



Plan View

The level of water in Bayou La Cache is raised by a weir to a higher elevation, discharging into an existing borrow pit. A collection of new weirs between the existing borrow pits control their water level. Using gravity, water cascades downwards and returns to the bayou allowing still water to move. Concurrently and during drought spells, modern wind mills, connected to Archimedes screw-pumps, elevate drainage water to the level-controlled borrow pits.

- 1

Weir to divert water to retention ponds
- 2

Terraced retention pond filled with native plants and recreational pathways
- 3

Observation Deck, Pavilion, Open-Air Classroom, and Water Literacy Signage
- 4

Wind-driven Archimedes Screw-pumps
- 5

Existing Sugarcane Fields
- 6

Future Cultural Center with Focus on Sugar Cultivation and Water Literacy



Precedent Image of Archimedes Screw Pump and Cascading Water



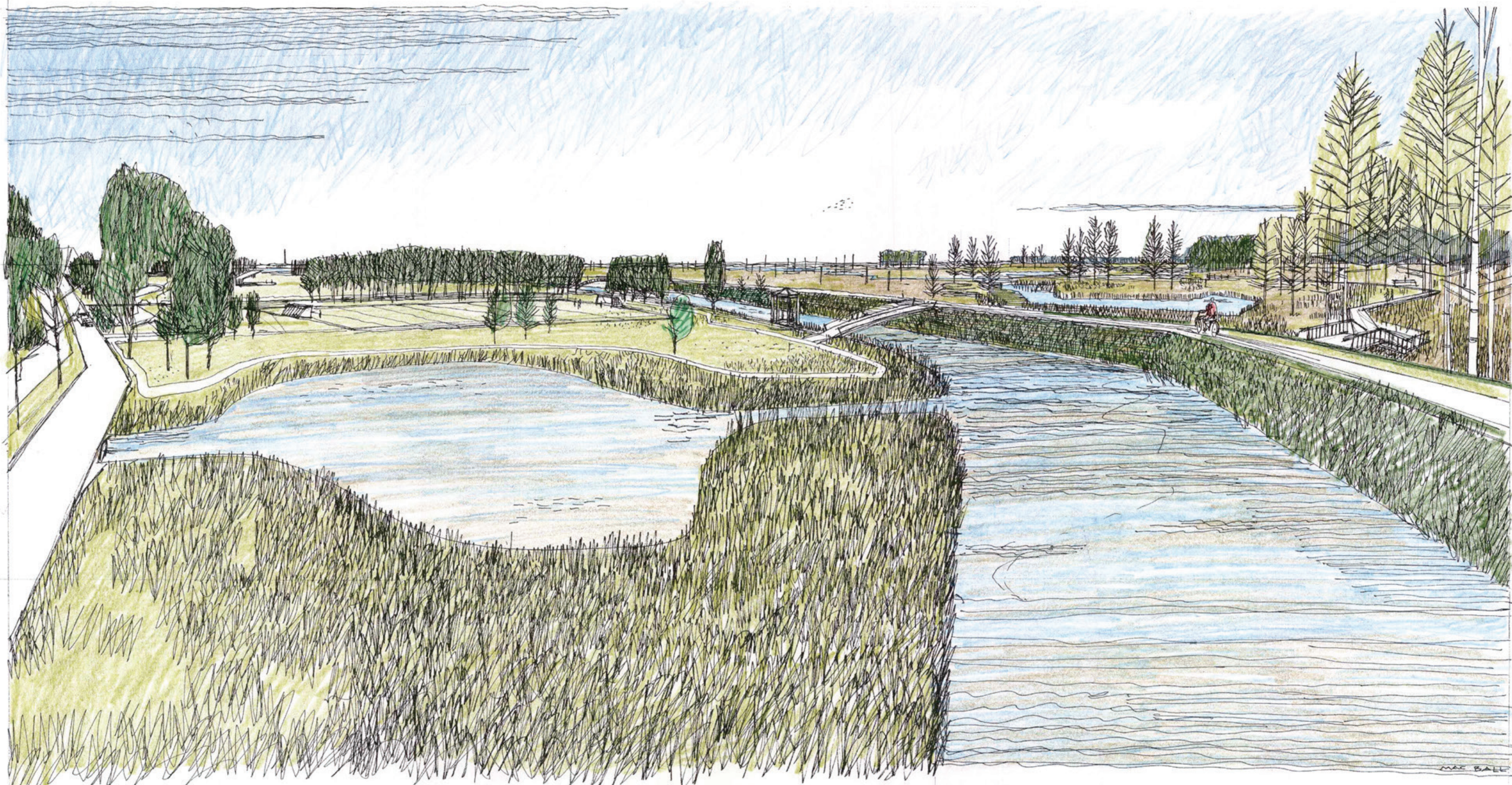
Precedent Image of Archimedes Screw Pump



Precedent Image of Wind Turbine



Precedent Image of Wind-driven Pumping System in St. Landry Parish, Louisiana



Aerial View of Wetland Park & Walking Trails



Precedent Image of Terraced Wetlands



Precedent Image of Wetlands, Boardwalks, and Plantings



Precedent Image of Park Pavilion and Deck



Precedent Image of Seating Area overlooking Wetlands



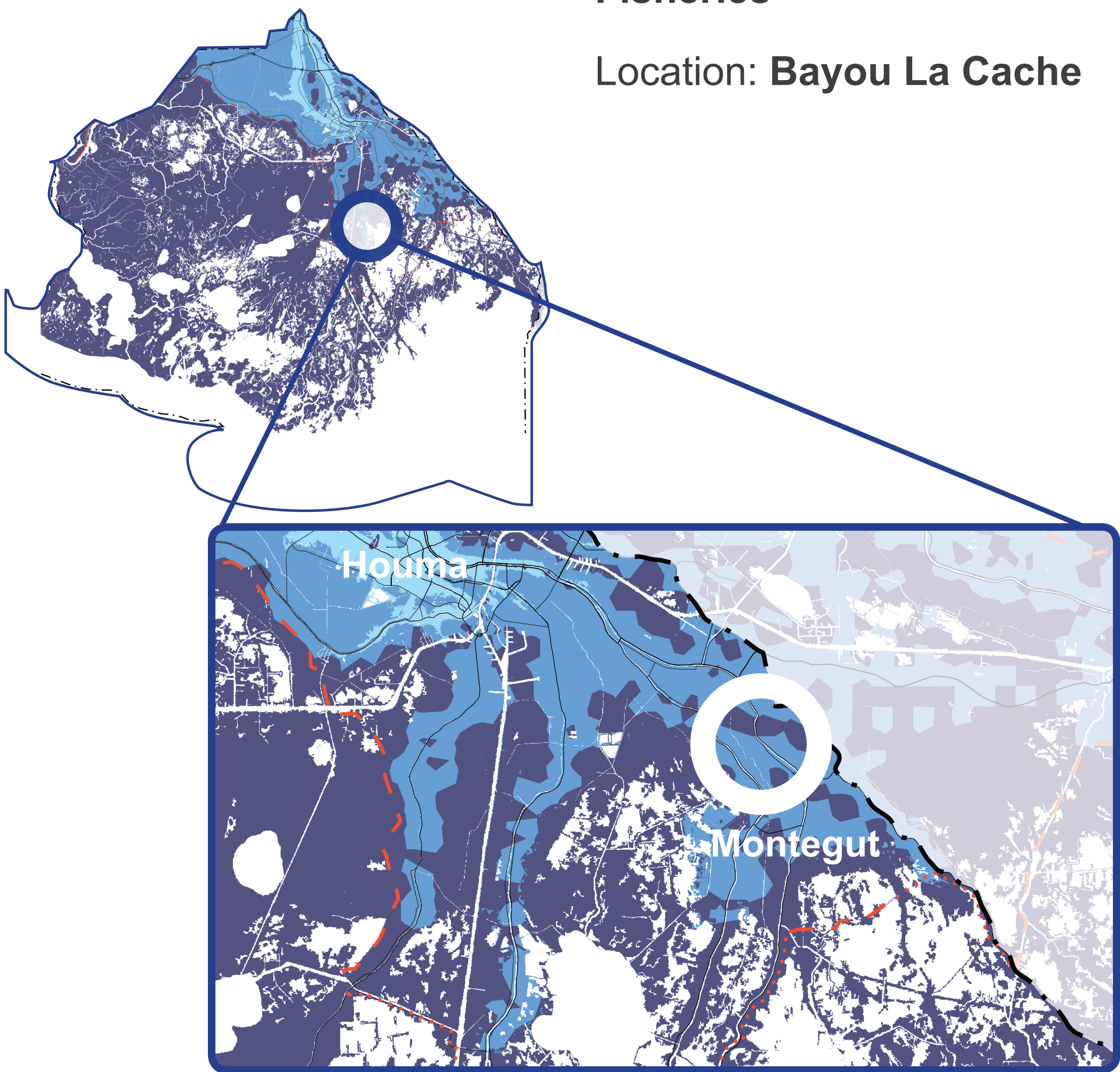
Precedent Image of Seating Area overlooking Wetlands

PROPOSAL

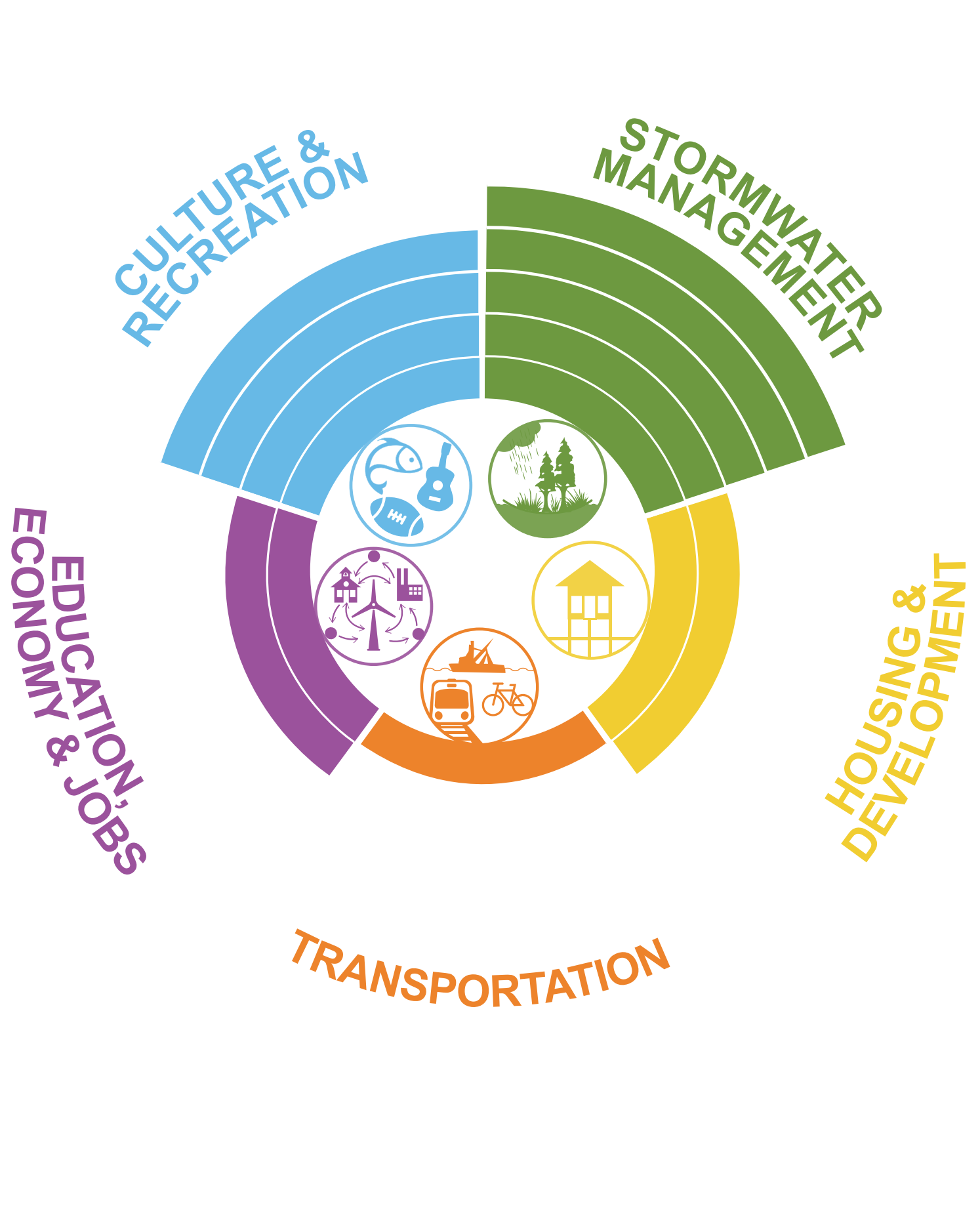
Areas subject to moderate and high future flood risk must consider stormwater management features in addition to current and planned structural protection systems. The Bayou La Cache Wetland Park in the Smith Ridge forced drainage system diverts and temporarily stores water during heavy rain events while providing access from Aragon Road to amenities such as bird and wildlife viewing and walking paths. Increasing the bayou's capacity by using weirs and shut off valves to divert water into existing ponds reduces flood risk down the bayou. The proposed project transforms an existing borrow pit site into a park that slows down the flow of stormwater and provides multiple ecosystem benefits, including stormwater management, water cleansing, recovery of native habitats, as well as creating a public space for education and recreation.

Key Info

Project Area	100 acres
Estimated Project Cost	\$5.4 million
Partners	Terrebonne Levee & Conservation District; Terrebonne Parish; Louisiana Wildlife & Fisheries
	Location: Bayou La Cache



Community Benefits



Diverts water from the bayou into detention ponds, allows for groundwater recharge, and alleviates loads on the drainage system.



Potential to reduce flooding for development down the bayou.



Includes an observation and education platform and open classroom.



Provides green space, walking paths and habitat.

COMMENTS



Aerial View Looking North

- 1 New Waterfront Gazebos for Seafood Retail with Boat Docks
- 2 Parking Lot with Permeable Pavers
- 3 New Roof on Existing Commercial Kitchen to be used for Seafood Processing
- 4 Existing Buildings - Renovation for New Uses
- 5 Retention Ponds
- 6 Boardwalk and Educational Discovery Trail
- 7 New Observation and Educational Platform (Open Classroom)
- 8 Educational Signage (Ex. "At this Point, You are 4 1/2 feet Below Sea Level")
- 9 New Trails in Forested Wetland
- 10 Retention Pond/Bioswale
- 11 New Boardwalk Connecting to Existing Trails
- 12 Existing Pump Station - Future upgrades can include windows & signage retrofits for educational purposes



Plan of Project Proposal

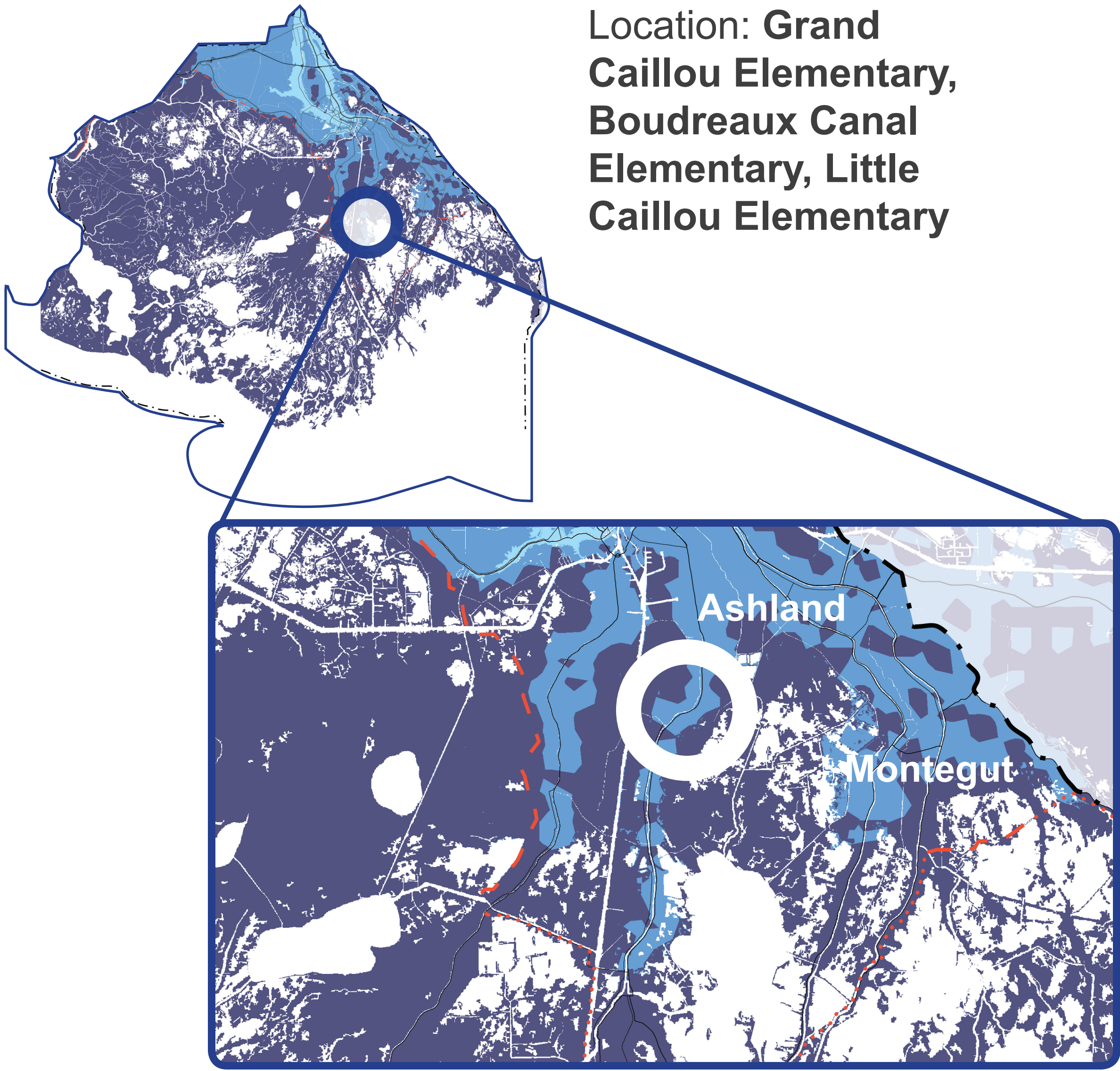
PROPOSAL

In areas projected to experience moderate future flood risk, it will be important to cluster goods and services in central locations where they will be easier to protect. In Terrebonne Parish, three abandoned elementary schools are available to repurpose in support of this goal: Grand Caillou Elementary in Dulac and Boudreaux Canal Elementary and Little Caillou Elementary Schools in Chauvin. Potential uses to support existing residents include a wetland discovery center; an ecotourism business incubator; a language cultural center and seafood processing with direct retail opportunities. Grand Caillou Elementary is adjacent to the Dulac branch library and the Grand Caillou Recreation Center, creating a centralized area for amenities and services.

Key Info

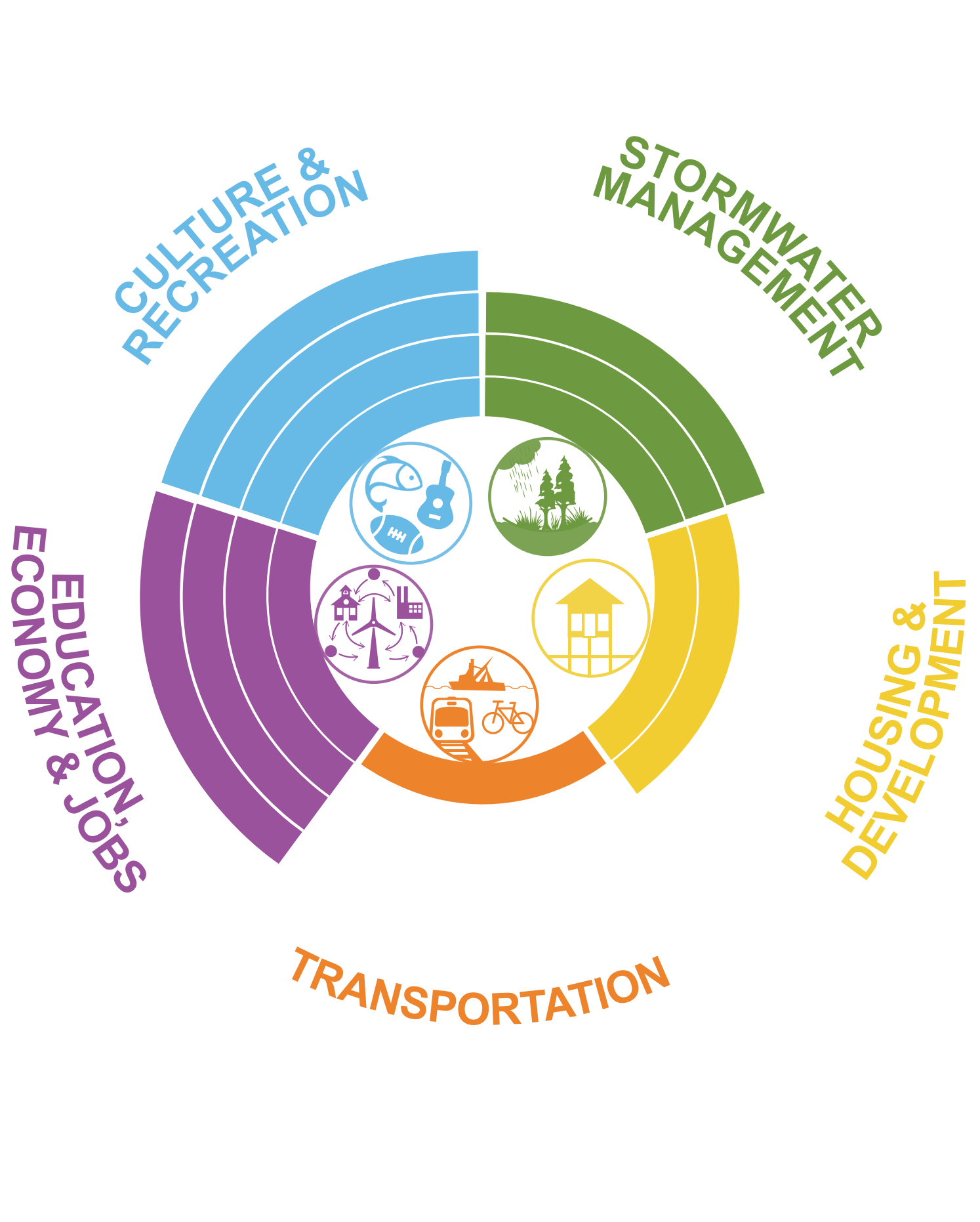
Project Area	15 acres
LA SAFE Investment	Up to \$6 million
Estimated Project Cost	\$7.3 million
Partners	Levee District; Nonprofit Grants; Property Owner

Location: Grand Caillou Elementary, Boudreaux Canal Elementary, Little Caillou Elementary



Source: CPRA & FEMA

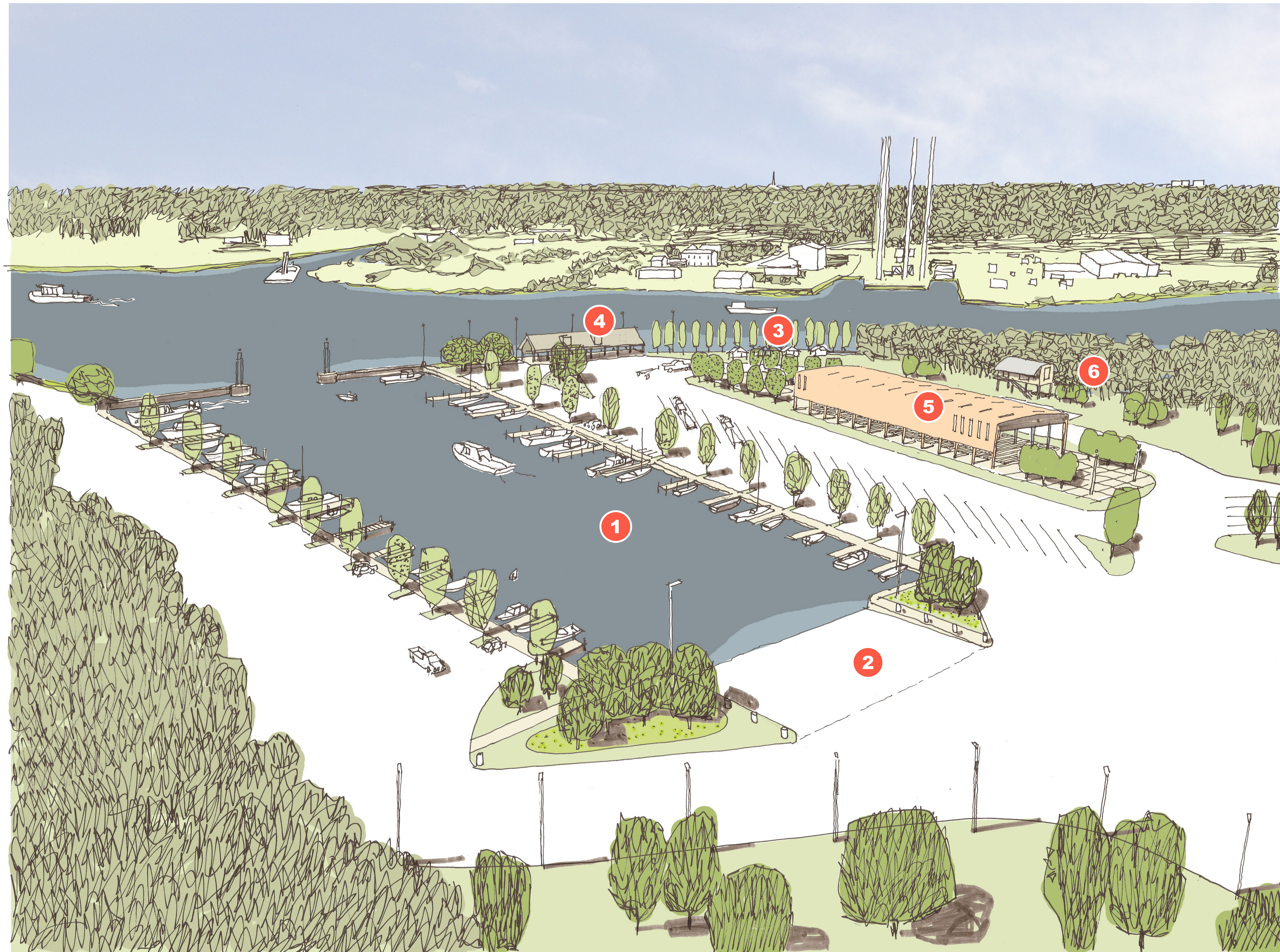
Community Benefits



- Green infrastructure on the campus will capture and slow water runoff. A wetland discovery center would educate visitors on the value of Terrebonne's wetlands and natural systems.
- Provides training, services and products needed by residents and businesses.
- Incubators assist business startups and retrain residents in emerging business opportunities. Support entrepreneurial spirit of residents.
- Provides green space, sports fields, walking paths and habitat.

COMMENTS

C HOUMA SEAFOOD MARKET & HARBOR OF REFUGE



Aerial View Looking Northwest

- 1 New Harbor of Refuge and Boat Docks
- 2 New Boat Launch
- 3 Picnic Area with Pavilions and Tables
- 4 Covered Pavilion and Fishing Dock
- 5 Seafood Market in Modified Existing Building
- 6 New Raised Convenience Store and Restrooms



Precedent images of project proposal activities



Precedents around Louisiana
Top, Middle: Delcambre Fish Market
Bottom: Westwego Fish Market



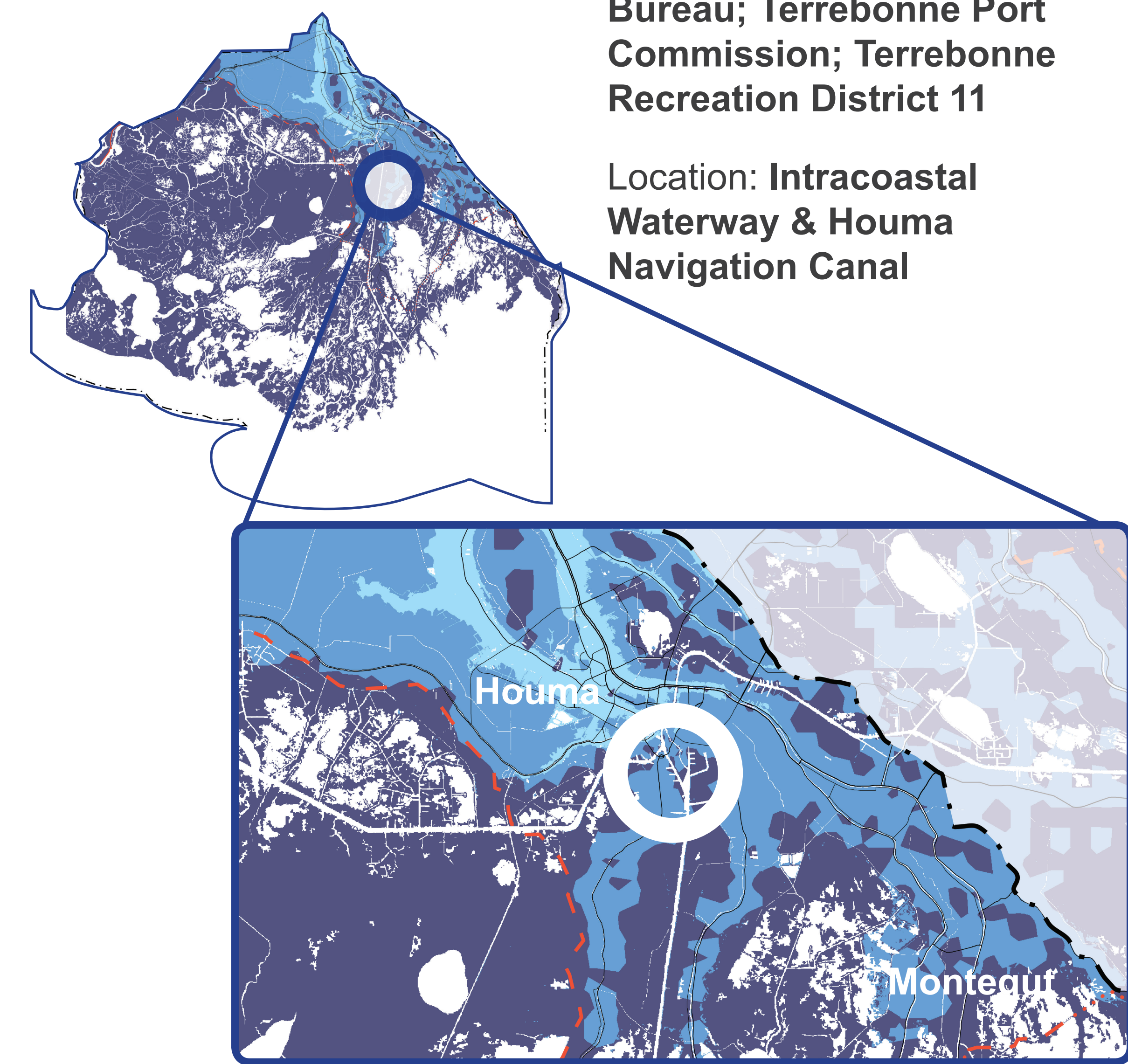
Plan View

PROPOSAL

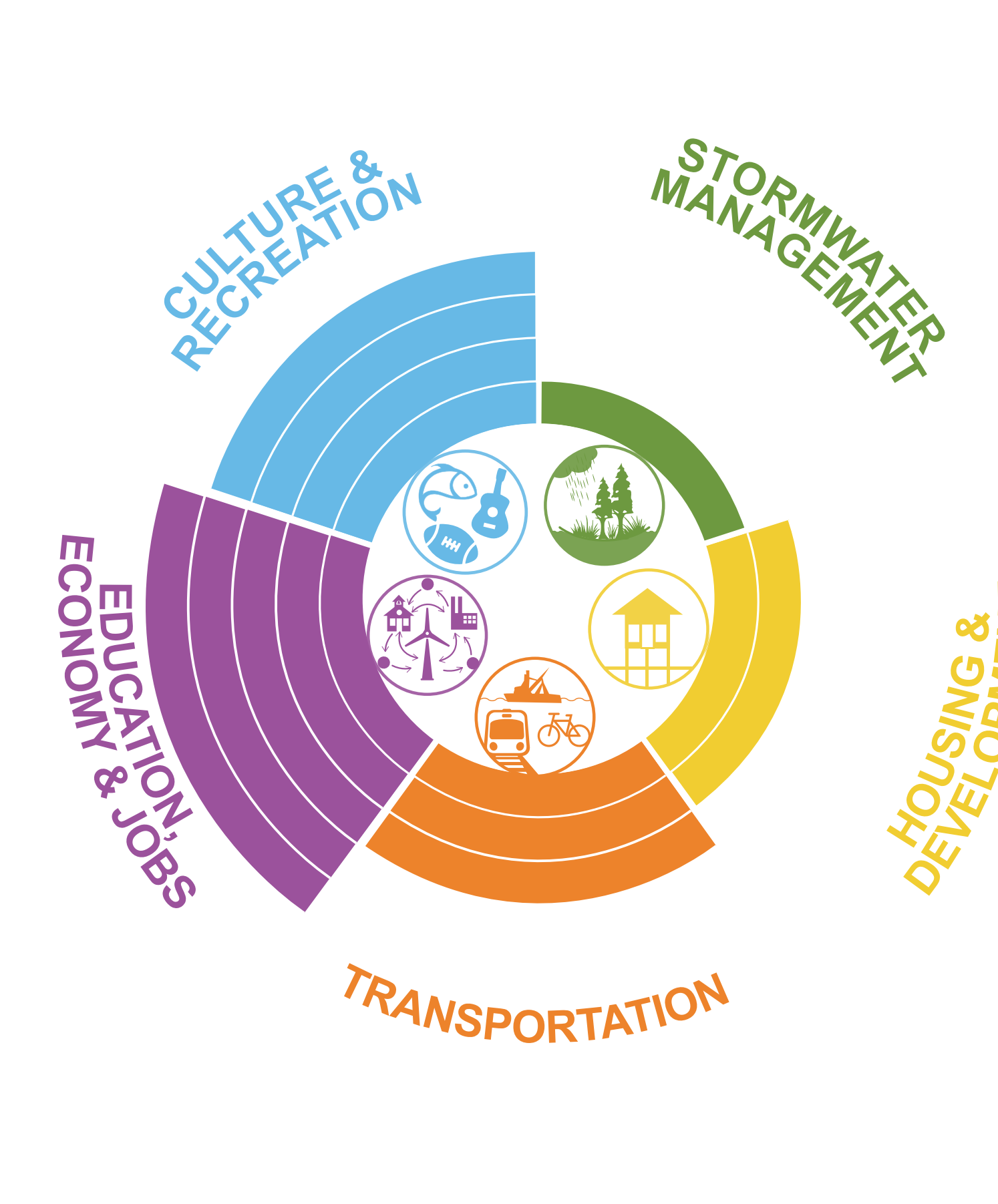
As permanent resident populations transition upland in response to increasing flood risk, it will be important to develop facilities supporting the water-based industries reliant on their access to the coast. The Terrebonne Seafood Market and Harbor of Refuge proposal expands LSU AgCenter's direct seafood marketing campaign. Modeled after the Seafood and Farmer's Market in Delcambre, LA, this strategy builds on LaTerDirectSeafood.com, and provides opportunities for residents living in areas with increasing risk to establish businesses that can thrive in a changing environment. This project creates a monthly physical seafood, vegetable and fruit market and would also include marina amenities and harbor of refuge wet- and dry-docking facilities for boats during extreme weather events.

Key Info

Project Area	30 acres
LA SAFE Investment	Up to \$6 million
Estimated Project Cost	\$8.2 million
Partners	TEDA; TPCG; LSU AgCenter; Houma C.O.C.; Houma Convention & Visitor's Bureau; Terrebonne Port Commission; Terrebonne Recreation District 11

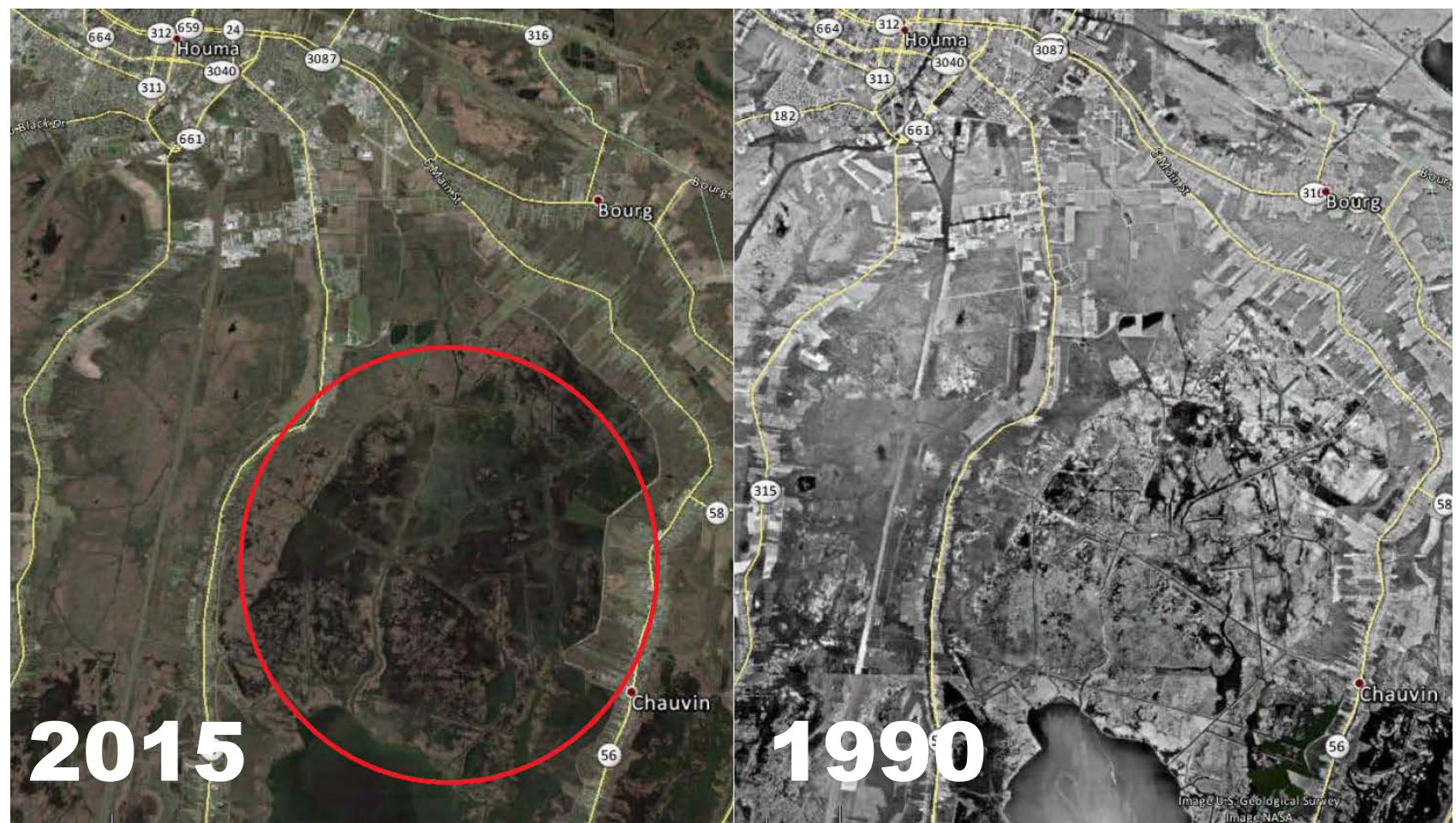


Community Benefits

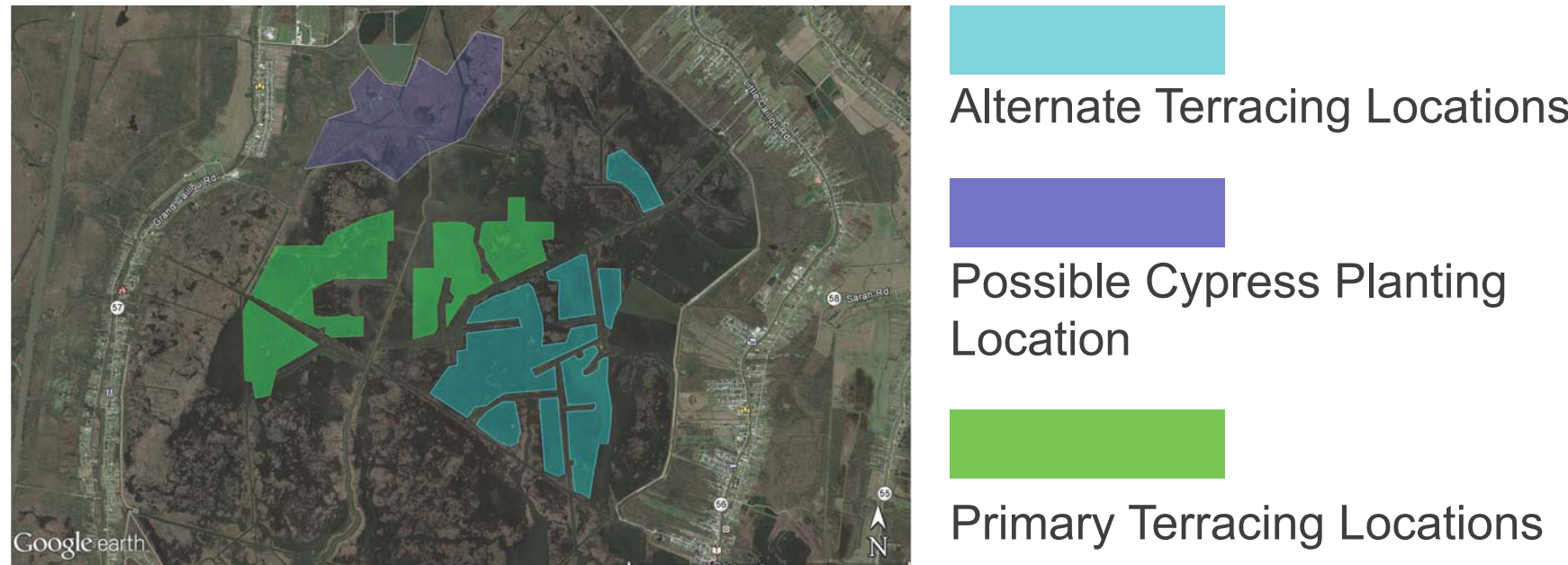


- Supports residents and businesses by providing needed goods and services.
- Provides safe storage for boats.
- Grows the direct seafood to consumer market and provides fishermen and farmers with a permanent location to sell and market goods.
- Enhances the arts and festival opportunities in the parish and provides a lively tourism venue.

COMMENTS



The project site is within the wetland area circled in red



Potential Project Area and Layout



Precedent image of coastal restoration



Precedent image of duck wing terraces



Precedent image of Four-Mile Terracing in Vermillion Bay, LA



Original image courtesy of LSU Coastal Sustainability Studio, edits by Waggonner & Ball

Aerial View

Vegetated terraces create marshland and reduce storm surge impact



Precedent image of wetlands as natural habitat



Precedent image of recreational fishing



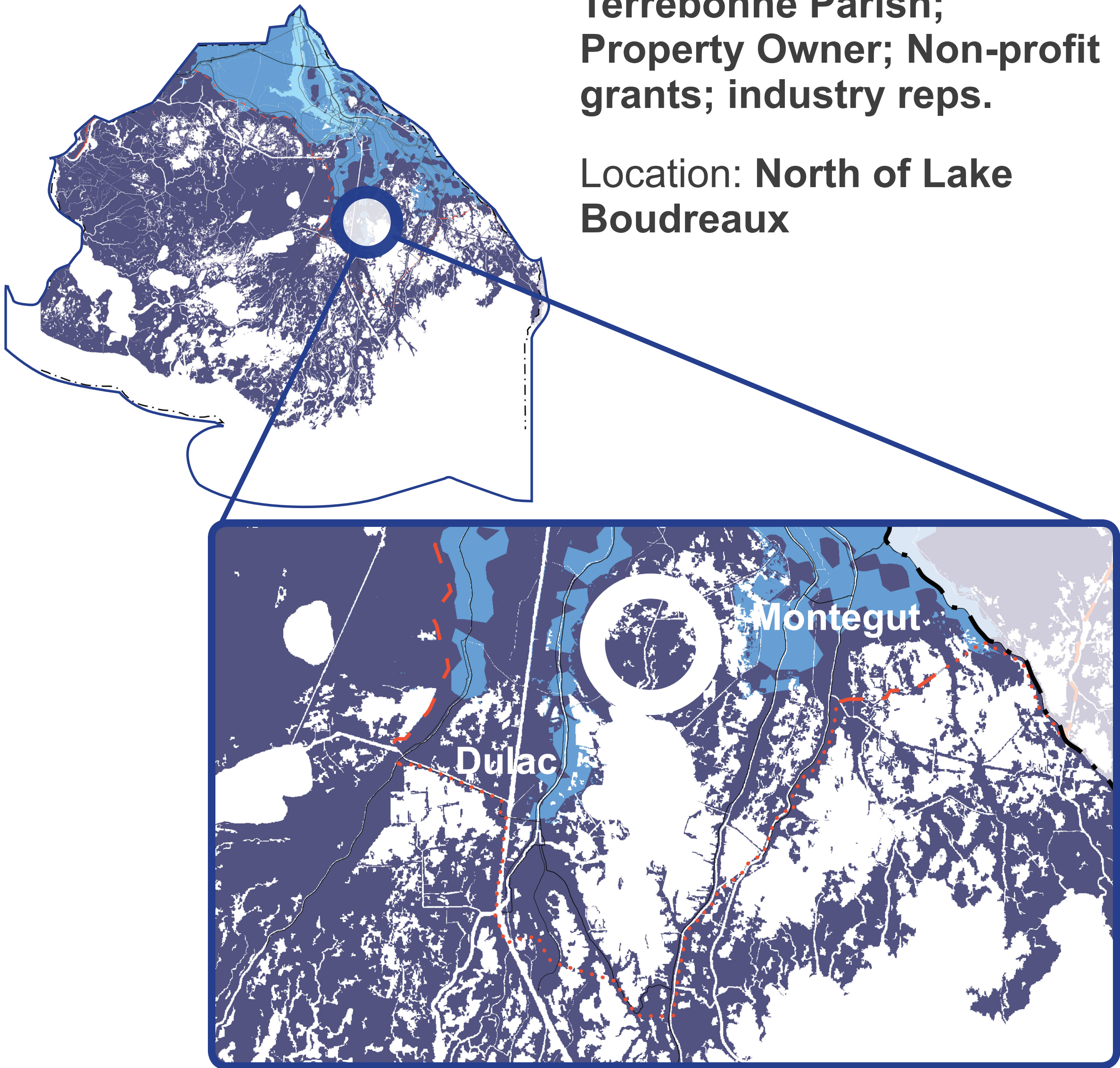
Precedent image of duck hunting in wetlands

PROPOSAL

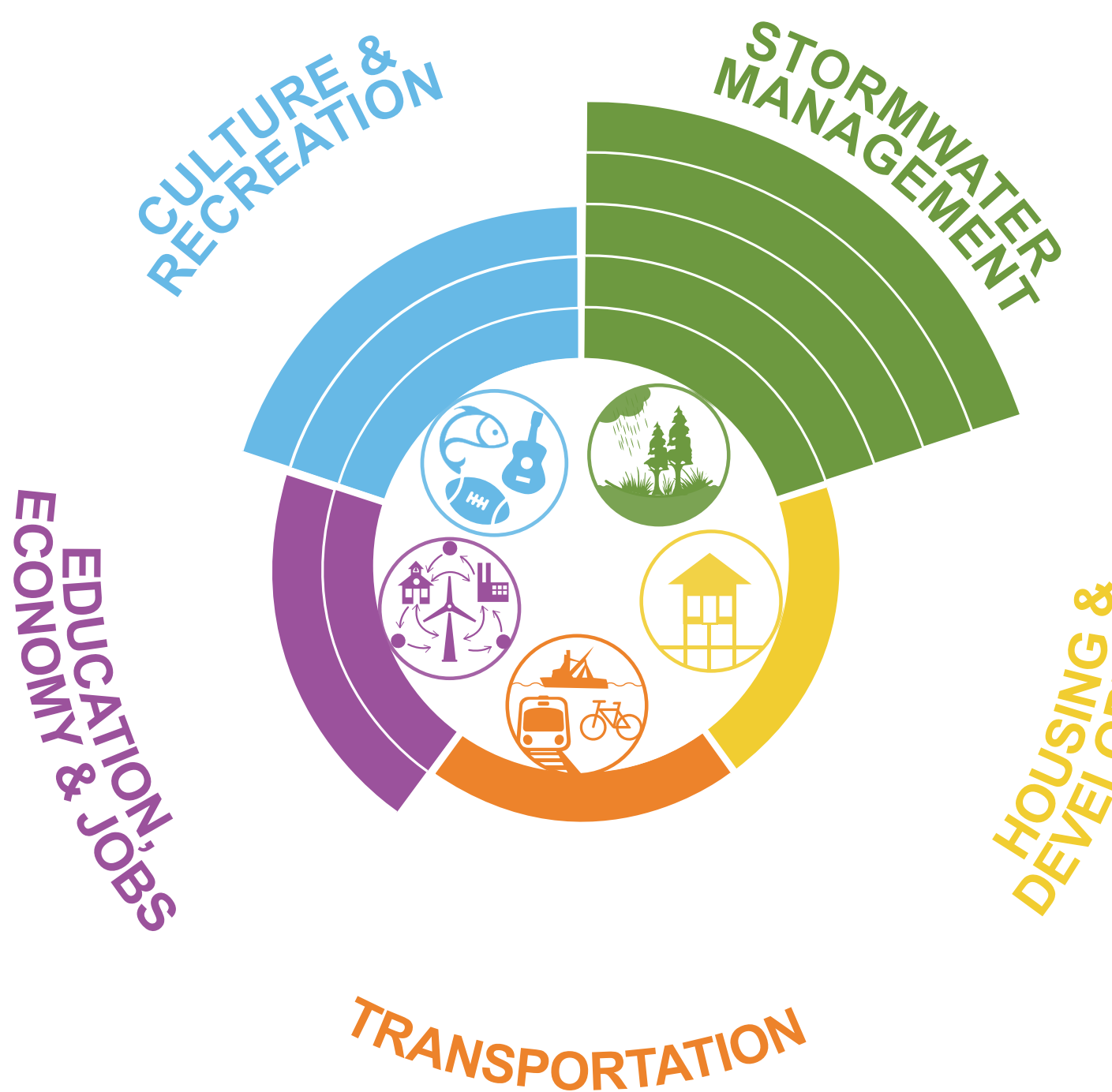
In thinking through a future with increasing flood risk, it will be important to employ what is known as a ‘multiple lines of defense’ approach. The living mitigation terraces create over 300 acres of terraces and marshlands within the Morganza to the Gulf protection system that will assist in reducing the impacts of storm surge for residents and businesses, as well as protecting Terrebonne’s infrastructure. The terraces also have environmental benefits such as enhancing submerged aquatic vegetation growth, restoring habitats, and trapping suspended sediments generated by wind and wave action.

Key Info

Project Area	1235 acres / 300 acres of created marsh
LA SAFE Investment	Approx. \$2 million
Estimated Project Cost	\$10 million
Partners	Terrebonne Levee & Conservation District; Terrebonne Parish; Property Owner; Non-profit grants; industry reps.



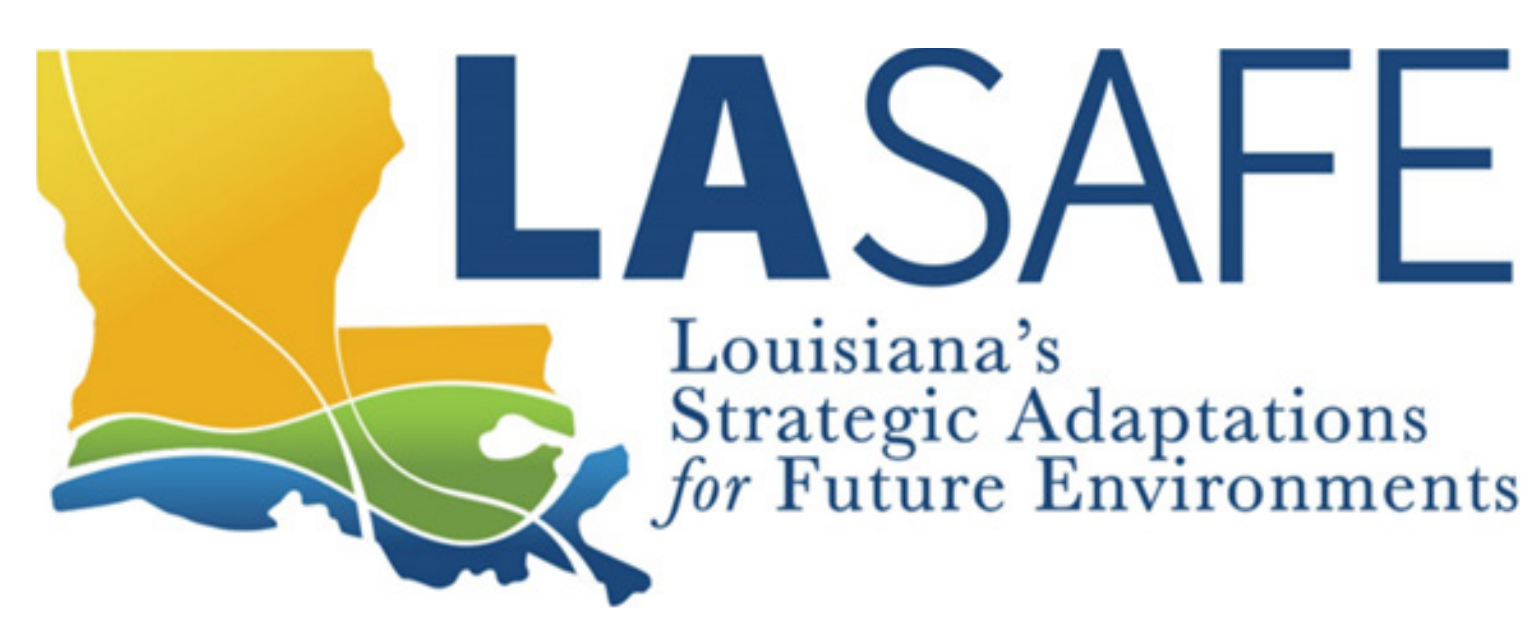
Community Benefits



-  The terraces produce marshlands and reduce storm surge, wave fetch, and turbidity. The project also traps suspended sediments generated by wind and wave action.
-  Protects residences and businesses from storm surge.
-  Protects roadways and infrastructure from storm surge.
-  Provides educational example of the value of wetlands and marshlands and habitat diversity.
-  Enhances submerged aquatic vegetation growth, providing resting and nesting habitat for avian life and the American alligator to support birding and tourism industries.

COMMENTS

E FISHERMEN AND SEAFOOD CULTIVATION LOAN PROGRAM



Fishermen Loans

Supporting Louisiana Seafood is a goal that LA SAFE heard across the coast. Fishermen struggle with changing ecosystems, increasing risk to their equipment, and cheap imported competition. They often need boat repairs and upgrades prior to fishing season. Due to the seasonal nature of the industry, conventional loans do not always meet their needs. This program would provide low interest loans with a flexible repayment schedule that matches the fishing season. By supporting fishermen, this program also supports the Louisiana seafood industry as a whole, a cornerstone of Louisiana economy and culture.



Upgrading equipment such as freezers allows fishermen to enhance product quality, and save on gas by taking longer trips.

Agriculture Transition Loans and Technical Assistance

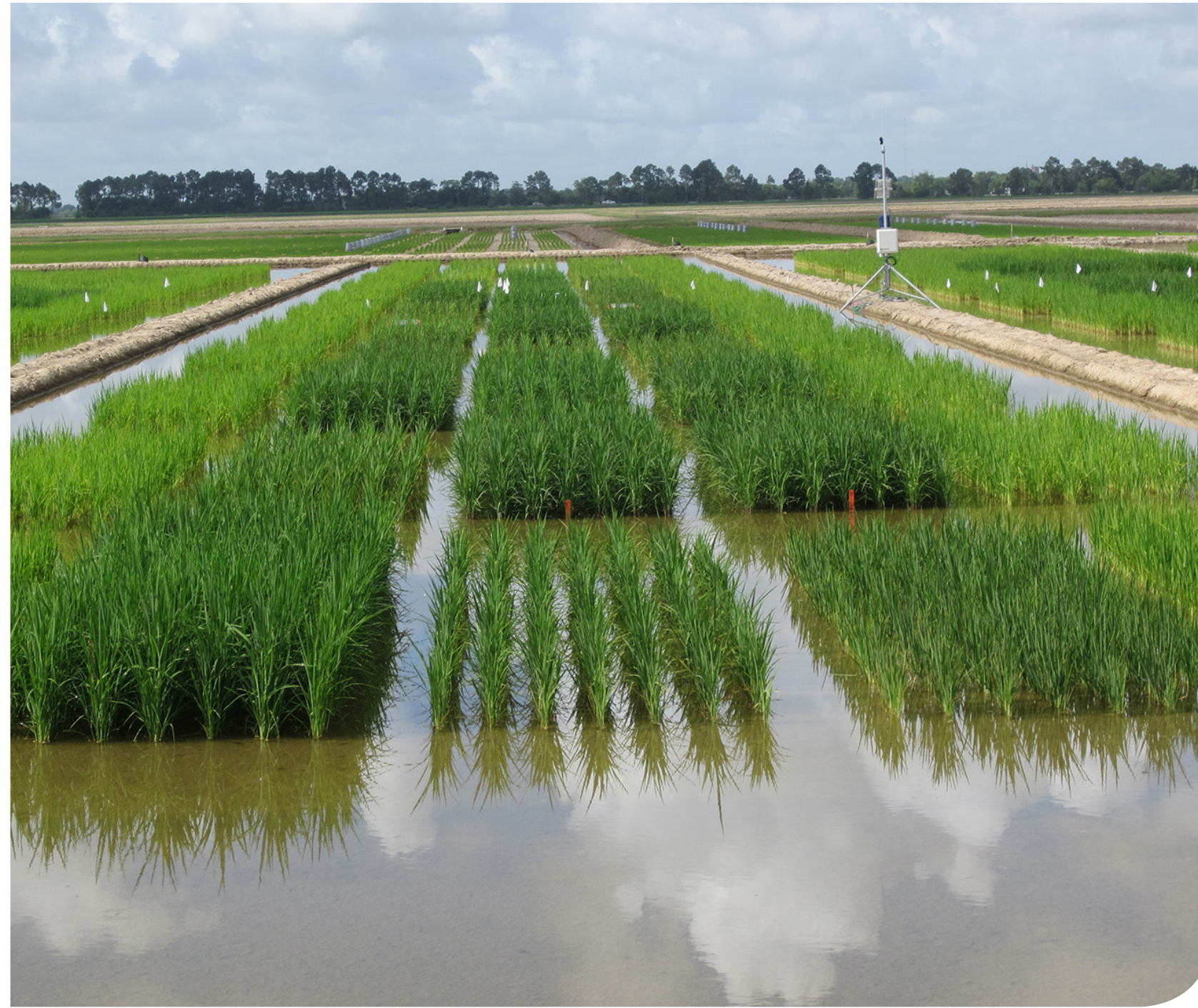
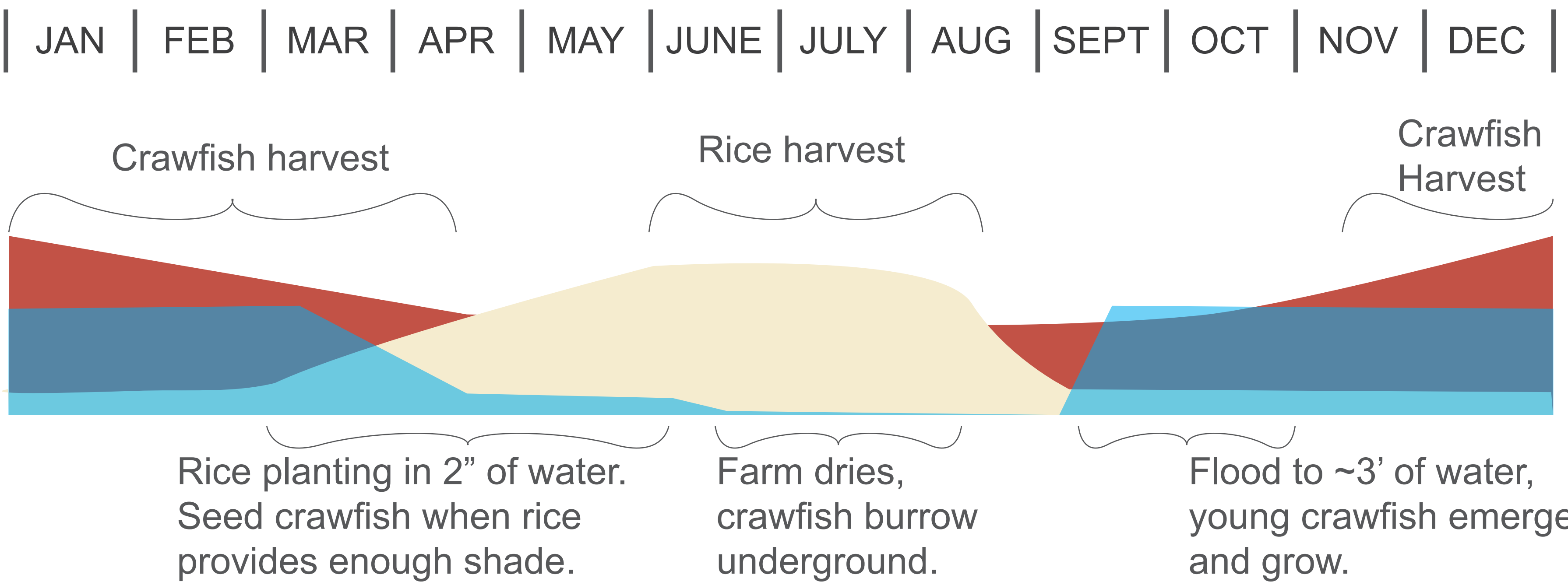
Changing coastal conditions will likely lead to different future habitats. Farmers seeking assistance to convert their operations to crops suited to a wet environment can benefit from this program. For example, dry wheat and sugarcane farms in increasingly wet regions could convert to combined rice and crawfish farms, providing income and stormwater management. This program will provide loans and technical assistance to farmers who want to adapt their crops to a changing environment.



Yearly Flooding and Harvests

This is an abstracted calendar showing the pattern of rice and crawfish harvests and the level of water during different times of the year.

Source: <https://www.cajuncrawfish.com/how-we-grow-crawfish.htm>

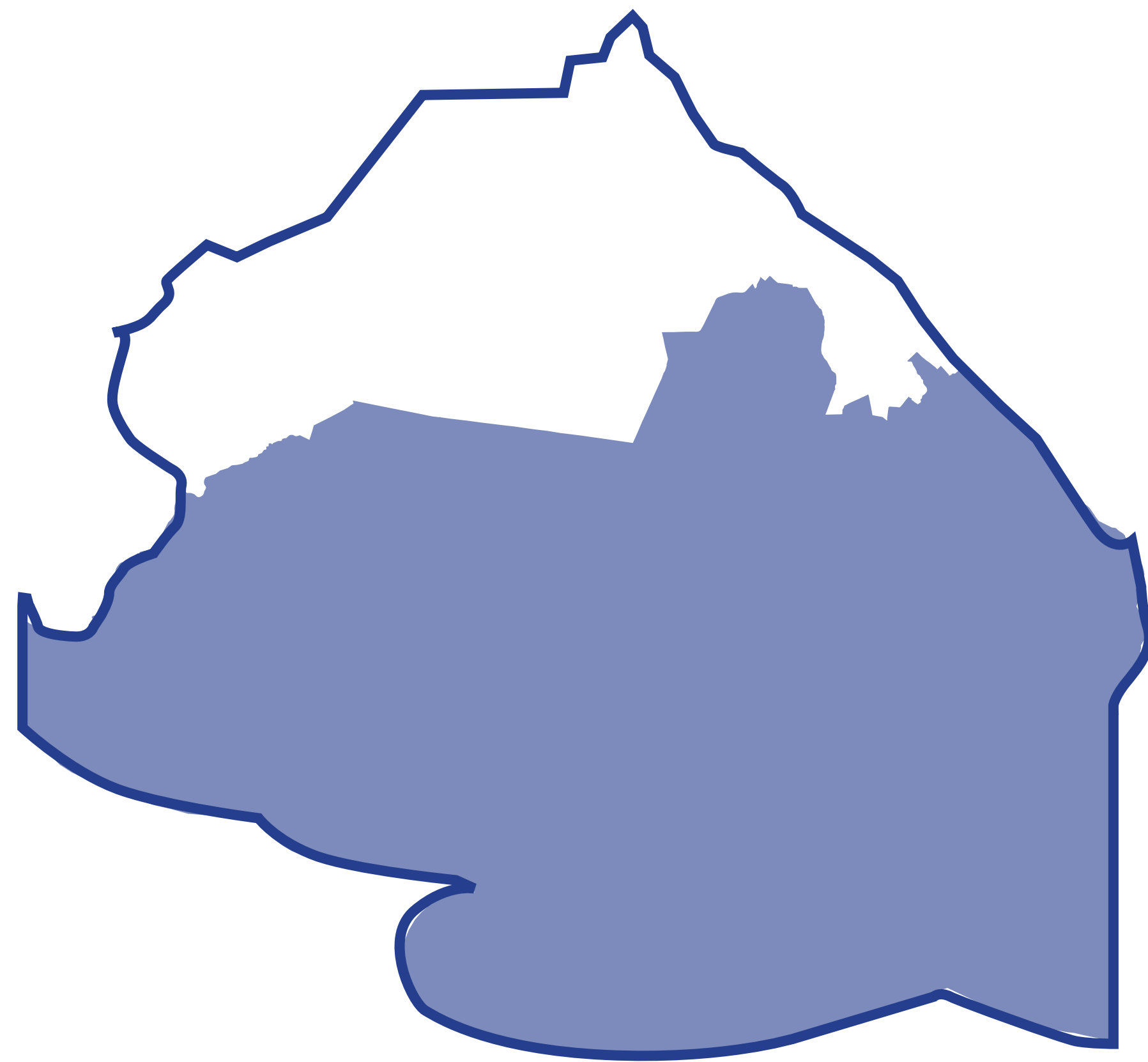


PROPOSAL

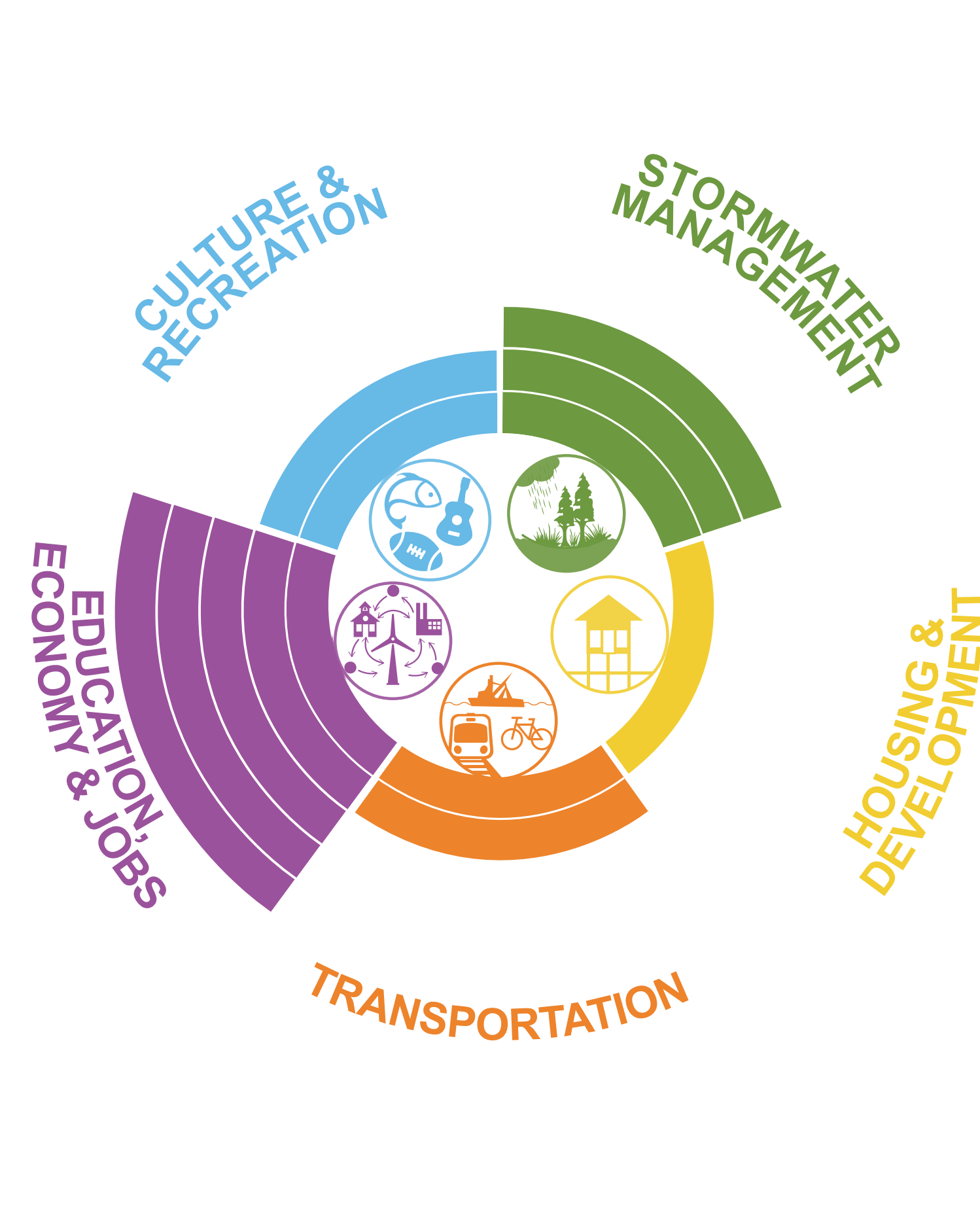
This program provides technical assistance and loans of up to \$50,000 to residents in the fishing or agriculture industries who do not have access to traditional lines of credit. Fishermen may use these loans to improve or repair boats and equipment, diversify into charter service or tourism, implement approved best practices or invest in product quality enhancement equipment. Likewise, farmers in low-lying areas that require expensive water management to maintain expected crop output may qualify for loans and technical assistance to convert dry agriculture operations to more sustainable land uses. Loans would be low-interest and borrowers may be eligible for flexible repayment options based on seasonal income.

Key Info

LA SAFE Investment	\$3 million
Estimated Project Cost	\$3 million
Partners	Community Development Financial Institution, Credit Union or non-profit
Location	In all eligible census tracts in Terrebonne Parish



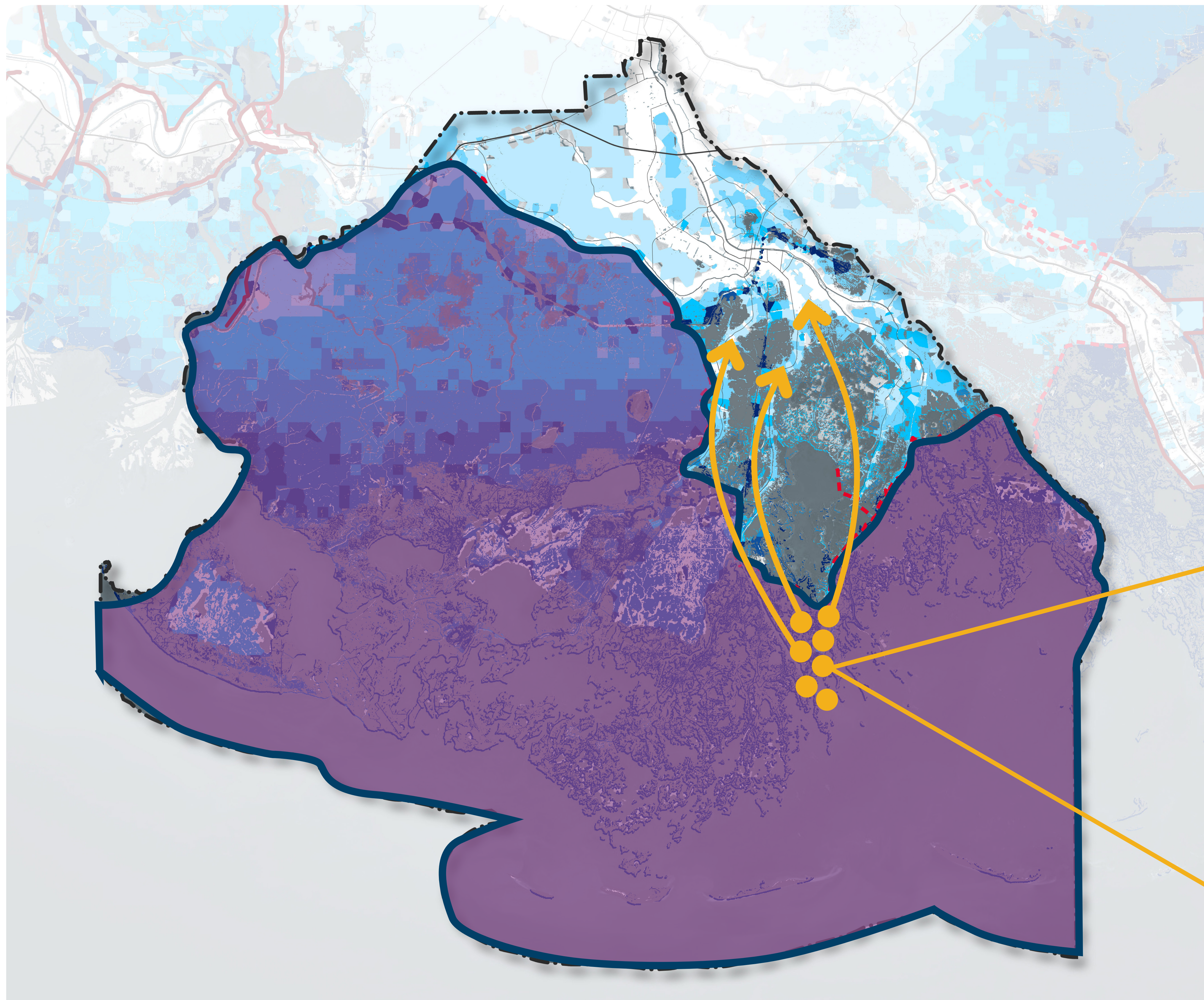
Community Benefits



- Transitioning from dry farming to seafood/crop (rice & crawfish) provides stormwater retention benefits to the region.
- Loans can be used to improve commercial fishing boats.
- Enhanced product quality can provide higher incomes for fishermen and farmers.
- Loans could be used by boat owners to expand into charter or tour businesses.

COMMENTS

F BUYOUTS FOR PERMANENT RESIDENT HOUSEHOLDS



Buyout program for permanent residents outside of Morganza to the Gulf

Residents who accept the voluntary buyout will receive funds to relocate to higher ground within Terrebonne Parish.



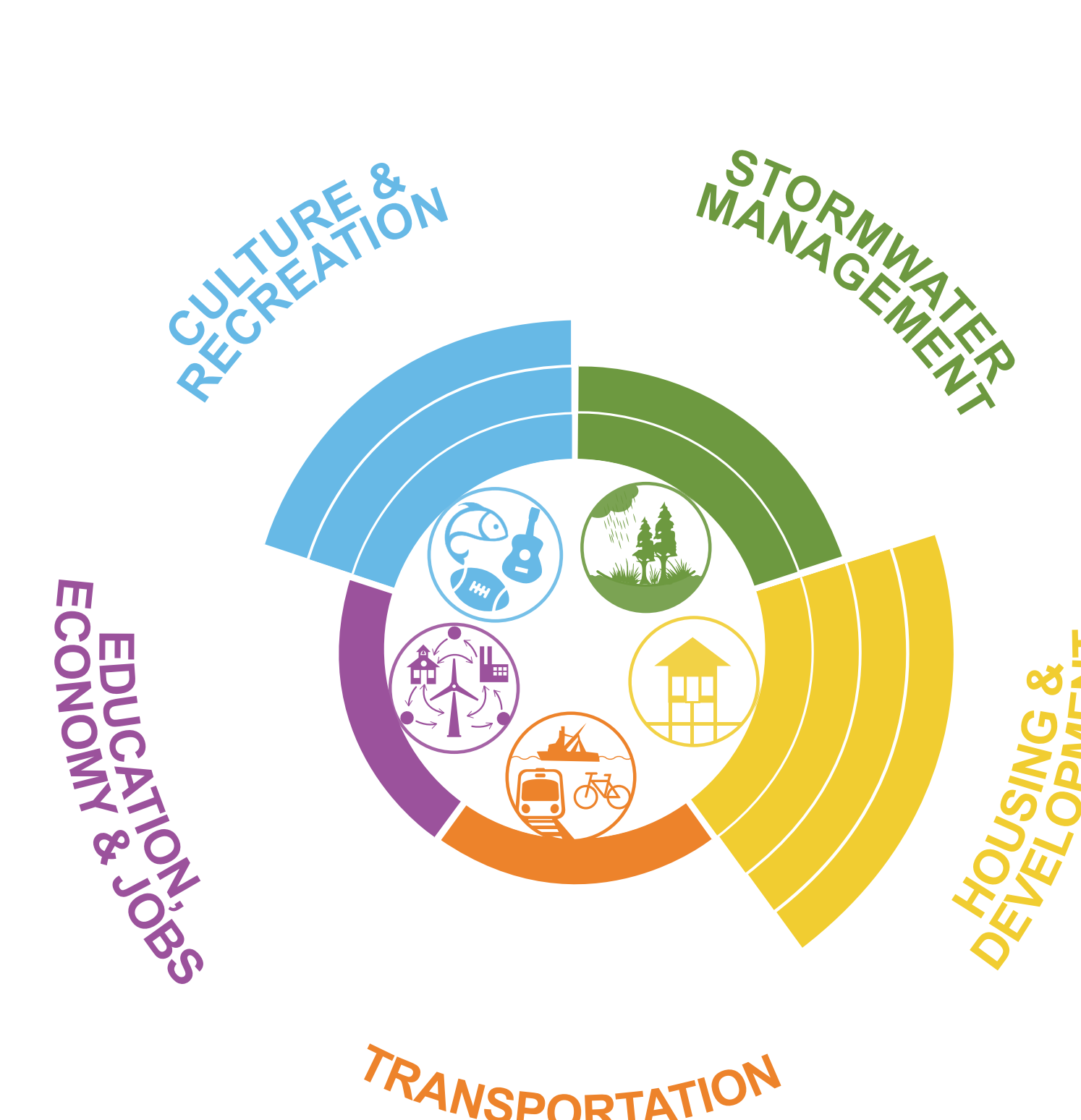
PROPOSAL

Areas not protected from the planned levee system, which are projected to experience high degrees of flood risk, are not suitable for permanent housing. In Terrebonne Parish most permanent residents living in these areas are located on Isle de Jean Charles. The State of Louisiana is in the process of resettling these residents to higher, safer ground. Approximately 7 permanent households are currently located in areas outside of Morganza to the Gulf. This program provides relocation assistance to a safer location. This program would be supported by policy implementations intended to prevent future permanent resident development in these areas.

Key Info

Number of permanent resident households	7
Estimated Project Cost	Up to \$2M • \$250,000 cap per household • \$250,000 for administration
Partners	Terrebonne Parish
Location	Eligible area outside Morganza to the Gulf

Community Benefits



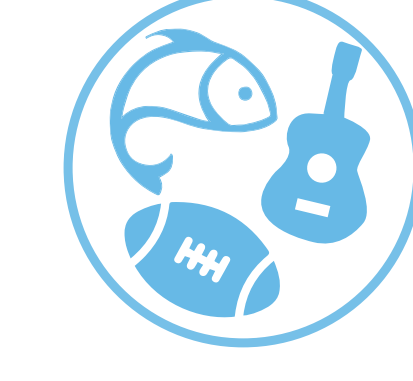
Vacated properties may be converted for stormwater retention or wave attenuation purposes.



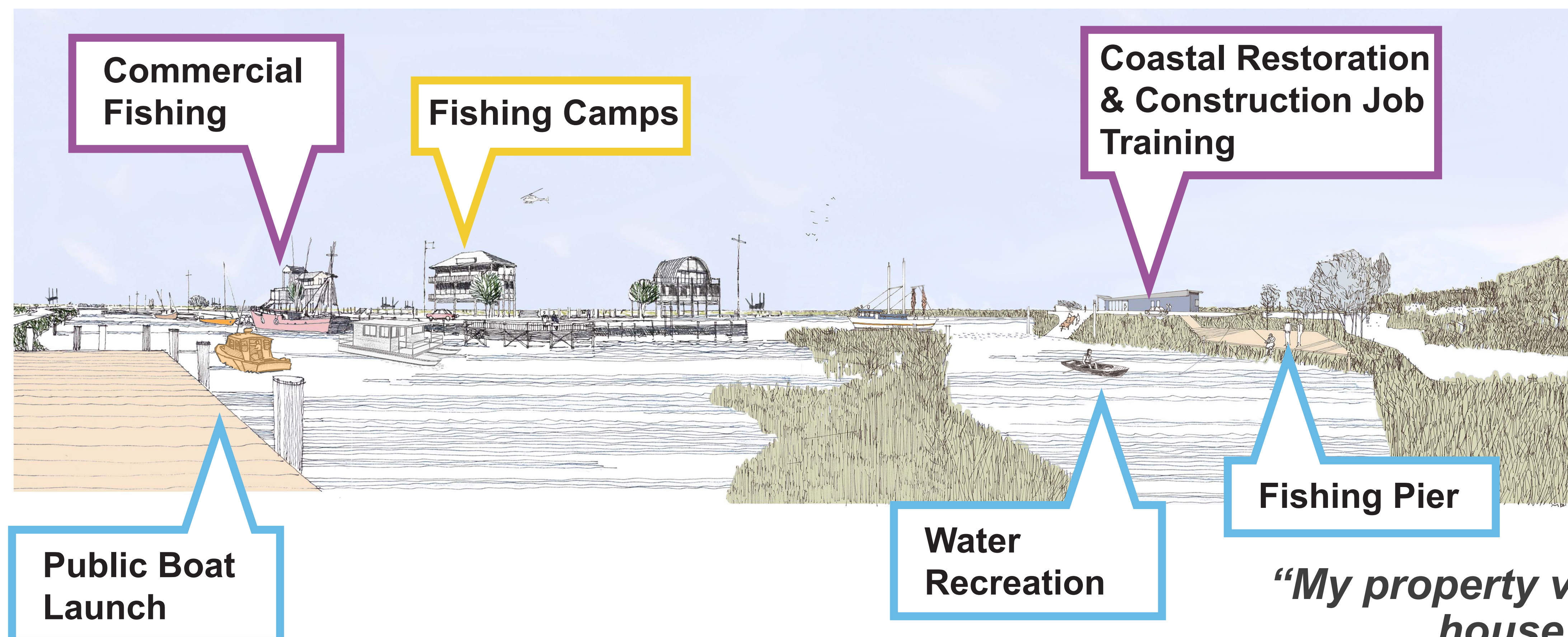
Residents who choose to relocate will be provided with funds to resettle in a safer area.



Relocated residents will enjoy closer access to goods and services.



Vacated properties may be converted to recreational camps, facilitating an economic transition to natural uses.



Even as residents leave land outside of protection systems, these areas can still serve a variety of economic and recreational purposes.



"My property value is nil. Been trying to sell my house for 2 years and no one wants it."

-Montegut Resident at Meeting 2

COMMENTS

