Lessons Learned from Gulf Shoreline Stabilization in the Chenier Plain



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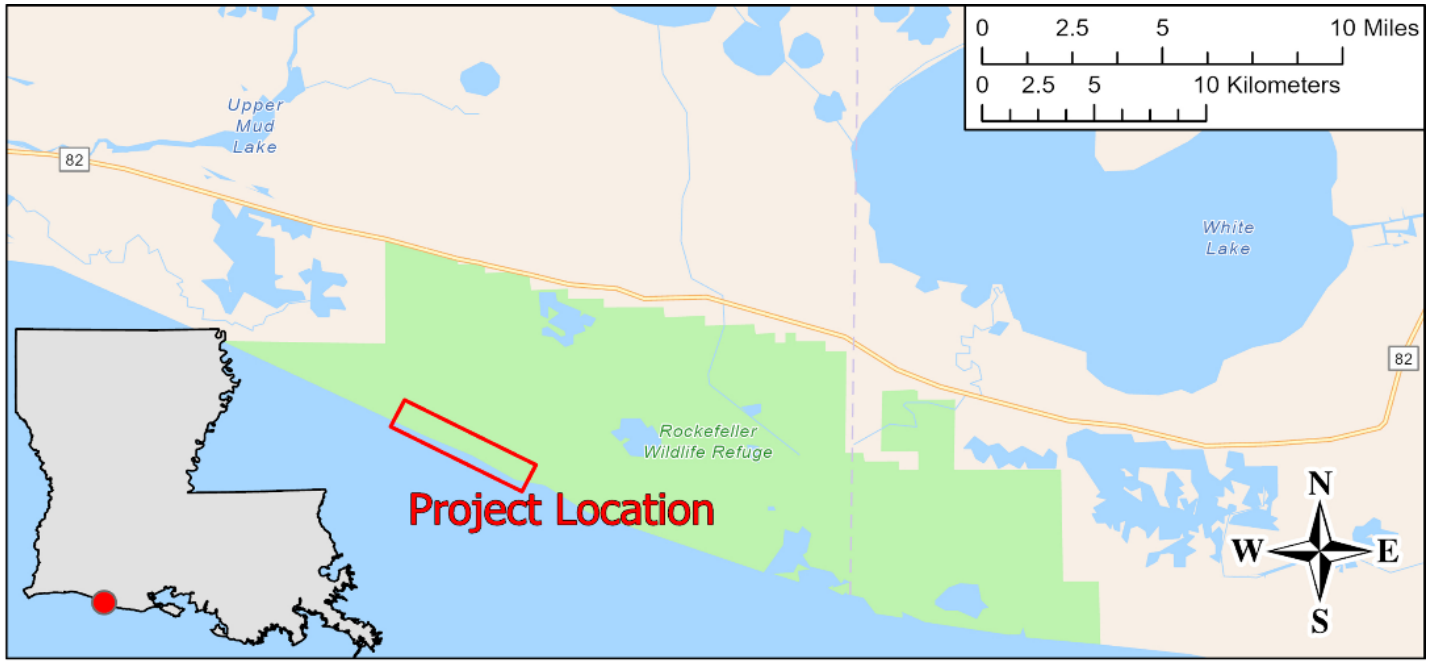
CPRA Board Meeting
October 21, 2026

ME-0018 Project Background

Project Objectives

1. Prevent beach erosion for up to Category 1 hurricane conditions, which were estimated to have a return interval of about 10 years at the project site.
2. Be designed, constructed, monitored, and maintained over a 20-year design life.
3. Where practicable, the protection should remain stable for more severe storm conditions up to an event having a 100-year return period. Note that a 100-year return period storm has an 18.2% probability of occurring within a given 20-year period.





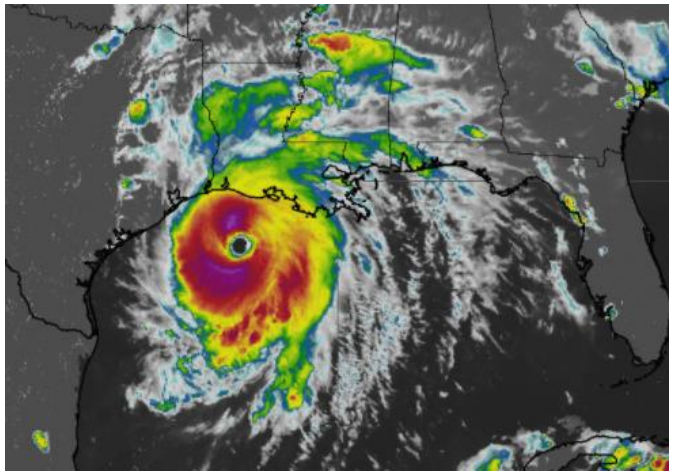


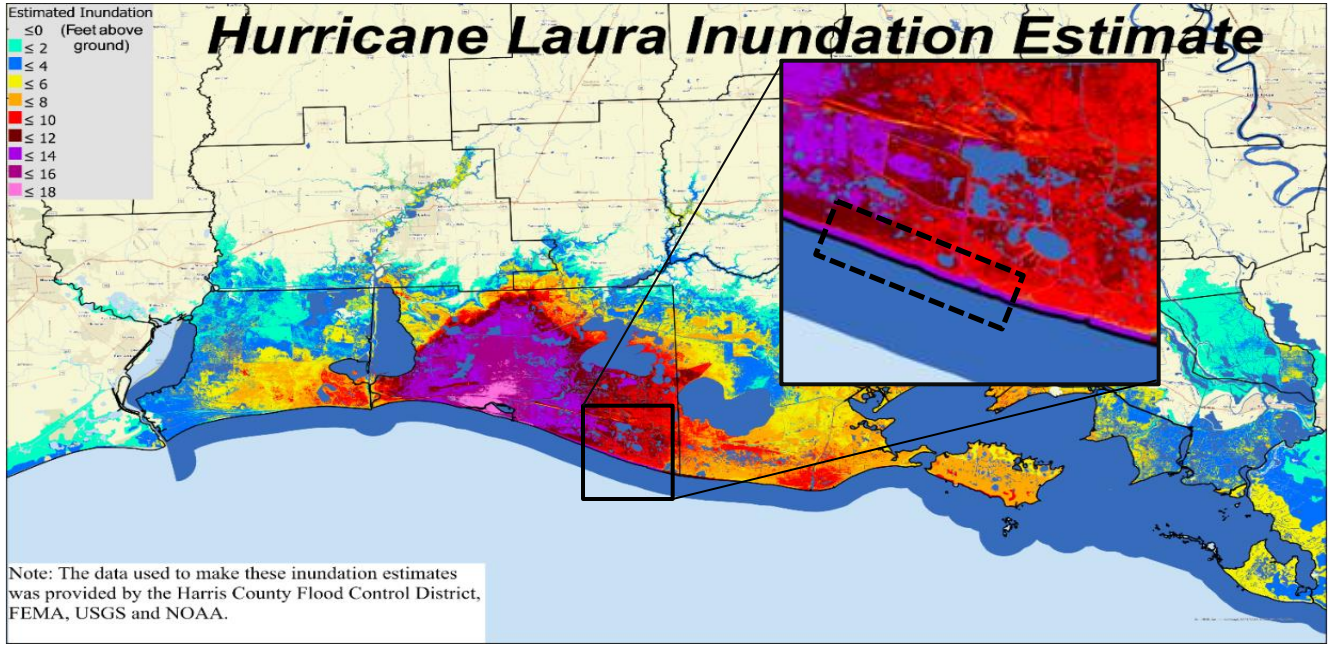
2020 Hurricane Season

Project Monitoring Timeline



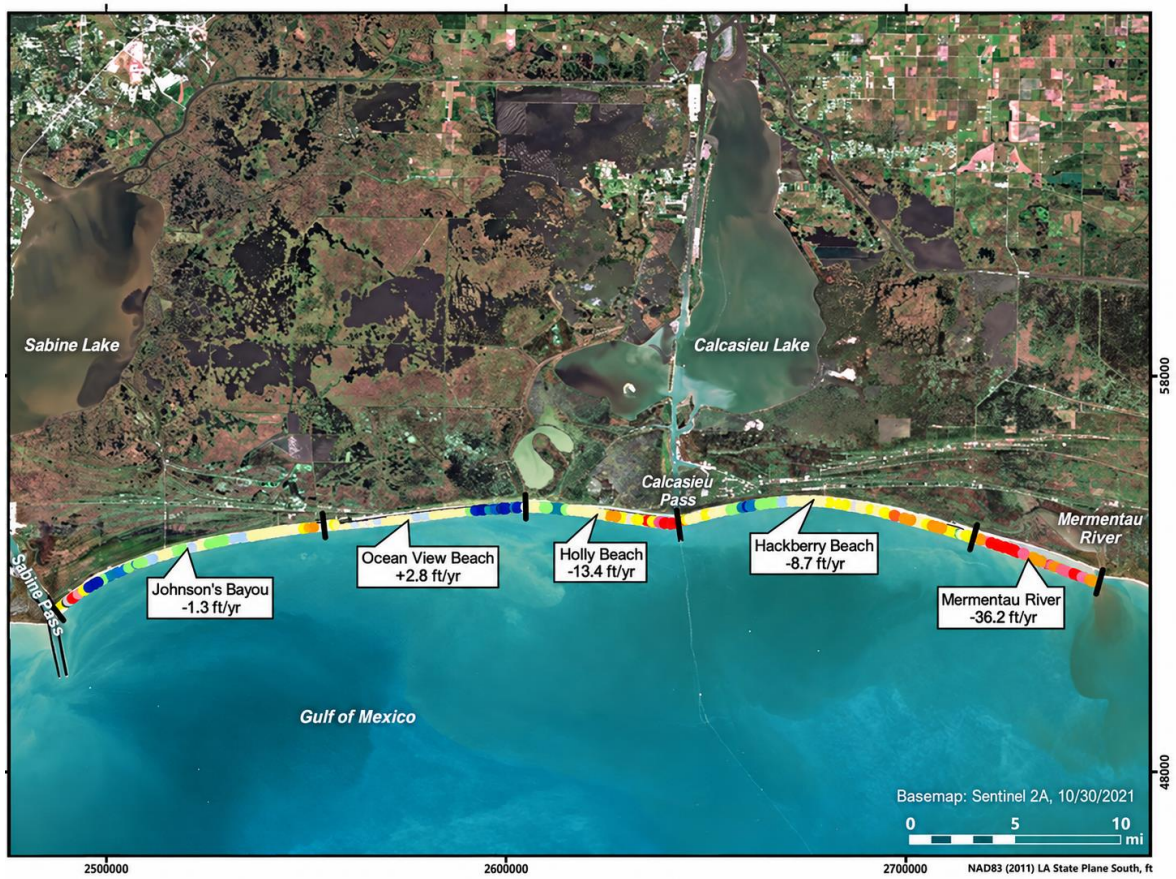
- Hurricane Laura is the strongest storm on record to hit Louisiana
  - Some of highest inundation was seen at ME-0018 project site (over 14 ft)
- Structure showed little to no impacts from 2020 Hurricane Season (no maintenance req.)





https://www.weather.gov/lch/2020Laura-Surge

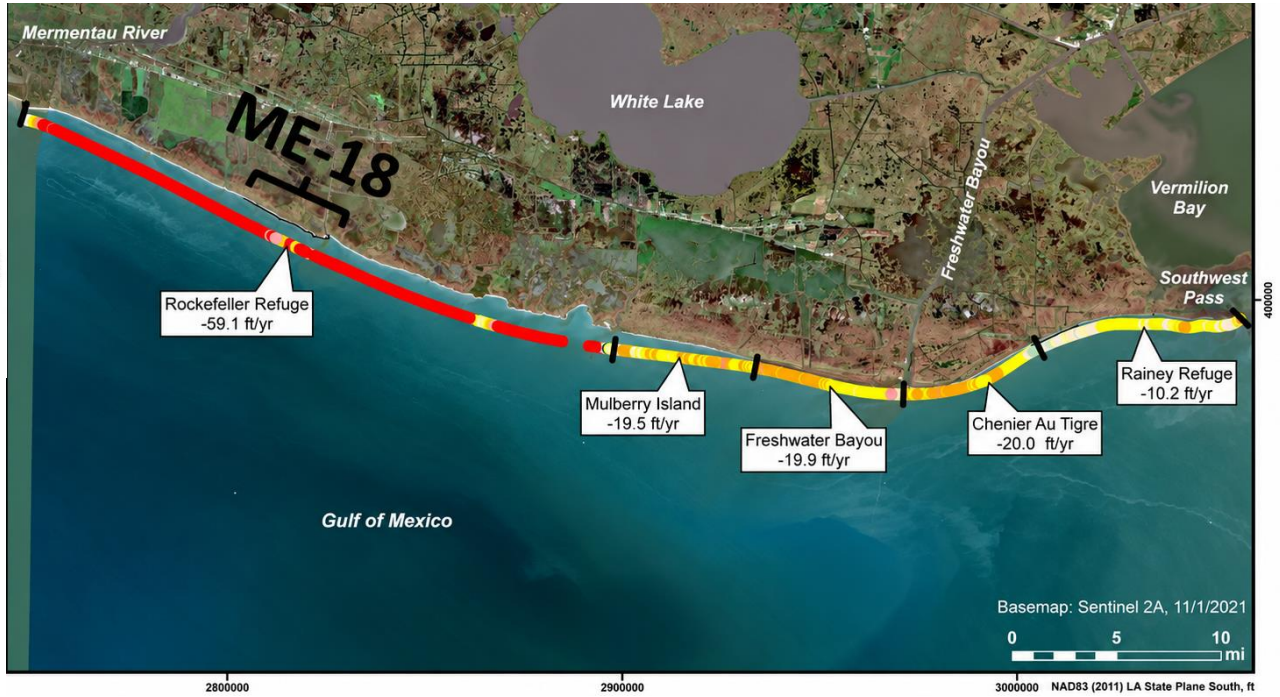
Shoreline Erosion in the Chenier Plain

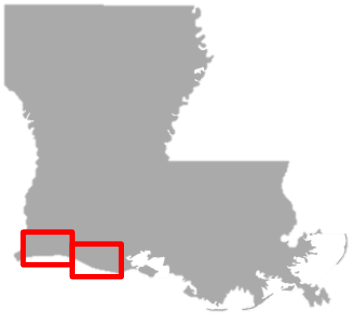


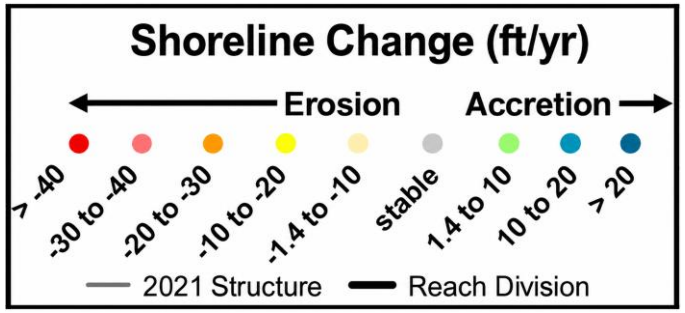
Average Shoreline Change, 2015–2021

Region	Average Shoreline Change (ft/yr)
Chandeleur Islands	-51.6
Eastern Chenier Plain	-37.1
Modern Delta	-21.8
Late Lafourche Delta	-21.2
Early Lafourche Delta	-12.8
Acadiana Bays	-10.8
Western Chenier Plain	-8.6
Pontchartrain Basin	-7.1
Atchafalaya & Wax Lake Deltas	-6.3

Source: Berlinghoff, J.L.; Beadley, B.S.; Byrnes, M.R., and Curole, G.P., 2025. Louisiana Barrier Island Comprehensive Monitoring Program (BICM): Phase 3 - Updated Shoreline Compilation and Change Assessment, 1880s to 2021. Prepared for Louisiana Coastal Protection and Restoration Authority (CPRA) by Applied Coastal Research Associates, Inc. Shoreline data sources: U.S. Department of Agriculture (2015); Digital Aerial Solutions (2021).

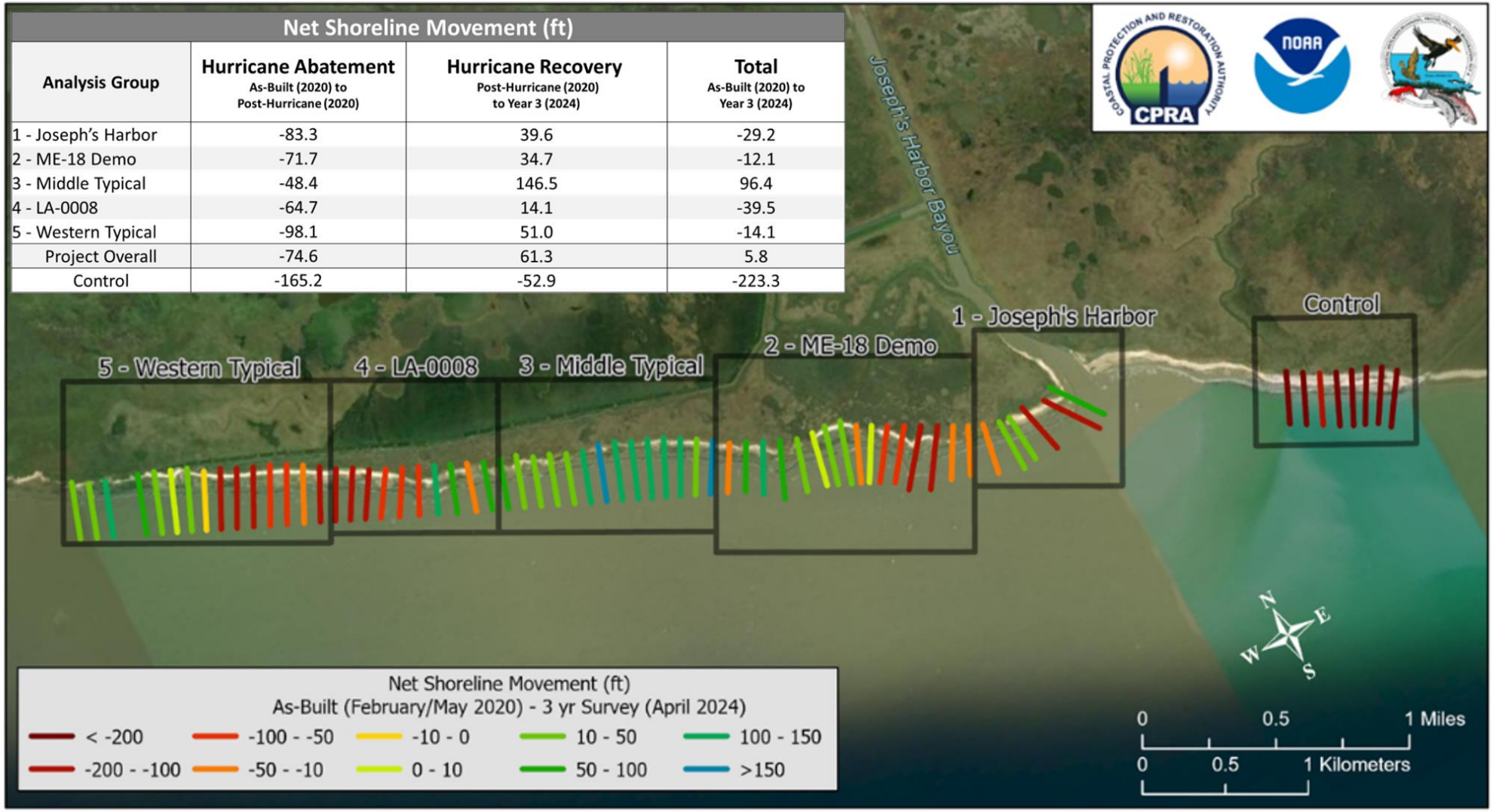






Shoreline Movement Analysis

Net Shoreline Movement (ft)			
Analysis Group	**Hurricane Abatement** As-Built (2020) to Post-Hurricane (2020)	**Hurricane Recovery** Post-Hurricane (2020) to Year 3 (2024)	**Total** As-Built (2020) to Year 3 (2024)
1 - Joseph's Harbor	-83.3	39.6	-29.2
2 - ME-18 Demo	-71.7	34.7	-12.1
3 - Middle Typical	-48.4	146.5	96.4
4 - LA-0008	-64.7	14.1	-39.5
5 - Western Typical	-98.1	51.0	-14.1
Project Overall	-74.6	61.3	5.8
Control	-165.2	-52.9	-223.3



Control
Established at the post-hurricane survey, the unprotected shoreline east of Joseph's Harbor Bayou provides a comparison for project performance.

1 - Joseph Harbor
Captures the influence of Joseph's Harbor Bayou on project area.

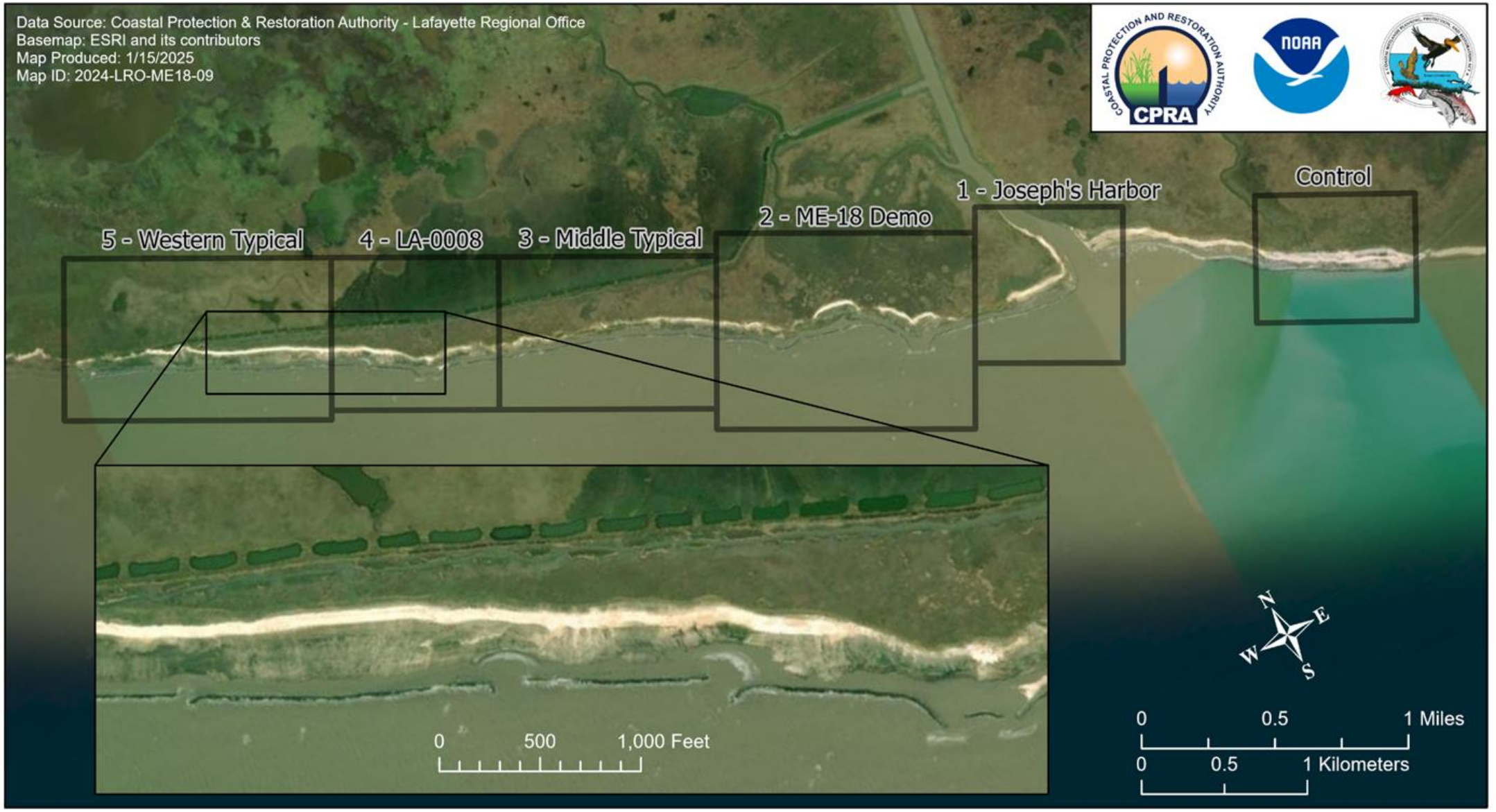
2 - ME-18 Demo
Includes the 2009 demonstration sections and nearby breakwaters.

3 - Middle Typical
Represents typical linear shoreline and breakwater construction in a fully enclosed section.

4 - LA-0008
Includes the 2012 demonstration project incorporated into ME-0018.

5 - Western Typical
Represents typical linear shoreline and breakwater construction, with an open end on the west.

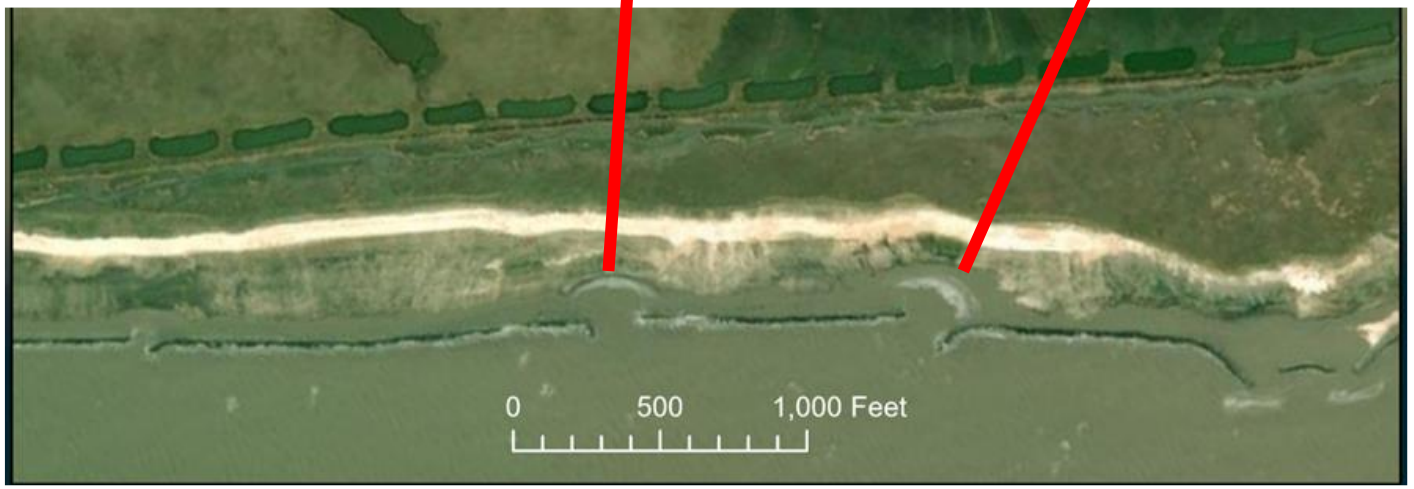
Breakwater Gap Width Effects



Breakwater Gap Width Effects

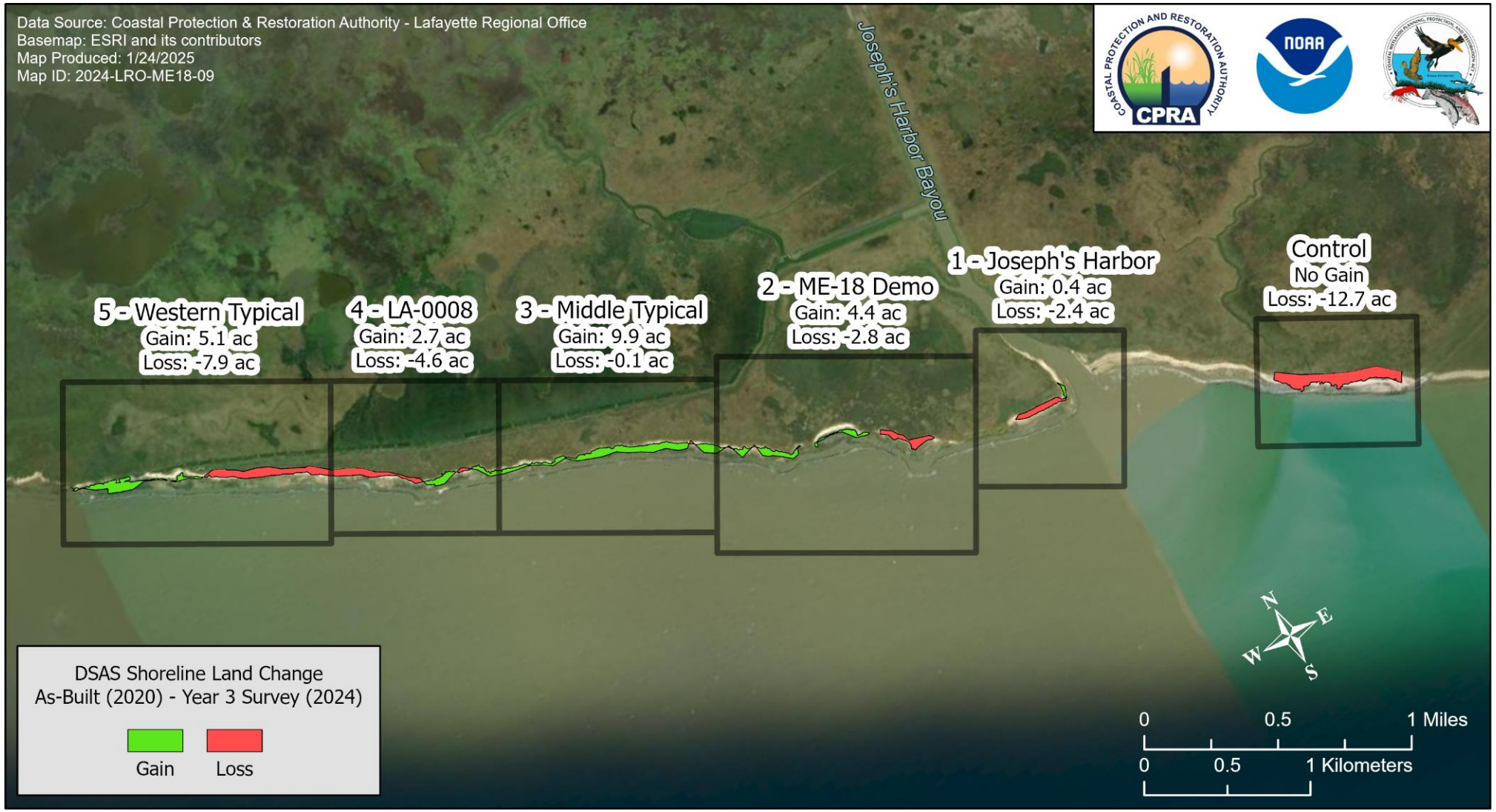






Aerial imagery captured
January 29, 2025

Shoreline Land Gain/Loss

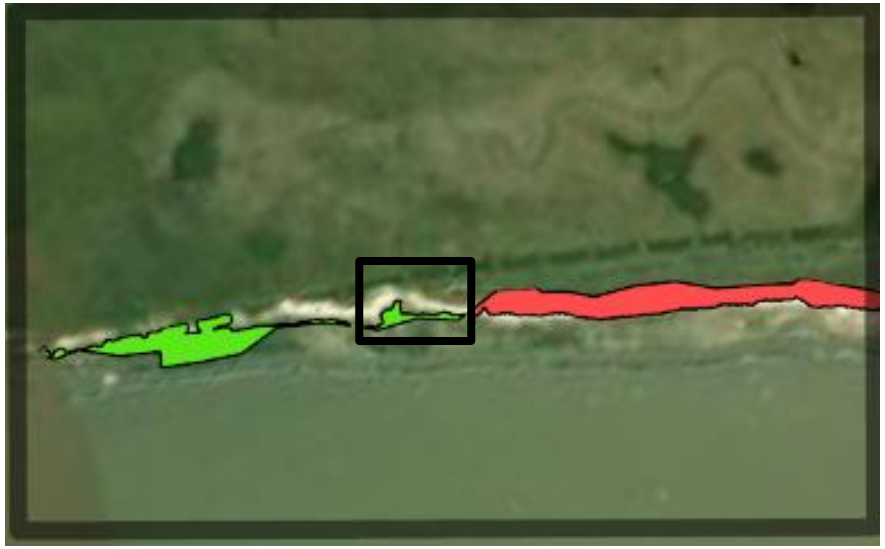


Shoreline Land Gain/Loss (cont.)

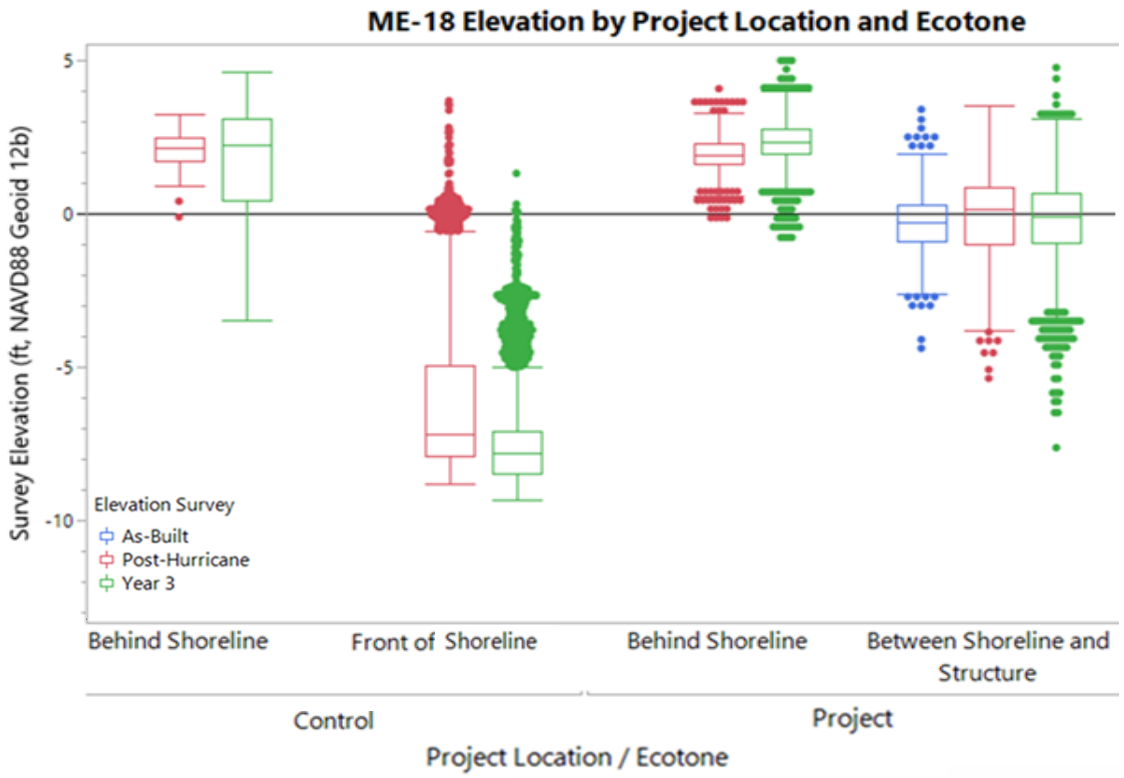


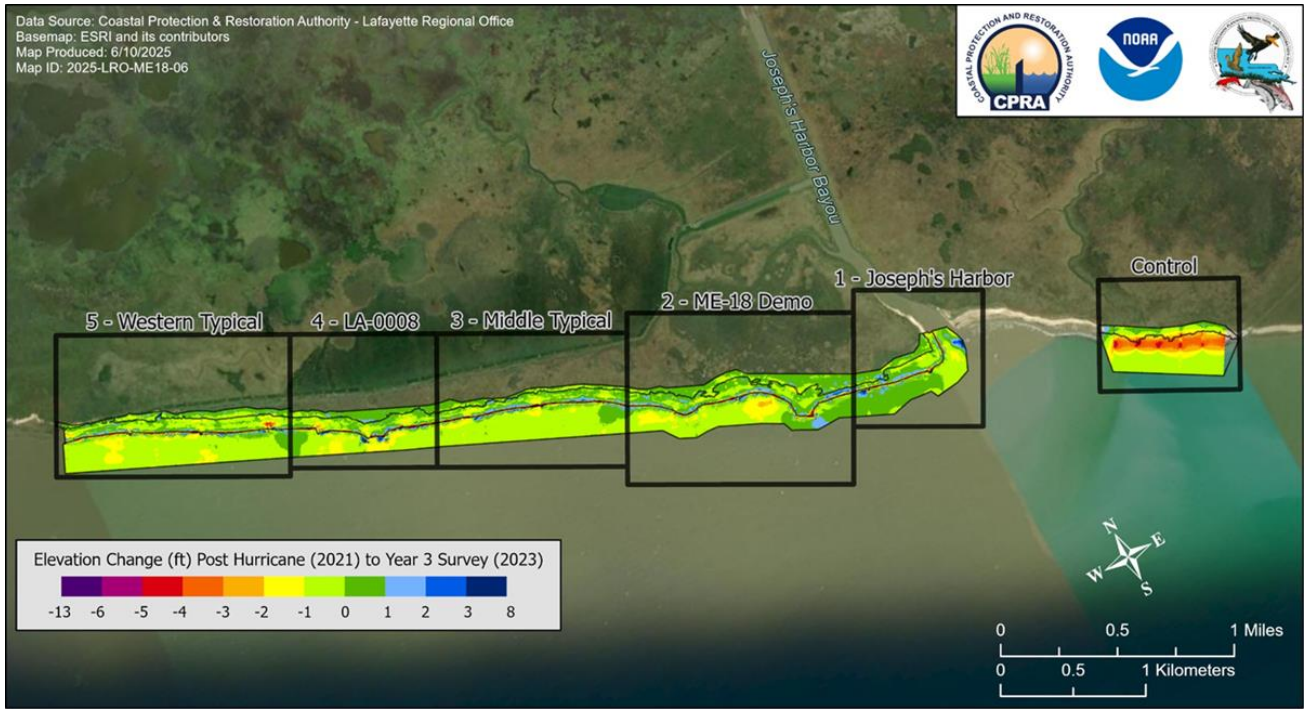






Elevation Change and Soil Volume





Soil Volume Change Comparison (Post Hurricane to Year 3)

	Length (linear miles)	Total Volume Change (cy)	Unit Volume Change (cy/lm)	Rate of Unit Volume Change (cy/lm/yr)
Project	3.85	-226,088	-58,724	-18,544
Control	0.4	-147,987	-369,967	-116,832
Difference			**311,243**	**98,287**

Cost Benefit Analyses

Land Retention Benefit Analysis (As-Built to Year 3)			
	Total Acres of Land Loss/Land Gain	Land Retained per Linear mile (ac/mile)	
Project	4.6	31.7	
Control	-12.7		
Project Benefit (Total Area)		**122.2 ac**	
ME-18 (2020-2024) Project Benefit	Land Retained in Project Area (ac)	Land Retained Cost Benefit ($80k/acre)	Land Retained Cost Benefit per Breakwater mile
	122.2	**$9.7 million**	**$2.5 million**
	Total Construction Cost	**Land Retention Annual Return on Investment**	**Break Even Period (years)**
	$28.6 million	**$2.5 million**	**11.5**

Soil Volume Benefit Analysis (Post-Hurricane to Year 3)			
	Total Soil Volume Change per linear mile (cy/mile)	Difference in Soil Volume Change per linear mile (cy/mile)	
Project	-58,724	311,243	
Control	-369,967		
Project Benefit (Total Volume)		**1,198,285 cy**	
ME-18 (2021-2024) Project Benefit	Total Soil Volume Retained in Project Area	Soil Cost Benefit ($18/cy)	Soil Cost Benefit per Breakwater mile
	1.2 mcy	$21.6 million	$5.6 million
	Total Construction Cost	**Soil Volume Annual Return on Investment**	**Break Even Period (years)**
	$28.6 million	**$6.8 million**	**4.2**

Conclusions







