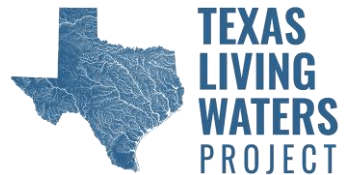


Vulnerability and Adaptation to Climate Change:

An Assessment for the Texas Mid-Coast



National Wildlife Federation
Texas Coast and Water Program





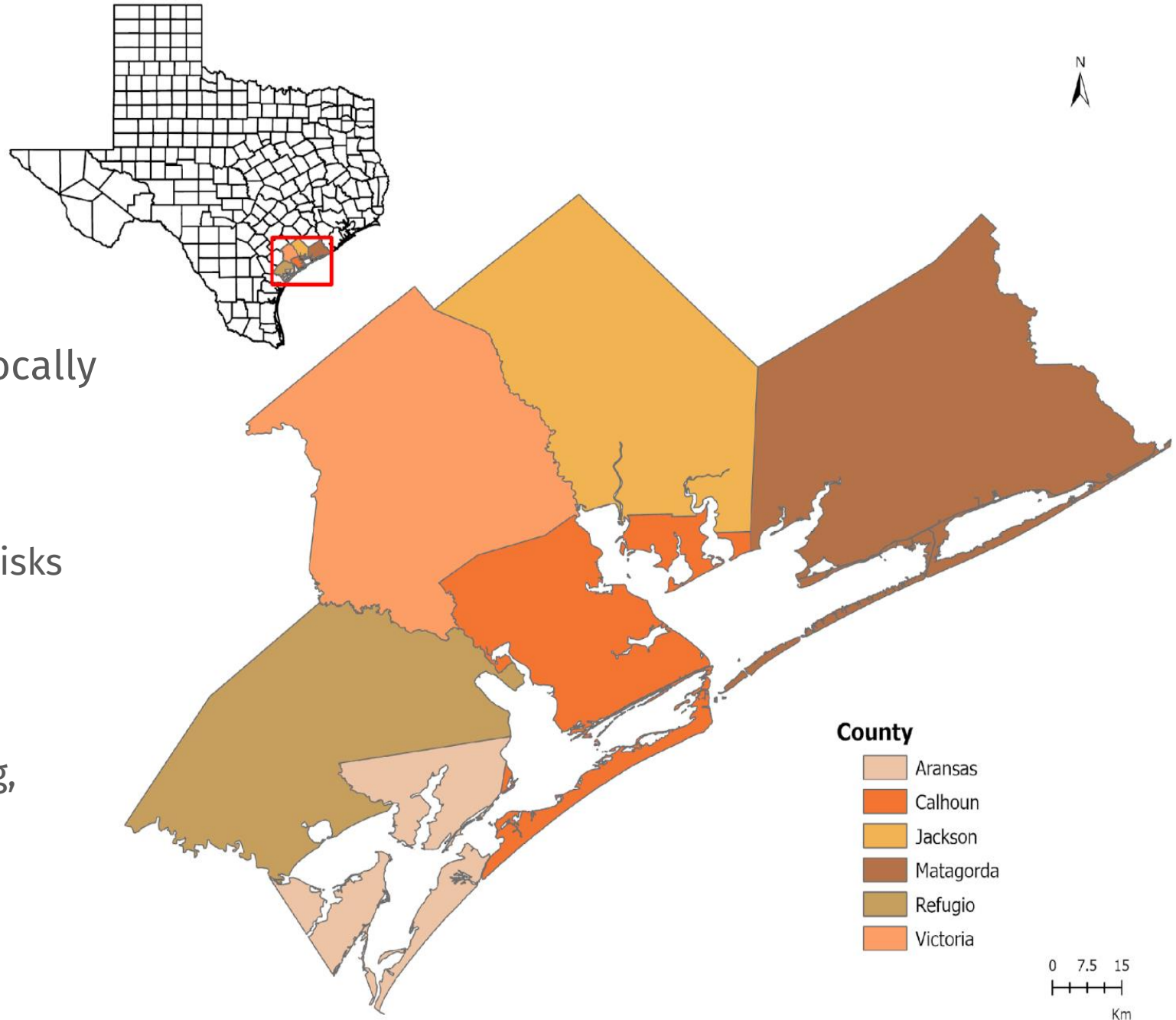
Agenda

- Project Goal and Objectives
- Understanding Changing Climate
- Exploring Solutions
- Project Reach and Engagement

Project Goal and Objectives

To equip local leaders and decision-makers in the Texas Mid-Coast with locally relevant information and help them leverage existing opportunities

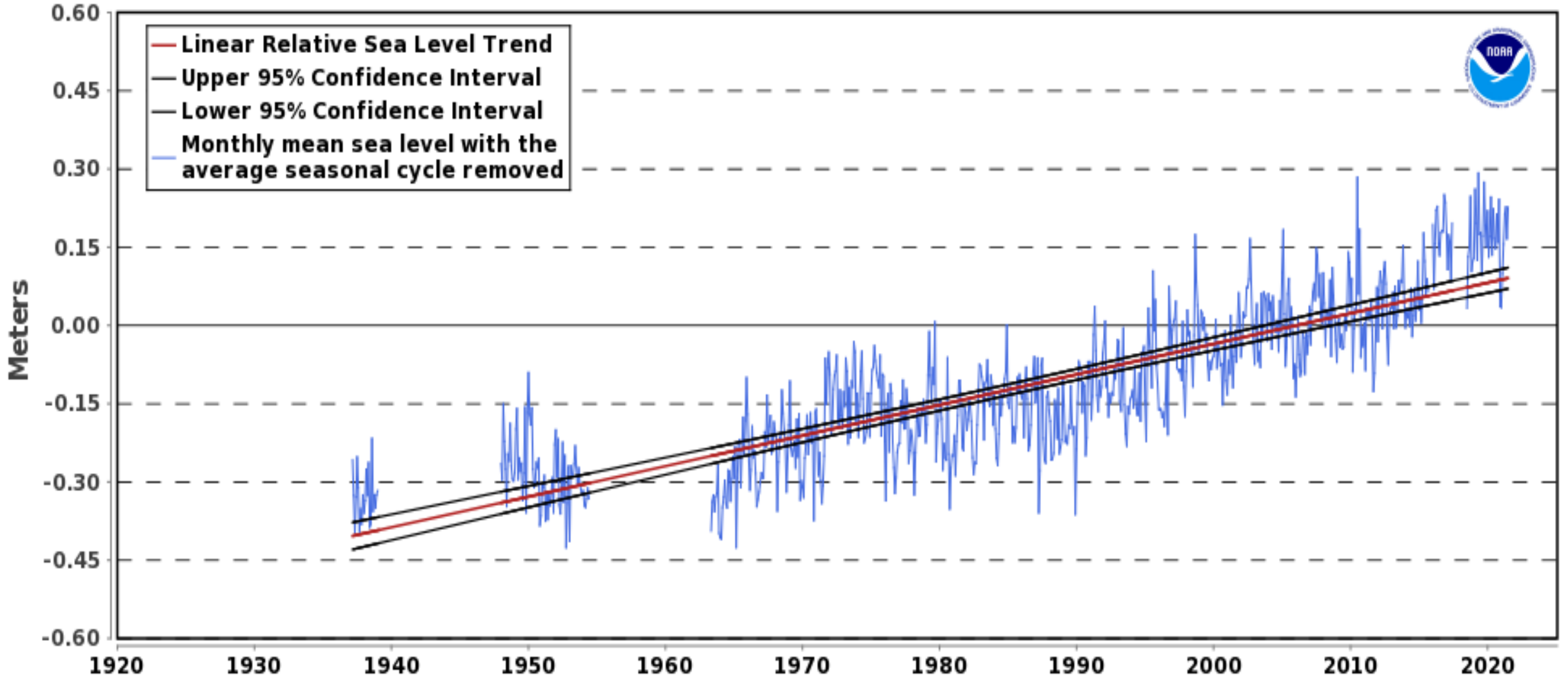
- To provide the latest information regarding climate change-related risks
- To examine the impacts of climate change on key socio-economic and environmental assets
- To explore the adaptation planning, including funding mechanisms for nature-based projects



Changing Climate: Why are sea levels rising?

8774770 Rockport, Texas

5.86 +/- 0.48 mm/yr



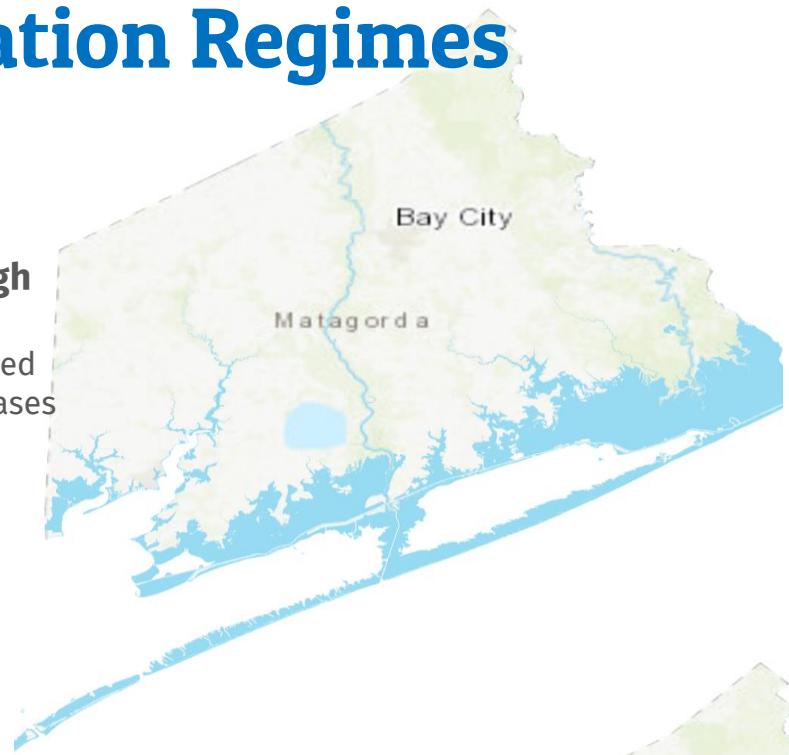
Relative Sea Level Trend in Rockport, Texas

Sea Level Rise and Inundation Regimes

Intermediate low scenario (3 feet)
represents a low-emissions scenario and aggressive climate policies



Intermediate high scenario (7 feet)
represents continued high greenhouse gases emissions with no climate policies



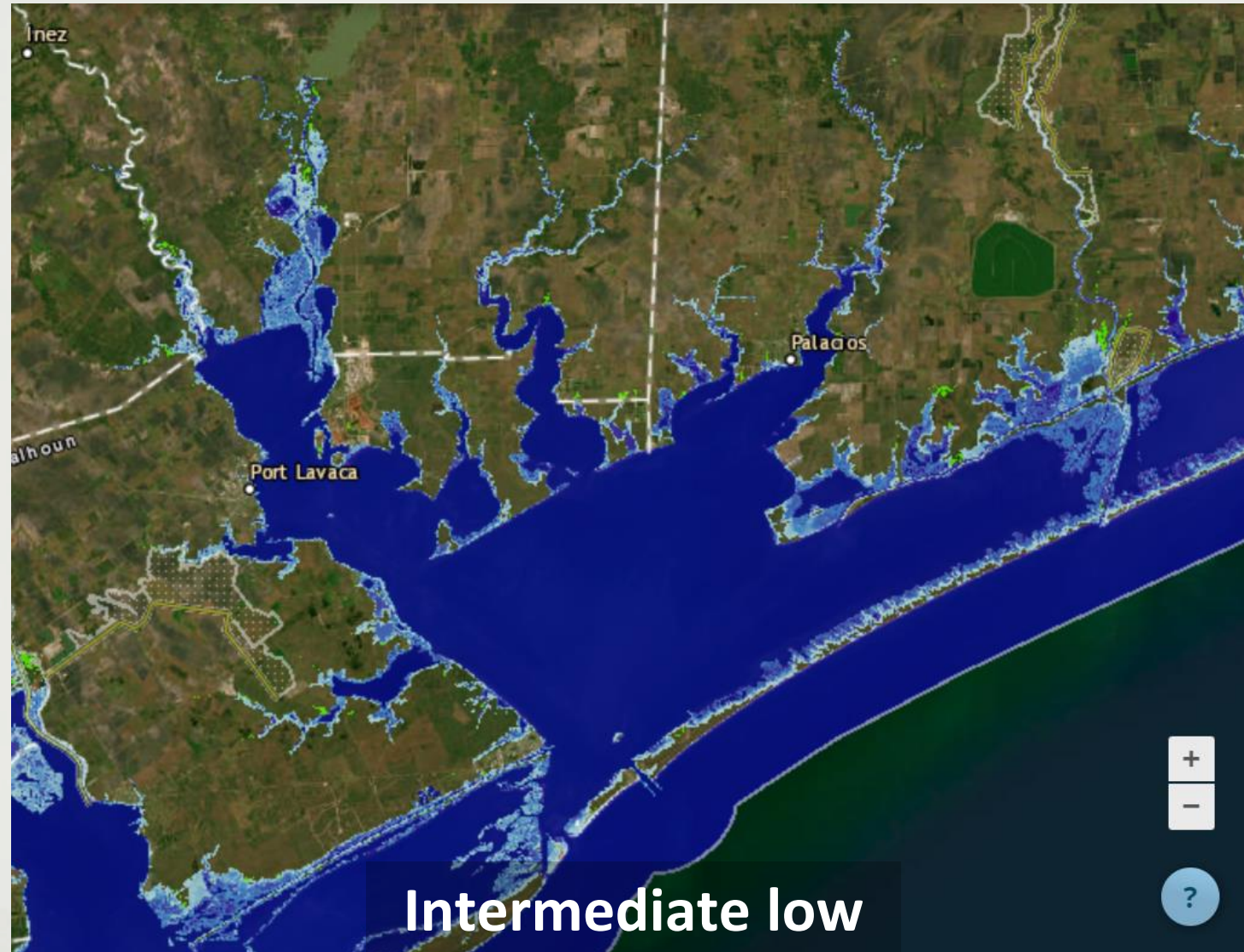
Intermediate scenario (5 feet)
represents a mid-range of emission reductions



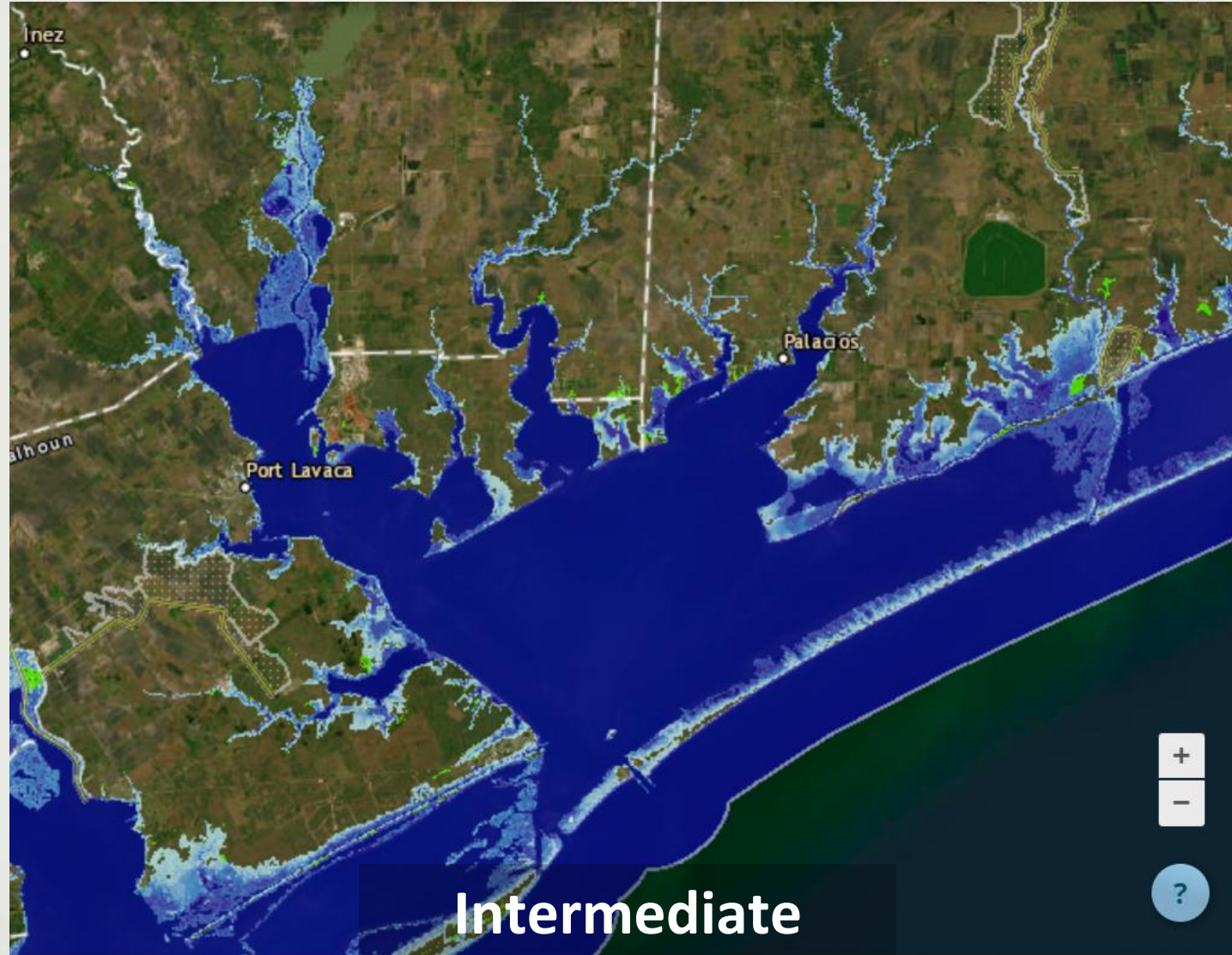
High scenario (9 feet) represents a significant increase in sea level rise and loss of ice sheets



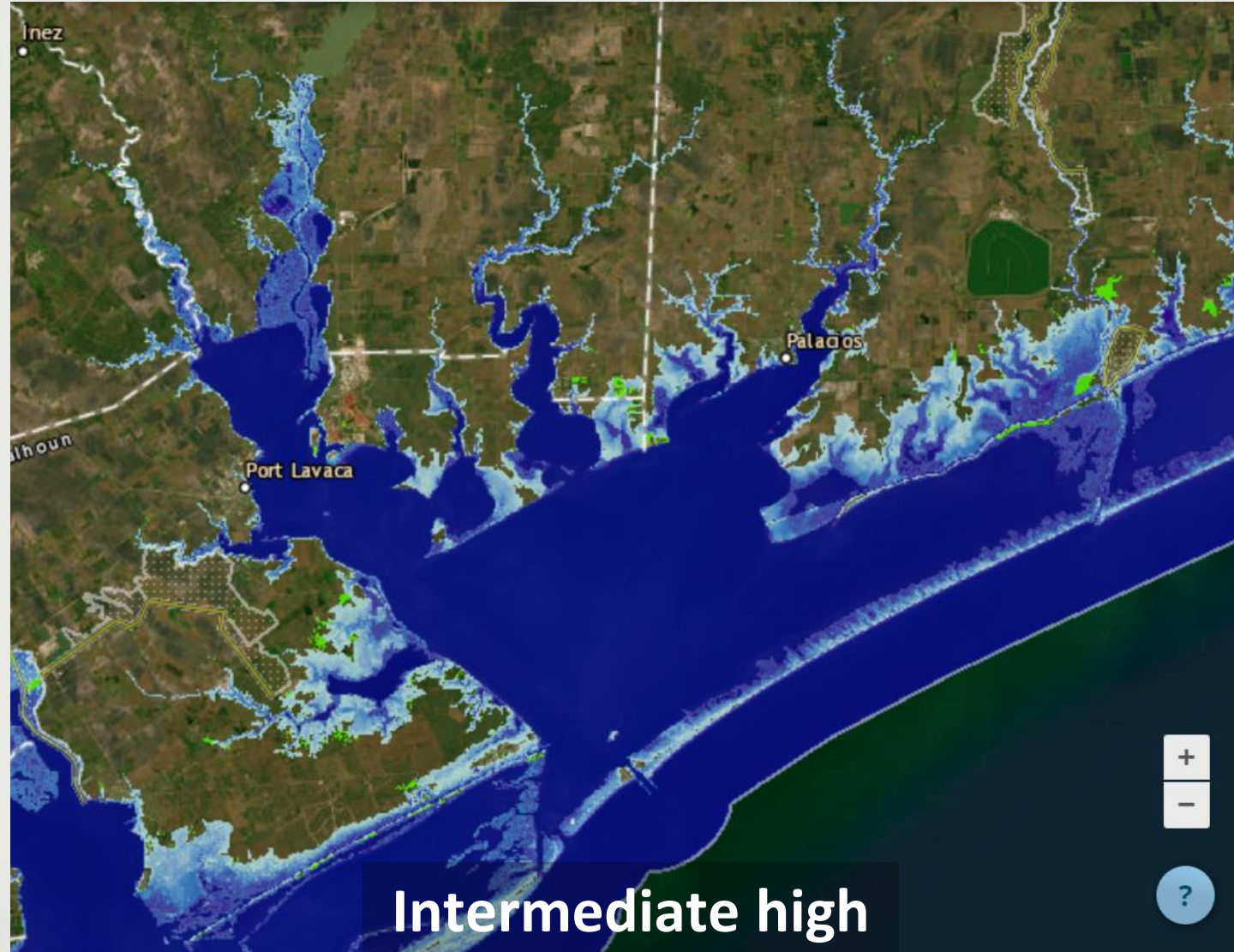
Increase in Inundation Regimes with an Increase in Relative Sea Level Rise



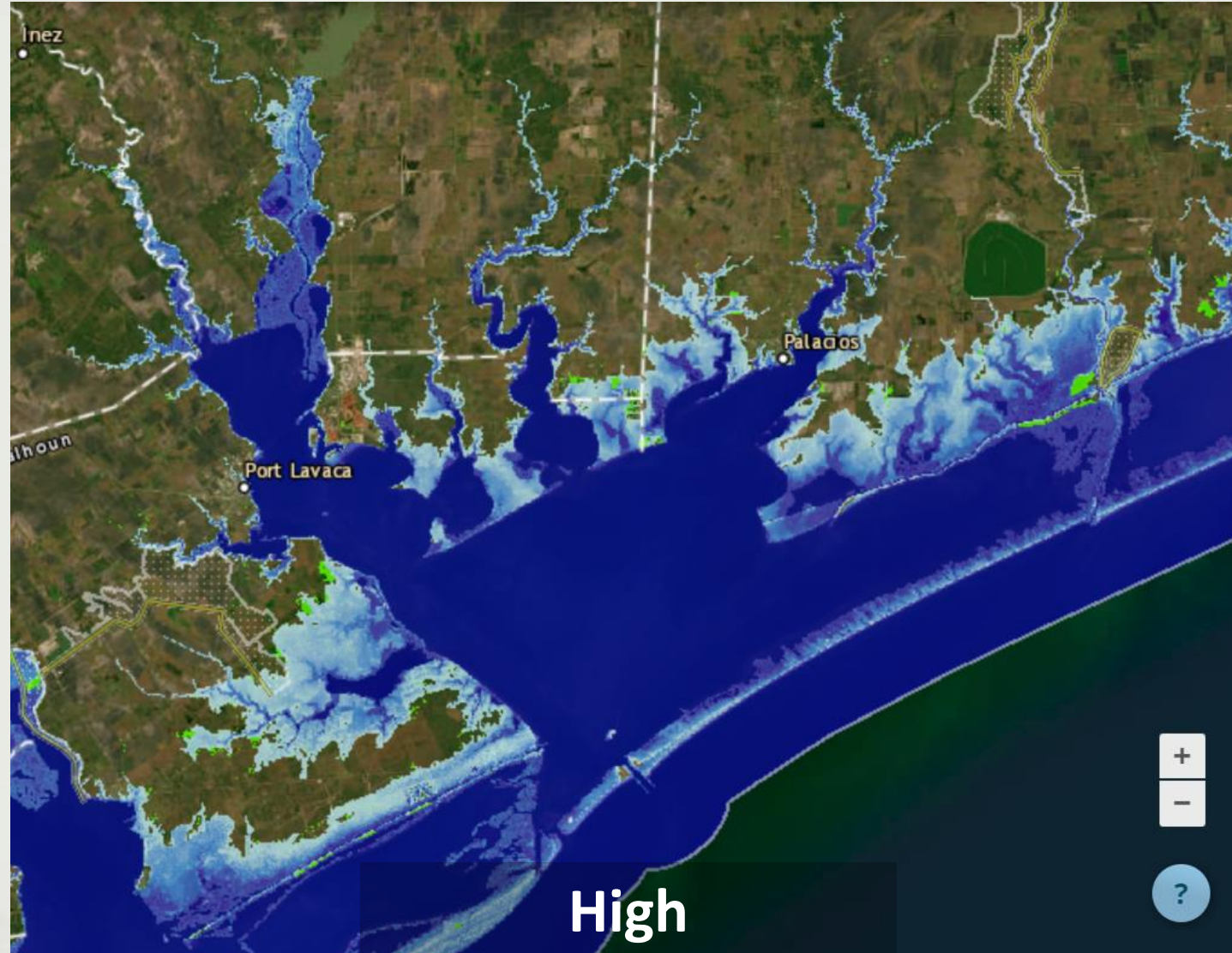
Increase in Inundation Regimes with an Increase in Relative Sea Level Rise



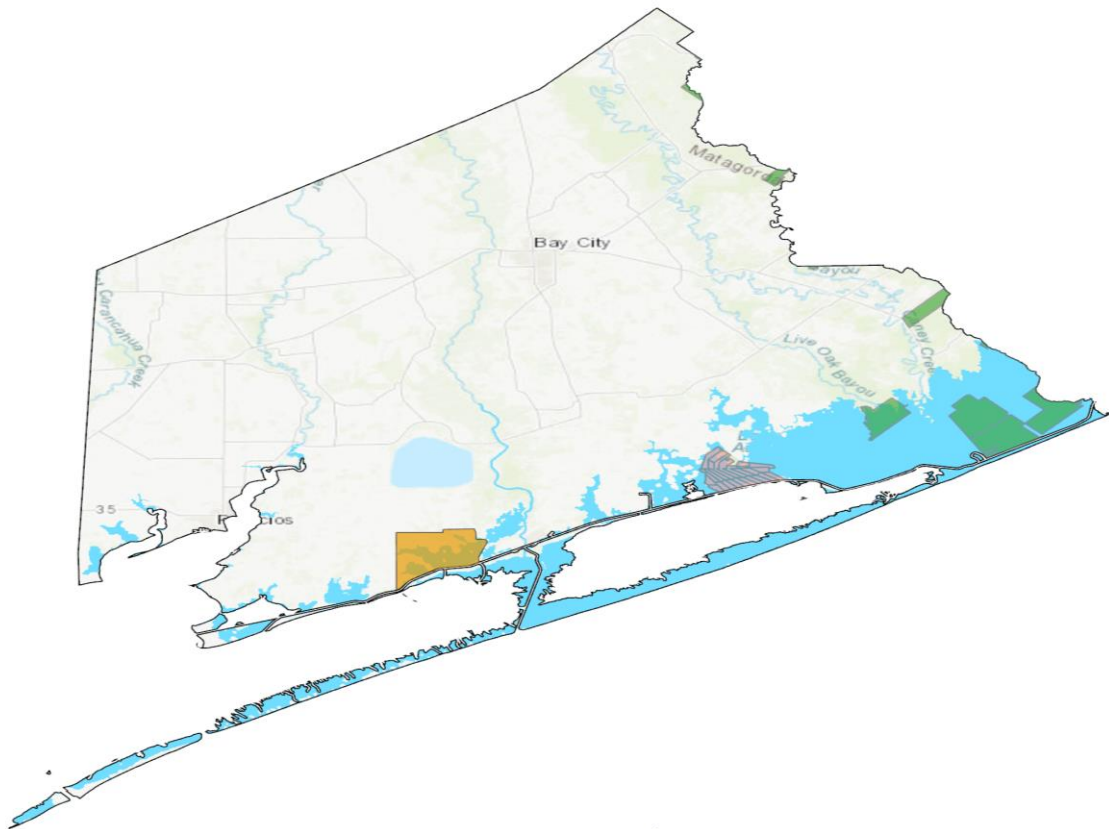
Increase in Inundation Regimes with an Increase in Relative Sea Level Rise



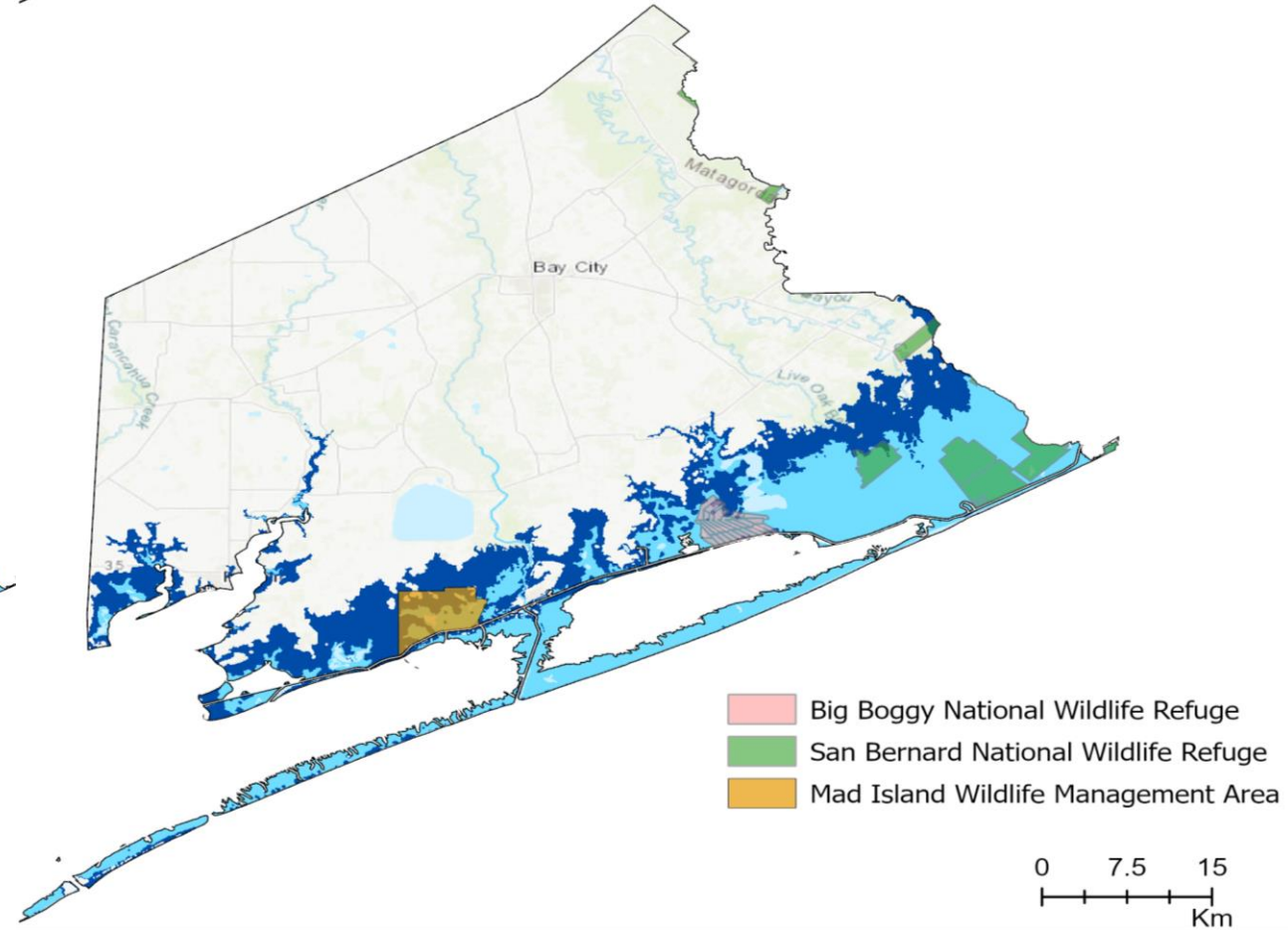
Increase in Inundation Regimes with an Increase in Relative Sea Level Rise



Coastal Storms and Storm Surge

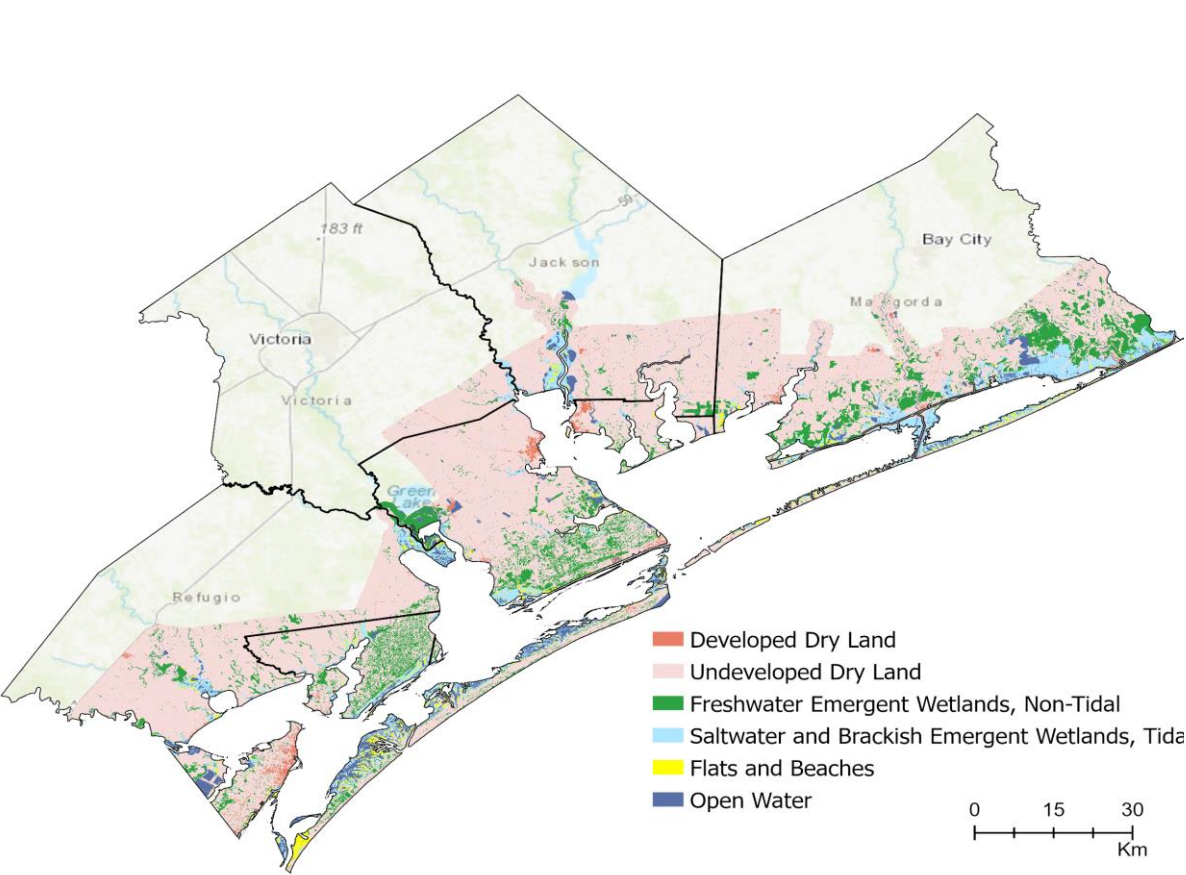


Present

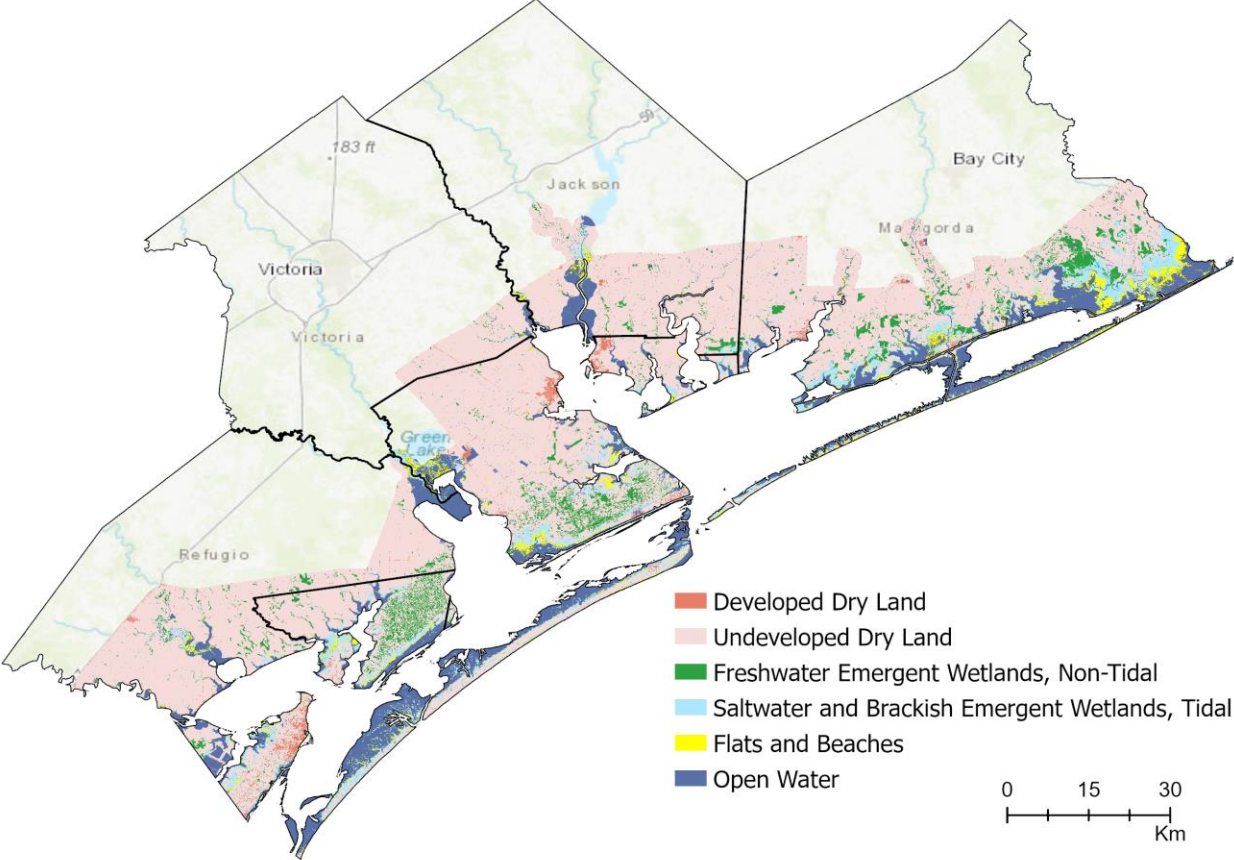


Future

Land Use Changes



Present



Future

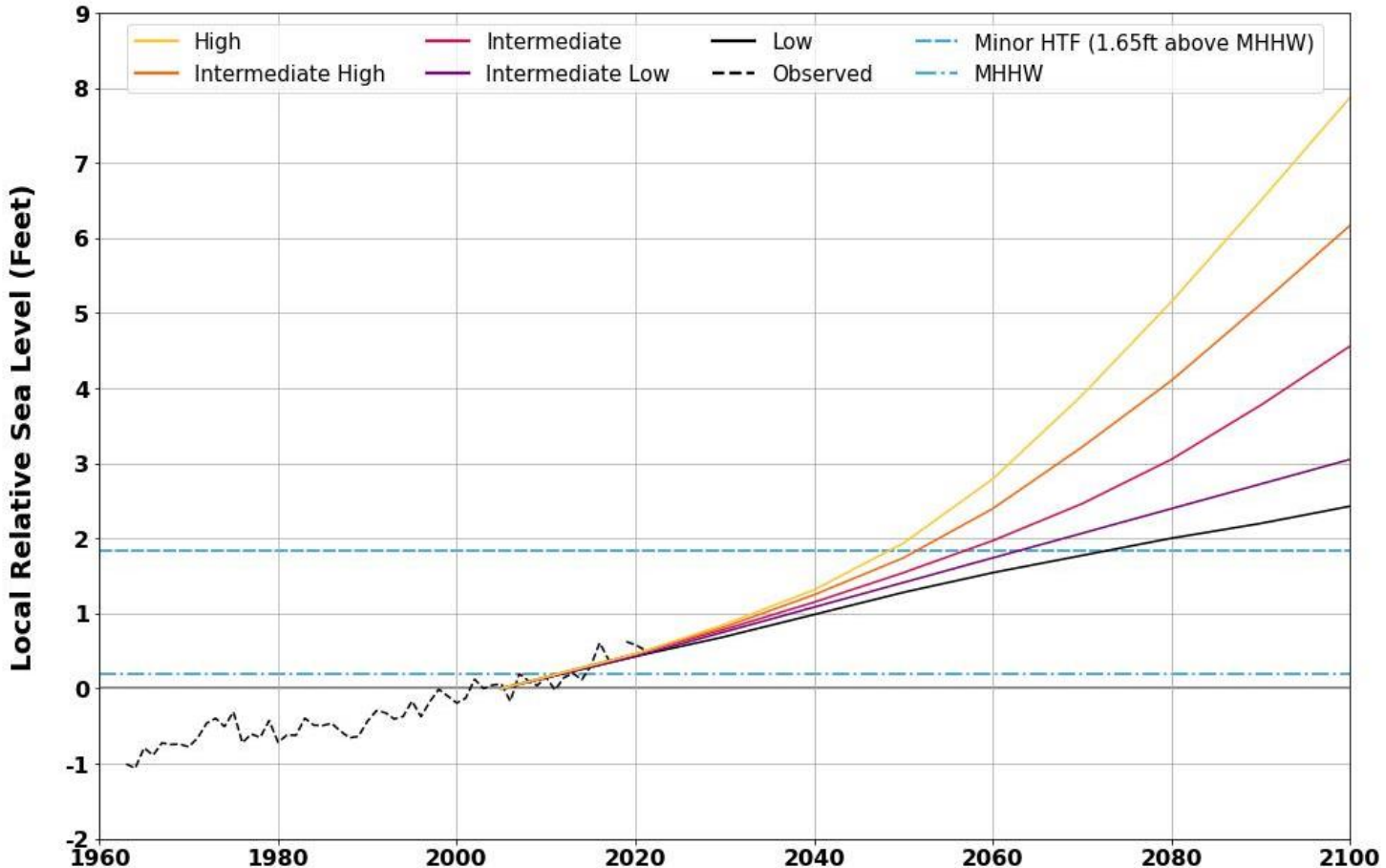
High Tide Flooding and Saltwater Intrusion

Year	Flood Days
2021	6

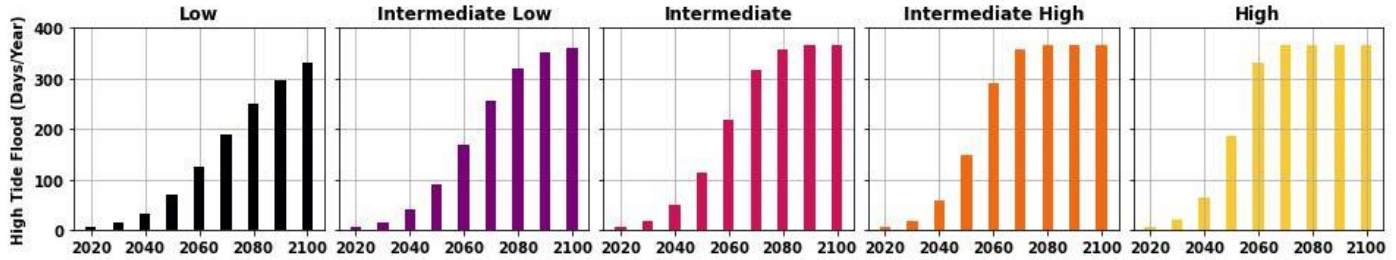
Projected High Tide Flood Days

Year	Flood Days
2022	2 - 6
2050	115 - 150

Average No. of flood days in 2000: 1
 Record No. of flood days: 11



Projected Annual Average High Tide Flooding by Decade



Socio-Economic and Environmental Impacts



Critical Facilities



Fisheries



Ecotourism



Implications for whooping cranes



Other wildlife species



Projected changes to water quantity and quality

Future Coastal Development

Land Cover	2006 sq.mi	Lost sq.mi	Gained sq.mi	2016 sq.mi	Net Change sq.mi	Change %
HID	8.48	0.00	0.73	9.21	0.73	8.61
LID	17.78	-0.01	0.65	18.41	0.64	3.59
OSD	9.39	-0.06	0.26	9.59	0.20	2.14
GRS	52.69	-5.43	5.98	53.24	0.55	1.04
AGR	605.71	-9.37	7.89	604.22	-1.48	-0.25
FOR	100.86	-3.69	3.05	100.21	-0.65	-0.64
SCB	58.74	-10.40	10.44	58.77	0.04	0.06
WDW	57.50	-1.31	4.28	60.46	2.96	5.15
EMW	175.44	-5.02	2.54	172.96	-2.48	-1.41
BAR	23.27	-0.67	0.55	23.15	-0.12	-0.52
WTR	502.37	-2.44	2.05	501.99	-0.38	-0.08

	Total (2020)	Total (2050)	Hispanic (2020)	Hispanic (2050)	Percent change	Non-Hispanic black (2020)	Non-Hispanic black (2050)	Percent change
Aransas	27699	46239	8331	22472	170	23	387	30
Calhoun	22840	23939	11522	14216	23	596	617	4
Jackson	15899	22877	5693	12583	121	1054	1106	5
Matagorda	37064	33307	15752	17272	10	3962	3708	-6
Refugio	7573	7570	4009	4915	23	484	414	-14
Victoria	97744	125663	46751	72133	54	5873	7001	19

Climate Adaptation: Nature-based Solutions Can help Matagorda County Prepare



Coastal wetlands



Riparian buffers



Headwaters protection



Natural channel design



Bottomland forest



Flood conservation easement



Conservation practices



Upland restoration



Low impact development



Living shorelines



Ag conservation easement

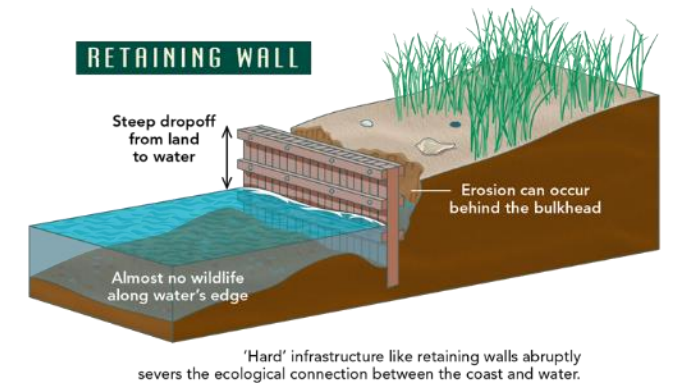


Urban wetlands

Nature-based Solutions

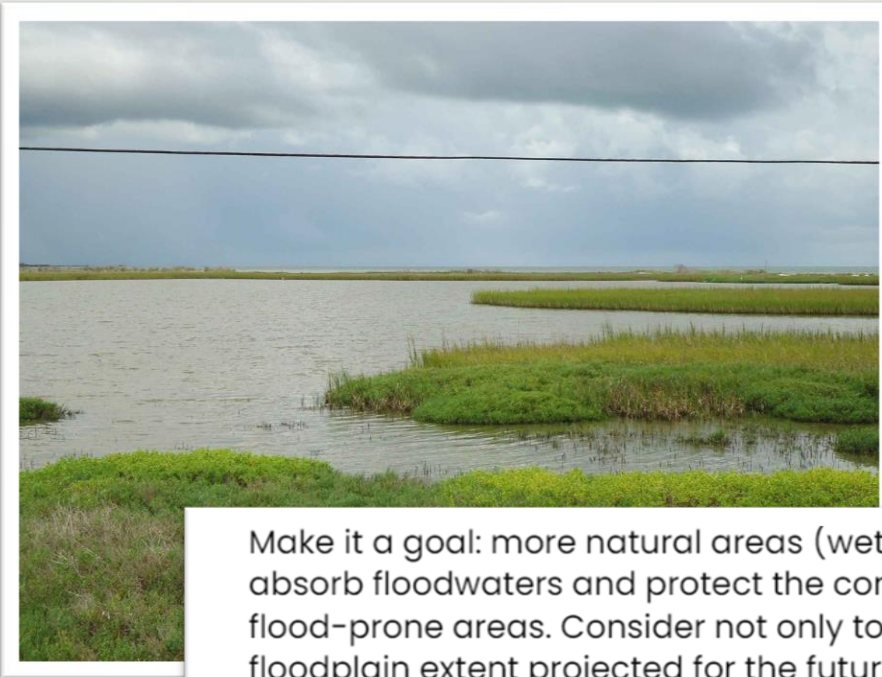
“Nature-based Solutions are actions to protect, sustainably manage and restore natural and modified ecosystems in ways that address societal challenges effectively and adaptively, to provide both human well-being and biodiversity benefits” (Cohen-Shacham et al. 2016)

- Centers around conservation or restoration of natural systems, or the emulation of natural system functions in built environment
- Alternative to hard infrastructure, or can be used in combination – “green-gray hybrid solutions”
- Delivers climate adaptation and mitigation outcomes
- Provides co-benefits such as water and air quality improvements, wildlife habitat, carbon sequestration, and community recreational use



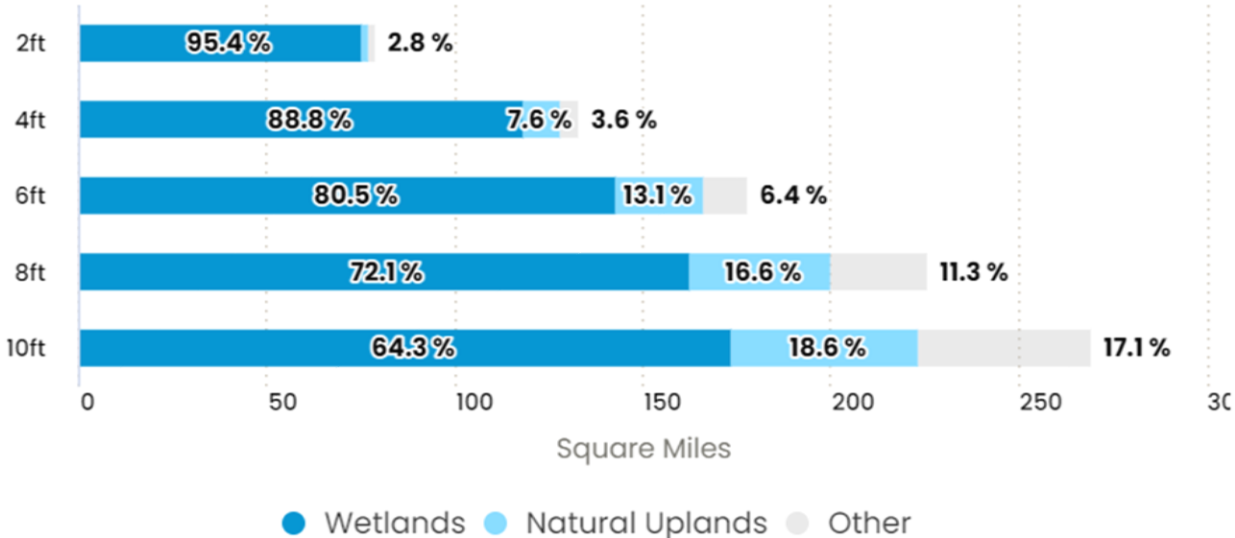
Example: Multiple Benefits of Coastal Wetlands

- ✓ Reduce flood impacts
- ✓ Support fishing and tourism economies
- ✓ Improve water quality



Make it a goal: more natural areas (wetlands, forests, parks, dunes, etc.) to absorb floodwaters and protect the community, and less development in flood-prone areas. Consider not only today's floodplain, but also the floodplain extent projected for the future.

Natural Landscapes Exposed To Inundation

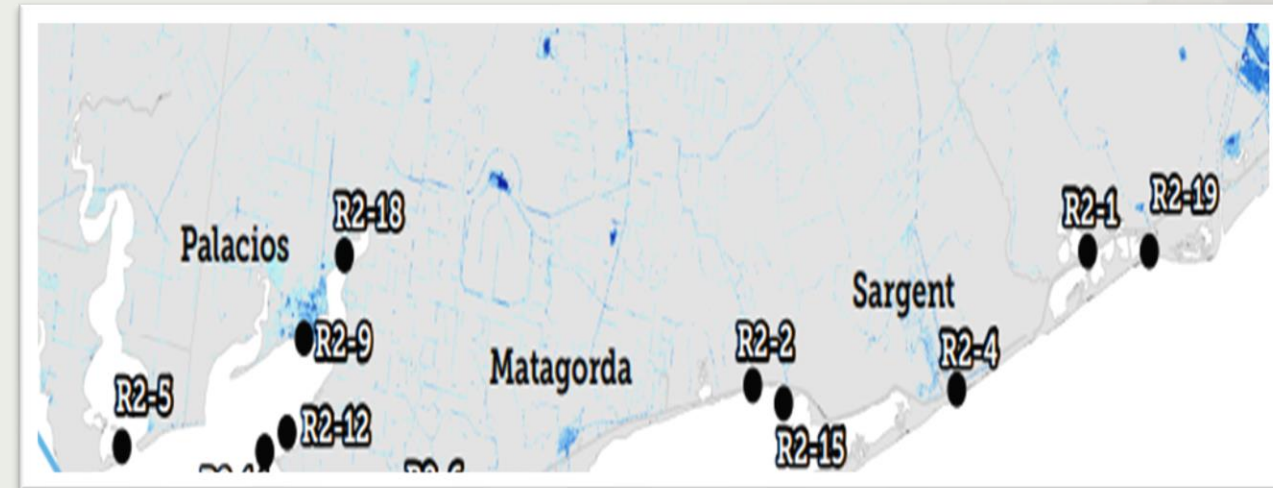


Advancing Ecosystem Restoration and Nature-based Adaptation

Leverage existing funding from the Deepwater Horizon Oil Spill

- Utilize new grant opportunities available for nature-based solutions from federal and state programs
 - FEMA's Building Resilient Infrastructure and Communities (BRIC)
 - Coastal Erosion Planning and Response Act (CEPRA) (administered by GLO)
 - Gulf of Mexico Energy Security Act (GOMESA) (administered by GLO)
 - Texas Coastal Management Program (CMP) (administered by NOAA/GLO)

Prioritize ecosystem conservation and restoration projects identified in the Texas Coastal Resiliency Master Plan



Nine Tier 1 Projects in Matagorda County

- Palacios Shoreline Revitalization Project
- Coon Island Restoration
- Oliver Point Oyster Reef Restoration

Project Reach and Engagement

- Presentations with different audience
- Connecting decision-makers to state agencies and funding opportunities
- Pursuing avenues to advance policy recommendations
- Building on this work to support coastal resilience efforts across the Mid-Coast



Thank you!

Check out the Full Assessment!



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