

# COASTAL TX PROTECTION AND RESTORATION FEASIBILITY STUDY

## Houston Storm Surge Flood Forum

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

7 March 2019

Mr. David Green, Deputy Director, Coastal Resources  
TX General Land Office (GLO)

*"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





# PROJECT GOALS & OBJECTIVES



## Goals

### Coastal Storm Risk Management (CSRMM)

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

## Objectives

- **Reduce economic damage** from coastal storm surge flooding to business, residents and infrastructure through 2085
- **Reduce risk to critical infrastructure** (e.g. medical centers, government facilities, universities, and schools) from coastal storm surge flooding to the maximum extent practical and reduce emergency costs
- **Reduce risk to public health and safety** from storm surge
- **Increase the resilience** of communities, the economy, coastal ecosystems, and infrastructure, including existing coastal storm risk reduction systems, from sea level rise and coastal storm surge
- **Enhance and restore coastal landforms** along Galveston Island and Bolivar Peninsula that contribute to reducing the risks of coastal storm surge damages
- **Improve hydrologic connectivity** of area wetlands in the Texas-Louisiana coastal marshes, mid-coast barrier islands and coastal marshes
- **Improve and sustain coastal marshes and bay shorelines** on barrier island and estuarine systems





US Army Corps of Engineers

# THE TENTATIVELY SELECTED PLAN (TSP)



Coast-wide system of ecosystem restoration and storm-risk management features

TSP supports the resilience of coastal communities and natural habitats in Coastal Texas

**Coastwide:**

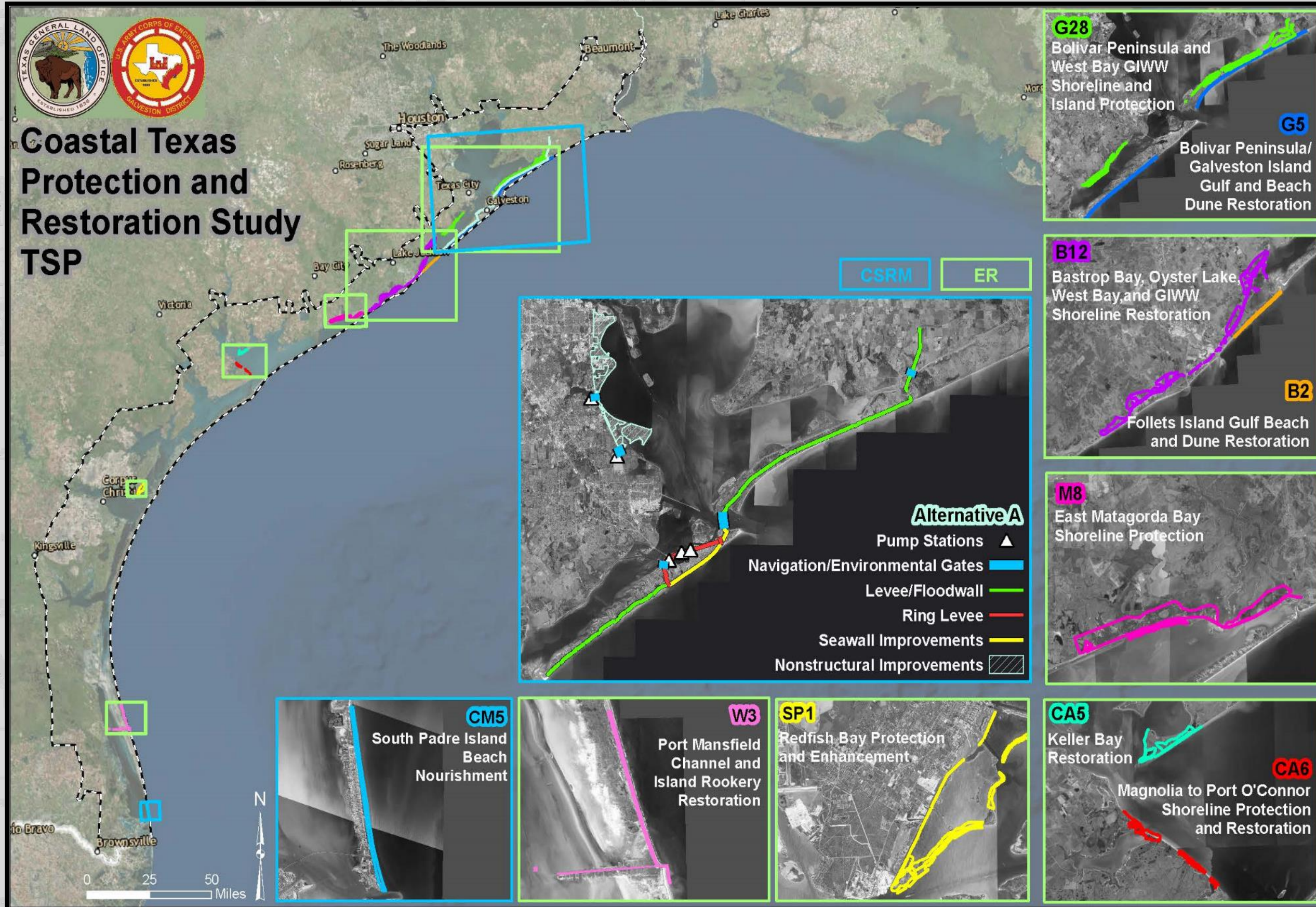
Large scale ER features which focus on critical landscape features and areas of threatened biologically diverse ecosystems

**Lower Coast:**

CSRM Dune and beach restoration project on South Padre Island

**Upper Coast:**

CSRM surge barrier system to protect the Houston-Galveston Region (Coastal Spine)





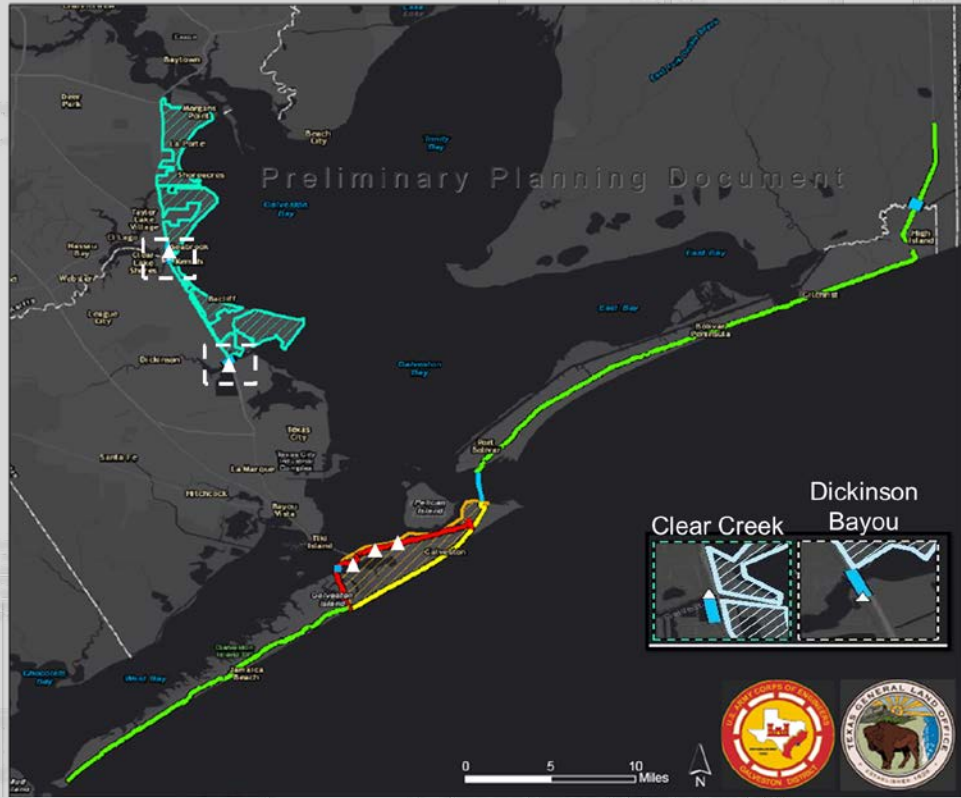


US Army Corps of Engineers

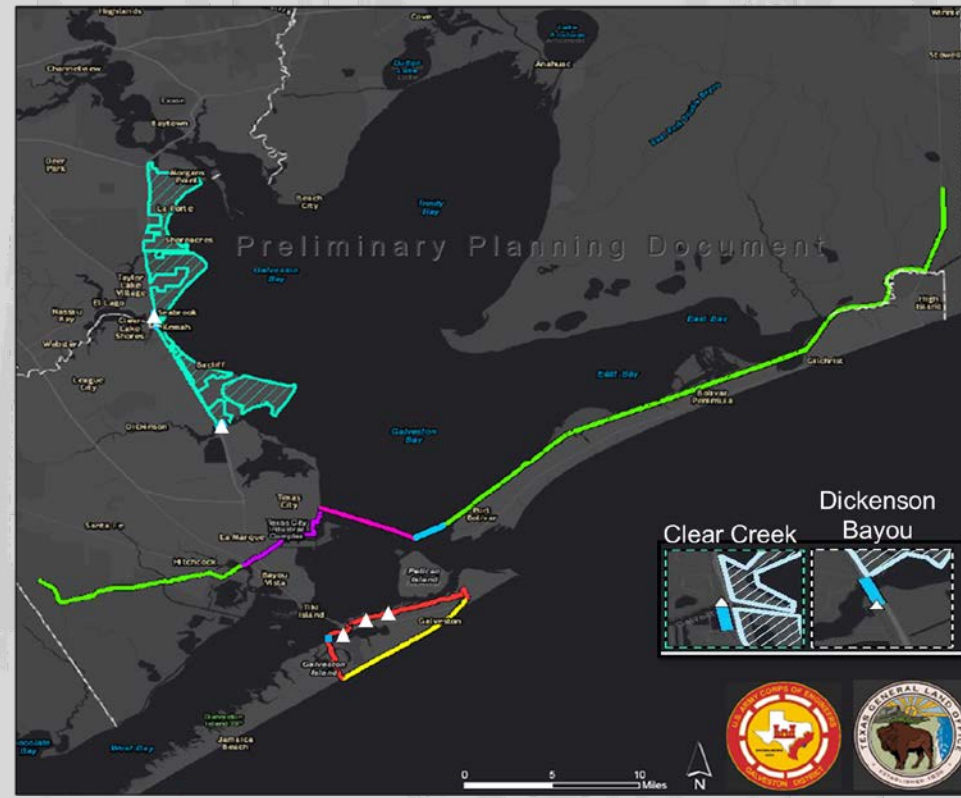


# OPTIONAL ALIGNMENTS

### ALT A: COASTAL BARRIER



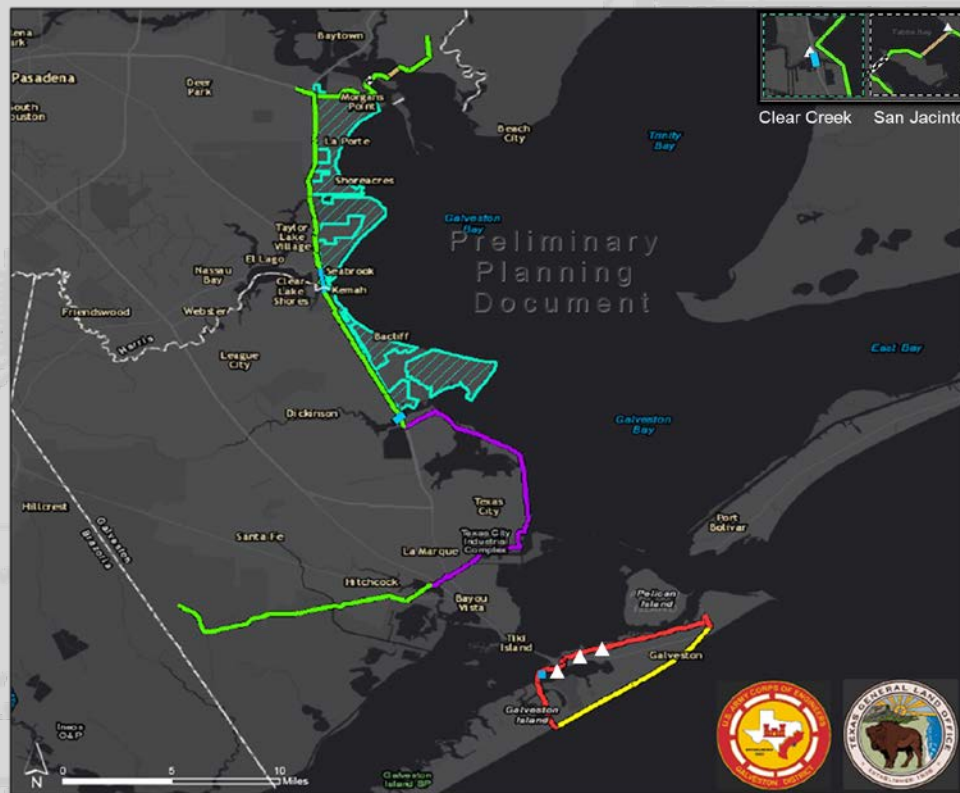
### ALT B: MODIFIED BARRIER (TX CITY)



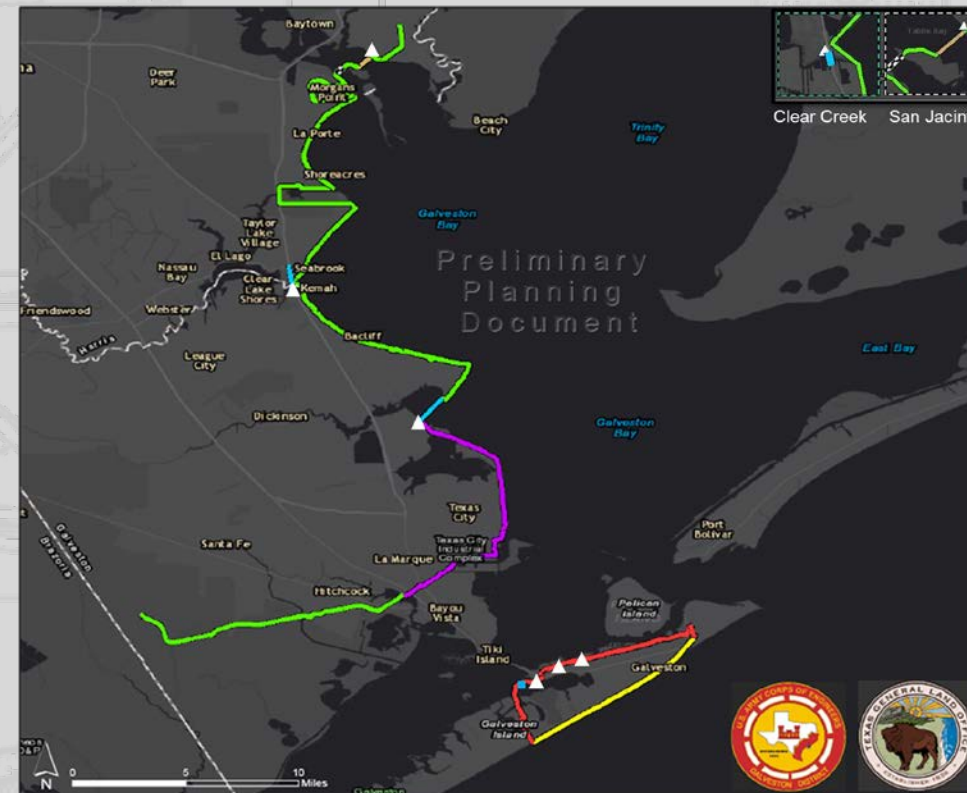
### ALT C: MID-BAY BARRIER



### ALT D1: UPPER BAY (SH 146)



### ALT D2: BAY RIM



NOTE: CLEAR  
DO THE BAYE BLUNHEADS CAN BE  
USED FOR 100% OF THE  
PREFRESSED-CONCRETE  
TRUNION GIDER  
NOTE:  
TANTER GATE  
NOT SHOWN



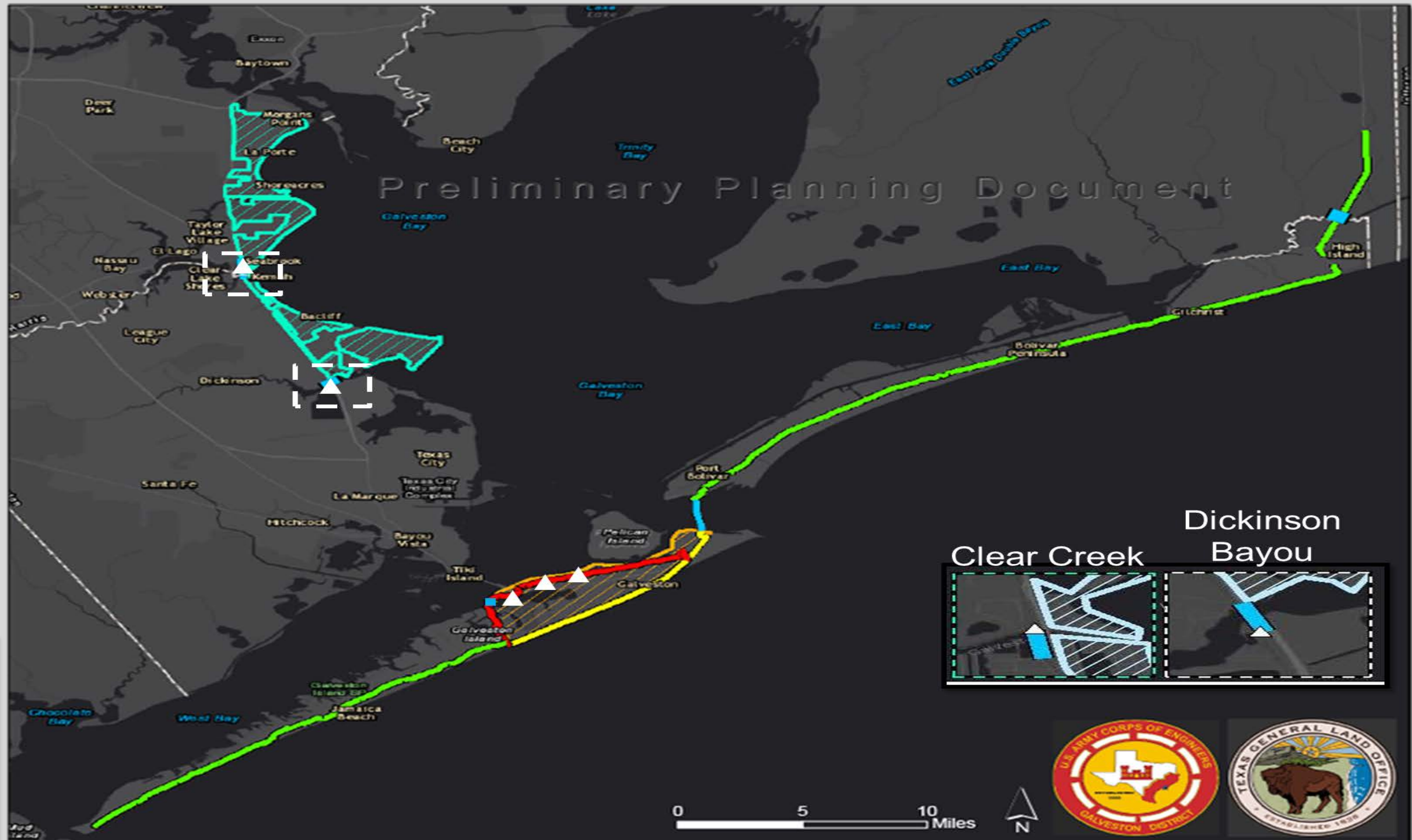


US Army Corps of Engineers



# OPTIONAL ALIGNMENTS

## ALT A: COASTAL BARRIER







US Army Corps of Engineers

# ECOSYSTEM RESTORATION MEASURES IN REGION 1



**G28**  
Bolivar Peninsula and West Bay GIWW Shoreline and Island Protection

**G5**  
Bolivar Peninsula/Galveston Island Gulf and Beach Dune Restoration

**B12**  
Bastrop Bay, Oyster Lake, West Bay, and GIWW Shoreline Restoration

**B2**  
Follets Island Gulf Beach and Dune Restoration







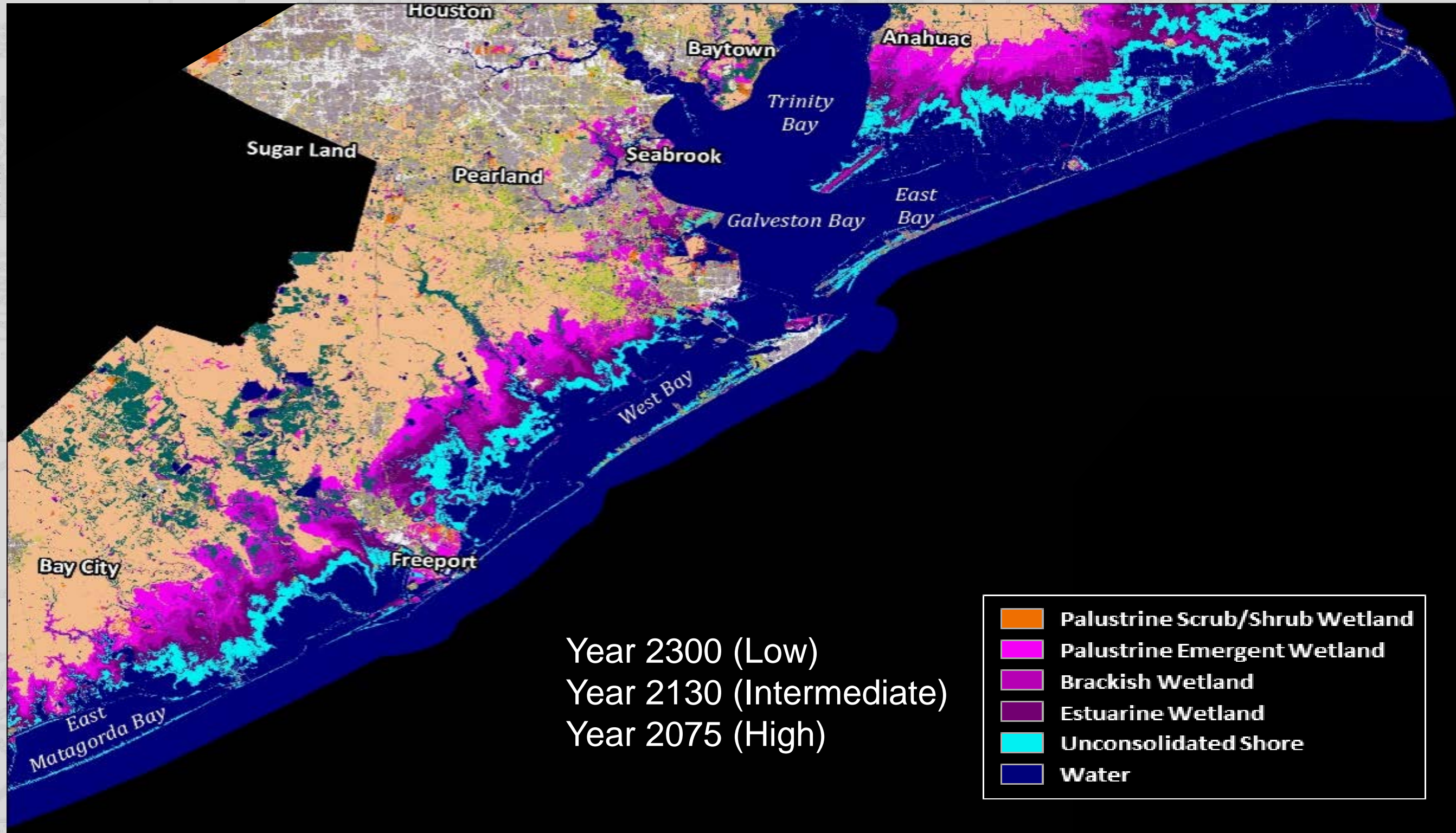
US Army Corps of Engineers

# ANTICIPATED RELATIVE SEA LEVEL CHANGES



## Upper Texas Coast

Break Point in Sea Level Change (about 3.5 feet)

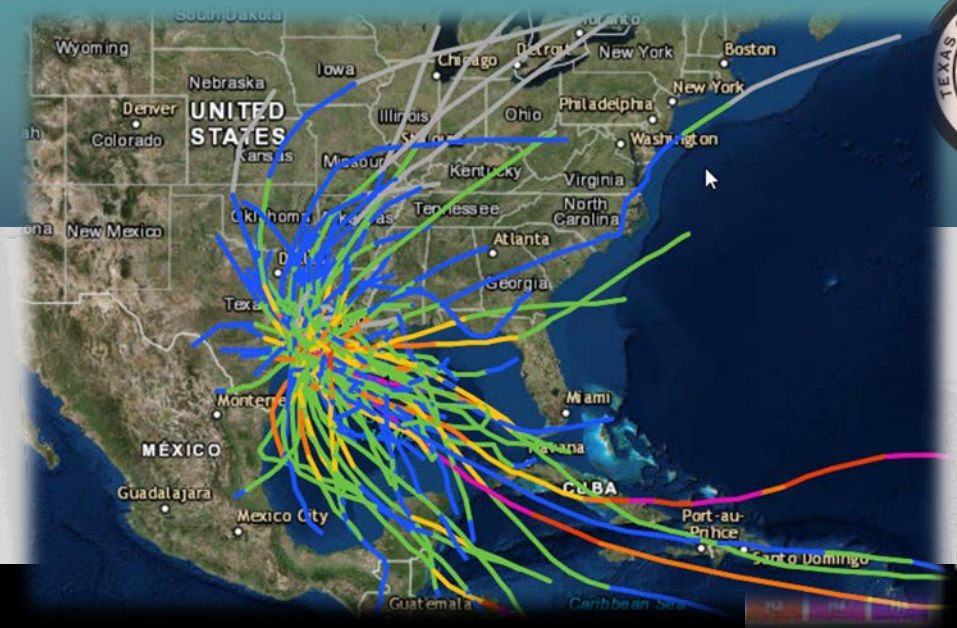






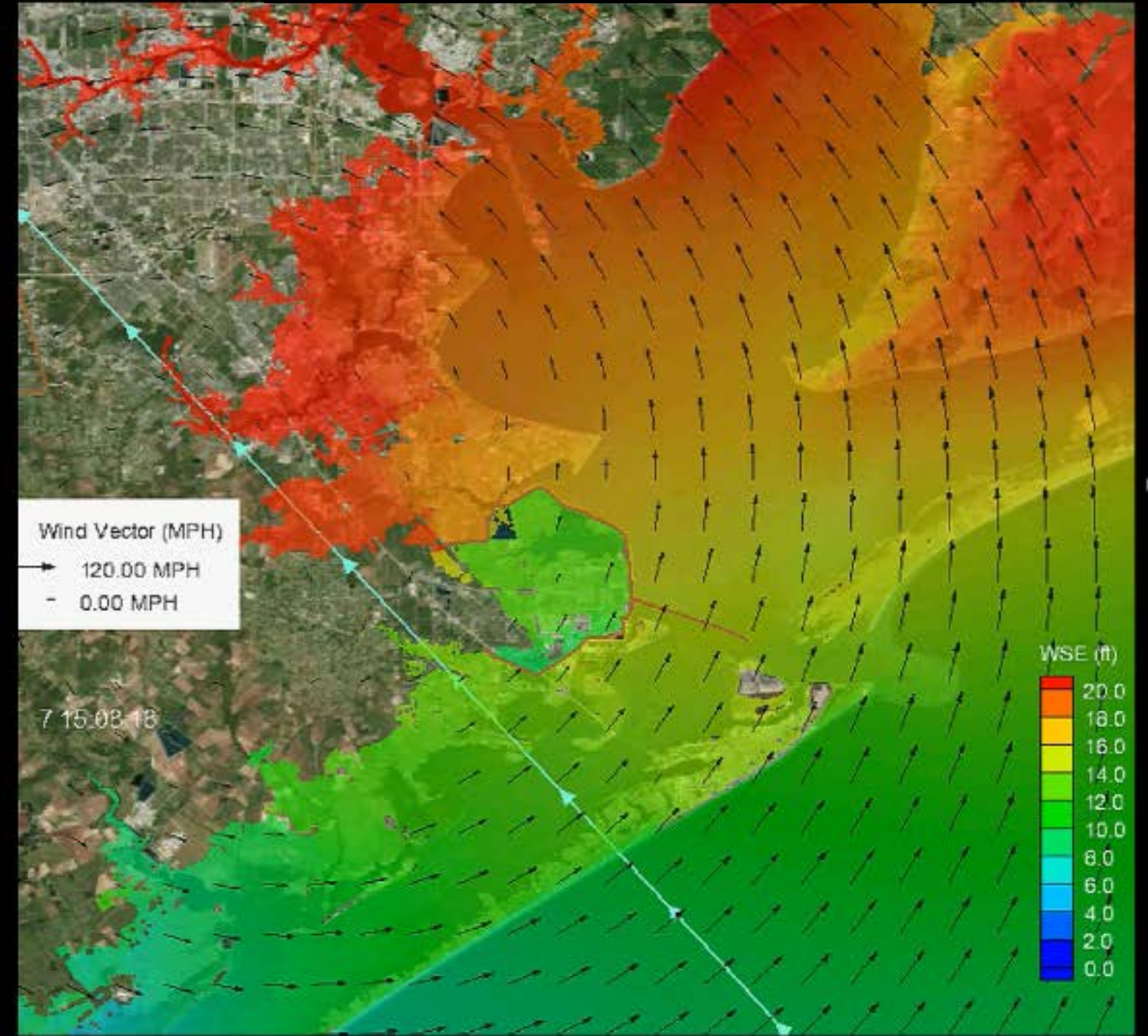
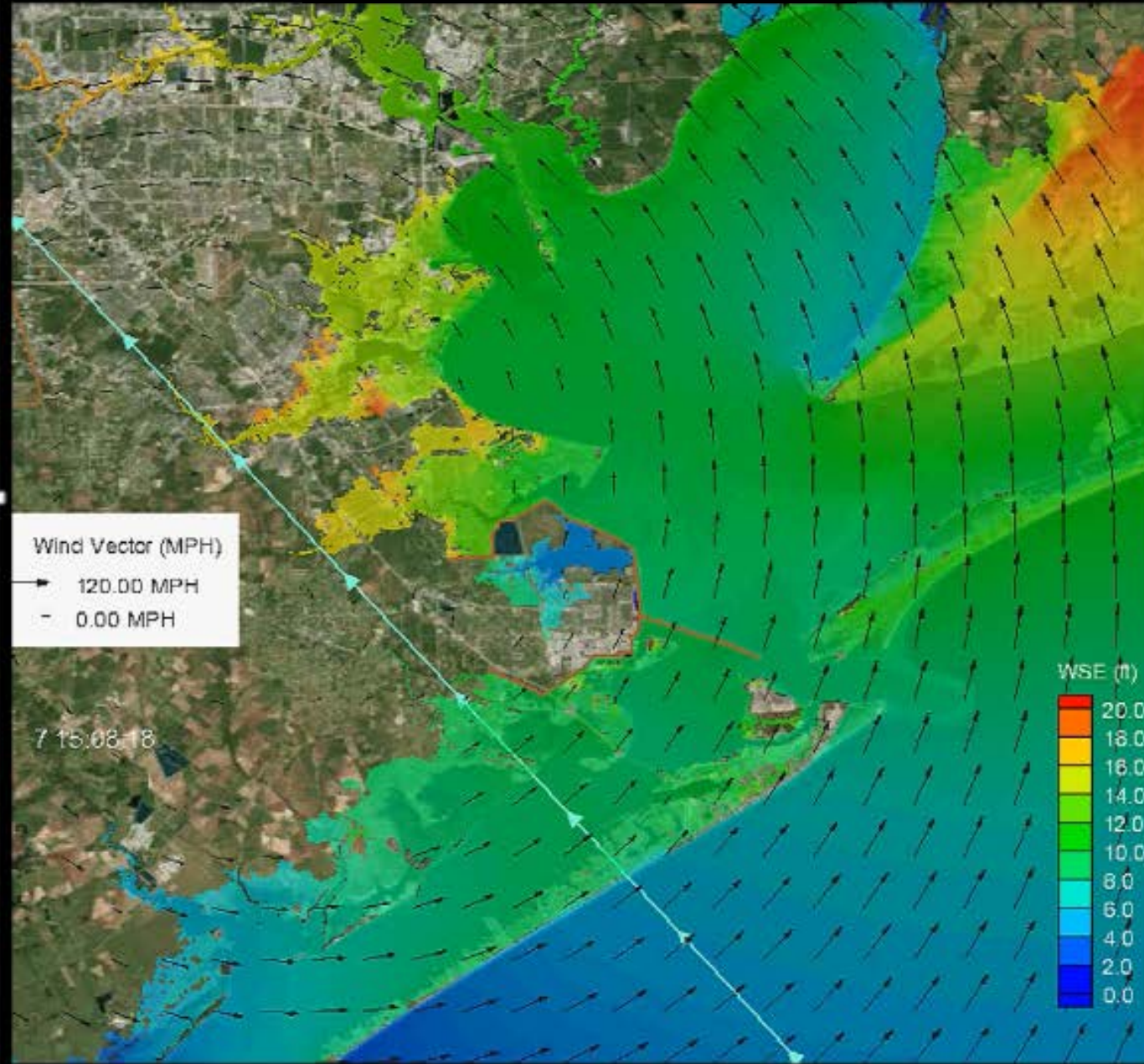
US Army Corps of Engineers

# COASTAL STORM RISKS



## Present Day

## With Sea Level Rise







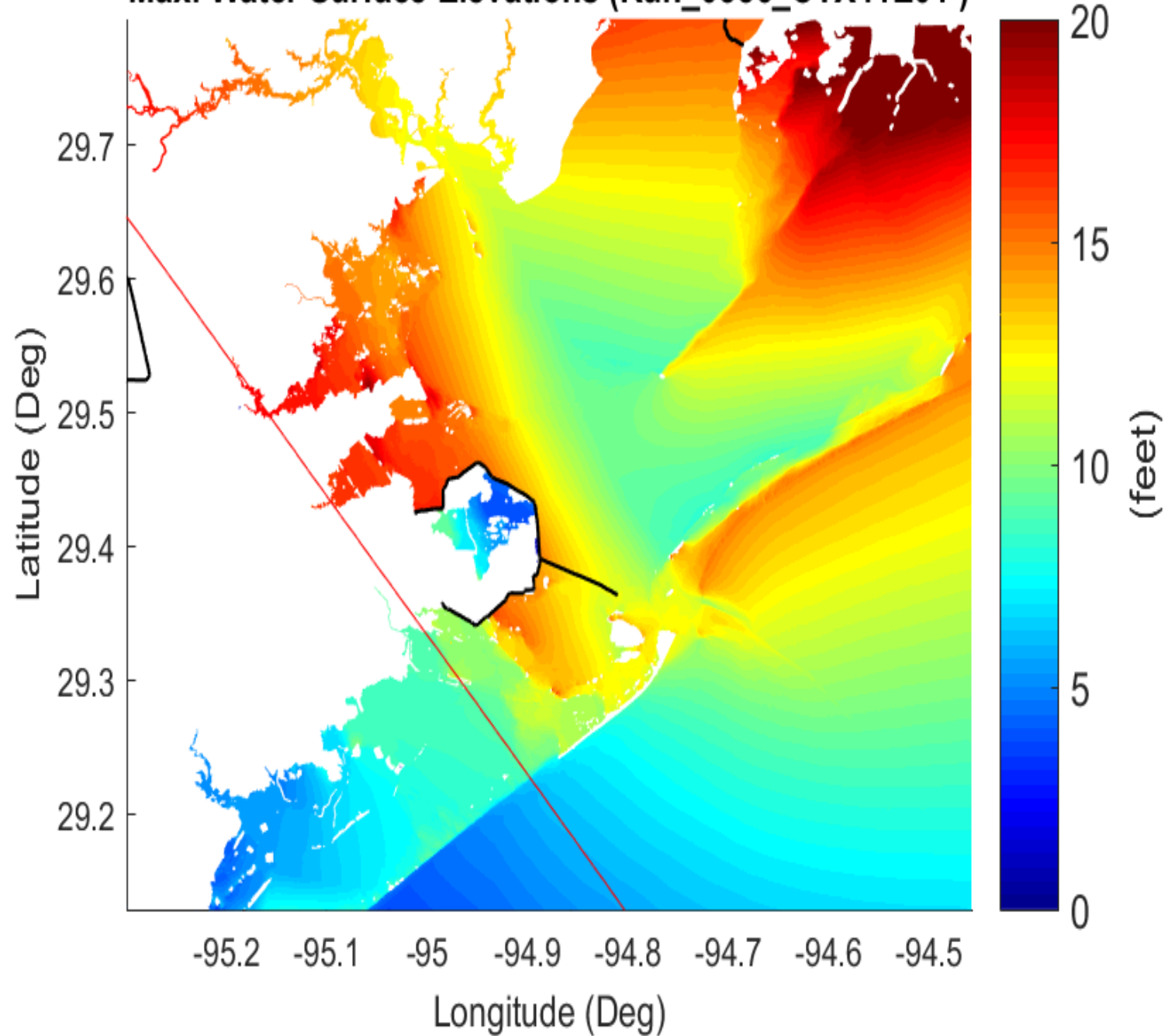
US Army Corps  
of Engineers

# PLAN EVALUATION & COMPARISONS



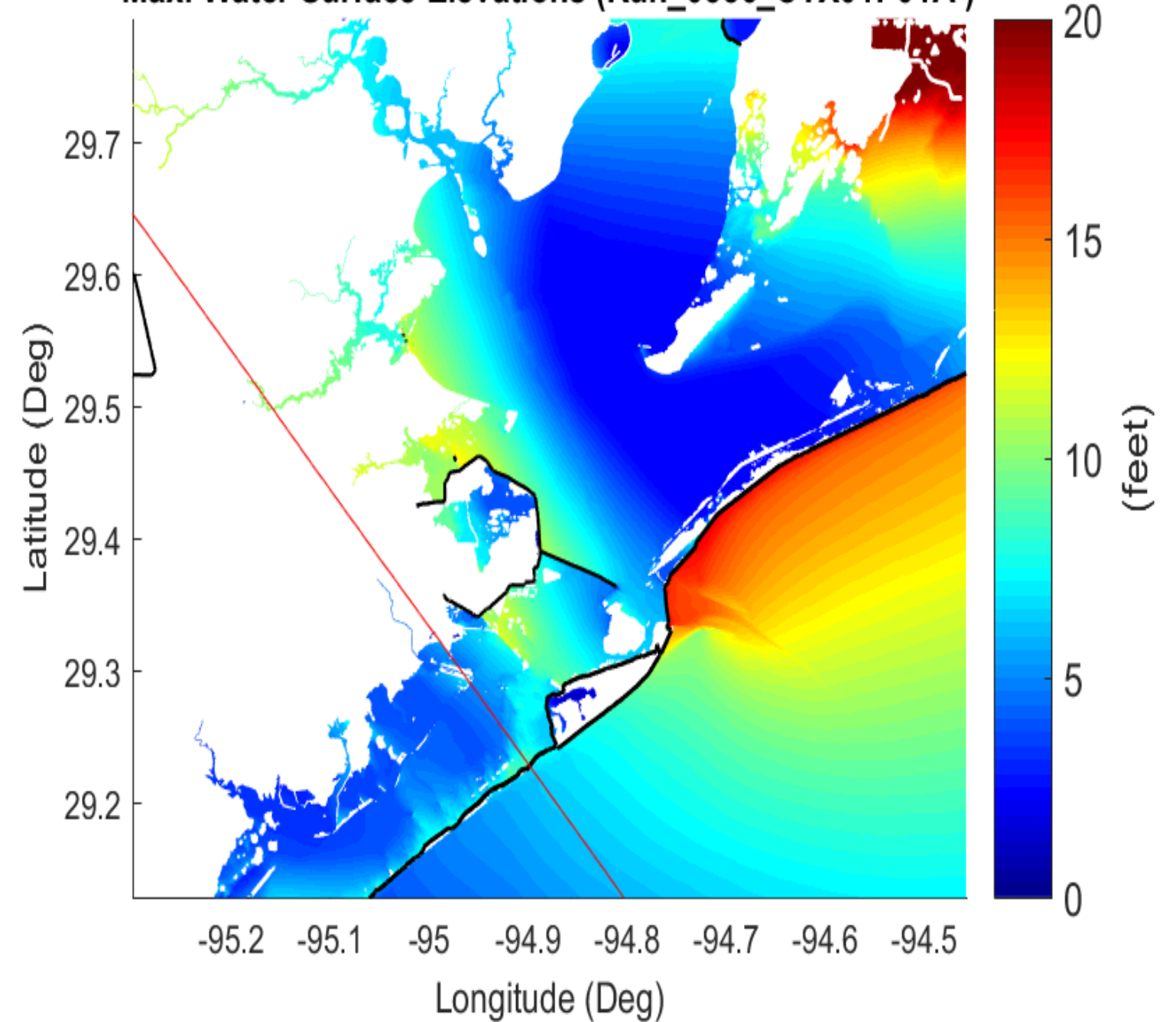
## Without Project

Max. Water Surface Elevations (Run\_0356\_CTX41E01)



## Plan A: Coastal Barrier

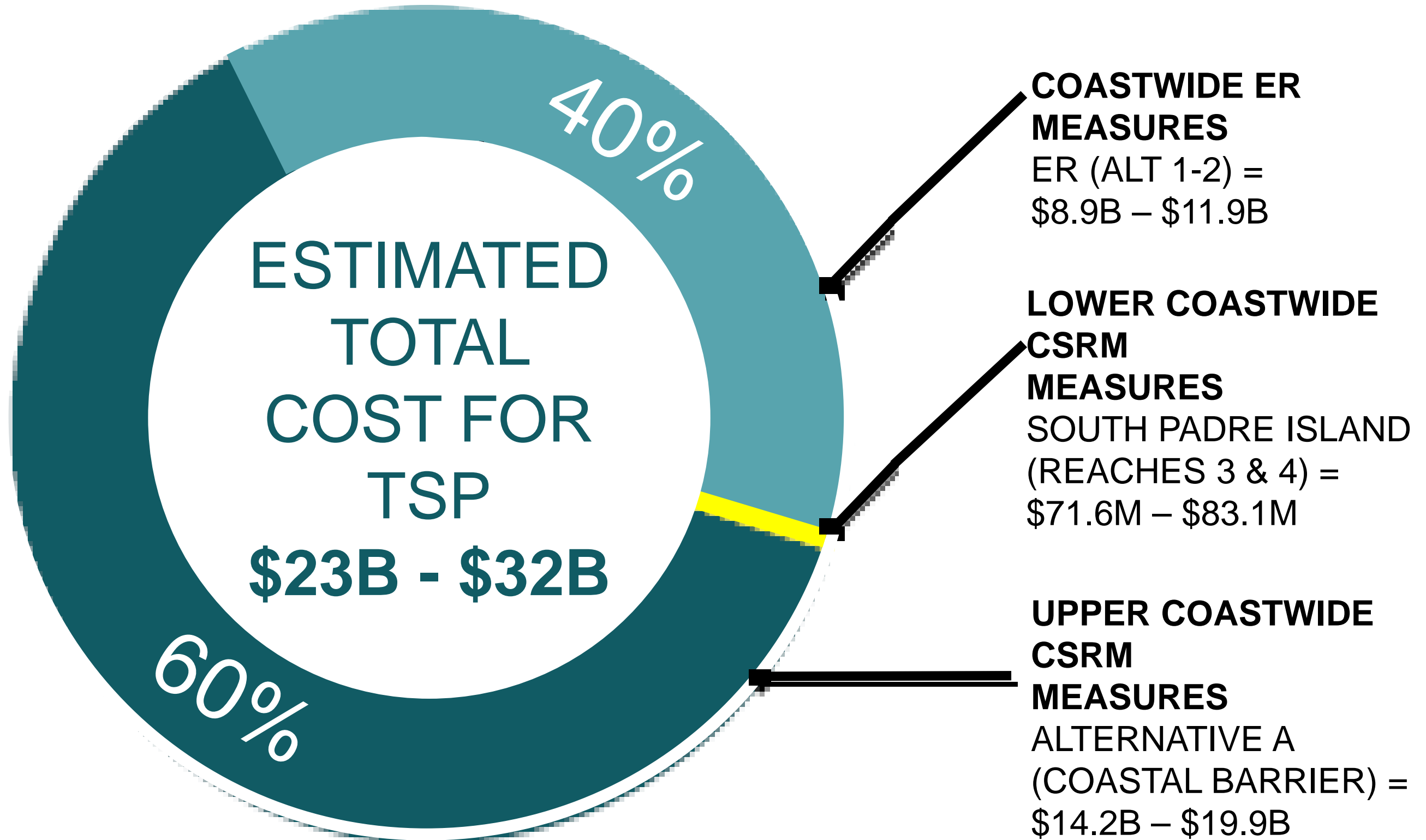
Max. Water Surface Elevations (Run\_0356\_CTX01P01A)







# TSP TOTAL PROJECT COST







# ENVIRONMENTAL IMPACTS & MITIGATION



- **Direct Impacts**

Alt A (TSP): 4,525.3 acres

South Padre: 365.8 acres

- **Indirect Impacts:**

- Altered tidal exchange
- Reduced velocities in Galveston Bay

- **Ecosystem Restoration Benefits**

- 160,000 acres of marsh, islands, dunes, beaches & oyster reefs



**TOTAL MITIGATION COST RANGE:**

**\$676 M – \$906 M**

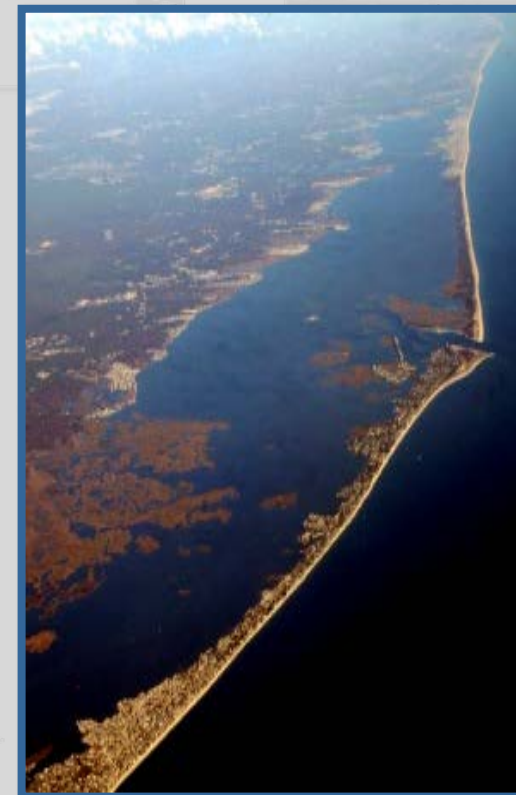




# PATH FORWARD



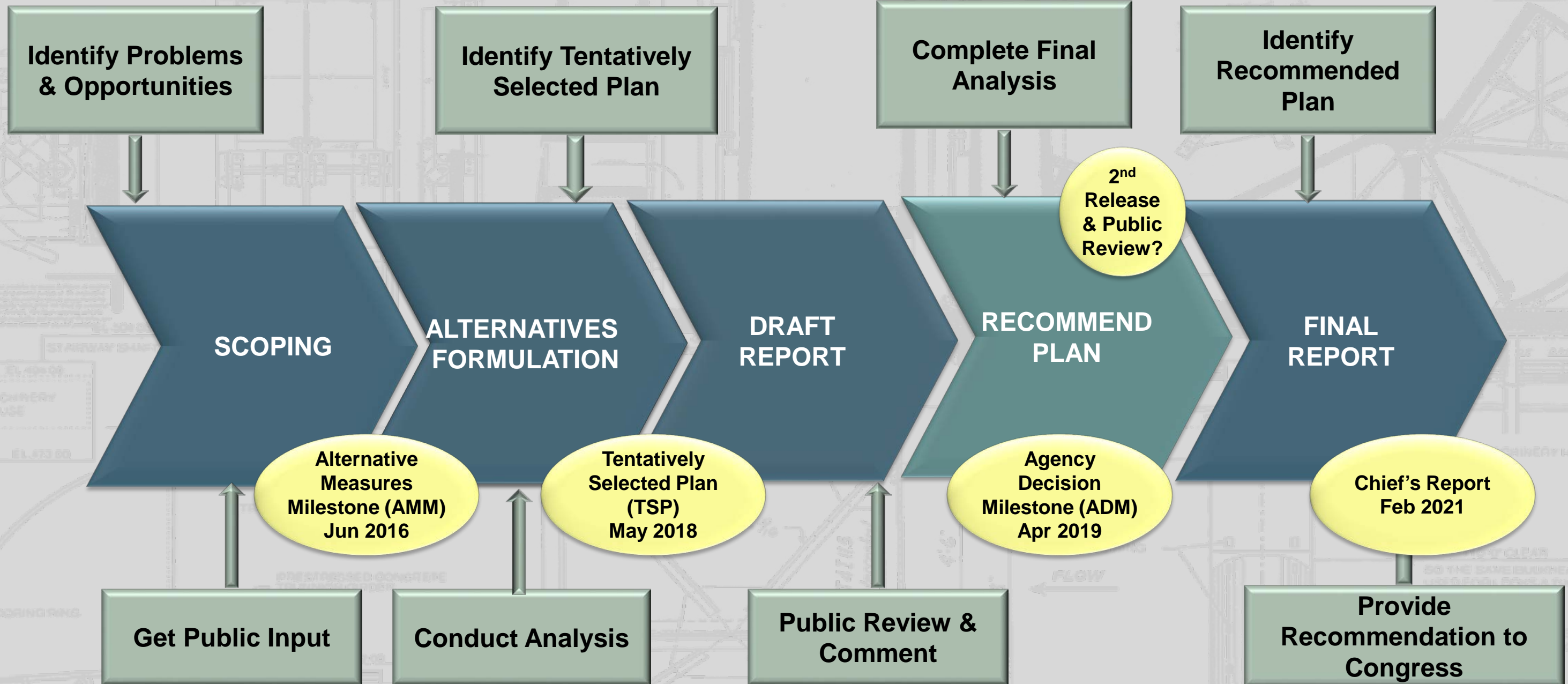
- **Based on public comments we are now:**
  - Evaluating moving the barrier to the beach and re-aligning the Galveston ring barrier
  - Exploring the utility of gates Clear Creek and Dickinson
- **In addition:**
  - We have met with Rice University (SSPEED Center) & Texas A&M at Galveston to understand the differences between the proposals
  - GLO is establishing Community Working Groups
- **Over the remaining study process we will:**
  - Host an International Gate Design Workshop
  - Conduct additional storm modeling
  - Evaluate non-structural measures on the west side of upper Galveston Bay
  - Continue Natural Resource Agency coordination
  - Evaluate a second Public Review and comment period







# WHERE WE ARE IN THE STUDY PROCESS





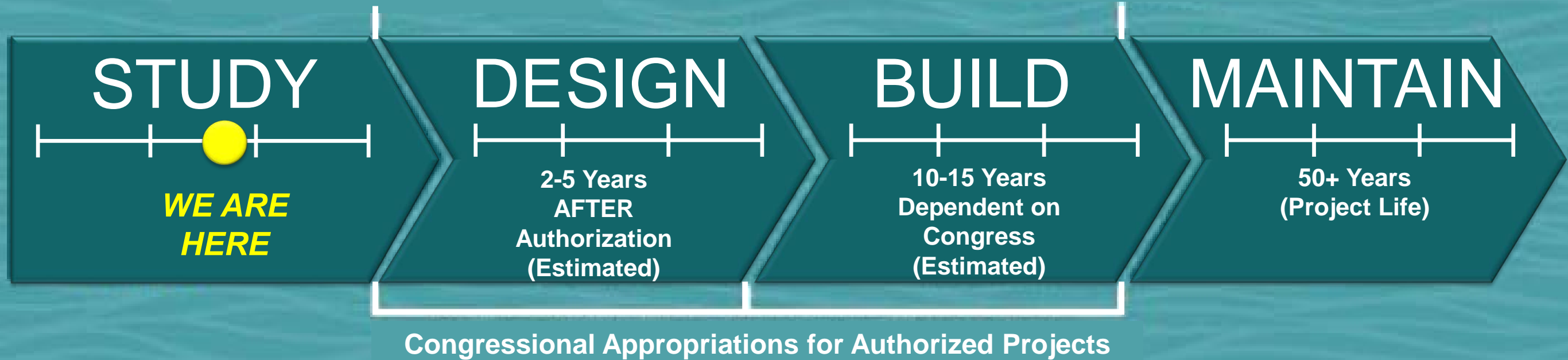


# NEXT STEPS

## ESTIMATED PROJECT SCHEDULE

Study Complete - Request Congressional Authorization for Project(s) 2021

Local Sponsor(s) Maintain Project







US Army Corps of Engineers

# COASTALSTUDY.TEXAS.GOV



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](#)

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.

[MORE](#)

**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.

[MORE](#)

**Environmental Impact Analyses**

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

[MORE](#)

Galveston District  
Southwestern Division

October 2018

# Coastal Texas Protection and Restoration Feasibility Study

## Draft Integrated Feasibility Report and Environmental Impact Statement