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Mitigation in Action

The State of Louisiana has supported numerous successful mitigation efforts statewide. These include efforts at the local and parish level, as well as projects that span multiple regions. This section details some of the successful mitigation efforts implemented in the state, including the outreach work of the Coastal Protection and Restoration Authority (CPRA), a regional adaptation strategy implemented by the Office of Community Development (OCD), a statewide watershed plan called the Louisiana Watershed Initiative, the Louisiana Department of Transportation and Development's (LADOTD) risk mapping, assessment, and planning, state and local Community Rating System (CRS) efforts, a drainage project and safe room in Calcasieu Parish, and mitigation projects at the household level.

Actions to Reduce Vulnerability

As a means to reduce the number of repetitive and severe repetitive loss properties in the state of Louisiana, GOHSEP continues to promote FEMA Non-Disaster Grant Programs as well as state funded programs to the parishes in Louisiana. One recent example includes the 2018 FMA grant obligated to East Baton Rouge Parish for nearly 9 million dollar to elevate seventeen homes and acquire twenty-four more.

Additionally, GOHSEP also continues working with local jurisdictions promote the use of HMGP funding to Parishes to reduce the threat of flooding through drainage projects. Large drainage projects in New Orleans and Plaquemines Parishes are underway as a result of disaster 1603 and 1607. More recently many more localized drainage improvement projects are either underway or being developed in many parishes throughout Louisiana. GOHSEP continues to promote localized drainage projects through HMGP funding that has become available following disasters 4228, 4263, 4277, and 4300.

GOHSEP is working with sister agencies in Louisiana to prioritize implementation of risk reducing activities, such as focusing on drainage projects that work to restore and improve the functions of floodplains; retrofitting infrastructure to protect against future damages and ensure continuity of services; construction of safe rooms to protect citizens from tropical cyclones and tornadoes; and development and updates to local hazard mitigation plans to better identify actions and activities at local levels.

Flood Risk and Resilience Program

As a part of the 2017 Coastal Master Plan, the Coastal Protection and Restoration Authority (CPRA) is working to implement a Flood Risk and Resilience Program, focused on reducing the impacts of storm surge based flooding on Louisiana's coastal communities. The program emphasizes planning for and implementation of nonstructural risk reduction projects, and recommends the implementation of large-scale nonstructural risk reduction projects. These projects work to support the Coastal Master Plan.



**Coastal Protection and
Restoration Authority**

NONSTRUCTURAL PROJECT TYPES AND ASSOCIATED FLOOD DEPTHS



The Flood Risk and Resilience Program works at the local level to support local decision making through parish prioritization of structures to be mitigated. It also promotes higher standards of risk reduction by recommending the elevation of residential structures to 100 year flood depths plus two feet above grade. Unlike other nonstructural programs, it provides reduced cost requirements, with 90% CPRA funding and up to 100% full state funding when certain requirements are met. It further functions as a piece of the multiple lines of defense strategy, by complementing other structural risk reduction measures, such as levees and flood gates. Additionally, it helps the most vulnerable, by requiring the prioritization of low to moderate income households.

The nonstructural projects included in this program are activities that do not stop floodwaters, but reduce the impacts of flooding to buildings and infrastructure by floodproofing, elevation, or voluntary acquisition. The program recommends floodproofing for non-residential structures in areas where flood depths are less than 3 feet, elevation for residential structures in areas where flood depths are between 3 and 14 feet, and voluntary acquisition for residential structures in areas where flood depths are greater than 14 feet.

The 2017 Coastal Master Plan recommends thirty two nonstructural risk reduction projects, including floodproofing 1,400 non-residential structures, elevating 22,400 residences, and acquiring 2,400 residences. All floodproofing, elevation, and acquisition projects are strictly voluntary. This will total over 26,000 structures, at a cost of \$6 billion over the next 50 years. The figure above depicts the areas where these mitigation activities can be implemented.

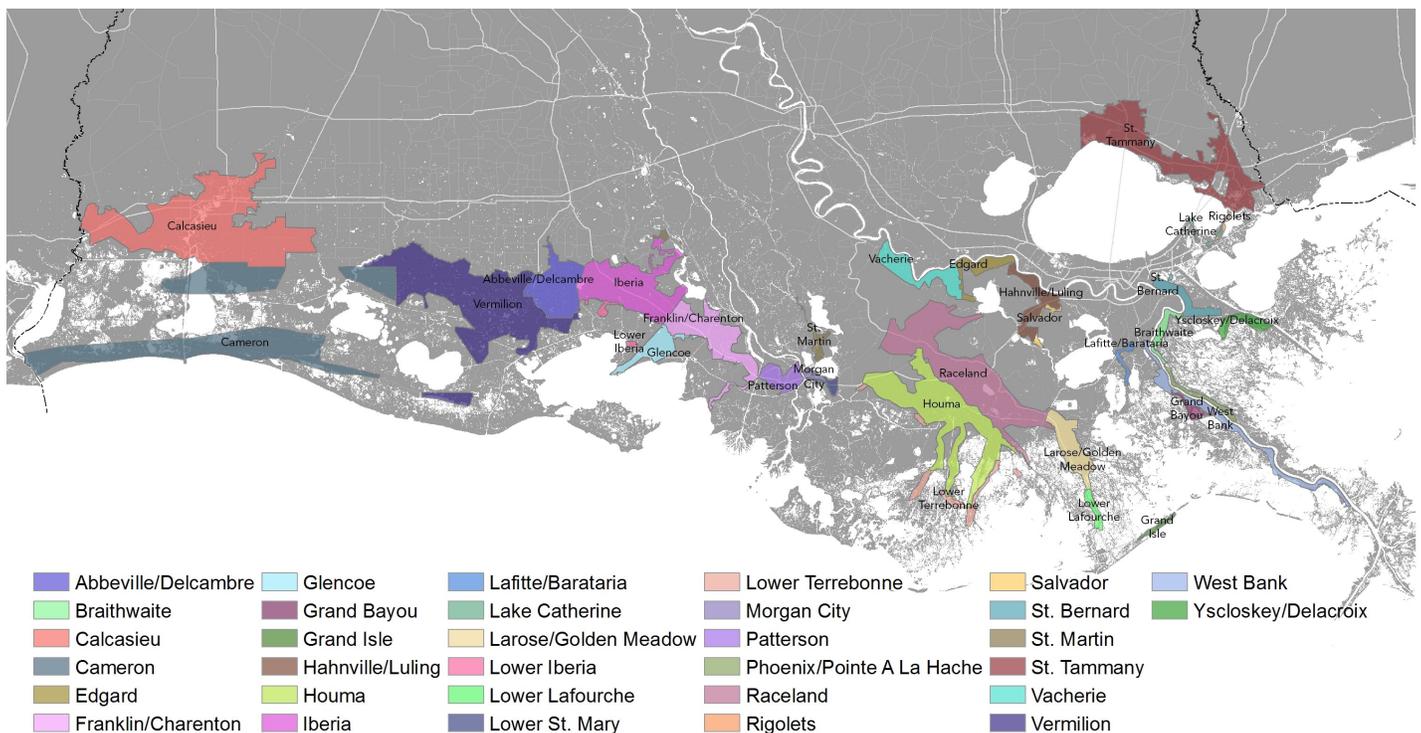
In order to implement these projects, CPRA will take advantage of different funding sources, with a focus on non-federal sources. CPRA has asked parishes to refine the recommendations and tailor the program to local needs and goals. CPRA has also asked parishes to prioritize properties by low to moderate income households, primary residences, contiguous properties, and properties with the highest flood depths.

Louisiana's Strategic Adaptations for Future Environments (LA SAFE)



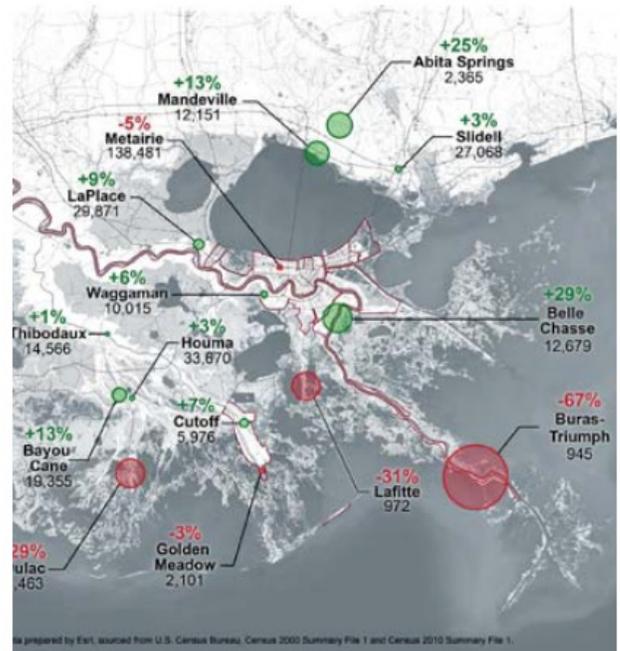
In coastal Louisiana, subsidence and sea level rise, plus the threat of hurricanes and flooding, combine to create one of the highest rates of relative sea level rise in the world. This relative sea level rise and continual damage from hurricanes and flooding has an acute effect on coastal communities in southeast Louisiana. To help address these issues, the National Disaster Resilience Competition (NDRC), sponsored by the U.S. Department of Housing and Urban Development (HUD) and the Rockefeller Foundation, awarded funding for LA SAFE – Louisiana's Strategic Adaptations for Future Environments. The LA SAFE program, a partnership between the Office of Community Development (OCD) and the Foundation for Louisiana (FFL), supported an inclusive public process to identify adaptation strategies to enhance the resilience of coastal Louisiana, and is providing funding for at least one project in each of six identified parishes.

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The LA SAFE program, a partnership between the Office of Community Development (OCD) and the Foundation for Louisiana (FFL), supported an inclusive public process to identify adaptation strategies to enhance the resilience of coastal Louisiana, and is providing funding for at least one project in each of six identified parishes. LA SAFE developed an intensive planning process that involved the six parishes most impacted by Hurricane Isaac in 2012: Jefferson, Lafourche, Plaquemines, St. John the Baptist, St. Tammany, and Terrebonne.

The figure above shows the population change over time in the six parishes from 2000 to 2010. As coastal Louisiana becomes more and more vulnerable to both chronic and acute flooding, populations with available resources are moving inland, away from the coast (The Data Center, 2017). In these vulnerable coastal areas, there are more workers commuting into the parish to work than workers that both reside and work in the parish. Additionally, the population in these areas is aging, and grappling with low incomes and high flood insurance rates.



% change in population, 2000-2010





Due to the high vulnerability of many of the LA SAFE parishes, the planning process had three main goals:

- GOAL 1** To generate parish-wide, community-driven adaptation plans focused on opportunities for residents and stakeholders to proactively adapt and prepare for anticipated environmental changes over the next 10, 25, and 50 years.
- GOAL 2** To implement a catalytic project in each of the six parishes that demonstrates adaptive development practices that conform to current and future flood risks. Furthermore, LA SAFE is intended to identify and support development of resilience-building projects and practices that can serve as models for the entire region
- GOAL 3** To create a statewide adaptation model that enhances long-term sustainability and resiliency for all Louisiana parishes.

The project team held five rounds of meetings in each of the six parishes, for a total of 71 meetings, attended by nearly 3,000 coastal residents. From the meetings, the team drafted adaptation strategies for each of the participating parishes, as well as a regional strategy encompassing all six parishes. The adaptation strategies in LA SAFE's regional and parish plans integrate stormwater management, housing and development, transportation, education, economy and jobs, and culture and recreation to provide community benefits that improve quality of life while mitigating flood risk. The strategies include implementation recommendations for low risk, moderate risk, and high risk areas.

The strategies included a series of projects to implement. From the strategies, the planning team identified at least one project in each parish to fund as a pilot project. The projects identified for LA SAFE in a collaborative process with the residents, stakeholders, and the planning team, include a resilience district and wetlands education center in Jefferson Parish, a blue-green trail in St. Tammany Parish, complete streets in St. John the Baptist Parish, marsh mitigation and property buyouts in Terrebonne Parish, a business incubator and resilient housing in Lafourche Parish, and a harbor of refuge and mental health program in Plaquemines Parish. The projects chosen for LA SAFE are depicted in the table below.

In addition to the strategies and project list, the LA SAFE planning process is still ongoing. The Rockefeller Foundation in coordination with UNO-CHART, Foundation for Louisiana, and Concordia LLC is in the process of conducting three convenings using the learnings from LA SAFE in relation to global knowledge of resilience and adaptation. The convenings provide a place to share the lessons learned from LA SAFE with a greater knowledge base, as well as allow LA SAFE participants to learn from other planning efforts. The planning team also hopes to expand this planning effort to other parishes across Louisiana.

Parish	Project
Jefferson	Gretna Resilience District Kickstart Louisiana Wetland Education Center
St. Tammany	Safe Haven Blue-Green Campus & Trails
St. John the Baptist	Airline & Main Complete Streets
Terrebonne	Lake Boudreaux Living Mitigation Buyouts for Permanent Resident Households
Lafourche	Emerging Industry Business Incubator Resilient Housing Prototype
Plaquemines	Harbor of Refuge Mental Health & Substance Abuse Program

Louisiana Watershed Initiative



LOUISIANA WATERSHED INITIATIVE

working together for sustainability and resilience

In March and August of 2016, Louisiana experienced two historic rain events that produced trillions of gallons of rainwater and impacted 56 of Louisiana's 64 parishes. According to FEMA verified loss data, the resulting floodwaters impacted more than 145,000 rental and owner-occupied homes across the state, and caused more than \$10 billion in damage, with recovery efforts that remain ongoing more than two years later.

These devastating events exposed key deficiencies in Louisiana's approach to floodplain management and community planning across all levels of government. Areas that were once considered to have low flood risks were devastated in 2016. While this flooding can be attributed to any number of causes, none are acceptable to Louisiana residents who rely on various government agencies to manage risk to their homes and businesses, develop effective solutions that protect the state's unique cultures, and improve quality of life.

The state is addressing these weaknesses through the establishment of the Louisiana Watershed Initiative, and it is critical for communities and their residents to understand the long-term nature of solutions that must be put into place. While there are projects that can and should be undertaken to provide short-term relief – provided that funding is available – the reality is that proper flood risk management requires a coordinated, coherent and long-term vision for sustainability and resilience. Put simply, Louisiana can no longer afford to rely on a siloed approach to managing projects, plans and policies separate and apart from each other.

The state is committed to solving watershed management collaboratively with cities, parishes, federal agencies, research and nonprofit organizations, universities and private-sector partners, with an emphasis that the status quo is simply no longer an option. Water flows downhill and does not recognize political or arbitrary boundaries; thus, it must be managed, and associated risks mitigated, in a manner that takes this behavior into account.

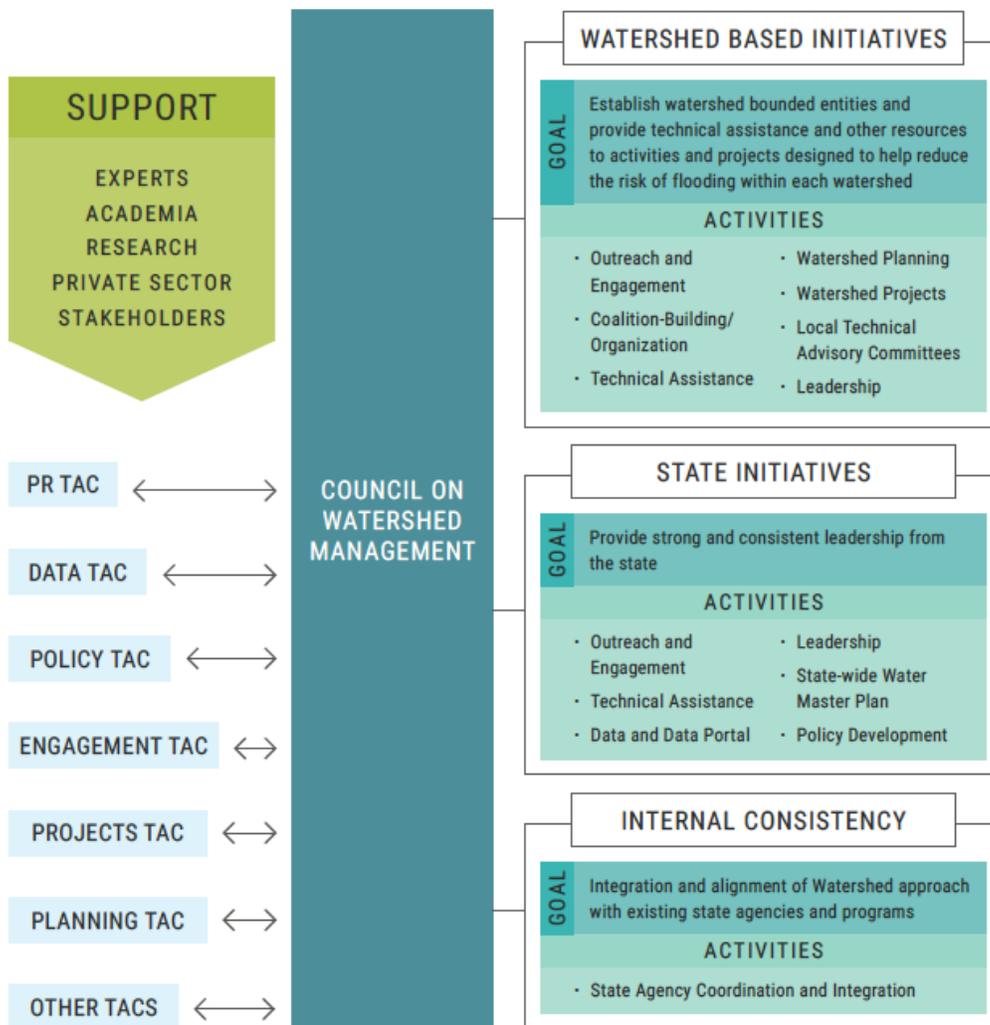
Passed during the 2017 Regular Legislative Session, Senate Resolution 172 (SR172) directed state agencies to "provide recommendations to establish, implement, and enforce floodplain management plans for each watershed in Louisiana." This resolution helped to reinforce the efforts that had already been initiated by state agencies to assess the feasibility of establishing

a coordinated, statewide model for watershed-based floodplain management, and identify the most appropriate path forward to implementing such a model. In May 2018, Gov. Edwards issued an executive order (EO JBE18-16) that further defined this level of interagency collaboration. The order established the Council on Watershed Management to oversee and coordinate Louisiana’s progress toward a statewide vision for sustainability and resilience.

The state agencies that comprise this Council on Watershed Management are in the process of launching the Louisiana Watershed Initiative, a statewide, watershed-based floodplain management program. To date, significant work has taken place in establishing a coordinated approach to flood risk mitigation for floodplains across all governmental levels, including a

process to synchronize local and statewide outreach and engagement, data management, policy development, technical assistance and master planning.

This new approach requires unprecedented coordination and cooperation across all facets and functions of government agencies, including the review of existing authorities and laws at both the state and local level that may impede watershed-based floodplain management. The figure on the previous page reveals the coordination model for the Council on Watershed Management. Through the interagency Council structure and programmatic approach established through the Louisiana Watershed Initiative, the state is demonstrating its commitment to this effort while asking municipalities, parishes, regional organizations and all stakeholders across the state to do the same.



DOTD as a FEMA Cooperating Technical Partner (CTP) for Risk MAP



On March 11, 2015, the Louisiana Department of Transportation and Development (LADOTD) signed a partnership agreement with FEMA Region VI to become a Cooperating Technical Partner (CTP) for Risk MAP. Susan Veillon manages this program under the direction of the State Coordinator, Cindy O'Neal, for the National Flood Insurance Program (NFIP), which resides in the LADOTD Public Works/Water Resources Section within the Engineering Division.

LADOTD selected Dewberry Consultants, LLC as the project consultant through an open solicitation process. Ms. Jerri Daniels is the CTP Project Manager for Dewberry Consultants, LLC. The consultant will assist LADOTD in the CTP activities as stipulated in the contract.

Since becoming a CTP with FEMA Region VI, LADOTD has been diligently planning and working with FEMA Region VI toward the release of updated flood risk information for Louisiana. LADOTD has made a significant investment in a prioritization tool, which is used for prioritizing projects in Louisiana. The Project Prioritization Decision Tool for allows the department to efficiently and effectively prioritize and select projects based on key criteria such as:

1. FEMA's Risk MAP metrics
2. Meeting specific needs to address known flood risk concerns
3. Knowing where communities have conducted flood studies or produced other relevant data that can be used as leverage and count toward cash-match contributions
4. Knowing which communities are at risk
5. Knowing where the most current LiDAR data exist in Louisiana

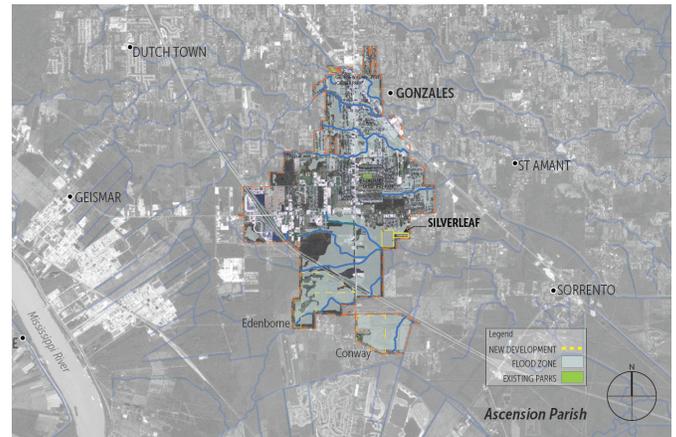
The final result is a project ranking list that best addresses the key criteria using the user's selected preferences.

Project Type	Project Description	Status
Year One Projects (2016)		
Castor and Little Watershed	Approximate A and limited detailed Phase 1, Discovery	Ongoing
Baou Sara Thompson Watershed		Ongoing
Year Two Projects (2017)		
Phase 1, Bayou Teche Watershed	Discovery	TBD
Phase 1, Tickfaw Watershed	Discovery	TBD
Phase 1, Tangipahoa Watershed	Discovery	TBD
Phase 1, Liberty Bayou/Tchefuncta Watershed	Discovery	TBD
Phase 1, Amite Watershed	Discovery	TBD
West Carroll Parish, Special Project	Community Outreach and	TBD
Flood Information Guide	Mitigation Strategies	

Flood Mitigation, Improved Resilience, and Community Enhancement for Gonzales, Louisiana

Following the storms of 2016, the City of Gonzales is exploring opportunities to acquire an area of repetitive loss properties, and then incorporating those properties into an adjacent park to increase the park's ability to mitigate flooding. Gonzales is interested in partnering with local and federal partners for design, funding, implementation, and maintenance, as appropriate. The Center for Planning Excellence (CPEX) is partnering with Gonzales on this project.

The area in question, E. Silverleaf Street, is a dead-end residential street of approximately 20 single-family homes on 11 acres. A number of these homes have flooded as many as four times in the past ten years. This property is adjacent to a city-owned 53-acre parcel, which is currently undeveloped but future plans call for a park with trails, parking, and other amenities. The city's vision is for the properties on Silverleaf to be bought out, so that the land can be incorporated into the proposed park. Doing this will allow for easier access to the park, as well as the opportunity to expand the park as a space that not only provides public amenities, but also as a flood mitigation element in an area that is routinely impacted by flooding. The opportunity to assist in the relocation of Silverleaf residents to other areas within Gonzales demonstrates the city's commitment to smart, responsible growth and development.



Silverleaf and the adjacent city-owned parcel (solid yellow outline) are situated at the edge of the city limits. These properties are just to the east of LA 44 (Burnside), a corridor of mixed commercial and industrial uses. Much of the surrounding land is low-lying and undeveloped, low density residential, or cultivated. The city's denser, more developed core is to the north. A number of waterways pass through the area and ultimately end up in Lake Maurepas.

This project provides an opportunity to reduce flood risk for Silverleaf residents by relocating them to less flood-vulnerable areas. It also allows the City of Gonzales to use property to manage stormwater, which can reduce flood risk for a larger area. This will further mitigate potential downstream flood risk, as well as provide recreational and nature amenities for area residents.



Local Community Rating System (CRS) Efforts

The Community Rating System (CRS) is a voluntary program, which provides incentives for communities to implement floodplain management activities that exceed those required by the National Flood Insurance Program (NFIP). The goals of the CRS are to (1) reduce flood damage to insurable property; (2) strengthen and support the insurance aspects of the NFIP; and (3) encourage a comprehensive approach to floodplain management. An incentive for communities to participate in the CRS is discounts on flood insurance premiums for local policyholders. A community earns points for each CRS activity completed; the number of points determines the amount of the flood insurance premium discount. The LADOTD Public Works/Water Resources Section within the Engineering Division assists with this program at the state level, providing resources, training, and assistance visits to participating communities. A number of communities throughout the State of Louisiana implement CRS efforts in order to receive flood insurance discounts. This section details efforts by a few of the CRS communities in the state.

CRS Users Group Support

The University of New Orleans' Center for Hazards Assessment, Response and Technology (UNO-CHART) facilitates two separate CRS User's Groups in Louisiana; one around the Lake Pontchartrain area, and one in the Baton Rouge area. The purpose of a CRS Users Group is to serve as a support and educational resource for local communities who participate in the CRS. These

two groups are comprised of only 16 of the 42 CRS participating communities in of Louisiana, but make up almost half of the total CRS discounts in the state. The groups are comprised of local officials who have been designated as CRS Coordinator for their communities. UNO-CHART provides support through facilitation of meetings and research.



The Flood Loss Outreach & Awareness Task force (FLOAT) is one of the CRS Users Groups, made up of communities in the Greater New Orleans area. In 2011, the member jurisdictions of FLOAT decided to come together, with the invaluable help of the Office of the Louisiana State Coordinator for the NFIP, the Louisiana Region CRS Coordinator for ISO, and UNO-CHART. From the humble beginnings of FLOAT, the group has been able to develop a cohesive program to increase outreach to the public regarding natural hazard preparation, and to continue planning for sustainable communities in the face of the environment in which we live, work and play. FLOAT currently has 10 participating communities: Lafourche Parish, Orleans Parish, St. Charles Parish, St. John the Baptist Parish, St. Tammany Parish, Tangipahoa Parish, Terrebonne Parish, the City of Covington, the City of Mandeville, and the City of Slidell.

In June 2012, the Capital Region Area Floodplain Task-force (CRAFT) was formed. The group is composed of the following communities: Ascension Parish, East Baton Rouge, West Baton Rouge Parish, City of Central, City of Denham Springs, City of Gonzales, City of Scott, City of Walker, and the City of Zachary.



CRAFT and FLOAT are working towards joint outreach efforts to make the southeast region of Louisiana more aware of the inherent risks associated with this region, all while making the citizenry more capable of handling and mitigating these risks. A large part of the outreach efforts is a Program for Public Information (PPI) report. FLOAT and CRAFT, along with our member jurisdictions, developed educational and outreach projects over the years with input and support from environmental volunteers, numerous partners, and with the use of creative and innovative tools. With such aggressive outreach programs spread out over multiple jurisdictions, FLOAT and CRAFT decided to assemble all of these activities, opportunities and materials in a single coordinated multijurisdictional program for public information.

Elevation Certificates in the City of New Orleans

The City of New Orleans is working to gather all of the elevation certificates available in the city. As a minimum requirement of the Community Rating System, the City must collect elevation certificates for all new construction and substantial renovations. The City will keep these documents permanently for each property and make available upon request. By collecting elevation certificates, the city will get more points through the Community Rating System, and ultimately receive a discount on flood insurance rates for residents in the Special Flood Hazard Area (SFHA).

Improved CRS Rating for the City of Mandeville

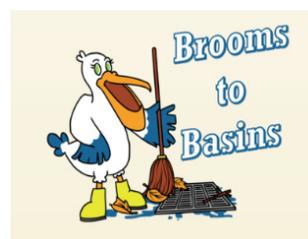
The City of Mandeville recently improved its CRS rating, moving up to a Class 6 from a Class 7. A Class 7 provides a 15% discount on flood insurance for residents in the SFHA, and a 5% discount for residents not in the SFHA, while a Class 6 provides a 20% discount on flood insurance for residents in the SFHA, and a 10% discount for residents not in the SFHA. Therefore, the class improvement will provide an additional 5% discount to residents with flood insurance. The city improved its ranking through improving drainage, elevating structures, and creating green space.

Outreach Projects in Jefferson Parish

Jefferson United Mitigation Professionals (JUMP), the Jefferson Parish based CRS Users Group, is comprised of Unincorporated Jefferson Parish, the Cities of Gretna, Harahan, Kenner, Westwego, and the Town of Jean Lafitte. Part of JUMP's mission is to take action in protecting the people and property of Jefferson Parish from future flooding. JUMP, like CRAFT and FLOAT, developed a Program for Public Information (PPI) in coordination with participants from real estate, banking, insurance and other private sectors. JUMP was the first group in Southeast Louisiana to complete and adopt a multijurisdictional PPI.



The PPI serves as an official strategy for joint education and outreach efforts focusing on flood protection. The benefits of a multijurisdictional PPI include a comprehensive outreach approach by providing communities and residents with clear, coordinated messages that are delivered in a cost-effective and consistent manner. The better access residents have to the flood risk and impacts, the higher chance these residents will be prepared to take action in reducing their risk. The result is a well-informed public, safer living environment, and lower costs associated with flood loss.



The parish identified a total of 114 outreach projects that reach 11 different priority audiences. They created Marsha the Pelican to impart information on how to protect people and property from hazards, and suggest ways to build more sustainably in the parish. The parish's newest outreach project, Brooms to Basins, encourages residents to clean catch basins in order to reduce flooding and pollution across the parish. The program provides an opportunity for residents to adopt a catch basin, help maintain it, and share their efforts on social media.

Belfield Ditch Drainage Improvement Project

In October 2006, approximately 400 homes were damaged due to an estimated 25-year flooding event in Calcasieu Parish. Therefore, the State of Louisiana funded a drainage project in the area. The Belfield Ditch Drainage Improvement Project increased the size of the Belfield Ditch from its connection point with the Belfield North-South Ditch west to 150 feet downstream of North Perkins Ferry Road. The project allows for greater flow through the channel to relieve the flooding in the area. The project also includes



added overflow pipes at Belfield Road, so the structure can accommodate the additional capacity of the modified ditch, as well as increase the capacities of North Perkins Ferry Road and Stafford Lane.

The State of Louisiana provided funding for a dual-use hurricane safe room, in compliance with all applicable guidance, including FEMA 361, Design and Construction Guidance for Community Safe Rooms (second edition, August 2008), and all applicable codes, standards, and regulations. This dual-use hurricane safe room provides near-absolute life safety protection for the people of Calcasieu Parish in the event of a hurricane.

After experiencing frequent flooding, a house in Calcasieu Parish was elevated to mitigate it from future damage. The photograph on the following page shows the home during one of the floods.

Calcasieu Parish Safe Room



House Elevation in Calcasieu Parish

After experiencing frequent flooding, a house in Calcasieu Parish was elevated to mitigate it from future damage. The photograph on the following page shows the home during one of the floods.



The house was elevated before Hurricane Harvey hit Calcasieu Parish in September 2017. The photograph below reveals that the home was not flooded from the storm due to its new elevation.

House Reconstruction in Golden Meadow

The State of Louisiana also uses mitigation funding to mitigate individual properties. One mitigation success story is located in Golden Meadow. In 2005, Hurricane Katrina and Hurricane Rita hit south Louisiana, devastating the coast. After Hurricane Rita, the Golden Meadow home was approved for elevation. The structure was slightly elevated, but not enough to protect it from further flooding and storm surge. During Gustav, the building was flooded and damaged by a boat, which completely knocked it off of its structure.



In 2008, Hurricane Ike hit Lafourche Parish, causing the house to be flooded and damaged even more. Due to the extended damage from Gustav and Ike, the project was amended to a reconstruction. The house is now reconstructed, and elevated many feet in the air, in order to properly mitigate future flooding and storm surge.

