Sec. 4091. Coastal Texas Ecosystem Protection and Restoration, Texas.

(a) In General.—The Secretary shall develop a comprehensive plan to determine the feasibility of carrying out projects for flood damage reduction, hurricane and storm damage reduction, and ecosystem restoration in the coastal areas of the State of Texas.
Important Houston Infrastructure

Images After Ike
Galveston Island

Aquatic Resources
and Endangered Species
SMART Planning

- USACE established new policies in 2012 modernizing the Planning process to reduce costs and time to study product delivery.

- $3M = complete studies in 3 years; cost $3M; 3 levels of review.

- Studies that would not fit into this policy require an exemption from Headquarters USACE (HQUSACE).

- Sec 1001 of Water Resources Reform Development Act (WRRDA) 2014 codifies 3x3x3 into law.

- Coastal TX received an exemption to the 3x3x3 law in October 2015.
  - $19.8 Million for study costs and 5.5 years to complete.
Texas General Land Office (GLO) study sponsor

Feasibility Cost Sharing Agreement (FCSA) signed in November 2015
- 50% Federal dollars / 50% Non-Federal

Implementing Sponsor (design and construction) needs to be identified
- Cost share varies pending final plan
- Final project is turned over to NFS for operations and maintenance responsibilities
Study Purpose

Coastal Storm Risk Management (CSRM) - Develop and evaluate coastal storm damage risk reduction measures for coastal Texas residents, industries and businesses which are critical to the nation’s economy.

Ecosystem Restoration (ER) - Increase the net quantity and quality of coastal ecosystem resources by maintaining, protecting, and restoring coastal Texas ecosystems and fish and wildlife habitat.
• 4 Regions identified under Recon
• 9 Texas Congressional Districts
• U.S. Senators Cornyn and Cruz (TX)
Problems and Opportunities

- Economic damage from coastal storm surge
- Inland shoreline erosion
- Gulf shoreline erosion
- Loss of T&E Critical Habitats (migratory bird habitat, critical T&E habitat, shellfish habitat)
- Loss of Natural Delta Processes
- Disrupted Hydrology
Constraints

- Avoid or minimize negative impacts:
  - to threatened and endangered species and protected species
  - to critical habitat, (e.g. Essential Fish Habitat.)
  - to commercial fisheries
  - that affect the ability of authorized navigation projects to continue to fulfill their purpose
  - that induce flooding
Other CSRM/ER Studies in Region 1

- Sabine Region
- Sab to Galv Study
- Orange County
- Sabine Lake
- Sabine Pass
- Jefferson County Study
- Gulf of Mexico
Feasibility Analyses

Impacts to physical environment and processes
- Circulation/salinity/flooding/erosion

Constructability / operability
- Engineering feasibility
- Real Estate requirements

Damages to property
- Personal and public damages from flooding

Project costs
- Study, design, construction and O&M

Benefit-to-cost ratio
- National Economic Development (NED)

Life/health
- Social impacts

NEPA compliance
Impacts to natural environment
Hazardous material spills
National Ecosystem Restoration (NER) Plan

Habitat
Fish and wildlife
Cultural Resources
COASTAL STORM DAMAGE RISK REDUCTION:
Promote a sustainable economy by reducing the risk of storm damage to residential structures, industries and businesses critical to the nation’s economy.

- Reduce economic damage from coastal storm surge to business, residents and infrastructure
- Reduce risk to human life from storm surge
- Enhance energy security and reduce economic impacts of petrochemical supply-related interruption due to storm surge
- Reduce risks to critical infrastructure (medical centers, ship channels, schools transportation, etc.)
- Manage regional sediment so it contributes to storm surge attenuation where feasible
- Increase the resilience for existing HFPS from sea level rise and storm surge impacts
# Region 1 Alternatives

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Description</th>
<th>Formulation strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative A - Coastal Barrier/Nonstructural System</td>
<td></td>
<td>Multiple lines of Defense (MLOD)</td>
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<tr>
<td></td>
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<td>Navigation Impacts</td>
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<td>Resiliency</td>
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<td></td>
<td>Focus on Significant Resources</td>
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<tr>
<td>Alternative B – Coastal Barrier</td>
<td></td>
<td>Multiple lines of Defense (MLOD)</td>
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<tr>
<td></td>
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<td>Navigation Impacts</td>
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<td></td>
<td></td>
<td>Resiliency</td>
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<tr>
<td></td>
<td></td>
<td>Focus on Significant Resources</td>
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<tr>
<td>Alternative C – Mid Bay Barrier</td>
<td></td>
<td>Navigation Impacts</td>
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<tr>
<td></td>
<td></td>
<td>Resiliency</td>
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<tr>
<td></td>
<td></td>
<td>Focus on Significant Resources</td>
</tr>
<tr>
<td>Alternative D – Upper Bay Barrier/Nonstructural System</td>
<td></td>
<td>Navigation Impacts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Focus on Significant Resources</td>
</tr>
</tbody>
</table>

All alternatives would also look at maximizing Ecosystem Restoration (ER) Benefits
Nonstructural Improvements
PLANNING EXAMPLE REGION 1: ALTERNATIVE B - COASTAL BARRIER

Galveston Ring Levee
ALTERNATIVE B - COASTAL BARRIER (ENG. WORKSHOP DISCUSSIONS)

Shift to Avoid Navigation Impacts and Open Gulf Conditions

Galveston Ring Levee
PLANNING EXAMPLE REGION 1: ALTERNATIVE D UPPER BAY BARRIER/ NONSTRUCTURAL SYSTEM

Navigation Gate and possible Drainage Feature

Nonstructural Improvements
Potential Barrier Designs

Maeslant Barrier

Eastern Scheldt Barrier
EWN Designs?

Katwijk Sea Defense

Sand Motor
Goals and Objectives

ECOSYSTEM RESTORATION:

*Promote a sustainable coastal ecosystem by minimizing future land loss, enhancing wetland productivity, and providing and sustaining diverse fish and wildlife habitats.*

- **Restore size and quality of fish and wildlife habitats** such as coastal wetlands, forested wetlands, rookery, oyster reefs, and beaches and dunes
- Improve **hydrologic connectivity** into sensitive estuarine systems;
- Reduce **erosion to barrier island**, mainland, interior bay and channel shorelines
- **Create, restore and nourish oyster reefs** to benefit coastal and marine resources
- Manage regional sediment so it contributes to improving and sustaining diverse fish and wildlife habitat
Coastal Texas Ecosystem Restoration Measures

First Line of Defense

Regions
- Region 1
- Region 2
- Region 3
- Region 4

Measures
- Beach and Dune Restoration
- Breakwaters
- Shoreline Protection & Restoration

Coastal TX – First Line of Defense Map
Coastal TX – Second Line of Defense Map

Coastal Texas
Ecosystem Restoration Measures
Second Line of Defense

Measures
- Breakwaters
- Shoreline Protection
- Island Restoration
- Lake Restoration
- Marsh Restoration
- Rookery Restoration

Regions
- Region 1
- Region 2
- Region 3
- Region 4

0 25 50 Miles
Coastal TX – Third Line of Defense Map

Coastal Texas Ecosystem Restoration Measures
Third Line of Defense

Regions
- Region 1
- Region 2
- Region 3
- Region 4

Measures
- Breakwaters
- Hydrologic Restoration
- Sediment Management

Service Layer Credits: Esri, HERE, DeLorme, MacDonald, © OpenStreetMap contributors, and the U.S. Army Corps of Engineers.
Comprehensive Plan:

Purpose

Provide an overarching, long-term strategic vision of a resilient Texas coast that supports, protects, and sustains the environment, economy, and culture of the region, and that contributes greatly to the economy and well-being of the nation.

Goals

- Focus on the long-term (100+ years)
- Identify threats & future conditions (coastal storms, urbanization, changing climate/sea level rise, petrochemical/oil & transportation outlooks, etc.)
- Enhance resilience – e.g., improve our capabilities to prepare for, resist, recover, and adapt to significant multi-hazard threats with minimum damage to social well-being, the economy, and the environment
- Take a systems-based approach and promote ecosystem-based management
- Adopt and communicate our “multiple lines of defense” strategy (structural, non-structural, natural and nature-based solutions)
- Highlight benefits and present these in terms of ecosystem goods and services
- Incorporate ALL ongoing and potential future activities (where possible)
  - USACE’s TX Coastal Feasibility study
  - GLO’s Master Plan
  - Other USACE studies
  - Other activities undertaken by other agencies & NGOs
- Lay the groundwork for future authorizations & programs
- Identify areas where additional research and development is warranted
# TEXAS COASTAL RESILIENCY MASTER PLAN PHASE 1 OUTCOMES

<table>
<thead>
<tr>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify current coastal issues of concern and create a database of projects to address regional vulnerabilities;</td>
</tr>
<tr>
<td>Framework for GLO implementation to inform effective coastal management to enhance and protect the coast;</td>
</tr>
<tr>
<td>Stakeholder engagement documents and website for education and outreach on the importance of the Texas coast and the significance of keeping it resilient;</td>
</tr>
<tr>
<td>Data from this initiative will be available for other planning initiatives to use;</td>
</tr>
<tr>
<td>Findings will be presented in 2017 to the Legislature.</td>
</tr>
</tbody>
</table>
COASTWIDE RESILIENCY STRATEGIES

- Delta & Lagoon Restoration
- Restoration of Beaches & Dunes
- Rookery Island Creation & Restoration
- Stabilizing the GIWW
- Freshwater Wetland & Coastal Uplands Conservation
- Living Shorelines
- Plans, Policies & Programs
- Oyster Reef Creation & Restoration
### Study Milestones and Funding Needs

#### Fiscal Year* Funding Summary

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Total Funding ($)</th>
<th>Federal Funding ($)</th>
<th>Non-Federal Funding*** ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>2,506,000</td>
<td>1,253,000</td>
<td>1,253,000</td>
</tr>
<tr>
<td>2017</td>
<td>3,650,000</td>
<td>1,825,000</td>
<td>1,825,000</td>
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<tr>
<td>2018</td>
<td>3,950,000</td>
<td>2,175,000</td>
<td>1,775,000</td>
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<tr>
<td>2019</td>
<td>5,350,000</td>
<td>2,675,000</td>
<td>2,675,000</td>
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<tr>
<td>2020</td>
<td>4,244,000</td>
<td>2,122,000</td>
<td>2,122,000</td>
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<tr>
<td>2021</td>
<td>100,000</td>
<td>50,000</td>
<td>50,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>19,800,000</strong></td>
<td><strong>10,100,000</strong></td>
<td><strong>9,700,000</strong></td>
</tr>
</tbody>
</table>

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**USACE FY is 1 Oct thru 30 Sept**

**Includes $400,000 for Independent External Peer Review (IEPR)**

**Includes cash and Work-In-Kind (WIK)**

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### Milestone Dates

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exemption Approval by Senior Leaders</td>
<td>Sep 2015</td>
</tr>
<tr>
<td>Exemption Approval by ASA(CW)/OMB</td>
<td>Nov 2015</td>
</tr>
<tr>
<td>Execute FCSA with GLO</td>
<td>Nov 2015</td>
</tr>
<tr>
<td><strong>Total Funding</strong></td>
<td><strong>19,800,000</strong></td>
</tr>
<tr>
<td><strong>Federal Funding</strong></td>
<td><strong>10,100,000</strong></td>
</tr>
<tr>
<td><strong>Non-Federal Funding</strong>*</td>
<td><strong>9,700,000</strong></td>
</tr>
<tr>
<td>Scoping</td>
<td></td>
</tr>
<tr>
<td>Alternatives Milestone</td>
<td>June 2016</td>
</tr>
<tr>
<td>Tentatively Selected Plan (TSP) Milestone</td>
<td>May 2018</td>
</tr>
<tr>
<td>Feasibility Level Analysis Complete</td>
<td>Oct 2018</td>
</tr>
<tr>
<td>Feasibility Report Complete</td>
<td>Oct 2020</td>
</tr>
<tr>
<td>Civil Works Review Board (CWRB)</td>
<td>Jan 2021</td>
</tr>
<tr>
<td>S&amp;A Review</td>
<td>Feb 2021</td>
</tr>
<tr>
<td>Chief’s Report</td>
<td>Apr 2021</td>
</tr>
</tbody>
</table>

In partnership with the Texas General Land Office, the Corps of Engineers has a funding strategy to achieve project authorization.
Study Process

Public input is critical for understanding needs/opportunities and reaching a implementable plan for authorization

Scoping; Identify Problems and opportunities

Initiate Engineering, Economic and Environmental analyses (NEPA); Identify tentatively selected plan

Complete final analyses: Engineering, Economics and Environmental (NEPA)

Identify Recommended Plan

Locally Preferred Plan Input

Recommendation to Congress

Collect Public Input

Public Review and Comment

Final Report

Draft Report

Recommend Plan

Alternatives Formulation

Scoping
USACE receives funding on an annual budget cycle (OCT-SEP)
Collaboration With Others

Maximizing Capital

Organizational Change

Strategic Partnerships

Civil Works Transformation / Process Improvement

Communication

Transparency

Stakeholder Community

Port of Corpus Christi

Port of Texas City

Port of Harlingen

CBP & ICE

TCEQ

NOAA

CALHOUN Port Authority

ASCE

LNIA

American Society of Civil Engineers

Sabine Neches

ERDC

U.S. Army Corps of Engineers

US Army

USDOT

MARAD

Port of Galveston

PHSA

Galveston County

Houston County

Jefferson County

Brownsville

Port Freeport

South Padre Island

Flood Control District

Texas Department of Transportation

Portable Sanitation

GCAA

GICA

TCOON

Transportation Texas

Port of Galveston

City of Galveston

City of Brownsville

City of Harlingen
Questions