

The Texas Coastal Resiliency Master Plan



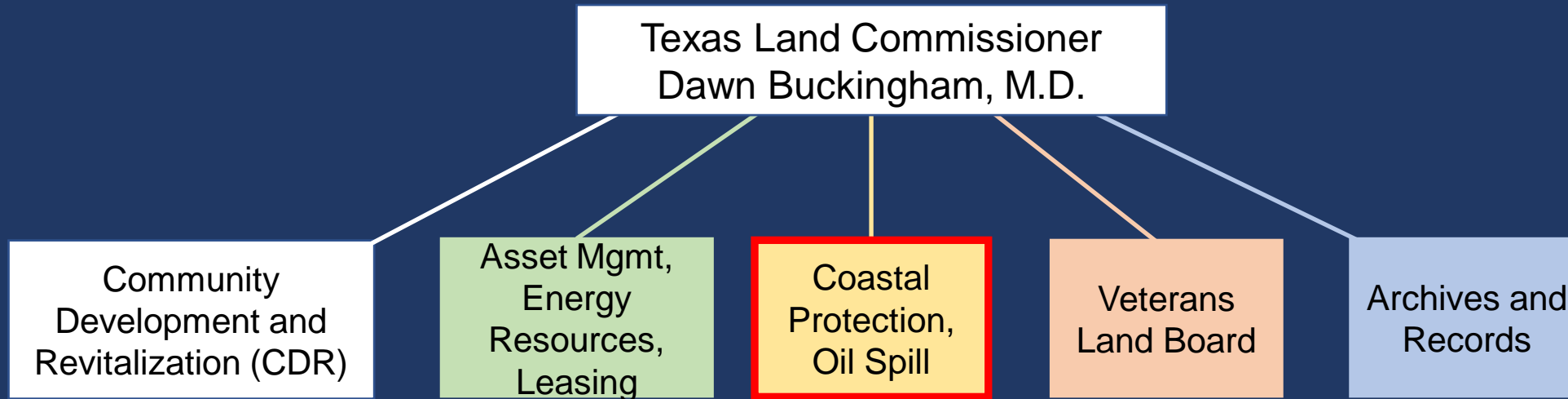
Lavaca Bay Foundation Monthly Meeting
June 20, 2024
Port Lavaca, TX

Joshua Oyer,
Coastal Resiliency Program Manager

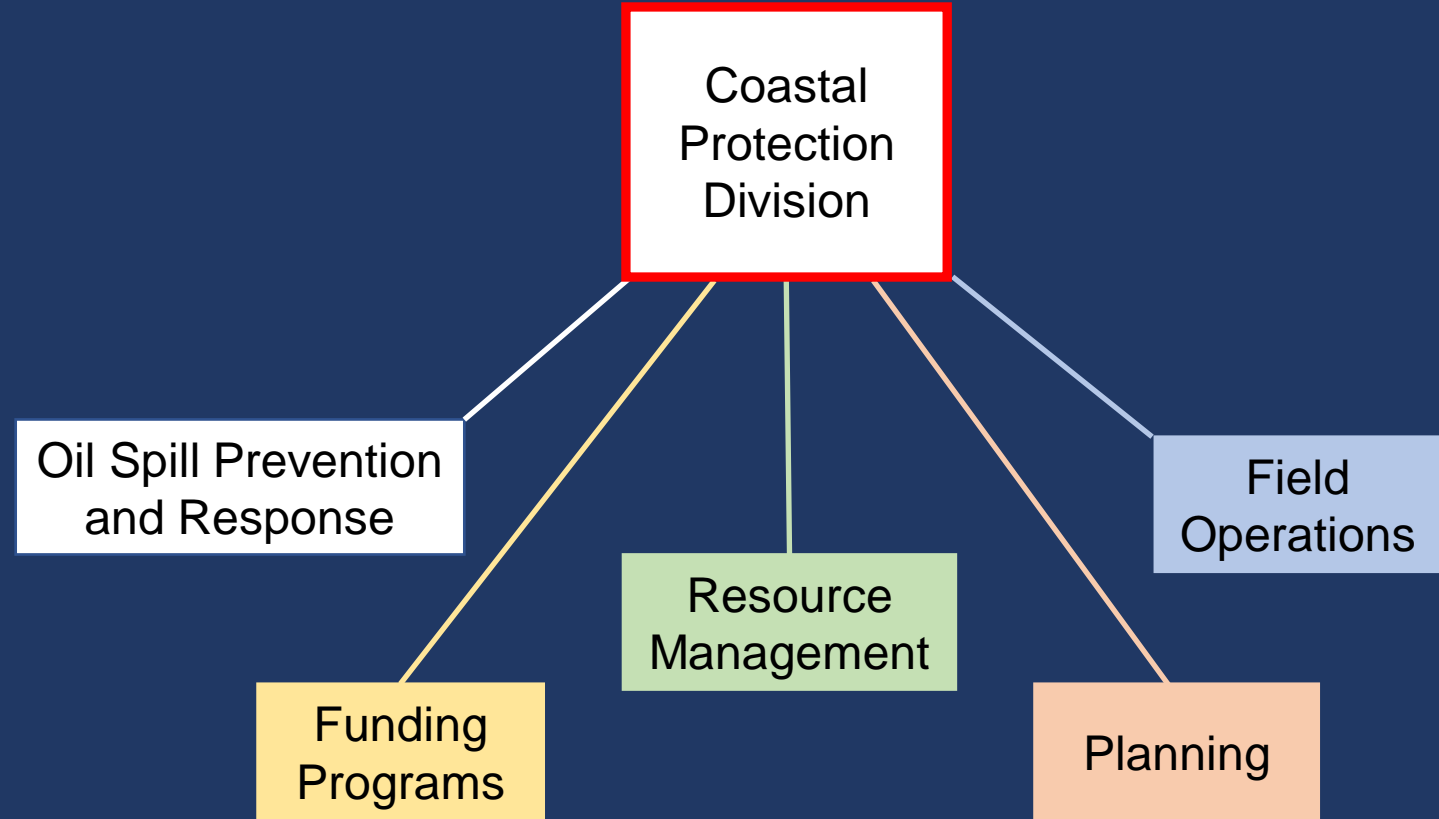
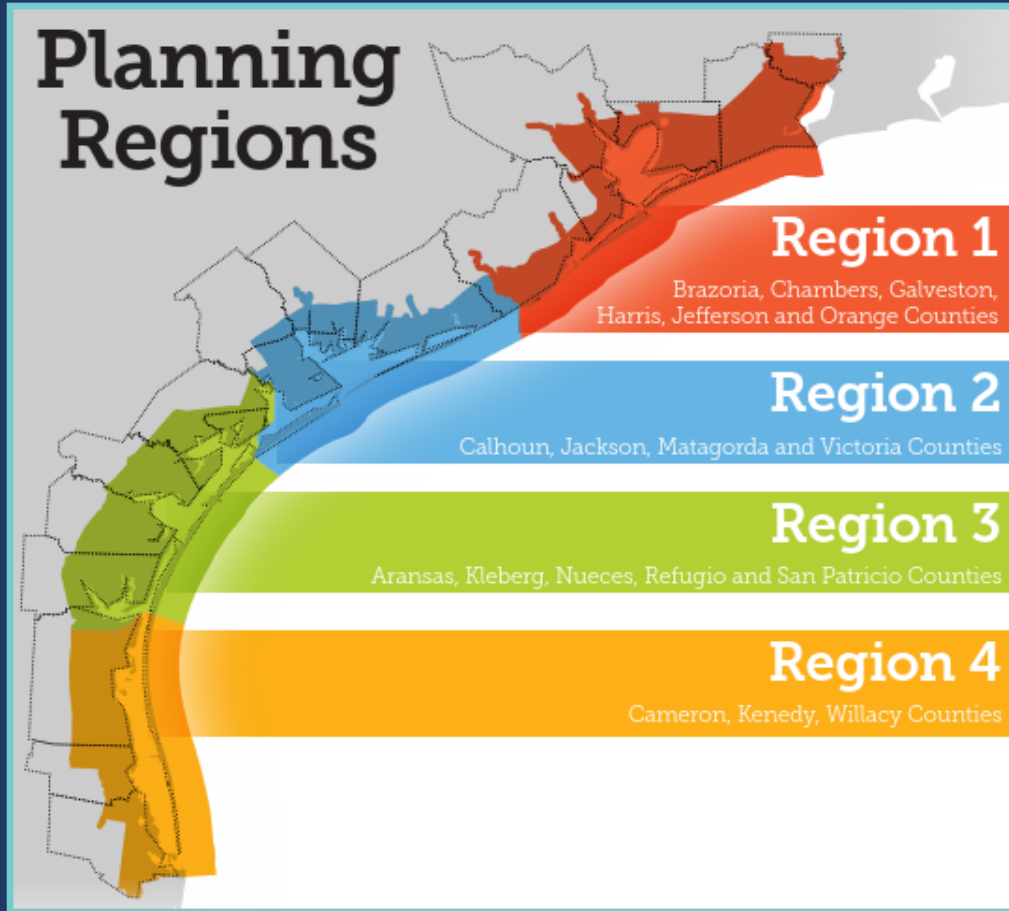
Texas General Land Office

Agency Mission

The Texas General Land Office primarily serves the schoolchildren, veterans, and the environment of Texas. The agency does so by preserving our history, maximizing state revenue through innovative administration, and through the prudent stewardship of state lands and natural resources.



GLO Coastal Protection



Need for a Plan

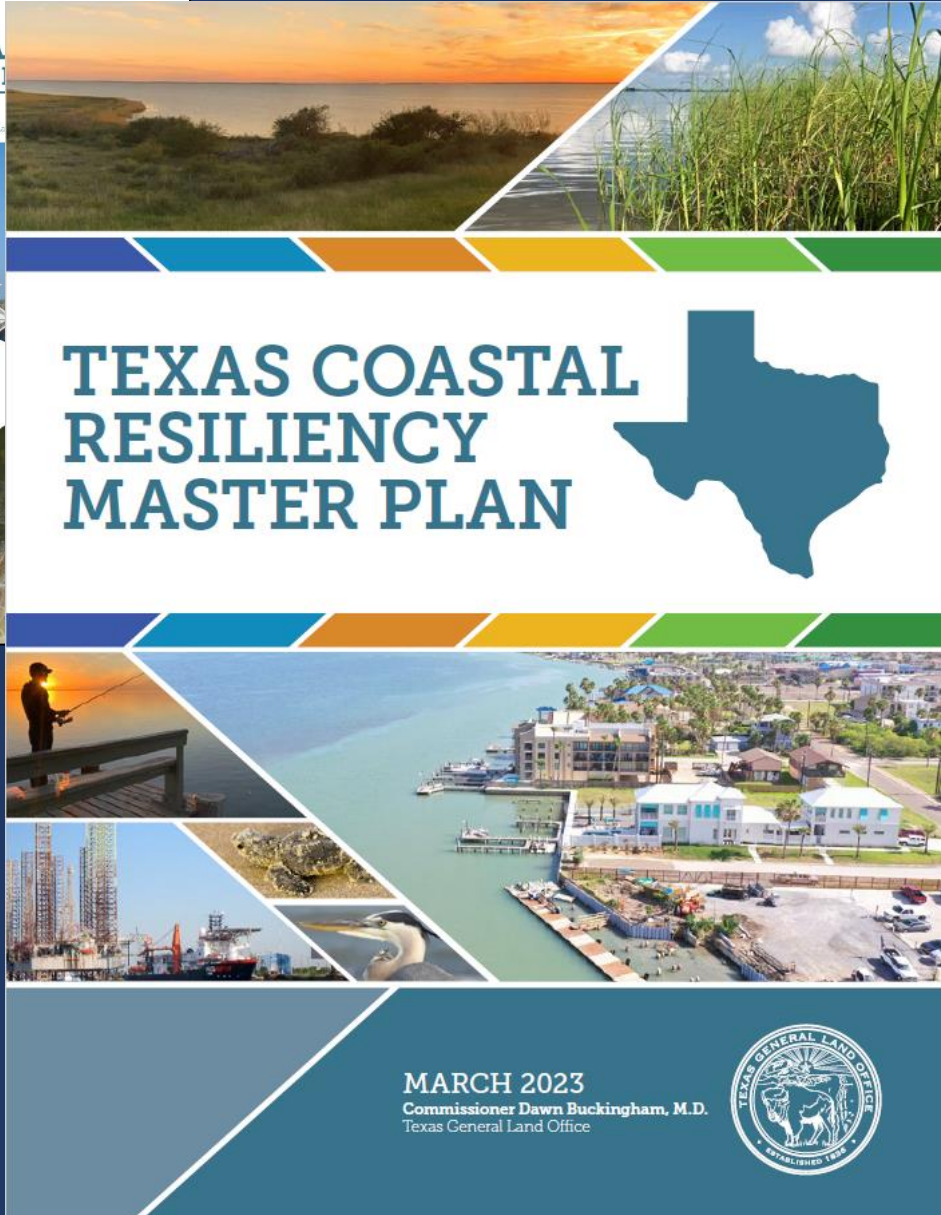
- Texas has 367 miles of Gulf beach shoreline (6th) and 3,359 miles of total shoreline (7th)
- The Bad News – Disasters
 - 2008 Hurricane Ike
 - 2010 Deepwater Horizon BP Oil Spill
 - 2017 Hurricane Harvey
 - 2020 Season (most named storms record of 30)
- The Good News – Funding
 - Help prioritize internal GLO funding decisions
 - Help inform external funding partners
 - Hotel Occupancy Tax to address coastal erosion
 - GOMESA



Bolivar Peninsula after Hurricane Ike

source: NWS





Goals and Objectives

1. Identify, select, and fund projects that address the coastal vulnerabilities to restore, enhance, and protect the Texas coast
2. Adapt priorities to accommodate changing conditions through future iterations
3. Communicate the environmental and economic value of the Texas coast to state and national audiences



Role of this Plan

What this Plan is

- A list of high-priority coastal resiliency initiatives and projects
- A snapshot of the needs of the state for coastal resiliency at the time of publication
- An opportunity for the GLO to align coastal resiliency priorities with feedback from stakeholders, coastal experts, and other public agencies

What this Plan is NOT

- An automatic funding mechanism
 - * *Tier 1 projects are typically prioritized for GLO funding programs*
- A guarantee that projects will be funded or completed
- A completely comprehensive list of the coastal resiliency projects that are necessary coastwide



Concurrent State and Federal Efforts on the Texas Coast



LEGEND

**TEXAS
COASTAL
RESILIENCY
MASTER PLAN**

Led by GLO



Led by USACE



Complementary Planning

Coastal Texas Project

- Galveston Bay Storm Surge Barrier System
- South Padre Island Beach Project
- Coastwide Ecosystem Restoration (8 projects)

Regional Flood Planning

- GLO River Basin Flood Studies
- TWDB Regional Flood Planning Groups

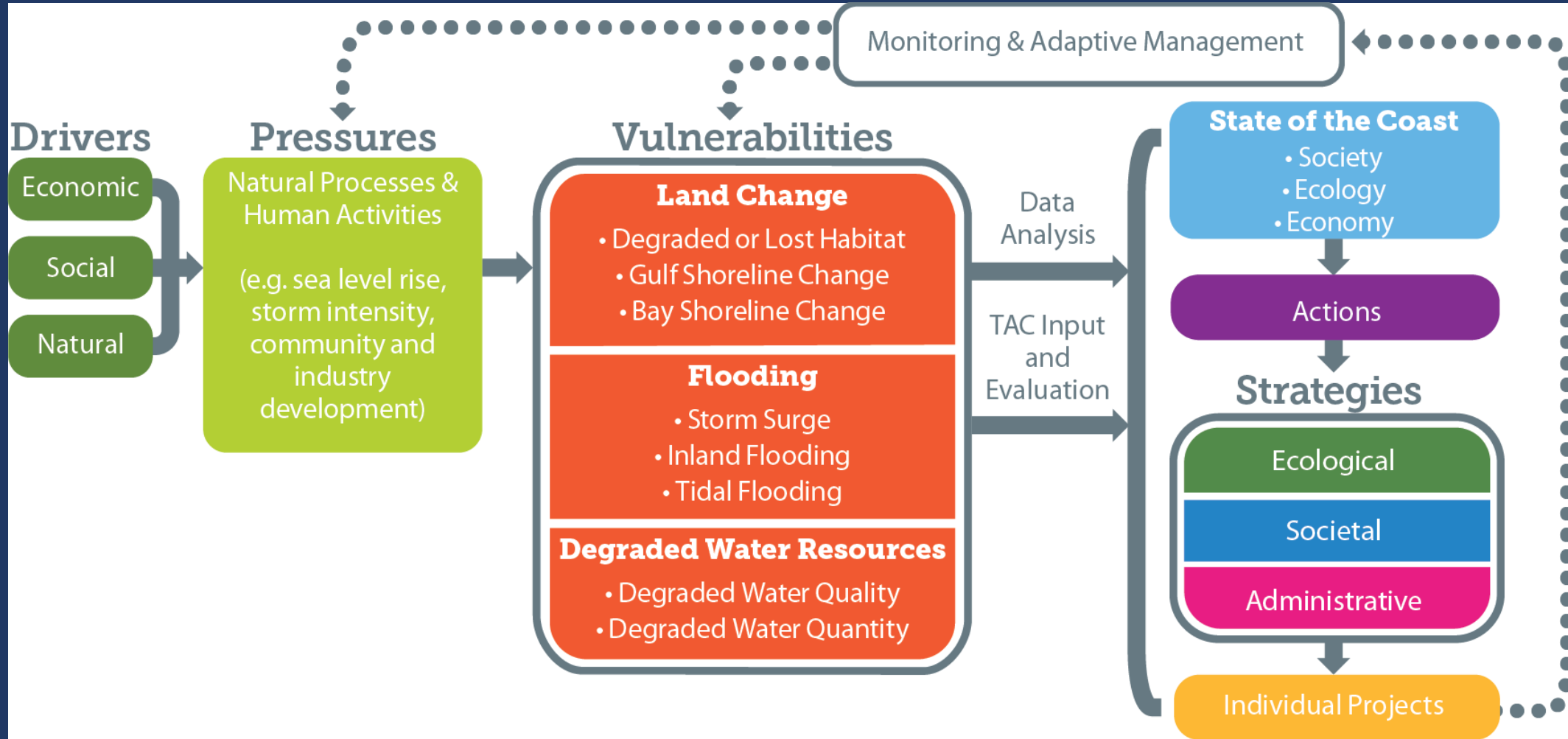
Restoration Planning

- NRDA
- RESTORE
- NFWF

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Coastal Resiliency Framework



Vulnerabilities

Planning Regions



Land Change



Degraded or Lost
Habitat



Gulf Shoreline
Change



Bay Shoreline
Change

Flooding



Inland Flooding



Storm Surge



Tidal Flooding

Degraded Water Resources



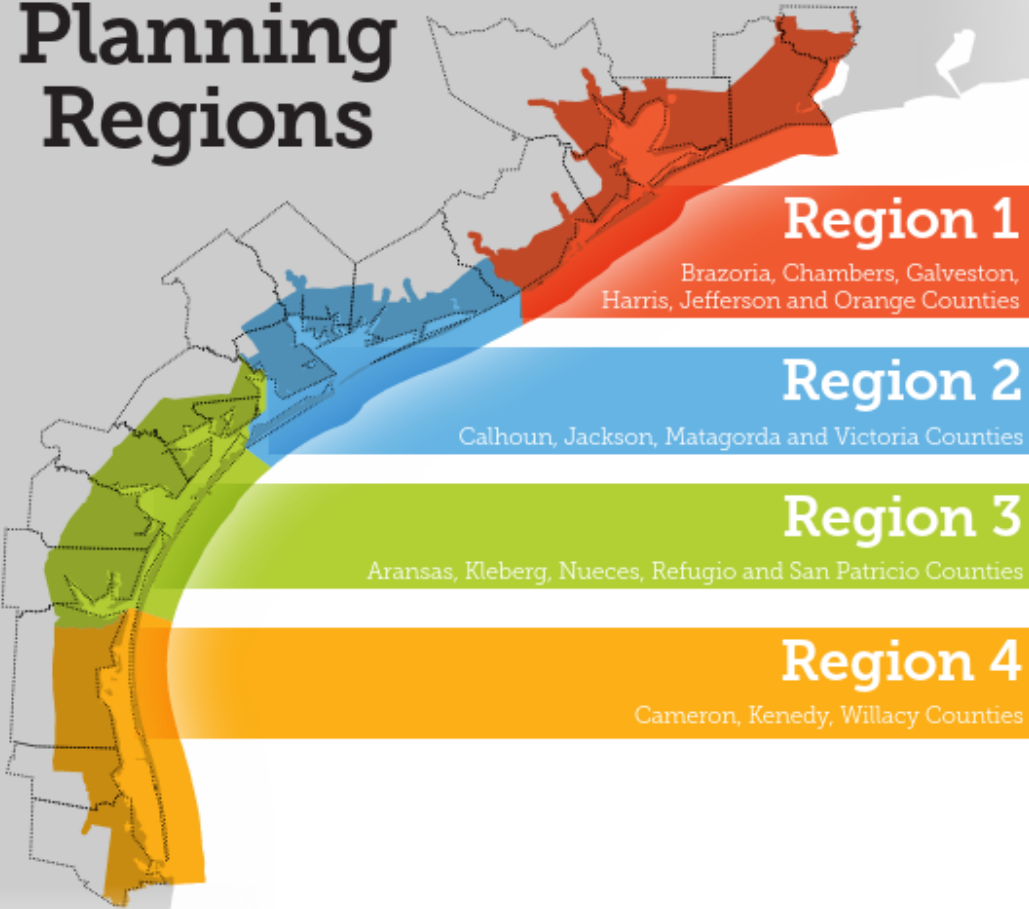
Degraded Water
Quality



Degraded Water
Quantity

Stakeholder Input

Planning Regions



Technical Advisory Committee (TAC)



Local Governments and Community Leaders

- Elected officials
- Local government staff
- Councils of government (COGs)
- Metropolitan Planning Organizations (MPOs)
- Other local and regional community leaders



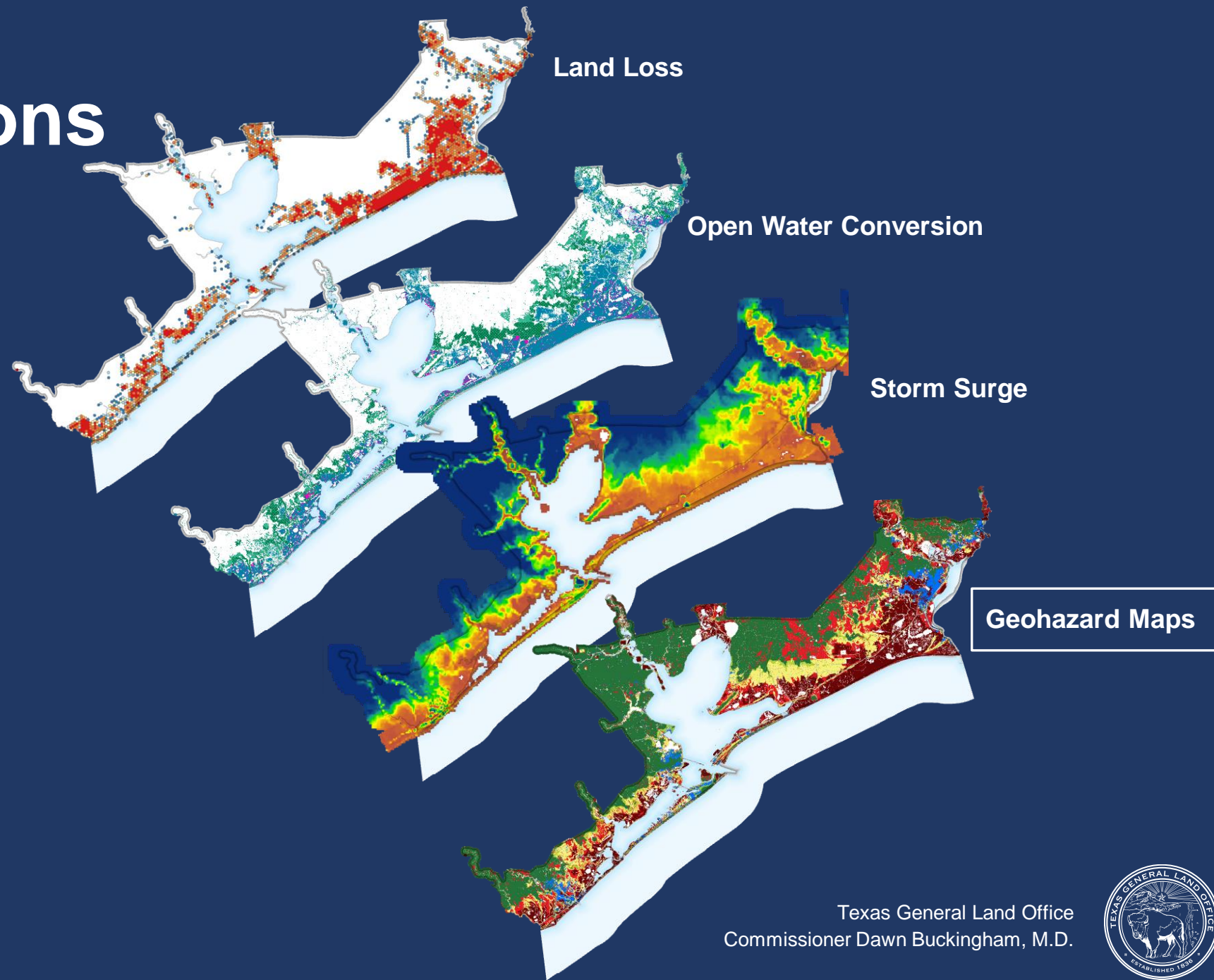
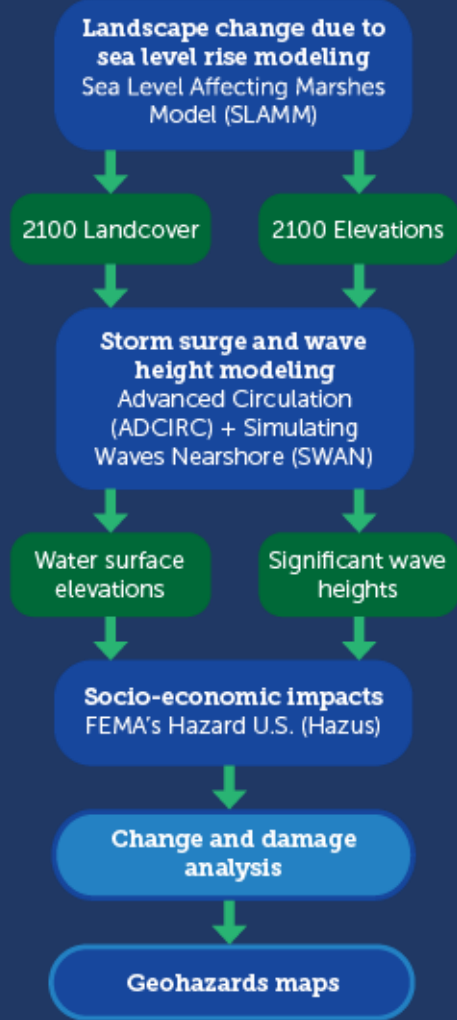
Coastal Experts and Practitioners

- State agencies
- Federal agencies
- Universities
- Ports and navigation districts
- River authorities
- Non-profits
- Other technical partners



Modeling Future Conditions

MODELING FRAMEWORK

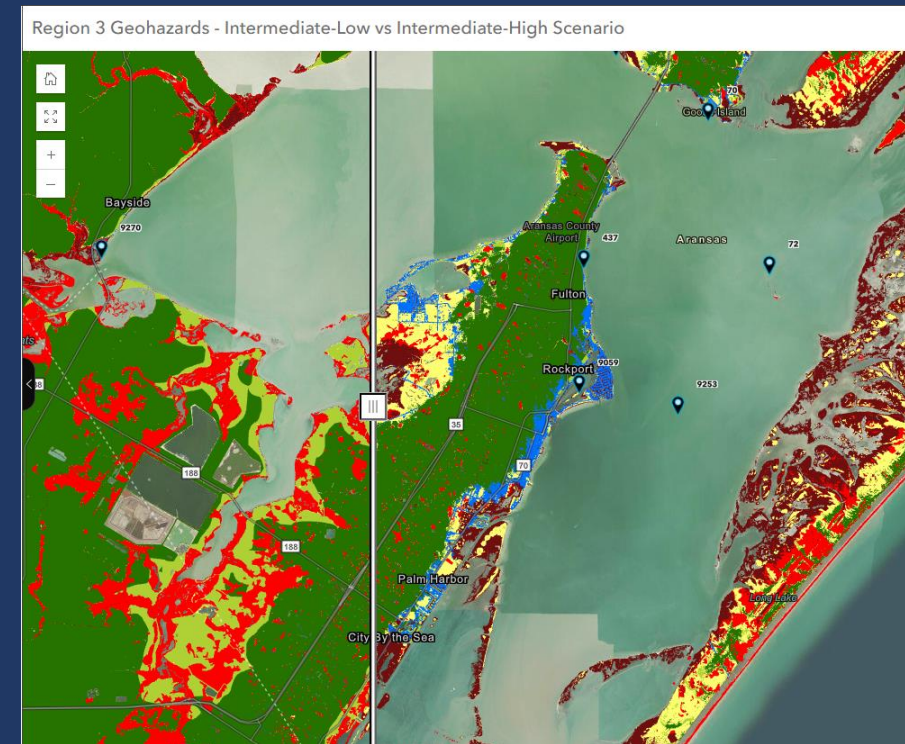
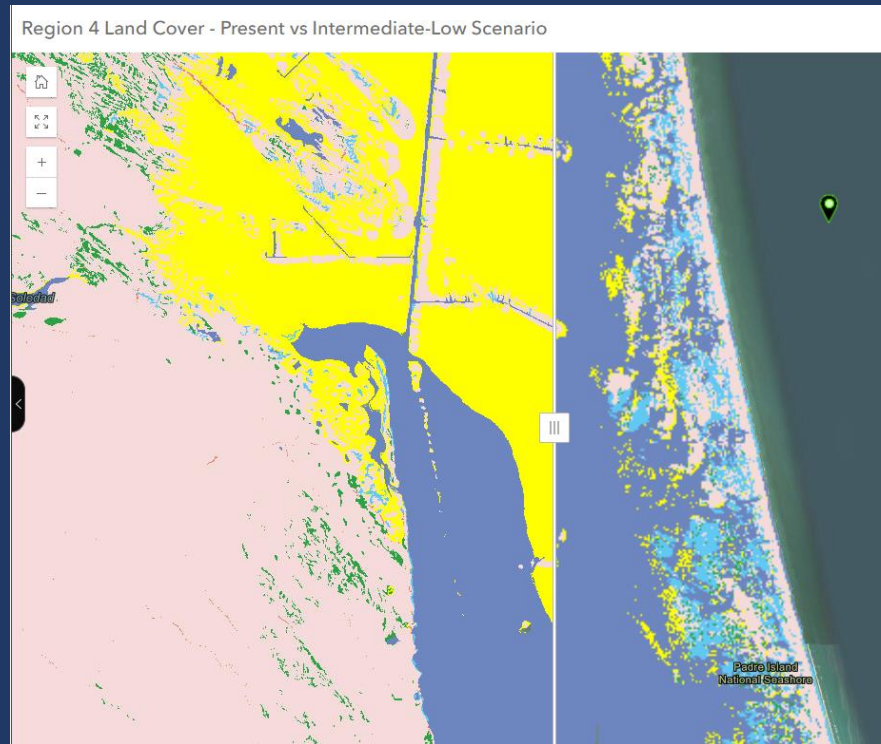
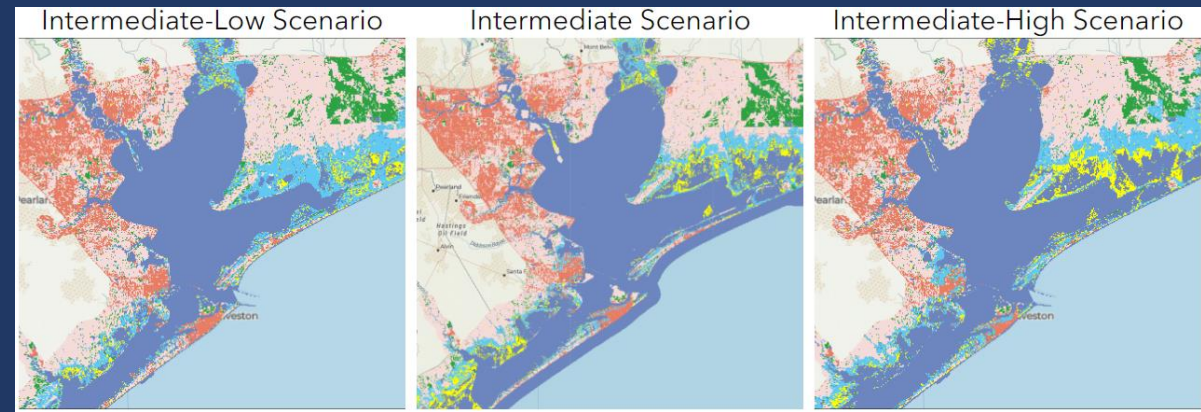


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Modeling Data Viewer

- Choose SLR scenario
- Search by location
- Compare slide bar
- Landscape type
- Storm surge
- Geohazards
- Downloads tab
- Tier 1 projects



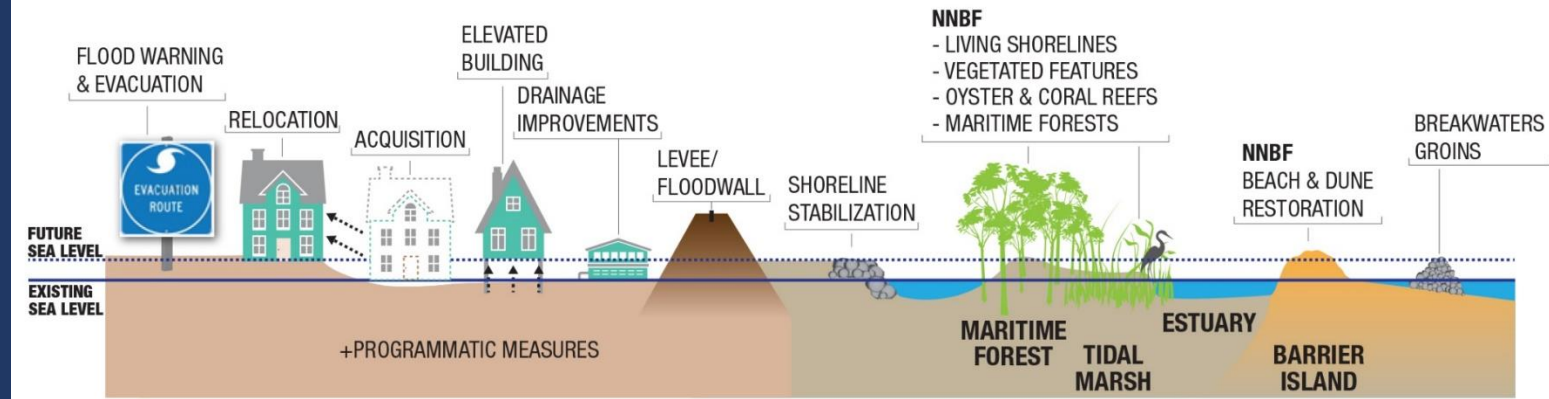
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Project Types

Project Type	Project Subtypes
Nature-Based	Hydrologic Connectivity <ul style="list-style-type: none"> Freshwater Inflow Hydrologic Restoration
	Habitat Creation & Restoration <ul style="list-style-type: none"> Estuarine Wetlands Freshwater Wetlands Oyster Reef Barrier Islands Coastal Uplands Coastal Prairies Rookery Islands Dredge Placement Islands Seagrasses Tidal Flats Fisheries
	Beach Nourishment <ul style="list-style-type: none"> Bay Gulf
	Dune Restoration <ul style="list-style-type: none"> Dune
	Shoreline Stabilization <ul style="list-style-type: none"> Living Shoreline Breakwater Misc. Wave Break Seawall Bulkhead Revetment Jetty Groin
Infrastructure-Based	Land Acquisitions <ul style="list-style-type: none"> Acquisitions Conservation Easements Fee Simple
	Structure/Debris Removal <ul style="list-style-type: none"> Structures on Public Easement Abandoned Oil and Gas Wells Abandoned Boats Dock Pilings Post Storm Cleanup
	Public Access & Improvements <ul style="list-style-type: none"> ADA Accessibility Walkovers Piers, Boat Ramps
	Flood Risk Reduction <ul style="list-style-type: none"> Levees Flood Wall Storm Surge Barrier
	Community Infrastructure <ul style="list-style-type: none"> Drainage Utilities Roadway/Bridge Repair Roadway/Bridge Elevation Critical Facilities Structure Raising
	Plans, Policies, Programs & Studies



source: USACE

Shoreline Stabilization	27%
Habitat Restoration	17%
Programmatic	16%
Land Acquisitions	10%
Rookery Islands	9%
Beach Nourishment	9%
Oyster Reef	5%
Hydrologic Connectivity	5%
Community Infrastructure	2%

2023 Tier 1 Projects

Project Information

- Ability to Address Vulnerabilities
- Description and Need
- Location
- Status
- Stakeholders
- Actions
- Project Types
- Potential Local Benefits


Project CutsheetsRegion 4Cameron County


South Padre Island Beach and Dune Management and Restoration (145)

Estimated Project Cost: \$89,000,000

ABILITY TO ADDRESS VULNERABILITIES

Land ChangeFloodingDegraded Water Resources





LAGUNA NARCISCA NATIONAL WILDLIFE REFUGE

Project Description

The City of South Padre Island's beach and dune system is a widely recognized symbol of the South Texas coastline and has been partially preserved through the beneficial use of dredged material (BUDM) from the Brownsville Ship Channel since 1988 under a perpetual Memorandum of Agreement between the U.S. Army Corps of Engineers (USACE) Galveston District and the Texas General Land Office (GLO). This project would fund annual beach renourishment along the eroding shoreline. Additionally, annual beach monitoring surveying, analysis, and reporting are undertaken as part of the project. Whenever possible, the City of South Padre Island, as the permit holder, and Cameron County work alongside GLO and USACE to place BUDM on beaches when regular dredging at the channel occurs. The most recent onshore placement of material took place from May to July 2021 and included approximately 355,250 cubic yards. Three-quarters of the material (75%) was placed in Placement Area 5 within the northern City limits and one-quarter (25%) of the material was placed in Isla Blanca Park.

Project Need

Gulf shoreline erosion occurs across the island at a regional scale, impacting County and City beaches, leading to potential damage to the environment, private property, and public infrastructure while hindering economic development. The Gulf shoreline erosion rate along much of the island averages between 10 to 15 ft/yr. The beaches and dunes are the primary defense against storm surge from tropical storms and hurricanes to islanders and bayfront communities on the mainland.


LOCATION:
Gulf shoreline of the City of South Padre Island

STATUS:
Shovel Ready

STAKEHOLDERS:

- City of South Padre Island
- Cameron County
- Texas General Land Office
- U.S. Army Corps of Engineers

ACTIONS:



PROJECT TYPE(S):
Beach Nourishment;
Dune Restoration

POTENTIAL LOCAL BENEFITS

160 Homes	1 Wetland Type
\$41.1M Structure Replacement Value	Structure Damage (1% Storm)
\$723M Building Replacement Value	2 Critical Facilities
High Social Vulnerability	

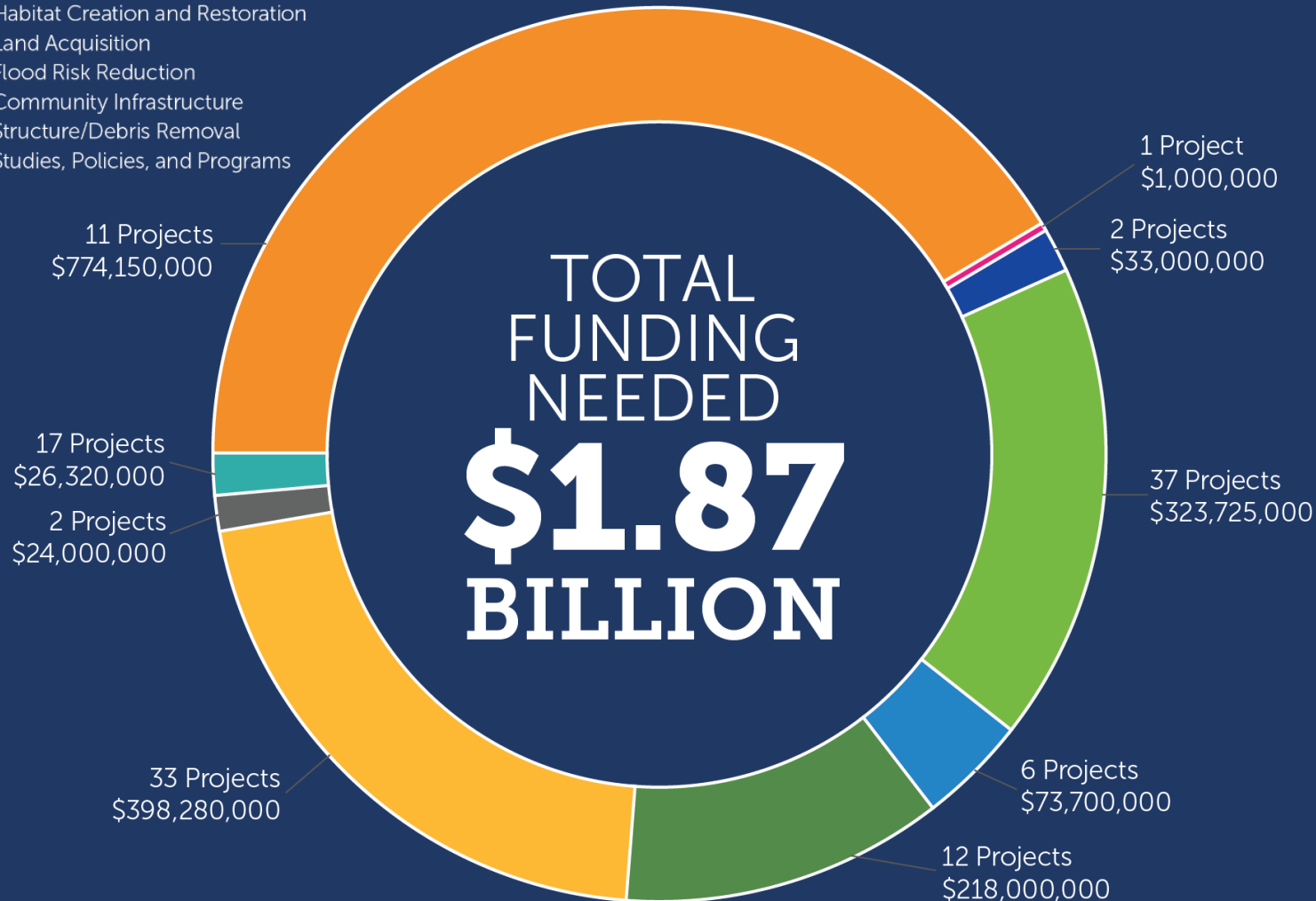
For more information on local estimates and project benefits calculations, see page 132 of the 2023 Texas Coastal Resiliency Master Plan.

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Project Funding Needs

Project Types

- Hydrologic Connectivity
- Beach Nourishment
- Shoreline Stabilization
- Habitat Creation and Restoration
- Land Acquisition
- Flood Risk Reduction
- Community Infrastructure
- Structure/Debris Removal
- Studies, Policies, and Programs



GLO Program Funding:

CEPRA

- ***\$54 Million this biennium

CMP

- \$3 Million annually Federal

Gulf of Mexico Energy Security Act (GOMESA)

- \$46 Million FY 2019 to Texas
- \$76 Million FY 2020
- \$54 Million FY 2021
- \$55 Million FY 2022
- \$76 Million FY 2023

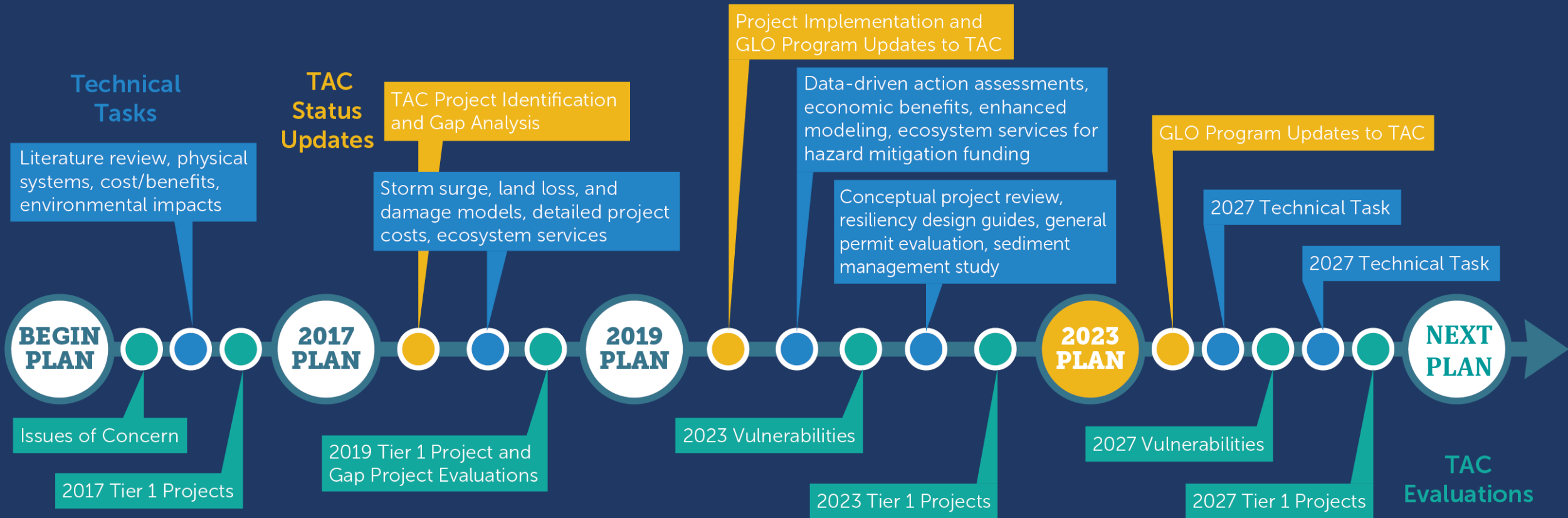
Community Development Block Grant – Mitigation Fund

- Coastal Resilience Program

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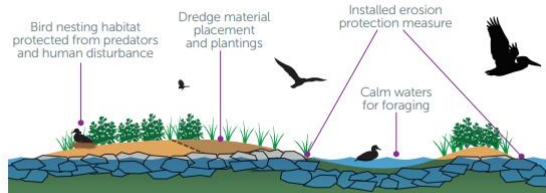


Ongoing, Iterative, Long-Term



Profile View

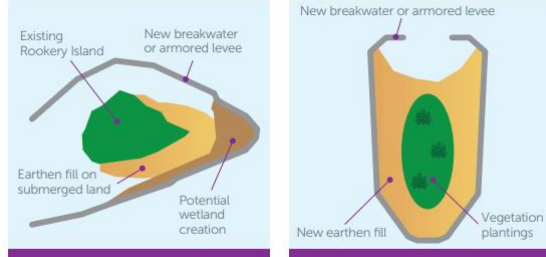
Profile view of a healthy rookery island.



Rookery Island Creation & Restoration

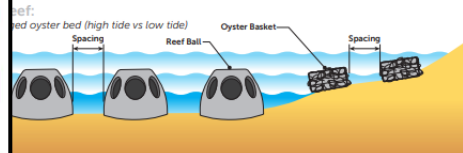
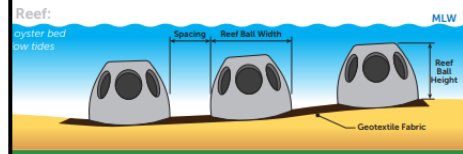
Plan View

Plan view showing possible designs for BUDM placement and ways to enhance existing rookery islands or build new rookery islands.

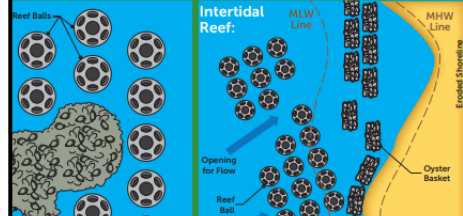


Sketches for Oyster Reef Enhancement

Illustrating spacing of oyster reef components and typical elevations relative to tidal datums.



Rating arrangement of oyster reef components. Identify any project constraints, and current directions.



Performance	Cost	Adaptability to RSLR	Wave Energy Reduction	Benefits and Drawbacks
Low	Low	Mod	Low	Benefits: stabilizes and captures sediment, assists in additional plant colonization, improves habitat for marine and benthic species, aesthetics Drawbacks: low permanence unless coupled with structures, susceptible to RSLR
Mod	Low	Low	Low	Benefits: anchors sediment, assists in plant colonization, small footprint, unobtrusive, aesthetics Drawbacks: requires periodic adjustment for maximum effect, may become a safety or debris concern once deteriorated
Mod	Low	Mod	Mod	Benefits: provides natural estuarine habitat, recreation opportunities, and water filtration Drawbacks: may be limited in the amount of vertical relief attained
Low	Mod	Mod	Mod	Benefits: can create additional protected space for habitats, such as marsh grass, and estuarine species, berms can act sacrificially and add sediment to the nearshore system Drawbacks: low permanence unless coupled with structures, susceptible to RSLR, may become a safety or debris concern once deteriorated
Low	High	High	High	Benefits: provides recreational opportunities, able to adapt to wave climate and recover from losses Drawbacks: causes disruption to beach microbiome, turtle nesting, and beach recreation during construction, cyclical sand losses are expected
High	High	Mod	High	Benefits: provides transitional estuarine habitat area, adaptive to RSLR, reduces need for structure height and hardening when compared to a traditional levee Drawbacks: requires larger footprint than a traditional levee to construct, requires maintenance
Mod	Mod	Low	Mod	Benefits: provides interstitial estuarine habitat Drawbacks: requires periodic adjustment for maximum effect, may become a safety or debris concern once deteriorated
High	High	Mod	Mod	Benefits: allows leeward sediment accretion, creates sheltered estuarine areas, can be coupled with natural features to create a living shoreline Drawbacks: downdrift erosion, may become a safety or debris concern once deteriorated
High	High	Mod	Mod	Benefits: anchors shoreline location, prevents upland erosion Drawbacks: downdrift erosion, disallows shoreline migration, vulnerable to flanking and scouring, difficult to permit
Mod	Mod	Low	Mod	Benefits: anchors shoreline location, prevents upland erosion, small footprint Drawbacks: profile deflation, vulnerable to flanking, erosion, and overwash, disrupts aesthetics, cuts off upland habitat from water
High	High	Low	Low	Benefits: updrift accumulation Drawbacks: downdrift erosion, vulnerable to flanking
High	High	Low	Low	Benefits: anchors shoreline location, flood and storm surge control Drawbacks: downdrift erosion, vulnerable to flanking and scouring, difficult to permit

Communication

- All Plan Documents
- Story Map
- Modeling Data Viewer
- Resiliency Design Guides

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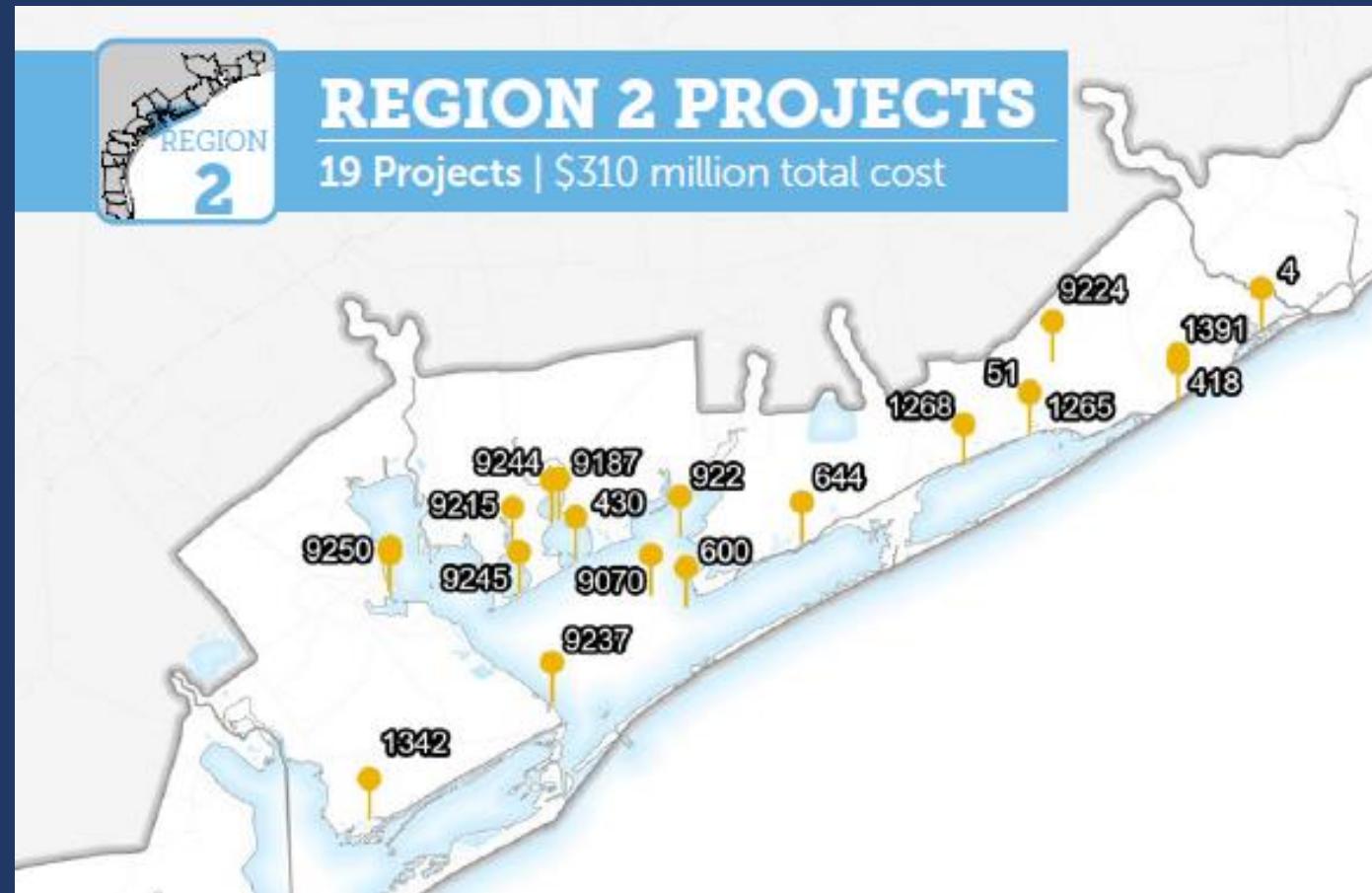
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2023 Tier 1 Projects

Region 2

- 1265 Big Boggy Marsh Protection Project
- 1268 Bird Island Restoration and Creation of Gulf Cut Island Complex
- 51 Boggy Cut GIWW Stabilization
- 9237 Boggy Nature Park Shoreline Stabilization
- 9187 Carancahua Bay Community Reefing Project
- 430 Carancahua Bay Habitat Preservation and Enhancement
- 600 Half Moon Oyster Reef Restoration - Phase 3
- 9250 Harbor of Refuge Protection and Restoration
- 1342 Hydrologic Restoration of Welder Flats
- 9224 Lake Austin Coastal Prairie Conservation
- 644 Mad Island Marsh Preserve Shoreline Protection and Coastal Ecosystem Restoration - Phase 1
- 9070 Matagorda Bay Regional Inflow Study
- 922 Oliver Point Shoreline Protection and Reef Restoration
- 9244 Port Alto County Park Shoreline Protection and Restoration - Phase 2
- 4 San Bernard NWR Shoreline Protection
- 1391 San Bernard NWR Sargent Unit Beneficial Use
- 9245 Sand Point Peninsula Living Shoreline
- 418 Sargent Beach and Dune Restoration
- 9215 Shoreline Protection and Restoration at Olivia Haterius County Park



Thank you!

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