



LOUISIANA
WATERSHED
INITIATIVE

REGION 4



WATERSHED PLAN

SPOKES OF THE WHEEL



Louisiana Watershed Initiative (LWI) Region 4 Comprehensive Plan | Draft

FULLY ADOPTED: **TBD**

SOUTHWEST LOUISIANA REGIONAL PLANNING COMMISSION (SWLA-RPC),
designated as the fiscal agent of the
LOUISIANA WATERSHED INITIATIVE (LWI) REGION 4,
representing Allen, Beauregard, Calcasieu, Cameron, DeSoto, Jefferson Davis, Rapides, Sabine,
and Vernon Parishes, as well as the Coshatta Tribe of Louisiana and all incorporated
municipalities and unincorporated areas therein, has prepared this
LOUISIANA WATERSHED INITIATIVE (LWI) REGION 4 COMPREHENSIVE PLAN
in cooperation with
LOUISIANA OFFICE OF COMMUNITY DEVELOPMENT (OCD)
LOUISIANA DEPARTMENT OF ENERGY AND NATURAL RESOURCES
LOUISIANA WATERSHED INITIATIVE (LWI)

LWI is managed and led by the Council on Watershed Management which includes the Secretaries and Executive Directors of the Office of Community Development (OCD), the Department of Transportation and Development (DOTD), the Coastal Protection and Restoration Authority (CPRA), the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP), and the Louisiana Department of Wildlife and Fisheries (LDWF).

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Executive Summary

Water shapes our lives in Louisiana. In Region 4, stretching from the pine forests of northern DeSoto Parish to the coastal marshes of Cameron Parish, lakes, rivers, bayous, and rainfall define both opportunity and risk. We are called to plan not just for today's challenges, but for a more resilient future. The Louisiana Watershed Initiative (LWI) Region 4 Comprehensive Plan is a collaborative blueprint designed as a regional framework for understanding flood risk, coordinating watershed management strategies, and guiding future investments.

Region 4 represents nine parishes, DeSoto, Sabine, Vernon, Rapides, Beauregard, Allen, Calcasieu, Jefferson Davis, and Cameron, interspersed with networks of rivers, bayous, wetlands, and groundwater systems ultimately draining to the Gulf Coast. Because these systems transcend political boundaries, water management challenges must be addressed through organized, watershed-based planning. Created in response to the historic 2016 floods, LWI promotes a science-based approach that enables communities to better understand regional hydrology and implement solutions that account for both upstream and downstream impacts.

A central organizing framework of the Region 4 plan is the "Seven Spokes of the Wheel," which identifies key regional priorities: managing floodwaters; retaining, generating, and utilizing clean water; integrating economic development with watershed initiatives; reducing repetitive flood loss in residential areas; expanding outdoor recreational opportunities; protecting and recharging the Chicot Aquifer; and preserving and restoring coastal ecosystems. Together, these priorities represent a comprehensive approach that balances environmental sustainability, economic growth, and community needs.

This plan also identifies strategic capital improvement opportunities to reduce flood risk and improve water management. A cornerstone initiative is the development of a series of retention reservoirs designed to store excess water, enhance water quality, and support multiple regional priorities, including flood mitigation, water supply, and economic development.

To support long-term implementation, the plan proposes the establishment of the West Louisiana Public Coordination District (WLPC), a regional entity designed to unify local governments and coordinate investments. Through this structure, the plan advances key initiatives such as modernizing drainage systems, expanding freshwater storage and management, improving transportation infrastructure, enabling resilient and insurable housing, and enhancing broadband and technological capacity. It also emphasizes workforce development through trades training, while promoting innovation in water treatment, energy generation, and technologies.

By aligning regional efforts and leveraging funding opportunities, the LWI Region 4 Comprehensive Plan positions the region to proactively address environmental challenges, strengthen economic competitiveness, and improve overall quality of life for our communities.

Guiding Regional Resilience Through Watershed Planning

Throughout the development of the Comprehensive Plan, the following elements were determined to be the priorities of local governments. A summary brief of each follows.

- A. Maintain Drainage Systems Throughout Jurisdiction.
- B. Build Freshwater Storage Capacity (Series Reservoirs)
- C. Transition Adjudicated Properties to Viable Economic Investments.
- D. Facilitate transportation improvements.
- E. Enable affordable, fortified, insurable housing in jurisdiction.
- F. Enhance technology speed, capacity and affordable networks.
- G. Economic development investment expansion.
- H. Research clean freshwater mechanisms
 - I. Management Technologies (MGO Connect prototypes)
 - J. Research power generation of water transfer
- K. Economic Technology Enterprise Centers (ETE)
- L. West Louisiana Hike and Bike Trail Development
- M. Regional Water Commodity Management
- N. West Louisiana Public Coordination District
- O. Trades Training
- P. Honoring trade professionals annually
- Q. Develop Public Fiber Network
- R. Accelerating Improvement Projects and Programs

A. Maintain Drainage System Network Throughout The District

Flood prevention is a well-practiced program if data and plans are communicated. Concurrent with information it is critically important for both the natural and manmade drainage network to be maintained. All stakeholders within a local jurisdiction should be aware of the drainage plan, the drainage system and the qualifying and quantifying maintenance of the network. Siltation, vegetation, and debris are mitigating factors for a functioning drainage plan.

In the “old days” the only reliable methodology for monitoring a drainage network was by physical site inspections. Blockages can occur anywhere in the natural and manmade drainage system within hours which negate the efficiency and effectiveness of local drainage networks. Installation of electronic water level gauges provides an early warning monitoring system for potential flood threats but does not mitigate the causes.

Proposed:

The West Louisiana Public Coordination (WLPC) District will institute drone technology to view and monitor the drainage network on a regular quarterly basis for impediments occurring naturally or manmade throughout the drainage system.

Funding alternatives to remove or mitigate impediments when and where located will be provided to the local governments for concurrence with the District.

B. Build Freshwater Storage Capacity

The LWI District 4 Watershed was initiated to study and develop strategies including modeling water flow to mitigate flooding. What has evolved is a critical awareness of a growing shortage of freshwater resources. All eleven Louisiana state aquifers are stressed and depleting. The aquifers are not being recharged naturally. Municipalities, agriculture, manufacturing, refining industries, and most recently a surging demand for data centers have pressed aquifers beyond their capacity limits.

Alternative freshwater resources must be planned, funded, and implemented throughout the Region 4 Watershed for current critical needs, relieving depletion of aquifers and programmed for projected future demand. The freshwater factor is a significant economic development challenge for the region. It cannot be resolved in a matter of months.

Proposed:

The West Louisiana Public Coordination (WLPC) District will plan and institute a Series of Retention Reservoirs the length of the Watershed within each parish for purposes of capturing, holding, cleaning and distributing freshwater when and where needed.

Funding for the Series of Retention Reservoirs will be secured through multiple sources including federal and state grants, front foot assessments, recreational assets but most importantly by providing freshwater as a commodity for sale to meet anticipated demands.

C. Transition Adjudicated Properties To Viable Economic Investments

One of the initial objectives of the LWI was mitigating repeat flooding housing and structures. The problem of repeat flooding varies from one area and parish to another. What emerged in the research and documentation analysis on housing was the simple abandonment, blighting, and prolific number of adjudicated properties within every municipality and parish. The state legislature has saddled local governments with an albatross of complex and conflicting requirements to excessively protect heirship to the detriment of neighborhoods and communities throughout the Region 4 Watershed. The adjudicated property cancer continues to expand while the legislature periodically applies technical mixers to stir the quagmire.

There are a couple of private companies that specialize in managing the problem for local jurisdictions. Unfortunately, private programs (cherry pick) select properties that might provide the best return to an investor/manager of the adjudicated property pending the 30-year redemption period. And, in most cases there is a cost to the local government for the benefits assumed. Until such time there is a legislative miracle and local governments must endure a growing and costly problem, the LWI Region 4 Comprehensive Plan has an alternative solution to benefit participating local jurisdictions.

Proposed:

The West Louisiana Public Coordination (WLPC) District will cooperate and coordinate with the regional Land Bank to secure intergovernmental agreements with local municipal and parish governments to:

- 1) Develop and manage an adjudicated property housing option for area citizens.
- 2) Refund local government monies un-collected from prior taxes and maintenance costs.
- 3) Reverse blighted neighborhoods.
- 4) Enhance property and sales tax collections.
- 5) Increase utilization of local public utilities.
- 6) Provide a “Maison Croft” (home investment rental) opportunity.

D. Facilitate Transportation Improvements

The Region 4 Watershed is crisscrossed by parish drainage networks (both natural and manmade) and by parish roads. Excessive rain events negatively affect the drainage system and impede the roadway network periodically. Bridges are a critical infrastructure link in the transportation grid, but so too are low lying roadways susceptible to flooding. Investment in durable and dependable bridges for industry, agriculture, commerce, emergency services (fire, law enforcement, ambulance, rescue, etc.), school buses, and automobiles are a prerequisite for local and regional economic development. Federal, state, regional and local resources should be regularly and routinely coordinated to leverage limited funding for common transportation infrastructure needs of the whole particularly for disaster experiences.

There is a myriad of grants, budgets, private as well as public funding accounts, and reserves accessible to municipal and parish governments and special districts to help facilitate transportation improvements. Tracking and monitoring the whole spectrum of financial support sources is a challenge that can provide opportunities and benefits for local governments particularly. The adage “Keep your eye on the ball.” might be rephrased to “Keep your eye on juggling balls.”

Proposed:

The West Louisiana Public Coordination (WLPC) District will plan and implement an inventory of bridges and low-lying roadway segments requiring remediation and maintenance documentation for application to multiple sources of funding available on the federal, state and local level both public and private.

Matching funds needed for a variety of transportation funding sources will be tracked to assist local parish and municipal governments with scheduling money timelines to apply for and secure available transportation financial opportunities to mitigate negative drainage and roadway system disasters.

E. Enable Construction Of Safe, Affordable, Fortified, And Insurable Housing Investments In Local Parish Jurisdictions

Disaster threats and occurrences are a common reality for everyone and everywhere regardless of your geographic location. The Louisiana Watershed Initiative (LWI) focused initially on mitigating repeat flooding housing for low to moderate income residents in the district. But the reality is much broader than just an excessive amount of water at any given time. Insurability of housing has become the new bell weather of need. When and how do housing opportunities materialize through informed decision making? A significant investment has been committed to the development of hydraulic and hydrologic drainage network modelling in LWI Region 4 and throughout the state.

Permitting new structures is based on potential flood threat reference to historic flood experiences. Science and technology help with informed decision making but affordability and insurability compound themselves into insurmountable challenges for citizens.

Proposed:

The West Louisiana Public Coordination (WLPC) District will cooperate and coordinate with parish school boards and trade associations for training and construction experience in building Pivot Houses (small super fortified housing units) capable of withstanding most natural and manmade threats. Creative financing and affordable insurance for an enduring investment is a time-honored tradition of home ownership and a primary objective of the program. Framed in best geography and topography for long term investment identifies most desirable and problem free land use. Ideally, the affordable fortified and insurable Pivot House program may additionally provide a “Maison Croft” (home investment rental) opportunity.

F. Enhance Technology Speed, Capacity, And Affordable Fiber Networks

Local parish and municipal jurisdictions help their respective constituencies by investing and building public utility infrastructure to benefit all citizens regardless of demographic status: sewer systems, water systems, drainage systems, electric systems, and street/road systems. Left to private enterprises to invest in commonly provided local public utilities might result in significant cost increases for local constituents. Communication utilities are strange, separated, and removed by the legislature which prohibits fiber optic development (planning, ownership, management, construction, etc.) by local parish and municipal governments.

The ultimate capacity of Fiber Optic infrastructure has yet to be determined and might be unlimited. The critical element in the revolution of communication technology is capacity, speed, and affordability of fiber optics. Education, health care, transportation, safety, recreation, and social media are in the process of revolutionizing the economy of national, state, regional and local services, and operations (both public and private). Without public investment in fiber optics, need for other public utilities may not be necessary in long run. How to level the playing field regardless of rural, urban, or suburban communities is the primary and most critical need of parish government going forward.

Proposed:

The West Louisiana Public Coordination (WLPC) District will plan and facilitate public fiber investment in primary and secondary areas of urban, suburban, and strategic rural areas of the region. Research and development throughout the Region 4 Watershed involve multiple investment avenues affecting multiple levels of interest and need for viable economic growth and quality of life objectives.

Funding for enhanced fiber optic speed, capacity, and affordable fiber optic networks is planned and proposed through establishment of specific geographic technology districts supported by both public and private resources for research and economic development.

G. Economic Development Investment Expansion

In economic development circles there are four angles of review for a region: Identification of Strengths, Weaknesses, Opportunities and Threats (SWOT). The Louisiana Watershed Initiative for Region 4 establishes a critical mass to address all four components of economic development. Too much water, not enough water, where to store water, how to use water, where to go with water, how to channel water, how to save water, etc. all consolidate in economic development planning and implementation. Water is a strength for the region. Water is a weakness for the region. Water is an opportunity for the region. Water is a threat for the region. The purpose of the Region 4 Watershed Comprehensive Plan is to identify water properties under the SWOT analysis and coordinate municipal and parish governments for the benefit of the whole. Duplicity is the bane of efficiency. Is there a practical reason for a single parish to have a multiplicity of drainage districts? One parish in the region has more than ten with five members for each board, ten engineers, ten attorneys and ten accountants. Many of the drainage concerns, problems, and solutions to drainage systems cross parish boundaries upstream and downstream.

Organization, coordination, cooperation, consensus, and leveraging scarce resources is a high priority over the next short-term ten to twenty years. Public dollars should be planned, programmed and applied for maximum cost/benefits. The pragmatic strategy for developing fresh water as an economic driver in the watershed is a comprehensive plan involving all stakeholders and a mechanism for implementation.

Proposed:

The West Louisiana Public Coordination (WLPC) District will review all drainage districts within the Region 4 Watershed for purpose, functionality and integration with the freshwater commodity needs of the nine parishes. A SWOT Analysis of freshwater in economic growth and quality of life are the core objectives of the comprehensive plan and are applied regularly for implementation

Funding for a review of drainage districts and freshwater SWOT Analysis is planned and proposed through intergovernmental and cooperative agreements among the independent drainage districts in Region 4 and additional public and private grant resources.

H. Research Clean Freshwater Mechanisms

Securing and processing freshwater is an on-going activity by all levels of government. There is a list of research specialists even in the state of Louisiana including the Water Resources Research Institute at LSU, the Institute for Coastal & Water Research at UL, the Water Institute (private), the Water Resources Development Program at DOTD, the Water Resources of Louisiana Parishes at the United States Geological Society (USGS) and the Louisiana Watershed Initiative. In the day to day and month to month process of cleaning water for consumption or manufacturing, most local governments rely on chemicals. Harnessing excessive amounts of water is the challenge of the Region 4 Watershed. The current strategy of moving excess water to the Gulf as soon as possible is outdated and counter-productive based on projected future needs. Freshwater is a gold commodity asset and should be managed cooperatively.

Research around the world is aggressively exploring natural and manmade techniques to clean water (or generate water). A platform exists for Western Louisiana to enter the water seeking, cleaning and storing challenges that are confronting a very thirsty world. Chemicals, vegetation, processes, natural and manmade filtering should be a priority objective and research function of the Region 4 Watershed with a multitude of planned retention reservoirs programmed in the comprehensive plan.

Proposed:

The West Louisiana Public Coordination (WLPC) District will partner with state water research schools and entities (federal and state) cooperating to advance and facilitate clean water processes throughout the Region 4 Watershed. Each constructed retention reservoir will be designated for one or more specific water quality research efforts.

Funding for clean water research should be secured from both public and private resources. The West Louisiana Public Coordination (WLPC) District shall seek grants for specialized testing and analyzing of data and reporting results for international evaluation.

I. Management Technologies (MGO Connect Prototypes)

The challenge for local governments in Region 4 is an adequate capacity to leverage limited personnel for multi-tasked responsibilities. Technology is rapidly accelerating individual and entity productivity. The key sea change and opportunity going forward in the process is a common partnership among local governments for specialized services. MGO Connect was developed in Houma, Louisiana under the auspices of the South Central Planning and Development Commission (a quasi-public entity) working to assist local governments with building inspections and permitting services. MGO Connect has continued to expand over the past twenty years. Participating jurisdictions are now located in over 27 states of the union between California and Florida. The cost of participation is minimal with maximum benefits. Large cities and small municipalities are working together to improve the service delivery system needed by every local government.

MGO Connect is expanding and enhancing local governmental services into a broader spectrum of membership needs including Public Works and Neighborhood Development. There are three, maybe four local governments in the LWI Region 4 Watershed participating in MGO Connect. The program, strategies, and cooperative structure of MGO Connect is a watershed (no pun intended) opportunity to more effectively provide local constituents with public services as needed and in the most cost affective way possible. Combined with the Region 4 Comprehensive Plan, MGO Connect is a secure path for implementation of regional and local objectives.

Proposed:

The West Louisiana Public Coordination (WLPC) District will collaborate with MGO Connect and facilitate local government participation throughout Region 4. The Region 4 Technical Advisory Committee (TAC) and Coalition Policy Council (CPC) are instrumental in supporting and directing partnership with MGO Connect and local governments.

Funding for MGO Connect on any number of formats and purposes does not generally entail upfront funding but is applied affordably over time through membership services as needed. MGO Connect is a self-sustaining and self-invested cooperative.

J. Research Power Generation of Water Transfer

One Louisiana municipality secured an allocation of freshwater in a reservoir designed, funded, built and maintained by the state in the 1960s. Fifty years have passed and now the municipality has need of the reservoir water allocation. The distance between the lake and the municipality is 28 miles. The estimated cost to construct a pipeline was \$30 million. The municipality is still working to determine where money might be sourced to undertake the water pipeline connection. The LWI Region 4 Comprehensive Plan has focused on an initial series of fifteen reservoirs across the length of Western Louisiana to capture and retain excess water for future use and demand. Transporting reservoir water north and south (and east and west) when and where needed is a powerful challenge. The Romans built aqueducts because water does flow downhill. But how do you move water uphill? Pumps perhaps. There is the question of an economical power source to operate pumps that is directly related to volume and capacity needed.

Two years ago, Beauregard Parish experienced a 2-month forest fire battle that was fought with all available local water resources. Amazon recently announced investment in data centers in the Shreveport Bossier area that will likely require extraordinary amounts of fresh water. Texas is negotiating on the need for Toledo Bend water. The necessity to capture excess water when opportunity arises is followed by how best to move water when and where needed and the power sources to accomplish that essential.

Proposed:

The West Louisiana Public Coordination (WLPC) District will continuously evaluate power generating research around the world. Artificial Intelligence (AI) has dramatically improved “state of the art” information globally. Each designated retention reservoir will be assigned

a specific power generator pilot research project combined with pump technology for the purpose of moving water around the Region 4 Watershed for agriculture, data centers, water systems, manufacturing, firefighting, and commodity sales.

Funding for research in power generation water transfer will be secured in conjunction with academic institutions, private foundations, public and private energy cooperatives, and state and federal grants.

K. Economic Technology Enterprise (ETE) Centers

Economic Development, as it may be defined, is a critical element in any Comprehensive Plan and no less so for the LWI Region 4 District. Business and industry access to the fastest, highest volume, and most affordable internet services is a fundamental prerequisite for viable commerce in any geographic location: rural, urban, or suburban. It is especially important for small businesses and startups. The research component of Region 4 prompts the need for the best and most affordable internet services possible. Provision for exceptional water research management internet services is the building of Economic Technology Enterprise (ETE) Centers capable of delivering small business, start-ups, and research operations with competitive (and affordable) communications.

River gauges, water quality, and siltation are mechanisms requiring state of the art monitoring and management of water resources throughout the region. Research applications affecting water apparatuses must be supported if there are to be economic outgrowths for the local and regional economy.

The Economic Technology Enterprise (ETE) Centers provide the essential three elements for increasing economic development by providing a facility focused on internet speed, volume and affordability that is available to any local entity requiring business or research services.

Proposed:

The West Louisiana Public Coordination (WLPC) District will invest in ten Economic Technology Enterprise (ETE) Centers providing a minimum of one in each of the nine LWI District 4 parishes. The ETE Centers do not compete with private enterprise but rather facilitate private entrepreneurial opportunities for competition while augmenting public water research.

Funding for local parish ETE Centers is generated by both public and private investment through Center membership and utilization fees. Public resources may be provided by local governments and the WLPC District to expedite private investment. Federal, state and private grants are additional anticipated funding prospects.

L. West Louisiana “Neutral Territory” Hike and Bike Trail Development

The State of Louisiana has a statewide hike and bike plan established through the Louisiana Department of Culture, Recreation, and Tourism in conjunction with the

Louisiana Department of Transportation and Development. Private and public resources have been tapped to implement various segments of the statewide plan with notable results in specific cases. Tammany Trace on the Northshore is a great successful example of local investment in trail development in Louisiana. But, for statewide, regional and local perspectives there is a major fragmentation factor among responsible jurisdictions. Comparable to creeks, coulee, bayous and rivers, the responsibilities for management of a state plan are splintered among a variety of stakeholders. There are, also, private national hike and bike associations that have developed their own recommended cross country trail networks including Louisiana.

The LWI Region 4 Comprehensive Plan incorporates a local parish and municipal hike and bike trail routes across the region into a unified whole for a systematic and connected management and implementation program. The Series Retention Reservoirs plan provides destinations and continuity to integrate a viable hike and bike network for enhanced recreational prospects the length of Western Louisiana. Coordination and cooperation built on a consensus framework of trail design and implementation are a critical key element in the watershed. Utilizing both natural and manmade water resources to leverage and attract discretionary hikers and bikers is the objective.

Proposed:

The West Louisiana Public Coordination (WLPC) District will adopt hike and bike design plans, development strategies (including safety), maintenance and marketing programs comprehensively for the West Louisiana “Neutral Territory” Hike and Bike Trail as an integral part of the LWI Watershed Plan.

Funding for the West Louisiana “Neutral Territory” Hike and Bike Trail network will be secured through both public and private resources as has been historically provided, but also new resources to accelerate implementation.

M. Regional Water Commodity Management

The first most important piece of the LWI Region 4 Comprehensive Plan is capturing and managing an overabundance of water when it occurs naturally. The second most important piece of the LWI Region 4 Comprehensive Plan is securing and cleaning collected freshwater for sale as a valued commodity. The Series Retention Reservoirs are planned to play a significant role in the freshwater management process. There does not exist an army of elves to program and administer a water retention reservoir network. The Series Retention Reservoirs provide storage and cleaning in water quality. It is the sale and distribution of freshwater that requires 24/7 marketing and administration for value.

The Retention Reservoirs identified in the Comprehensive Plan are situated in all nine parishes of the West Louisiana Region. Operating as a cohesive network will provide organized consistency leveraged for an optimum return on investment for the local government as well as the region. The unifying administration for the watershed cohesive freshwater endeavor is the West Louisiana Public Coordination District. Functioning with

and through intergovernmental agreements among local parishes and municipalities, the WLPC is administrator of freshwater marketing and distribution for benefit of local governments first and outside entities second. Freshwater is the financial commodity backbone of the LWI Region 4 Watershed over the long-term.

Proposed:

The West Louisiana Public Coordination (WLPC) District will plan and facilitate public fiber investment in primary and secondary areas of urban, suburban, and strategic rural areas of the region. Research and development throughout the Region 4 Watershed involve multiple investment avenues affecting multiple levels of interest and need for viable economic growth and quality of life objectives.

Funding for managing, sustaining, marketing and distributing freshwater of the Series Retention Reservoirs will be dependent on the resources of the West Louisiana Public Coordination District as it is established and agreed to by local participating government stakeholders.

N. West Louisiana Public Coordination District

The LWI Region 4 Initial Steering Committee (first three years) identified establishment of a governmental entity with powers to operate as any local government subdivision of the state including ability to propose and adopt taxes to support its purpose and operations as a central objective. The succeeding Coalition Policy Council (CPC) reaffirmed the Steering Committee intention and has incorporated the regional governmental objective in the LWI Region 4 Comprehensive Plan. Several LWI Watershed Districts in the state have accomplished through the Louisiana Legislature authority to establish Regional Watershed District entities, but with different qualifications.

The proposed West Louisiana Public Coordination District (WLPC) is framed on Bylaws, Policies and Procedures adopted by the LWI Region 4 Coalition Policy Council including representation. Otherwise, the draft legislation generally replicates previous watershed district authorities enabled by the Louisiana Legislature with a few specific exceptions.

Proposed:

The West Louisiana Public Coordination (WLPC) District is proposed as a regional subdivision of the state government with the authority to propose and adopt taxes to fund operations and infrastructure as determined needed and appropriate to its purpose. The West Louisiana Public Coordination District shall prioritize securing private resources to support its operations and infrastructure including but not limited to freshwater sales and linear front foot assessments along planned retention reservoirs as may be planned and developed by the West Louisiana Public Coordination District. The boundaries of the West Louisiana Public Coordination District shall generally follow those set by the Louisiana Watershed Initiative with modifications as may be determined among participating governments.

O. Trades Training

Implementation of the LWI Region 4 Comprehensive Plan is built on the capacity of local and regional resources to support infrastructure improvements and execute relevant priority plans and programs. One of the real issues discussed and noted in plan preparation was a critical shortage of professional trades construction specialists throughout the region. Fifty years ago, every high school included “industrial arts” curriculums for students not intending to go to college. Today it is rare for trades training instruction in high schools. Watershed infrastructure requires more than hydraulic modelers, planners, and engineers. Fortified housing and other essential structures require a corps of carpenters, electricians, plumbers, welders, painters, landscapers, surveyors, and heavy machine earth-moving operators.

The LWI Region 4 Comprehensive Plan includes a new initiative in cooperation with area school boards and technical schools to reverse a negative perception of trade professionals not being a “high calling”. The reality for professional trades specialist can in fact be a very rewarding and profitable career path. Parents need to know and potential students need to know the opportunities and needs for trade professionals. Perception and desirability are one thing and opportunity is another. Local school systems should coordinate and enhance availability of “industrial arts” curriculums. Not all parish school systems can afford the offering.

Proposed:

The West Louisiana Public Coordination (WLPC) District will work in cooperation and coordination with parish school boards and technical colleges to share and provide common facilities for trade training operations throughout the Region 4 Watershed. Commuting challenges for students will be factored into the curriculum network.

Funding for implementing a trade training initiative and sustaining it is proposed to be an intergovernmental partnership between and among the respective schools and the West Louisiana Public Coordination District. Private corporate sponsors would be solicited.

P. Recognizing and Honoring Trade Professionals Annually

Key players in implementation of infrastructure improvements identified in the Watershed Region 4 Comprehensive Plan are specific trade construction professionals. Even with “nature-based solution” alternatives the value professional construction practitioners bring to the field are often overlooked and under-recognized for their contributions. Trade trainers both in schools and informally out in the field of experience often lament a lack of recognition for their work by anyone but themselves. The status quo must be changed. Perception and reality should come together cooperatively and coordinated with professional trade associations throughout the LWI Region 4 Watershed district to identify and honor the best skill sets and expertise for individuals in their respective fields of construction specialty.

Spillways, vegetation, trails, pipelines, pumps, fortified structures, docks, power generation and distribution, lighting, levees, bulkheads, sewer systems, and water filters are samples of the trade professionals needed for the LWI Region 4 Comprehensive Plan implementation. The builders and maintainers of the infrastructure for water management should be recognized for their expertise and contribution to the program.

Proposed:

The West Louisiana Public Coordination (WLPC) District will coordinate and cooperate with each of the identified trade associations in the region to select and award the most proficient associates within their respective areas of expertise. An annual professional trades recognition banquet will be held in a central regional location and hosted by the West Louisiana Public Coordination (WLPC) District. Each awardee and their immediate family and friends will be invited to the award banquet at no cost. Each awardee will be highlighted and honored for their proficiency and achievement in their profession by their peers and benefits their work provides the region.

Funding for the Annual Professional Trades Recognition Banquet will be secured through public and private donations and the West Louisiana Public Coordination (WLPC) District.

Q. Develop Public Fiber Optic Network

The term broadband is often used when there is discussion about the internet. The core communication infrastructure is centered on fiber optics which to date have no known capacity limitation. Wireless communication has limitations. Fiber optic towers provide for wireless cell phones. Artificial Intelligence (AI) is the future. Local governments should be allowed to invest in their communities with local public fiber optic networks similarly to water, sewer, electrical and drainage infrastructure and operations. Fiber optics is another service for constituents to lower cost and feather economic development. A small village or large city could build one of two types of fiber optic systems: 1) a closed network in which the local government specifies a specific level of speed, capacity and cost contracted to a private operator or 2) an open network where any number of private operators contract to utilize the local public fiber optic system. There are advantages to either preference type without local government having to be responsible for services. The two types of public fiber optic alternative investments are implemented all over the United States to the benefit of private operators who do not have to invest in costly infrastructure and provides competition to benefit constituents.

Currently, Louisiana does not allow local governments to invest in fiber optics. AI can hopefully change that restriction imposed by lawmakers and lift that limitation for the betterment of local government. Fiber optics is simply another utility that is critically essential. Local governments should and must be permitted public investment services as provided for other utilities such as potable water, sewer, electrical, drainage, etc. The viability of community development will be increasingly tied to internet communications capacity and most importantly: affordability.

Proposed:

The West Louisiana Public Coordination (WLPC) District will facilitate, coordinate and cooperate with each local participating government to advance public community development in public fiber optic enhancement opportunities for the watershed region. The communication technology demands across a broad spectrum of community institutions and services education, utilities, health care, flood mitigation, economic development) is a certainty. Organizing and preparing for the best public investment in public fiber optic opportunities should not be casual or delayed.

Funding for the development of public fiber optic networks in Region 4 are generated primarily by local governments working individually or in cooperation utilizing self-generated revenues to support economic development. The West Louisiana Public Coordination (WLPC) District would help facilitate public and private resources through grants for public fiber deployment.

R. Accelerating Improvement Projects and Programs

Most elected officials and public administrators recognize there is an extraordinary amount of time required for any public improvement projects or programs due to checks and balances built into the democratic system of governance. Private business enterprises analyze data and cost/benefits for profit and then proceed in a comparatively short period of time with a decision to start or not. Their delay frustrations are usually tied to the government inspection and permitting processes. Local government and private enterprises must work together to protect the common good and market incentives needed for economic growth. The driving forces for each (government and private enterprise) are essentially opposite. Channeling through tiers of regulatory hurdles (usually established in response to previous problems) requires time and resources that test the best individuals. Managing and navigating routine a labyrinth of procedural steps with each step taking days and weeks generates exasperation particularly for private enterprises accustomed to quick actions (time is money). Processing government inspections and permitting would presume equal practice. It does not. Series Retention Reservoirs will not be constructed rapidly unless subjected to a national emergency. Freshwater demand may be the catalyst to spearhead technology advancement for economic development. The LWI Region 4 Comprehensive Plan must focus relevancy on the most advanced procedural steps providing quick turnarounds on improvement project inspections and permitting practices by local and state governments. Drones may or may not facilitate field and site location inspections. But testing and research can converge to create new pragmatic systems and procedures. The Series Retention Reservoirs and drainage waterway maintenance program implementation afford experimentation and expeditious processing advances.

Proposed:

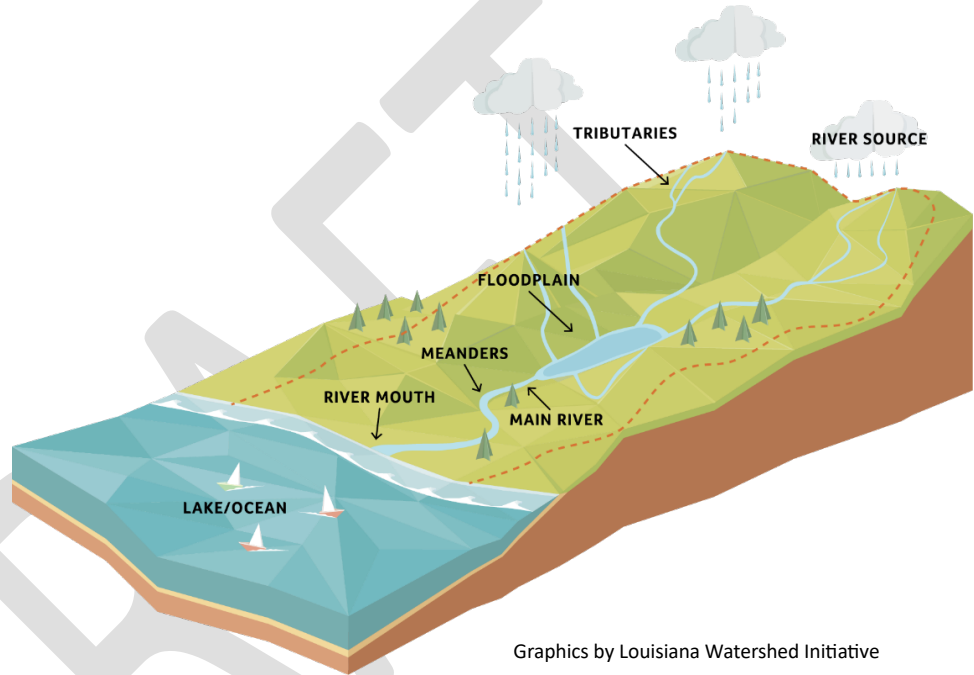
The West Louisiana Public Coordination (WLPC) District will facilitate, coordinate and cooperate with each local participating government to review and evaluate existing procedural steps for infrastructure inspections and maintenance operations with objective

to expedite process and at the same time assure safety purposes. AI technology combined with drone accessibility is a primary emphasis of this objective.

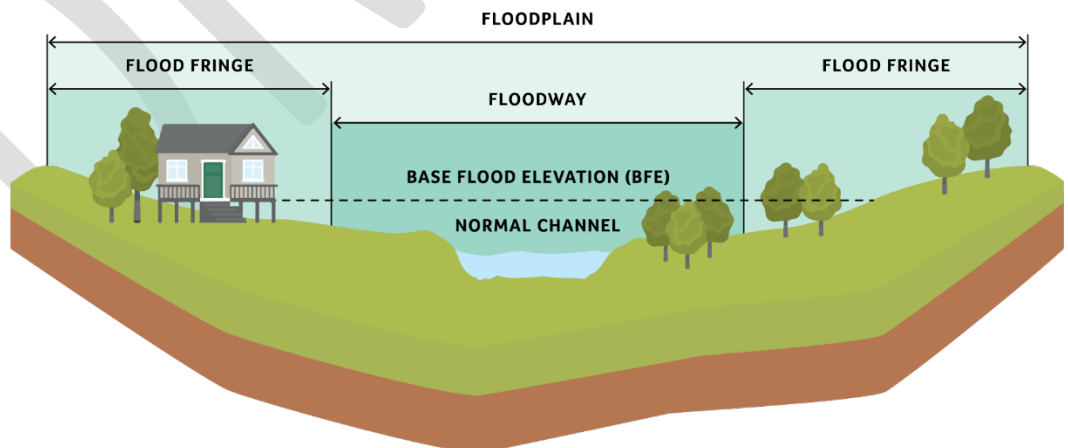
Funding for development of an accelerated process to inspect and permit improvements throughout the LWI Region 4 Watershed will be provided by the West Louisiana Public Coordination (WLPC) District with coordination and intergovernmental agreements with local governments.

Watershed Planning Context: Understanding Watersheds and Floodplains

A **watershed** is an area of land which drains rainwater into a common outlet, such as a river, bayou, lake, or ocean. Watersheds naturally cross political and property boundaries, connecting parishes, communities, and ecosystems through shared water flow and are often shaped through elevation.



A **floodplain** is the flat or low-lying land adjacent to rivers, bayous, lakes, and other water bodies that is naturally subject to flooding. These areas temporarily hold excess water during heavy rainfall or high river stages, helping to reduce the intensity of downstream flooding. While floodplains play a vital role in managing water and supporting ecosystems, they are also point of flatter elevation where people often live, work, and build.



What is the Louisiana Watershed Initiative (LWI)

In 2016, widespread flooding across Louisiana revealed major weaknesses in how the state managed its floodplains, leading to a reevaluation of how Louisiana prepares for future flood events. Following a review of innovative approaches, the Louisiana Watershed Initiative (LWI) was created through an executive order.

LWI is managed and led by the Council on Watershed Management which includes the Secretaries and Executive Directors of the Office of Community Development (OCD), the Department of Transportation and Development (DOTD), the Coastal Protection and Restoration Authority (CPRA), the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP), and the Louisiana Department of Wildlife and Fisheries (LDWF).

The LWI program is unique in its approach to flood mitigation and management by using a science-based framework that aligns with natural watershed boundaries, rather than arbitrary political lines. Floodwaters do not respect city, parish, or state borders and neither should our flood management strategies. By organizing efforts around watersheds, LWI promotes a more holistic and effective response to flooding. Research has shown that upstream communities, which may rarely experience flooding themselves, can still significantly influence downstream flood risk. This underscores the importance of coordinated regional solutions that consider the full dynamics of water flow across the landscape.

In 2019, the Council on Watershed Management established the Watershed regions which led to the establishment of nine (9) designated LWI Watershed Regions across the state. These regions were dictated through watershed and waterflow boundaries and were meant to bring together the local municipalities and parish governments overlapping within each region.

The Western Watershed: Region 4

In 2019, the State of Louisiana was divided into nine (9) watershed regions as part of a broader effort to implement watershed-based planning and management. Region 4 encompasses the western portion of the state and includes nine parishes:

- A – DE SOTO
- B – SABINE
- C – VERNON
- D – RAPIDES
- E – BEAUREGARD
- F – ALLEN
- G – CALCASIEU
- H – JEFFERSON DAVIS
- I – CAMERON



Since inception, the Louisiana Office of Community Development (OCD) provided funding to each watershed region to build the organizational capacity necessary to manage the program effectively. Each region was required to designate a fiscal agent to oversee funding, administration, and the broader capacity-building process.

In Region 4, the participating parishes designated the Southwest Louisiana Regional Planning Commission (SWLA-RPC) as the fiscal agent and organizing body. In this role, SWLA-RPC supports regional collaboration, facilitates planning efforts, and assists with the development of projects and funding opportunities related to watershed management and flood resilience.

Leading Region 4: Governance Structure

To guide watershed planning efforts, Region 4 established a governance structure consisting of two primary bodies:

The **Coalition Policy Council (CPC)** provides policy leadership for the Region 4 watershed coalition. The council is composed of representatives from each of the nine participating parishes. Members of the CPC help establish regional priorities, guide planning efforts, and coordinate collaboration among local governments.

The **Technical Advisory Committee (TAC)** provides technical guidance to support watershed planning within the region. The committee includes planners, engineers, environmental specialists, and other subject matter experts who assist with data analysis, mapping, and project evaluation.

Together, the CPC and TAC support a coordinated regional approach to addressing flood risk, water management, and long-term resilience across the Western Watershed.

Flood Risk Profile Within Region 4

Flooding presents one of the most significant natural hazards affecting communities across Region 4. The region's landscape, climate, and hydrologic systems combine to create a complex flood risk environment that includes coastal surge, heavy rainfall events, river flooding, and localized drainage challenges.

Understanding the types of flood risks present in the region is essential for developing effective mitigation strategies and guiding future infrastructure investments. Flood events in Region 4 may originate from several different sources, including tropical storms, prolonged rainfall, river overflow, and coastal storm surge.

In many cases, these flood drivers occur simultaneously or compound one another, increasing the severity and geographic extent of flood impacts. Because of this complexity, a watershed-based planning approach is critical for identifying regional vulnerabilities and coordinating mitigation strategies.

The following sections describe the primary types of flooding that affect Region 4 and highlight key data sources used to assess regional flood risk.

Types of Flood Risks Affecting Region 4

Flooding within Region 4 can occur through several mechanisms. While each type of flood has unique causes, they often interact with one another and contribute to broader regional flood events.

Coastal flooding occurs when storm surges and elevated tides push seawater inland during tropical storms or hurricanes. Communities located along the Gulf Coast, particularly within Cameron Parish and surrounding coastal areas, are especially vulnerable to coastal surge events.

Storm surge can raise water levels several feet above normal sea level, resulting in widespread inundation of coastal lands, infrastructure, and communities. The severity of surge flooding depends on factors such as storm intensity, storm track, coastal elevation, and tidal conditions.

Rainfall-Induced flooding is a frequent driver of flooding in Louisiana. The state receives some of the highest annual rainfall totals in the United States, and intense storm systems can produce large volumes of precipitation over short periods of time.

When rainfall exceeds the capacity of natural drainage systems and built infrastructure, surface water accumulates and floods low-lying areas. Tropical systems and severe thunderstorms often produce these types of events.

Because the landscape of Region 4 is relatively flat in many areas, water may move slowly across the landscape, prolonging flood conditions.

Fluvial flooding occurs when rivers and streams exceed their capacity and overflow their banks. This type of flooding is often associated with prolonged rainfall events that increase runoff across the watershed.

As tributaries feed larger rivers, water levels can rise rapidly and create widespread flooding along river corridors and adjacent floodplains. Rivers such as the Sabine River and Calcasieu River play an important role in regional flood dynamics.

Pluvial flooding occurs when rainfall overwhelms urban drainage systems, causing water to accumulate in streets, neighborhoods, and other developed areas. This type of flooding is common in urban environments where impervious surfaces such as roads and buildings prevent water from infiltrating into the ground.

Localized flash flooding can occur quickly during intense rainfall events, particularly in areas with limited drainage capacity.

Backwater flooding occurs when rising water levels in rivers, lakes, or coastal systems push water upstream into tributaries or drainage channels. This can cause flooding in areas that may not normally experience direct river overflow.

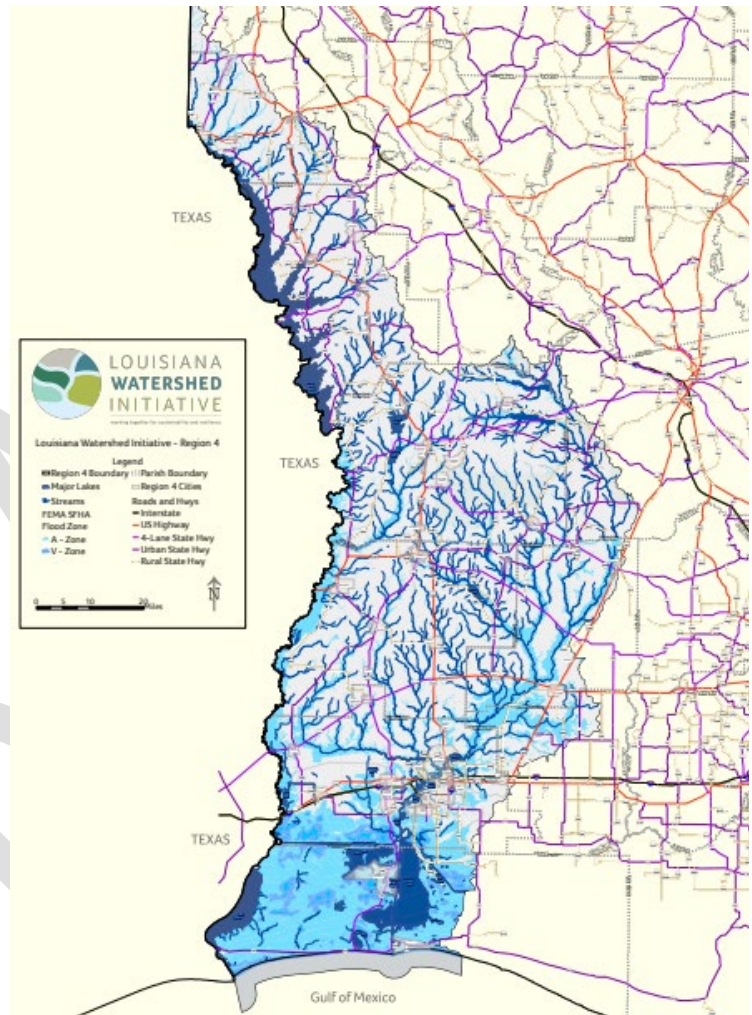
Backwater flooding is particularly difficult to predict because it may occur when water levels rise in adjacent systems or when drainage pathways become obstructed.

Region 4 Flood Risk Map

This map details a particular focus on flood zone delineations in Region 4 of the Louisiana Watershed Initiative. It distinctly outlines the areas within the Special Flood Hazard Areas (SFHA). These zones are indicated in a shade contrasting with the non-flood zones, visually highlighting regions at a higher risk for flooding.

The network of blue lines crisscrossing the map illustrates the intricate system of waterways, both natural and manmade, that traverse the region. Their proximity to the flood zones suggests the potential for these waterways to overflow their banks, contributing to the flood risk in adjacent areas.

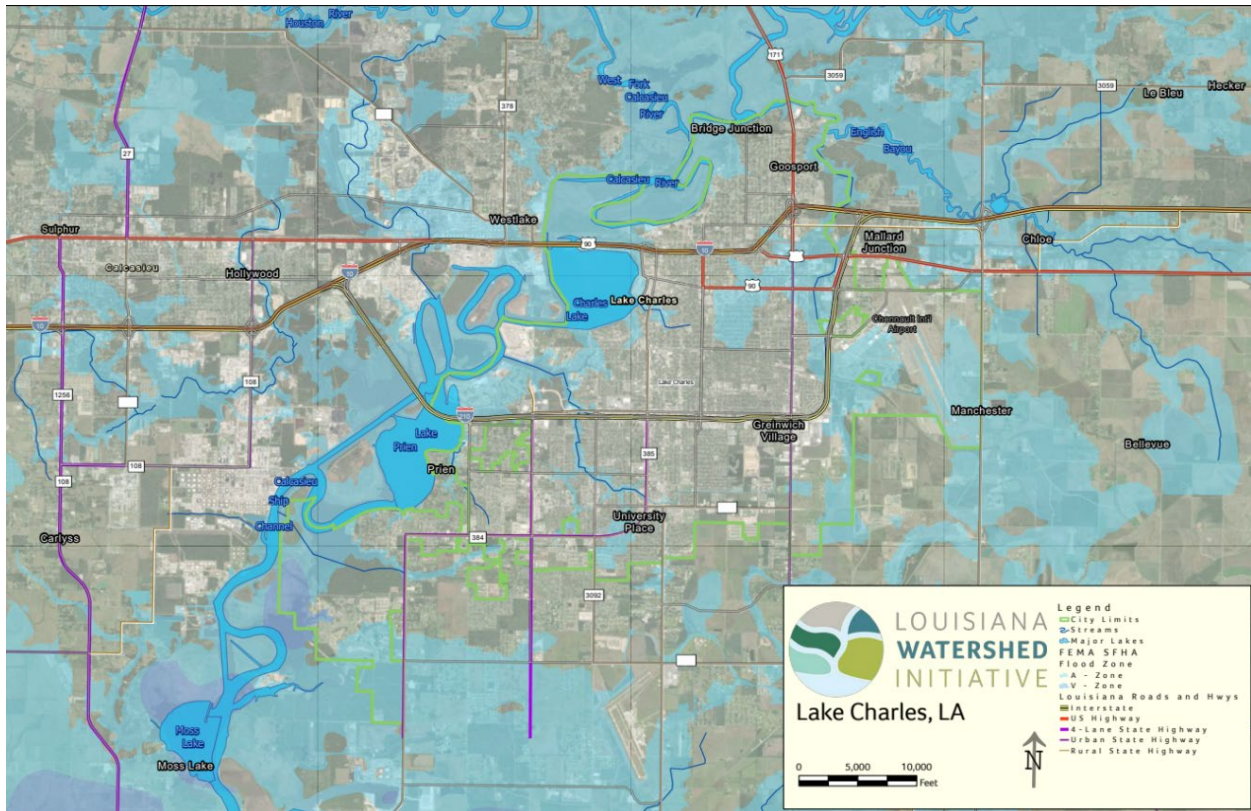
The map's detailed legend assists in distinguishing between the varying levels of infrastructure such as interstates, highways, and rural routes, all of which could be impacted by flood events. Urban areas are marked, providing context for the population centers that might be affected by flood conditions and the subsequent need for emergency response routes and evacuation planning.



The designation of A-Zones on the map is particularly noteworthy as these areas require careful management and planning due to their susceptibility to a one percent annual-chance flood event. The identification of these areas is crucial for urban planning, emergency preparedness, and infrastructure development, ensuring that flood risk mitigation is an integral part of the region's development strategy.

Lake Charles Detailed Flood Risk Map

The flood risk map of the City of Lake Charles map delineates the flood zones, designated as FEMA Special Flood Hazard Areas (SFHA), that are spread throughout the city. Shaded in a distinct blue, the zones are easily distinguishable from non-flood zones. These areas are of particular interest because they are subject to inundation by the base flood, which has a 1% chance of being equaled or exceeded in any given year.



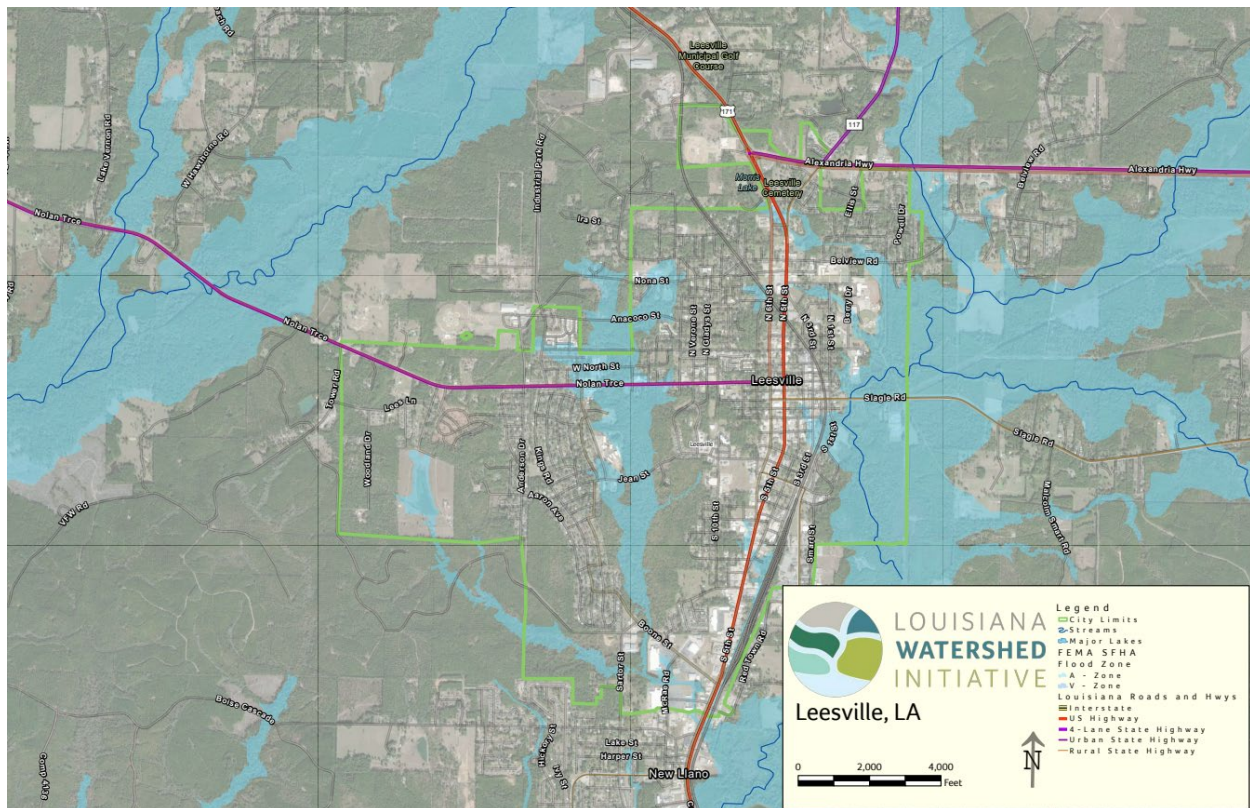
Various bodies of water, such as Prien Lake, Moss Lake, and the Calcasieu River, are prominently featured and are integral to the area's watershed. The proximity of these water bodies to the highlighted flood zones underscores their potential to contribute to flooding, especially during significant weather events.

The map also integrates a network of transportation routes, labeling interstates, US state highways, and rural state highways. These routes are crucial for planning both routine and emergency transit, especially considering their intersections with the SFHA zones. The potential impact on infrastructure during flood events becomes a key factor for emergency services, urban planning, and development.

Urban areas are outlined, signifying populated zones that may be impacted by flooding, which is vital for urban planners and disaster response units to prioritize areas for flood defense and evacuation routes. The detail provided in the map serves as an informative tool for the development of comprehensive flood risk mitigation strategies, balancing urban growth and infrastructure development with the realities of the region's flood risks.

Leesville Detailed Flood Risk Map

The map of Leesville in Vernon Parish emphasizes the delineation of flood-prone areas, specifically those designated as FEMA SFHA zones, which are highlighted in blue. These zones are indicative of land that has a higher likelihood of flooding, known as the 1% annual chance floodplain.



Central to the map is the town of Leesville, with the urban boundary distinctly outlined, showcasing its proximity to these flood zones. It is apparent that critical infrastructure and populated areas within Leesville could be at risk in the event of flooding. The presence of such zones within and around the town necessitates careful planning and management to protect property and ensure public safety.

Water bodies, likely creeks and tributaries, meander through and around the town, expanding into wider flood zones that suggest areas of potential water accumulation during heavy rainfall events. The blue expanses adjacent to the town serve as a visual reminder of the natural water flow paths that must be considered in urban development and emergency planning.

The map also details the various transportation routes, including interstates, US state highways, and rural state highways, in purple, red, and green respectively. These routes are integral to the region's connectivity and could serve as critical evacuation paths or as conduits for aid in times of flooding. Their intersections with flood zones are points of interest for infrastructure reinforcement and emergency response planning.

Logansport Detailed Flood Risk Map

The map illustrating the area surrounding the Town of Logansport in DeSoto Parish draws attention to the flood-prone zones within the area, designated by the FEMA SFHA classification and marked in various shades of blue. These delineated zones signal areas that have a 1% or greater chance of experiencing flooding annually, emphasizing the need for careful flood risk management.



Prominently featured is the town of Logansport, with its city limits clearly outlined. The map reveals that several flood zones intersect and border the town, suggesting that significant portions of the local population and infrastructure could be vulnerable to flood events. This proximity highlights the necessity for effective flood response strategies and infrastructure resilience planning.

To the northwest of Logansport, the Toledo Bend Reservoir stands out as a large body of water. Its presence near the town underscores its potential impact on local water levels and flood risks, especially during periods of heavy rain or overflow.

The map also details the transportation network, marked by interstates, US state highways, and rural state highways, color-coded in purple, red, and green lines. These thoroughfares are critical for connectivity and mobility, especially during emergencies. Where these routes meet or cross the SFHA zones, they become strategic points for emergency planning and potential reinforcement to maintain accessibility during flood conditions.

Mansfield Detailed Flood Risk Map

This map presents a segment of flood risk focusing on the Mansfield area, which is also located in DeSoto Parish. It highlights the FEMA Special Flood Hazard Areas (SFHA) within and around the city, depicted in various shades of blue. These are critical zones that have been identified to have a minimum of 1% annual chance of flooding and are therefore significant for flood risk management and urban planning efforts.



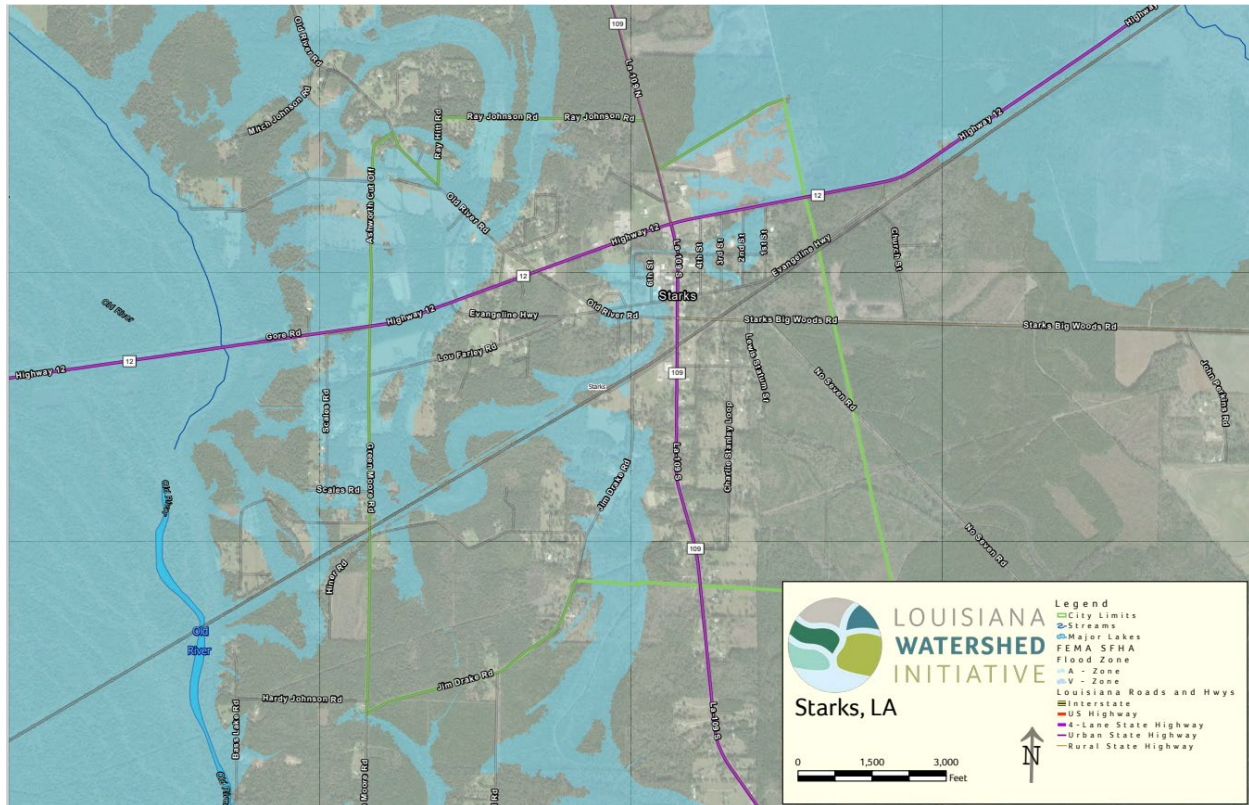
The urban boundaries of Mansfield and the adjacent South Mansfield are clearly delineated, allowing for the identification of residential and commercial areas that could be affected by flood events. The interlacing of SFHA zones within these boundaries illustrates the potential risk to infrastructure and the need for vigilant flood preparedness and mitigation measures in the community.

Watercourses, depicted in blue, can be seen meandering through the town. The proximity of these to populated areas underlines their influence on local flood risk. The presence of these water bodies necessitates careful consideration in municipal planning, particularly regarding stormwater management and emergency response strategies.

Key transportation routes are indicated in red and green, representing major highways and state roads, respectively. These routes are essential for daily commute and commercial activities and could play a pivotal role in evacuation and disaster relief operations during a flood incident.

Starks Detailed Flood Risk Map

This map provides a detailed view of the Starks area in Calcasieu Parish, with a focus on flood risk management, with Special Flood Hazard Areas (SFHA) designated by FEMA delineated in blue. These areas represent zones with a high risk for flooding, characterized by a 1% annual chance flood event, also known as the base flood.



The map shows that significant portions of the land surrounding Starks are within these high-risk flood zones, indicating potential for water inundation that must be factored into local planning and emergency management strategies. The widespread nature of these zones around Starks suggests a landscape that is intimately tied to the waterways, which can pose both challenges and considerations for development, conservation, and habitat protection.

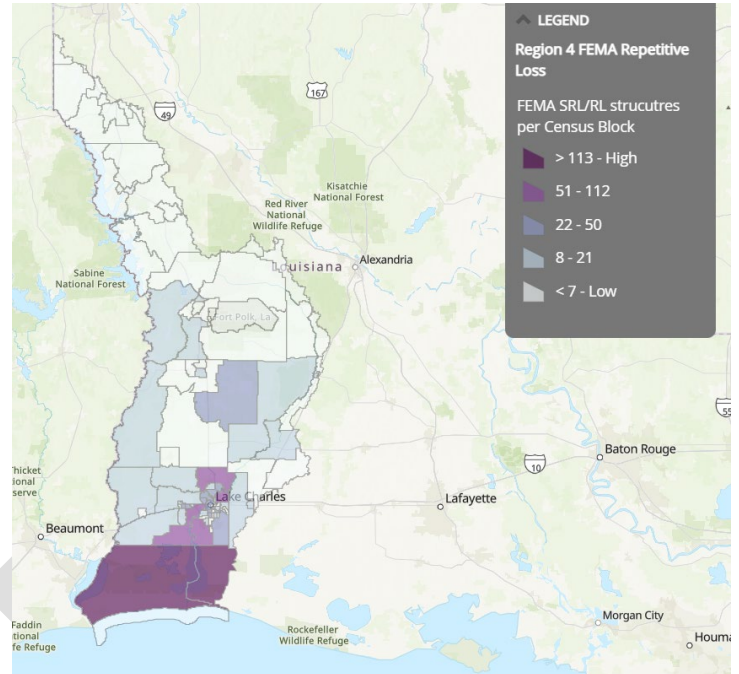
The town itself is intersected by a major transportation route, highlighted in purple, indicating an interstate highway. The intersection of this highway with the flood zones is critical, as it implies potential vulnerability to disruption during flood events, which is a vital consideration for disaster response and evacuation planning.

In addition to the interstate, various other roadways are mapped, including US state highways and rural state highways in red and green. These roads form the essential transportation network for the region and are key for ensuring mobility and access, particularly in times of flooding when route planning becomes essential for the safety of the local population.

Region 4 FEMA Repetitive Loss

This map of Region 4 indicates the distribution of repetitive loss (RL) and severe repetitive loss (SRL) structures, based on data per census block. These classifications from the National Flood Insurance Program (NFIP), indicate RL properties with at least two paid flood losses of more than \$1,000 each within any 10-year period since 1978, and SRL properties with either four or more claims of over \$5,000 each, or at least two claims that cumulatively exceed the property's market value.

The color-coded legend on the map shows the concentration of these structures, with darker shades indicating higher numbers of claims:



- **Dark Purple (> 113 claims):** Indicates areas with the highest concentration of SRL/RL properties. These are critical zones that have repeatedly experienced significant flood damage, highlighting an urgent need for mitigation measures to reduce the flood risk.
- **Medium Purple (51 - 112 claims):** Areas with a medium to high concentration of SRL/RL properties. These regions also represent significant flood risk and necessitate attention for flood damage reduction efforts.
- **Light Purple (22 - 50 claims):** These areas have a moderate number of SRL/RL properties, suggesting a considerable impact of flooding on these communities.
- **Light Grey (8 - 21 claims):** Represents areas with a lower concentration of SRL/RL properties, but still notable for the potential for recurring flood damage.
- **Very Light Grey (< 7 claims):** Indicates areas with the fewest SRL/RL properties, where flood risk is present but affects fewer properties.

From the data provided in the image, it appears the greatest concentration of SRL/RL structures is in the southernmost part of region 4, particularly around Lake Charles. This suggests that this area, more than others, has a history of flood-related challenges. It is imperative for planning and resource allocation to focus on these hotspots to implement risk reduction strategies and enhance community resilience.

Understanding the distribution and concentration of SRL/RL properties is crucial for regional planning. It allows for targeted interventions and supports decision-making processes for floodplain management practices, emergency preparedness, and infrastructure investment. It also underlines the importance of improving community understanding of flood risks, promoting insurance coverage, and developing robust hazard mitigation plans.

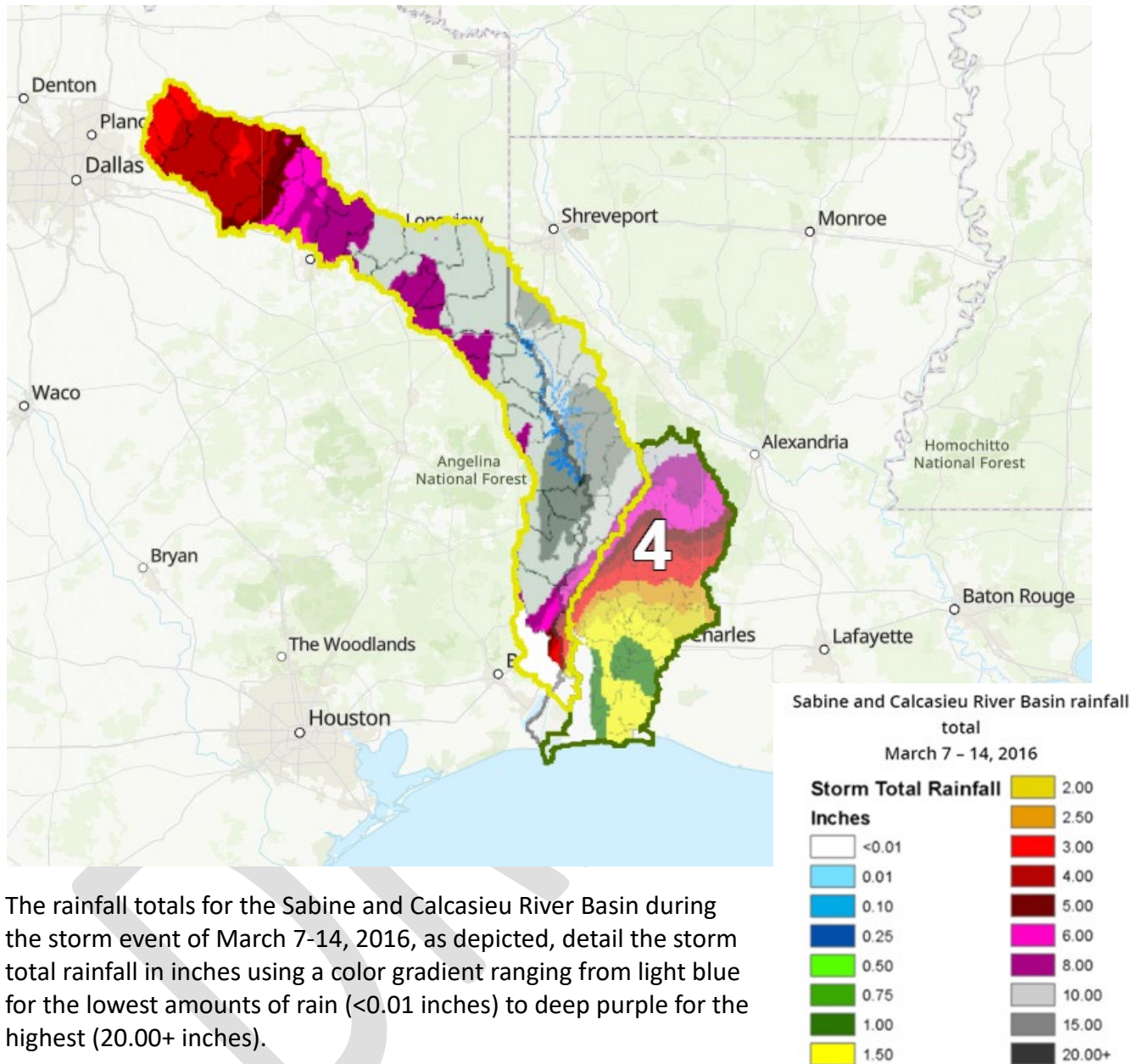
FEMA National Risk Index

The Federal Emergency Management Agency (FEMA) National Risk Index is a nationwide dataset developed by the to identify and compare natural hazard risk. The index evaluates these risks by combining several factors that measure potential losses, community vulnerability, and the ability to recover from disasters. The Expected Annual Loss (EAL) Value represents the estimated average annual economic loss from natural hazards such as flooding, hurricanes, and severe storms. Social Vulnerability measures how susceptible a population may be to harm based on demographic and socioeconomic factors such as income, age, housing, and access to transportation. Community Resilience reflects a community’s ability to prepare for, respond to, and recover from hazard events. The Community Resilience Factor (CRF) is a numerical value that adjusts overall risk based on resilience, where higher values generally indicate lower resilience and higher risk. The Risk Value represents the combined impact of expected losses, social vulnerability, and community resilience, and the Risk Index Score is the overall comparative score used to rank communities relative to one another, with higher scores indicating greater overall risk.

Rank	Community	State	EAL Value	Social Vulnerability	Community Resilience	CRF	Risk Value	Risk Index Score
1	Calcasieu Parish	LA	\$137,743,838	Relatively High	Relatively Low	1.16	\$159,546,984	96.91
2	Caddo Parish	LA	\$34,050,831	Very High	Relatively Moderate	1.26	\$42,798,068	89.6
3	Jefferson Davis Parish	LA	\$28,694,116	Very High	Relatively Low	1.3	\$37,280,257	88.45
4	Vernon Parish	LA	\$11,122,288	Relatively High	Very Low	1.27	\$14,093,872	73.31
5	Beauregard Parish	LA	\$10,625,695	Relatively Moderate	Relatively Low	1.22	\$13,000,048	71.84
6	Allen Parish	LA	\$8,029,654	Relatively High	Relatively Low	1.23	\$9,883,102	64.05
7	Sabine Parish	LA	\$6,860,647	Very High	Very Low	1.36	\$9,359,117	62.71
8	Cameron Parish	LA	\$7,436,447	Relatively Low	Very High	0.99	\$7,350,902	55.81
9	De Soto Parish	LA	\$4,893,298	Very High	Relatively Low	1.33	\$6,512,881	51.48

Based on the National Risk Index rankings, several parishes within the region show relatively high to very high social vulnerability combined with relatively low community resilience, resulting in elevated overall risk scores. Calcasieu Parish ranks highest in the region in overall risk value and risk index score, followed by Jefferson Davis, Vernon, Beauregard, and Allen Parishes, indicating significant exposure to flood-related and natural hazard risks. While some parishes show lower expected annual loss values, high social vulnerability and low resilience factors still contribute to elevated risk levels. These findings support the regional approach of Region 4, as flood risk, economic vulnerability, and infrastructure resilience are interconnected across parish boundaries and require coordinated planning and watershed management strategies to reduce long-term risk.

Region 4 Historic 2016 Rainfall Mapping Analysis



The rainfall totals for the Sabine and Calcasieu River Basin during the storm event of March 7-14, 2016, as depicted, detail the storm total rainfall in inches using a color gradient ranging from light blue for the lowest amounts of rain (<0.01 inches) to deep purple for the highest (20.00+ inches).

As shown above, the storm affected a substantial portion of the region, with rainfall totals increasing from north to south. The second and third images show a more detailed regional map with the number 4, indicating Region 4 of the Louisiana Watershed Initiative, which has been heavily affected by this storm event.

The most intense rainfall, as indicated by the deep purple and red shading, occurred within the central portion of Region 4, encompassing Lake Charles and its surrounding areas. These areas experienced more than 20 inches of rain, which is a significant amount likely to cause extensive flooding, especially in areas that are already prone to repetitive loss and severe repetitive loss due to flooding.

The historic rainfall of the 2016 events show a gradient of rainfall intensity, with the highest totals concentrated in a band that appears to follow the path of the Sabine and Calcasieu rivers. This data is crucial for understanding the flood risk profile of the region, as areas with the highest rainfall totals are often more susceptible to flooding, especially if they also coincide with regions that have a high number of repetitive loss properties.

Natural Systems and Environmental Conditions

The natural landscape of Region 4 plays a critical role in shaping how water moves through the watershed. Rivers, wetlands, coastal marshes, vegetation systems, and groundwater resources all influence flood behavior, water quality, and ecological health.

These natural systems function as an important component of the region's water management framework. Wetlands and marshes store and slow floodwater, vegetation stabilizes soils and reduces erosion, and groundwater systems provide critical freshwater resources for agriculture, industry, and communities.

Understanding the condition and distribution of these systems helps inform regional watershed planning and supports strategies that work with natural processes to improve resilience.

The following sections highlight several environmental features that influence flood risk and water management across Region 4.

Region 4 Wetlands

The following series of images demonstrates the natural flood mitigation role played by wetlands in Region 4, showcasing how wetlands within this area function as essential components of the watershed. They highlight the spatial distribution of wetlands, particularly around major water bodies such as the Toledo Bend Reservoir, Sabine Lake, and the Sabine and Calcasieu Rivers.

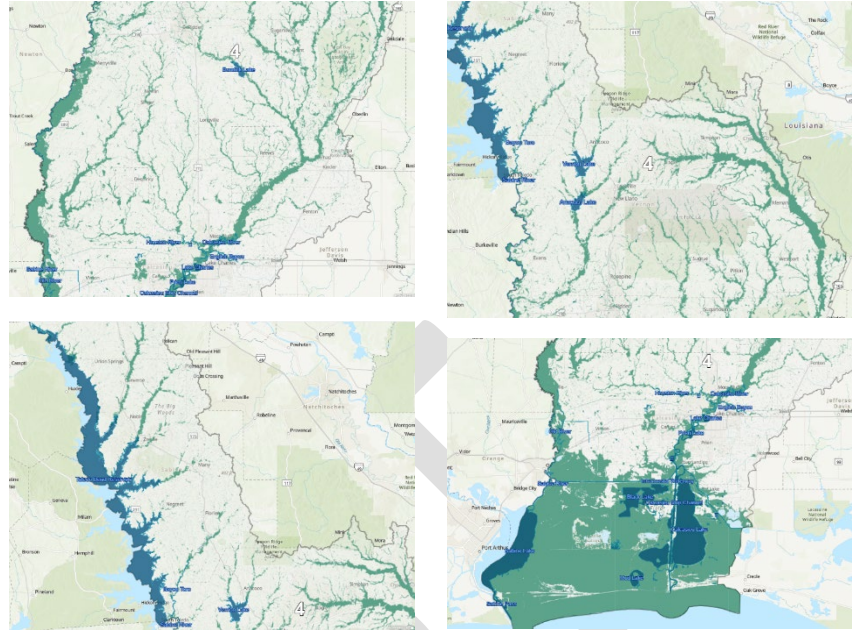
Wetlands, often described as nature's own water management systems, are crucial for reducing the impact of flooding. They act as natural sponges, absorbing and holding a significant amount of water that might otherwise contribute to flood levels. The intricate network of roots and vegetation in these areas also serves to slow down floodwater, dispersing them more gradually across the floodplain. This process effectively reduces the height of floods and minimizes soil erosion.

In Region 4, the wetland areas along the Sabine River and around the lakes and tributaries can be seen as critical natural infrastructure for flood control. Their



strategic locations along the waterways are vital for the slowing and storage of water flows, which contributes significantly to the reduction of flood risks in the region.

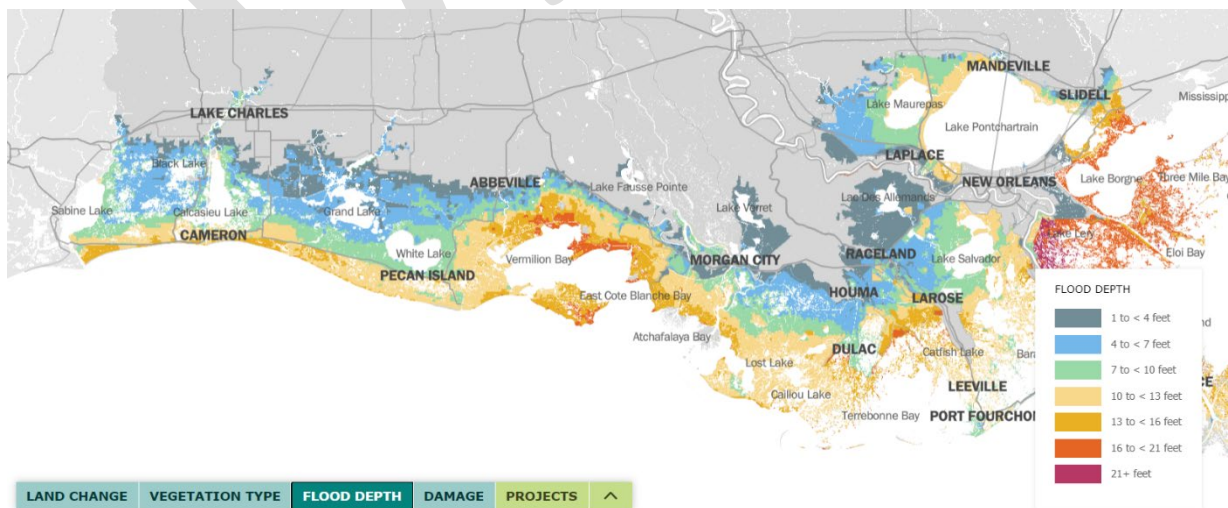
The preservation and restoration of these wetlands are not just about maintaining natural beauty or biodiversity; they represent a cost-effective and sustainable approach to flood management. Traditional flood control measures like dredging and levees are expensive and can have a significant environmental impact. Meanwhile, wetlands offer a dual benefit: they provide a habitat for wildlife and a service for flood control.



By maintaining the integrity of these wetlands and supporting their natural functions, Region 4 can enhance its resilience against flooding. This could be a focal point in the planning for the watershed, emphasizing best practices that work with nature rather than against it. Investment in wetland conservation and restoration could be equally as valuable as engineered solutions, offering a complementary strategy that provides flood control benefits while also contributing to the health of the ecosystem.

Region 4 Coastal Flood Depths

The Coastal Flood Depths map is representative of a specific event, detailing the impact on Cameron and Grand Chenier.



impacts, signified by the darkest colors, are concentrated around major water bodies and densely populated areas. This distribution suggests that flooding here has not only been physically widespread but also financially crippling, affecting both residential and commercial properties as well as public infrastructure.

The economic damage data depicted is a critical component of the regional flood risk analysis. It assists in identifying which communities have borne the brunt of the financial toll from flooding. Furthermore, it aids in structuring flood mitigation measures tailored to economic vulnerabilities, such as reinforcing commercial zones, safeguarding residential areas through insurance programs, and investing in robust flood defense systems.

The information presented by the map is instrumental in reinforcing the watershed plan's emphasis on economic resilience. It underscores the importance of effective flood risk management strategies that consider not only the physical but also the economic well-being of the communities within Cameron and Lake Charles. By integrating this data into the planning process, the watershed management plan aims to bolster the region's capacity to withstand and recover from the financial impacts of future flooding.

Region 4 Coastal Vegetation

This map illustrates the types of vegetation in the context of flooding within the Louisiana watershed, particularly around the Cameron and Grand Chenier regions. The map uses a color scheme to differentiate between various vegetation types, which are crucial for understanding the landscape's response to flood events.

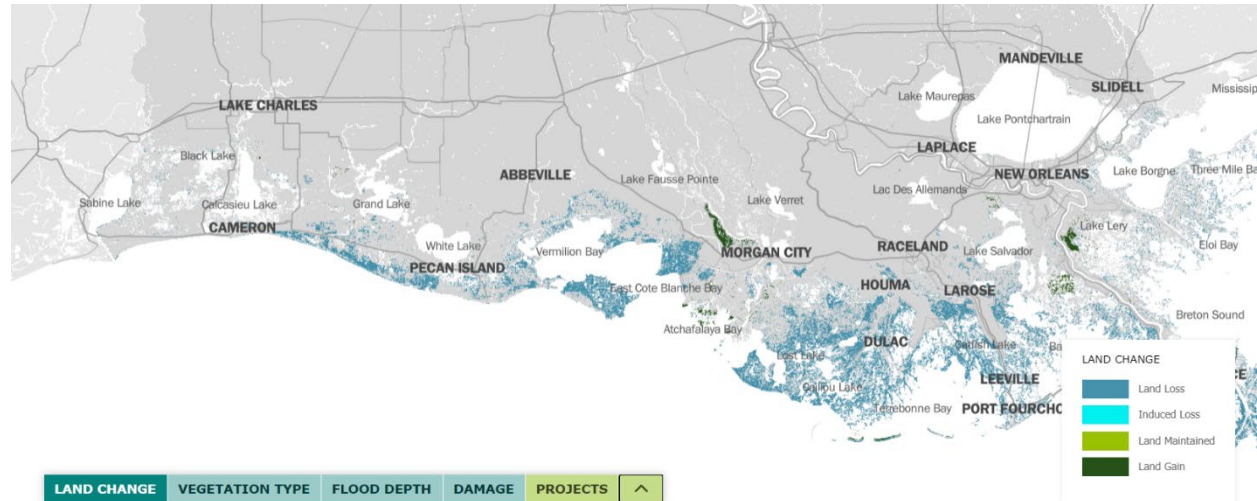
Fresh forests, indicated in dark green, are typically resilient to water but can be adversely affected by significant flooding. Fresh marshes, shown in a lighter shade of green, serve as natural buffers during flood events, absorbing water and mitigating flood damage. The presence of intermediate and brackish marshes, depicted in blue tones, reveals transitional areas where salinity levels affect the type of vegetation that can thrive. Finally, areas with saline marshes, represented in the lightest blue, are accustomed to high salt levels, and are often found in coastal regions where tidal influence is most profound.

The areas around Lake Charles and to the south near Cameron, with their variety of marshland, are key to the region's flood management. These marshes can absorb a significant amount of floodwater, reducing the impact on developed areas. However, they also face the threat of degradation from severe and repeated flooding, which can result in a loss of biodiversity and a decrease in the land's natural resilience to floods.

Understanding the distribution of these various wetland types is essential for watershed management planning. It informs conservation efforts, helps prioritize areas for restoration, and underlines the importance of wetlands in flood mitigation. By maintaining and restoring these natural habitats, they continue to provide invaluable ecosystem services, including flood risk reduction for the surrounding communities.

Region 4 Coastal Land Change Over the Next 50 Years

The 50-year Coastal Land Change map focuses on land loss and gain in the Cameron and Grand Chenier areas. It employs color coding to denote various types of land change: light blue for land loss, dark blue for induced loss, green for land maintained, and dark green for land gain.

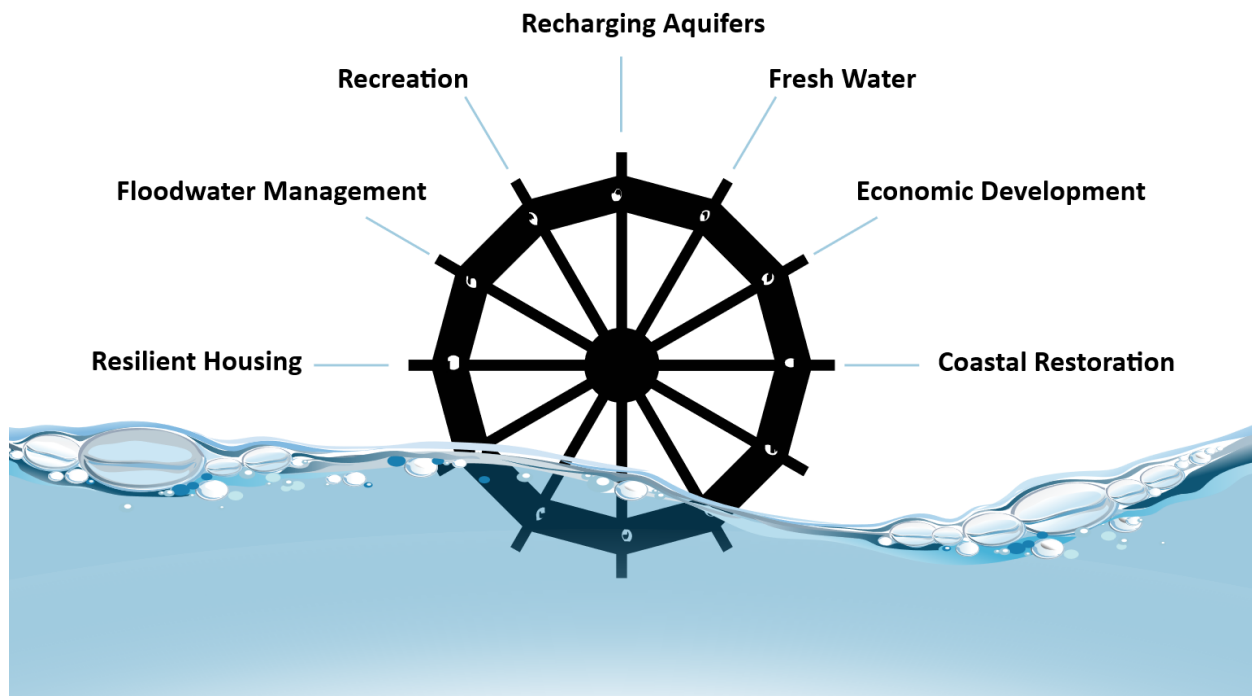


Significant land loss is apparent along the coastline and waterways, indicated by the light and dark blue areas. These losses may be attributed to a combination of factors, including erosion, subsidence, and the impact of flooding and storm surge events. The areas categorized as 'induced loss' suggest human activities, such as development or industrial actions, have accelerated land degradation.

The map also reveals pockets of land maintained or gained in green tones, which could be the result of successful land management practices, sediment deposition, or proactive conservation efforts. The presence of land gains in a region susceptible to land loss is noteworthy, as it indicates potential areas of ecological recovery or successful human intervention.

Strategic Priorities: Seven (7) Spokes of the Wheel

The Louisiana Watershed Region 4 Coalition Policy Council determined that planning and development of the region should be focused primarily on the Seven Spokes of the Wheel, referencing specific needs confronting West Louisiana and Region 4: floodwater management, fresh water, recharging the aquifers, coastal restoration, resilient housing, economic development, and recreation. As new issues and needs arise, potential solutions are incorporated into the Comprehensive Plan.



Spoke 1: Managing flood waters.

There is a great deal of data and information on topography, water hydrology, human infrastructure, soil types and characteristics, public and private investments, Louisiana weather patterns, and vegetation. Documenting and corraling many moving factors is both challenging and critically important for the region and its inhabitants. The Louisiana Watershed Initiative is a positive step forward but is a limited resource in planning and programming solutions needed. If flood-generating weather events could be suspended for approximately seventy years, there might be adequate monies available to build necessary improvements and prepare and manage excessive water. Reality is different and the region must work with means and strategies that are obtainable. Taking inventory of what problems exist and determining what is needed begins a transition to resolving current critical short-term and long-term flooding difficulties or, at very least, prevents swelling or growing the critical challenges. There is no single solution or remedy to the task. Multiple factors must be evaluated, and options defined to select courses of action. The Louisiana Watershed Initiative and the Region 4 Watershed Steering Committee are a start in mitigating flooding problems in the region. It is incumbent on private and public entities to rally and implement a pragmatic and effective flood management plan.

Goals:

The Primary goal is to develop a comprehensive flood management plan for the Region utilizing the latest available science and data. The Secondary goal is to develop implementation strategies affecting infrastructure and operations for short-term and long-term deliverables and continuity.

Spoke 2: Retaining, generating, and utilizing clean water.

Reference: Louisiana Department of Environmental Quality

Louisiana is well known for water – high above, in the air, on the ground and down below -- and plenty of it. But not all is sweet in the bountiful. Saltwater intrusion, toxic chemical spills, hazardous waste, urban development contamination, agricultural runoff, oxygen depletion, vegetation decomposition, acid rain, etc. contribute to lower water quality across the state and Region 4. Drought is not unknown. Water quality is essential to life and livelihood. Is there a problem? The answer is yes. Urban development aggravates the contamination situation and at the same time demands greater amounts of clean quality water. Agricultural rice production, aquatic farming, and herd ranching place significant demand on fresh clean water. Refining, manufacturing, mining, and most industry require fresh water in abundance for continued economic development. Problems abound when there is too much water in a short period of time or in a long period of time either contaminated or not. Louisiana Region 4 Watershed encompasses all or parts of nine parishes from northern DeSoto Parish to coastal Cameron Parish. There is a significant and growing need to generate, retain, and manage clean water throughout the region for all the above stated reasons. Clean water is a clear and critical commodity and asset the region should take cognizance of and responsibility for in developing long term health and economic sustainability.

Goals:

The Primary goal is to develop a regional clean water program that generates, retains, and utilizes this valuable resource. The Secondary goal is to assess current value to the clean water commodity and manage distribution.

Spoke 3: Promoting and facilitating local and regional economic development integrated with watershed initiatives.

Reference: Louisiana Economic Development (LED) and U.S. Dept. of Commerce

Economic development is generally a primary objective and standard element of a community, municipal, parish, and regional comprehensive master plans. The purpose of an official plan is to provide a comprehensive, coordinated, continuous, cooperative and consensus developed vision (sometimes referred to as the “5-C Process”). Planning districts prepare and adopt Comprehensive Economic Development Strategies (CEDS) to provide focus for implementation and maximum efficiency in the use of public and private dollars. Louisiana Region 4 Watershed identified needs and planned infrastructure should not be for sole intent of flood water management but integrated with several concurrent economic development goals for the nine-parish geography. Demonstrable and quantitative programs and projects can and should be leveraged, which enhance and facilitate implementation of multiple plans simultaneously. The term economic development can encompass a broad range of definitions, but primarily the meaning is based on viability of workforce and employment growth and support. The Steering Committee for the Louisiana Region 4 Watershed is comprised of nine members representing nine parishes who determine the best mechanisms for achieving and operating the “5-C Process” which is central to and a critical element in the Watershed Region 4 “Spokes of the

Wheel”. Economic development is and should be a concerted effort by municipalities and parishes to influence the direction of private sector investment for sustainable growth. Infrastructure support must be sustained by profitable business opportunities throughout Region 4.

Goals:

The Primary goal is to organize and establish a nine-parish economic development entity for purpose of facilitating, enhancing, and leveraging opportunities for scarce public resources to achieve new job creation and business/industry growth while working the “Seven Spokes of the Wheel” objectives. The Secondary goal is to identify and implement multi-jurisdictional resources to support the entity and adopted objectives for plan implementation.

Spoke 4: Preventing and extricating repeat flooding residential structures.

Reference: Watershed Region 4 Steering Committee Meeting held November 6, 2020.

One of the primary objectives identified by the Louisiana Watershed Region 4 Steering Committee is mitigating thousands of repeat flooding residential units throughout length and breadth of the nine (9) parish district. Challenges to mitigate or replace repeat flooding housing is correlated with preventing new housing being built in flood hazard locations. Federal and state resources are sometimes available to provide funding grants for elevating residential units out of harms way or offering limited buyouts. Local funding is rarely a resource for mitigating or replacing repeat flooding housing. The Southwest Louisiana Regional Planning Commission has initiated a regional housing system with comprehensive and resilient components that incorporate both public and private funding, manufacture, and incremental construction options for maximum flexibility and feasibility called the “Centerpiece Housing Program”. Centered on core construction units (and financing) the Centerpiece Housing Program (CHP) can be responsive to regular housing demand, context sensitive needs, affordability factors, and temporary disaster housing. Based on a Texas disaster recovery proposal called Rapido, the Centerpiece Housing Program is a significantly expanded initiative.

Goals:

The Primary goal is to review and adopt a multijurisdictional housing program to remediate existing repeat flooding residential units throughout the region (CHP). The Secondary goal is to review and adopt current inventory of recognized restricted areas for new housing and the local mechanisms to support restrictions and/or prohibitions.

Spoke 5: Expanding and Enhancing Outdoor Recreational Opportunities

Reference: National Park Service (NPS) has a long history and experience in recreational park development nationally.

Louisiana has recently published the Statewide Comprehensive Outdoor Recreation Plan (SCORP) There are multiple factors affecting Louisiana Watershed Region 4 and flood management infrastructure is certainly a primary and purposeful one. Recent years have experienced and demonstrated a new and significant factor that can outweigh most. A Covid-19

reality check (and subsequent variants) have challenged society and local/regional economies to develop safe and affordable outdoor recreational opportunities generally and specifically. The Region 4 Watershed provides an ideal venue to potentially foster recreational development through an interconnected network of infrastructure projects and intergovernmental management. Outdoor recreation comes in various forms and can generate economic incentives to sustain a variety of business resources on land and water that has a positive effect on local employment, income, and fiscal solvency. Where there is a purpose and economic strategies there should be a plan of action. A comprehensive integrated nine parish outdoor recreation plan can and should be a foundation layer to achieving many of the goals established for the Watershed Region. Simultaneously, there are numerous prospects for instituting a variety of support services to help mitigate flooding impacts - economically. No magic formulas or miracle funding can be anticipated, but through a multitude of approaches concurrent goals are achievable. Outdoor recreation planning and development is essential and indispensable for the nine-parish region and should be incorporated into the framework of the Watershed.

Goals:

The Primary goal is to develop a comprehensive outdoor recreation plan for the Region. The Secondary goal is to develop a multijurisdictional implementation strategy affecting infrastructure and operations for short-term and long-term use.

Spoke 6: Protecting and Recharging the Chicot Aquifer.

Reference: Louisiana Sea Grant sponsored “Chicot Aquifer Groundwater Availability Study”

The Chicot Aquifer is the most important aquifer in Louisiana and a major water resource in the southwest part of the state supplying water for agriculture, aquaculture, industry, and public sector entities. Tapped by more than 2300 pumping wells, Chicot aquifer provides approximately 400 million gallons of water per day (MGD) mostly used for irrigating rice, soybean and corn fields as well as growing crawfish. Since the Chicot area is the major producer of rice in the state and Louisiana is ranked third in the entire nation for its rice, the Chicot Aquifer plays a vital role economically. Intensified water abstraction from the aquifer during the last decade has caused serious problems such as saltwater intrusion from the Gulf of Mexico and soil subsidence. These issues eventually lead to loss of freshwater resources in addition to land loss in the gulf side of the region. Focusing on groundwater modeling, Louisiana Sea Grant investigators have processed more than 30,000 well log data from three sources of electrical logs, screen information from USGS, and drillers’ logs and developed the very first complex groundwater model for the Chicot aquifer. Groundwater flow directions and patterns, recharge zones, head variations, and cones of depression in the aquifer can be identified through the groundwater model. The model can also bring insight into saltwater fronts and recognize the areas encountering the thread of land loss. In order to further investigate water resources in the region, the groundwater model contributes to an Aquifer Storage and Recovery (ASR) project in collaboration with the University of Louisiana at Lafayette. The study links two surface water and groundwater models and aims to look for a feasible solution where saltwater intrusion encroachment and land subsidence impacts are counteracted in the aquifer system. Harvesting the surface runoff and conveying it into the aquifer system through injection wells to create a

freshwater buffer is the underlying idea of the project. In addition to combating the adverse effects of water over-drafting from the groundwater system, the ASR project can help to augment the freshwater storage in the aquifer.

Goals:

The Primary goal is to develop a Chicot Aquifer alternative draw initiative within the Region. The Secondary goal is to develop a Chicot Aquifer Recharge Program among multiple jurisdictions.

Spoke 7: Preservation and restoration of coastal ecosystem

Reference: Louisiana Coastal Protection and Restoration Authority

Everyday Louisiana citizens are affected by our land loss catastrophe. Whether it is a family forced to leave a cherished community to move out of harm's way, a local business that has trouble obtaining insurance, or investments that lose value because of uncertainty about the future of our landscape, Louisiana's land loss disaster takes a heavy toll. Land loss in Louisiana is caused by many different factors, both natural and man-made. Levees, floodgates, and drainage canals provided national flood control and economic benefits, but these forms of waterway management have also channeled rivers, bayous, and coulees into the Gulf of Mexico, depriving the coastal ecosystem of the freshwater and sediment it needs to survive. Sea level rise, subsidence, storms, and invasive species add further stress.

The national significance of the Southwest Louisiana coast is centered on the Gulf Intracoastal Waterway, Calcasieu River Ship Channel and pipeline infrastructure providing an extensive transportation system for commodity flows to the entire world. Billions of dollars in exports, oil and gas production and distribution, waterborne commerce and commercial fisheries landings are critical economic impacts requiring resiliency and development support.

Goals:

The Primary goal is to develop a Southwest Louisiana Support Program for the Louisiana Coastal Protection and Restoration Authority Plan in coastal Cameron Parish. The Secondary goal is to formulate an alternative redevelopment plan for public and private infrastructure reinvestment in coastal Cameron Parish.

Regional Capital Projects

The strategic priorities outlined in this plan identify key areas where coordinated action can improve flood resilience and water management across Region 4. Achieving these priorities will require targeted investments in infrastructure and watershed management projects.

Regional capital projects can help manage stormwater flows, increase water storage capacity, reduce flood risk, and improve long-term watershed resilience. In many cases, these projects provide multiple benefits, including flood mitigation, water supply management, recreational opportunities, and environmental improvements.

The following projects represent potential infrastructure investments that may support the long-term goals identified through the Region 4 watershed planning process.

Series of Reservoirs Concept

The proposed series of reservoir projects represents a potential infrastructure strategy that aligns closely with the strategic priorities identified in the Seven (7) Spokes of the Wheel framework. While each reservoir location would serve specific hydrologic functions within its local watershed, the system as a whole could provide regional benefits that support multiple planning objectives.

From a flood management perspective, reservoirs can temporarily store stormwater during major rainfall events and release it gradually over time. This capacity can help reduce peak flows within downstream river systems and drainage networks, supporting the goal of improved flood management throughout Region 4.

Reservoir development may also contribute to several additional regional priorities. Water storage infrastructure can help retain and manage freshwater resources, supporting long term water availability for communities, agriculture, and industry. During periods of drought, stored water can provide an important buffer against water shortages and support regional water supply needs.

Recent drought conditions experienced across Louisiana have highlighted the importance of considering water storage and long-term water resource management as part of regional planning. While Louisiana is often associated with abundant rainfall, prolonged dry periods can place stress on groundwater systems, agriculture, and public water supplies. Strategic water storage infrastructure may help increase resilience to both flood and drought conditions.

Reservoir systems can also support economic development and recreation opportunities. Water bodies created through reservoir projects often become regional assets that support fishing, boating, tourism, and other outdoor activities. These amenities can contribute to local economies while improving quality of life for residents.

Some reservoirs may also play a role in protecting and recharging groundwater systems, including the Chicot Aquifer. By retaining surface water within the watershed, reservoirs may help support long term groundwater sustainability and reduce pressure on existing water supplies.

In addition, reservoirs can provide environmental benefits by supporting wetland systems, wildlife habitat, and ecosystem health when designed with environmental considerations in mind.

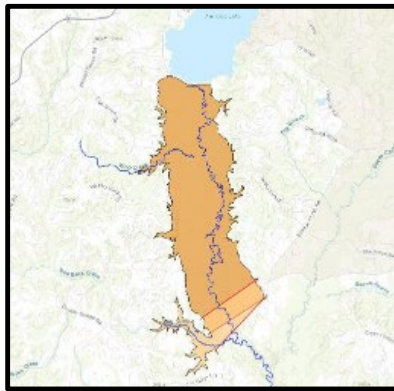
While each reservoir project would contribute differently to the regional strategy, the concept of a coordinated system of reservoirs offers the potential to support multiple strategic priorities

simultaneously. Some reservoirs may provide greater flood mitigation benefits, while others may emphasize water supply, aquifer recharge, or recreation opportunities.

As global water scarcity becomes an increasing concern, freshwater resources are also gaining strategic economic importance. In some regions of the world, including parts of the Caribbean, freshwater is already being imported to meet growing demand. While Region 4’s primary focus remains local resilience and resource management, the region’s freshwater resources may represent a valuable asset in the future.

By considering long term water storage and watershed management strategies today, Region 4 can position itself to protect its water resources, strengthen regional resilience, and support sustainable economic opportunities in the decades ahead.

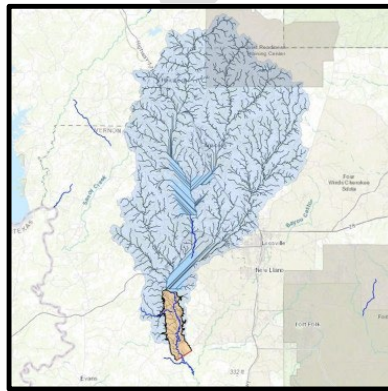
Anacoco Retention Reservoir Vernon Parish, LA



Anacoco Retention Reservoir

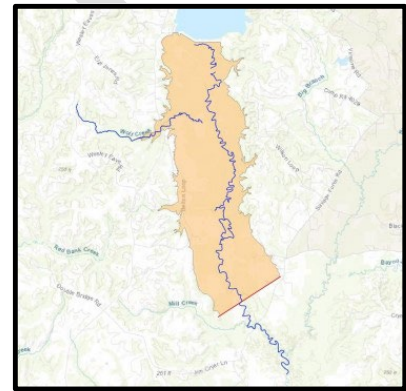
Mill Creek Reservoir Options

- Water Surface Elevations
 - 195 FT Option 1
 - 195 FT Option 2
 - 195 FT Option 3
 - Weir Boundary
- Water Sources
 - Anacoco Bayou
 - Mill Creek
 - Wolf Creek



**Anacoco Retention Reservoir
Reservoir / Catchment**

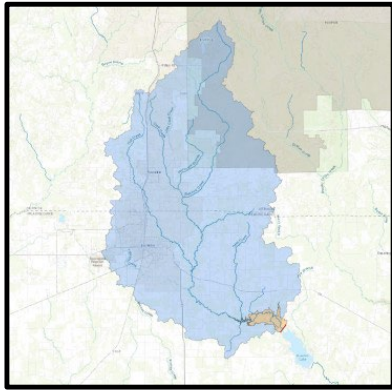
- Reservoir
 - Weir Boundary
- Catchment
 - Area – 142,110 Acres
 - Perimeter – 679,822 Linear Feet
 - Primary Water Sources
 - Mill Creek
 - Anacoco Bayou
 - Wolf Creek
 - Stream Tributaries



**Anacoco Retention Reservoir
Water Surface Level 195'**

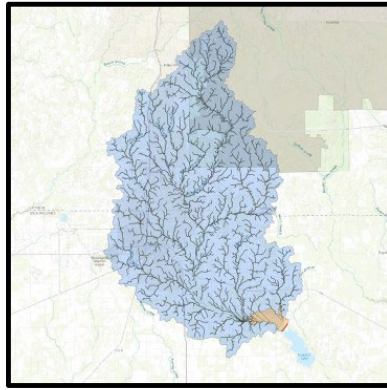
- Reservoir
 - Area – 4,300 Acres
 - Perimeter – 127,371 Linear Feet
 - Avg Depth – 23 FT
 - Outer Boundary
 - Cost Estimate – \$370,875,000
 - Classification – Lake
 - Weir Boundary
 - Weir – 9,257 Feet
- Primary Water Sources
 - Mill Creek
 - Anacoco Bayou
 - Wolf Creek

Bundick Lake Reservoir
Beauregard Parish, LA



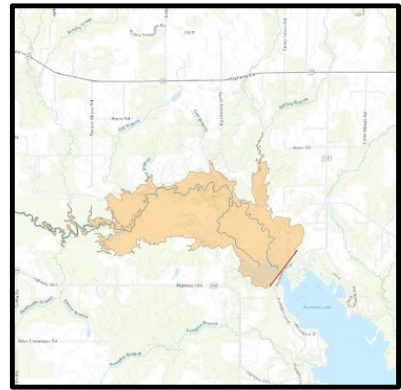
**Bundick Retention Reservoir
Catchment Water Sources**

- Primary Water Source
 - Bundick Creek
- Tributaries of Bundick Creek
 - Deer Creek
 - Big Branch
 - Flat Creek
 - Clear Creek
 - Hurricane Branch
 - Black Creek



**Bundick Retention Reservoir
Reservoir / Catchment**

- Reservoir
 - Weir Boundary
- Catchment
 - Area – 122,357 Acres
 - Perimeter – 815,905 Linear Feet
 - Primary Water Sources
 - Bundick Creek
 - Reservoir Tributaries

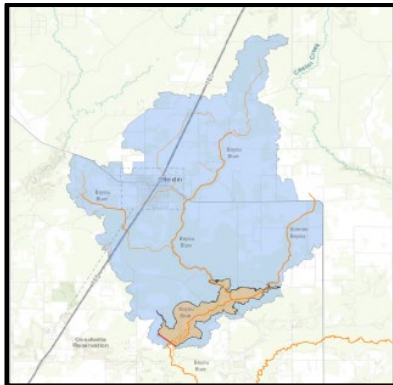


**Bundick Retention Reservoir
Water Surface Level 105'**

- Reservoir
 - Area – 1,493 Acres
 - Perimeter – 162,224 Linear Feet
 - Avg Depth – 2 FT
 - Volume – 1,975 (Acre-FT)
 - Outer Boundary
 - Cost Estimate – \$7,406,250
 - Classification – Pond
 - Weir Boundary
 - Weir – 3,196 Feet
- Primary Water Sources
 - Bundick Creek
 - Tiger Branch
 - Deer Creek
 - Big Branch
 - Calf Branch

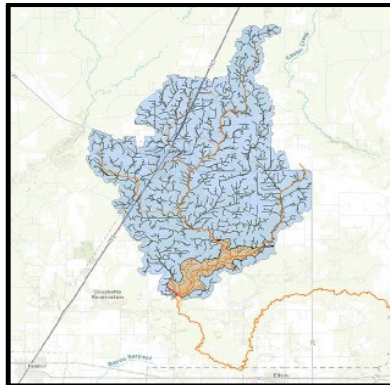


Coushatta Option 1 Reservoir
Coushatta Tribe of Louisiana



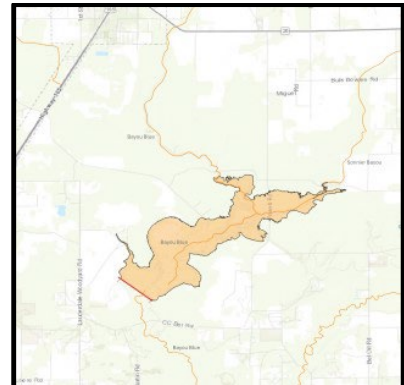
**Lake West of Powell Retention Reservoir
Catchment Water Sources**

- Primary Water Source
 - Bayou Blue —
 - Sonnier Bayou —
- Tributaries of Primary Water Sources
 - Shown but not identified by name —



**Lake West of Powell Retention
Reservoir / Catchment**

- Reservoir
 - Weir Boundary —
- Catchment
 - Area – 34,128 Acres
 - Perimeter – 501,706 Linear Feet
- Primary Water Sources
 - Bayou Blue —
 - Sonnier Bayou —
 - Reservoir Tributaries —
 - Tributary Connectors —

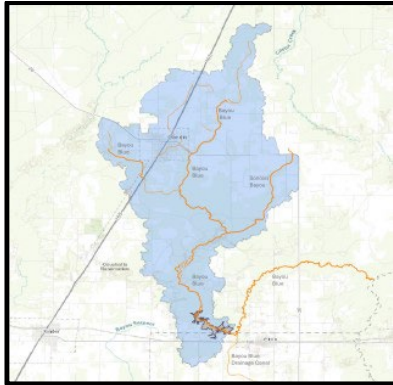


**Lake West of Powell Retention Reservoir
Water Surface Level 53'**

- Reservoir
 - Area – 1,832 Acres
 - Perimeter – 131,666 Linear Feet
 - Avg Depth – 2.65 FT
 - Volume – 4,855 (Acre-FT)
 - Outer Boundary —
 - Cost Estimate – \$18,206,365
 - Classification – Pond
 - Weir Boundary —
 - Weir – 4,012 Feet
- Primary Water Sources
 - Bayou Blue
 - Sonnier Bayou

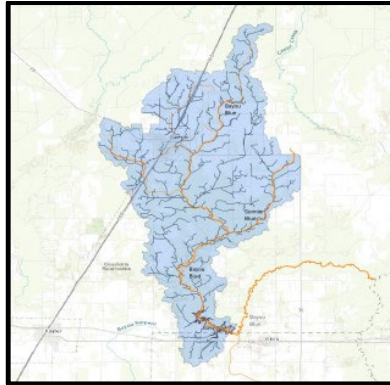
Coushatta Option 2 Reservoir
Coushatta Tribe of Louisiana
For planning development

Coushatta Option 3 Reservoir
Coushatta Tribe of Louisiana



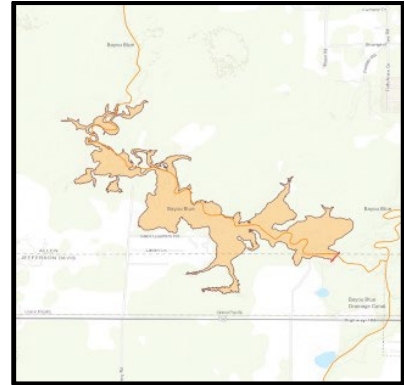
**South Lake Retention Reservoir
Catchment Water Sources**

- Primary Water Source
 - Bayou Blue —
 - Sonnier Bayou —
- Tributaries of Primary Water Sources
 - Shown but not identified by name —



South Lake Retention Reservoir / Catchment

- Reservoir
 - Weir Boundary —
- Catchment
 - Area – 40,520 Acres
 - Perimeter – 648,187 Linear Feet
- Primary Water Sources
 - Bayou Blue —
 - Sonnier Bayou —
 - Reservoir Tributaries —
 - Tributary Connectors —



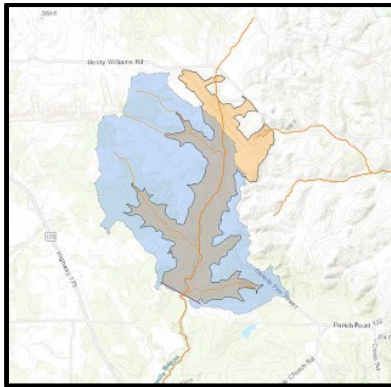
**South Lake Retention Reservoir
Water Surface Level 40'**

- Reservoir
 - Area – 226 Acres
 - Perimeter – 84,384 Linear Feet
 - Avg Depth – 0.81 FT
 - Volume – 183 (Acre-FT)
 - Outer Boundary —
 - Cost Estimate – \$686,475
 - Classification – Pond
 - Weir Boundary —
 - Weir – 435 Feet
- Primary Water Sources
 - Bayou Blue

Coushatta Option 4 Reservoir
Coushatta Tribe of Louisiana
For planning development

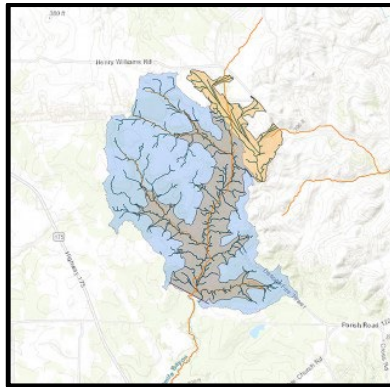
Desoto Retention Reservoir

Desoto Parish, LA



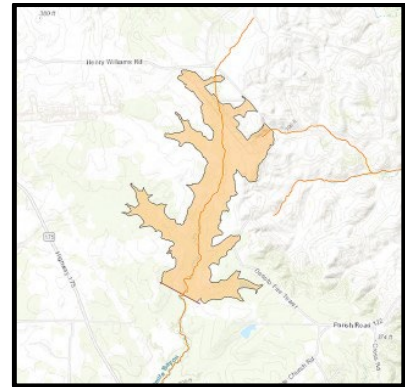
**Desoto Retention Reservoir
Catchment Water Sources**

- Primary Water Source
 - Tenmile Bayou
- Tributaries of Primary Water Sources
 - Shown but not identified by name



**Desoto Retention
Reservoir / Catchment**

- Reservoir
 - Weir Boundary
- Catchment
 - Area – 1,225 Acres
 - Perimeter – 59,371 Linear Feet
- Primary Water Sources
 - Tenmile Bayou
 - Reservoir Tributaries



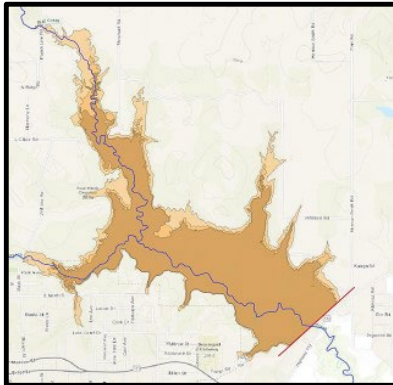
**Desoto Retention Reservoir
Water Surface Level 340'**

- Reservoir
 - Area – 552 Acres
 - Perimeter – 68,150 Linear Feet
 - Avg Depth – 15.24 FT
 - Volume – 8,411 (Acre-FT)
 - Outer Boundary
 - Cost Estimate – \$31,542,228
 - Classification – Pond
 - Weir Boundary
 - Weir – 2,047 Feet
- Primary Water Sources
 - Tenmile Bayou



Flat Creek Reservoir

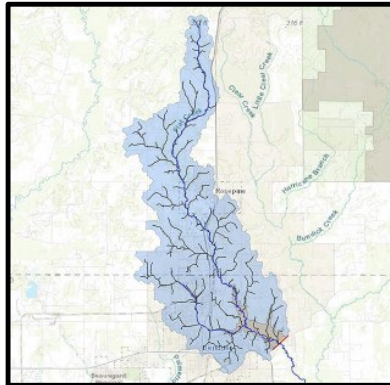
Beauregard Parish, LA



Flat Creek Retention Reservoir

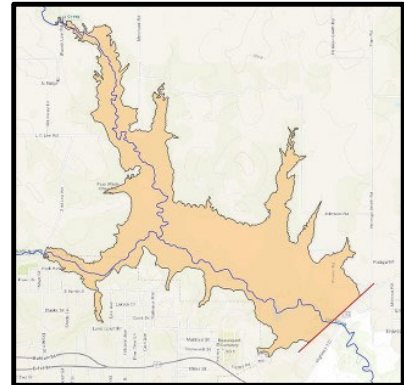
Flat Creek Reservoir Options

- Water Surface Elevations
 - 158 FT Option 1
 - 155 FT Option 2
 - 150 FT Option 3
 - Weir Boundary
- Water Sources
 - Flat Creek
 - Hickory Creek



Flat Creek Retention Reservoir Reservoir / Catchment

- Reservoir
 - Weir Boundary
- Catchment
 - Area – 742 Acres
 - Perimeter – 95,209 Linear Feet
 - Primary Water Sources
 - Flat Creek
 - Hickory Branch
 - Stream Tributaries



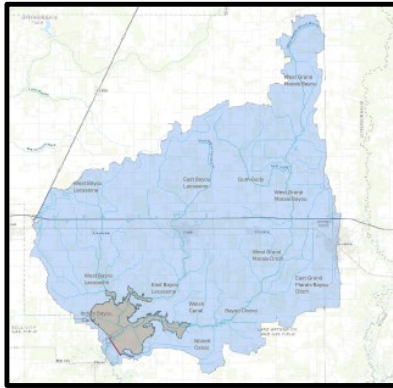
Flat Creek Retention Reservoir Water Surface Level 158'

- Reservoir
 - Area – 737 Acres
 - Perimeter – 95,213 Linear Feet
 - Avg Depth – 7 FT
 - Outer Boundary
 - Cost Estimate – \$19,346,250
 - Classification – Lake
 - Weir Boundary
 - Weir – 8,456 Feet
- Primary Water Sources
 - Flat Creek
 - Hickory Creek



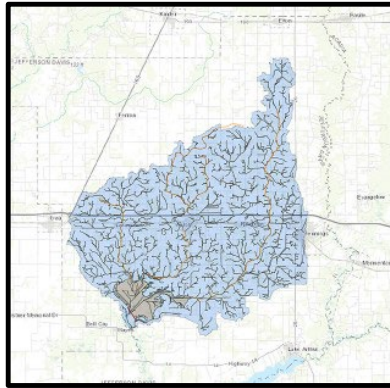
Lacassine Reservoir

Jefferson Davis Parish, LA



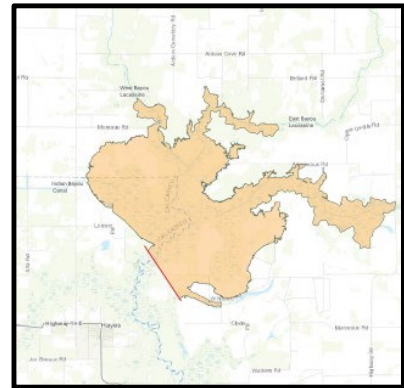
**Lacassine Retention Reservoir
Catchment Water Sources**

- Primary Water Source
 - East / West Bayou Lacassine
 - West Grand Marais Bayou
- Tributaries of Primary Water Source
 - Gum Gully
 - Welsh Canal
 - Bayou Chene
 - West Grand Marais Ditch
 - Indian Bayou Canal
 - Niblett Canal



**Lacassine Retention Reservoir
Reservoir / Catchment**

- Reservoir
 - Weir Boundary
- Catchment
 - Area – 166,074 Acres
 - Perimeter – 954,050 Linear Feet
- Primary Water Sources
 - West/East Bayou Lacassine
 - West Bayou Grand Marais
 - Reservoir Tributaries



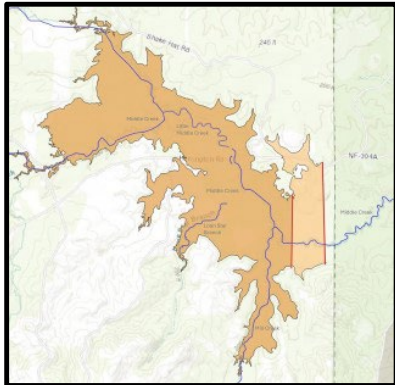
**Lacassine Retention Reservoir
Water Surface Level 3'**

- Reservoir
 - Area – 6,900 Acres
 - Perimeter – 389,652 Linear Feet
 - Avg Depth – 0.6 FT
 - Volume – 4,140 (Acre-FT)
 - Outer Boundary
 - Cost Estimate – \$15,525,000
 - Classification – Pond
 - Weir Boundary
 - Weir – 7,187 Feet
- Primary Water Sources
 - West Bayou Lacassine
 - East Bayou Lacassine
 - Indian Bayou Canal



Middle Creek Reservoir

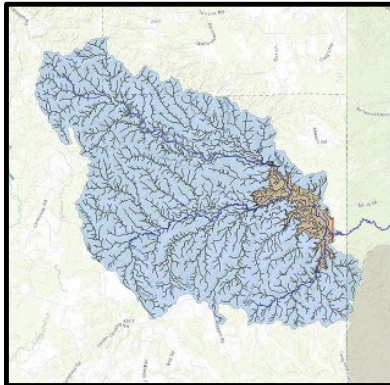
Sabine Parish, LA



Middle Creek Retention Reservoir

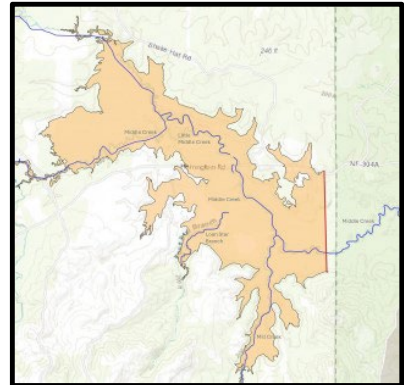
Middle Creek Reservoir Options

- Water Surface Elevations
 - Option 1
 - Option 2
 - Weir Boundary
- Water Sources
 - Mill Creek
 - Middle Creek
 - Little Middle Creek
 - Loan Star Branch



Middle Creek Retention Reservoir Reservoir / Catchment

- Reservoir
 - Weir Boundary
- Catchment
 - Area – 22,051 Acres
 - Perimeter – 253,938 Linear Feet
 - Primary Water Sources
 - Mill Creek
 - Little Mill Creek
 - Stream Tributaries



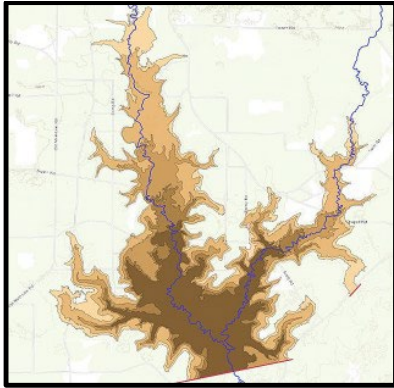
Middle Creek Retention Reservoir Water Surface Level Option 2

- Reservoir
 - Area – 1,124 Acres
 - Perimeter – 142,012 Linear Feet
 - Avg Depth – 10 FT
 - Outer Boundary
 - Cost Estimate – \$42,150,000
 - Classification – Lake
 - Weir Boundary
 - Weir – 4,286 Feet
- Primary Water Sources
 - Mill Creek
 - Little Mill Creek
 - Little Middle Creek
 - Loan Star Branch











Mill Creek Reservoir

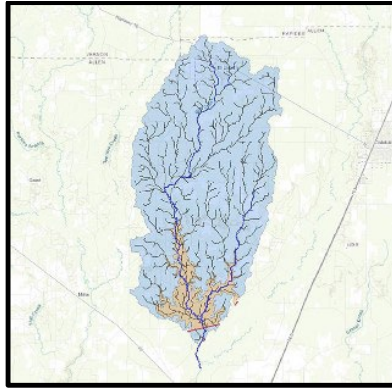
Allen Parish, LA









Mill Creek Retention Reservoir

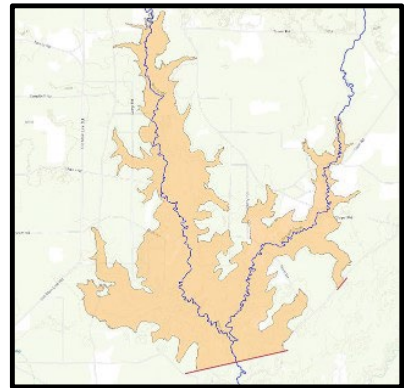
Mill Creek Reservoir Options

- Water Surface Elevations
 - 87 FT 
 - 85 FT 
 - 80 FT 
 - 77 FT 
 - 75 FT 
- Weir Boundary 
- Water Sources
 - Mill Creek 
 - Little Mill Creek 








Mill Creek Retention Reservoir Reservoir / Catchment

- Reservoir 
 - Weir Boundary 
- Catchment 
 - Area – 49,885 Acres
 - Perimeter – 399,149 Linear Feet
 - Primary Water Sources
 - Mill Creek 
 - Little Mill Creek 
 - Stream Tributaries 

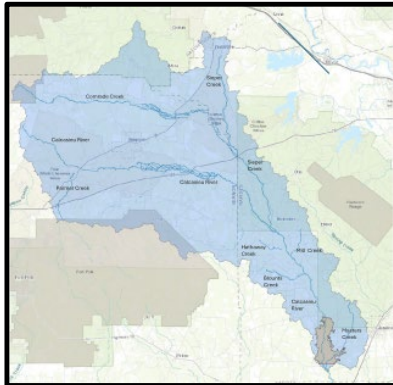


Mill Creek Retention Reservoir Water Surface Level 87'

- Reservoir 
 - Area – 4,935 Acres
 - Perimeter – 351,005 Linear Feet
 - Avg Depth – 8 FT
 - Volume – 39,480 (Acre-FT)
 - Outer Boundary 
 - Cost Estimate – \$148,050,000
 - Classification – Lake
 - Weir Boundary 
 - Weir – 8,456 Feet
- Primary Water Sources
 - Mill Creek 
 - Little Mill Creek 

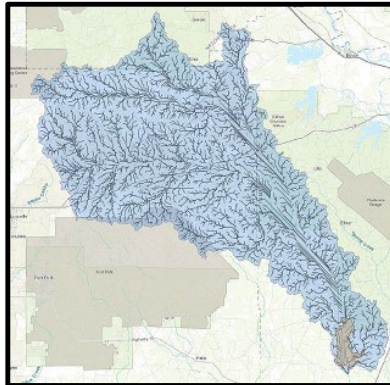


Rapides Reservoir
Rapides Parish, LA



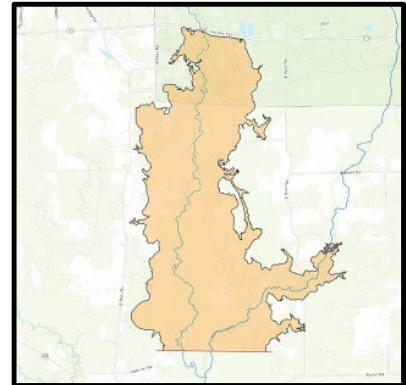
**Rapides Retention Reservoir
Catchment Water Sources**

- Primary Water Source
 - Calcasieu River
- Tributaries of Calcasieu River
 - Parmer Creek
 - Sieper Creek
 - Hathaway Creek
 - Blounts Creek
 - Masters Creek
 - Mill Creek
 - Comrade Creek



**Rapides Retention Reservoir
Reservoir / Catchment**

- Reservoir
 - Weir Boundary
- Catchment
 - Area – 347,567 Acres
 - Perimeter – 1,717,410 Linear Feet
 - Primary Water Sources
 - Calcasieu River
 - Reservoir Tributaries



**Rapides Retention Reservoir
Water Surface Level 123'**

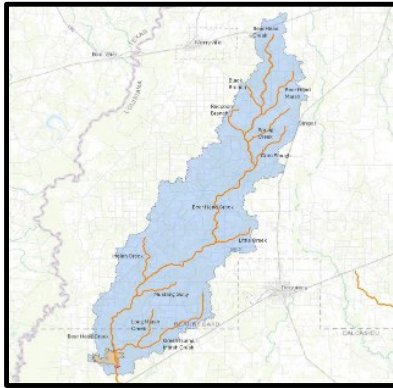
- Reservoir
 - Area – 4,860 Acres
 - Perimeter – 235,845 Linear Feet
 - Avg Depth – 5 FT
 - Volume – 25,758 (Acre-FT)
 - Outer Boundary
 - Cost Estimate – \$96,592,500
 - Classification – Lake
 - Weir Boundary
 - Weir – 9,238 Feet
- Primary Water Sources
 - Masters Creek
 - Calcasieu River

Sweet Lake Reservoir
Cameron Parish, LA
For planning development

West Calcasieu Option 1 Reservoir
Calcasieu Parish, LA
For planning development

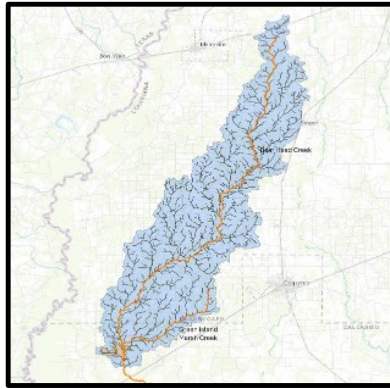
West Calcasieu Option 2 Reservoir

Calcasieu Parish, LA



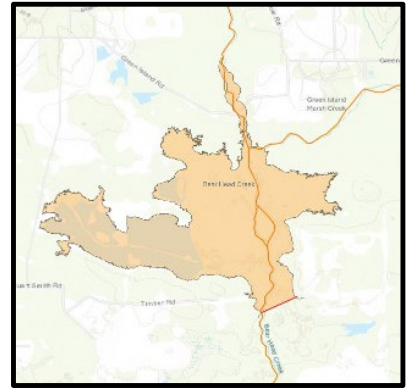
**W Calcasieu Opt 2 Retention Reservoir
Catchment Water Sources**

- Primary Water Source
 - Bear Head Creek
- Tributaries of Bear Head Creek
 - Gum Slough
 - Spring Creek
 - Bear Head Marsh
 - Black Branch
 - Raccoon Branch
 - Little Creek
 - Indian Creek
 - Mustang Gully
 - Long Marsh Creek
 - Green Island Marsh Creek



**W Calcasieu Opt 2 Retention Reservoir
Reservoir / Catchment**

- Reservoir
 - Weir Boundary
- Catchment
 - Area – 114,329 Acres
 - Perimeter – 1,295,621 Linear Feet
- Primary Water Sources
 - Green Island Marsh Creek
 - Bear Head Creek
 - Stream Tributaries



**W Calcasieu Opt 2 Retention Reservoir
Water Surface Level 32'**

- Reservoir
 - Area – 1,130 Acres
 - Perimeter – 125,991 Linear Feet
 - Avg Depth – 1.5 FT
 - Volume – 1,695 (Acre-FT)
 - Outer Boundary
 - Cost Estimate – \$6,356,250
 - Classification – Pond
 - Weir Boundary
 - Weir – 1,706 Feet
- Primary Water Sources
 - Bear Head Creek
 - Green Island Marsh Creek



Record of Changes

Approval Date	Section(s) Updated	Description of Changes	Adopting Resolution

DRAFT

APPENDIX

Funding Mechanisms and Opportunities

Implementation of the strategies and projects identified in the LWI Region 4 Comprehensive Watershed Plan will require sustained coordination among federal, state, regional, and local partners. Watershed management and flood mitigation projects often involve complex planning, engineering, and environmental review processes, as well as significant financial investment.

Because of the scale of infrastructure and environmental projects needed to improve watershed resilience, successful implementation will likely depend on leveraging multiple funding sources. These may include federal programs, state initiatives, local revenue mechanisms, and partnerships with private or nonprofit organizations.

Regional collaboration will play an important role in identifying funding opportunities, coordinating project proposals, and ensuring that investments support the broader watershed strategy.

Local Revenue Mechanisms

Property Taxes – General

Local governments may levy property taxes on parcels within their jurisdiction to fund general government operations. These revenues may support public works activities, drainage maintenance, and infrastructure improvements that contribute to watershed resilience.

Property Taxes – Special Purpose

Local governments may also establish special-purpose millages dedicated to specific services or infrastructure needs. Common applications include drainage districts, flood control improvements, levee maintenance, and stormwater management infrastructure.

Sales Taxes – General

Local sales taxes collected within a parish or municipality may be used for general government purposes. These revenues may be directed toward public infrastructure improvements, including drainage systems, pump stations, and flood protection infrastructure.

Sales Taxes – Special Purpose

Special-purpose sales taxes may be approved by voters to support specific infrastructure initiatives such as drainage improvements, flood control projects, environmental restoration, or watershed management programs.

Drainage or Stormwater Utility Fees

Local governments may establish stormwater or drainage utility programs that assess fees based on impervious surface area, property size, or other measurable characteristics. These programs create a dedicated funding stream for stormwater infrastructure maintenance, drainage system improvements, and flood mitigation projects.

Special Assessment Districts

Local governments may create special assessment districts or improvement districts within defined geographic areas where property owners benefit directly from infrastructure improvements. Property owners within the district contribute funding through assessments to support projects such as drainage improvements, retention basins, or levee construction.

Development Impact Fees

Impact fees may be assessed on new developments to help offset the cost of infrastructure needed to accommodate growth. In watershed management contexts, impact fees can be used to fund stormwater infrastructure, detention facilities, drainage improvements, and flood mitigation measures associated with new development.

User Fees

User fees may be applied to specific services or infrastructure systems. While commonly associated with transportation systems, similar models can apply to water management systems where appropriate, particularly for services such as drainage infrastructure maintenance or flood control facilities.

Federal Funding Programs

Numerous federal programs support flood mitigation, hazard reduction, and watershed management initiatives. Examples include programs administered by:

Federal Emergency Management Agency (FEMA)

- Hazard Mitigation Grant Program (HMGP)
- Building Resilient Infrastructure and Communities (BRIC)

U.S. Army Corps of Engineers (USACE)

- Flood Risk Management Programs
- Continuing Authorities Program

U.S. Department of Housing and Urban Development (HUD)

- Community Development Block Grant – Mitigation (CDBG-MIT)
- Community Development Block Grant – Disaster Recovery (CDBG-DR)

Environmental Protection Agency (EPA)

- Clean Water State Revolving Fund

Federal funding programs often require state or local cost-sharing and may involve competitive application processes.

State Funding Programs

The State of Louisiana administers several programs supporting watershed management, drainage improvements, and resilience initiatives. These programs may include:

- Louisiana Watershed Initiative (LWI) funding programs
- Coastal Protection and Restoration Authority (CPRA) project funding
- State capital outlay funding
- Louisiana Department of Transportation and Development (DOTD) drainage and infrastructure programs

State programs frequently provide matching funds for federal initiatives or support projects that address regional priorities.

Public-Private Partnerships and Grants

Additional funding opportunities may be available through partnerships with private sector entities, nonprofit organizations, and philanthropic foundations. Grant programs offered by nonprofit organizations and national resilience initiatives often support planning efforts, environmental restoration, and community resilience projects. These grants frequently focus on nature-based solutions, wetland restoration, water resource protection, and climate adaptation strategies.

Public-Private Partnerships (PPPs) represent another potential tool for delivering large infrastructure projects. PPPs involve collaborative agreements between public agencies and private sector partners to finance, design, construct, or operate infrastructure. By combining public oversight with private investment and expertise, these partnerships can help accelerate project delivery and expand the funding available for critical infrastructure.

Within Region 4, large transportation and infrastructure initiatives such as the Interstate 10 Calcasieu River Bridge project demonstrate how public and private collaboration can support major capital improvements. While watershed and water management projects may differ in scale, similar partnership models could be explored for certain regional initiatives, particularly where projects provide both public benefits and economic value.

Leveraging Multiple Funding Sources

Given the scale and complexity of watershed infrastructure projects, implementation will likely require blended funding strategies that combine federal grants, state programs, local revenue sources, and private investment. Successful projects often leverage multiple funding mechanisms to secure sufficient financial support while minimizing the burden on any single jurisdiction.

Regional coordination among parishes, municipalities, drainage districts, and state agencies will be critical to securing funding and implementing projects that benefit the entire Region 4 watershed system.

Acronyms

Acronym	Meaning
ASR	Aquifer Storage and Recovery
RIC	Building Resilient Infrastructure and Communities
CDBG-DR	Community Development Block Grant – Disaster Recovery
CDBG-MIT	Community Development Block Grant – Mitigation
CPC	Coalition Policy Council
CPRA	Coastal Protection and Restoration Authority
DOTD	Louisiana Department of Transportation and Development
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
GOHSEP	Governor’s Office of Homeland Security and Emergency Preparedness
HMGF	Hazard Mitigation Grant Program
HUD	U.S. Department of Housing and Urban Development
LDWF	Louisiana Department of Wildlife and Fisheries
LWI	Louisiana Watershed Initiative
NFIP	National Flood Insurance Program
NPS	National Park Service
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SWLA-RPC	Southwest Louisiana Regional Planning Commission
TAC	Technical Advisory Committee
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey

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