# COASTAL TEXAS STUDY
# STUDY SUMMARY

US Army Corps of Engineers®
Galveston District

## FAST FACTS

- The Texas coastal region is home to 25 percent of the entire state's population.
- Galveston Bay and Corpus Christi Bay are 2 of 28 National Estuary Programs in the U.S.
- There are 12 National Wildlife Refuges in the study area.
- The study area includes significant commercial fisheries for oysters, shrimp, and finfish.
- Texas is the nation's top state for waterborne commerce with Texas ports representing over $82.8 billion in economic value to the state.
- The Texas coast is home to four of the eight largest refineries in the country, and represents 25 percent of the nation's refinery capacity and most of the National Petroleum Reserve.


**COASTAL TEXAS STUDY TEAM CONTACTS:**

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**Texas General Land Office:**
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## ABOUT THE STUDY

The U.S. Army Corps of Engineers (USACE), in partnership with the Texas General Land Office (GLO), began an examination in November 2015 of the feasibility of constructing projects for coastal storm risk management and ecosystem restoration along the Texas coast. The goal of the Coastal Texas Study is to enhance resiliency in coastal communities and improve capabilities to prepare for, resist, recover and adapt to coastal hazards.

To meet that goal the study team identified and screened numerous projects and individual measures and determined a Tentatively Selected Plan (TSP). Alternatives analysis and plan selection is an iterative process based on economic, engineering, social, and environmental factors. The Draft Integrated Feasibility Report and Environmental Impact Statement (DIFR-EIS) is a comprehensive report that documents that process.

When the DIFR-EIS is complete and finalized, the TSP, consisting of coastal storm risk management (CSRM) and ecosystem restoration (ER) features, will be recommended to Congress for authorization, funding, and construction.

## ABOUT THE STUDY AREA

The study area consists of the entire Texas Gulf coast from the mouth of the Sabine River to the mouth of the Rio Grande, and includes the Gulf and tidal waters, barrier islands, estuaries, coastal wetlands, rivers and streams, and adjacent areas that make up the interrelated ecosystems along the coast of Texas.

## PURPOSE OF THE STUDY

The Texas coast is subject to coastal erosion, relative sea level rise, coastal storm surge, habitat loss and water quality degradation. These coastal hazards are placing the environmental and economic health of the coast at risk, which can negatively impact the state and national economy. In addition, events such as Hurricane Rita, Hurricane Ike and Hurricane Dolly, caused further ecological and economic devastation to the Texas coast, and emphasize the need for enhanced protection of the coast to prevent future damage and loss.

This feasibility study is necessary to determine if there is Federal interest in supporting projects for CSRM and ER that would protect the health and safety of Texas coastal communities, reduce the risk of storm damage to residences, industries, and businesses critical to the Nation's economy, and address critical coastal ecosystems in need of restoration.

More information is available online at:
**http://coastalstudy.texas.gov**

# ABOUT THE STUDY PROCESS

The Coastal Texas Study includes a National Environmental Policy Act, or NEPA-compliant integrated feasibility report and environmental impact statement. This requires the planning process to consider the impacts projects will have on natural, economic, social, and cultural resources. National security interests also are researched during the environmental and feasibility analyses.

## What is an Environmental Impact Statement (EIS)?

A Federal agency must prepare an EIS if it is proposing a major federal action that may significantly affect the quality of the natural and human environment to comply with NEPA. NEPA established our country's national environmental policies in 1969. The environmental review process seeks to facilitate better-informed decisions and involve citizens, and the USACE will seek to involve the many stakeholders throughout this study process.

## What is a Feasibility Study?

All major Federal water resource projects, including navigation, must follow a study process that evaluates proposed solutions to problems by analyzing the engineering, economic, environmental, cost, and other impacts and aspects of alternative solutions. This study process, consisting of six major steps, is used to identify a plan of most value to the national economy, consistent with protecting the nation's environment and follows principles and guidelines in Federal water resource law and USACE regulations.

## Where are we in the study process?

We are currently in the public comment period for the DIFR-EIS. Following this period, the study team will review and address the input received from the public, resource agencies, and the USACE and GLO leadership to produce the final report. It is anticipated that the Final Integrated Feasibility Report and Environmental Impact Statement will be published for public, state, and agency review in the fall of 2020.

# STUDY APPROACH

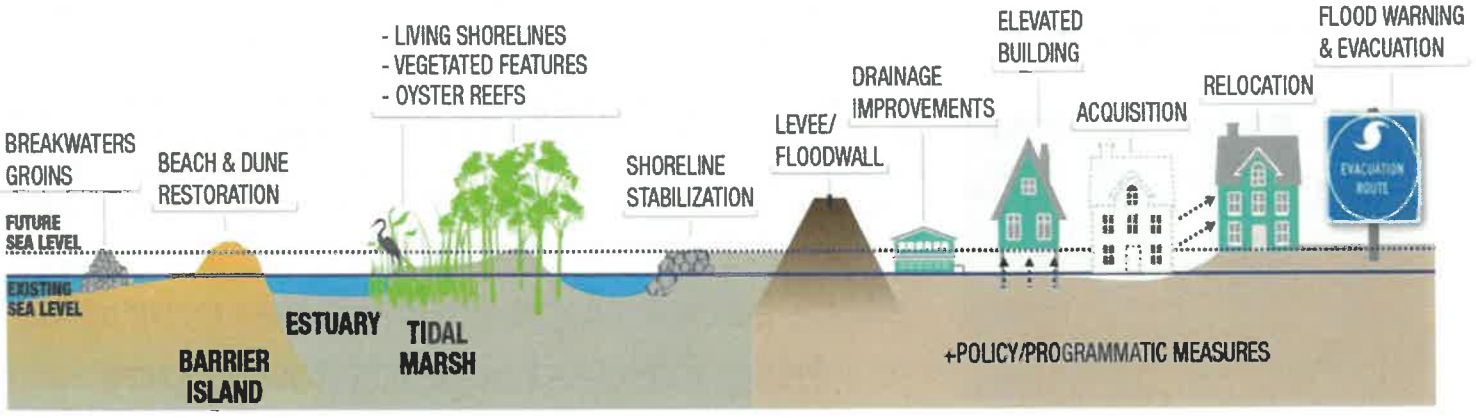
A "multiple lines of defense" strategy is utilized in the formulation of the measures and alternatives in the Coastal Texas Study. Employing three primary goals – preserve, minimize, and avoid – coastal communities should consider a system of comprehensive, resilient and sustainable coastal storm risk management and ecosystem restoration solutions. The system should include a combination of measures (structural, natural and nature-based features, and nonstructural) to form resilient, redundant, robust and adaptable strategies that promote life safety based on local site conditions and societal values. To achieve a multiple lines of defense approach, the Coastal Texas Study evaluates the following coastal problems:

- Economic damage from coastal storm surge
- Shoreline erosion
- Gulf shoreline erosion
- Loss of threatened and endangered critical habitats
- Disrupted hydrology

The Coastal Texas Study identifies nationally important environmental restoration strategies along the entire Texas coast. These restoration measures are evaluated based on long-term benefits, costs, feasibility and resiliency. Objectives for ecosystem restoration focus on:

- Restoring fish and wildlife habitat
- Improving hydrologic connectivity
- Reducing erosion to shorelines
- Creating and restoring oyster reefs
- Implementing sediment management

## MULTIPLE LINES OF DEFENSE ON THE TEXAS COAST



# THE NEPA AND FEASIBILITY STUDY PROCESS

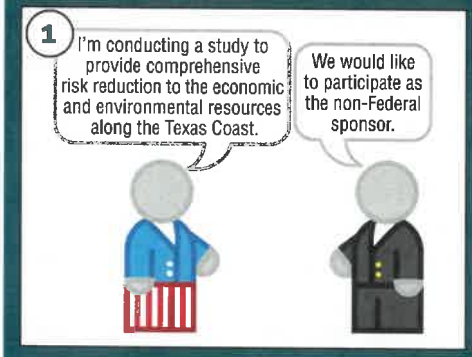
*The EIS preparation and Feasibility Study are being conducted concurrently to result in a single Integrated Feasibility Report and EIS document, or a DIFR-EIS.*

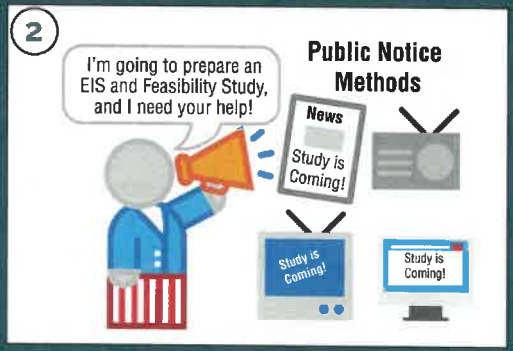
## THE STUDY TEAM AND PUBLIC

U.S. Army Corps of Engineers (The Lead Agency)

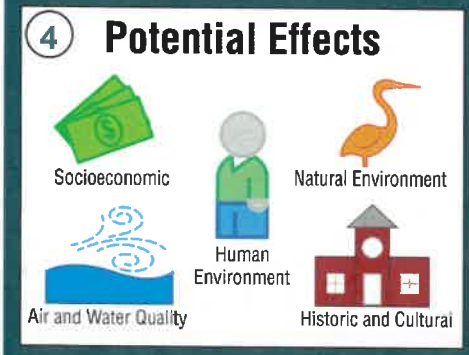
Texas General Land Office (The Non-Federal Sponsor)

**You** The Public and Local Stakeholders



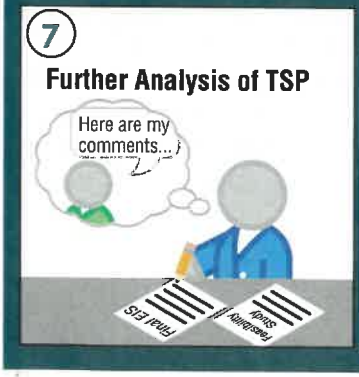










**WE ARE HERE**





# THE TENTATIVELY SELECTED PLAN

## STUDY AREA

*MARSH RESTORATION*

*BEACH RESTORATION*

*ISLAND RESTORATION*

The Coastal Texas Study Team has carried out detailed analyses to determine the feasibility and impacts of constructing large-scale CSRM and ER alternative plans to restore and enhance the State's ecologic coastal features and reduce the risk of coastal storm damage.

CSRM measures consist of structural features that include levees, floodwalls, and navigable and environmental surge barrier gates.

ER measures consist of features that include habitat restoration and shoreline erosion control through wetlands, oyster reef, beach/dune, and island restoration. ER features address important coastal ecosystems in need of restoration, including wetlands, seagrass beds, sea turtle nesting habitat, piping plover critical habitat, bird island rookeries, and Federal and State wildlife refuges.

CSRM and ER measures were developed and evaluated through several screening workshops and then assembled into alternatives to reduce risk of coastal hazards to the natural and human environment for the Texas coast.

The Tentatively Selected Plan is formulated to achieve an integrated system of risk reduction actions and includes a combination of both CSRM and ER measures that work together to enhance coastal resiliency.

The Tentatively Selected Plan includes three main components:

1. Ecosystem Restoration measures for areas along the entire coast
2. A Coastal Barrier CSRM measure to address storm surge in the upper Texas coast
3. A South Padre Island CSRM measure to address erosion and storm surge in the lower Texas coast

Cost estimates for the TSP range from $25B to $32B

### ER Component of the TSP

The ER component of the Tentatively Selected Plan addresses habitat loss and degradation from coastal processes and also supports the CSRM components by providing a natural buffer from coastal storms.

The ER component of the Tentatively Selected Plan includes a total of nine ER measures along the entire Texas coast. Each of the nine measures represents a combination of features and is formulated in a specific geographic location to restore diverse habitats and provide multiple lines of defense.

Marsh restoration improves degraded marsh habitat or restores habitat that has become open water due to erosion, relative sea level rise and other coastal forces. Breakwaters will be placed to reduce erosion and sediment placed behind the breakwaters increases the elevation of the land to restore or maintain fluctuating water levels as tides vary. Restoration also includes planting of native marsh vegetation to provide habitat and trap sediment, thus reducing erosion.

Beach restoration places sand dredged from offshore sources or from nearby navigation channels on degraded gulf shorelines to restore dune and beach habitat. To maintain the habitat over time sand is replaced at regular intervals.

Island restoration includes placement of sediment to increase the elevation of degraded islands. These restored islands include shoreline stabilization along the Gulf Intracoastal Waterway to withstand erosion and will provide bird nesting habitat. To increase the diversity of habitat and provide natural erosion control, the bay side of the island will slope to a created marsh and oyster reef.

Hydrologic restoration is the reestablishment of a connection between water bodies to maintain salinity balances that sustain habitats.

The nine ER measures are:

- G-5: Bolivar Peninsula/Galveston Island Gulf Beach and Dune Restoration
- G-28: Bolivar Peninsula and West Bay Gulf Intracoastal Waterway (GIWW) Shoreline and Island Protection
- B-2: Follets Island Gulf Beach and Dune Restoration
- B-12: Bastrop Bay, Oyster Lake, West Bay, and GIWW Shoreline Protection
- M-8: East Matagorda Bay Shoreline Protection
- CA-5: Keller Bay Restoration
- CA-6: Powderhorn Shoreline Protection and Wetland Restoration
- SP-1: Redfish Bay Protection and Enhancement
- W-3: Port Mansfield Channel, Island Rookery, and Hydrologic Restoration of the Laguna Madre System

## Upper Coast CSRM Measure of the TSP

The Coastal Barrier CSRM measure to address storm surge in the upper Texas coast is a risk reduction system made up of structural features including: floodwalls, floodgates at highways and railroads, seawall improvements, and surge barrier gates. There will be levees and floodwalls along Bolivar and Galveston, with surge gates at Bolivar Roads and a ring levee around the city of Galveston. It also includes features located at Clear Creek Channel and Dickinson Bayou.

A unique feature of the Coastal Barrier is at the pass to Galveston Bay between Bolivar Peninsula and Galveston Island. This feature includes surge barrier gates that are made up of a 1,200 foot navigable floating sector gate and environmental lift gates.

## Lower Coast CSRM Measure of the TSP

The South Padre Island CSRM measure to address storm surge in the lower Texas coast consists of approximately 2.2 miles of dune and beach restoration along South Padre Island. The restoration would be aligned along the existing beach and dune system and would begin 2 miles from the Brazos Santiago Pass North Jetty system and end 4.2 miles from that same system.

# TENTATIVELY SELECTED PLAN COMPONENTS:

1. **Ecosystem Restoration measures for areas along the entire coast**
2. **A Coastal Barrier CSRM measure to address storm surge in the upper Texas coast**
3. **A South Padre Island CSRM measure to address erosion and storm surge in the lower Texas coast**

*Beach and dune system on South Padre Island.*

More information is available online at:
**http://coastalstudy.texas.gov**

# THE TENTATIVELY

## ECOSYSTEM RESTORATION MEASURES

Marsh Restoration

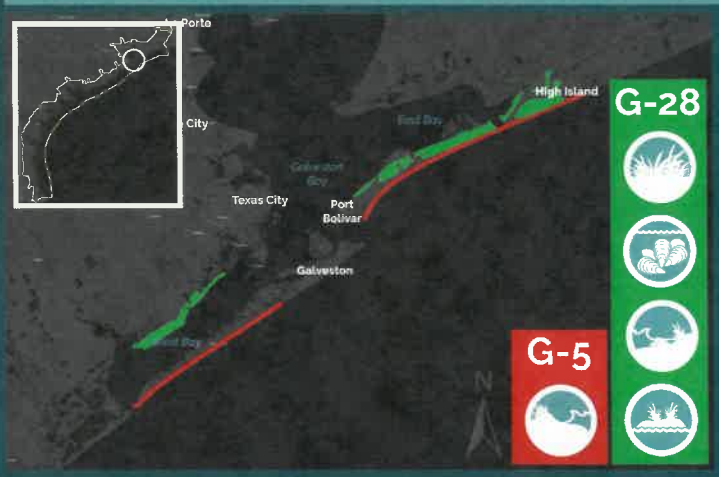
Beach Restoration

Oyster Reef Restoration

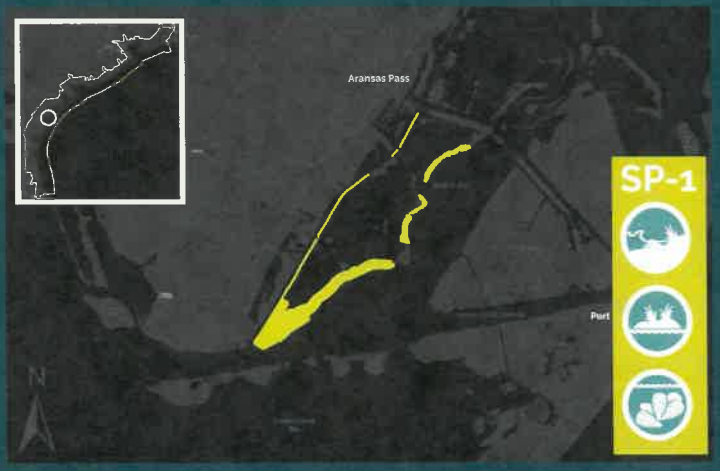
Island Restoration

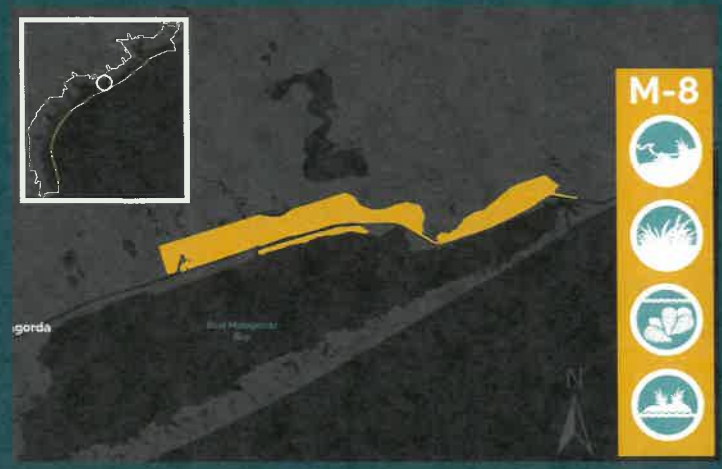
Breakwater Creation

Hydrologic Restoration






# SELECTED PLAN



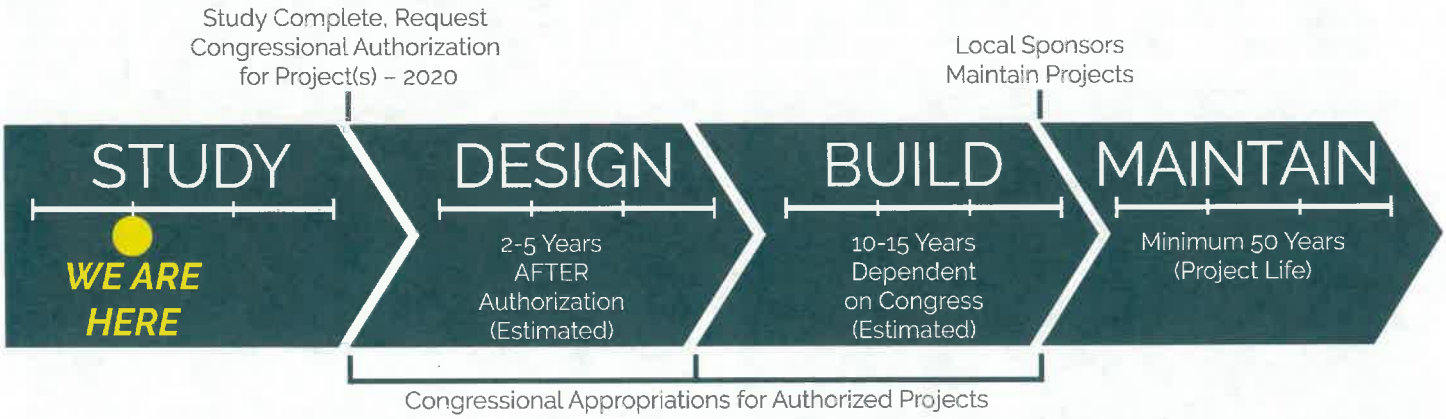

## COASTAL BARRIER CSRM

- Levees and Floodwalls
- Surge Gates
- House Raising and Buyout
- Pump Stations




## SOUTH PADRE ISLAND CSRM

# ESTIMATED PROJECT SCHEDULE




## WHAT WILL HAPPEN NEXT?

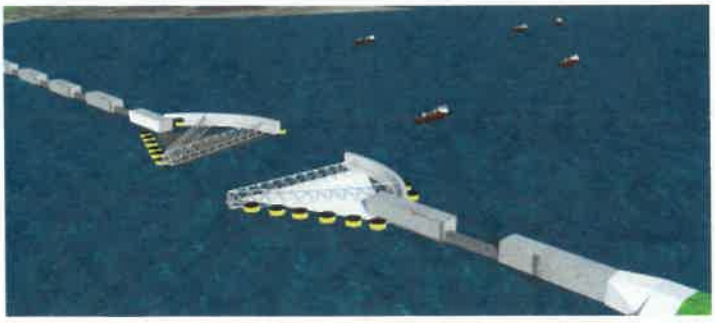
After the Study Phase, a Recommended Plan will be refined and proposed for congressional authorization and funding. Construction of the Recommended Plan is dependent upon approved congressional funding.

The Recommended Plan identified in the Final report would be built over a period of 10 to 15 years, depending on congressional authorization and partnerships. The project would be maintained after construction by a local sponsor.

## HOW DO I PARTICIPATE IN THE STUDY PROCESS?

You may participate in this process by providing comments for consideration by the study team. Public involvement is integral to assessing the environmental consequences of the proposed project and improving the quality of the environmental and feasibility decision making. The study team is utilizing this meeting to receive comments on the proposed TSP.

The study team encourages full public participation to promote open communication on the issues surrounding the study. In addition, participation by Federal, State, local agencies, and other interested organizations is encouraged.



*A conceptual rendering of a proposed gate feature.*

*Bolivar Peninsula following Hurricane Ike, 2008.*

## HOW CAN I PROVIDE COMMENTS ON THE DIFR-EIS?

**MAIL:**

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All comments must be received or postmarked by **January 9, 2019.**

**More information is available online at: http://coastalstudy.texas.gov**