#### COASTAL TEXAS PROTECTION AND RESTORATION PROJECT



23 February 2017

"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."





INION GIRE

### **Coastal TX Study Authority**

Texas.

Section 4091, Water Resources Development Act (WRDA) of 2007 Public Law (P.L.) 110-114 2

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

US Army Corps

#### Important Houston Infrastructure









Images After Ike Galveston Island





Aquatic Resources and Endangered Species





# **USACE Planning Modernization**

#### **SMART Planning**

- USACE established new policies in 2012 modernizing the Planning process to reduce costs and time to study product delivery
- 3x3x3 = 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





## **Non-Federal Sponsor**

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

NEY CLEAR SOME DAME DAMAGE OF STARE VELOPON DOWN THM

PRESIDE SSED SONORE TE

NOTE FAMIER GATE NOT SHOWN





## **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





# **Problems and Opportunities**



Economic damage from coastal storm surge

erosion

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** 





**US Army Corps** of Engineers

#### 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**



### **Feasibility Analyses**



US Army Corps of Engineers

### **Goals and Objectives**

#### **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

5





# **Region 1 Alternatives**

Formulation	strategies
	<u> </u>

Alternative A - Coastal Barrier/Nonstructural System	<ul> <li>Multiple lines of Defense (MLOD)</li> <li>Navigation Impacts</li> <li>Resiliency</li> <li>Focus on Significant Resources</li> </ul>
Alternative B – Coastal Barrier	<ul> <li>Multiple lines of Defense (MLOD)</li> <li>Navigation Impacts</li> <li>Resiliency</li> <li>Focus on Significant Resources</li> </ul>
Alternative C – Mid Bay Barrier	<ul> <li>Navigation Impacts</li> <li>Resiliency</li> <li>Focus on Significant Resources</li> </ul>
<ul> <li>Alternative D – Upper Bay Barrier/ Nonstructural System</li> </ul>	<ul> <li>Navigation Impacts</li> <li>Focus on Significant Resources</li> </ul>
All alternatives would also look at maximizing E Restoration (ER) Benefits	Cosystem

#### PLANNING EXAMPLE REGION 1: ALTERNATIVE A - COASTAL BARRIER/NONSTRUCTURAL SYSTEM



#### PLANNING EXAMPLE REGION 1: ALTERNATIVE B - COASTAL BARRIER



#### ALTERNATIVE B - COASTAL BARRIER (ENG. WORKSHOP DISCUSSIONS)



#### PLANNING EXAMPLE REGION 1: ALTERNATIVE C – MID BAY



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



#### PLANNING EXAMPLE REGION 1: ALTERNATIVE D - OPTIONS REVIEWED BASED ON GCCPRD COMMENTS



### **Potential Barrier Designs**



#### 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

5





### **Coastal TX – First Line of Defense Map**



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



10

### Coastal TX – Third Line of Defense Map



11

#### **Comprehensive Plan: Overarching Vision**

Houston Ship Channel ECIP Mega Study (USACE)

Matagorda

Ship

Channel

(USACE)

Other

USACE

Activities

(CAP,

O&M, etc)

Storm Surge Suppression Study (GCCPRD)

Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States (RESTORE) Act TX Coastal Resiliency Master Plan (GLO)

> Natural Resource Damage Assessment (NRDA) (NOAA)

TX Coastal CSRM & ER Mega Study (USACE)

> TX Coastal Infrastructure Study (GLO)

+ Gulf of Mexico Energy Security Act (GOMESA) (USEPA)

Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) Jefferson County ER (USACE)

Sabine

Pass

to

Galveston

(USACE)

Other Studies and Activities Not Yet Identified

### **Comprehensive Plan:**

#### Purpose

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

#### 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

Identify current coastal issues of concern and create a database of projects to address regional vulnerabilities;

Framework for GLO implementation to inform effective coastal management to enhance and protect the coast;

Stakeholder engagement documents and website for education and outreach on the importance of the Texas coast and the significance of keeping it resilient;

Data from this initiative will be available for other planning initiatives to use;

Findings will be presented in 2017 to the Legislature.

#### **COASTWIDE RESILIENCY STRATEGIES**



# **Study Milestones and Funding Needs**

						-		
	Milestone Exemption Approval	Date Sep	Fiscal Year*	Total Funding (\$)	Federal Funding (\$)	Non-Federal Funding*** (\$)		
Scoping	Exemption Approval by ASA(CW)/OMB	2015 Nov	2016	2,506,000	1,253,000	1,253,000		
		2015	2017	3,650,000	1,825,000	1,825,000		
	Execute FCSA with GLO	Nov 2015	2018	3,950,000	2,175,000**	1,775,000		
Alternative Evaluation and Analysis	Alternatives Milestone	June	2019	5,350,000	2,675,000	2,675,000		
		2016	2020	4,244,000	2,122,000	2,122,000		
	Plan (TSP) Milestone	мау 2018	2021	100,000	50,000	50,000		
y Level Analysis	Agency Decision Milestone (ADM)	Oct 2018	Total	19,800,000**	10,100,000	9,700,000		
	Feasibility Report Complete	Oct 2020	* USACE FY is 1 Oct thru 30 Sept ** Includes \$400,000 for Independent External Peer Review (IEPR) *** Includes cash and Work-In-Kind (WIK)					
	Civil Works Review Board (CWRB)	Jan 2021	In partnership with the Texas General Land Office, the Corps of Engineers has a funding strategy to achieve project					
asibilit	S&A Review	Feb 2021						
U U		A						

**Chief's Report** 

Apr

2021

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



### **Project Process**



# **Collaboration With Others**



# Questions

