

# COASTAL TX PROTECTION AND RESTORATION FEASIBILITY STUDY

## Community Working Groups Study Update

Dr. Kelly A. Burks-Copes, Project Manager  
US Army Corps of Engineers  
Galveston District

5 December 2019

Mr. Tony Williams  
Director of Planning, Coastal Resources  
Texas General Land Office  
Austin, TX

*"The views, opinions and findings contained in this report are those of the authors(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other official documentation."*

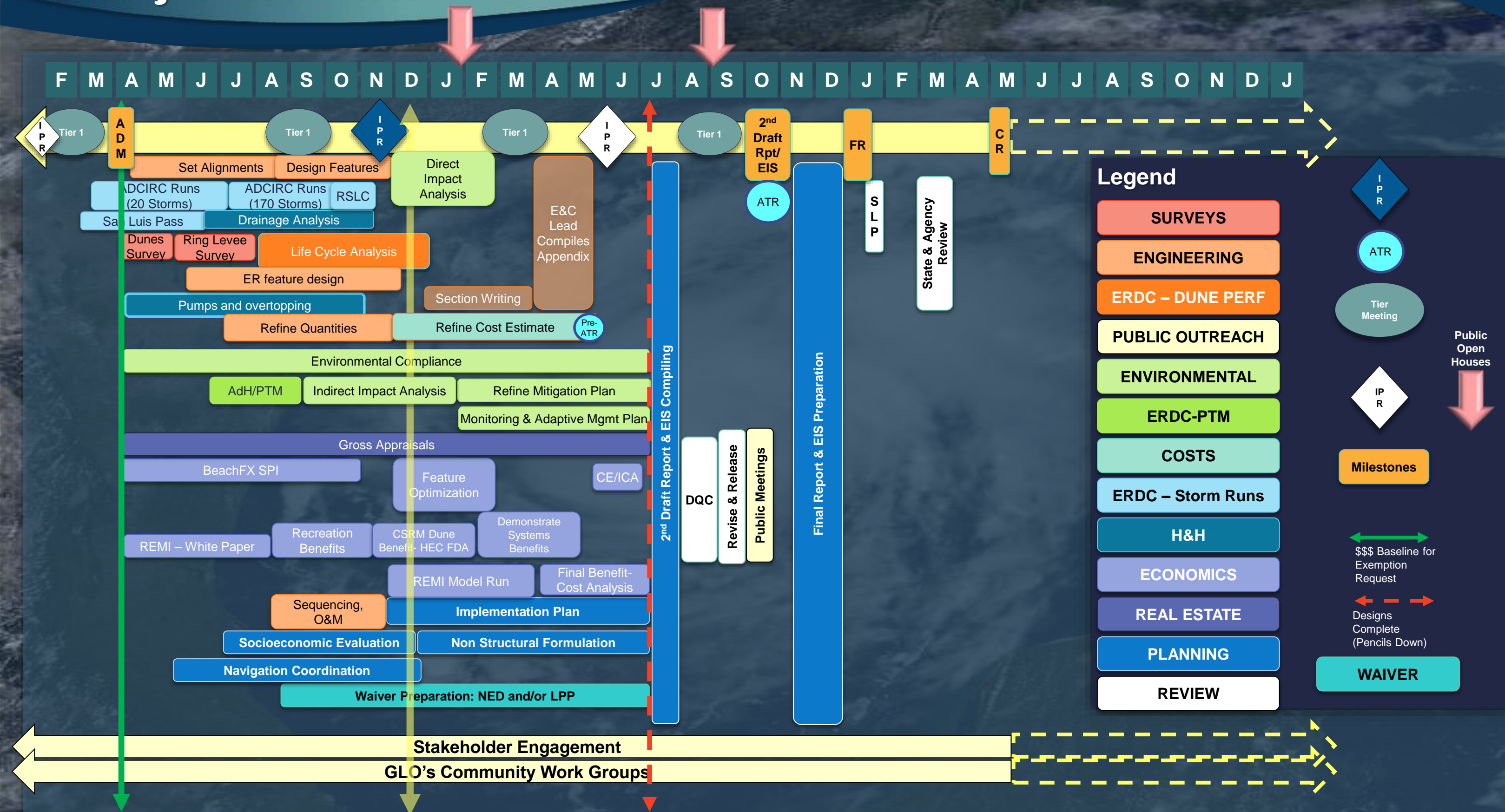


US Army Corps  
of Engineers





# Coastal TX Study Schedule: Major Activities





## • Technical Updates:

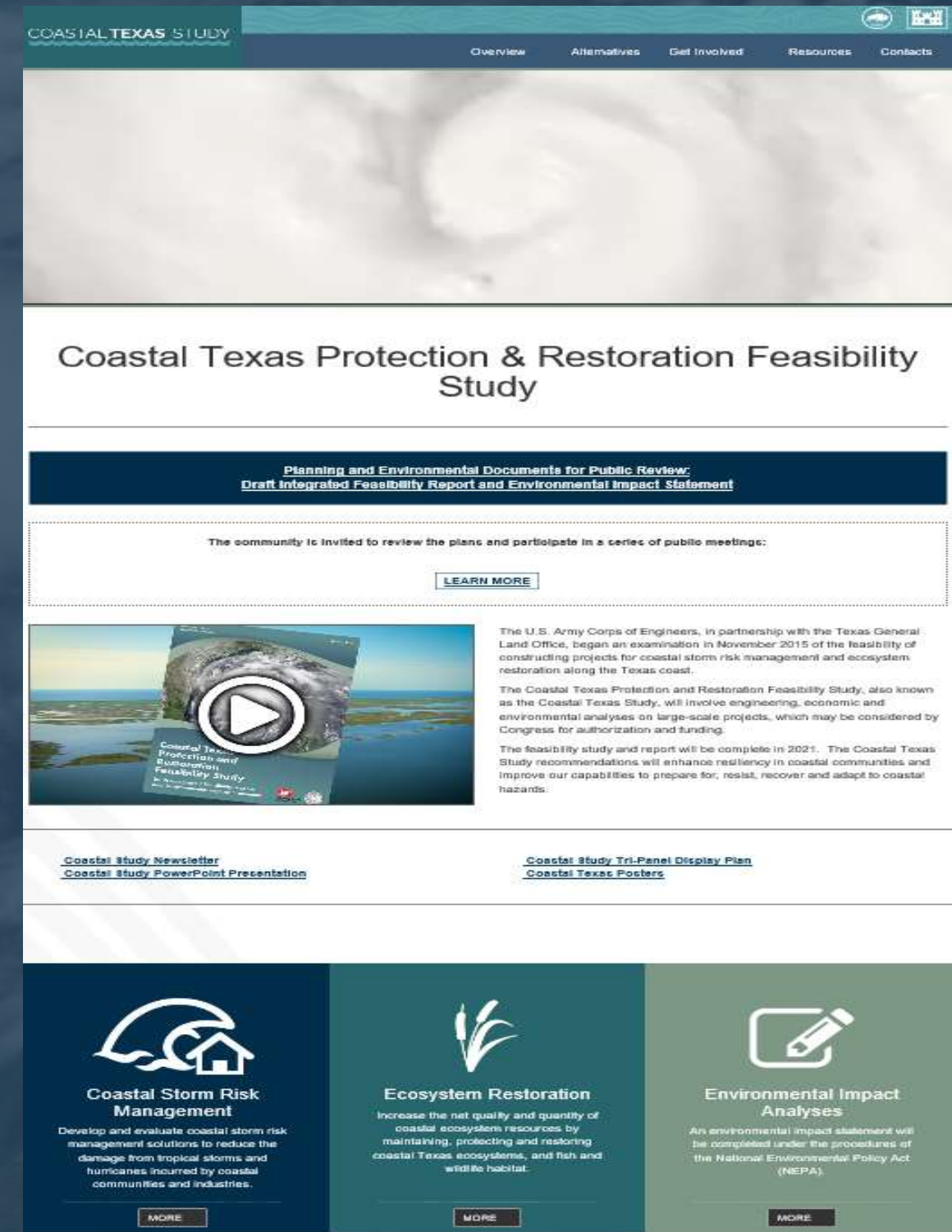
- Ring Barrier Alignment Finalized: 21 Oct 2019
- Dune Alignment Finalized: 13 Nov 2019
- H&H WSEs complete: 22 Nov 2019
- Pencils Down for Engineering: 31 Dec 2019
- Mitigation Requirements: 13 Feb 2019
- Draft NED Waiver: 23 Jan 2019
- USCG has id'd significant impacts to 3 anchorages (mitigation being planned)
- PTM modeling complete – no significant impacts to larvae movement evidenced

## • Upcoming VT/Agency Meetings:

- Interagency Meeting: 4 Dec 2019
- Tier 3: 20 Nov 2019 (0900-1000)
- Tier 2: 16 Jan 2019 (0900-1100)
- Tier 1: 29 Jan 2019 (Time TBD)

## • PM Updates

- Study went “Full Federal” on 1 Oct 2019
- WIK audit underway
- Strat Comm implemented





## • Website

- Post-TSP Updates posted to website: <http://coastalstudy.texas.gov/>

## • Public Outreach

### • Community Working Groups:

	Kickoff	Round 2	Round 3	Round 4	Round 5
– Galveston:	23 Apr	3 Jun	24 Jul	29 Oct	TBD
– Harris Co.:	30 Apr	5 Jun	24 Jul	5 Dec	TBD
– Bolivar:	16 May	25 Jul	7 Oct	TBD	TBD
– SPI:	19 Jun	11 Oct	TBD	TBD	TBD

- Facebook active & posting 3x/week
- Technical “TED Talk” webinars planning underway
- GIS-based Storyboard under development to present “Map Book” to public

### • Other Groups:

- 21 Oct Bolivar Peninsula Realtor's Association Presentation
- 21 Oct Galveston Flood Defense Coalition
- 28 Oct Targeted Stakeholder Mtg (TSM) - University Area & Lindale (aka Fish Village)
- 28 Oct Deer Park & Houston CAPs
- 29 Oct TSM - Chamber of Commerce Harborside Mgmt District
- 29 Oct TSM - Teichman Road, Channelview, Crash Boat Basin Communities
- 30 Oct NGOs Bi-Annual Update
- 4 Nov US Coast Guard
- 19 Nov Port of Galveston Board of Trustees (aka Wharves Board)
- 20 Nov TSM - East End Historic District Association

## • Media Interviews & Podcasts (Ongoing)

- Galveston Daily News (30 Oct)

## • Public Open Houses

### COASTAL TEXAS STUDY

#### Community Work Group Talking Points

##### Key Talking Points:


These key talking points are expanded on in the following pages.

- 1) The Coastal Texas Protection and Restoration Feasibility Study, also known as the Coastal Texas Study, involves engineering, economic, and environmental analyses on large-scale projects.
- 2) The purpose of the Coastal Texas Study is to identify coastal storm risk management and ecosystem restoration measures that would protect the health and safety of Texas coastal communities, reduce the risk of storm damage to industries and businesses critical to the Nation's economy, and address critical coastal ecosystems in need of restoration.
- 3) The goal of the Coastal Texas Study is to form a system of resilient, robust, and adaptable projects that will work in conjunction with each of the specific areas of the Texas coast.
- 4) The Coastal Texas Study's history began in 2001 with the U.S. Army Corps of Engineers (USACE) Sabine Pass to Galveston Study.
- 5) The Coastal Texas Study team is comprised of the USACE and Texas General Land Office (GLO) and their engineering, environmental, and public outreach consultants.
- 6) The Coastal Texas Study is approximately half way through a 5.5-year study process.
- 7) The Tentatively Selected Plan (TSP) is not a final plan.
- 8) The Coastal Texas Study area encompasses 18 coastal counties.
- 9) Prior and ongoing studies are being considered during the Coastal Texas Study process.
- 10) The Coastal Texas Study is the only study of its kind to truly examine what can be done to restore ecological habitats in the study area.
- 11) The Coastal Texas Study has already begun considering the feedback received during the public review and comment period for the Draft Integrated Feasibility Report and Environmental Impact Statement (DIFR-EIS) that concluded on February 8, 2019.
- 12) The total cost for the projects proposed in the TSP is approximately \$23 to \$32 billion.
- 13) Over 600 storms that could potentially impact the Texas coast were modeled and analyzed.
- 14) The Coastal Texas Study investigated five CSRM Alternatives for the Upper Texas Coast.
- 15) The Coastal Texas Study utilizes a “multiple lines of defense” approach/strategy.
- 16) Public comments are accepted throughout the life of the study.



COASTAL TEXAS STUDY

Overview Alternatives Get Involved Resources Contacts




## Coastal Texas Protection & Restoration Feasibility Study

**Planning and Environmental Documents for Public Review:**  
**Draft Integrated Feasibility Report and Environmental Impact Statement**

The community is invited to review the plans and participate in a series of public meetings:

[LEARN MORE](#)




Coastal Texas Protection and Restoration Feasibility Study

The U.S. Army Corps of Engineers, in partnership with the Texas General Land Office, 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 Coastal Texas Protection and Restoration Feasibility Study, also known as the Coastal Texas Study, will involve engineering, economic and environmental analyses on large-scale projects, which may be considered by Congress for authorization and funding.


The feasibility study and report will be complete in 2021. The Coastal Texas Study recommendations will enhance resiliency in coastal communities and improve our capabilities to prepare for, resist, recover and adapt to coastal hazards.



### Coastal Storm Risk Management

Develop and evaluate coastal storm risk management solutions to reduce the damage from tropical storms and hurricanes incurred by coastal communities and industries.


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### Ecosystem Restoration

Increase the net quality and quantity of coastal ecosystem resources by maintaining, protecting and restoring coastal Texas ecosystems, and fish and wildlife habitat.

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### Environmental Impact Analyses

An environmental impact statement will be completed under the procedures of the National Environmental Policy Act (NEPA).

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Coastal Texas Study

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MISCONCEPTION: Rice University's SSPEED Center has proposed a less costly plan called the "Bay Park Plan" that can be built in less time and will have the same (or greater) level of protection with little or no environmental impacts.

While we believe the Bay Park Plan and our own Coastal Barrier Plan complement one another, more information is needed in order to make direct comparisons between them. Some key concerns include:

1) The Bay Park Plan is still in the concept pha... [See More](#)

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COASTAL TEXAS STUDY

Coastal Texas Study

July 29 at 10:33 AM

We are utilizing a "multiple lines of defense" approach to develop a system of comprehensive, resilient, and sustainable coastal storm risk management solutions. For more information, please visit <http://coastalstudy.texas.gov/>.

MULTIPLE LINES OF DEFENSE ON THE TEXAS COAST

Gulf of Mexico Barrier Islands Bays & Estuaries Inland

Beach & Dune Restoration

Oyster Reefs, Marsh Restoration, Shoreline Stabilization

Levees/Man-made Barriers Elevated Buildings

Existing Sea Level Projected Sea Level Rise

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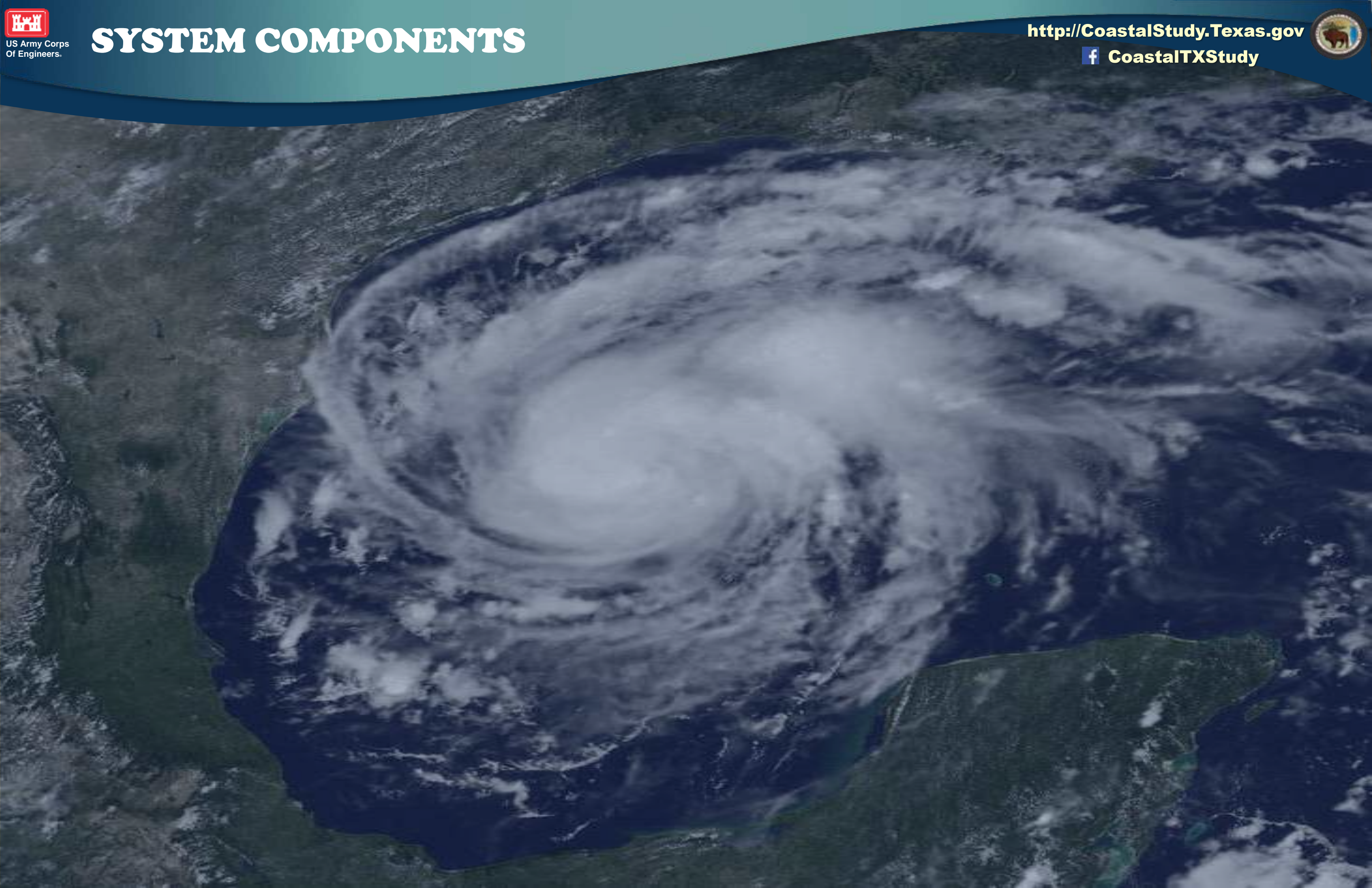
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# SYSTEM COMPONENTS





1st Line: Hardened Perimeter at the Gulf Inlet  
Storm Surge Gates

Next Lines: Lateral and Interior Features

Dune Flanks

Ring Barrier

Upper West Bay – Clear Creek, Dickinson & Non-Structural  
GIWW Breakwaters

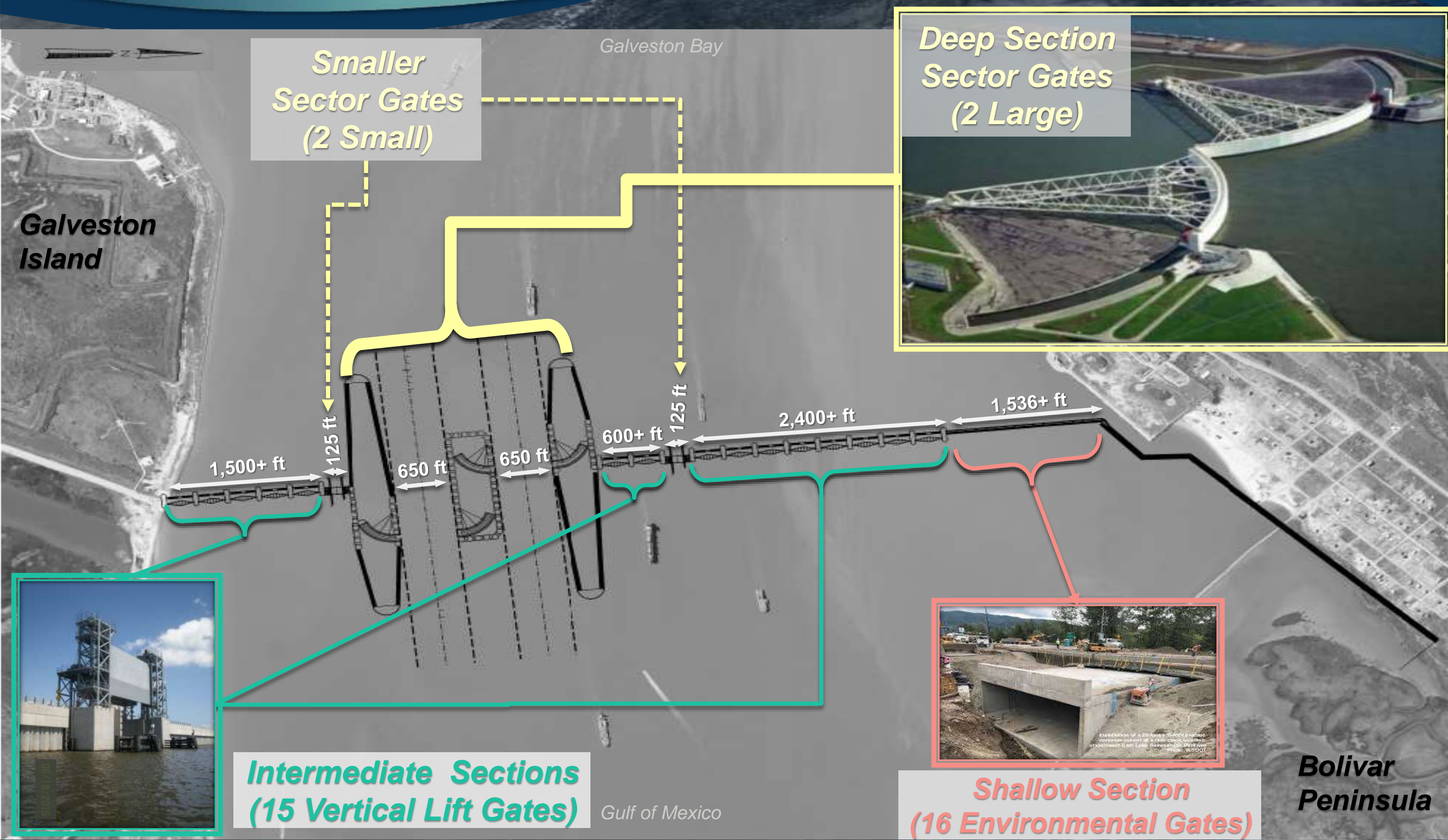
Oyster Reefs

ER Site-specific restoration features (e.g., marsh creation)





# STORM SURGE GATES (DESIGN IN PROGRESS)



**Smaller  
Sector Gates  
(2 Small)**

**Deep Section  
Sector Gates  
(2 Large)**

**Intermediate Sections  
(15 Vertical Lift Gates)**

**Shallow Section  
(16 Environmental Gates)**

**Bolivar  
Peninsula**

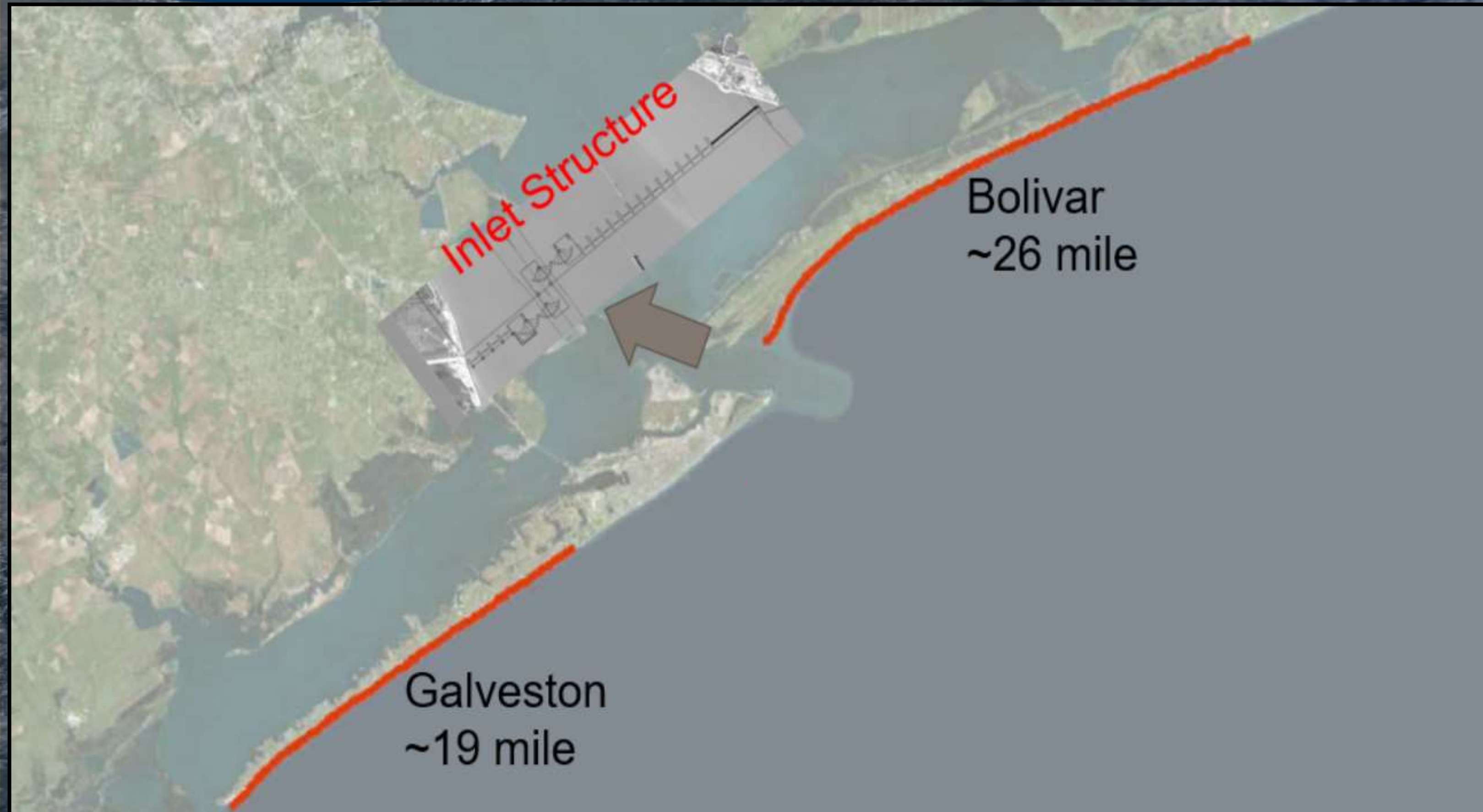
Galveston Bay

Gulf of Mexico

**Galveston  
Island**



# NATURE-BASED SOLUTIONS: DUNE & BEACHES





# NATURE-BASED SOLUTIONS: DUNE & BEACHES



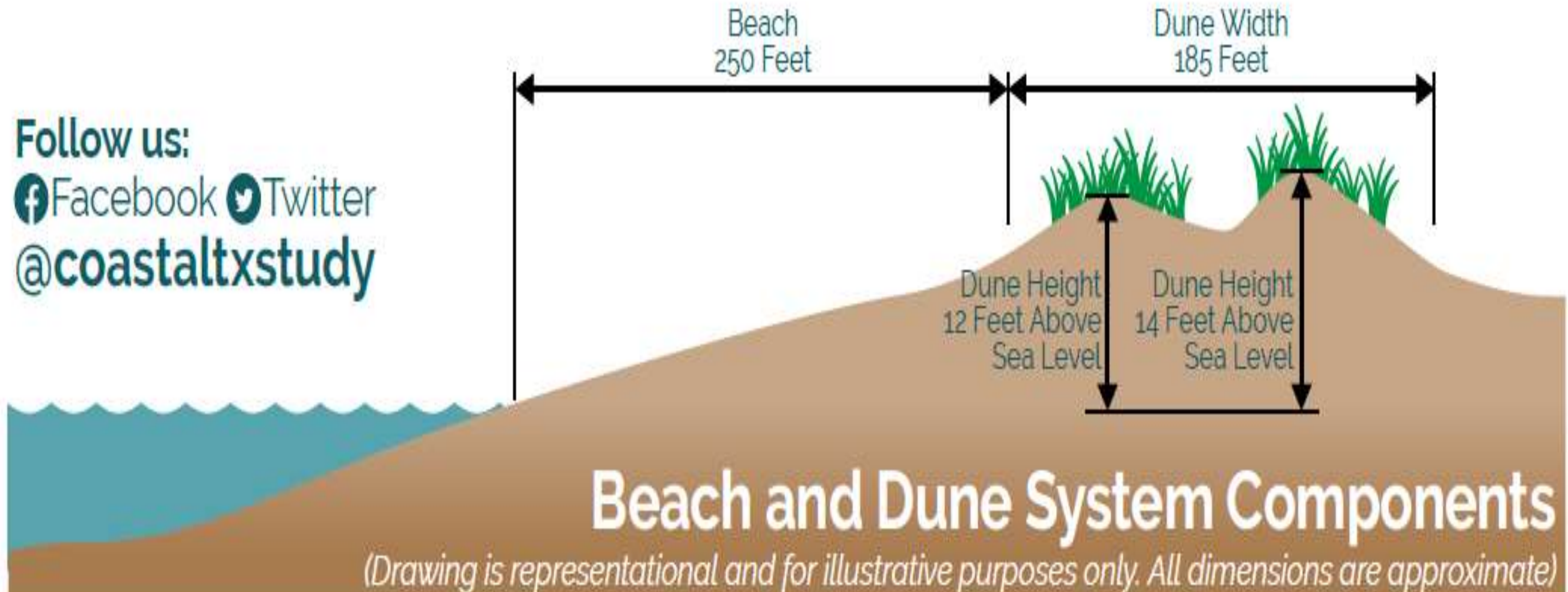


# NATURE-BASED SOLUTIONS: DUNE & BEACHES



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More information is available online at: [coastalstudy.texas.gov](http://coastalstudy.texas.gov)

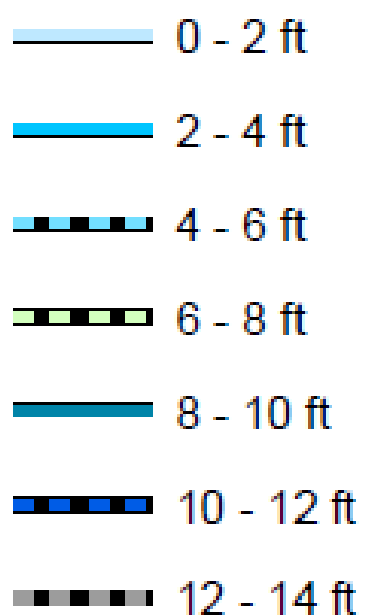


# GALVESTON RING BARRIER

## (DESIGN IN PROGRESS)

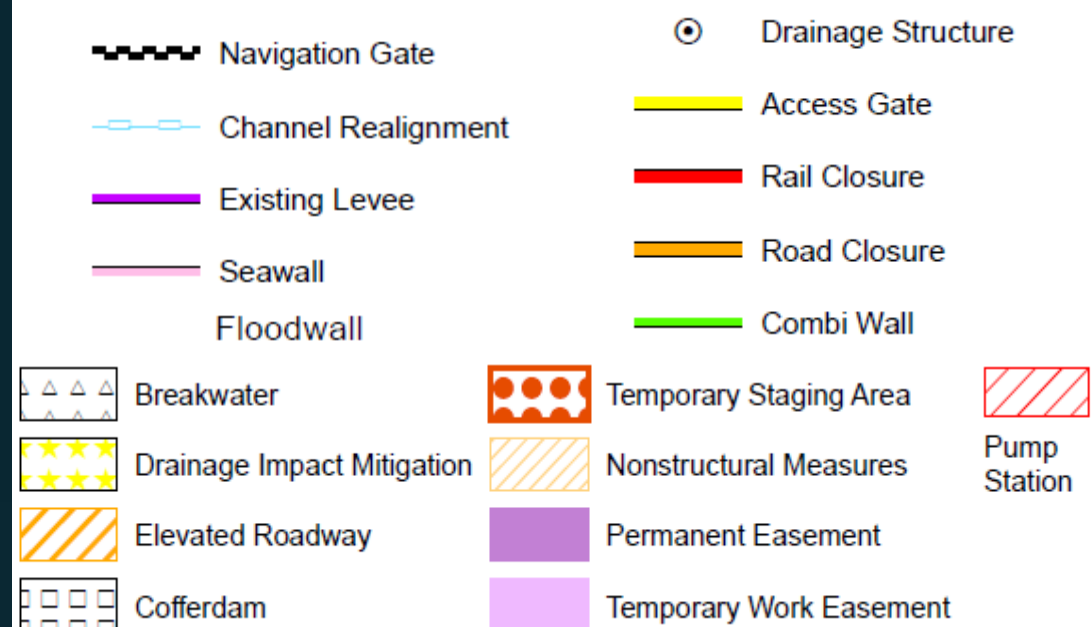


### Height Above Ground



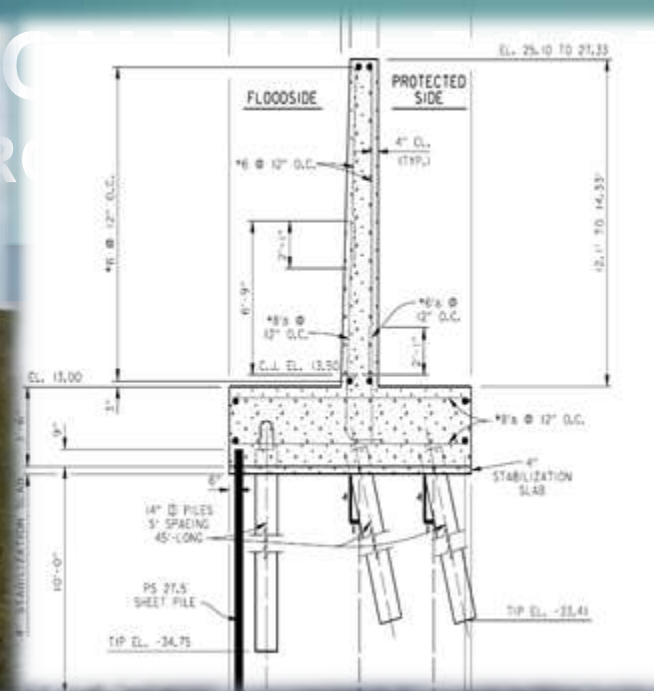
0 0.25 0.5 1 Miles

### Legend





Floodwall



Road Closure



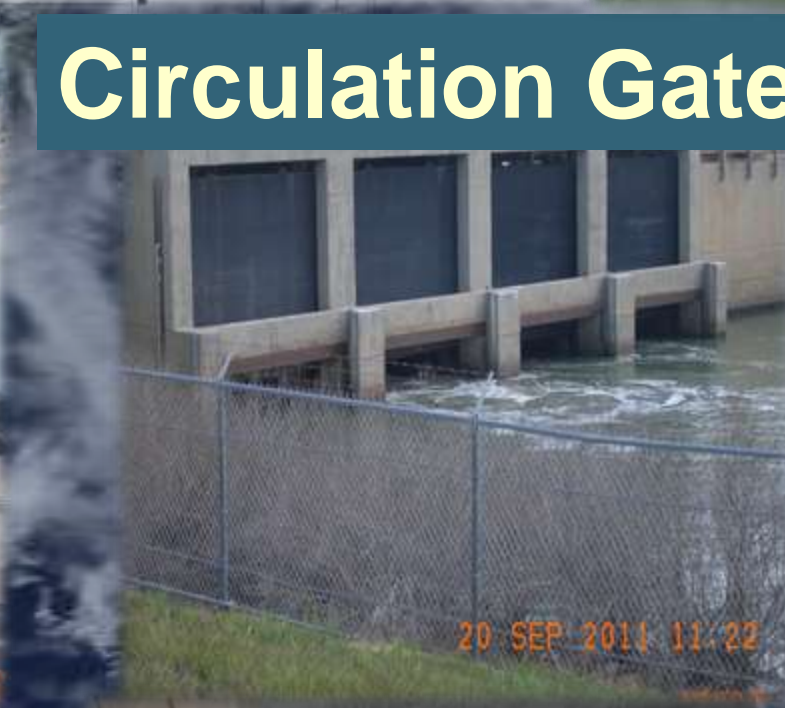
Railroad Gate



Combi-Wall



Circulation Gates



Navigation Gate



Vertical Lift Gate



Slide Gate



Flap Gate



Pump Station





- Dickinson Gate & Pumps
- Clear Creek Gate & Pumps
- Non-structural Measures – flood proofing, raisings & buyouts

## Clear Creek



## Dickinson





# ECOSYSTEM RESTORATION (DESIGNS IN PROGRESS)



1. **Shoreline Protection** – Reduce/prevent shoreline erosion of barrier system shorelines, estuarine bay shorelines, and channel shorelines.
2. **Hydrologic Connectivity** – restore and/or create hydrologic connectivity of sensitive estuarine systems.
3. **Estuarine Bay Systems Restoration** – Restore, create, and/or protect critical estuarine wetlands, tidal flats, etc.
4. **Barrier Beach, Dune and Back Marsh Restoration** – Nourish and protect barrier beach, dune, and back marsh
5. **Oyster Reef Restoration** – Restore and/or create important oyster reefs.
6. **Neotropical Migratory Bird Habitat Restoration** – Restore and/or create important habitat used by migratory birds
7. **Bird Island Rookeries Restoration** – Restore and/or create important islands used as bird rookeries.
8. **Restore Habitat Used by Species of Concern** – Restore and/or create habitat (important, critical, essential, and other habitat types) used by species of concern, such as federally-listed species, shorebirds, federally-managed aquatic species (e.g., essential fish habitat [EFH]), and others.





## Environmental Impact Analysis

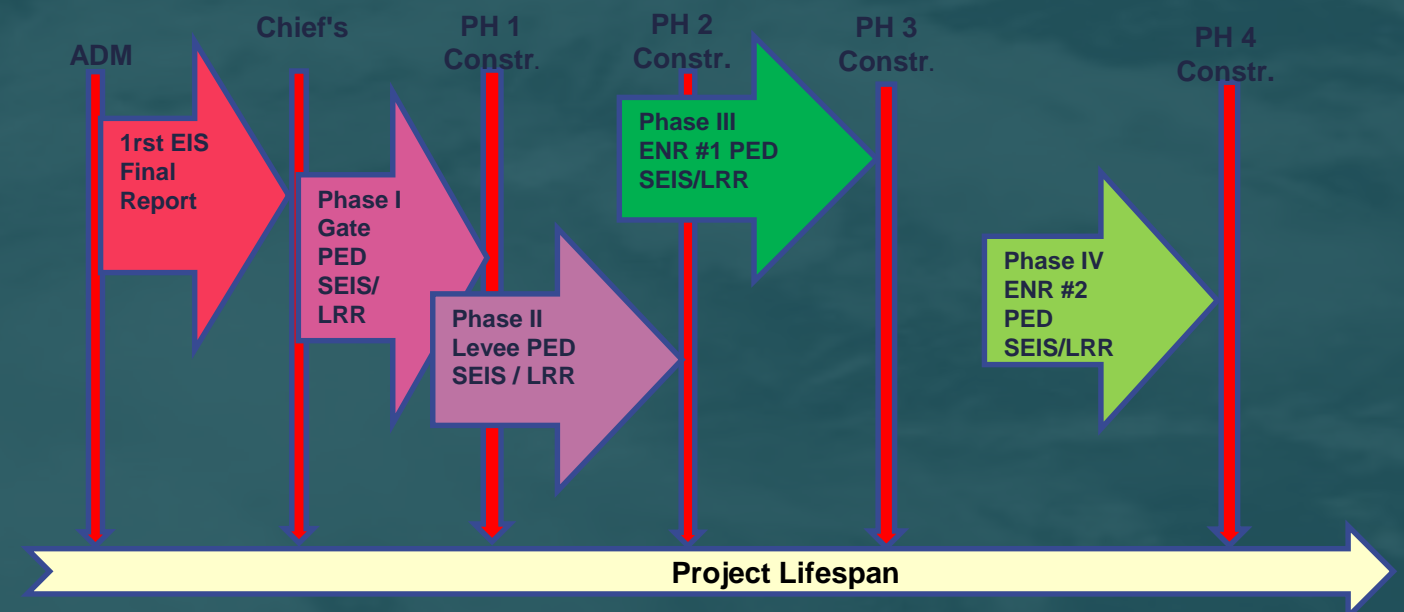
- NEPA is the nation's foremost environmental law
- NEPA drives our process by requiring the identification of direct, indirect and cumulative impacts
- Tiered NEPA has been authorized for this study

## Analyses Underway

- Direct Impacts
  - Habitat Evaluation Procedures (HEP)
    - Quality x Quantity of Species Habitat
  - Advanced Hydrologic Modeling
    - Salinity, Velocity & Sediment Transport
  - Particle Track Modeling
    - Larval Movement & Recruitment Success
- Indirect & Cumulative Impacts

## Mitigation Planning Underway

## Conceptual Tiered NEPA Approach



## Particle Track Modeling (PTM)





# PROJECT COSTS

## IS IT WORTH IT?

### The NED/NER Plan must balance:

- ✓ Engineering soundness
- ✓ Environmental acceptability
- ✓ Economically justifications

- Unity: Benefits Equal Cost
- Benefits include quantitative, qualitative, monetized & non-monetized units
- Locally Preferred Plan (LPP) is a plan that is preferred by the non-Federal sponsor over the NED/NER plan, and is sometimes recommended for project authorization instead (with caveats)
- LPPs must be evaluated just as the Federal Plan (costs, impacts, benefits)



### Projected Costs

Coastal Barrier:	\$14.2B-\$19.9B
Ecosys. Restoration:	\$8.9B-11.9B
South Padre CSRM:	\$71.6-\$83.1M
<b>TOTAL:</b>	<b>\$23B - \$32B</b>

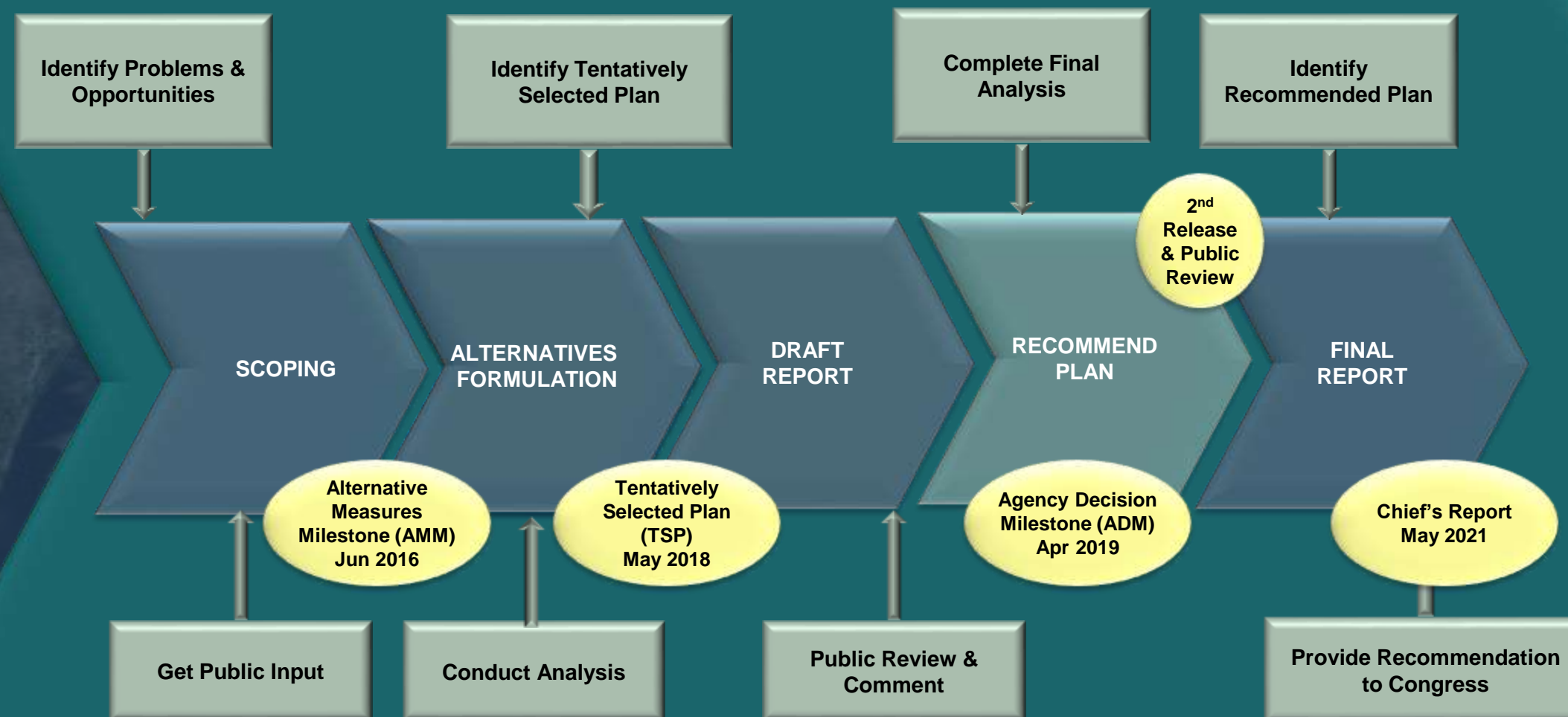
### Recovery Costs for Past Storms:

Hurricane Ike (2008):	<b>\$38B</b>
Hurricane Harvey (2017):	<b>\$125B</b>





# STUDY

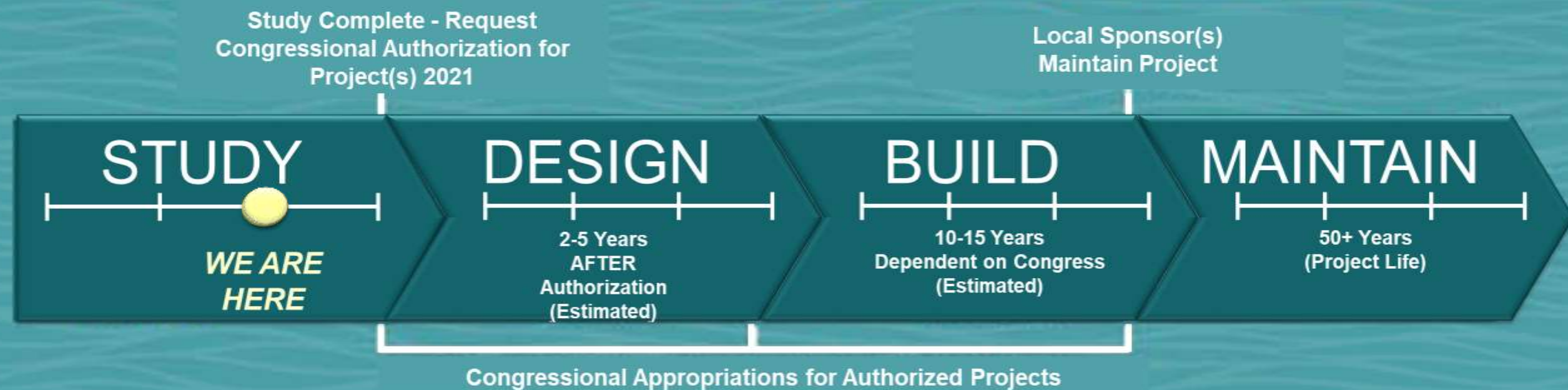






# STUDY

## ESTIMATED PROJECT SCHEDULE





- Formal Comment Period (45 days)
- Formal Meetings (NEPA Required)
- Public Open Houses
- CWGs
- Social Media
- Tech Talks
- Newsletters
- Email lists
- Stakeholder Briefings

More opportunities to engage are on the project horizon . . . . .remember Tiered NEPA!

## COASTAL TEXAS STUDY STUDY UPDATE



US Army Corps  
of Engineers  
Galveston District



Representatives attend a Community Work Group Meeting in May 2019.

### WE HEARD YOU!

The Coastal Texas Study has already begun considering the feedback received during the comment period for the Draft Integrated Feasibility Report and Environmental Impact Statement (DIFR-EIS). Based upon your input, the study team is:

- Establishing Texas General Land Office (GLO)-led Community Working Groups
- Dropping the barrier levee along Galveston Island and Bolivar Peninsula from the study completely, and investigating a dune-and-beach system along Bolivar Peninsula beach
- Re-aligning the Galveston Ring Barrier
- Evaluating non-structural measures on the west side of Inner Galveston Bay
- Exploring the use of storm surge barriers

Additionally, the study team will:

- Continue collaboration with local stakeholders on evacuation from the Gulf Coast
- Further storm modeling
- Coordinate and hold a public meeting in the summer of 2020 (including a Design Workshop)

More information is available at [CoastalStudy.Texas.gov](http://CoastalStudy.Texas.gov)

Coastal Texas Study - Study Update

### ABOUT THE STUDY

Serving as an important economic and industrial hub for the United States, the Texas Gulf Coast is home to a coastal ecosystem vital to the national economy that provides valuable

## COASTAL TEXAS STUDY

### Community Work Group Fact Sheet

Version 1.5, Updated July 26, 2019

### Key Study Facts:

These key talking points are expanded on in the following pages.

- 1) The Coastal Texas Protection and Restoration Feasibility Study, also known as the Coastal Texas Study, involves engineering, economic, and environmental analyses on large-scale civil works projects.
- 2) The purpose of the Coastal Texas Study is to identify coastal storm risk management (CSRM) and ecosystem restoration (ER) measures that would protect the health and safety of Texas coastal communities, reduce the risk of storm damage to industries and businesses critical to the Nation's economy, and address critical coastal ecosystems in need of restoration.
- 3) The goal of the Coastal Texas Study is to form a system of resilient, robust, and adaptable projects that will work together to protect coastal communities and ecosystems.

## COASTAL TEXAS STUDY NOTHING BUT THE FACTS



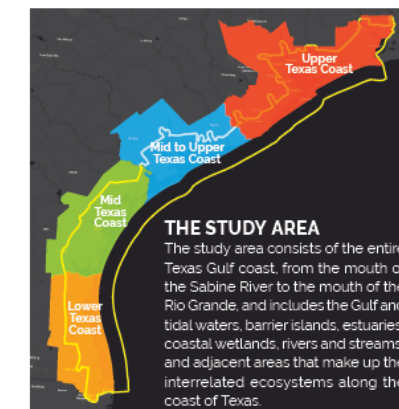
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of Engineers  
Galveston District



Large, long-term studies like the Coastal Texas Study often face misconceptions. The purpose of this document is to clear up some of these misconceptions and provide you with "Nothing But the Facts."

**Misconception: The proposed plan would protect only highly populated areas and not all parts of the Texas coastline that have been impacted by past weather events.**

The Coastal Texas Study includes a combination of ecosystem restoration (ER) and coastal storm risk management (CSRM) measures located throughout the 18 coastal counties of the Texas Gulf Coast.



### 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.

**Misconception: The Coastal Texas Study is only being proposed to protect the industrial facilities in the Houston-Galveston area.**

The proposed features reduce risk to the community at large, not just the concentration of industrial facilities in Houston. Surrounding areas are filled with residences, as well as railways and port facilities that serve Houston, Galveston,

and the nation. Comprehensive risk reduction in the region requires a combined effort of federal, state, and private agencies increasing the area's ability to prepare for, withstand, respond, and adapt to coastal risk. Industries in the Houston area will contribute to risk reduction through investments in their own facilities that contribute to the success of the larger features.

**Misconception: The study would use eminent domain to acquire and demolish any property along the proposed barrier alignment.**

The non-federal sponsor will have the responsibility of acquiring all necessary real estate interests for the project and ensuring that relocation of utilities and facilities is accomplished. Where necessary, voluntary relocations and acquisitions will be pursued, and eminent domain would only be imposed by a local sponsor as a last resort.

**Misconception: The Coastal Texas Study is only considering past, historical flood events**


Over 600 storms that could potentially impact the Texas coast were modeled and analyzed. These possible tropical storms include the entire range of storm factors, such as storm intensity, storm size, forward speed and angle of approach on top of the landfall locations along the entire Texas coast. The storms range from very weak and small tropical storm events all the way to catastrophically strong and large Category 5 storms and beyond.


Based on this data, a sample of 170 storms was taken through the Advanced Circulation model (ADCIRC - Certified by the Federal Emergency Management Agency (FEMA) for use in performing storm surge analyses) to determine storm surge heights with and without the barrier systems. The storms that were selected were the most destructive scenarios for storm surge and wave conditions. Additional storm modeling is currently being conducted to optimize the plan.

More information is available online at: [coastalstudy.texas.gov](http://coastalstudy.texas.gov).






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## Coastal Texas Protection & Restoration Feasibility Study

**Planning and Environmental Documents for Public Review:**  
**Draft Integrated Feasibility Report and Environmental Impact Statement**

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### MULTIPLE LINES OF DEFENSE ON THE TEXAS COAST



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