CFR 60.3c) within Rapides Parish. Village of McNary has adopted a regulations suitable for managing floodplains without Base (1-percent-annual-chance) Flood Elevations (44 CFR 60.3b) also within Rapides Parish. Communities can review and update their current ordinances to reflect potential flood hazard changes by adopting updated ordinances early. This action can reduce

[2] Data obtained from the U.S. Census Bureau; National Hydrologic Database – Medium Resolution, and National Land Cover Database (2011)

future flood losses by affecting how substantial improvements or new construction are regulated. Table 3 depicts NFIP and CRS participation status and provides an overview of the effective flood data availability.

Table 3: Bayou Teche Watershed NFIP and CRS Participation[3]

Risk MAP Project	Participating NFIP Communities/ Total Communities	Number of CRS Communities	CRS Rating Class Range	Average Years since FIRM Update	Level of Regulations (44 CFR 60.3)
Bayou Teche	41/42	0	N/A	16	CFR 60.3 (a-d)

The number of dams impacting the Bayou Teche Watershed is reflected in Table 4. These dams reflect major dams within the watershed while there may be smaller local dams. Rapides Parish Policy Jury is owner of the Indian Creek Dam and the Kincaid Reservoir Dam both of which are considered high hazard potential according the National Inventory of Dams. Louisiana Department of Wildlife and Fisheries own the Bayou Cocodrie Dam while the Louisiana Office of State Parks owns the Chicot Lake Dam both of which are considered high hazard potential according the National Inventory of Dams.

Table 4: Risk MAP Project Dam Characteristics[4]

Risk MAP Project	Total Number of Identified Dams	Number of Dams Requiring EAP	Percentage of Dams without EAP	Average Years since Inspection	Average Storage (acre-feet)
Bayou Teche	22	2	82%	5.5	10,150.2

Dams can be of particular concern, especially in areas prone to heavy rainfall, because many older dams were not built to any particular standard and thus may not withstand extreme rainfall events. Older dams are often made out of an assortment of materials and some of these structures may not have any capacity to release water in a controlled manner and could be overtopped, which could result in catastrophic failure. Furthermore, without proper regulation the downstream risk may have changed since the original hazard classification was determined. For other dams, the dam failure inundation zone may not be known. Not having knowledge of these risk areas could lead to unprotected development in these zones.

[3] Data obtained from the FEMA Community Information System.

[4] Data obtained from the U.S. Army Corps of Engineers (USACE) National Inventory of Dams (March 2017)

Project Phases and Map Maintenance

Background

FEMA manages several risk analysis programs, including the Flood Hazard Mapping, National Dam Safety, Earthquake Safety, Multi-Hazard Mitigation Planning, and Risk Assessment Programs, that assess the impact of natural hazards and lead to effective strategies for reducing risk. These programs support the Department of Homeland Security's objective to "strengthen nationwide preparedness and mitigation against natural disasters."

> *Flood-related damage between 1980 and 2013 totaled $260 billion, but the total impact to our Nation was far greater—more people lose their lives annually from flooding than any other natural hazard.*
>
> *FEMA, "Federal Flood Risk Management Standard (FFRMS)" (2015)*

FEMA manages the NFIP, which is the cornerstone of the national strategy for preparing American communities for flood hazards. In the Nation's comprehensive emergency management framework, the analysis and awareness of natural hazard risk remains challenging. For communities to make informed risk management decisions and take action to mitigate risk, a consistent risk-based approach to assessing potential vulnerabilities and losses is needed, as are tools to communicate the message. Flood hazard mapping remains a basic and critical component for a prepared and disaster-resilient Nation.

In Fiscal Year 2009, FEMA's Risk MAP program began to synergize the efforts of Federal, State, and local partners to create timely, viable, and credible information identifying natural hazard risks. The intent of the Risk MAP program is to share resources to identify the natural hazard risks a community faces and ascertain possible approaches to minimizing them. Risk MAP aims to provide technically sound flood hazard information to be used in the following ways:

- To update the regulatory flood hazard inventory depicted on FIRMs and the National Flood Hazard Layer (NFHL);
- To provide broad releases of data to expand the identification of flood risk (flood depth grids, water surface elevation grids, etc.);
- To support sound local floodplain management decisions; and
- To identify opportunities to mitigate long-term risk across the Nation's watersheds.

How are FEMA's Flood Hazard Maps Maintained?

FEMA's flood hazard inventory is updated through several types of revisions.

Community-submitted Letters of Map Change. First and foremost, FEMA relies heavily on the local communities that participate in the NFIP to carry out the program's minimum requirements. These requirements include the obligation for communities to notify FEMA of changing flood hazard information and to submit the technical support data needed to update the FIRMs.

Although revisions may be requested at any time to change information on a FIRM, FEMA generally will not revise an effective map unless the changes involve modifications to SFHAs. Be aware that the best floodplain management practices and proper assessments of risk result when the flood hazard maps present information that accurately reflects current conditions.

Under the current minimum NFIP regulations, a participating community commits to notifying FEMA if changes take place that will affect an effective FIRM no later than 6 months after project completion.

Section 65.3, Code of Federal Regulations

Letters of Map Amendment (LOMA). The scale of an effective FIRM does not always provide the information required for a site-specific analysis of a property's flood risk. FEMA's LOMA process provides homeowners with an official determination on the relation of their lot or structure to the SFHA. Requesting a LOMA requires a homeowner to work with a surveyor or engineering professional to collect site-specific information related to the structure's elevation; it may also require the determination of a site-specific Base Flood Elevation (BFE). Fees are associated with collecting the survey data and developing a site-specific BFE. Local survey and engineering professionals usually provide an Elevation Certificate to the homeowner, who can use it to request a LOMA. A successful LOMA may remove the Federal mandatory purchase requirement for flood insurance, but lending companies may still require flood insurance if they believe the structure is at risk.

FEMA-Initiated Flood Risk Project. Each year, FEMA initiates a number of Flood Risk Projects to create or revise flood hazard maps. Because of funding constraints, FEMA can study or restudy only a limited number of communities, counties, or watersheds. As a result, FEMA prioritizes study needs based on a cost-benefit approach whereby the highest priority is given to studies of areas where development has increased and the existing flood hazard data has been superseded by information based on newer technology or changes to the flooding extent. FEMA understands communities require products that reflect current flood hazard conditions to best communicate risk and implement effective floodplain management.

Flood Risk Projects may be delivered by FEMA or one of its Cooperating Technical Partners (CTPs). The CTP initiative is an innovative program created to foster partnerships between FEMA and participating NFIP communities, as well as regional and State agencies. Qualified partners collaborate in maintaining up-to-date flood maps. In Region 6, CTPs are generally statewide agencies that house the State Floodplain Administrator. However, some Region 6 CTPS are also large River Authority or Flood Control Districts. They provide enhanced coordination with local, State, and Federal entities, engage community officials and technical staff, and provide updated technical information that informs updates to the national flood hazard inventory.

Risk MAP has modified FEMA's project investment strategy from a single investment by fiscal year to a multi-year phased investment, which allows the Agency to be more flexible and responsive to the findings of the project as it moves through the project lifecycle. Flood Risk Projects are funded and completed in phases.

General Flood Risk Project Phases

Each phase of the Flood Risk Project provides both FEMA and its partner communities an opportunity to discuss the data that has been collected to determine a path forward. Local engagement throughout each phase of the project enhances the opportunities for partnership and discussion about current and future risk, as well as offering the opportunity to identify projects and activities that local communities may pursue to reduce their long-term natural hazard risk.

Flood Risk Projects may be funded for one or more the following phases:

- Phase Zero – Investment
- Phase One – Discovery
- Phase Two – Risk Identification and Assessment
- Phase Three – Regulatory Product Update

Local input is critical throughout each phase of a Flood Risk Project. More detail about the tasks and objectives of each phase are included below.

Phase Zero: Investment

Phase Zero of a Flood Risk Project initiates FEMA's review and assessment of the inventories of flood hazards and other natural hazards within a watershed area. During the Investment Phase, FEMA reviews the availability of information to assess the current flood plain inventory. FEMA maintains several data systems in order to perform watershed assessments and selects watersheds for a deeper review of available data and potential investment tasks based on the following factors:

Availability of High-Quality Ground Elevation. FEMA reviews readily available and recently acquired ground elevation data. This information helps identify development and earth-moving activities near streams and rivers. Where necessary, FEMA may partner with local, State, and other Federal entities to collect necessary ground elevation information within a watershed.

If high-quality ground elevation data is both available for a watershed area and compliant with FEMA's quality requirements, FEMA and its mapping partners may prepare engineering data to assess, revise, replace, or add to the current flood hazard inventory.

Mile Validation Status within Coordinated Needs Management Strategy (CNMS). FEMA uses the CNMS database to track the validity of the flood hazard information prepared for the NFIP. The CNMS database reviews 17 criteria to determine whether the flood hazard information shown on the current FIRM is still valid.

Communities may also inform and request a review or update of the inventory through the CNMS website at https://msc.fema.gov/cnms/. The CNMS Tool Tutorial provides an overview of the online tool and explains how to submit requests.

Local Hazard Mitigation Plans (HMPs). Reviewing current and historic HMPs provides an understanding of a community's comprehension of its flood risk and other natural hazard risks. The mitigation strategies within a local HMP provide a lens to local opportunities and underscore a potential for local adoption of higher standards related to development or other actions to reduce long-term risk.

Cooperating Technical Partner State Business Plans. In some states, a CTP generates an annual state business plan that identifies future Flood Risk Project areas that are of interest to the state. Within the Bayou Teche Watershed, the Louisiana Department of Transportation and Development and the Louisiana Governor's Office of Homeland Security and Emergency Preparedness provided both information and insight. In this project area, FEMA has worked closely with these entities to develop the project scope and determine the necessary project tasks.

Communities that have identified local issues are encouraged to indicate their data needs and revision requests to the State CTP so that they can be prioritized and included in the State business plans.

Possible Investment Tasks. After a review of the data available within a watershed, FEMA may choose to (1) purchase ground elevation data and/or (2) create some initial engineering modeling against which to compare the current inventory. This type of modeling is known as Base-Level Engineering.

Phase One: Discovery

Phase One, the Discovery Phase, provides opportunities both internally (between the State and FEMA) and externally (with communities and other partners interested in flood potential) to discuss local issues with flooding and examine possibilities for mitigation action. This effort is made to determine where communities currently are with their examination of natural hazard risk throughout their community and to identify how State and Federal support can assist communities in achieving their goals.

The Discovery process includes an opportunity for local communities to provide information about their concerns related to natural hazard risks. Communities may continue to inform the project identification effort by providing previously prepared survey data, as-built stream crossing information, and engineering information.

For a holistic community approach to risk identification and mapping, FEMA relies heavily on the information and data provided at a local level. Flood Risk Projects are focused on identifying (1) areas where the current flood hazard inventory does not provide adequate detail to support local floodplain management activities, (2) areas of mitigation interest that may require more detailed engineering information than is currently available, and (3) community intent to reduce the risk throughout the watershed to assist FEMA's future investment in these project areas. Watersheds are selected for Discovery based on these evaluations of flood risk, data needs, availability of elevation data, regional knowledge of technical issues, identification of a community-supported mitigation project, and input from Federal, State, and local partners.

Possible Discovery Tasks. Discovery may include a mix of interactive webinars, conference calls, informational tutorials, and in-person meetings to reach out to and engage with communities for input. Data collection, interviews and interaction with community staff, and data-mining activities provide the basis for watershed-, community- and stream-level reviews to determine potential projects that may benefit the communities. A range of analysis approaches are available to determine the extent of flood

risk along streams of concern. FEMA and its mapping partners will work closely with communities to determine the appropriate analysis approach, based on the data needs throughout the community. These potential projects may include local training sessions, data development activities, outreach support to local communities wanting to step up their efforts, or the development of flood risk datasets within areas of concern, to allow a more in-depth discussion of risk.

Phase Two: Risk Identification and Assessment

Phase Two (Risk Identification and Assessment) continues the risk awareness discussion with communities through watershed analysis and assessment. Analyses are prepared to review the effects of physical and meteorological changes within the project watershed. The new or updated analysis provides an opportunity to identify how development within a watershed has affected the amount of stormwater generated during a range of storm probabilities and shows how effectively stormwater is transported through communities in the watershed.

Coordination with a community's technical staff during engineering and model development allows FEMA and its mapping partners to include local knowledge, based on actual on-the-ground experience, when selecting modeling parameters.

The information prepared and released during Phase Two is intended to promote better local understanding of the existing flood risk by allowing community officials to review the variability of the risk throughout their community. As FEMA strives to support community-identified mitigation actions, it also looks to increase the effectiveness of community floodplain management and planning practices, including local hazard mitigation planning, participation in the NFIP, use of actions identified in the CRS Manual, risk reduction strategies for repetitive loss and severe repetitive loss properties, and the adoption of stricter standards and building codes.

FEMA is eager to work closely with communities and technical staff to determine the current flood risk in the watershed. During the Risk Identification and Assessment phase, FEMA would like to be alerted to any community concerns related to the floodplain mapping and analysis approaches being taken. During this phase, FEMA can engage with communities and review the analysis and results in depth.

Possible Risk Identification and Assessment Tasks. Phase Two may include a mixture of interactive webinars, conference calls, informational tutorials, and in-person meetings to reach out to and engage with communities for input. Flood Risk Project tasks may include hydrologic or hydraulic engineering analysis and modeling, floodplain mapping, risk assessments using Hazus-MH software, and preparation of flood risk datasets (water surface elevation, flood depth, or other analysis grids). Additionally, projects may include local training sessions, data development activities, outreach support to local communities that want to step up their efforts, or the development of flood risk datasets within areas of concern, to allow a more in-depth discussion of risk.

Phase Three: Regulatory Products Update

If the analysis prepared in the previous Flood Risk Project phases indicate that physical or meteorological changes in the watershed have significantly changed the flood risk since the last FIRM was printed, FEMA will initiate the update of the regulatory products that communities use for local floodplain management and NFIP activities. Delivery of the preliminary FIRMs and Flood Insurance Study

(FIS) reports begins another period of coordination between community officials and FEMA to discuss the required statutory and regulatory steps both parties will perform before the preliminary FIRM and FIS reports can become effective. As in the previous phases, FEMA and its mapping partners will engage with communities through a variety of conference calls, webinars, and in-person meetings.

Once the preliminary FIRMs are prepared and released to communities, FEMA will initiate the statutory portions of the regulatory product update. FEMA will coordinate a Consultation Coordination Officer (CCO) meeting and initiate a 90-day comment and appeal period. During this appeal period, local developers and residents may coordinate the submittal of their comments and appeals through their community officials to FEMA for review and consideration.

FEMA welcomes this information because additional proven scientific and technical information increases the accuracy of the mapping products and better reflects the community's flood risks identified on the FIRMs.

Communities may host or hold Open House meetings for the public. The Open House layout allows attendees to move at their own pace through several stations, collecting information in their own time. This format allows residents to receive one-on-one assistance and ask questions pertinent to their situation or their interest in risk or flood insurance information.

FEMA will review all appeals and comments received during the statutory 90-day appeal period, including the community's written opinion, to determine the validity of the appeal. Once FEMA issues the appeal resolution, the associated community and all appellants will receive an appeal resolution letter and FEMA will make any revisions to the FIRM as appropriate. A 30-day period is provided for review and comment on successful appeals. Once all appeals and comments are resolved, the flood map is ready to be finalized.

After the appeal period, FEMA will send community leaders a Letter of Final Determination (LFD) stating that the preliminary FIRM will become effective in six months. The letter also discusses the actions each affected community participating in the NFIP must take to remain in good standing with the NFIP.

After the preceding steps are complete and the six-month compliance period ends, the FIRMs are considered effective maps and new building and flood insurance requirements become effective.

That is a brief general overview of a flood risk project. Next, the Flood Risk Report will provide details on the specific efforts in the Bayou Teche Watershed.

Phase Zero: Investment

Extending from southwest Alexandria, LA in Rapides Parish, the Bayou Teche Watershed extends south along Interstate 49 east of Lafayette, LA in St. Martin Parish before turning southwest and emptying into Cote Blanche Bay (Gulf of Mexico). The watershed can be considered long and narrow as it is much longer ~145 miles than it is wide ~48 miles at its widest and ~1.5 miles at its narrowest.

The Bayou Teche watershed covers eight parishes and thirty six municipalities. Those communities include approximately 211,000 people within the watershed, when examining the actual watersheds and SFHAs, the areas of study become more focused. While the subject communities cover more than 2,200 square miles, 1,077 square miles are currently designated within an SFHA. SFHA land designations account for a considerable amount of coverage across the Parish's and their communities at ~49%.

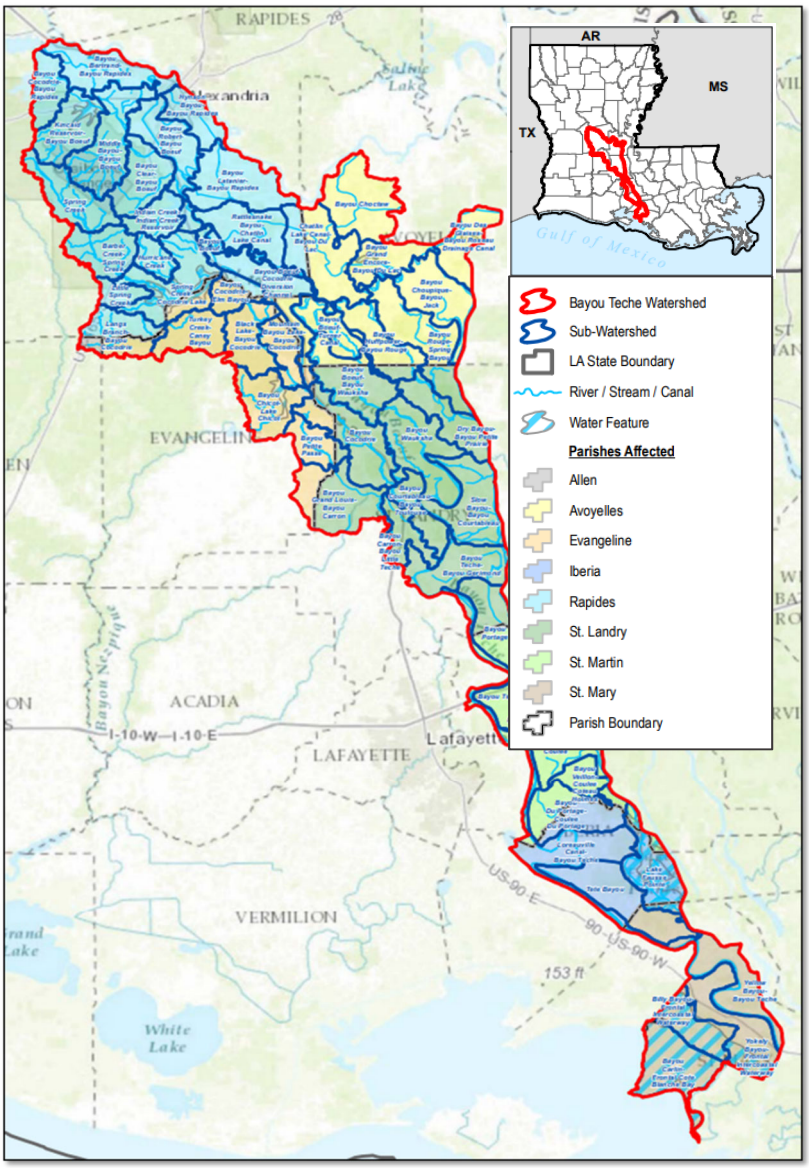


Figure 3: Parishes and sub-watersheds of the Bayou Teche Watershed

Bayou Teche draws water from Bayou Courtableau upstream before feeding into the Atchafalaya River basin. Having historically been the main course of the Mississippi River and in a drainage area with relatively flat grade, Bayou Teche is interconnected with braided channels of slow moving water when not in flood stage.

Flooding typically comes in the form of rainwater runoff and post-tropical events. Adding to the potential risk is the rainfall endemic to the region. Throughout the watershed, annual rainfall totals of more than 60 inches are not uncommon. This exceeds Louisiana's already high annual precipitation rate and represents one of the highest in the country. Combined with periodic hurricanes, the entire region is subject to both higher than normal rainfall and periods of torrential downpours, which create systemic flooding events.

Area of Interest Selection Factors

In large part, the selection of the Bayou Teche Watershed stems from both its risk and the age of the data connected to it. On average, the age of data related to the watershed's previous study is 16.5 years old. In that time span, several hurricanes have impacted the watershed, while at the same time, the area has become more urbanized. This creates a scenario in which an inhabited area becomes larger, while the potential damage caused by a single flooding event is increased. Combined, these two factors

make the further evaluation of the Bayou Teche Watershed both pressing and imperative. Many factors and criteria are reviewed to determine which watershed is selected: flood risk, the age of the current flood hazard data, population growth trends and potential for growth, recent flood claims, and disaster declaration history. The availability of local data and high-quality ground elevation data is reviewed for use in preparing flood hazard data. The CNMS database is reviewed to identify large areas of unknown or unverified data for streams. FEMA consults the State of Louisiana CTP, the State NFIP Coordinator, and the State Hazard Mitigation Officer when basins are identified for study.

Flood Risk. In the past two years, the Bayou Teche Watershed experienced three FEMA-designated disasters. The first, and largest of the three floods became a FEMA-declared major disaster on August 14, 2016. It resulted in property damage and adversely impacted Avoyelles, Evangeline, Iberia, St. Landry, and St. Martin parishes in the study area. This disaster was also caused by heavy rains; demonstrating that the Bayou Teche Watershed has the capacity to flood with remarkable rapidity. The second notable disaster is attributed to the August 28, 2017 declaration associated with Tropical Storm Harvey impacting the parishes of Allen, Iberia, Rapides, and St. Mary (10/16/2017). Most recently was Tropical Storm Nate which impacted the parishes of Iberia, St. Martin, and St. Mary. All parishes experienced a disaster in one of these three declarations. It should also be noted that the parishes within Bayou Teche experience flood risk as evidence from claims made outside of federally declared disasters. These floods and the resulting claims occur through unnamed rain events and account for significant loss in the watershed.

Growth Potential. While overall population growth throughout the watershed is projected to be minimal, there is an emerging internal migration. With a larger proportion of the population moving to the watershed's urban areas, the potential flood risks for the area are rapidly concentrating. With a more concentrated population the potential for any one flooding event to hit a population center is lowered, but the damage a single flooding event can cause is magnified. Economically, the watershed continues to be dominated by cities of Alexandria, Opelousas, and Franklin. Most unincorporated areas in the Bayou Teche watershed are experiencing net growth Allen, Avoyelles, and St. Mary Parishes are experiencing a decline within this watershed. Additionally, where the communities are experiencing net growth populations grew at much faster rates than their surrounding parish. If current trends continue, the watershed's population and economics will be concentrated in a more compact geographic areas.

Age of Current Flood Information. With an average of 16.5 years since maps were issued in the study area, the current information is dated. Newer maps should address this concern.

Availability of High-Quality Ground Elevation Data

LiDAR is available for the entire watershed. The Louisiana Statewide LiDAR Project provided high-resolution elevation data for the area. This Project was executed in a series of Phases and Task. The watershed had LiDAR acquired between 2003 and 2005. More recently the USGS has sourced LiDAR from three separate missions in 2010-2013 these are not of significant coverage of the watershed as they are capturing lands adjacent to the watershed in the coastal region and Atchafalaya Basin.

Coordinated Needs Management Strategy Database Review. The CNMS database indicates the validity of FEMA's flood hazard inventory. Streams that are indicated as ***Unverified*** or ***Unknown*** in the database indicate that the information used to map the floodplains currently shown on the FIRM is inaccessible or that a complete evaluation of the critical and secondary CNMS elements could not be performed.

The CNMS database for the Bayou Teche Watershed represents a large, but incomplete set of information. Within the 1,406 stream miles of the Bayou Teche Watershed, 410 miles were denoted as "valid" (138 miles detailed, 271 approximate). This leaves 996 miles as "unknown" or "unverified" (92 miles detailed, 904 miles approximate). It should be noted that only 9.83% of the current FIS inventory is considered NVUE compliant. For further analysis of the Zone A miles see the "CNMS Validation and Assessment" portion of the "Base Level Engineering" section below.

Table 5: CNMS NVUE Report[5]

	Valid		Unverified	
	Compliant	**Being studied**	**To be studied**	**Being studied**
Modern inventory	138.16	271.4	103.15	892.75

Unmapped Stream Coverage. FEMA also reviewed the current stream coverage areas against the National Hydrography Dataset (NHD). The NHD medium-resolution data inventoried by the U.S. Geological Survey maps created at a 1:100,000 scale reflects the target streams for mapping within a given watershed. The NHD medium resolution data shows approximately ~814.2 stream miles not currently reflected in the CNMS database. Although the mileage count seems rather high variances between perceived and actual mileage could be attributed to the mixture of dendritic and braided network of the streams among effective flood insurance study flooding sources.

[5] Collected from the FEMA Map Service Center CNMS Report 21 September 2018.

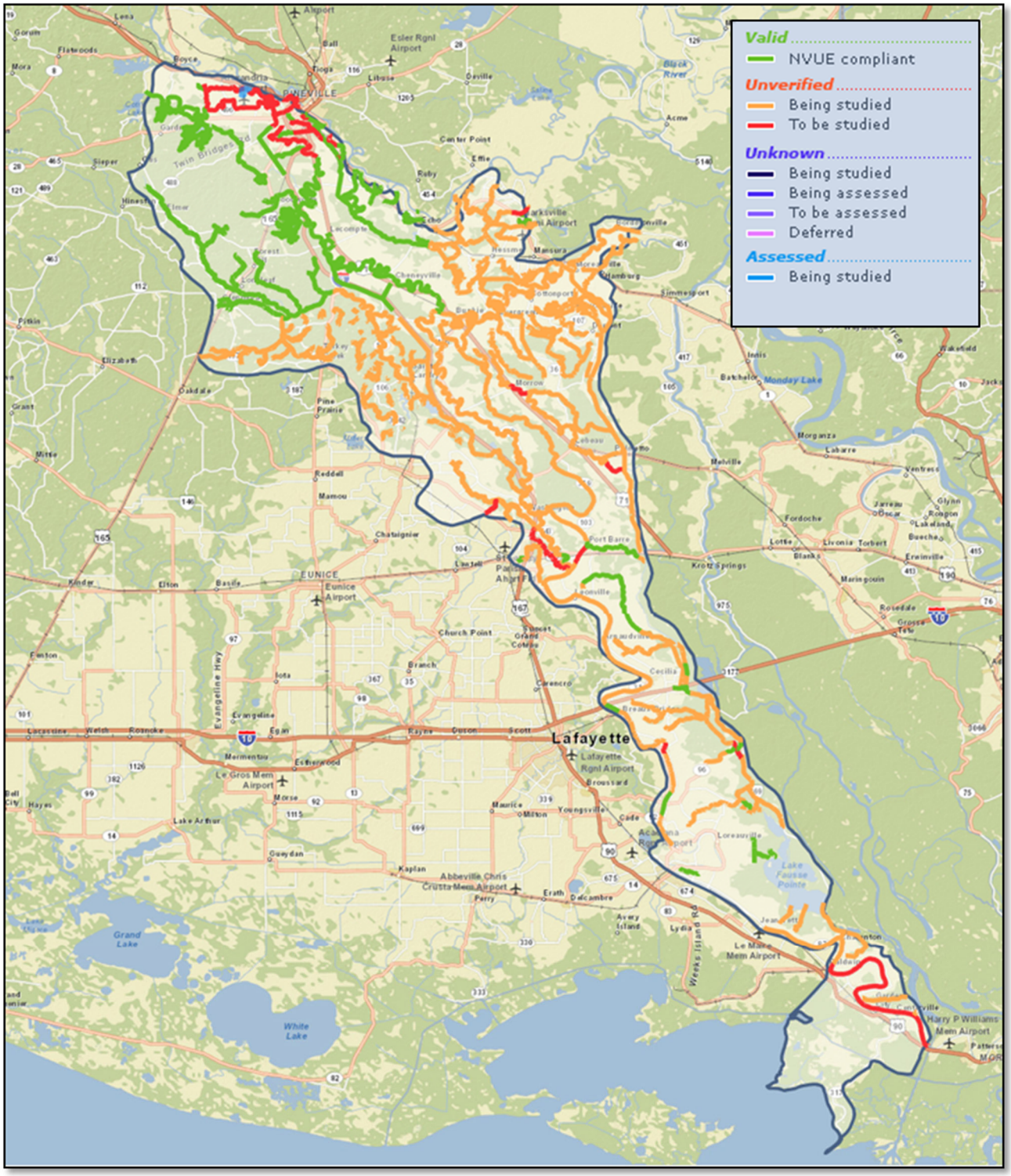


Figure 4: Current status of stream studies in the Bayou Teche Watershed

Base-Level Engineering

This approach prepares multi-profile hydrologic (how much water) and hydraulic (how is water conveyed in existing drainage) data for a large stream network or river basin to generate floodplain and other flood risk information for the basin area.

Base Level Engineering provides an opportunity for FEMA to produce and provide non-regulatory flood risk information for a large watershed area in a much shorter period of time. The data prepared through BLE provides planning-level data that meet FEMA's Standards for Floodplain Mapping.

FEMA Investment (2018). The BLE analysis provides the following items for use in the Bayou Teche Watershed:

- Hydrology modeling (regression) flow values for the 10-, 4-, 2-, 1- and 0.2-percent-annual-chance storm events
- Hydraulic (HEC-RAS) 2-dimensional modeling for all study streams
- 1- and 0.2-percent-annual-chance floodplain boundaries
- 1- and 0.2-percent-annual-chance Water-Surface Elevation Grids
- 1- and 0.2-percent-annual-chance Flood Depth Grids

BLE was conducted and produced flood hazard identification for ~2,655 linear stream miles of major flooding sources through the Bayou Teche watershed. The Base-Level Engineering information has been provided to the communities throughout the basin for planning, risk communication, floodplain management, and permitting activities. It should be noted that BLE data exist where effective FEMA FIS information may be available. CNMS indicates that ~410 miles of effective flood data is currently available and considered 'valid' so care should be used in areas where effective flood information has been validated in CNMS and BLE is available.

CNMS Validation and Assessment. FEMA has compared the Base-Level Engineering results to the current flood hazard inventory identified in the CNMS database. This assessment allows FEMA to compare this updated flood hazard information to the current effective floodplain mapping throughout the basin. The Base-Level Engineering information was made available September 2018. Table 5 below shows the change in area for the effective SFHA and the flood mapping that was produced as part of the BLE analysis.

Community Coordination. FEMA has shared the BLE results with communities throughout the project area. Communities were provided the information, workshops, and training to support the use of BLE for planning, floodplain management, permitting, and risk communication activities. FEMA will continue to work with communities to review, interpret, and incorporate the BLE information into their daily and future community management and planning activities.

Follow-On Phase Project Decisions. The BLE results and the current effective inventory were compared to identify any areas of significant change. If the results show large areas of change (i.e. - expansions and contractions of the floodplain). Table 5 below shows the change in area for the effective SFHA and the flood mapping that was produced as part of the BLE analysis. It should be noted that the SFHA Increase numbers can be attributed to the differences in modeling methodology used in the effective analysis and the BLE analysis. Effective analysis models a specific riverine flooding sources by methods that differ

from that of a rain on grid 2-dimensional model which is the basis of the BLE analysis. 2 dimensional rain on grid models determine the flood hazard extent with consideration for the pluvial flooding beyond that of the fluvial (riverine) channel. Figure 4 below illustrates these large areas. Additionally, it should also be noted that there some areas where SFHA Increases are due to additional streams being studied in the BLE analysis that were not studied for the effective SFHA.

Table 6: Changes to SFHA (Effective SFHA vs. BLE Flood Mapping)

Community	Community Area (sq. miles)	No Change (sq. miles)	Decrease (sq. miles)	Increase (sq. miles)
Allen Parish	3.9	0.2	0.0	1.4
Avoyelles Parish	336.2	132.8	11.4	104.6
Chitimacha Tribe of Louisiana	0.2	0.0	0.0	0
City of Alexandria	27.5	7.1	1.5	9.5
City of Bunkie	3.0	0.2	0.0	1.4
City of Franklin	10.4	7.1	1.1	0.7
City of Jeanerette	0.7	0.1	0.0	0.0
City of Marksville	3.5	0.2	0.1	0.7
City of New Iberia	5.9	0.9	0.3	1.7
City of Opelousas	1.5	0.1	0.0	0.2
City of St. Martinville	1.3	0.1	0.0	0.2
Evangeline Parish	218.2	65.5	2.6	35.3
Iberia Parish	139.4	82.9	0.6	30.9
Rapides Parish	607.9	185.6	11.5	127.6
St. Landry Parish	429.9	270.0	23.9	66.7
St. Martin Parish	183.3	101.4	3.9	45.3
St. Mary Parish	198.7	146.1	13.9	18.2
Town of Arnaudville	0.4	0.0	0.0	0.1
Town of Baldwin	0.2	0.0	0.0	0.0
Town of Boyce	0.4	0.0	0.0	0.2
Town of Breaux Bridge	4.8	0.2	0.1	2.5
Town of Cheneyville	1.0	0.2	0.1	0.3
Town of Cottonport	2.0	0.0	0.0	1.0
Town of Evergreen	1.0	0.0	0.0	0.3
Town of Glenmora	1.7	0.2	0.1	0.2
Town of Henderson	1.7	0.8	0.1	0.4
Town of Lecompte	1.1	0.3	0.1	0.3
Town of Leonville	1.1	0.1	0.0	0.5
Town of Mansura	0.8	0.0	0.1	0.3
Town of Port Barre	1.1	0.4	0.1	0.2
Town of Washington	0.8	0.3	0.1	0.0
Tunica-Biloxi Indians of Louisiana	0.6	0.1	0.1	0.0

Community	Community Area (sq. miles)	No Change (sq. miles)	Decrease (sq. miles)	Increase (sq. miles)
Village of Forest Hill	3.3	0.0		0.6
Village of Hessmer	0.8	0.0	0.0	0.3
Village of Loreauville	0.4	0.1	0.0	0.1
Village of McNary	1.9	0.2	0.0	0.2
Village of Moreauville	3.0	0.2	0.0	1.8
Village of Palmetto	0.9	0.4	0.0	0.3
Village of Parks	0.7	0.1	0.0	0.2
Village of Plaucheville	1.5	0.1	0.0	0.8
Village of Turkey Creek	1.0	0.1	0.0	0.1
Village of Woodworth	8.9	1.3	0.1	1.0
WATERSHED TOTAL	**2212.7**	**1005.3**	**71.9**	**456.1**

Looking at changes in previously mapped areas, some areas do stand out. Within Rapides Parish many tributaries to Spring Creek are apparent that are not in the effective analysis. Little Spring Creek and Tributaries within Rapides Parish, Town of Glenmora and Village of McNary is depicted as a flooding source. Hurricane Creek in Rapides Parish and the Village of Forest Hill is depicted as a flooding source. Also in Rapides Parish upstream areas of Brown Creek, Valentine Creek, Castor Creek, Bayou Clear, Indian Creek, Cockrell Creek, Beaver Creek, Bayou Carron, Bayou Cocodrie and their tributaries. Bayou Boeuf and Bayou Des Glaises and tributaries run north to south. Bayou Boeuf drains from the west into Bayou Teche near the Town of Washington in St. Landry Parish. Bayou Cocodrie continues further south and drains into Bayou Teche from the east near Chitimacha Tribe of Louisiana in St. Mary Parish. Both bayou's account for additional flooding not depicted on the current effective FIRMs.

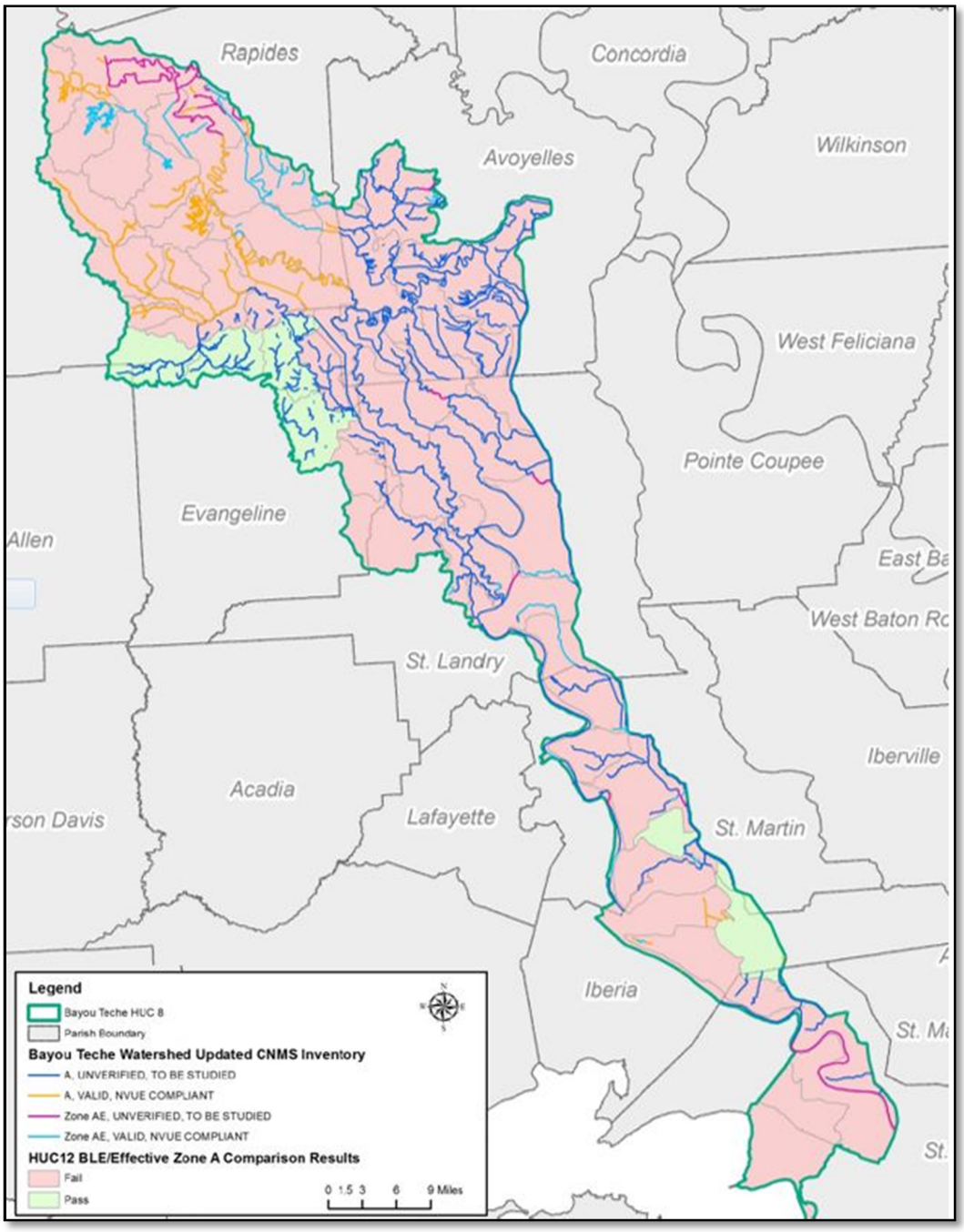


Figure 5: Changes *between Effective SFHA and BLE Flood Mapping*

Please note that due to differences between the effective studies and the Base Level Engineering that there are areas on this map which may falsely reflect increases or decreases to the floodplains. These issues are discussed in the text of this section of the report.

Finally, it should be noted that an overall trend can be seen when looking at the change data. Specifically areas with more recent studies tend to show less overall change than areas with newer studies,

FEMA will continue to coordinate with the communities to identify the streams that should be considered if the FIRMs are updated. To identify other streams for future refinement, local officials should discuss community growth patterns and potential growth corridors with FEMA. These areas of expected community growth and development may benefit from updated flood hazard information. Base Level Engineering can be further refined to provide detailed study information for a FIRM update.

Areas of communities that were developed prior to 1970 (pre-FIRM areas) may include repetitive and severe repetitive loss properties. They may also be areas where redevelopment is likely to occur. Having updated flood hazard information before redevelopment and reconstruction activities take place may benefit communities by providing guidance to mitigate future risk.

FEMA will work with communities following the delivery of Base-Level Engineering to identify a subset of stream studies to be updated and included on the FIRMs. Communities may wish to review these possible areas and provide feedback once the Base-Level Engineering data has been received. Local communities can also refine Base-Level Engineering information and submit it through the Letter of Map Revision (LOMR) process to revise the existing flood hazard information and maintain the FIRMs throughout their community.

Phase One: Discovery

Overview

The Louisiana Department of Transportation and Development (LA DOTD) in conjunction with FEMA Region 6 elected to pursue a Phase 1 Discovery project in the Bayou Teche Watershed during Fiscal Year 2017 (FY18). This was a natural progression given the completion of the BLE analysis in July 2018 and the results of its assessment and validation.

The Discovery process provides an opportunity not only to collect additional information that can be used to further refine areas of interest, but more importantly offers opportunities to work directly with communities within the watershed to discuss local issues which may not be apparent from the BLE analysis and research.

During Discovery the project team has contacted the communities through a variety of means to not only let them know that the project is underway, but to actively engage them so as to open lines of communication and make the resulting discussion more productive.

The following sections are a summary of the information gathered and a discussion of how that information may inform the discussion of future investments. The information that follows comes from FEMA, other Federal agencies, and the states and communities that make up the watershed.

Watershed Information and Review

The following section will explore data from a number of sources to develop a better understanding of the level of risk that the watershed communities face. This will include, but not be limited too, information on the number of flood insurance policies, the number of claims, past disaster declarations,

information about hazard mitigation plans, and NFIP engagement with both FEMA and state representatives.

National Flood Insurance Program (NFIP) Information.

All of the communities within the watershed participate in the National Flood Insurance Program. Table 6 shows community CRS ratings, the date and status of their effective maps, and the estimated 2016 population. Please note that the population figures represents the population for the entire community and not just the portion in the watershed.

Table 7: NFIP Information[6]

Community Name	CID	NFIP Participant	CRS Rating	FIRM Date	FIRM Status	Population (2016 ACS Estimate)
City of Alexandria	220146	Y	N/A	9/3/1997	BFE, Floodway, All Zone A, C and X	48,044
Allen Parish	220009	Y	N/A	3/17/2011	BFE, Floodway, All Zone A, C and X	25,619
Town of Arnaudville	220166	Y	N/A	11/04/10(M)	No BFE Determined - All Zone A, C and X	1,337
Avoyelles Parish	220019	Y	N/A	02/26/80(M)	No BFE Determined - All Zone A, C and X	41,252
Town of Baldwin	220193	Y	N/A	4/19/2017	No FW, all streams contained in Levees	2,283
Town of Boyce	220147	Y	N/A	(NSFHA)	No Special Flood Hazard Area - All Zone C	1,439
Town of Breaux Bridge	220180	Y	N/A	11/4/2010	BFE, Floodway, All Zone A, C and X	8,331
Town of Bunkie	220020	Y	N/A	11/06/79(M)	No BFE Determined - All Zone A, C and X	4,083
Town of Cheneyville	220148	Y	N/A	3/2/1981	No BFE Determined - All Zone A, C and X	548
Chitimacha Tribe of LA	220379	Y	N/A	(NSFHA)	No Special Flood Hazard Area - All Zone C	660
Town of Cottonport	220021	Y	N/A	9/3/2010	N/A	1,780
Evangeline Parish	220064	Y	N/A	9/3/2010	BFE, Floodway, All Zone A, C and X	33,765
Town of Evergreen	220284	N	N/A	N/A	Not a participating Community	281
Village of Forest Hill	220287	Y	N/A	(NSFHA)	No Special Flood Hazard Area - All Zone C	829
City of Franklin	220195	Y	N/A	4/19/2017	BFE, Floodway, All Zone A, C and X	7,339
Town of Glenmora	220149	Y	N/A	2/3/1982	BFE, Floodway, All Zone A, C and X	1,231
Town of Henderson	220189	Y	N/A	11/4/2010	BFE, Floodway, All Zone A, C and X	2,141
Village of Hessmer	220294	Y	N/A	(NSFHA)	No Special Flood Hazard Area - All Zone C	831
Iberia Parish	220078	Y	N/A	12/2/2011	No Special Flood Hazard Area - All Zone C	73,799
City of Jeanerette	220080	Y	N/A	12/02/11(M)	No BFE Determined - All Zone A, C and X	5,526
Town of Lecompte	220150	Y	N/A	6/2/1999	No BFE Determined - All Zone A, AE, C and X	904
Town of Leonville	220171	Y	N/A	08/05/10(M)	No BFE Determined - All Zone A, C and X	880
Village of Loreauville	220081	Y	N/A	12/02/11(M)	No BFE Determined - All Zone A, C and X	756
Town of Mansura	220255	Y	N/A	06/25/76(M)	No BFE Determined - All Zone A, C and X	1,796
City of Marksville	220022	Y	N/A	7/16/1980	BFE, Floodway, All Zone A, C and X	5,560
Village of McNary	220299	Y	N/A	07/13/82(M)	No BFE Determined - All Zone A, C and X	153
Village of Moreauville	220023	Y	N/A	01/31/78(M)	No BFE Determined - All Zone A, C and X	859

[6] FEMA Community Information System (May 2017)

Community Name	CID	NFIP Participant	CRS Rating	FIRM Date	FIRM Status	Population (2016 ACS Estimate)
City of New Iberia	220082	Y	N/A	12/2/2011	BFE, Floodway, All Zone A, C and X	30,717
City of Opelousas	220173	Y	N/A	8/5/2010	BFE, Floodway, All Zone A, C and X	16,605
Village of Palmetto	220174	Y	N/A	08/05/10(M)	No BFE Determined - All Zone A, C and X	135
Village of Parks	220190	Y	N/A	11/4/2010	BFE, Floodway, All Zone A, C and X	836
Village of Plaucheville	220024	Y	N/A	09/11/79(M)	No BFE Determined - All Zone A, C and X	196
Town of Port Barre	220175	Y	N/A	8/5/2010	BFE, Floodway, All Zone A, C and X	2,030
Rapides Parish	220145	Y	N/A	6/2/1999	BFE, Floodway, All Zone A, C and X	132,373
St. Landry Parish	220165	Y	N/A	8/5/2010	BFE, Floodway, All Zone A, C and X	83,699
St. Martin Parish	220178	Y	N/A	11/4/2010	BFE, Floodway, All Zone A, C and X	53,385
City of St. Martinville	220191	Y	N/A	11/4/2010	BFE, Floodway, All Zone A, C and X	6,096
St. Mary Parish	220192	Y	N/A	4/19/2017	BFE, Floodway, All Zone A, C and X	53,053
Tunica-Biloxi Tribe of LA	220304	Y	N/A	N/A	BFE, Floodway, All Zone A, C and X	133
Village of Turkey Creek	220069	Y	N/A	09/03/10(M)	No BFE Determined - All Zone A, C and X	379
Town of Washington	220177	Y	N/A	08/05/10(M)	No BFE Determined - All Zone A, C and X	792
Town of Woodworth	220260	Y	N/A	1/7/1998	BFE, Floodway, All Zone A, C and X	1,201

Table 8 includes both the number of flood insurance policies in each community but the coverage of those policies.

Table 8: NFIP Policy Information[7]

Community Name	CID	Policies in Force	Insurance in Force
City of Alexandria	220146	1867	$44,387,200
Allen Parish	220009	255	$3,961,600
Town of Arnaudville	220166	30	$583,200
Avoyelles Parish	220019	827	$11,998,700
Town of Baldwin	220193	63	$1,354,400
Town of Boyce	220147	8	$180,800
Town of Breaux Bridge	220180	253	$6,892,300
Town of Bunkie	220020	48	$1,034,100
Town of Cheneyville	220148	6	$33,800
Chitimacha Tribe of LA	220379	-	-
Town of Cottonport	220021	7	$120,400
Evangeline Parish	220064	459	$7,264,500
Village of Forest Hill	220287	-	-
City of Franklin	220195	679	$11,965,300
Town of Glenmora	220149	4	$49,400
Town of Henderson	220189	76	$1,153,500

[7] FEMA Community Information System (March 2018)

Community Name	CID	Policies in Force	Insurance in Force
Village of Hessmer	220294	10	$209,600
Iberia Parish	220078	3283	$77,564,600
City of Jeanerette	220080	89	$1,818,100
Town of Lecompte	220150	41	$554,800
Town of Leonville	220171	24	$325,300
Village of Loreauville	220081	19	$439,700
Town of Mansura	220255	11	$259,700
City of Marksville	220022	47	$821,500
Village of McNary	220299	-	-
Village of Moreauville	220023	12	$252,700
City of New Iberia	220082	1493	$40,717,600
City of Opelousas	220173	296	$5,558,100
Village of Palmetto	220174	9	$97,000
Village of Parks	220190	19	$535,500
Village of Plaucheville	220024	4	$54,500
Town of Port Barre	220175	71	$877,800
Rapides Parish	220145	1528	$33,246,200
St. Landry Parish	220165	2070	$39,958,300
St. Martin Parish	220178	2456	$53,505,900
City of St. Martinville	220191	146	$3,059,000
St. Mary Parish	220192	1462	$35,013,400
Tunica-Biloxi Tribe of LA	220304	-	-
Village of Turkey Creek	220069	-	-
Town of Washington	220177	22	$171,200
Town of Woodworth	220260	41	$698,400

Table 9 shows the total number of flood insurance claims, the number of paid claims, the total amount paid out for those claims, and the number of substantial damage claims for each community since 1978.

Table 9: NFIP Claims Information[8]

Community Name	CID	Claims	Paid Claims	Losses Paid
City of Alexandria	220146	1270	1100	$22,962,678
Allen Parish	220009	132		$1,411,359
Town of Arnaudville	220166	20	18	$50,456
Avoyelles Parish	220019	1763	1516	$9,942,179
Town of Baldwin	220193	47	36	$348,905
Town of Boyce	220147	5	4	$245,910

[8] FEMA Community Information System (May 2017), FEMA Region 4 and FEMA Region 6 (February 2017)

Community Name	CID	Claims	Paid Claims	Losses Paid
Town of Breaux Bridge	220180	83	63	$1,406,391
Town of Bunkie	220020	33	30	$658,623
Town of Cheneyville	220148	7	7	$54,265
Chitimacha Tribe of LA	220379	-	-	-
Town of Cottonport	220021	2	2	$74,537
Evangeline Parish	220064	83	64	$2,154,517
Town of Evergreen	220284	-	-	-
Village of Forest Hill	220287	-	-	-
City of Franklin	220195	555	403	$6,531,505
Town of Glenmora	220149	6	6	$37,673
Town of Henderson	220189	51	40	$1,181,800
Village of Hessmer	220294	11	10	$292,005
Iberia Parish	220078	1949	1724	$66,743,013
City of Jeanerette	220080	47	31	$1,135,750
Town of Lecompte	220150	37	30	$959,266
Town of Leonville	220171	2	2	$8,977
Village of Loreauville	220081	4	4	$21,834
Town of Mansura	220255	4	2	$4,522
City of Marksville	220022	53	46	$779,197
Village of McNary	220299	-	-	-
Village of Moreauville	220023	4	4	$56,968
City of New Iberia	220082	568	474	$7,961,102
City of Opelousas	220173	87	70	$1,930,254
Village of Palmetto	220174	1	0	-
Village of Parks	220190	7	7	$107,800
Village of Plaucheville	220024	6	6	$115,204
Town of Port Barre	220175	22	20	$222,011
Rapides Parish	220145	1370	1178	$17,195,456
St. Landry Parish	220165	511	416	$10,536,984
St. Martin Parish	220178	1130	950	$15,401,658
City of St. Martinville	220191	49	36	$851,399
St. Mary Parish	220192	1166	971	$21,934,220
Tunica-Biloxi Tribe of LA	220304	-	-	-
Village of Turkey Creek	220069	-	-	-
Town of Washington	220177	8	8	$213,593
Town of Woodworth	220260	28	28	$965,635

Table 10 show the total number of properties that have repetitive flood claims, the total number of claims made for those properties, the total amount paid out for those claims, and the number of severe

repetitive loss properties. Repetitive loss and severe repetitive loss properties are good targets for mitigation as they are certainly in a location that has a higher proclivity for flooding. Mitigation actions may include elevating the structure or a property buyout. Decisions on the best approach will likely be based on the depth and frequency of floods affecting the property.

Table 10: Repetitive Loss Property Information[9]

Community Name	Total Properties	Total Claims	Total Paid Losses	Severe Repetitive Loss Properties
City of Alexandria	179	518	$13,235,929.39	25
Allen Parish	22	88	$1,520,084.90	6
Town of Arnaudville	-	-	-	-
Avoyelles Parish	173	506	$4,371,793.74	22
Town of Baldwin	6	16	$173,218.73	-
Town of Boyce	-	-	-	-
Town of Breaux Bridge	11	24	$330,458.35	-
Town of Bunkie	3	9	$198,715.00	1
Town of Cheneyville	1	7	$8,198.61	1
Chitimacha Tribe of LA				
Town of Cottonport	-	-	-	-
Evangeline Parish	10	28	$828,075.19	1
Town of Evergreen	-	-	-	-
Village of Forest Hill	-	-	-	-
City of Franklin	65	175	$3,528,594.17	5
Town of Glenmora	-	-	-	-
Town of Henderson	2	14	$582,089.93	1
Village of Hessmer	1	5	$123,020.61	1
Iberia Parish	314	727	$28,708,167.42	29
City of Jeanerette	4	9	$321,511.87	1
Town of Lecompte	5	25	$768,546.04	2
Town of Leonville	-	-	-	-
Village of Loreauville	-	-	-	-
Town of Mansura	-	-	-	-
City of Marksville	7	19	$434,425.45	1
Village of McNary	1	4	$17,048.97	-
Village of Moreauville	-	-	-	-
City of New Iberia	43	143	$2,976,795.85	8
City of Opelousas	14	43	$1,145,896.26	3
Village of Palmetto	-	-	-	-
Village of Parks	2	4	$90,744.33	-
Village of Plaucheville	-	-	-	-
Town of Port Barre	-	-	-	-

[9] Information obtained from FEMA Region 4 and Region 6 (February 2017)

Community Name	Total Properties	Total Claims	Total Paid Losses	Severe Repetitive Loss Properties
Rapides Parish	184	677	$9,432,929.83	43
St. Landry Parish	69	187	$4,883,546.29	6
St. Martin Parish	74	219	$3,566,465.28	9
City of St. Martinville	1	2	$89,557.91	-
St. Mary Parish	147	391	$12,665,560.45	21
Village of Turkey Creek	-	-	-	-
Town of Washington	1	2	$9,390.03	-
Town of Woodworth	6	15	$346,048.27	1

Disaster Declarations

Table 10 lists the Federal Disaster Declaration for the watershed. Disasters are declared at the parish level. In the Bayou Teche Watershed St. Martin Parish has the largest number of declarations at 32, Rapides has 29, St. Mary has 26, St. Landry has 25, Avoyelles and Iberia both has 24, Allen has 21, and Evangeline has 17. Declarations for flood events include twelve for St. Martin, eleven for Rapides and St. Landry, ten for Avoyelles, six for St. Mary, five for Allen, and four for Evangeline.

Table 11: Disaster Declarations in the Watershed[10]

Date	Title	Allen Parish	Avoyelles Parish	Evangeline Parish	Iberia Parish	Rapides Parish	St. Landry Parish	St. Martin Parish	St. Mary Parish
9/10/1965	HURRICANE BETSY		x		x	x	x	x	x
8/18/1969	HURRICANE CAMILLE			x	x		x	x	x
4/27/1973	SEVERE STORMS & FLOODING		x			x	x	x	x
9/23/1974	HURRICANE CARMEN				x		x	x	x
4/12/1975	HEAVY RAINS & FLOODING		x			x			
6/6/1975	HEAVY RAINS, TORNADOES & FLOODING		x			x	x		
2/22/1977	DROUGHT & FREEZING		x			x			
5/2/1977	SEVERE STORMS & FLOODING						x	x	
5/2/1979	SEVERE STORMS & FLOODING							x	
9/25/1979	SEVERE STORMS & FLOODING	x				x			
4/9/1980	SEVERE STORMS & FLOODING							x	x
1/11/1983	SEVERE STORMS AND FLOODING	x	x	x		x			
10/31/1984	SEVERE STORMS & FLOODING				x			x	
11/1/1985	HURRICANE JUAN				x				
11/30/1987	TORNADOES & FLOODING		x			x			
5/20/1989	SEVERE STORMS & FLOODING	x					x	x	

[10] FEMA https://www.fema.gov/openfema-dataset-disaster-declarations-summaries-v1 , (April 2018)

Date	Title	Allen Parish	Avoyelles Parish	Evangeline Parish	Iberia Parish	Rapides Parish	St. Landry Parish	St. Martin Parish	St. Mary Parish
7/17/1989	TROPICAL STORM ALLISON	x				x	x		
4/23/1991	SEVERE STORMS & FLOODING					x			
5/3/1991	SEVERE STORMS, TORNADOES & FLOODING		x			x		x	
8/26/1992	HURRICANE ANDREW	x	x	x	x	x	x	x	x
2/2/1993	SEVERE STORMS & FLOODING							x	
9/23/1998	HURRICANE GEORGES/TS FRANCES			x				x	x
9/11/2000	LA-WESTERN LOUISIANA FIRE COMPLEX-9/8/00	x		x		x			
6/11/2001	TROPICAL STORM ALLISON				x			x	x
9/27/2002	TROPICAL STORM ISIDORE				x				x
10/3/2002	HURRICANE LILI	x	x	x	x	x	x	x	x
2/1/2003	LOSS OF SPACE SHUTTLE COLUMBIA	x	x	x		x	x	x	x
6/8/2004	SEVERE STORMS AND FLOODING						x	x	
9/15/2004	HURRICANE IVAN					x		x	
8/27/2005	HURRICANE KATRINA	x	x	x	x	x	x	x	x
8/29/2005	HURRICANE KATRINA	x	x	x	x	x	x	x	x
9/21/2005	HURRICANE RITA	x	x	x	x	x	x	x	x
9/24/2005	HURRICANE RITA	x	x	x	x	x	x	x	x
11/2/2006	SEVERE STORMS AND FLOODING	x		x		x	x		
2/23/2007	SEVERE STORMS AND TORNADOES							x	
8/29/2008	HURRICANE GUSTAV	x	x	x	x	x	x	x	x
9/2/2008	HURRICANE GUSTAV	x	x	x	x	x	x	x	x
9/13/2008	HURRICANE IKE	x			x			x	x
5/6/2011	FLOODING		x		x		x	x	x
8/18/2011	FLOODING		x		x		x	x	x
8/27/2012	TROPICAL STORM ISAAC	x	x		x	x		x	x
8/29/2012	HURRICANE ISAAC	x	x	x	x	x	x	x	x
2/22/2013	SEVERE STORMS AND FLOODING			x			x		
7/13/2015	SEVERE STORMS AND FLOODING					x			
2/5/2016	FLOODING						x		x
3/13/2016	SEVERE STORMS AND FLOODING	x	x			x			
8/14/2016	SEVERE STORMS AND FLOODING		x	x	x		x	x	
8/28/2017	TROPICAL STORM HARVEY	x			x	x			
10/6/2017	TROPICAL STORM NATE				x			x	x
10/16/2017	TROPICAL STORM HARVEY	x			x	x			x

Hazard Mitigation Plan Review

Table 11 lists the status of hazard mitigation plans for the communities in the watershed. It should be noted that most communities participate in multi-jurisdiction plans that cover entire parishes.

Table 12: Hazard Mitigation Plan Status

Plan	Date Plan Approved	Plan Expiration Date
Allen Parish Hazard Mitigation Update - 2017	12/4/2017	12/4/2022
Avoyelles Parish Hazard Mitigation	In development	-
Evangeline Parish Hazard Mitigation Update - 2016	6/11/2017	6/11/2022
Iberia Parish Hazard Mitigation Update - 2015	8/27/2015	8/27/2020
Rapides Parish Hazard Mitigation Update - 2016	5/4/2016	5/4/2021
St. Landry Parish Hazard Mitigation Update - 2016	12/26/2016	12/26/2021
St. Martin Parish Hazard Mitigation Update - 2015	6/9/2015	6/9/2020
St. Mary Parish Hazard Mitigation Update - 2014	10/29/2014	10/29/2019

Allen Parish

The Allen Parish Hazard Mitigation Update (2017) is a multi-jurisdictional plan. Mitigation actions identified within the plan are organized by three goals identified by the steering committee.

- Goal 1 – Protect residents from natural hazards
  - Retrofit the shell of public buildings so that they may be used before and after events
  - Construction of a safe room for first responders
  - Enhance public outreach programs
  - Installation of generators at public facilities
  - Update/upgrade the public warning system
- Goal 2 – Protect schools, homes, and businesses from damage
  - Promote the purchase of flood insurance
- Goal 3 – Give special attention to repetitively flooded areas
  - Improve drainage to reduce flooding problems
  - Mitigation of repetitive and severe repetitive loss properties through elevation, acquisition-demolition, acquisition-relocation, and reconstruction

Evangeline Parish

The Evangeline Parish Hazard Mitigation Update (2016) is a multi-jurisdictional plan, which includes the Village of Turkey Creek. Mitigation actions identified within the plan are organized by four goals identified by the steering committee.

- Goal 1- Implement mitigation measures to reduce the vulnerability from natural hazards
  - Retrofit the shell of public buildings so that they may be used before and after events
  - Construction of a safe room for first responders
  - Mitigation of repetitive and severe repetitive loss properties through elevation, acquisition-demolition, acquisition-relocation, and reconstruction
  - Installation of generators at public facilities
  - Update/upgrade the public warning system
  - Creation of a dam failure working group
  - Install/upgrade minor flood control structures including berms and floodwalls

- Goal 2- Improve citizen education and practice in the field of disaster preparedness and hazard mitigation
    - Enhance public outreach programs
    - Promote the purchase of flood insurance
- Goal 3 – Support economic recovery and resiliency through the mitigation of natural hazard impacts and recovery costs
- Goal 4 – Improve sustainable land-use development practices by integrating hazard mitigation strategies and technologies that reduce the potential impact of hazards

Iberia Parish

The Iberia Parish Hazard Mitigation Update (2015) is a multi-jurisdictional plan, which includes the City of Jeanerette, Village of Loreauville, and City of New Iberia. Mitigation actions identified within the plan are organized by five goals identified by the steering committee.

- Goal 1 – Increase public awareness of hazard mitigation opportunities
    - Development of GIS inventory of at-risk properties
    - Conduct a levee and coastal erosion study
    - Continue community education campaign to increase awareness for preparedness and mitigation
- Goal 2 – Ensure that there is safe and accessible shelter from violent storms
    - Construct a hardened 911 communications center with a safe room
- Goal 3 – Reduce losses from flooding
    - Elevate electrical components of lift stations
    - Install flood gates on Delcambre/Avery Canal
    - Resize drainage pipes to improve drainage
    - Acquisition/reconstruction or elevation of repetitive loss structures
- Goal 4 – Reduce impacts from drought
- Goal 5 – Reduce impacts of hurricanes, storm surge, and coastal erosion
    - Conduct feasibility study and construction of a levee system
    - Install generators for sewerage lift stations
    - Hardening of courthouse to improve continuity of government
    - Improve bridges along evacuation routes
    - Marsh creation and shoreline restoration
    - Monitor tides and sea level
    - Hardening of critical facilities
    - Construction of a safe room
    - Install permanent generators and communications equipment at critical facilities

The City of New Iberia has its own set of action items that are separate from the parish.

- Goal 1 – Increase public awareness of hazard mitigation opportunities
    - Develop a continuous program of new flood insurance rate maps
    - Obtain initial rating from the Community Rating System
- Goal 2 – Ensure that there is safe and accessible shelter from violent storms
- Goal 3 – Reduce losses from flooding
    - Conduct a drainage analysis and prepare a master plan

    - Update and enforce floodplain ordinances and building codes
    - Elevate roadways and structures that are prone to flooding
- Goal 4 – Reduce impacts from drought
- Goal 5 – Reduce impacts of hurricanes, storm surge, and coastal erosion
    - Develop building codes to address land subsidence
    - Improve drainage by installing culvert and headwall upgrades and expanding canals and ditches
    - Replace and upgrade bridges and crossings

Rapides Parish

The Rapides Parish Hazard Mitigation Update (2016) is a multi-jurisdictional plan, which includes the City of Alexandria, Town of Boyce, Town of Cheneyville, Village of Forest Hill, Town of Glenmora, Town of Lecompte, Village of McNary, and Town of Woodworth. Mitigation actions identified within the plan are organized by four goals identified by the steering committee.

- Goal 1 – Preventative measures that will reduce future damages from hazards
    - Retrofit the shell of public buildings so that they may be used before and after events
    - Construction of a safe room for first responders
    - Construct a public shelter for extreme weather
    - Redundancy of potable water at critical facilities
    - Install generators at critical facilities for continued operations during events
- Goal 2 – Enhance public awareness and understanding of disaster preparedness
    - Enhance public outreach programs
    - Provide information on high risk areas
    - Install reverse 911 system
- Goal 3 – Reduce repetitive flood losses
    - Improve drainage
    - Elevation or acquisition/demolition of repetitive and severe repetitive loss structures
- Goal 4 – Facilitate sound development to reduce or eliminate the impact of hazards

St. Landry Parish

The St. Landry Parish Hazard Mitigation Update (2016) is a multi-jurisdictional plan, which includes the Town of Arnaudville, Town of Leonville, City of Opelousas, Village of Palmetto, Town of Port Barre, and Town of Washington. Mitigation actions identified within the plan are organized by four goals identified by the steering committee.

- Goal 1 – Preventative measures that will reduce future damages from hazards
    - Retrofit the shell of public buildings so that they may be used before and after events
    - Construction of a safe room for first responders
    - Construct a public shelter for extreme weather
    - Redundancy of potable water at critical facilities
    - Install generators at critical facilities for continued operations during events
- Goal 2 – Enhance public awareness and understanding of disaster preparedness
    - Enhance public outreach programs
    - Provide information on high risk areas

    - Install reverse 911 system
- Goal 3 – Reduce repetitive flood losses
    - Improve drainage
    - Elevation or acquisition/demolition of repetitive and severe repetitive loss structures
- Goal 4 – Facilitate sound development to reduce or eliminate the impact of hazards
    - Promote the purchase of flood insurance

St. Martin Parish

The St. Martin Parish Hazard Mitigation Plan Update (2015) is a multi-jurisdictional plan, which includes the Town of Arnaudville, City of Breaux Bridge, Town of Henderson, Village of Parks, and City of St. Martinville. Mitigation actions identified within the plan are organized by four goals identified by the committee.

- Goal 1 – Eliminate the threat of catastrophic flood loss and mitigate repetitive loss properties
    - Eliminate sewer system outages during flood events
    - Upgrade current drainage infrastructure
    - Construct new flood control structures
    - Elevation or acquisition of repetitive and severe repetitive loss structures
    - Elevate equipment that is vulnerable to flood damage
    - Flood proof public buildings that are vulnerable to flood damage
    - Install warning system to indicate imminent levee breach
    - Insure levees are properly maintained
- Goal 2 – Facilitate future development to reduce or eliminate the impacts of disasters
    - Enforce floodplain ordinance
    - Promote preservation or conservation of flood prone areas for parks, recreation areas and floodplain management
    - Reduce effects of land subsidence and expansive soils
    - Reduce damages from hailstorms by installing hail resistant roofing on critical facilities
- Goal 3 – Minimize property damage and injuries from high winds
    - Wind harden municipal and parish structures
    - Install generators at critical facilities for continued operations during events
    - Construct safe rooms
    - Install hazard early warning system
    - Build and maintain hurricane shelters
- Goal 4 – Enhance public awareness
    - Provide educational brochures about mitigation measures on all hazards to public facilities

St. Mary Parish

The St. Mary Parish Hazard Mitigation Update (2014) is a multi-jurisdictional plan, which includes the Town of Baldwin, City of Franklin, and the Chitimatcha Tribe. Mitigation actions identified within the plan are organized by eight goals identified by the steering committee.

- Goal 1 – Insure that all levees are certified to eliminate the threat of flood loss that could result from levee failure
    - Maintain and expand existing levee protection

- Goal 2 – Ensure that drainage districts continue maintenance and upgrades to facilities
    - Improve existing drainage infrastructure
    - Elevate existing infrastructure to protect from flood damage
    - Create new infrastructure to protect from flood damage
    - Ensure pump stations, potable water intakes, drainage, and public safety facilities have an adequate power supply in case of an event
- Goal 3 – Reduce repetitive flood damage
    - Elevation or acquisition of repetitive and severe repetitive loss structures
    - Initiate drainage and flooding studies
- Goal 4 – Facilitate responsible development in the parish to reduce or eliminate the impact of hazards
    - Insure future development does not increase losses from hazards
    - Install generators at critical facilities
    - Promote preservation or conservation of flood prone areas for parks, recreation areas and floodplain management
- Goal 5 – Minimize property damage from wind storms
    - Wind retrofit public facilities
    - Construction of safe rooms
- Goal 6 – Continue federal and state efforts to restore and preserve coastal shoreline
    - Seek funds for coastal erosion mitigation
    - Continue current coastal protection projects to reduce coastal erosion
- Goal 7 – Participation in the FEMA Community Rating System
    - New regulations reducing development density in floodplains
    - Establish public outreach campaign for coverage options through the NFIP
    - Establish homeowner education program on flood mitigation measures
- Goal 8 – Enhance public awareness
    - Notify media of hazard mitigation measures and plans
    - Provide educational brochures about mitigation measures on all hazards to public facilities
    - Enhance interagency and public communications system
    - Inform public about evacuation route through educational materials

Ordinances and Regulations Review

A review of development regulations helps shed light on how a community tries to limit their exposure to damages from disasters by guiding development away from floodplains or insuring flood proofing strategies are utilized. The following section will review the ordinances, development regulations, and any additional guidelines as they are related to development activities, or renovations, within flood zones or areas affected by flooding.

Allen Parish

Chapter 42, article II of the Allen Parish code of ordinances addresses flood damage prevention. This chapter of the ordinance establishes the need and purpose to prevent flood damage and then provides a framework for ensuring that purpose is fulfilled. Specifically, the ordinance creates the floodplain administrator position and assigns their duties and responsibilities, and also outlines the need for and processes related to development permits, including procedures for obtaining variances.

Division III states the provisions for flood hazard reduction. This section is divided into four sections general standards, specific standards, standards for subdivision proposals, and standards for areas of shallow flooding (AO/AH zones). General standards include proper anchoring to prevent the structure from floatation, using construction methods that minimize flood damage, the use of construction materials that are resistant to flood damage, locating service facilities where flood damage will be minimized, and water supply and sanitary sewage systems will minimize or eliminate infiltration of floodwaters and the discharge into floodwaters. Specific standards require that the lowest floor is elevated to or above the base flood elevation, that mobile homes are elevated and anchored and restrictions on the placement of recreational vehicles. The subdivision standards require compliance with the previous standards. The standards for shallow flooding state that the lowest floor is elevated at least two feet or at least as high as the depth number specified on the FIRM, adequate drainage paths to guide floodwaters around and away, and that a registered professional engineer submits certification to the floodplain administrator.

The Allen Parish Code of Ordinances can be found here:
https://library.municode.com/la/allen_parish_police_jury/codes/code_of_ordinances

Avoyelles Parish

Chapter 8.5 of the Avoyelles Parish code of ordinances addresses flood damage prevention. This chapter of the ordinance establishes the need and purpose to prevent flood damage and then provides a framework for ensuring that purpose is fulfilled. Specifically, the ordinance creates the floodplain administrator position and assigns their duties and responsibilities, and also outlines the need for and processes related to development permits, including procedures for obtaining variances.

Section 8.5- 8-11 states the provisions for flood hazard reduction. There are four sections general standards, specific standards, standards for subdivision proposals, and standards for areas of shallow flooding (AO/AH zones). General standards include proper anchoring to prevent the structure from floatation, using construction methods that minimize flood damage, the use of construction materials that are resistant to flood damage, locating service facilities where flood damage will be minimized, and water supply and sanitary sewage systems will minimize or eliminate infiltration of floodwaters and the discharge into floodwaters. Specific standards require that the lowest floor is elevated to or above the base flood elevation, that mobile homes are elevated and anchored and restrictions on the placement of recreational vehicles. The subdivision standards require compliance with the previous standards. The standards for shallow flooding state that the lowest floor is elevated at least two feet or at least as high as the depth number specified on the FIRM, adequate drainage paths to guide floodwaters around and away, and that a registered professional engineer submits certification to the floodplain administrator.

The Avoyelles Parish Code of Ordinances can be found here:
https://library.municode.com/la/avoyelles_parish_police_jury/codes/code_of_ordinances

Evangeline Parish

Chapter 8, article II of the Evangeline Parish code of ordinances addresses flood damage prevention. This chapter of the ordinance establishes the need and purpose to prevent flood damage and then provides a framework for ensuring that purpose is fulfilled. Specifically, the ordinance creates the floodplain administrator position and assigns their duties and responsibilities, and also outlines the need for and processes related to development permits, including procedures for obtaining variances.

Division 3 states the provisions for flood hazard reduction. There are five sections general standards, specific standards, standards for subdivision proposals, standards for areas of shallow flooding (AO/AH zones), and floodways. General standards include proper anchoring to prevent the structure from floatation, using construction methods that minimize flood damage, the use of construction materials that are resistant to flood damage, locating service facilities where flood damage will be minimized, and water supply and sanitary sewage systems will minimize or eliminate infiltration of floodwaters and the discharge into floodwaters. Specific standards require that the lowest floor is elevated to or above the base flood elevation, that mobile homes are elevated and anchored and restrictions on the placement of recreational vehicles. The subdivision standards require compliance with the previous standards. The standards for shallow flooding state that the lowest floor is elevated at least two feet or at least as high as the depth number specified on the FIRM, adequate drainage paths to guide floodwaters around and away, and that a registered professional engineer submits certification to the floodplain administrator. The floodway standards prohibit encroachments on the floodway, including fill new construction, substantial improvements and other development within the floodway unless it is certified by a professional registered engineer providing that the encroachment will not increase flood levels.

The Evangeline Parish Code of Ordinances can be found here:
https://library.municode.com/la/evangeline_parish_police_jury/codes/code_of_ordinances

City of New Iberia

Chapter 34, article II of the City of New Iberia code of ordinances addresses flood damage prevention. This chapter of the ordinance establishes the need and purpose to prevent flood damage and then provides a framework for ensuring that purpose is fulfilled. Specifically, the ordinance creates the floodplain administrator position and assigns their duties and responsibilities, and also outlines the need for and processes related to development permits, including procedures for obtaining variances.

Division 4 states the provisions for flood hazard reduction. There are five sections general standards, specific standards, standards for subdivision proposals, standards for areas of shallow flooding (AO/AH zones), and floodways. General standards include proper anchoring to prevent the structure from floatation, using construction methods that minimize flood damage, the use of construction materials that are resistant to flood damage, locating service facilities where flood damage will be minimized, and water supply and sanitary sewage systems will minimize or eliminate infiltration of floodwaters and the discharge into floodwaters. Specific standards require that the lowest floor is elevated to or above the base flood elevation, that mobile homes are elevated and anchored and restrictions on the placement of recreational vehicles. The subdivision standards require compliance with the previous standards. The standards for shallow flooding state that the lowest floor is elevated at least two feet or at least as high as the depth number specified on the FIRM, adequate drainage paths to guide floodwaters around and away, and that a registered professional engineer submits certification to the floodplain administrator. The floodway standards prohibit encroachments on the floodway, including fill new construction, substantial improvements and other development within the floodway unless it is certified by a professional registered engineer providing that the encroachment will not increase flood levels.

The City of New Iberia Code of Ordinances can be found here:
https://library.municode.com/la/new_iberia/codes/code_of_ordinances

Rapides Parish

Chapter 10 ½ of the Rapides Parish code of ordinances addresses flood damage prevention. This chapter of the ordinance establishes the need and purpose to prevent flood damage and then provides a framework for ensuring that purpose is fulfilled. Specifically, the ordinance creates the floodplain administrator position and assigns their duties and responsibilities, and also outlines the need for and processes related to development permits, including procedures for obtaining variances.

Section 16 states the provisions for flood hazard reduction. There are five sections general standards, specific standards, standards for subdivision proposals, standards for areas of shallow flooding (AO/AH zones), and floodways. General standards include proper anchoring to prevent the structure from floatation, using construction methods that minimize flood damage, the use of construction materials that are resistant to flood damage, locating service facilities where flood damage will be minimized, and water supply and sanitary sewage systems will minimize or eliminate infiltration of floodwaters and the discharge into floodwaters. Specific standards require that the lowest floor is elevated to or above the base flood elevation, that mobile homes are elevated and anchored and restrictions on the placement of recreational vehicles. The subdivision standards require compliance with the previous standards. The standards for shallow flooding state that the lowest floor is elevated at least two feet or at least as high as the depth number specified on the FIRM, adequate drainage paths to guide floodwaters around and away, and that a registered professional engineer submits certification to the floodplain administrator. The floodway standards prohibit encroachments on the floodway, including fill new construction, substantial improvements and other development within the floodway unless it is certified by a professional registered engineer providing that the encroachment will not increase flood levels.

The Rapides Parish Code of Ordinances can be found here:
https://library.municode.com/la/rapides_parish_police_jury/codes/code_of_ordinances

St. Landry Parish

Chapter 18 of the St. Landry Parish code of ordinances addresses flood damage prevention. This chapter of the ordinance establishes the need and purpose to prevent flood damage and then provides a framework for ensuring that purpose is fulfilled. Specifically, the ordinance creates the floodplain administrator position and assigns their duties and responsibilities, and also outlines the need for and processes related to development permits, including procedures for obtaining variances.

Section IV states the provisions for flood hazard reduction. There are five sections general standards, specific standards, standards for subdivision proposals, standards for areas of shallow flooding (AO/AH zones), and floodways. General standards include proper anchoring to prevent the structure from floatation, using construction methods that minimize flood damage, the use of construction materials that are resistant to flood damage, locating service facilities where flood damage will be minimized, and water supply and sanitary sewage systems will minimize or eliminate infiltration of floodwaters and the discharge into floodwaters. Specific standards require that the lowest floor is elevated to or above the base flood elevation, that mobile homes are elevated and anchored and restrictions on the placement of recreational vehicles. The subdivision standards require compliance with the previous standards. The standards for shallow flooding state that the lowest floor is elevated at least two feet or at least as high as the depth number specified on the FIRM, adequate drainage paths to guide floodwaters around and away, and that a registered professional engineer submits certification to the floodplain administrator. The floodway standards prohibit encroachments on the floodway, including fill new construction,

substantial improvements and other development within the floodway unless it is certified by a professional registered engineer providing that the encroachment will not increase flood levels.

The St. Landry Code of Ordinances can be found here:
https://library.municode.com/la/st._landry_parish/codes/code_of_ordinances

St. Martin Parish

Chapter 18 of the St. Landry Parish code of ordinances addresses flood damage prevention. This chapter of the ordinance establishes the need and purpose to prevent flood damage and then provides a framework for ensuring that purpose is fulfilled. Specifically, the ordinance creates the floodplain administrator position and assigns their duties and responsibilities, and also outlines the need for and processes related to development permits, including procedures for obtaining variances.

Article III states the provisions for flood hazard reduction. There are five sections general standards, specific standards, standards for subdivision proposals, standards for areas of shallow flooding (AO/AH zones), and floodways. General standards include proper anchoring to prevent the structure from floatation, using construction methods that minimize flood damage, the use of construction materials that are resistant to flood damage, locating service facilities where flood damage will be minimized, and water supply and sanitary sewage systems will minimize or eliminate infiltration of floodwaters and the discharge into floodwaters. Specific standards require that the lowest floor is elevated to or above the base flood elevation, that mobile homes are elevated and anchored and restrictions on the placement of recreational vehicles. The subdivision standards require compliance with the previous standards. The standards for shallow flooding state that the lowest floor is elevated at least two feet or at least as high as the depth number specified on the FIRM, adequate drainage paths to guide floodwaters around and away, and that a registered professional engineer submits certification to the floodplain administrator. The floodway standards prohibit encroachments on the floodway, including fill new construction, substantial improvements and other development within the floodway unless it is certified by a professional registered engineer providing that the encroachment will not increase flood levels.

The St. Martin Code of Ordinances can be found here:
https://library.municode.com/la/st._martin_parish/codes/code_of_ordinances

St. Mary Parish

Chapter 3, division 8 of the St. Mary Unified Development Code addresses floodplain management and flood protection. This chapter of the code establishes the need and purpose to prevent flood damage and then provides a framework for ensuring that purpose is fulfilled.

Sections 3.8.4 to 3.8.8 state the provisions for flood hazard reduction. There are five sections general standards, specific standards, standards for subdivision proposals, standards for areas of shallow flooding (AO/AH zones), and coastal high hazard areas. General standards include proper anchoring to prevent the structure from floatation, using construction methods that minimize flood damage, the use of construction materials that are resistant to flood damage, locating service facilities where flood damage will be minimized, and water supply and sanitary sewage systems will minimize or eliminate infiltration of floodwaters and the discharge into floodwaters. Specific standards require that the lowest floor is elevated to or above the base flood elevation, that mobile homes are elevated and anchored and restrictions on the placement of recreational vehicles. The subdivision standards require compliance with the previous standards. The standards for shallow flooding state that the lowest floor is elevated at

least two feet or at least as high as the depth number specified on the FIRM, adequate drainage paths to guide floodwaters around and away, and that a registered professional engineer submits certification to the floodplain administrator. The standards for coastal high areas include elevation on pilings and columns so that the lowest floor is elevated above the base flood level, the space below the lowest floor is free of obstruction or use breakaway walls, the use of fill for structural support is prohibited, man-made alteration of sand dunes or mangroves is prohibited. There are restrictions on the placement of manufactured homes and recreational vehicles.

The St. Mary Unified Development Code can be found here:
http://online.encodeplus.com/regs/stmary-la/index.aspx

Land Use Change

Growth within the watershed has been relatively limited. Examining National Land Cover Data (https://www.mrlc.gov/finddata.php) from 2001, 2006, and 2011, the latest available, the watershed has seen some development but in a limited quantity. From 2001 to 2006 developed land increased by 2.1 square miles or 1.2% increase. From 2006 to 2011 developed areas increase by about 1.4 square miles or 0.8%, bringing the total for the entire 10 year period to 3.5 square miles or a change of 2 percent.

Letters of Map Change

Letters of Map Change are letters that revise the special flood hazard area on a given map panel or panels. A Letter of Map Amendment, or LOMA usually applies to a single property that is higher than the mapped 1%-annual-chance floodplain, but due to limitations of scale or topographic detail appears to be located within the floodplain on the FIRM panel. A Letter of Map Revision is a letter that revises a FIRM panel or panels usually due to a project designed to reduce flood risk in an area. A Letter of Map Revision Based on Fill, or LOMR-F, revises a FIRM panel of panels due to a property having fill placed on it that raises it above the map flood elevation for an area. The number and types of map revisions in a community can provide insight into measures being taken to reduce or manage flood risk, or be an indication that a community's maps are in need of revision. Communities within the Bayou Teche Watershed have a total of 546 Letters of Map Change, consisting of 452 LOMAs and 91 LOMR-Fs. Table 13 below illustrates which communities have Letter of Map Change and their types.

Table 13: Letters of Map Change

Community Name	LOMA	LOMR-F
City of Alexandria	124	39
Allen Parish	-	-
Town of Arnaudville	1	-
Avoyelles Parish	55	5
Town of Baldwin	-	-
Town of Boyce	-	-
Town of Breaux Bridge	2	-
Town of Bunkie	1	1
Town of Cheneyville	-	-

Chitimacha Tribe of LA	-	-
Town of Cottonport	-	-
Evangeline Parish	6	-
Town of Evergreen	-	-
Village of Forest Hill	-	-
City of Franklin	3	-
Town of Glenmora	-	-
Town of Henderson	1	-
Village of Hessmer	-	-
Iberia Parish	60	10
City of Jeanerette	-	-
Town of Lecompte	1	-
Town of Leonville	-	-
Village of Loreauville	1	-
Town of Mansura	-	-
City of Marksville	3	2
Village of McNary	-	-
Village of Moreauville	1	-
City of New Iberia	75	2
City of Opelousas	-	-
Village of Palmetto	-	-
Village of Parks	-	-
Village of Plaucheville	-	-
Town of Port Barre	2	-
Rapides Parish	78	24
St. Landry Parish	7	1
St. Martin Parish	15	2
City of St. Martinville	1	2
St. Mary Parish	4	1
Village of Turkey Creek	-	-
Town of Washington	-	-
Town of Woodworth	11	2

Hydraulics and Floodplain Analysis

Hydraulics, floodplain, and floodways were reviewed based on the FIS reports, available hydraulic models, and FIRMs. CNMS identified flooding sources with effective flood data. Where CNMS validation is considered 'valid' accounting for ~138 miles of detailed study and ~271 miles of approximate the most recent BLE analysis was used for comparison. Comparison is looking for notable changes in the horizontal (X,Y) extent of flooding that are captured in the Changes Since Last FIRM (CSLF). This assessment will be summarized below. In addition where CNMS has not assessed the effective Zone A analysis CSLF/BLE will be leverage in order to note significant horizontal changes in the SFHA. Utilizing

the limited hydraulic analysis data available and with engineering judgment, several disconnects in floodplain boundaries along streams were identified, with all of these issues located at county/parish boundaries. No floodway or BFE disconnects were identified in this research.

Generally where CNMS is denoted as 'valid' along approximate Zone A flooding sources the BLE analysis is showing an increase in horizontal flooding extents. This increase can be attributed to several causes that should be looked at in more detail if a new study were to be recommended. Increase in WSEL could be attributed due to difference in modeling used between the effective approximate study 1-dimentional hydraulics and the BLE 2-dimentional hydraulics, hydrology difference between the studies, and more recent higher resolution topography (LiDAR). This trend is also seen along other effective approximate study (Zone A) flooding sources where in CNMS they are tagged as 'unverified'. These trends seem to indicate that the effective analysis might be dated and in need of evaluation to determine if an updated study is warranted. Stated previously in this report the effective analysis models a specific riverine flooding sources by methods that differ from that of a rain on grid 2-dimensional model which is the basis of the BLE analysis. 2 dimensional rain on grid models determine the flood hazard extent with consideration for the pluvial flooding beyond that of the fluvial (riverine) channel. A closer look at the effective detailed analysis (Zone AE) as compared to the more recent BLE analysis is summarized below:

Iberia Parish

- Tete Bayou within New Iberia and Iberia Parish Unincorporated Areas BLE analysis depicts inundation outside of the effective analysis indicating more areas flooding. There are a number of structures within this area of concern.

Rapides Parish

- Upper reach of Bayou Sauvage at East Tunica Drive or LA-1 BLE analysis depicts flooding not contained in the channel and differs from the effective detailed analysis which depicts flooding contained in channel. There are a number of structures within this area of concern.
- Bayou Boeuf at Lecompte BLE analysis depicts flooding not contained in the channel and differs from the effective detailed analysis which depicts flooding contained in channel. Several structures within this area of concern.
- Upper reaches of Chatlin Lake Canal within Alexandria closely match between the BLE and effective detailed analysis with the potential to revise BFEs in the area with a decrease in water surface elevations.
- Downstream Chatlin Lake Canal as it exists Alexandria and drains into the portion within Rapides Parish Unincorporated Areas the inundation area increases when comparing the BLE to the effective detailed analysis. This can be attributed to an increase in WSEL when comparing the two. It should be noted that a majority of this area is agricultural low lands and not heavily populated.

St. Landry Parish

- Detailed effective analysis for Coulee Razos and North Bayou Rawles when compared to the BLE analysis show similar WSEL although in the upper reaches of Coulee Rawles the WSEL tends to decrease when compared to the BLE analysis. LiDAR topographic data could improve current or future delineations on these flooding sources where WSEL is known.
- Bayou Courtableau at the confluence of Bayou Tech in Port Barre BLE analysis depicts flooding not contained in the channel and differs from the effective detailed analysis which depicts flooding contained in channel. There are a number of structures within this area of concern.

- Bayou Portage western side of flooding source near the community of Leonville and Arnaudville BLE analysis depicts flooding not contained in the channel and differs from the effective detailed analysis which depicts flooding contained in channel. There are a number of structures within this area of concern.

St. Martin Parish

- Henderson flooding sources of Bayou Peyronnet, Bayou Portage, and True Canal BLE analysis depicts flooding not contained in the channel and differs from the effective detailed analysis. There are a number of structures within this area of concern.
- Around the community of Catahoula flooding sources of Catahoula Coulee and Bayou Berard Canal there are both increases and decreases in the horizontal coverage when comparing the effective detailed analysis to that of the BLE analysis. There are a number of structures within this area of concern.

Mismatches at corporate limits or county boundaries often appear when community-based FIRMs and FISs are compiled together. Several mismatches at corporate limits were apparent including:

Avoyelles Parish

- Marksville mapping matches, but flood zone type does not match due to differences in flood studies along multiple flooding sources. Example Zone A mixed in with numbered A Zones (detailed studies).
- Cottonport there is no effective data in this community effective flooding stops at the Avoyelles Parish Unincorporated Areas / Cottonport political line. Major flooding source Bayou Rouge. BLE indicates continuation of flooding into Cottonport. There are a substantial number of structures in Cottonport that could be impacted.
- Evergreen there is no effective data in this community effective flooding stops at the Avoyelles Parish Unincorporated Areas / Evergreen political line. Major flooding source Bayou Rouge. BLE indicates continuation of flooding into Cottonport. There are a substantial number of structures in Evergreen that could be impacted.
- Mansura effective data has no flood zones. BLE indicates flooding within Mansura and continuation of flooding into Avoyelles Parish Unincorporated Areas.
- Tunica-Biloxi Indians of Louisiana effective Zone A analysis is wider than the BLE analysis. BLE analysis shows better channel definition than that of the effective analysis.
- Hessmer effective flood study does not indicate flooding source found in the BLE analysis. Effective Zone A study ends at the Avoyelles Parish Unincorporated Areas political boundary. BLE indicates flooding within Hessmer and continuation of flooding into Avoyelles Parish Unincorporated Areas.
- Moreauville BLE indicates more flooding than depicted in the effective Zone A analysis. Effective flood zones are not contiguous and should be.

Rapides Parish

- Alexandria/Rapides Parish Unincorporated Areas mapping matches, but flood zone type does not match due to differences in flood studies along multiple flooding sources. Example Zone AE mixed in with numbered A Zones (detailed studies).
- Cheneyville there is a mismatch at State Highway 181 Drainage Ditch West Side where Rapides Unincorporated Areas meets Cheney. There is an AH Zone in Cheney the abruptly stops at the political boundary. BLE indicates continuation of flooding into Cheneyville. There are a substantial number of structures in Cheneyville that could be impacted.

- Glenmora at Rapides Parish Unincorporated Areas boundary at the upstream end of Johnsons Bottom the effective Zone A terminates at the political boundary. BLE indicates continuation of flooding into Rapides Parish Unincorporated Areas.
- Lecompte effective detail study stops at political boundary. BLE indicates continuation of flooding into Rapides Parish Unincorporated Areas. Additional structures could be impacted.
- McNary at Rapides Parish Unincorporated Areas boundary at the confluence with Myers Branch and Johnsons Bottom the effective Zone A does not match the effective detailed study at this location.
- Rapides Parish Unincorporated Areas there is a mismatch where Chatlin Lake Canal Zone A meets Avoyelles Parish Unincorporated Areas Zone A.
- Boyce there is no effective data in this community effective flooding stops at the Rapides Parish Unincorporated Areas / Boyce political line. BLE indicates continuation of flooding into Boyce. There are a substantial number of structures in Boyce that could be impacted.
- Forest Hill there is no effective flood data for this community. There is a major flooding sources Hurricane Creek and BLE indicates flooding within Forest Hill and continuation of flooding into Rapides Parish Unincorporated Areas.

  St. Mary Parish
- Jeanerette there is an AO Zone carved out of an AE Zone within Bunkie. This Zone does not appear to follow topography or manmade features. Gutter does not follow floodplain mapping conventions.

  St. Landry
- Port Barre there is a detailed study that terminates at the southeast corner of Port Barre at the St. Landry Parish Unincorporated Areas boundary. This appears to be backwater from Bayou Courtableau. BLE indicates flooding continues into Point Barre yet effective data terminates.

The table below summarizes the effective FIS and the modeling used in the effective analysis.

Table 14: Effective Hydrology and Hydraulic Modeling

Community Name	CID	NFIP Participant	Date H&H analysis	Hydrology Model	Hydraulics Model
Allen Parish	220009	Y	December 1987	Unknown Zone A	Unknown Zone A
Avoyelles Parish	220019	Y	February 1980	Unknown No BFE Determined - All Zone A, C and X	Unknown No BFE Determined - All Zone A, C and X
Town of Bunkie	220020	Y	February 1980	Unknown No BFE Determined - All Zone A, C and X	Unknown No BFE Determined - All Zone A, C and X
City of Marksville	220022	Y	February 1980	Unknown No BFE Determined - All Zone A, C and X	Unknown No BFE Determined - All Zone A, C and X
City of St. Martinville	220191	Y	February 1980	Unknown No BFE Determined - All Zone A, C and X	Unknown No BFE Determined - All Zone A, C and X
Town of Arnaudville	220166	Y	February 1980	Unknown No BFE Determined - All Zone A, C and X	Unknown No BFE Determined - All Zone A, C and X
Town of Breaux Bridge	220180	Y	February 1980	Unknown No BFE Determined - All Zone A, C and X	Unknown No BFE Determined - All Zone A, C and X
Town of Cottonport	220021	Y	February 1980	Unknown No BFE Determined - All Zone A, C and X	Unknown No BFE Determined - All Zone A, C and X
Town of Evergreen	220284	N	February 1980	Unknown No BFE Determined - All Zone A, C and X	Unknown No BFE Determined - All Zone A, C and X
Town of Henderson	220189	Y	February 1980	Unknown No BFE Determined - All Zone A, C and X	Unknown No BFE Determined - All Zone A, C and X

Community Name	CID	NFIP Participant	Date H&H analysis	Hydrology Model	Hydraulics Model
Town of Mansura	220255	Y	February 1980	Unknown No BFE Determined - All Zone A, C and X	Unknown No BFE Determined - All Zone A, C and X
Village of Hessmer	220294	Y	February 1980	Unknown No BFE Determined - All Zone A, C and X	Unknown No BFE Determined - All Zone A, C and X
Village of Moreauville	220023	Y	February 1980	Unknown No BFE Determined - All Zone A, C and X	Unknown No BFE Determined - All Zone A, C and X
Village of Parks	220190	Y	February 1980	Unknown No BFE Determined - All Zone A, C and X	Unknown No BFE Determined - All Zone A, C and X
Village of Plaucheville	220024	Y	February 1980	Unknown No BFE Determined - All Zone A, C and X	Unknown No BFE Determined - All Zone A, C and X
Iberia Parish	220078	Y	Detailed Studies: February 2006 Approximate Studies: May 1981	Detailed Studies: Regression Equations Approximate Studies: Unknown Zone A	Detailed Studies: HEC-RAS Approximate Studies: Unknown Zone A
Rapides Parish	220145	Y	June 1982	Detailed Studies: Rational Runoff Method Approximate Studies: Unknown Zo	Detailed Studies: HEC-2 Approximate Studies: Unknown Zone A
City of Alexandria	220146	Y	September 1991	Detailed Studies: HEC-1 Approximate Studies: Unknown Zo	Detailed Studies: HEC-2 Approximate Studies: Unknown Zone A
Town of Boyce	220147	Y	N/A	(NSFHA)	No Special Flood Hazard Area - All Zone C
Town of Cheneyville	220148	Y	October 1979	USGS regional method	HEC-2
Town of Glenmora	220149	Y	June 1980	Detailed Studies: USGS regional method Approximate Studies: Unknown Zone A	Detailed Studies: HEC-2 Approximate Studies: Unknown Zone A
Town of Lecompte	220150	Y	October 1979	USGS regional method	HEC-2
Village of Forest Hill	220287	Y	N/A	(NSFHA)	No Special Flood Hazard Area - All Zone C
Village of McNary	220299	Y	1982	Approximate Studies: Unknown Zone A	Approximate Studies: Unknown Zone A
Town of Woodworth	220260	Y	June 1994	Detailed Studies: rainfall run-off Approximate Studies: Unknown Zone A	Detailed Studies: HEC-2 Approximate Studies: Unknown Zone A
St. Landry Parish	220165	Y	1979-1990	Detailed Studies: USGS regional method Approximate Studies: Unknown Zone A	Detailed Studies: HEC-2 Approximate Studies: Unknown Zone A
St. Martin Parish	220178	Y	1979-1986	Detailed Studies: Gage analysis Approximate Studies: Unknown Zone A	Detailed Studies: HEC-2 Approximate Studies: Unknown Zone A
St. Mary Parish	220192	Y	1976-1985	Detailed Studies: rainfall runoff or gage stationing Approximate Studies: Unknown Zone A	Detailed Studies: HEC-2 Approximate Studies: Unknown Zone A

Discovery Outreach and Meeting

In developing a comprehensive analysis of the Bayou Teche watershed, several government agencies and departments contributed information. In April 2018 staff of the Louisiana Department of Transportation and Development and Dewberry, the state's CTP contractor, held a project kickoff meeting. Having finalized a list of community contacts compiled from DOTD information and public sources, the communities within the watershed were first contacted in April 2018 via telephone to inform them on the Discovery Project and to verify contact information. September 5th, 2018 an email went out to the communities. This email informed the communities that a Discovery meeting was scheduled for September 20th, 2018 and asked that they begin sending relevant information to the CTP contractor. The email discussed the purpose of the Discovery Meeting, stipulated the date, time and location, and asked for any pertinent data to be brought to the meeting. The enclosures to the letter included the Discovery Newsletter.

The mailing also include a Pre-Discovery newsletter which provided further information on the Discovery process and listed specific kinds of information that the project team could utilize.

In preparation for the Discovery Meeting, the project team held weekly meetings in August and September 2018 to review draft deliverables and begin to plan out the Discovery meeting in more detail.

Phone calls to follow up with the communities after the initial email occurred the week of September 17th, 2018. These phone calls reiterated the points made in the email and was intended to maintain awareness of the Discovery process.

The Discovery Meeting was held on September 20, 2018 from 2:00 PM until 4:00 PM. St. Landry Parish hosted the meeting at The Delta Grand Theatre 120 South Market Street Opelousas, LA 70570. The meeting room was arranged into four stations with map exhibits on easels in the center of the room. This provided an interactive setting between Project Team staff and the Discovery Meeting attendees. Upon arrival attendees were asked to sign in. The following communities were represented at the meeting:

- City of Alexandria
- Allen Parish
- Avoyelles Parish
- Town of Boyce
- Town of Cheneyville
- Town of Evergreen
- Village of Forest Hill
- City of Franklin
- Town of Glenmora
- Iberia Parish
- Town of Lecompte
- Village of McNary
- City of New Iberia
- City of Opelousas
- Rapides Parish
- St. Landry Parish
- Town of Woodworth

Attendees rotated around the stations focused on Planning and Grants, NFIP Compliance and Mapping. The following information was provided at each station:

- Planning & Grants – Mitigation Planning information and Information on grant opportunities and community projects. This station was staffed by Jeff Giering, the State Hazard Mitigation Officer at the Governor's Office of Homeland Security and Preparedness (GOHSEP).

- NFIP Compliance Station – Information about the National Flood Insurance Program and Community Rating System
- Mapping Station – Discovery maps illustrating flood risk and flood hazard areas, draft Pre-Discovery Flood Risk Reports. Since this study included BLE data, the CSLF data was also shown on a map comparing the BLE data to the current Effective FIRM data within the watershed. Custom maps for each community were on display depicting the Effective FIRM data and the BLE data overlain in a way for easy comparison with aerial photography as a backdrop.
- Interactive Mapping Station – This station had a computer with an interactive map that allowed Discovery Meeting attendees to enter community concerns by location directly into a Geographic Information System (GIS) database "live" at the meeting. A GIS staff person was provided to run the computer and guide the attendee in providing needed information.

The data collected on the Discovery worksheet forms was also entered into the GIS database after the meeting.

Attendees were asked to contribute information about concerns in the watershed by indicating the location on the large watershed map with a numbered sticker, and to provide a short write-up that was recorded on a comment form. The GIS station allowed attendees to pinpoint areas of concern that were recorded digitally on the watershed map. The activity at the stations was intended to be interactive, with attendees and staff working together to listen, discuss and document any topical items for the watershed. Staff from the Regional Project Team were available at each station to answer questions and engage in conversation with everyone.

No official minutes were recorded during this meeting. Information sheets were collected at each station and the Discovery watershed maps were labeled at locations within the watershed. These sheets are included in the supplemental digital data that accompanies this report. The data from the information sheets was also digitized.

The meeting was overall considered a success. 17 of the 40 communities or 43% in the watershed were represented. All communities acknowledged having received the emails in the follow-up phone calls. Representative from The Water Institute of the Gulf were present. Concerns were mostly collected in Rapides and St. Landry Parishes.

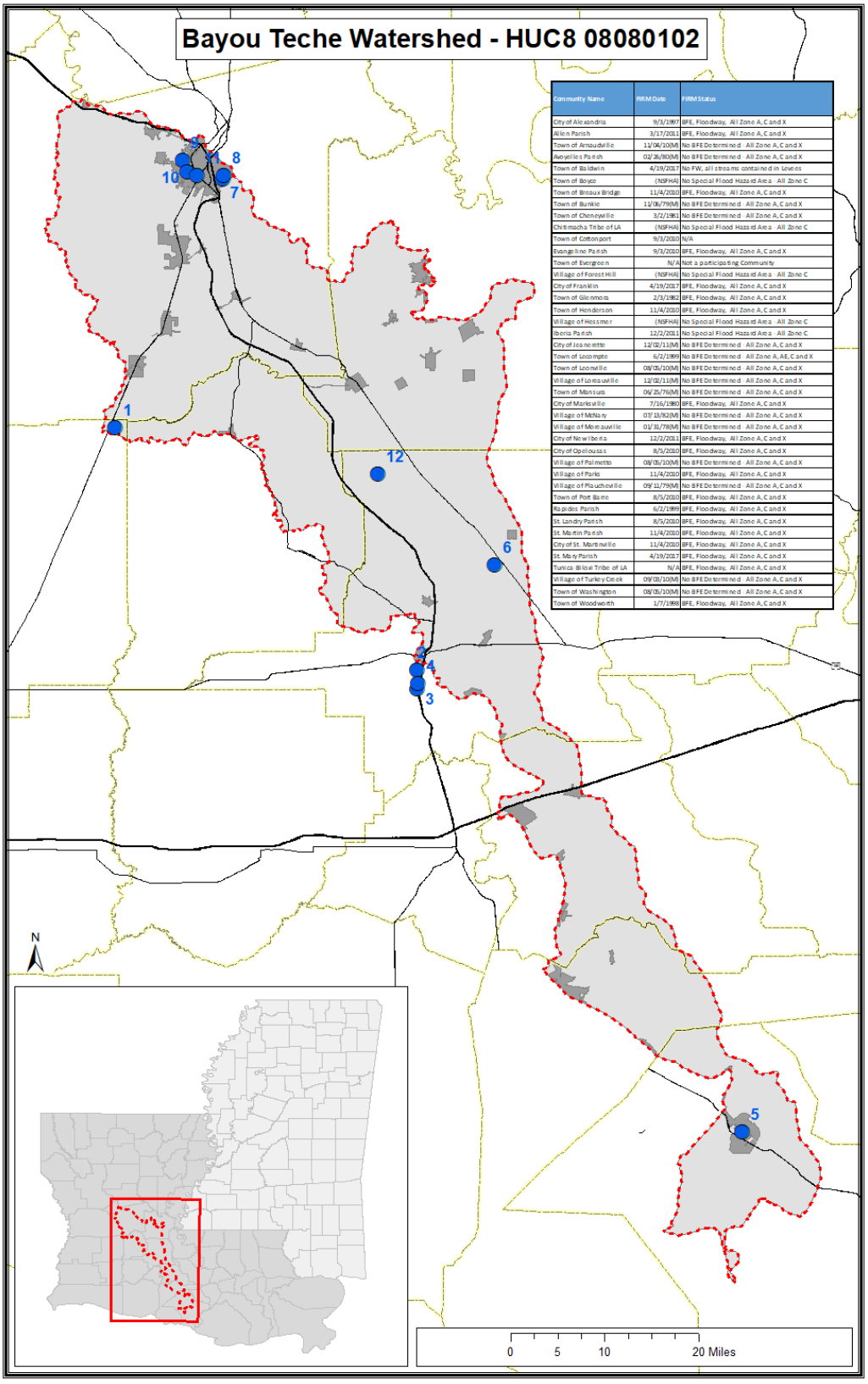


Figure 6: Map of concerns collected at the Discovery Meeting

Table 15: Issues and Concerns Collected During the Discovery Process

Item	Location	Information Provided By	Discovery Workshop Comment Summary
1	Allen Parish	Community Official	Wants updated FIRMs in unmapped parts of the parish. Development coming from Calcasieu Parish and they want to be proactive.
2	City of Opelousas	Community Official	Area between Creswell Lane and Judson Walsh Drive floods. This area is outside Bayou Teche, located in the adjacent Vermilion watershed.
3	City of Opelousas	Community Official	New development in the area of Harry Guilbeau Road and the eastside of I-49. ETJ no maps. This area is outside Bayou Teche, located in the adjacent Vermilion watershed.
4	City of Opelousas	Community Official	Clos du Bois subdivision incorporated lots in AE zone. . This area is outside Bayou Teche, located in the adjacent Vermilion watershed.
5	City of Franklin	Community Official	City has numerous drainage improvements including pumps and levees to protect from up to 12 feet of storm surge.
6	St. Landry Parish	Community Official	Feels as though the current maps are ok. Has had development in the parish.
7	City of Alexandria	Community Official	New bridge. Hudson Blvd and Hynson Bayou.
8	City of Alexandria	Community Official	New bridge. Chatlin Lake Canal.
9	City of Alexandria	Community Official	2D drainage map CAD map showing drainage structures and pipes. 85-90% accurate.
10	City of Alexandria	Community Official	2007 FIRMs performed excellent during Gustave 100 year event.
11	City of Alexandria	Community Official	Prescott Road, northeast side of MacArthur Drive. Box culvert with drainage improvements finished in 2018. Funded by Gustave funds, LRA $.
12	Bayou Teche Watershed	Community Consultant	HEC-RAS 1D model is under development for all areas in the watershed and will be available October 2018. Includes hydrology.

Advisory Base Flood Elevations (ABFE) Mapping Effort

Post Hurricane Rita FEMA developed ABFE for coastal areas in portions of Iberia and St. Mary Parish's. Rite ABFE recovery maps provide essential elements of information including: Preliminary surveyed coastal high water mark (HWM) flood elevations from Hurricane Rita's storm surge (i.e., excluding HWMs reflecting surge plus local wave effects);

- Hurricane Rita coastal surge inundation limits; and
- Advisory Base Flood Elevations (ABFEs).

Local Data Availability – City of Franklin Drainage Improvements. The City has numerous drainage improvements in order to protect the city from storm surge. These improvements include pumps and levees. Pumps are designed to pump water from inside to outside the levee system.

Local Data Availability – City of Alexandria Drainage Improvements. The City has numerous drainage improvements due to undersized or dated infastructure. Hudson Blvd. at Henson Bayou a new bridge was built. Prescott Road on the northeast side of McArthur a box culvert with drainage improvements was completed in 2018. Box culvert was paid for with Louisiana Recovery Authority (LRA) Gustav

recovery funds. There was a new bridge constrcuted over Chatlin Lake Canal. The city has a 2D drainage map (CAD) map showing drainage structures and pipes and is concidered to be 85%-90% accurate as to what is in the ground to date. Alexandria has 2012 LiDAR in the city limits for the portion that is in Bayou Teche.

FEMA Investment Decision

Local consultant has indicated that they have extensive riverine modeling throughout the Parish. Leverage of their modeling effort into FEMA specifications would address most concerns brought up as part of the Bayou Teche watershed Discovery effort. Effective FIS for all communities is well over 30 years old and development has occurred in sub watersheds throughout the region that impact runoff and flood patterns within the watershed. BLE indicates significant changes and will be an important tool in focusing areas that are in need of an updated analysis. Based on the information collected at the Discovery Meeting, it is recommended that future projects be initiated within the Bayou Teche Watershed. They are as follows:

1. Leverage results of existing studies:
    - Superimpose the resulting water surface elevations of the 2D BLE analysis with the resulting water surface elevations of the watershed-wide 1D analysis to identify areas where pluvial flooding may be of concern and is not captured with 1D methodologies.
2. Leverage existing hydrology calculations:
    - Regression equations used in the watershed-wide 1D model will be reviewed and utilized where 1D steady state modeling is deemed applicable. These results can then be compared to peak discharges determined from flow frequency analysis of neighboring stream gauges for agreement.
    - In cases of fluvial flooding near urbanized areas or in very flat areas with extensive low lying overbanks where pluvial flooding is of concern, an unsteady hydraulic model may be more applicable. In such situations it may be possible to leverage existing sub basin delineations from the regression analysis to construct a rainfall-runoff model. This model would produce the direct runoff hydrographs required for an unsteady hydraulic analysis. Additionally, the existing 1D model could be used for the routing within the rainfall-runoff model if the modified Puls methodology were adopted. The resulting peak discharges could then be compared to existing regression results and peak discharges resulting from a flow frequency analysis of neighboring stream gauges. Furthermore, the rainfall-runoff model could be calibrated if both precipitation and gauge data exist for historical events.
3. Leverage existing hydraulic data:
    - Existing channel geometry and structure data can be extracted from existing 1D analysis for 1D steady, 1D unsteady, or 1d/2D hydraulic modeling.
    - Where structure information is not included in the existing 1D model, as-built drawings can be requested from the cities, parishes, or state DOTD.
    - Breaklines used in the 2D BLE data can be recycled into any newly scoped 2D areas. Existing road and levee centerline datasets can also be enforced as breaklines into any 2D areas.
    - The 2D BLE data can be used to inform the development of 1D models by identifying inundated areas that have zero or near-zero velocities in the direction of the 1D stream.

These are areas of zero conveyance and should be implemented in scoped 1D models as ineffective flow areas.

- For areas identified for 1D steady state hydraulic modeling the existing 1D analysis can be reviewed and possibly used as is. If the model is adequate as is it would simply need to be packaged in FEMA spec.

Future Investments for Refinement

FEMA will work closely with communities to identify additional areas for model refinement and FIRM panel updates. Once the Base Level Engineering information is prepared and released to communities, FEMA will coordinate with watershed communities to identify additional areas for future investment.

Bibliography

Friedley, Renae. *Images of America Breaux Bridge*. Charleston, South Carolina, Arcadia Publishing, 2014. Print.

"The Teche/Vermilion Basin." *Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA)*, United State Geologic Survey (USGS) National Wetlands Research Center, retrieved October 2018, from https://lacoast.gov/new/About/Basin_data/tv/Default.aspx

R.D. DeLaune, et al. "Rejuvenated marsh and bay-bottom accretion on the rapidly subsiding coastal plain of U.S. Gulf coast: a second-order effect of the emerging Atchafalaya delta." *Estuarine, Coastal and Shelf Science*. October 1987.

Appendix [1]: Community-Specific Reports

The following list depicts the county and community-specific reports contained within this appendix.

Communities
ALLEN PARISH
AVOYELLES PARISH
CITY OF BUNKIE
TOWN OF COTTONPORT
TOWN OF EVERGREEN
VILLAGE OF HESSMER
TOWN OF MANSURA
CITY OF MARKSVILLE
VILLAGE OF MOREAUVILLE
VILLAGE OF PLAUCHEVILLE
EVANGELINE PARISH
VILLAGE OF TURKEY CREEK
IBERIA PARISH
CITY OF JEANERETTE
VILLAGE OF LOREAUVILLE
CITY OF NEW IBERIA
RAPIDES PARISH
CITY OF ALEXANDRIA
TOWN OF BOYCE
TOWN OF CHENEYVILLE
VILLAGE OF FOREST HILL

TOWN OF GLENMORA
TOWN OF LECOMPTE
VILLAGE OF MCNARY
VILLAGE OF WOODWORTH
ST. LANDRY PARISH
TOWN OF ARNUNDVILLE
TOWN OF LEONVILLE
CITY OF OPELOUSAS
VILLAGE OF PALMETTO
TOWN OF PORT BARRE
TOWN OF WASHINGTON
ST. MARTIN PARISH
TOWN OF ARNAUDVILLE
TOWN OF BREAUX BRIDGE
TOWN OF HENDERSON
VILLAGE OF PARKS
CITY OF ST. MARTINVILLE
ST. MARY PARISH
TOWN OF BALDWIN
CHITIMACHA TRIBE OF LOUISIANA
CITY OF FRANKLIN

Appendix II: Resources

State Partners

Organization/Title	Name	Partner Location	Contact Information
Louisiana Department of Transportation & Development State NFIP Coordinator	Cindy O'Neal, CFM	P.O. Box 94245 Baton Rouge, LA 70804	Phone: 225-379-3005 Email: cindy.oneal@la.gov Web Page: http://floods.dotd.la.gov
Louisiana Governor's Office of Homeland Security and Emergency Preparedness State Hazard Mitigation Officer	Jeffrey Giering, CFM	1201 Capitol Access Rd. Baton Rouge, LA 70802	Phone: 225-379-3005 Email: jeffrey.giering@la.gov Web Page: http://gohsep.la.gov

Watershed Follow Up Points of Contact

Subject/Topic of Interest	Name	Contact Information
FEMA Project Monitor *Project Outreach*	Diane Howe Risk Analysis Branch	Phone: 940-898-5171 Email: diane.howe@fema.dhs.gov
• Floodplain Management • Floodplain Ordinance • Community Assistance Visits • Higher Standards	John Miles, Jr.	Phone: 840-297-0185 Email: john.milesjr@fema.dhs.gov
• Community Rating System • Flood Insurance	Jonathan Smith	Phone: 228-235-6506 Email: jsmith@iso.com
• How to find and read FIRMs • Letters of Map Change and Elevation Certificates • Flood zone disputes • Mandatory insurance purchase guidelines • Map Service Center (MSC) & National Food Hazard Layer	FEMA Map Information eXchange (FMIX)	Phone: 877.FEMA.MAP (336.2627) Email: FEMAMapSpecialist@riskmapcds.com Live Chat: https://www.floodmaps.fema.gov/fhm/fmx_main.html

Governor's Office of Homeland Security and Emergency Preparedness

http://gohsep.la.gov/

Louisiana is a high-risk state for emergency events and disasters. The Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) is the agency responsible for coordinating the state's efforts throughout the emergency management cycle to prepare for, prevent where possible, respond to, recover from, and mitigate against to lessen the effects of man-made or natural disasters that threaten the state. GOHSEP can save lives and reduce property damage by understanding risks and taking action to address those risks, as well as minimizing disaster impacts and increasing the resiliency in our communities, environment, and economy.

HELPFUL LINKS:

FLOOD INDEX: http://gohsep.la.gov/ABOUT/LOUISIANA-HAZARDS-THREATS/FLOODING

GOHSEP CONTACTS: http://gohsep.la.gov/ABOUT/CONTACT-US/GOHSEP-CONTACTS

FLOOD MITIGATION ASSITASTANCE GRANT PROGRAM: http://gohsep.la.gov/GRANTS/RECOVERY-GRANTS/Hazard-Mitigation-Assistance

GOHSEP MITIGATION PLANNING: http://getagameplan.org/planMitigate.htm

Louisiana Department of Transportation and Development

http://wwwsp.dotd.la.gov

The Louisiana Department of Transportation and Development (DOTD) is the State Coordinating Agency for the NFIP as designated by the Governor. The purpose of the program is to promote local government compliance with NFIP regulations to ensure the availability of low-cost flood insurance, and in doing so, minimize loss of life and property due to catastrophic flooding. This is accomplished through on-site assessments, distribution of a quarterly newsletter, conducting workshops, providing technical assistance on local government ordinance development, and participation in post-disaster Flood Hazard Mitigation activities.

DOTD FLOOD INFORMATION & RESOURCES

Louisiana Floodplain Management Desk Reference—The Louisiana Floodplain Management Desk Reference is a comprehensive guide that gives detailed information on administering floodplain ordinances at the community level.

POINTS OF CONTACT:

Cindy O'Neal, CFM
State NFIP Coordinator
Phone: 225-379-3005
Fax: 225-379-3002
Email: cindy.oneal@la.gov

Louisiana Floodplain Management Association

Organization	Contact Information	Website
Louisiana Floodplain Management Association (LFMA)	Phone: 318-226-6934	http://lfma.org

Certified Floodplain Manager (CFM) Certification

The Association of State Floodplain Managers (ASFPM) established a national program for certifying floodplain managers. This program recognizes continuing education and professional development that enhances the knowledge and performance of local, state, federal, and private-sector floodplain management professionals.

The role of the nation's floodplain managers is expanding due to increases in disaster losses, the emphasis on mitigation to alleviate the cycle of damage-rebuild-damage, and a recognized need for professionals to adequately address these issues. This certification program will lay the foundation for ensuring that highly qualified individuals are available to meet the challenge of breaking the damage cycle and stopping its negative drain on the nation's human, financial, and natural resources.

CFM® is a registered trademark and available only to individuals certified and in good standing under the ASFPM Certified Floodplain Manager Program.

For more information, you may want to review these available CFM Awareness Videos:

- What is the CFM Program?
- Who can be a CFM?
- What are the Benefits of a CFM?

Study Materials for those interested in applying for the CFM certification can be found on the ASFPM Website at: http://www.floods.org/index.asp?menuID=215

Estimated Base Flood Elevation (BFE) Viewer

As a part of the Risk MAP process, FEMA is completing **Base Level Engineering (BLE)** to provide a complete picture of flood hazard throughout a watershed. The BLE analysis uses high resolution ground elevation data, flood flow calculations, and fundamental engineering modeling techniques to define flood extents for streams.

To provide a look at BLE data availability and relative engineering analysis, FEMA developed the through the **Estimated BFE Viewer** for community officials, property owners, and land developers to identify the flood risk (high, moderate, low), expected flood elevation, and estimated flood depth near any property or structure within watersheds where BLE has been prepared.

It should be noted that Note: Due to differences between the effective studies and the Base Level Engineering there are areas on this map which may inaccurately show increases or decreases to the floodplains. In other areas the BLE analysis may show SFHA increases because waterways in that area had not been previously studied and mapped. Base Level Engineering cannot be compared to detailed studies that result in AE Zones because the BLE analysis does not incorporate the same level of information used in those models. BLE data was not created for Mississippi.

Visit the Estimated BFE Viewer (https://webapps.usgs.gov/infrm/estBFE/) application to learn the status of BLE in your area of interest or surrounding communities, to view the flood hazard data developed, or to utilize the tool's flood risk reporting features for a location where BLE has been made available.

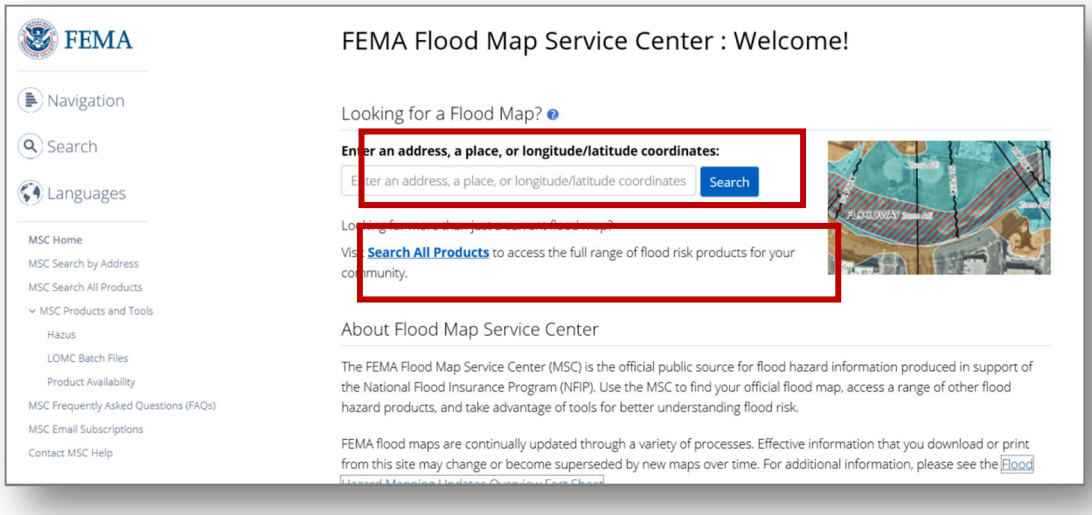
FEMA Flood Map Service Center (MSC)

The FEMA Flood Map Service Center (MSC) is the official public source for flood hazard information produced in support of the NFIP. Use the MSC to find your official effective flood map, preliminary flood maps and access a range of other flood hazard products.

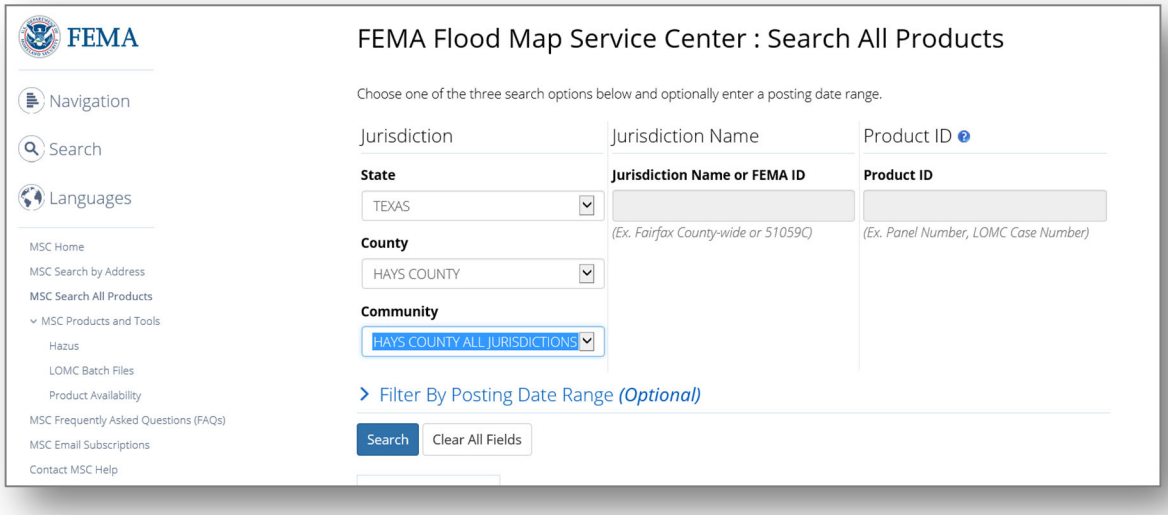
FEMA flood maps are continually updated through a variety of processes. Effective information that you download or print from this site may change or become superseded by new maps over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet.

At the MSC, there are two ways to locate flood maps in your vicinity.

1. Enter an address, place name or latitude/longitude coordinates, and click search. This will provide the current effective FIRM panel for the location.
2. Or Search All Products, which will provide access to the full range of flood risk information available.

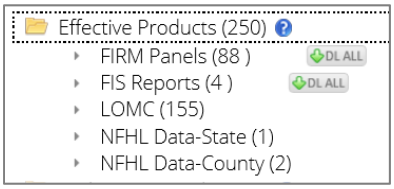


By using the more advanced search option, "Search All Products," users may access current, preliminary, pending and historic flood maps. Additionally, GIS data and flood risk products may be accessed through the site with these few steps



Using the pull down menus, select, your state, county and community of interest. For this example, we selected Hays County - All Jurisdictions. After the search button is selected, the MSC will return all items in the area. There are five types of data available.

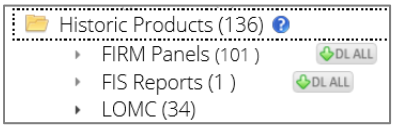
Effective Products. The current effective FIS, FIRM and DFIRM database (if available) is available through the MSC. If users click on the available effective products they are presented a breakdown of the available products. FIRM panels, FIS reports, Letters of Map Revision, Statewide NFHL and Countywide NFHL data may be available, as indicated in the breakdown on the right of the page



Preliminary Products. Once a project area has been issued preliminary, the FIRM panels, FIS reports and preliminary DFIRM database are available for download.

Pending Products. After the appeal and comment period is held and the received appeals and comments are incorporated, the LFD is issued, establishing an effective issuance date for the study. Panels are available here once an LFD is issued.

Historic Products. A range of historic flood hazard maps, FIS texts and LOMCs are available through the MSC.



Flood Risk Products. The Flood Risk Report, Flood Risk Map and Flood Risk Database will be made available through the MSC once it has been compiled and completed. These products are made available after the flood study analysis and mapping has been reviewed and community comments can be incorporated.