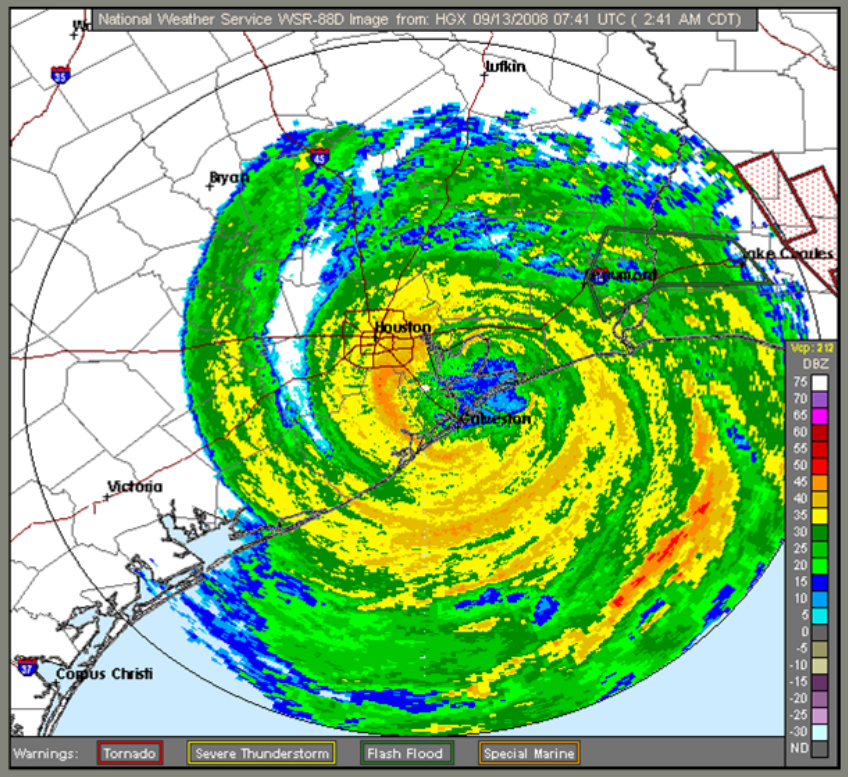
COASTAL TEXAS PROTECTION AND RESTORATION PROJECT



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."

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Coastal TX Study Authority

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

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.*

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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

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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

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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

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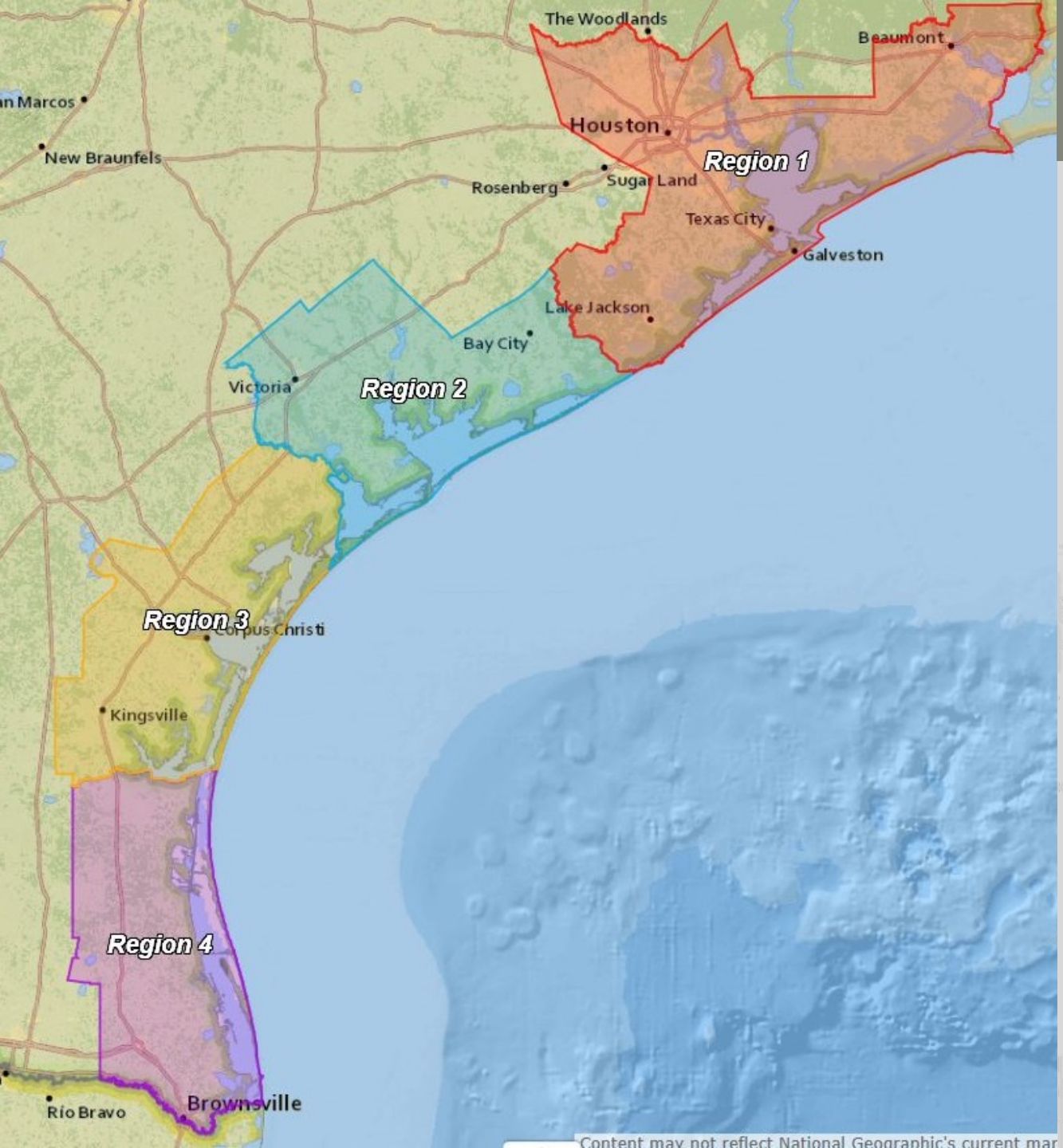
Study Area



- 4 Regions identified under Recon
- 9 Texas Congressional Districts
- U.S. Senators Cornyn and Cruz (TX)

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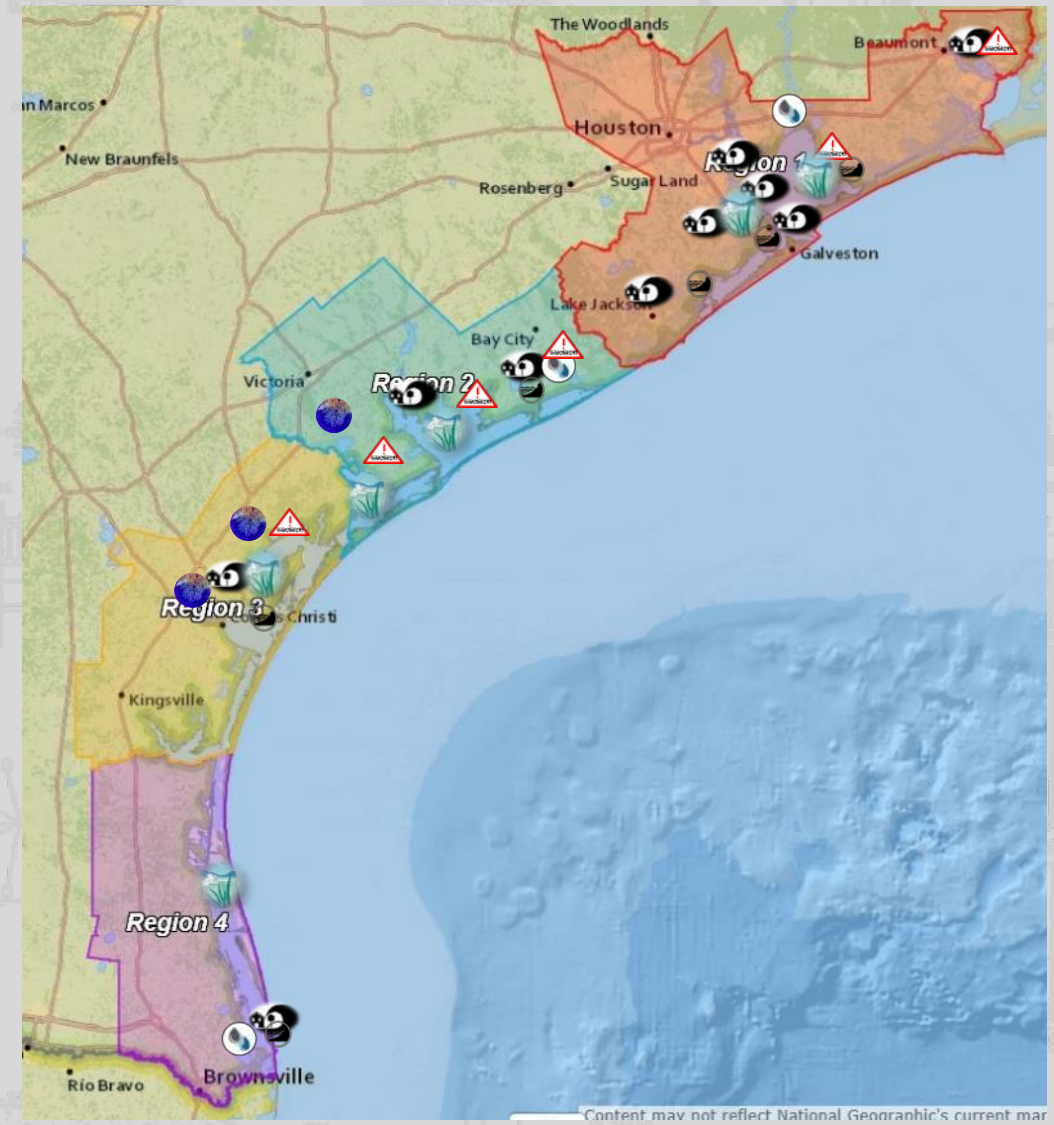
Problems and Opportunities



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

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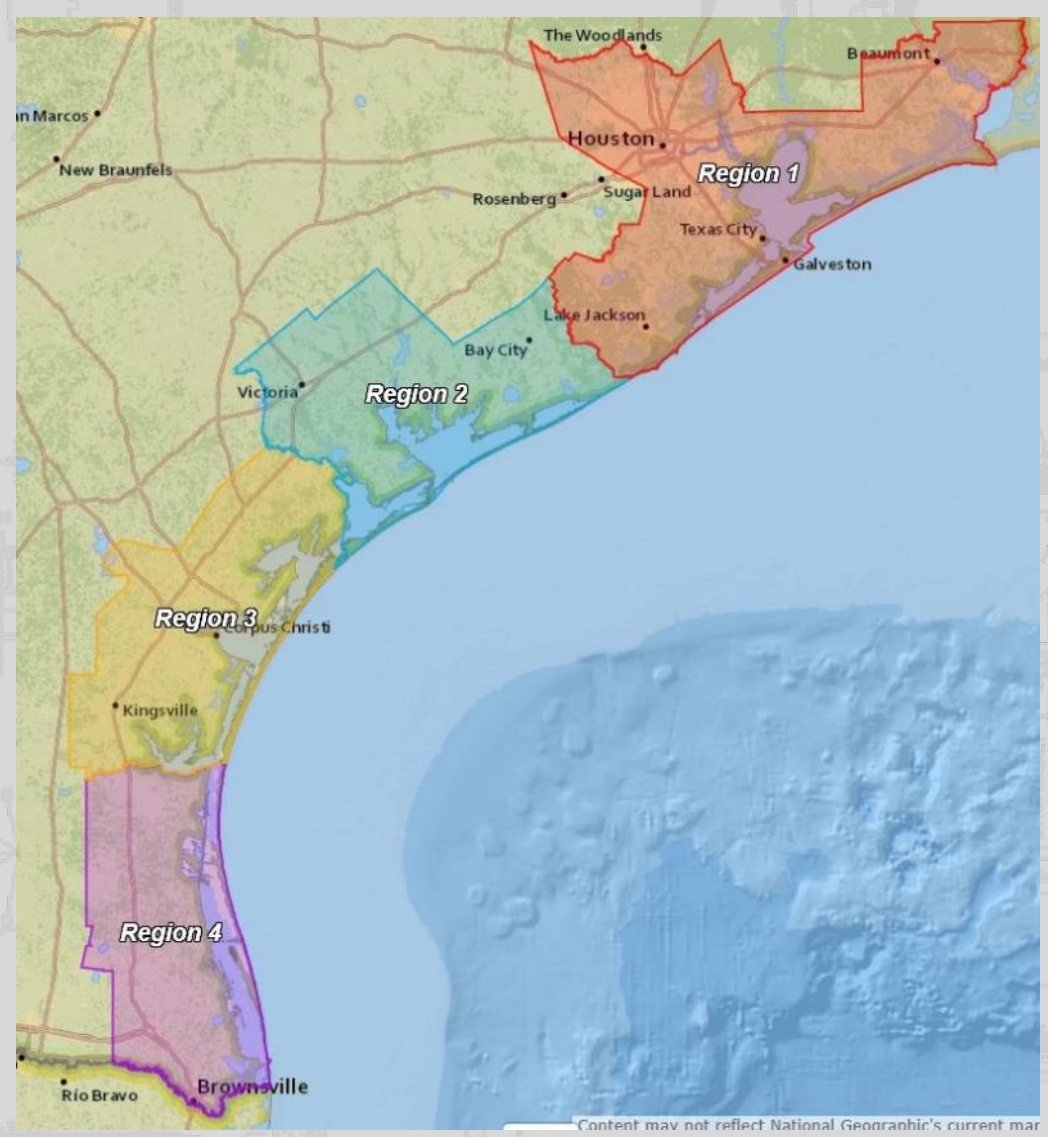
Constraints



- 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

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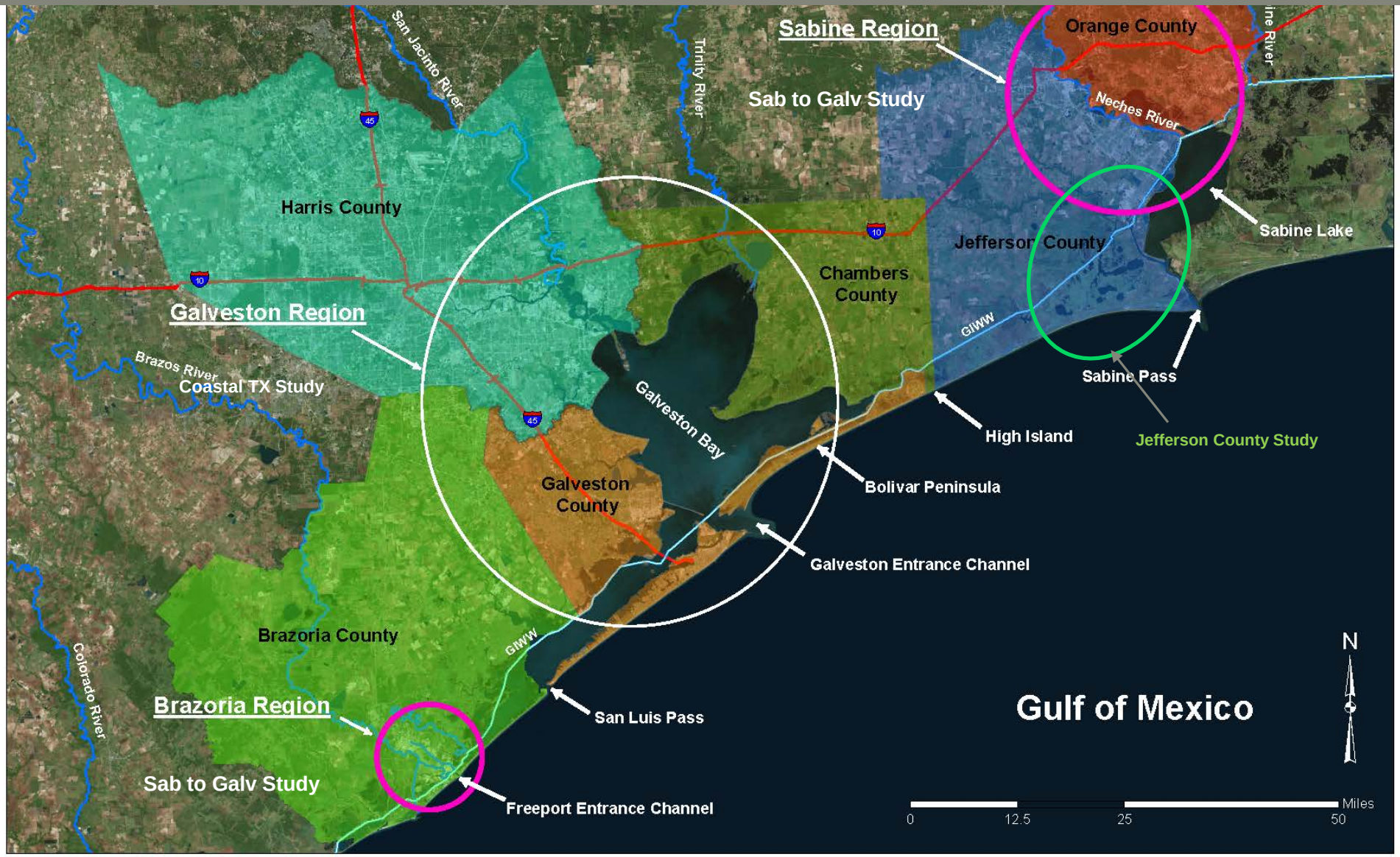
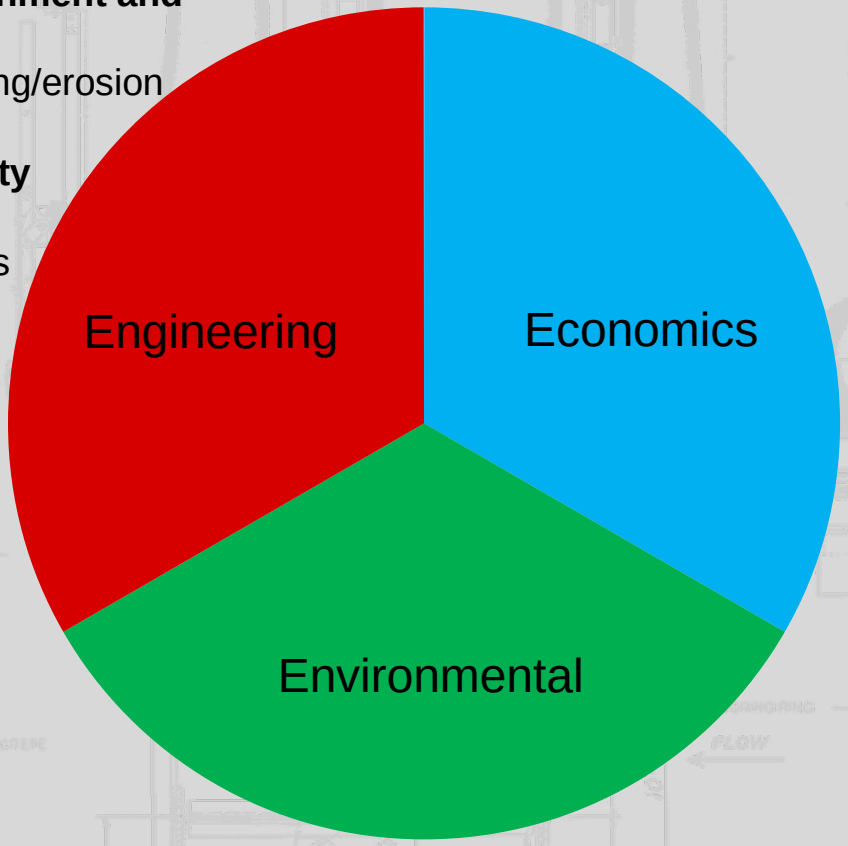
Other CSRM/ER Studies in Region 1



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

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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

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Region 1 Alternatives

	Formulation strategies
• Alternative A - Coastal Barrier/Nonstructural System	• Multiple lines of Defense (MLOD) • Navigation Impacts • Resiliency • Focus on Significant Resources
• Alternative B – Coastal Barrier	• Multiple lines of Defense (MLOD) • Navigation Impacts • Resiliency • Focus on Significant Resources
• Alternative C – Mid Bay Barrier	• Navigation Impacts • Resiliency • Focus on Significant Resources
• Alternative D – Upper Bay Barrier/ Nonstructural System	• Navigation Impacts • Focus on Significant Resources

All alternatives would also look at maximizing Ecosystem Restoration (ER) Benefits

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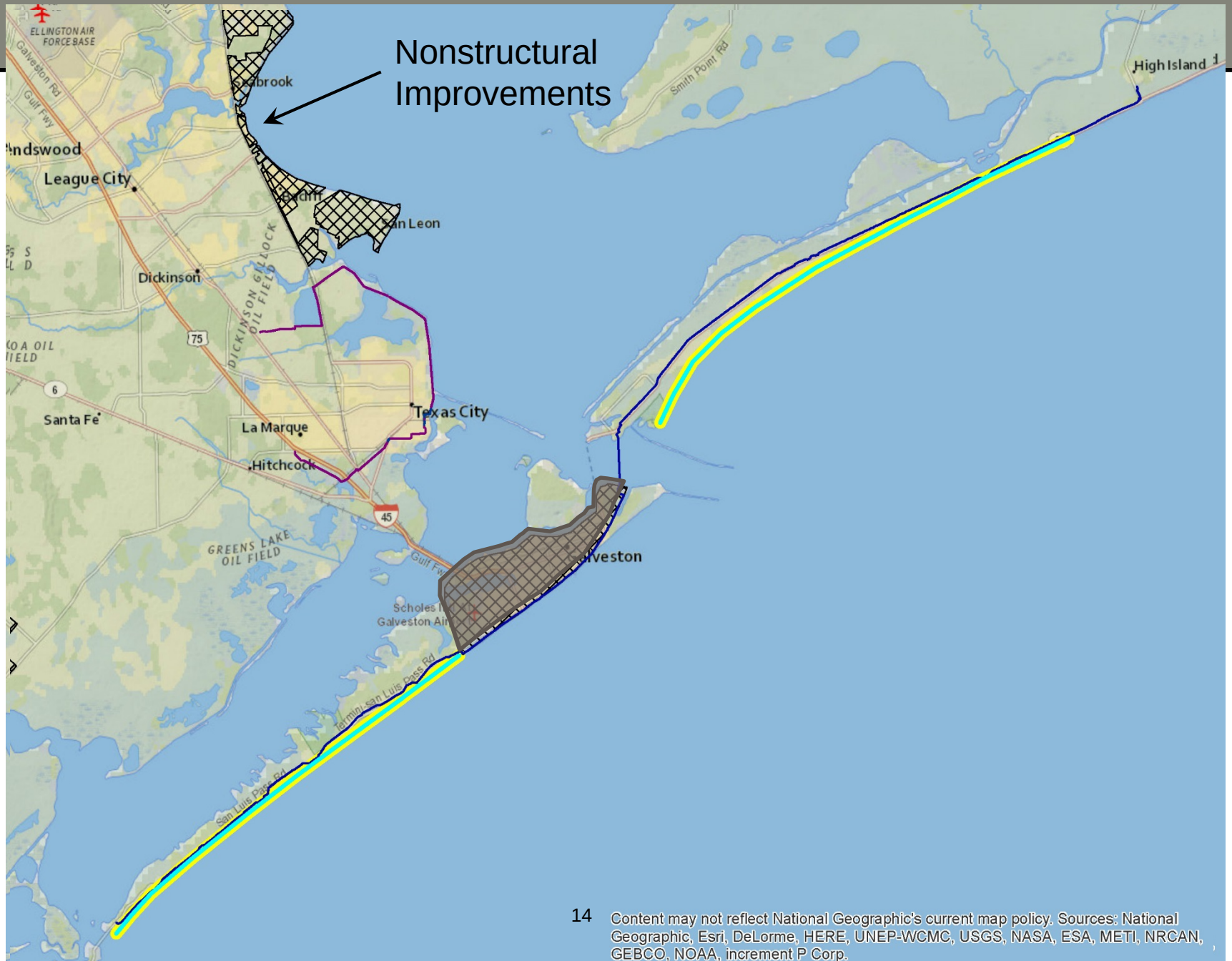
PLANNING EXAMPLE REGION 1: ALTERNATIVE A - COASTAL BARRIER/NONSTRUCTURAL SYSTEM



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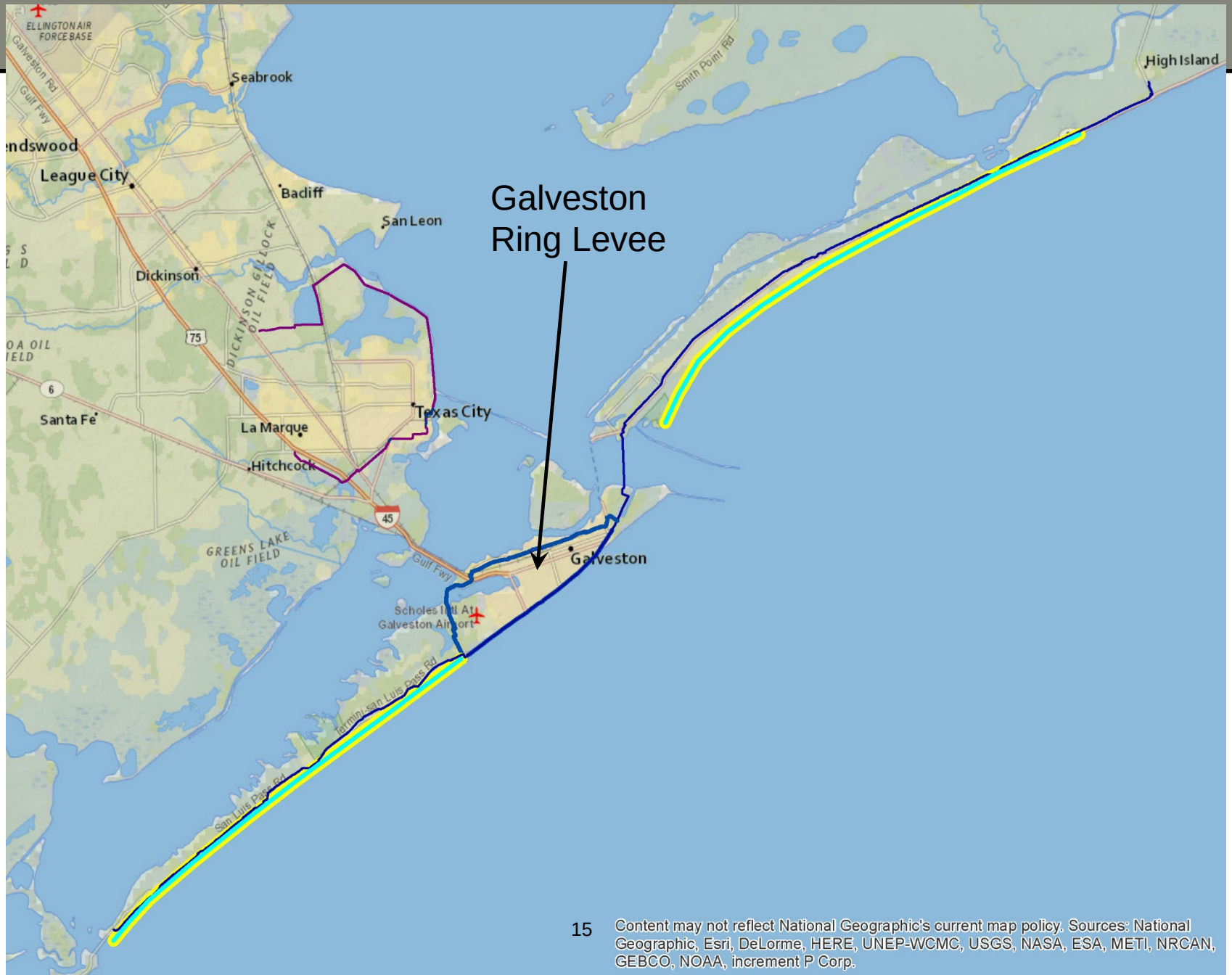
PLANNING EXAMPLE REGION 1: ALTERNATIVE B - COASTAL BARRIER



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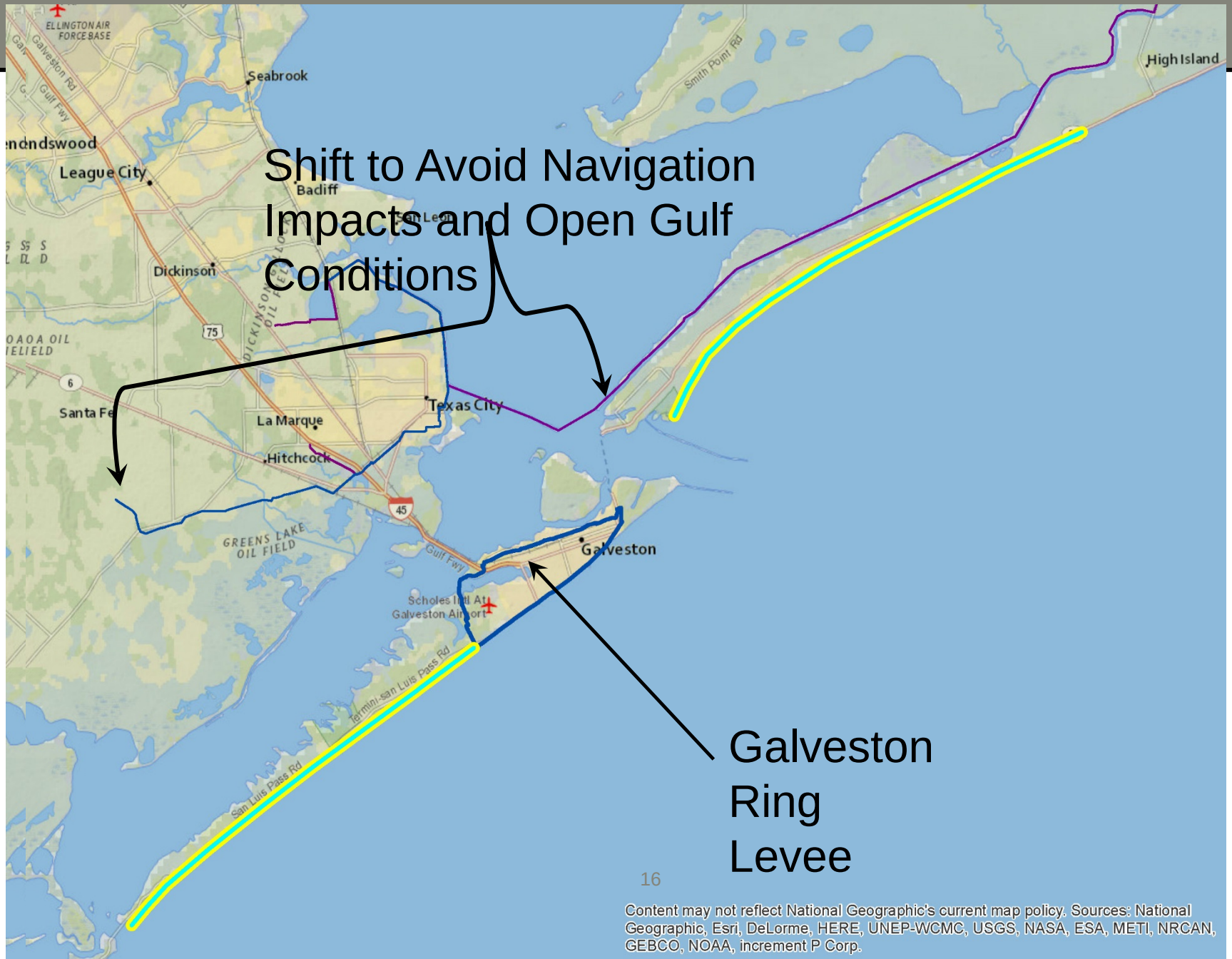
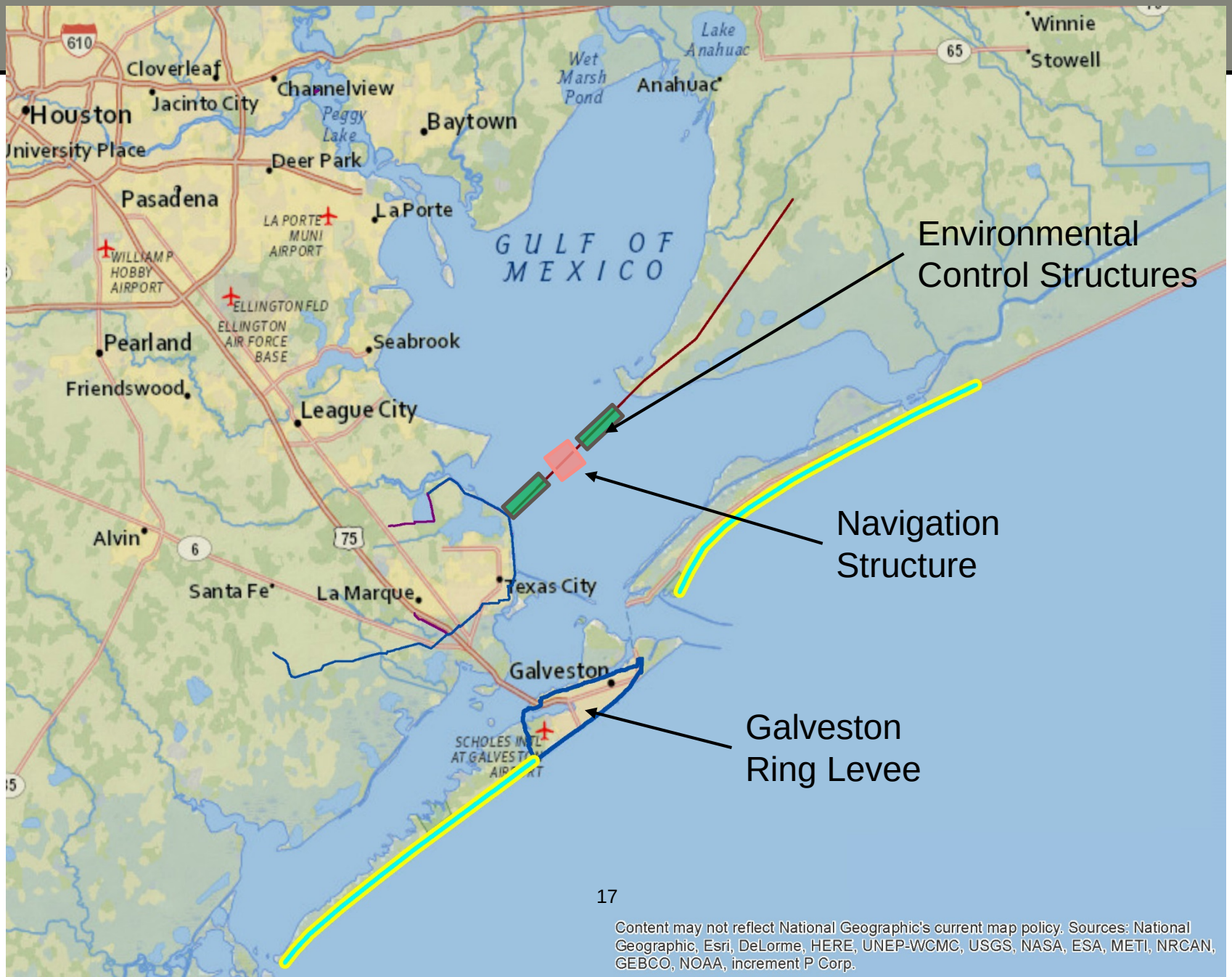
ALTERNATIVE B - COASTAL BARRIER (ENG. WORKSHOP DISCUSSIONS)



PLANNING EXAMPLE REGION 1: ALTERNATIVE C – MID BAY



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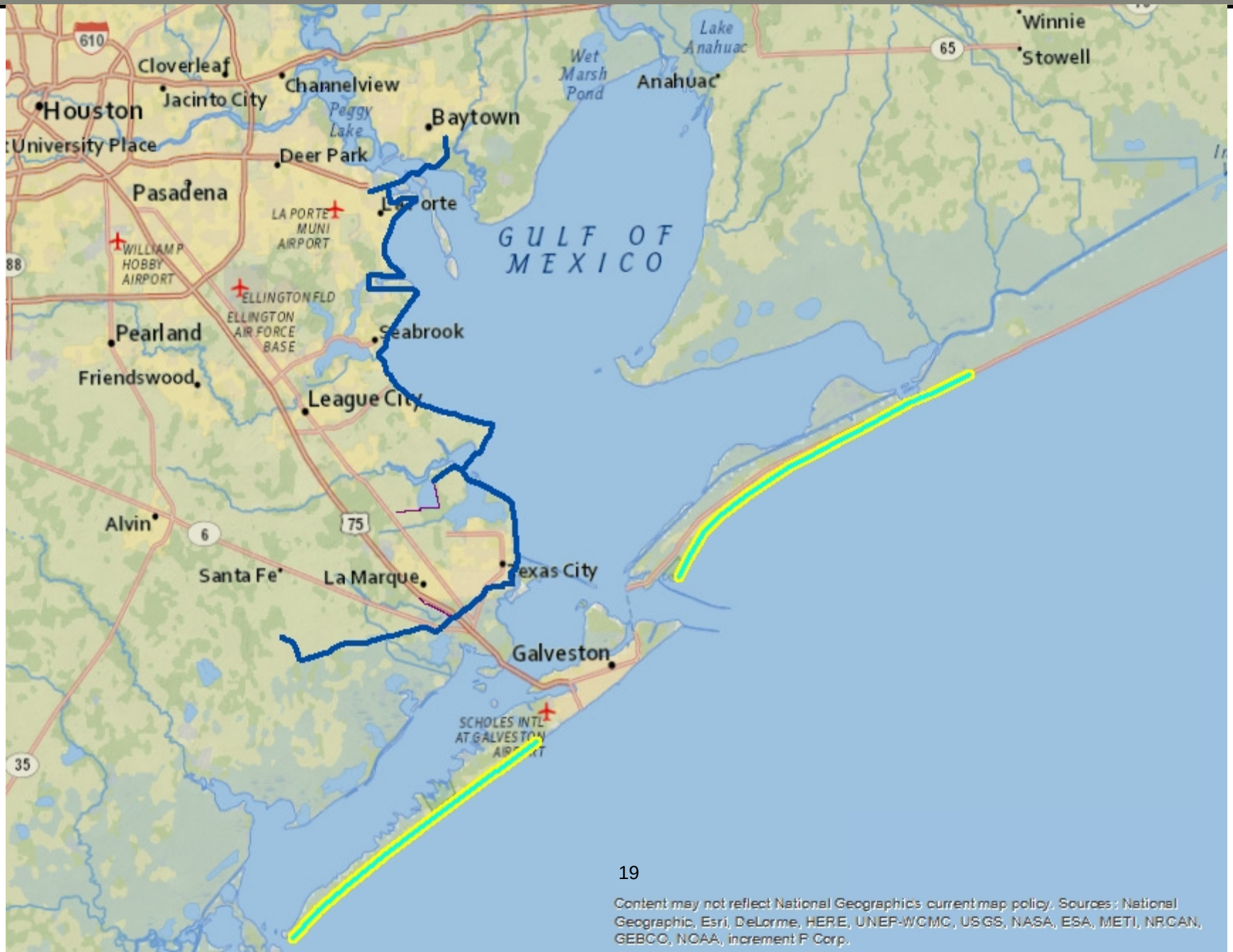
PLANNING EXAMPLE REGION 1: ALTERNATIVE D UPPER BAY BARRIER/ NONSTRUCTURAL SYSTEM

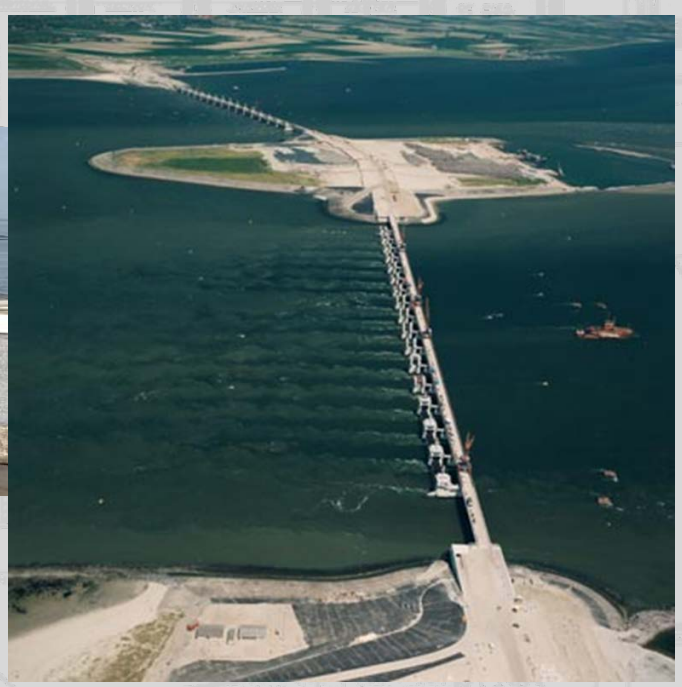
PLANNING EXAMPLE REGION 1: ALTERNATIVE D - OPTIONS REVIEWED BASED ON GCCPRD COMMENTS

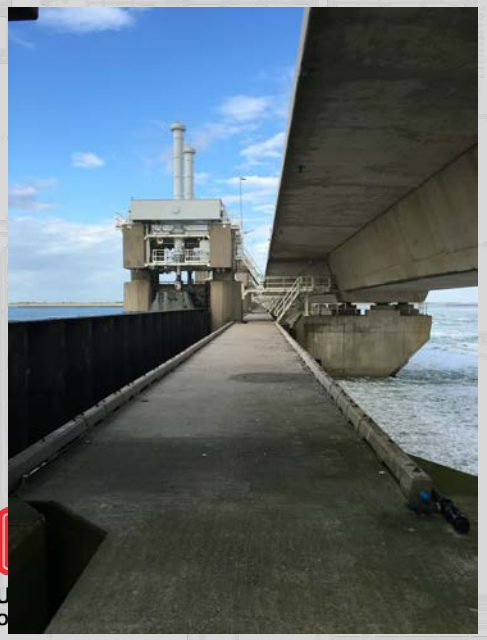


Potential Barrier Designs

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

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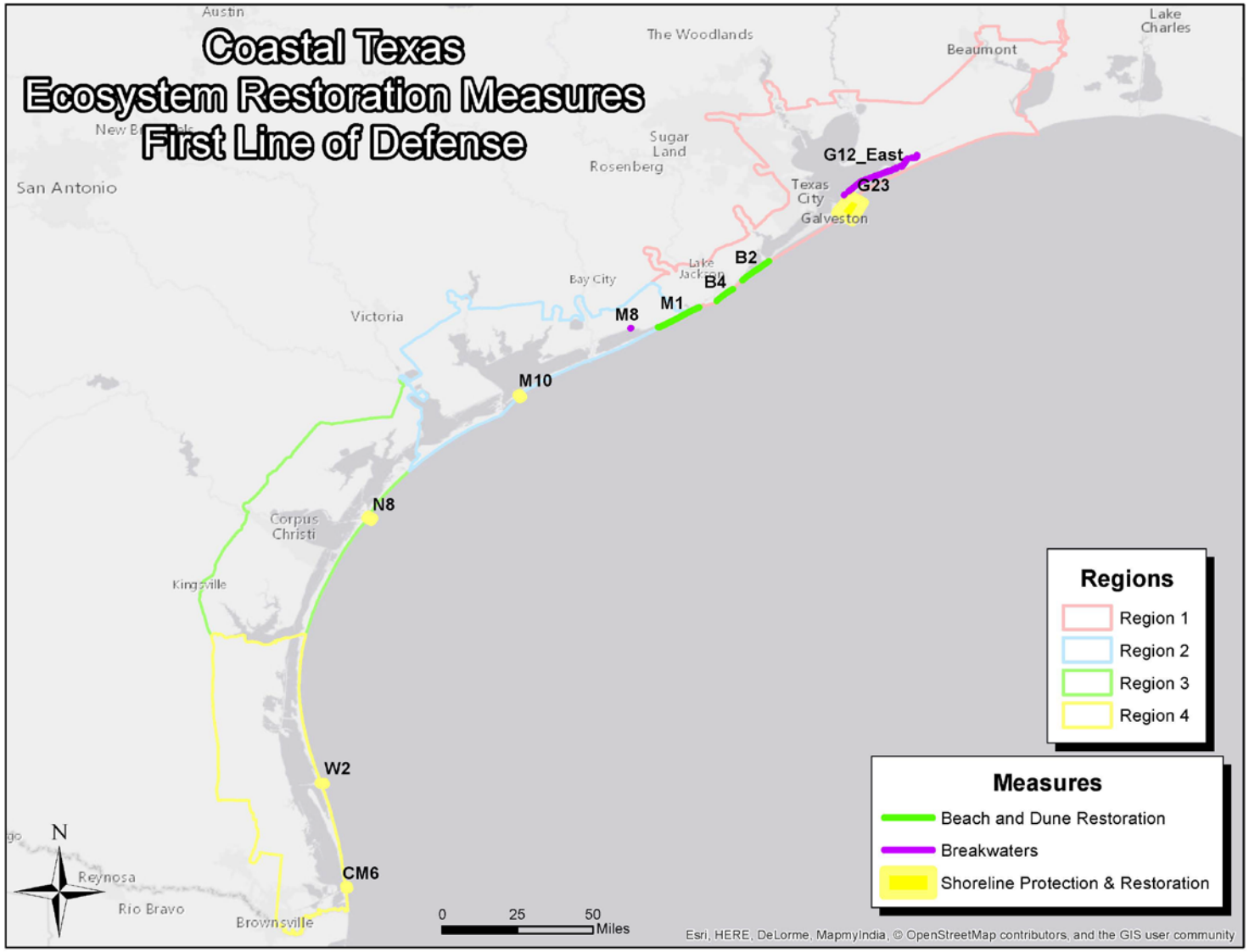
Coastal TX – First Line of Defense Map



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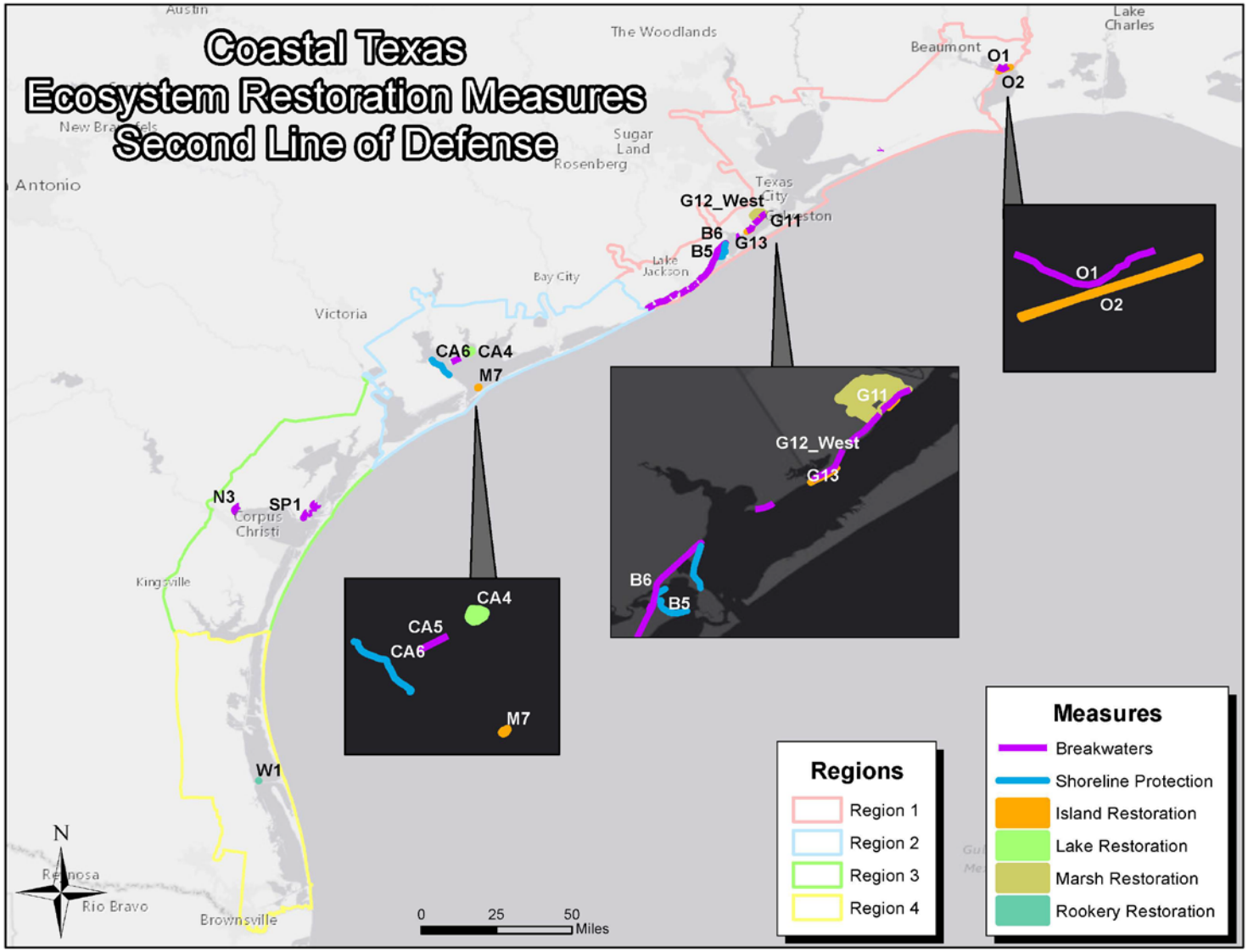
Coastal TX – Second Line of Defense Map



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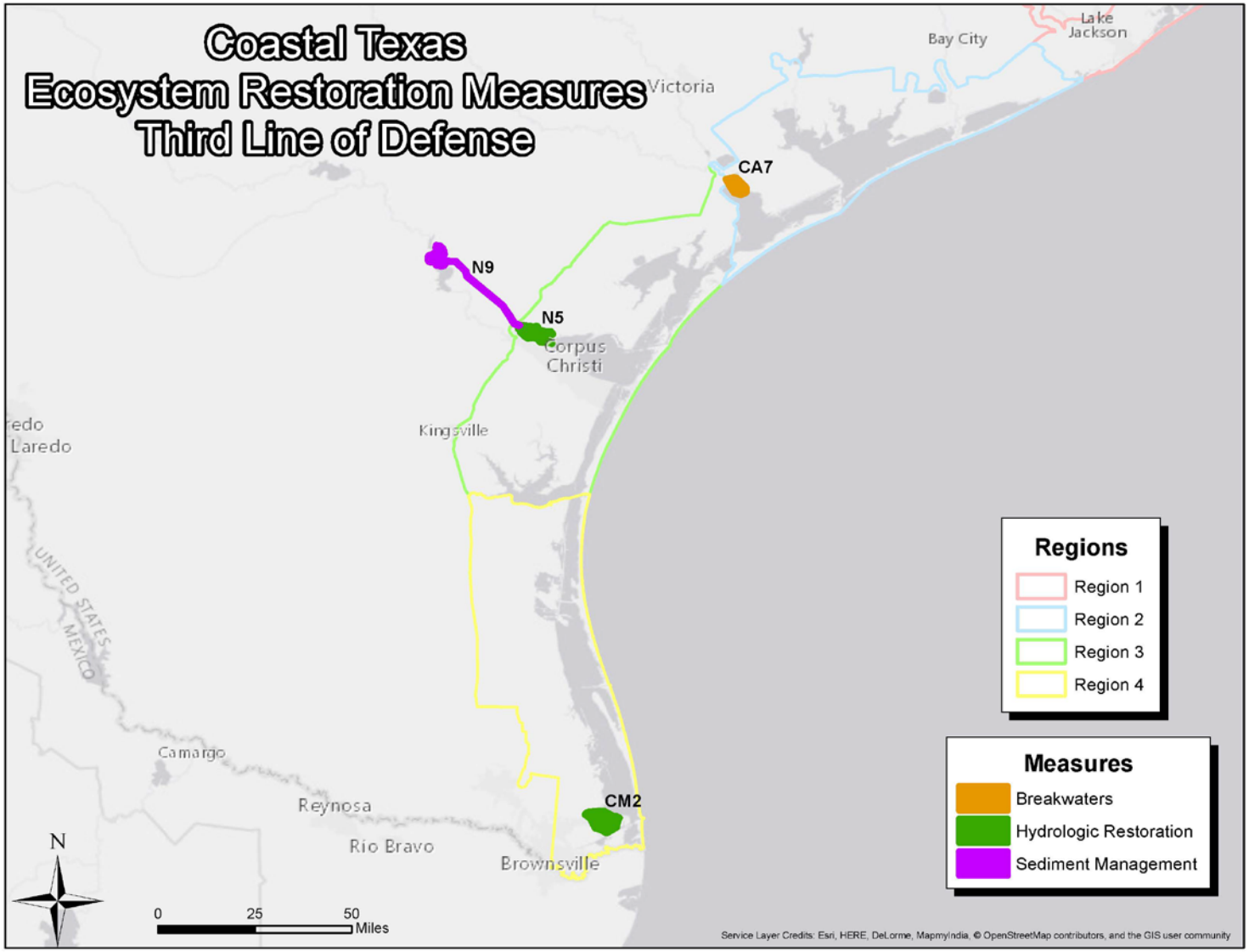
Coastal TX – Third Line of Defense Map



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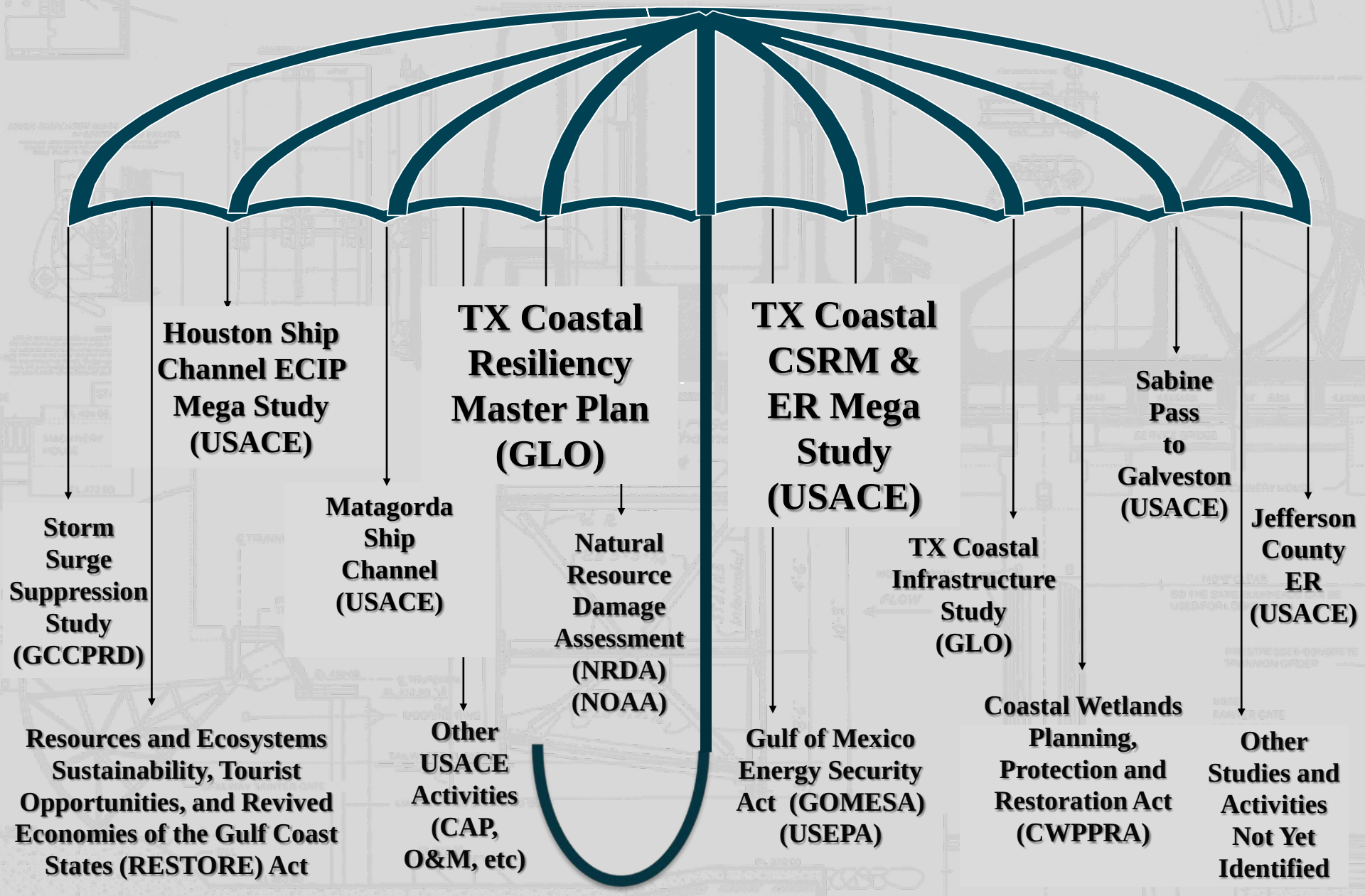
Comprehensive Plan: Overarching Vision



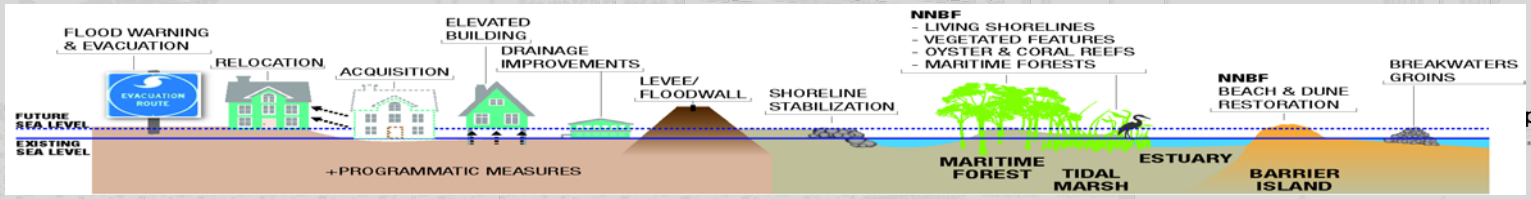
Comprehensive Plan:

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

- 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		Date
Scoping	Exemption Approval by Senior Leaders	Sep 2015
	Exemption Approval by ASA(CW)/OMB	Nov 2015
	Execute FCSA with GLO	Nov 2015
Alternative Evaluation and Analysis	Alternatives Milestone	June 2016
	Tentatively Selected Plan (TSP) Milestone	May 2018
Feasibility Level Analysis	Agency Decision Milestone (ADM)	Oct 2018
	Feasibility Report Complete	Oct 2020
	Civil Works Review Board (CWRB)	Jan 2021
	S&A Review	Feb 2021
	Chief's Report	Apr 2021

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

* USACE FY is 1 Oct thru 30 Sept
** Includes $400,000 for Independent External Peer Review (IEPR)
*** Includes cash and Work-In-Kind (WIK)

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

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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

Scoping → **Alternatives Formulation** → **Draft Report** → **Recommend Plan** → **Final Report**

Collect Public Input

Public Review and Comment

Locally Preferred Plan Input

Recommendation to Congress

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Project Process

The Corps process generates an executable project that is authorized by Congress and can compete for federal funding for construction and maintenance

Congressional Study Authorization "New Start"

Congressional Project Authorization

STUDY → DESIGN → BUILD → MAINTAIN

Local or State Cost Sharing Sponsor

$ Congressional Appropriations $

USACE receives funding on an annual budget cycle (OCT-SEP)

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Collaboration With Others

Questions

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