

# Update on the Texas Coastal Spine Project

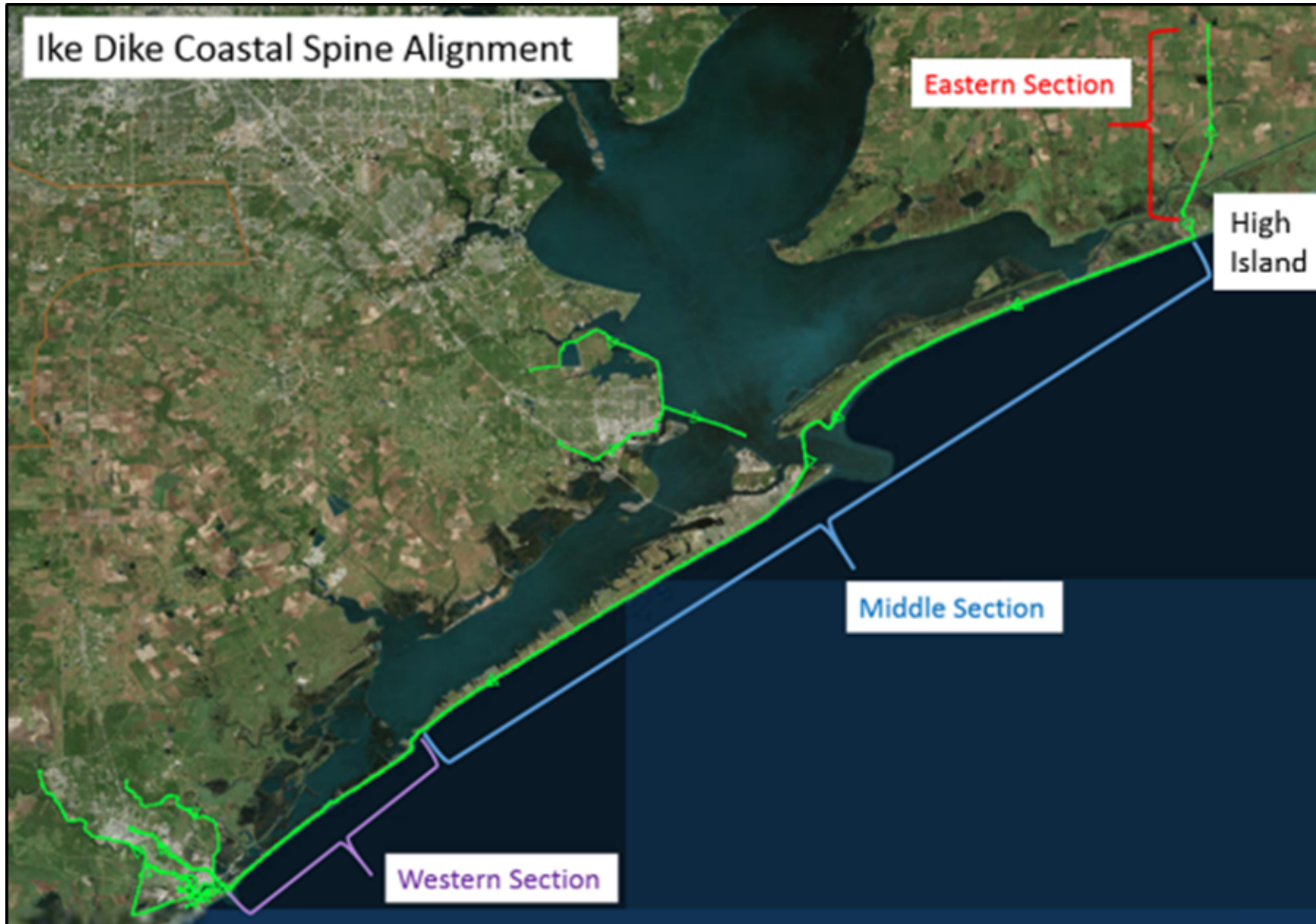
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**STORMS, FLOODING & SEA LEVEL DEFENSE CONFERENCE (SFSLD)**  
November 3, 2021

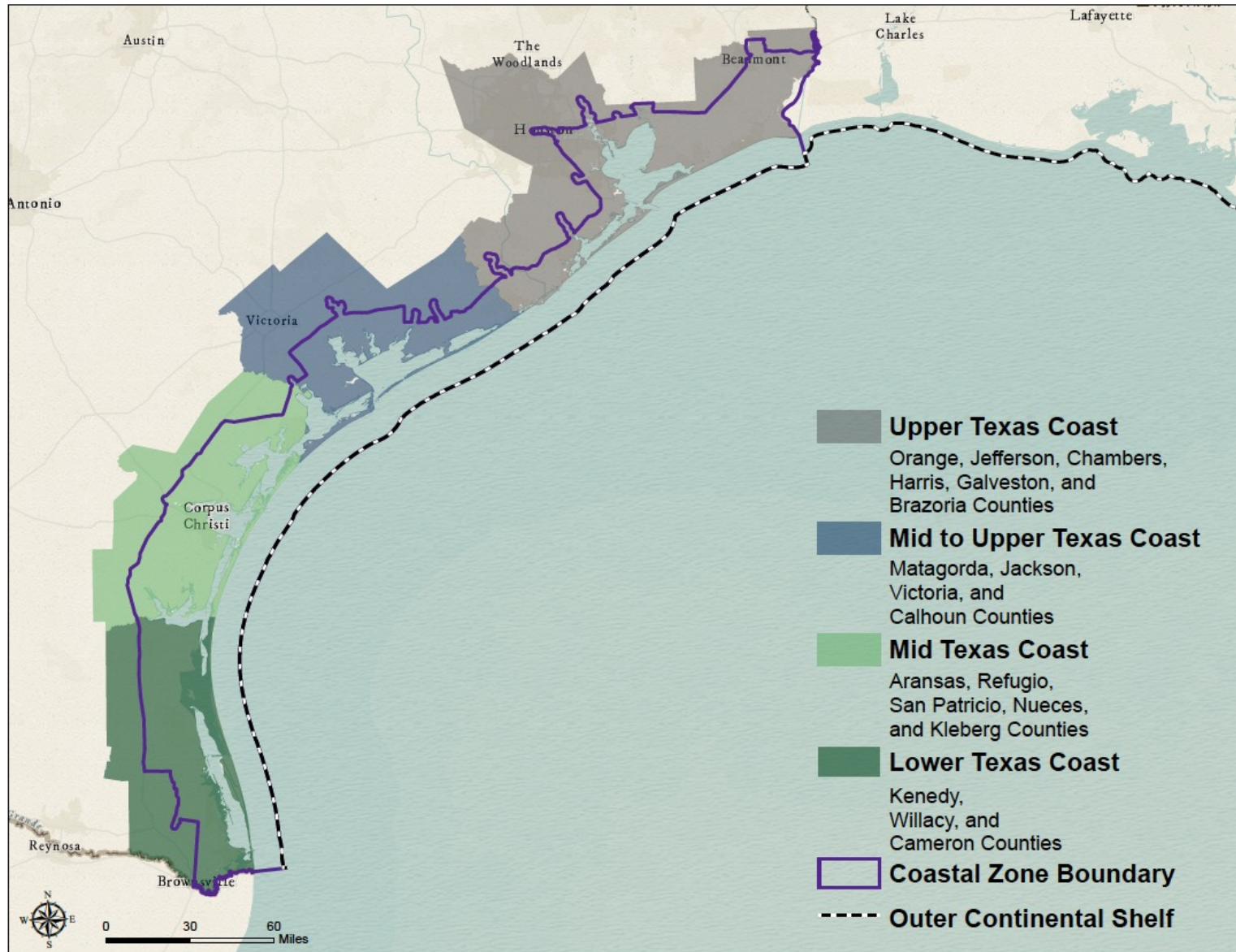
# Texas Coastal Spine – Early Developments

- Texas coastal spine (a.k.a Ike Dike) was first proposed a mitigation strategy a month after the 2008 hurricane Ike that devastated upper Texas coast.
  - Hurricane Ike was a category 2 storm but was accompanied by a storm surge level of category 5 hurricane
  - Damages of Ike were approximately \$29.5 billions
- Initial study was performed by Texas A&M University at Galveston with collaboration from the Delft University, Netherlands →
  - Simple design – 17ft barrier at coast with gates across inlets
  - Provides protection from 100yr storm

# IKE Dike Concept November 2008



# Coastal Texas Study Areas and Regions



**Source:** USACE. 2021. Coastal Texas Protection and Restoration Feasibility Study, 2021 (available: [https://www.swg.usace.army.mil/Portals/26/Coastal%20TX%20Executive%20Summary\\_FINAL\\_20210827.pdf](https://www.swg.usace.army.mil/Portals/26/Coastal%20TX%20Executive%20Summary_FINAL_20210827.pdf))

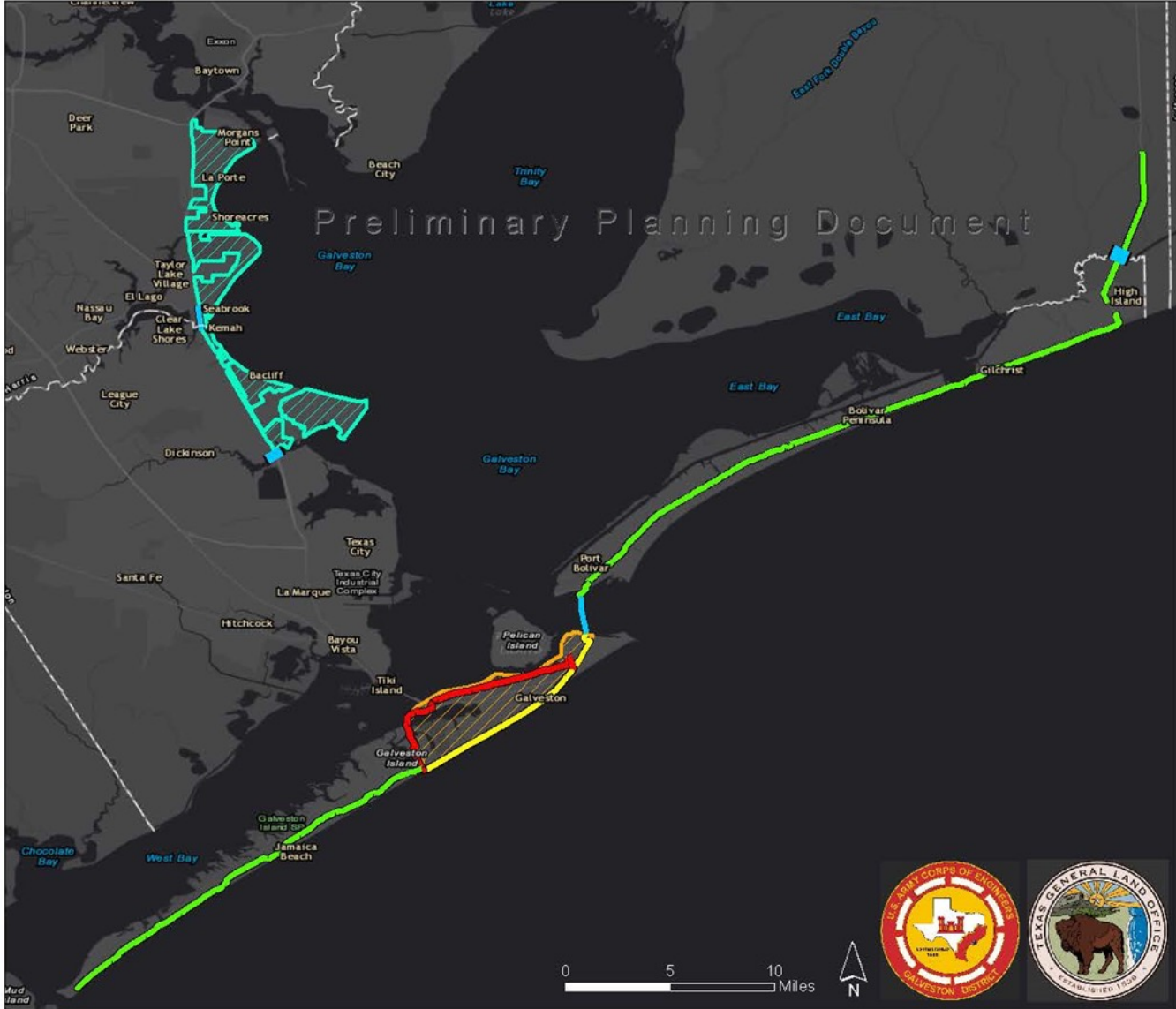
# 2021 USACE Alternative A – Coastal Barrier/Non-Structural System

## Coastal Texas Protection and Restoration Feasibility Study

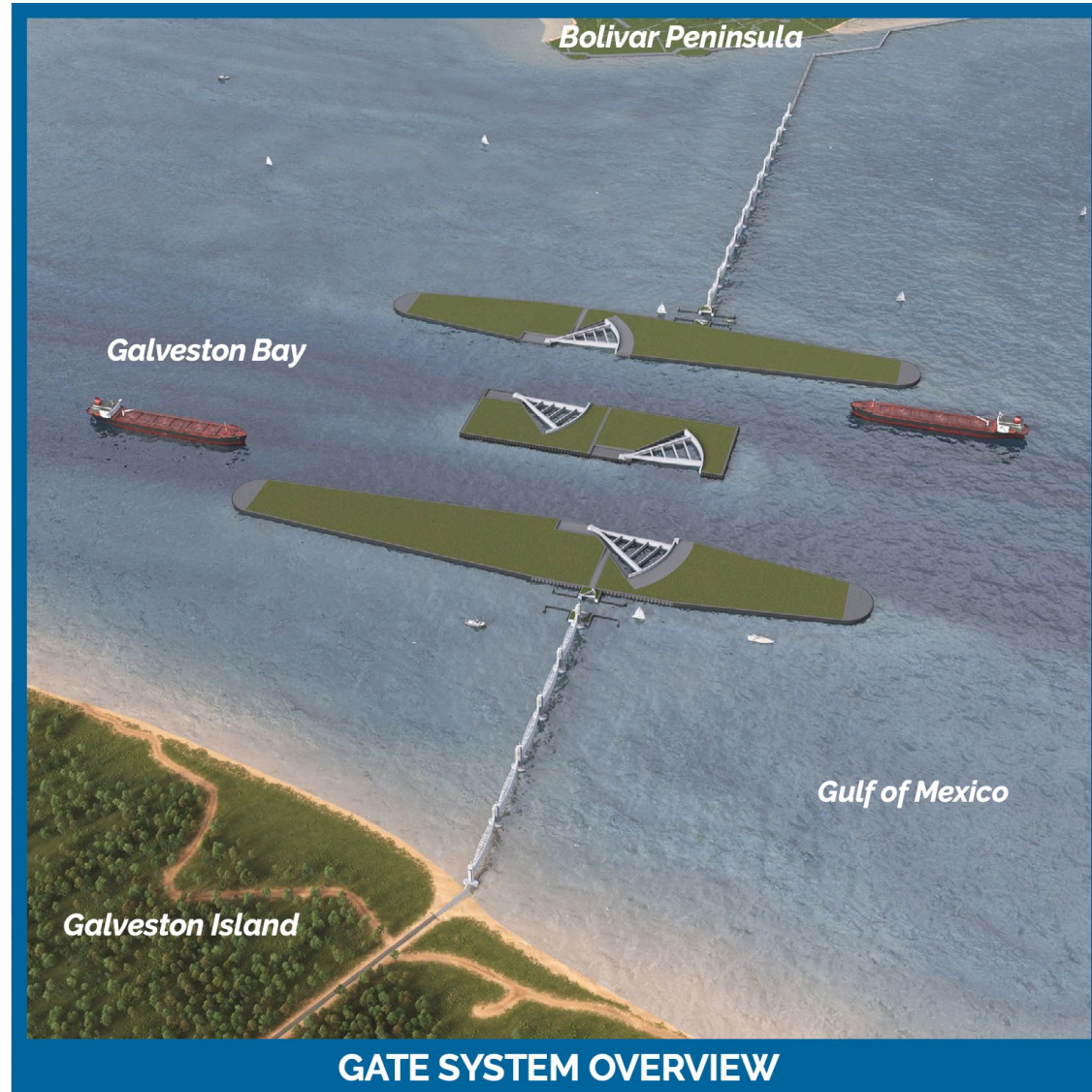
### Alternative A

-  Navigation and Environmental Gates
-  Levee/Floodwall
-  Galveston Ring Levee\*
-  Galveston Seawall Improvements
-  Galveston Island\*
-  Nonstructural Improvements

\* One or both of these features may be selected.



# 2021 USACE Alternative A – Coastal Barrier/Non-Structural System

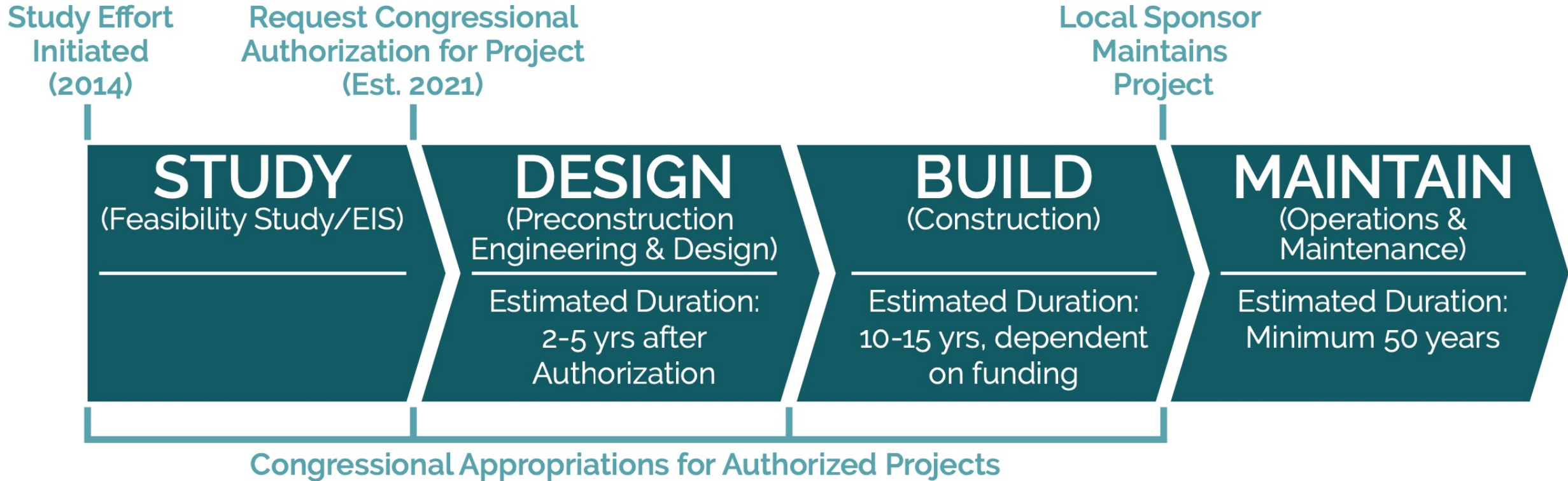


**Source:** USACE. 2021. Coastal Texas Protection and Restoration Feasibility Study, 2021 (available: [https://www.swg.usace.army.mil/Portals/26/Coastal%20TX%20Executive%20Summary\\_FINAL\\_20210827.pdf](https://www.swg.usace.army.mil/Portals/26/Coastal%20TX%20Executive%20Summary_FINAL_20210827.pdf))

# Texas Coastal Protection and Restoration Feasibility Study (USACE)

- Coastal Texas Protection and Restoration Feasibility Study (Coastal Texas Study), was initiated in 2014 to evaluate the feasibility of coastal storm surge protection and ecosystem restoration strategies along coastal communities of Texas (entire coastline)
- This Final Feasibility Report was completed August, 2021, built on previous drafts (2018 Draft Integrated Feasibility Report and Environmental Impact Statement (DIFR-EIS) and the October 2020 Draft Feasibility Report and Draft EIS).
- Upon approval of the USACE, a plan is set to be recommended to Congress for authorization and funding.
  - If funded, will be the largest USACE project ever built in the U.S.

# ESTIMATED PROJECT SCHEDULE



**Source:** USACE. 2021. Coastal Texas Protection and Restoration Feasibility Study, 2021 (available: [https://www.swg.usace.army.mil/Portals/26/Coastal%20TX%20Executive%20Summary\\_FINAL\\_20210827.pdf](https://www.swg.usace.army.mil/Portals/26/Coastal%20TX%20Executive%20Summary_FINAL_20210827.pdf))



# Gulf Coast Protection District

- The new 5-county protection special funding district has been established by the Texas Legislature (S.B. 1160) and signed by the Governor.
  - Charged with providing the matching funds for the local share of the construction costs of a comprehensive surge protection barrier and after construction, be solely responsible for the operation and maintenance of the barrier.
- The governor has made his 6 appointments to the Districts Board and the 5 member counties, Orange, Jefferson, Chambers, Harris and Galveston, have made appointments.

# Texas Coastal Protection and Restoration Feasibility Study (USACE)

- Total Estimated Project Cost ~ \$28.9 Billion
  - Galveston Bay Storm Surge Barrier System ~ \$26.1 Billion
  - South Padre Island Beach Nourishment and Sediment Management ~ \$74.4 Million
  - Coast-wide Ecosystem Restoration (ER) Plan ~ \$2.7 Billion
  
- Benefits to Costs Ratio (USACE)
  - Galveston Bay Storm Surge Barrier System – 1.91
  - South Padre Island Beach Nourishment and Sediment Management – 2.03

# Average Annualized Impacts (\$ millions )and B/C (TAMUG study)

	18 days	26 days	33 days
<b>Benefit to Cost (B/C)</b>			
<b>B/C ratio low cost</b>	2.65	2.87	3.06
<b>B/C ratio medium cost</b>	1.53	1.66	1.77
<b>B/C ratio high cost</b>	1.08	1.17	1.25

**Est. engineering cost:** Low cost: \$4.65B

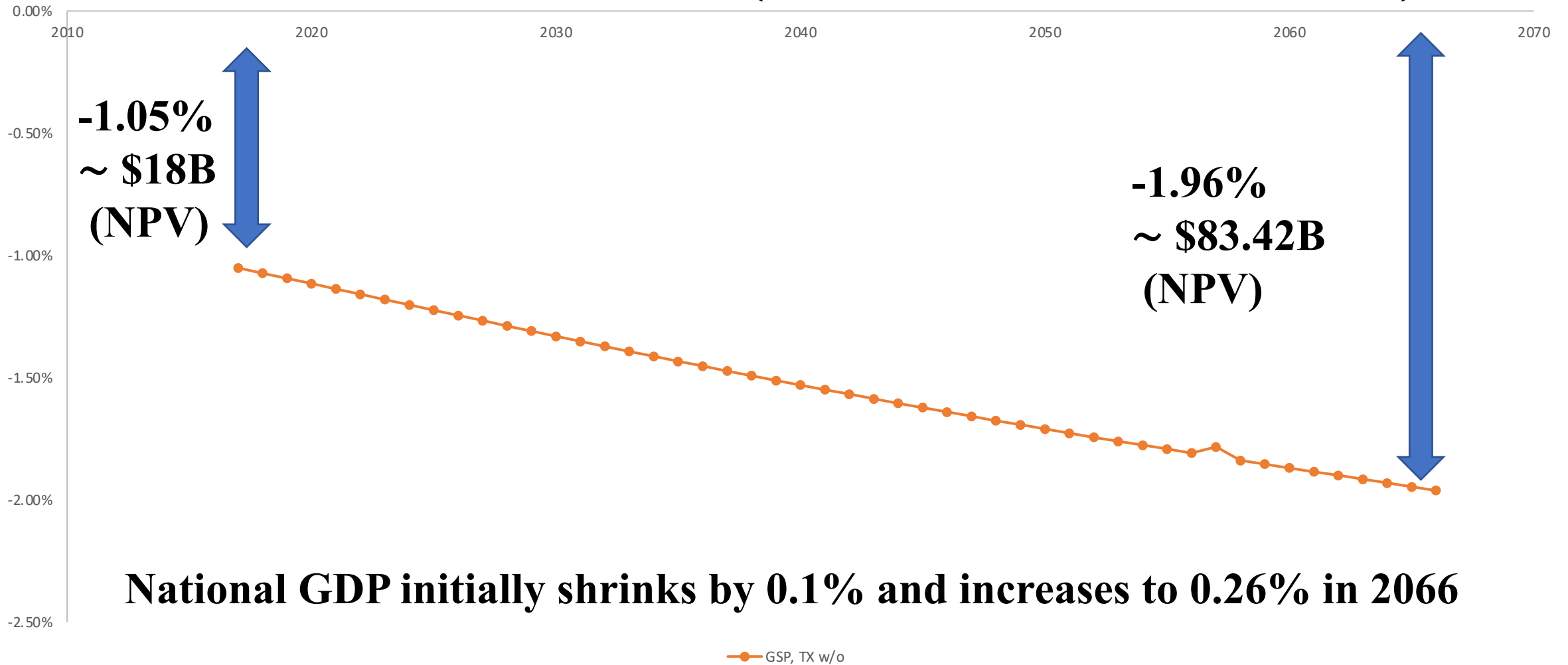
Medium cost: \$8.03B

Average cost: \$8.03B

Upper cost: 11.42B

(Jonkman et al. (2015)).

# Impact of 500-yr storm surge on Economy Conservative Estimates (Gross State Product)



**National GDP initially shrinks by 0.1% and increases to 0.26% in 2066**

# Economic Significance of Galveston Bay

- Home to approximately 4.42 million people (U.S. Census, 2010)
- Projected to surpass 6.3 million people by 2040 (Houston Galveston Area Council 2017).
- Hub of some of the nation's largest refineries, petrochemical manufacturing facilities, and critical infrastructure (the largest port in the US imports and export tonnage).
- The region generated over 341 billion of GDP, contributing a quarter of the entire Texas State economy, and employed more than 62% of the state's total population (year 2012)
- The combined output value from the chemical manufacturing, mining, oil, and gas extraction sectors was estimated above 294 billion dollars in the same year (MIG 2012).

**Thank you!**  
**Questions?**