Implementation of LCA Barataria Basin Barrier Shoreline Feasibility Projects

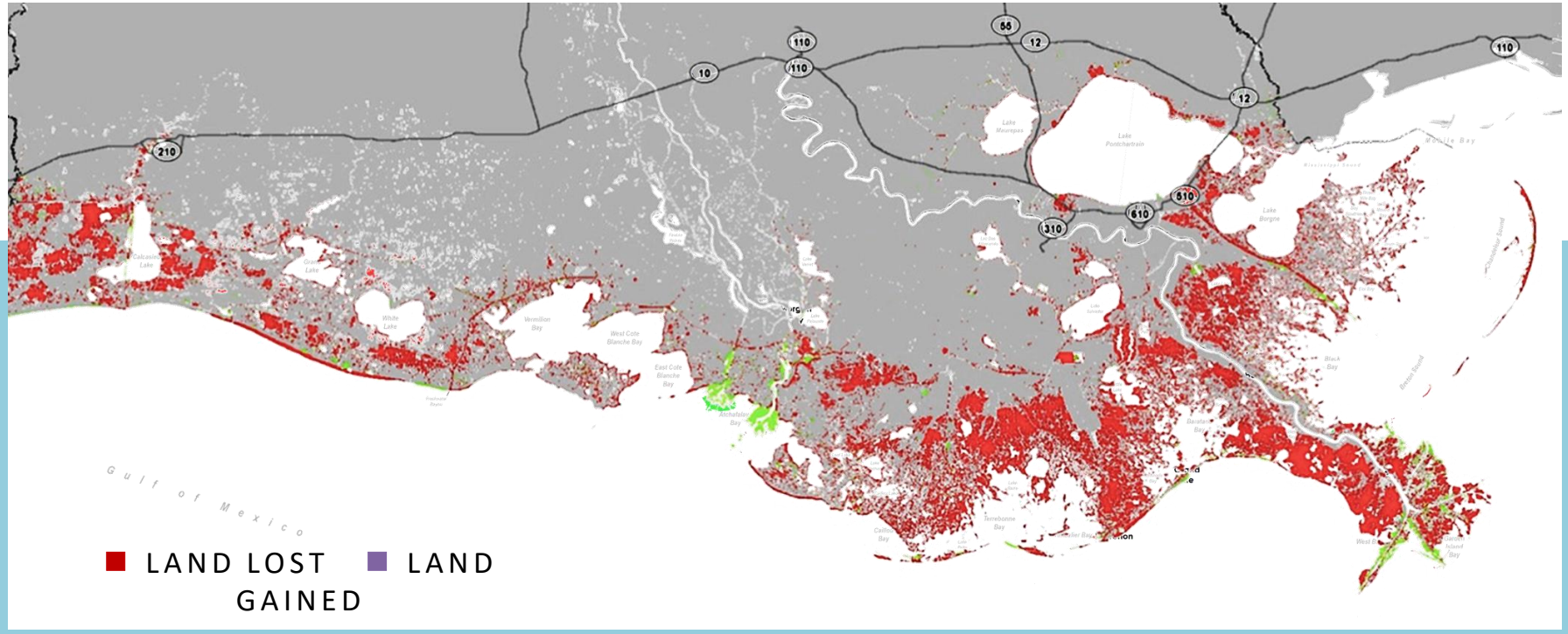
CPRA
Coastal Protection and Restoration Authority of Louisiana

November 17, 2022

committed to **our coast**

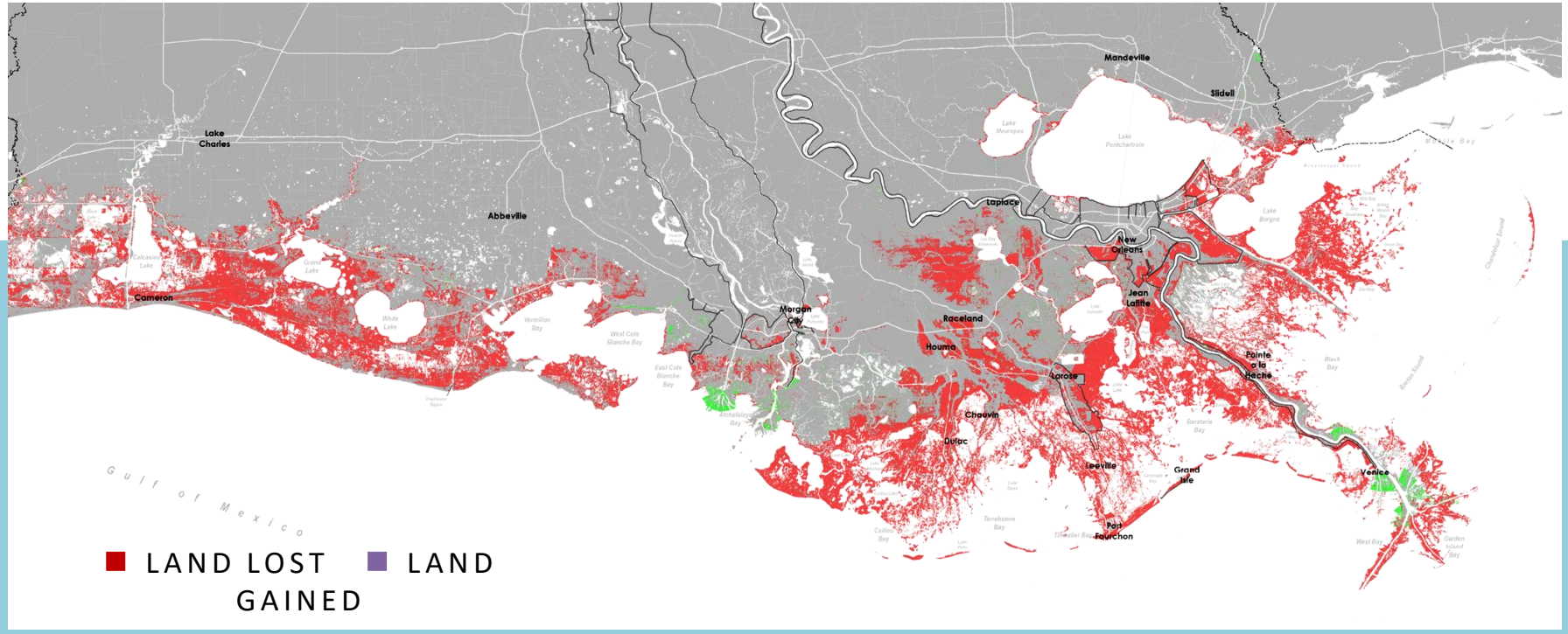
- Louisiana's Land Loss
  - Since 1932

•2,006 square miles



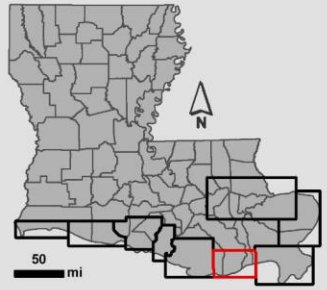
- What We Stand To Lose
  - Year 50

•4,200 square miles



Louisiana Shoreline Change: Late Lafourche Delta Region, 1880s to 2015

Barrier Island Comprehensive Monitoring Program (BICM) - Phase 2



Shoreline Change (ft/yr)

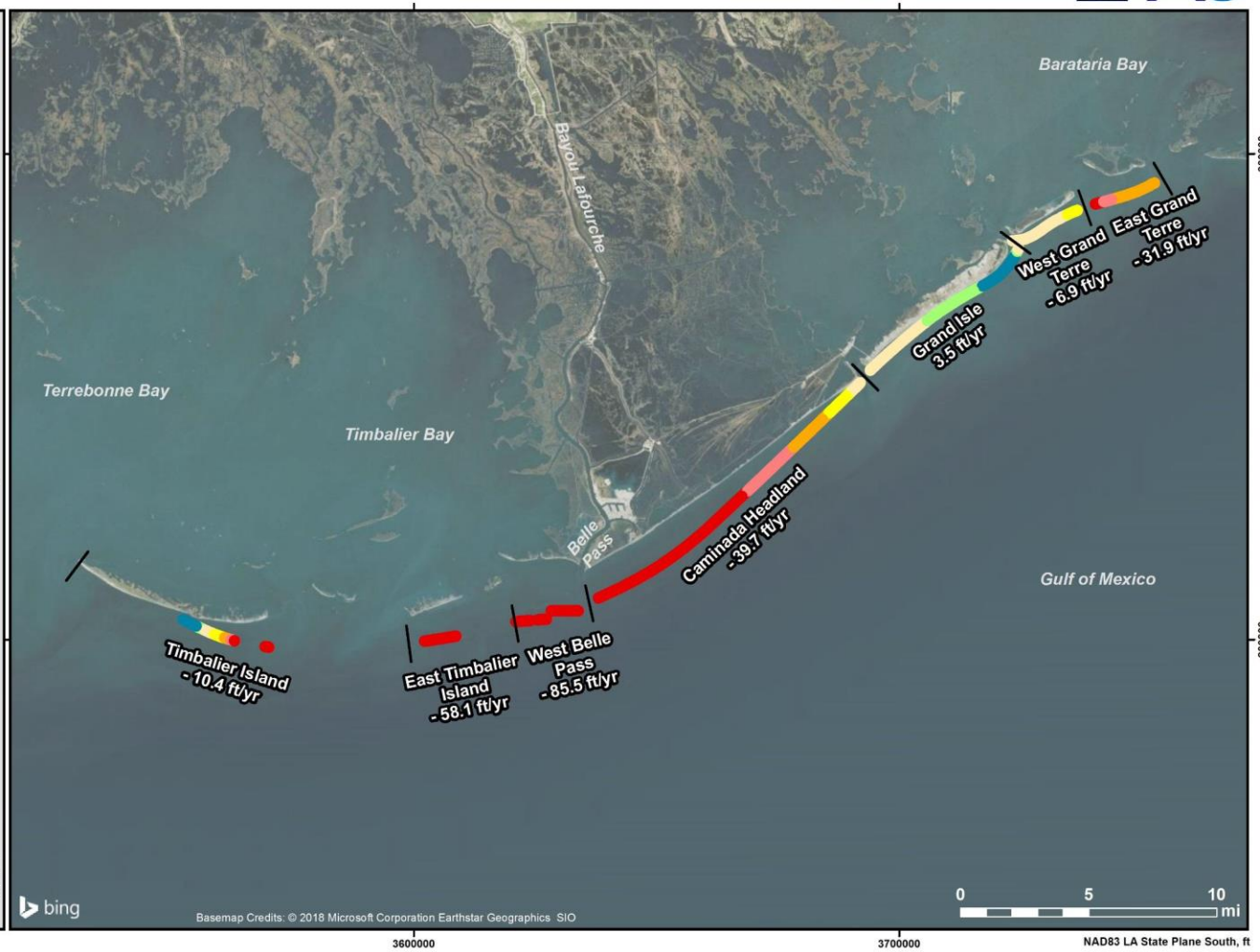
← Erosion Accretion →

> -40 | -30 to -40 | -20 to -30 | -10 to -20 | 0 to -10 | 0 to 10 | 10 to 20 | > 20

Shoreline Data Sources:
US Coast & Geodetic Survey T-Sheets (1877/87)
US Department of Agriculture Aerial Imagery (2015)

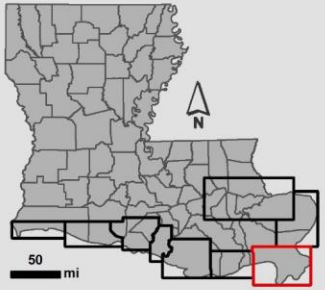
1880s to 2015 Average Shoreline Change by Region (ft/yr)	
Western Chenier Plain	3.4
Eastern Chenier Plain	-18.4
Acadiana Bays	-8.2
Atchafalaya & Wax Lake Deltas	-8.5
Early Lafourche Delta	-19.6
Late Lafourche Delta	**-27.3**
Modern Delta	-19.3
Chandeleur Islands	-31.3
Pontchartrain Basin	-5.5

Source: Byrnes, M.R., J.L. Berlinghoff, S.F. Griffee, and D.M. Lee, 2018. Louisiana Barrier Island Comprehensive Monitoring Program (BICM): Phase 2 - Updated Shoreline Compilation and Change Assessment, 1880s to 2015. Prepared for Louisiana Coastal Protection and Restoration Authority (CPRA) by Applied Coastal Research and Engineering, Mashpee, MA and Metairie, LA.



Louisiana Shoreline Change: Modern Delta Region, 1880s to 2015

Barrier Island Comprehensive Monitoring Program (BICM) - Phase 2



Shoreline Change (ft/yr)

Erosion ← → Accretion

> -40 | -30 to -40 | -20 to -30 | -10 to -20 | 0 to -10 | 0 to 10 | 10 to 20 | > 20

Shoreline Data Sources:
US Coast & Geodetic Survey T-Sheets (1877/83/84)
US Department of Agriculture Aerial Imagery (2015)

1880s to 2015 Average Shoreline Change by Region (ft/yr)	
Western Chenier Plain	3.4
Eastern Chenier Plain	-18.4
Acadiana Bays	-8.2
Atchafalaya & Wax Lake Deltas	-8.5
Early Lafourche Delta	-19.6
Late Lafourche Delta	-27.3
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2017 Master Plan

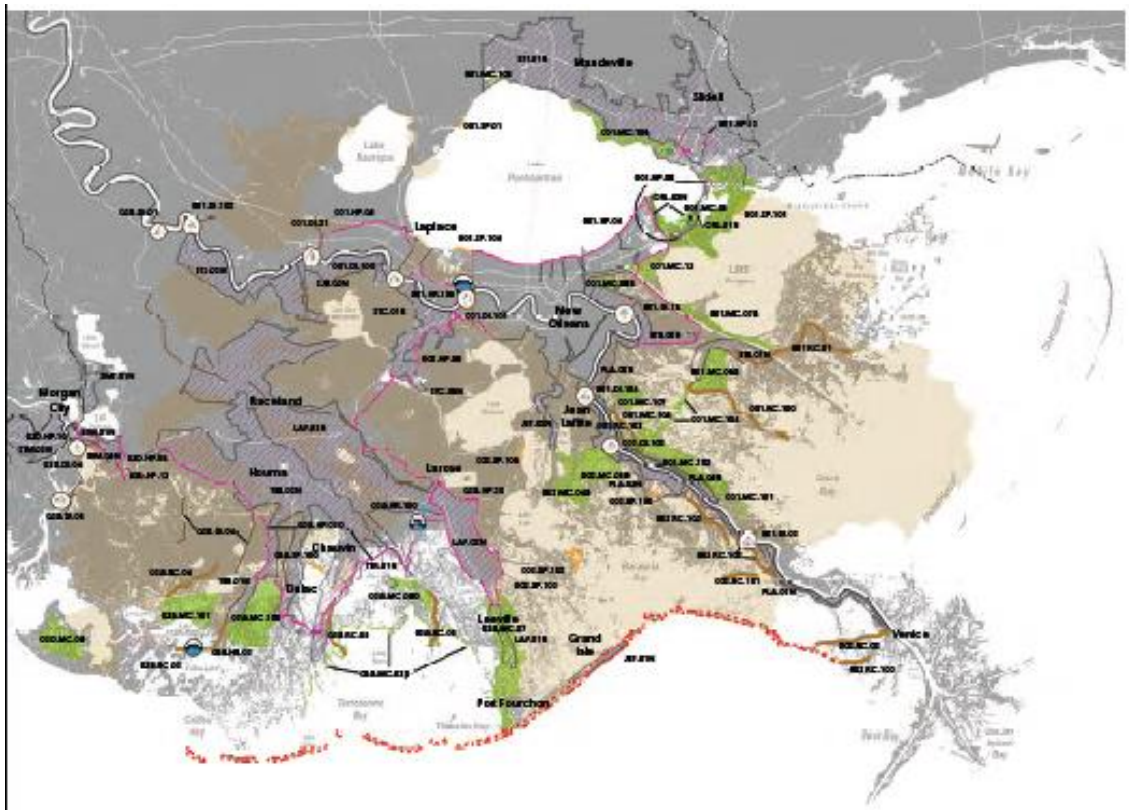
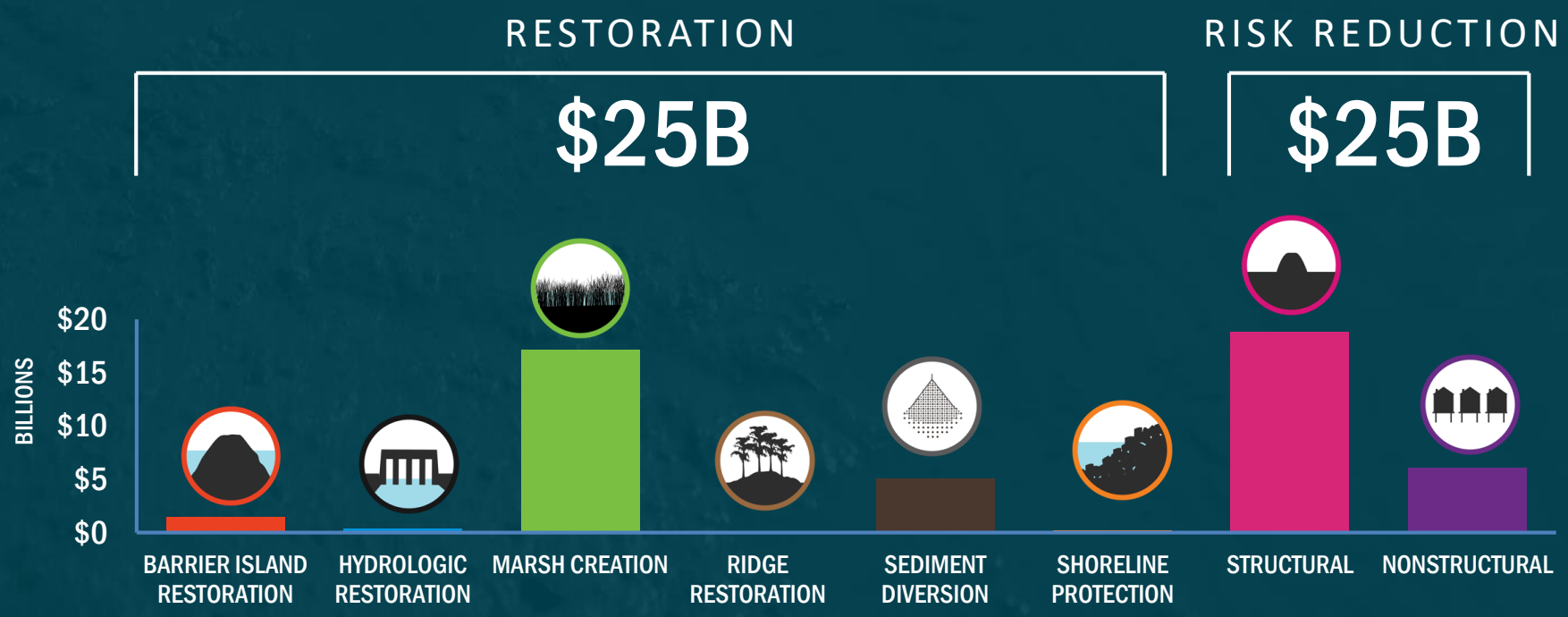


FIGURE ES.5

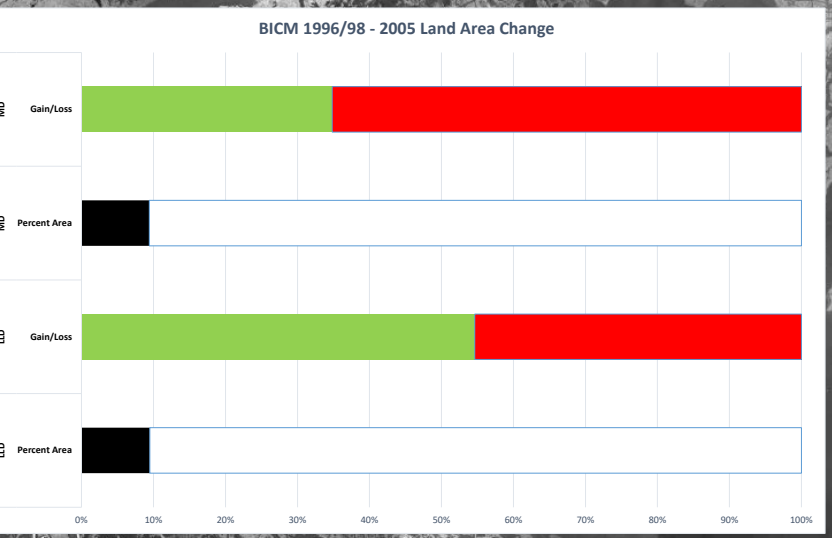
The 2017 Coastal Master Plan includes 79 restoration, 13 structural protection, and 32 nonstructural risk reduction projects that will be implemented throughout coastal Louisiana. Restoration projects build or maintain land and support productive habitat for commercially and recreationally important activities coast wide. Structural protection projects reduce flood risk by acting as physical barriers against storm surge. Nonstructural risk reduction projects elevate and floodproof buildings and help property owners prepare for flooding or move out of areas of high flood risk.

- Coastal Master Plan

- $50B
- total funding



Barataria Basin - Issues



Four islands-West Grand Terre, East Grand Terre, Grand Pierre, and Cheniere Ronquille-had a combined area of just over 1,800 acres in 1990. By 2015, the islands will be reduced to a total of approximately 1,000 acres. East Grand Terre and Grand Pierre are predicted to disappear by 2045, and the remaining islands will consist of only 400 acres.
-LA Coast.gov

LCA Barataria Basin Barrier Shoreline Restoration

Barataria Basin Barrier Shoreline (BBBS) Restoration feature, Caminada Headland and Shell Island (CSI), is to restore and protect the natural barrier shoreline system in order to support reestablishment of a sustainable ecosystem in the Barataria Basin.

-The CSI project is one of the five initial near-term critical restoration.

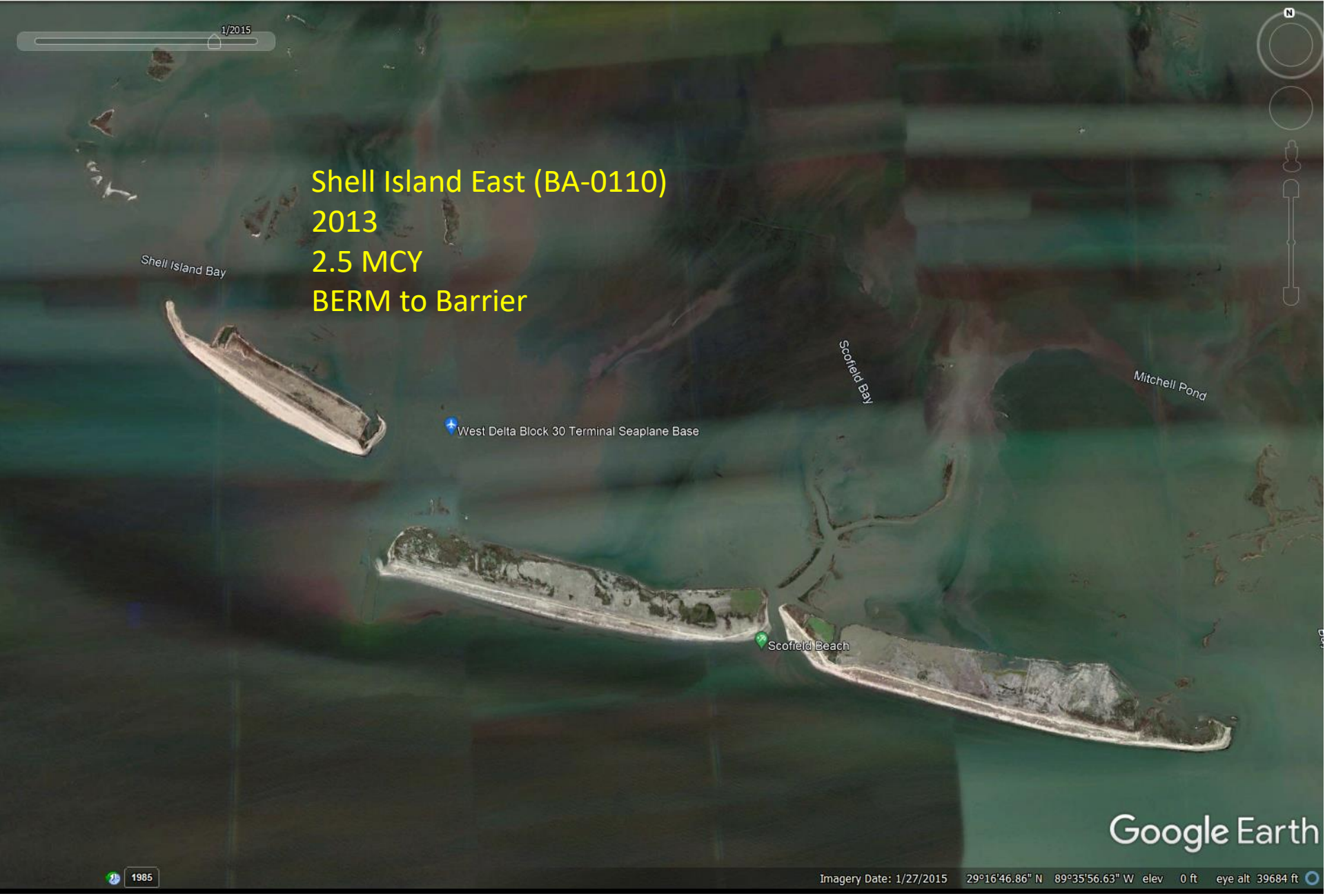
-Considered critical because the barrier shoreline in the Barataria Basin is among those experiencing the highest erosion rate.

-Relatively advanced levels of investigations already performed in this area provide the potential for construction within the next 10 years.

Barataria Basin Barrier Shoreline – CSI Alternative

12/2010
Shell Island Bay
West Delta Block 30 Terminal Seaplane Base
Scofield Bay
Mitchell Pond
Scofield Beach
Image © 2022 Maxar Technologies
Image USDA/FPAC/GEO
Google Earth
1985
Imagery Date: 12/31/2009 29°17'47.44" N 89°36'37.01" W elev 0 ft eye alt 39684 ft

2010

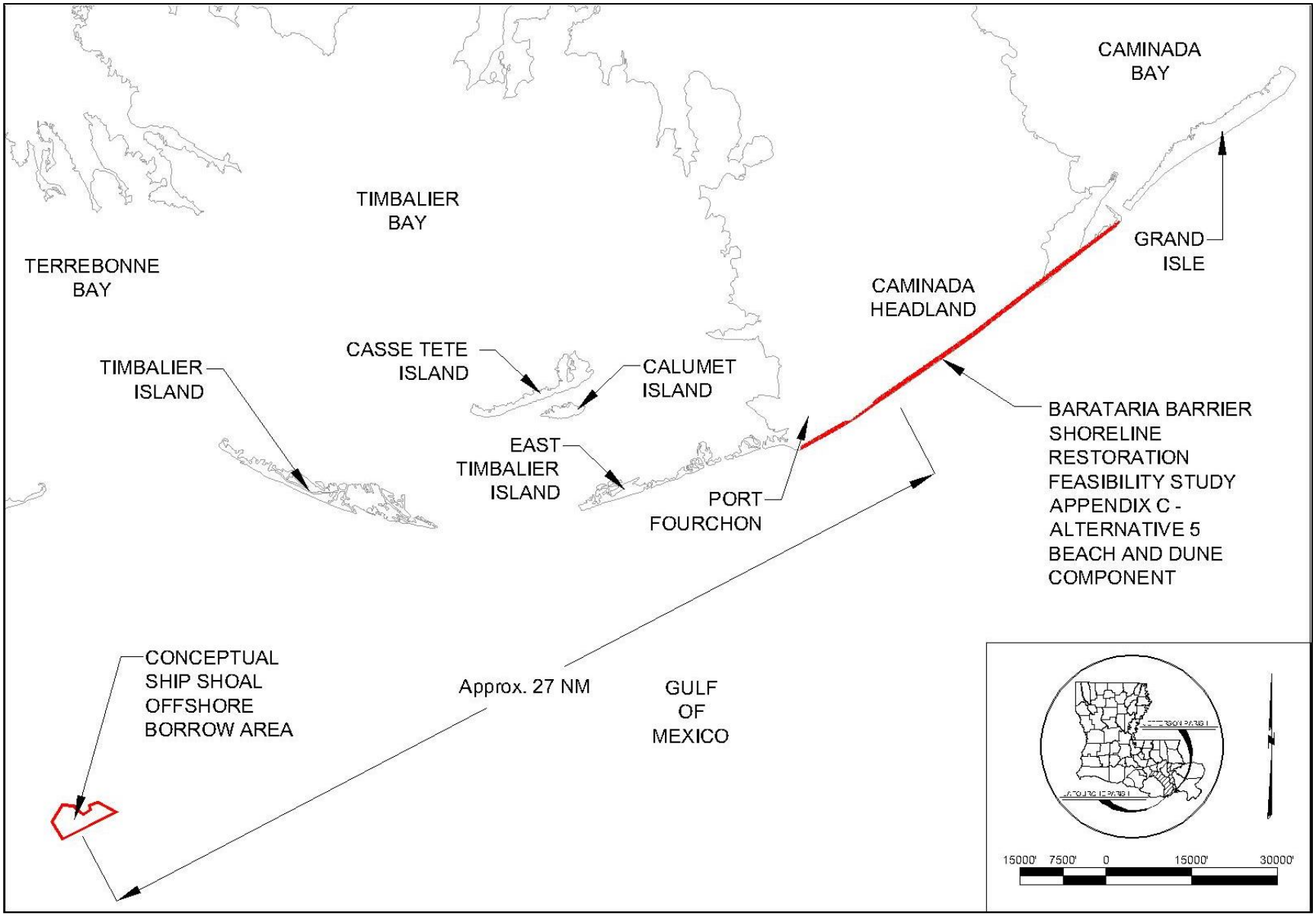

Shell Island East (BA-0110)
2013
2.5 MCY
BERM to Barrier
Shell Island Bay
Scofield Bay
Mitchell Pond
West Delta Block 30 Terminal Seaplane Base
Scofield Beach
Google Earth
1/2015
1985
Imagery Date: 1/27/2015 29°16'46.86" N 89°35'56.63" W elev 0 ft eye alt 39684 ft

2015

1/2021
Shell Island West (BA-0111)
2017
5.8 MCY
DWH - NRDA
Shell Island Bay
Scofield Bay
Mitchell Pond
West Delta Block 30 Terminal Seaplane Base
Scofield Beach
Image © 2022 Maxar Technologies
Google Earth
1985
Imagery Date: 1/17/2021 29°17'08.08" N 89°35'05.27" W elev 0 ft eye alt 39684 ft

2021

PROJECT LOCATION MAP



COASTAL ENGINEERING CONSULTANTS INC.

Project Overview

11/2012
Grand Isle Beach
Elmer's Island Wildlife Refuge
Elmer's Island Beach
1
1
InterMoor
Port Fourchon
Google Earth
29°09'18.08" N 90°12'11.00" W elev 1 ft eye alt 12.03 mi

2012

Caminada Beach and Dune INCR1 (BA-0045)
2015
2.9 MCY
CIAP/State Surplus
1/2015
Grand Isle Beach
Elmer's Island Wildlife Refuge
Elmer's Island Beach
InterMoor
Port Fourchon
Image © 2022 Maxar Technologies
Image USDA/FPAC/GEO
Google Earth
29°08'50.92" N 90°07'07.11" W elev 2 ft eye alt 12.03 mi

2015

Caminada Beach and Dune INCR2 (BA-0143)
2016
4.9 MCY
NFWF - GEBF
2/2022
Grand Isle Beach
Elmer's Island Wildlife Refuge
Elmer's Island Beach
InterMoor
Port Fourchon
Image © 2022 Maxar Technologies
Google Earth
Imagery Date: 9/10/2021 29°08'04.92" N 90°04'20.12" W elev -28 ft eye alt 12.03 mi

2022

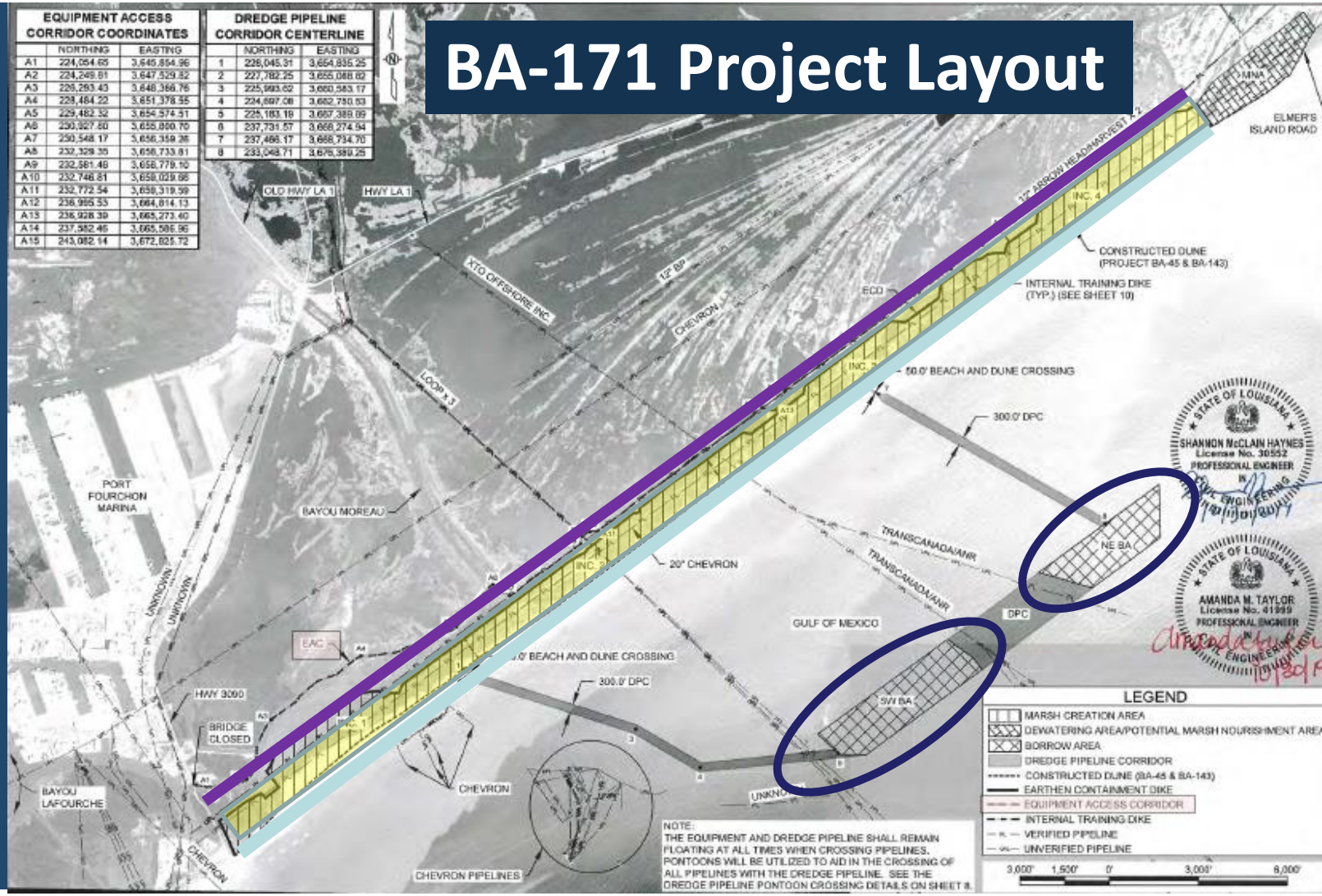
BA-171 Project Layout

8 + miles of northern earthen containment dikes

4 + miles of southern earthen containment dikes

Marsh fill/creation area

Two borrow sites in GOM



North ECD Under Construction - Pre-storms

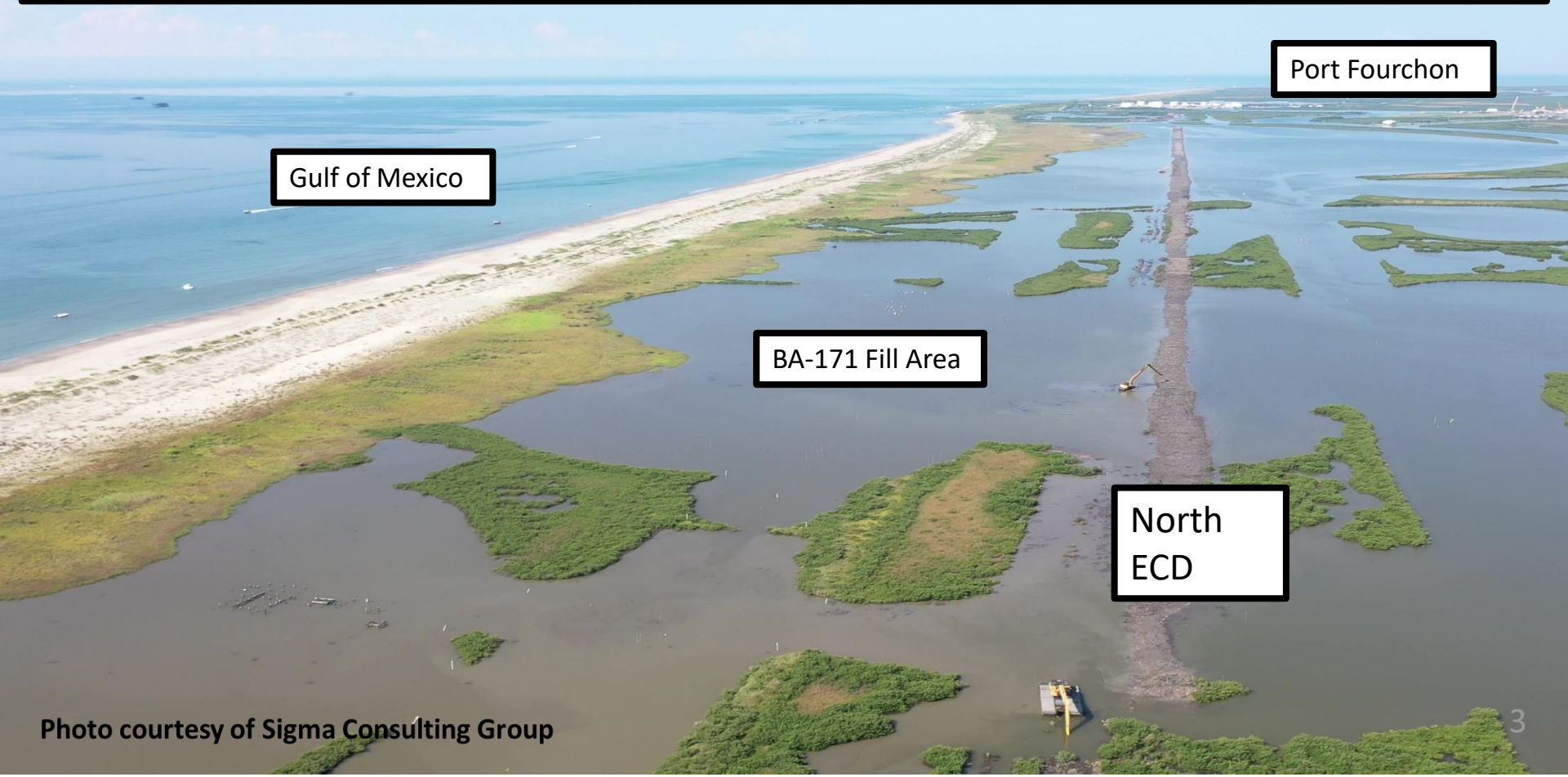


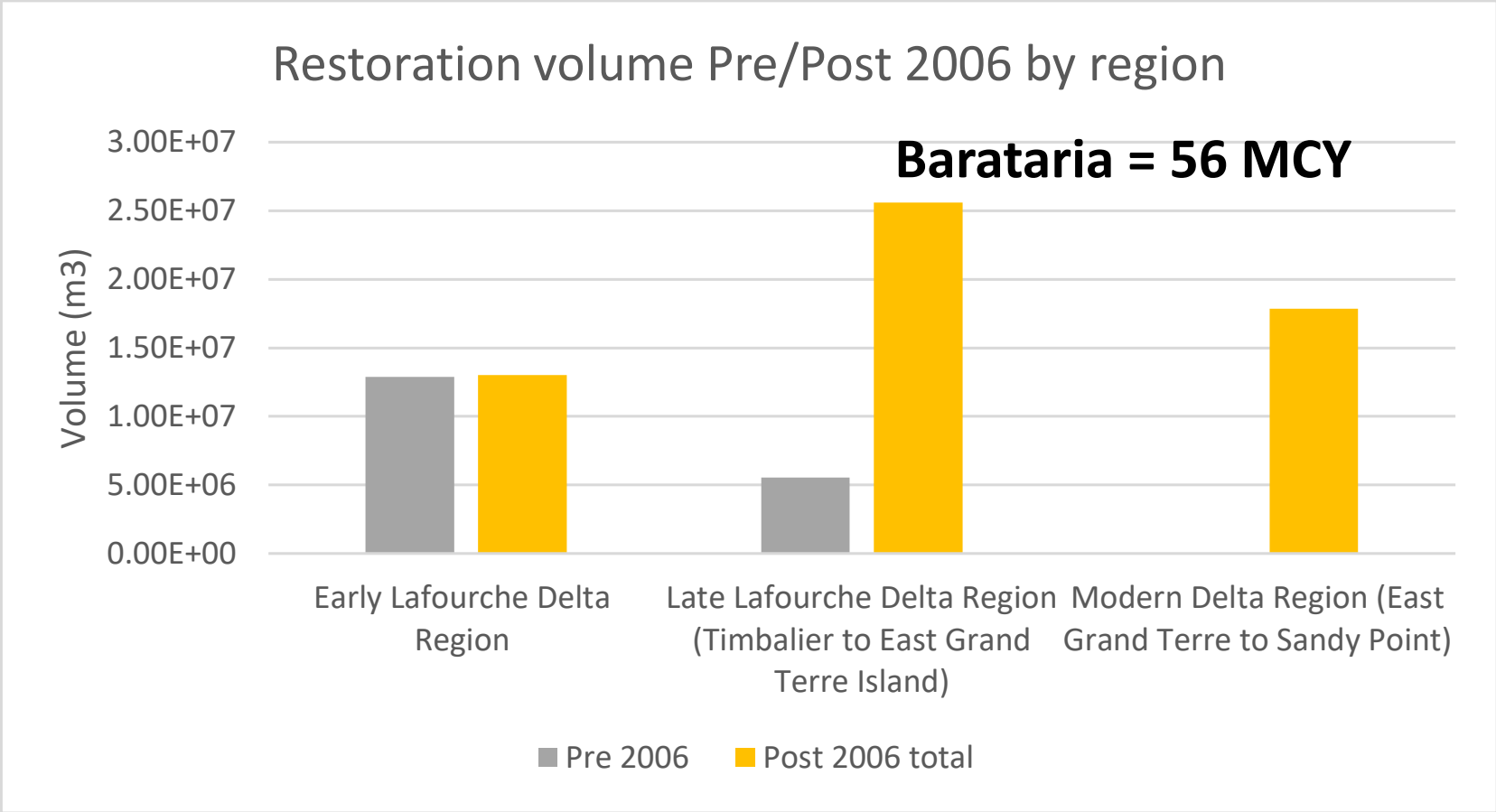
Photo courtesy of Sigma Consulting Group

Dredging Underway August 2022

Photo courtesy of Sigma Consulting Group

Newly Placed Dredged Material

LOUISIANA BARRIERS ISLANDS RESTORATION PROJECTS



*** Since the 1990's, approx. **98 Million yrd^3** of sediment has been used to nourish LA barrier islands along the central portion of the coast.

Barataria Basin Barrier Shoreline Restoration

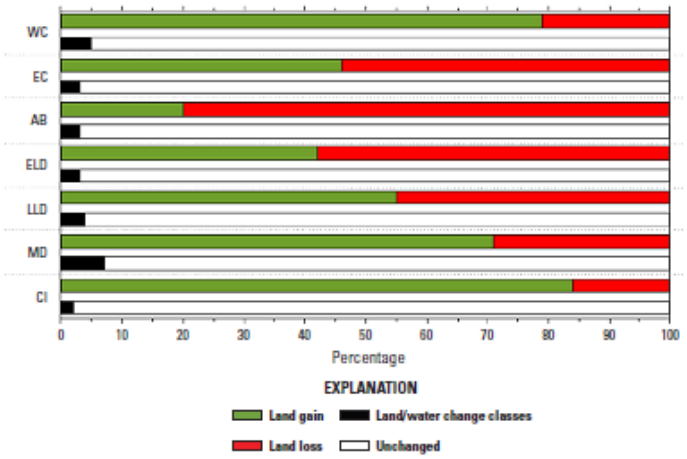
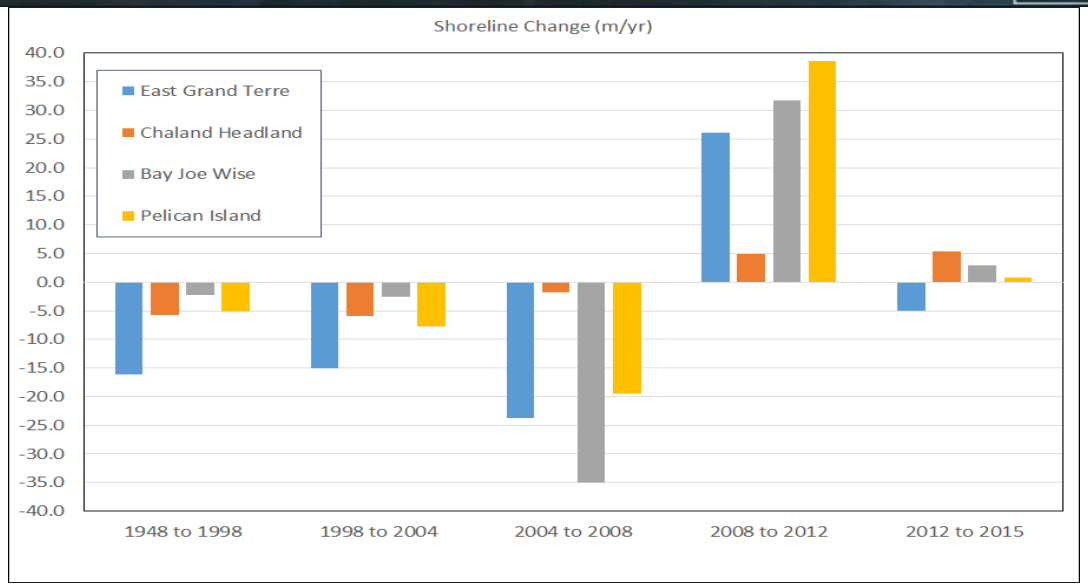


Figure 12. The percentages of areal coverage for land/water change classes (table 5), by Louisiana Barrier Island Comprehensive Monitoring Program region. For each region, the first bar shows the percentage of change made up by each change class, and the second bar shows the percentage of cover for changed and unchanged classes. [WC, West Chenier Plain; EC, East Chenier Plain; AB, Acadiana Bays; ELD, Early Lafourche Delta; LLD, Late Lafourche Delta; MD, Modern Delta; CI, Chandeleur Islands]



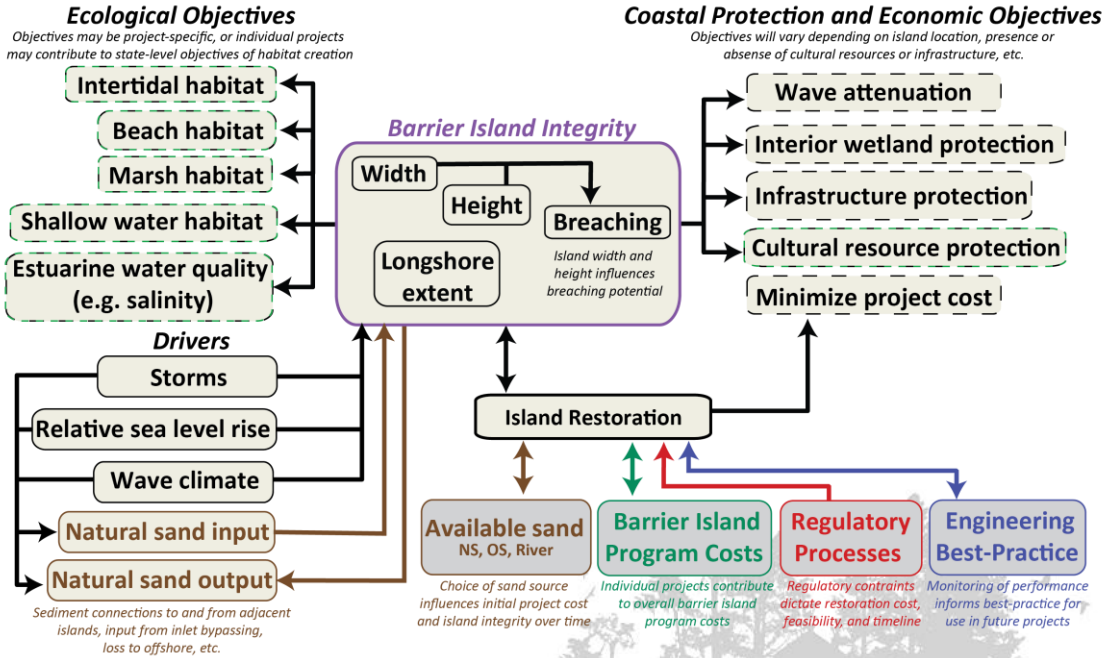
Courtesy of APTIM (Benedet and Pierro, IN PRESS)

Future Assessments

- Land Changes
- Habitat Changes
- Shoreline Lengths
- Tidal Pass Cross-Sections
- Sediment Volumes
- Elevation Changes
- Shoreface Slope Changes
- Cost Benefits

Future Efforts

- Continued Restoration
  - Achieve CMP Goals thru Cooperation among various programs and funding sources
- Utilize Systemic/Holistic Project Integration
  - Barrier Island System Management (BISM)



QUESTIONS?

BA-0143 Caminada Headlands (approx. 4 yrs post fill)