

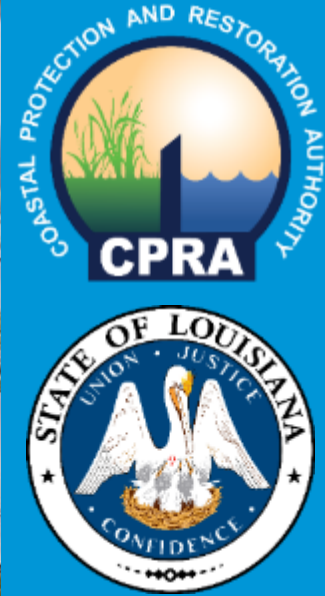
COASTAL PROTECTION AND RESTORATION AUTHORITY

Progression of Barrier Island Restoration in Louisiana

ICCE Conference

August 3, 2018

Jerry Carroll



committed to **our coast**

Louisiana's Coastal Emergency

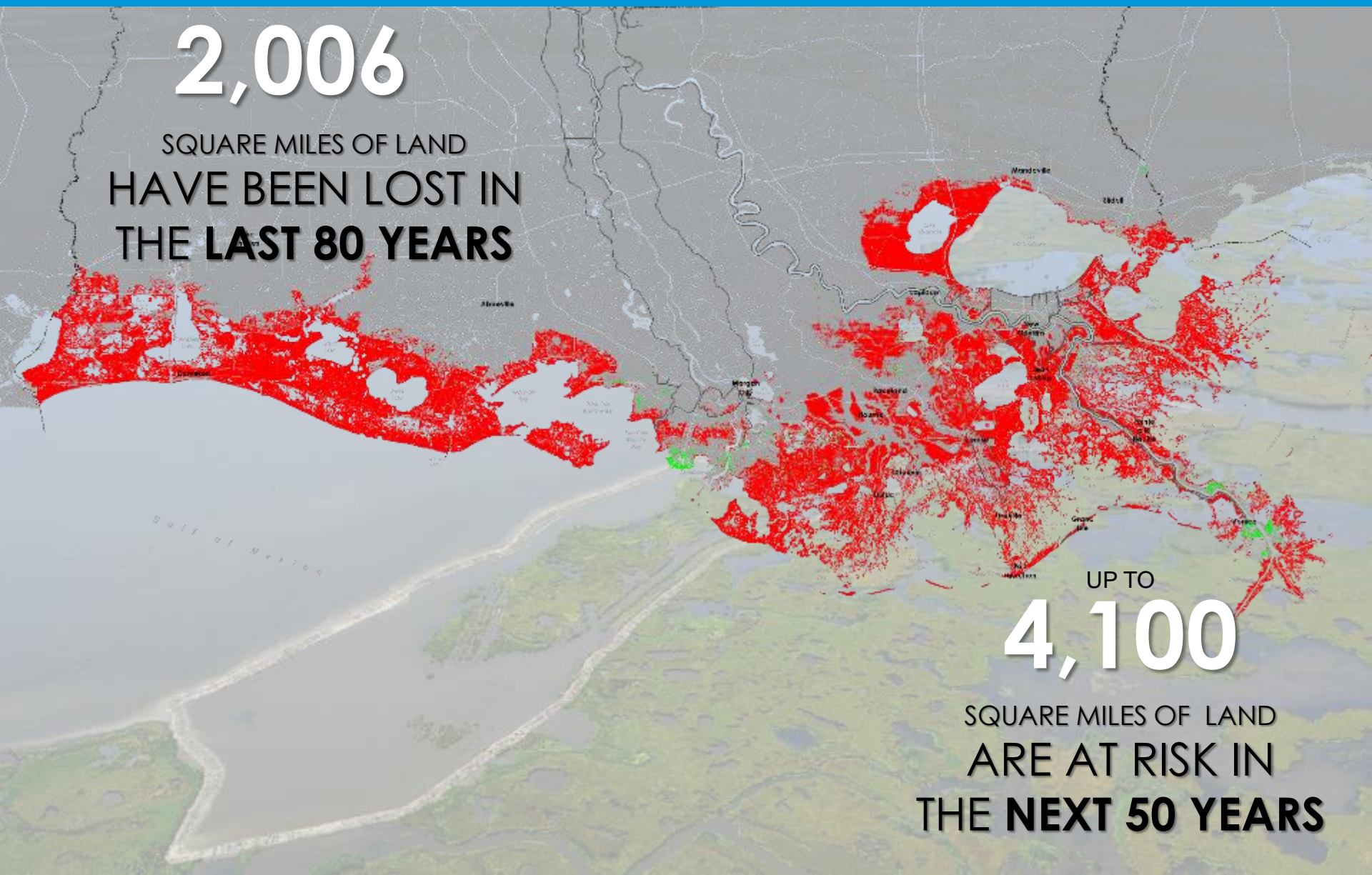


2,006

SQUARE MILES OF LAND
HAVE BEEN LOST IN
THE **LAST 80 YEARS**

UP TO
4,100

SQUARE MILES OF LAND
ARE AT RISK IN
THE **NEXT 50 YEARS**

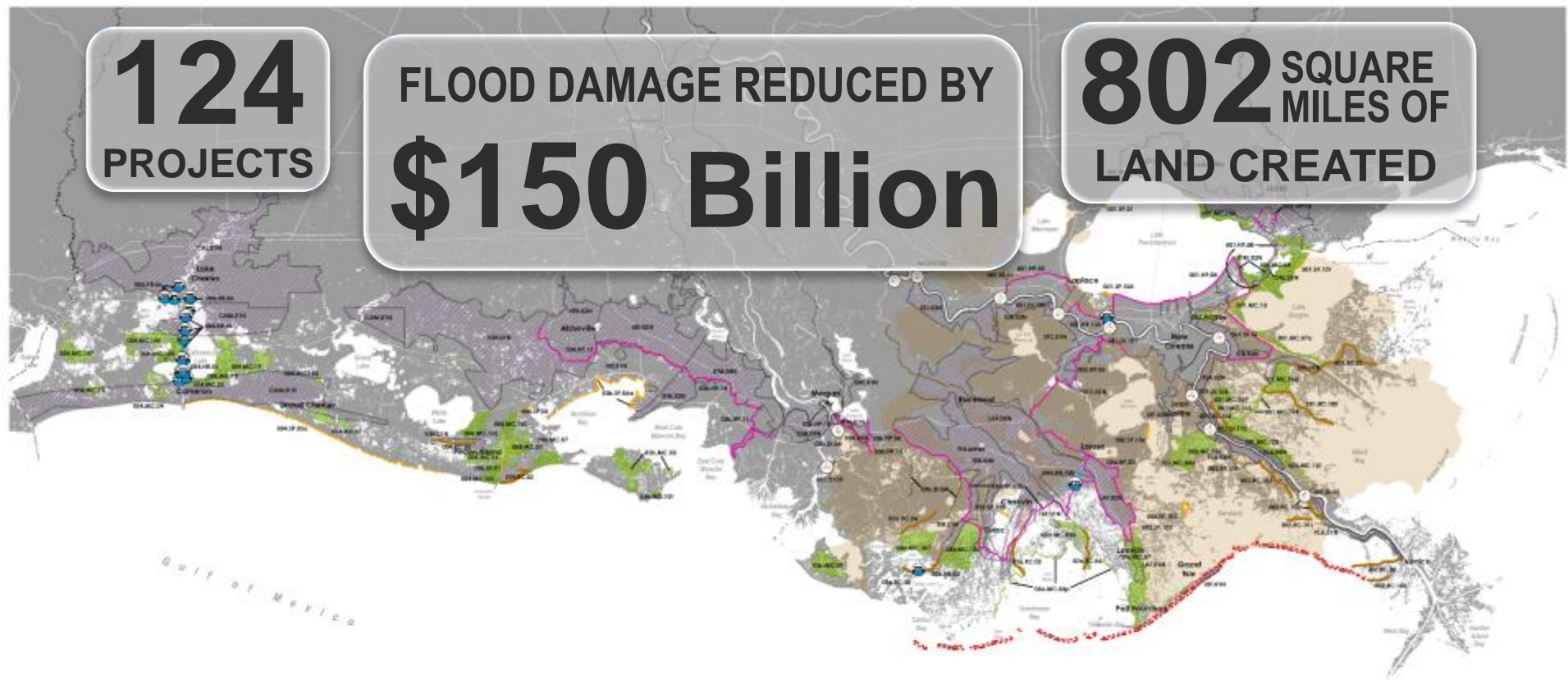


Louisiana's 2017 Coastal Master Plan

124
PROJECTS

FLOOD DAMAGE REDUCED BY
\$150 Billion

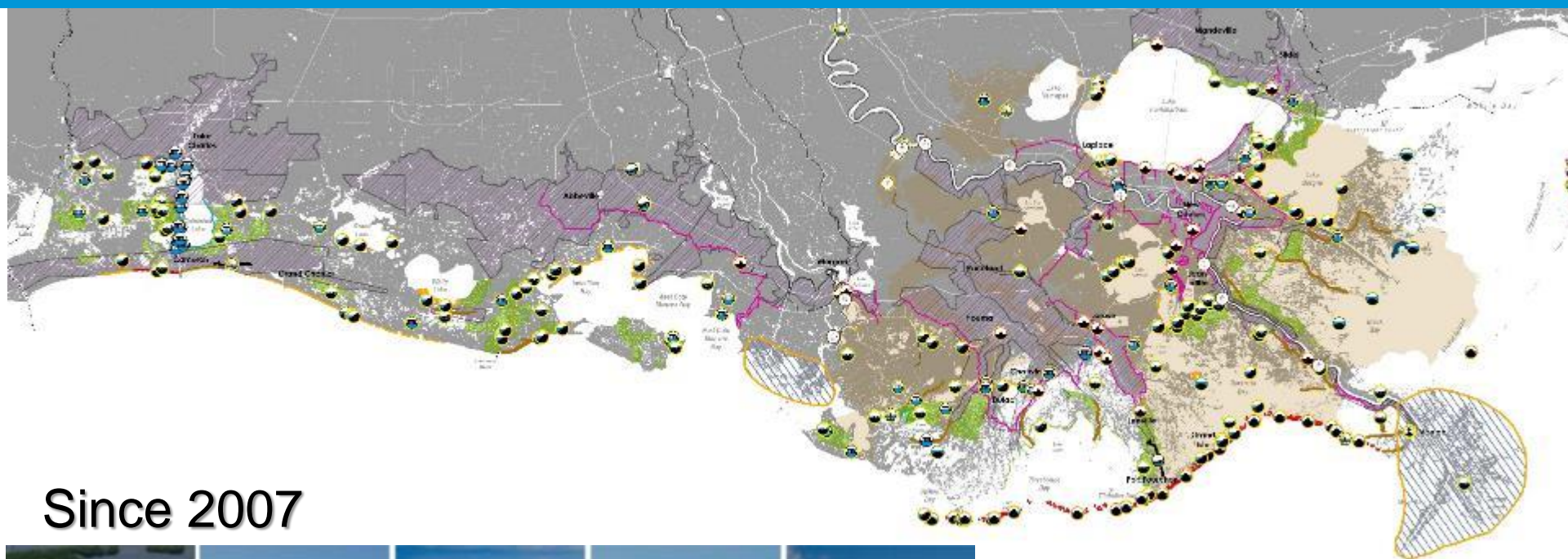
802 SQUARE
MILES OF
LAND CREATED



- Structural Protection
- Nonstructural Risk Reduction
- Ridge Restoration
- Shoreline Protection
- Barrier Island Restoration
- Marsh Creation
- Sediment Diversion
- Hydrologic Restoration

Small scale hydrologic restoration and oyster reef/living shoreline projects are included programmatically in the 2017 Coastal Master Plan. Consistency of individual projects will be determined on a case-by-case basis.

A Decade of Progress



Since 2007



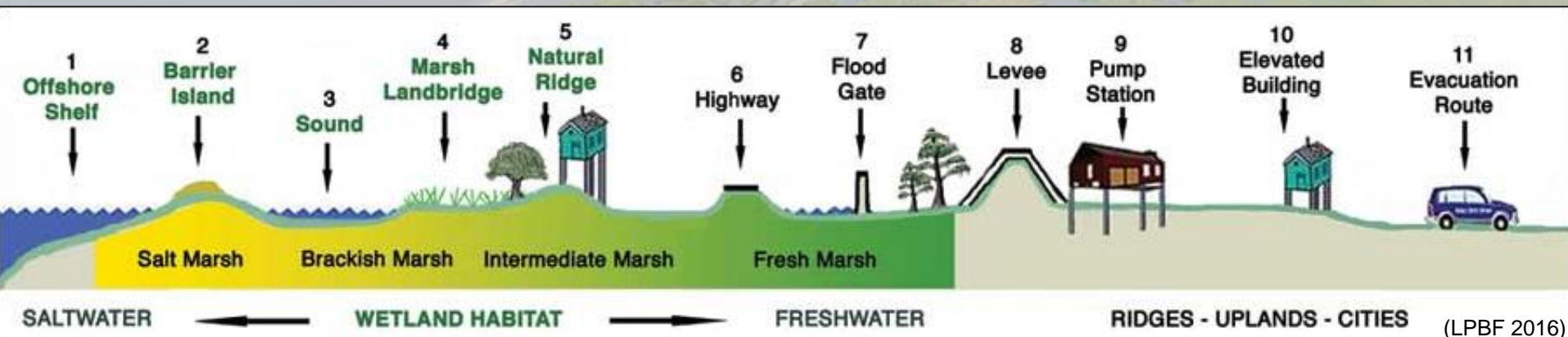
Barrier Island System of Louisiana



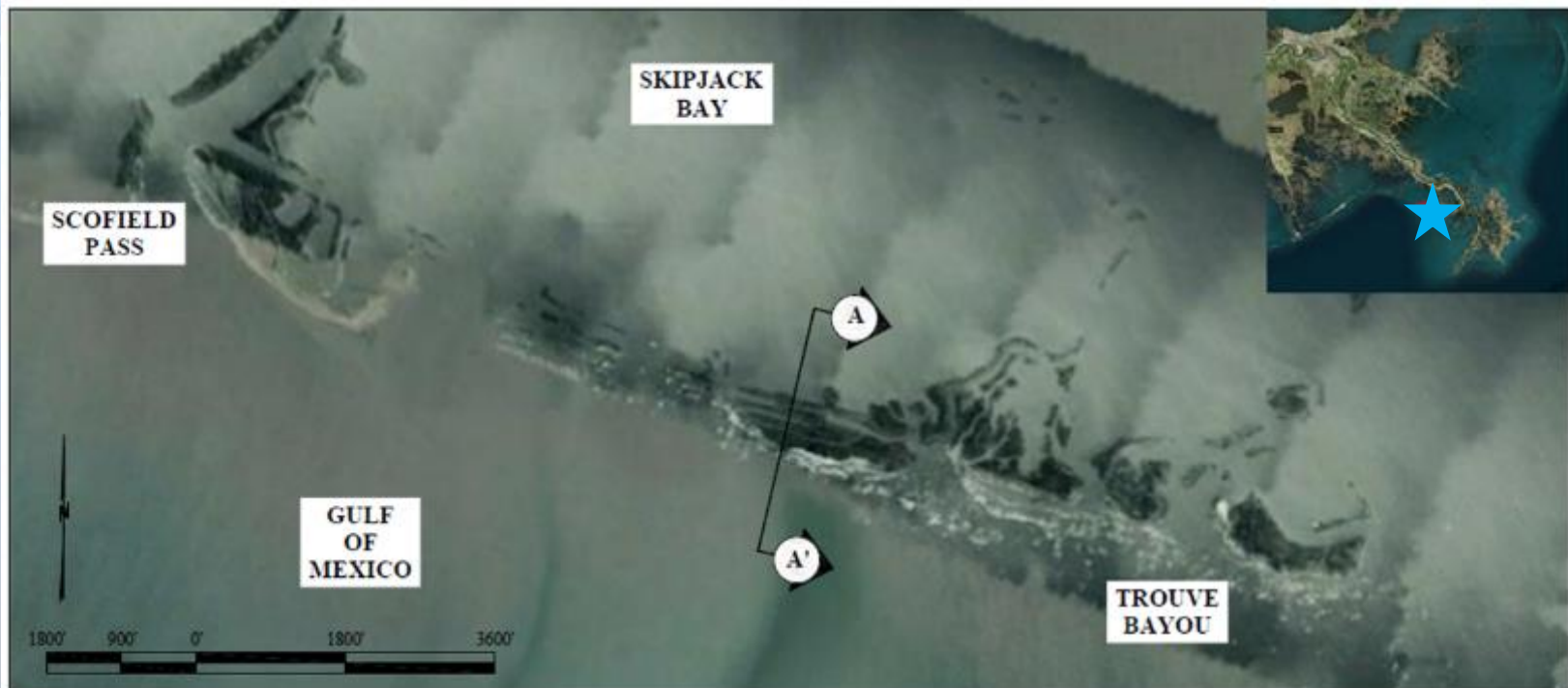
- BIs though dynamic are degrading (55% decline in 100 years @ 155 acres/yr.)
- Soft engineering option or “Dynamic Preservation”
- Health of BI System is related to the health of broader ecosystem

Importance of Barrier Islands

- First line of defense
- Storm surge reduction
- Wave and Wind energy reduction
- Provide various habitats (beach, dune, and marsh)
- Critical habitat for flora and fauna
- Wildlife refuges (Terrebonne Barrier Islands Refuge, Breton National Wildlife Refuge)
- Local community & tourism

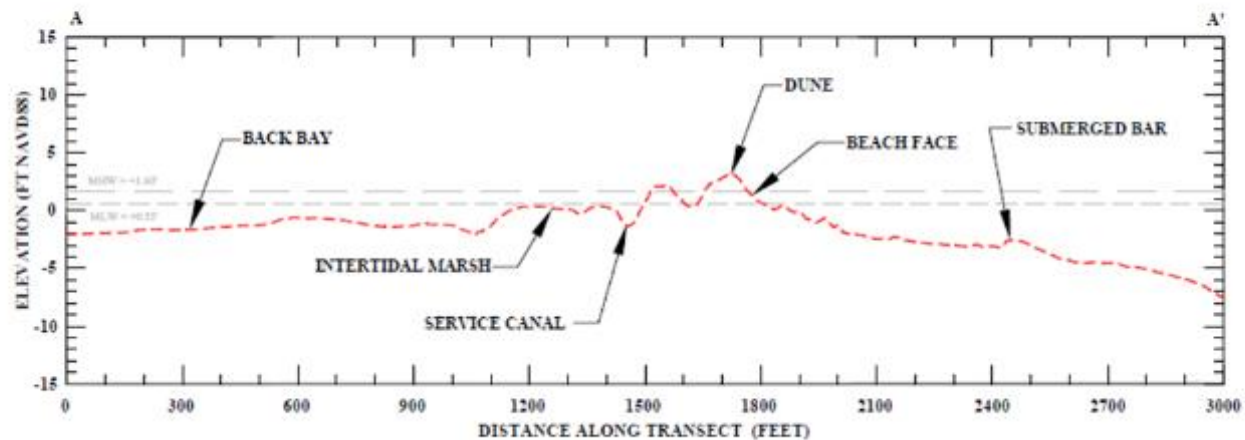


Scofield Island 2008



LEGEND:
--- EXISTING
GRADE (2008)

NOTES:
AERIAL IMAGE FROM
GOOGLE EARTH AND IS
DATED 9/1/2008



Coastal Wetlands Planning, Protection and Restoration Act, (CWPPRA)



- Enacted in 1990
- Designed to identify, prepare, and fund construction of coastal wetland restoration projects
- Annual budget varies but has ranges between \$30 and \$80 million
- First CWPPRA Barrier Island Restoration in 1997

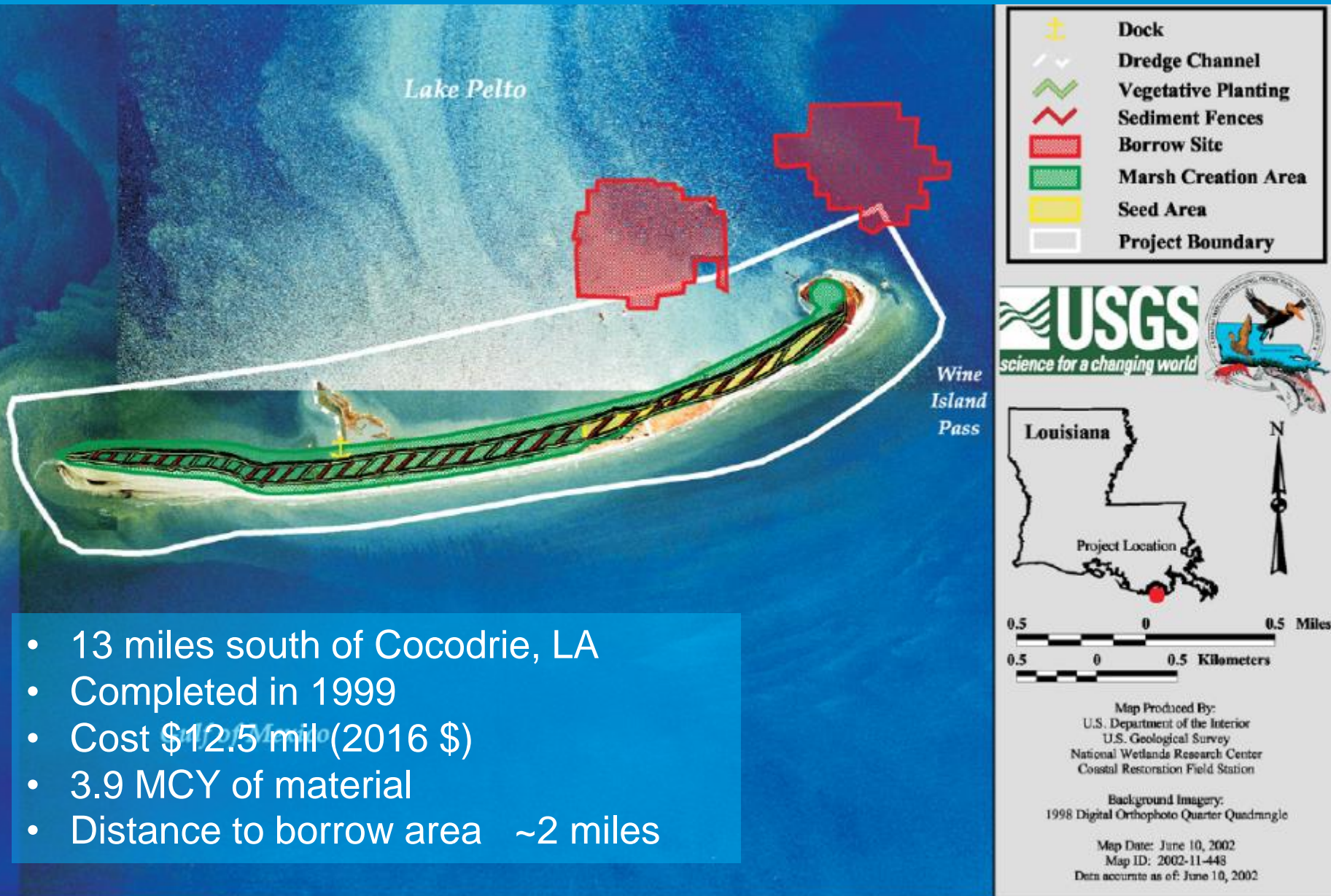
CWPPRA

Coastal Wetlands Planning,
Protection, and Restoration Act

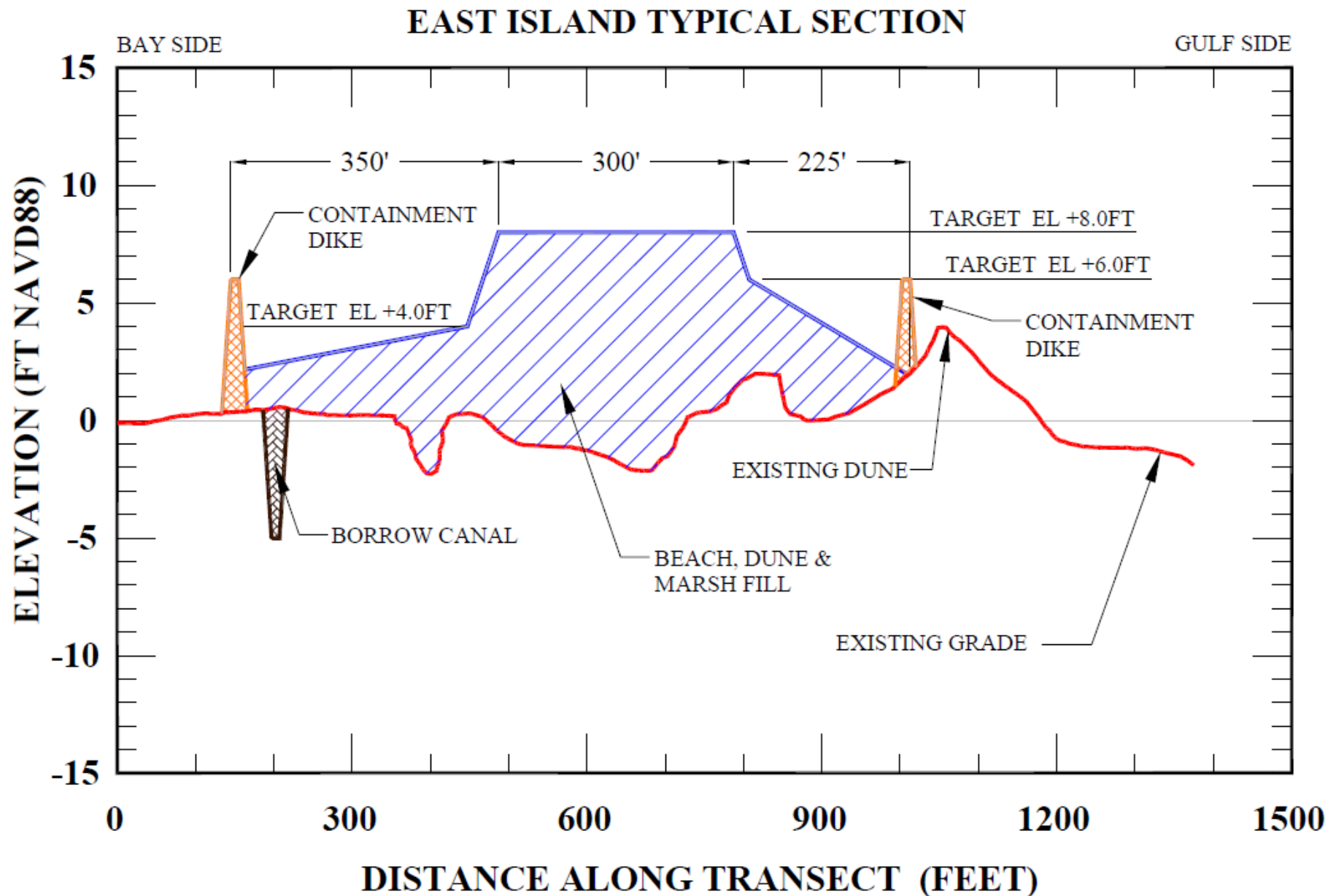


Restoring Coastal Louisiana since 1990

Isle Dernieres Restoration – East Island (TE-20)



Isle Dernieres Restoration – East Island (TE-20)



Timbalier Island Restoration (TE-40)



Terrebonne Bay

Cat Island
Pass

B

Caillou Pass

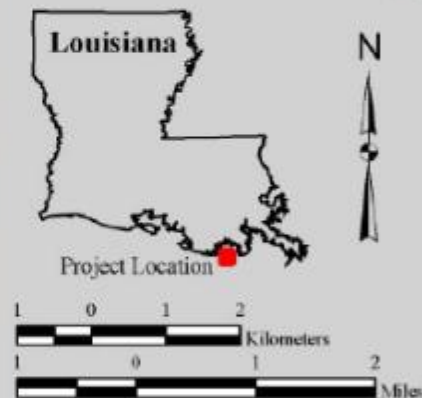
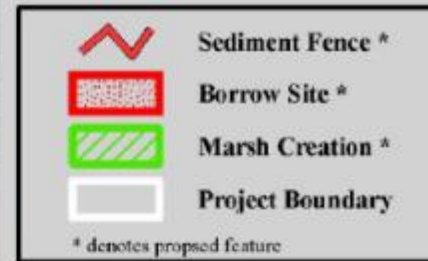
Timbalier Island

Brush
Island

A

Gulf of Mexico

- 15 miles west of Port Fourchon, LA
- Completed in 2005
- Cost \$15.2 mil (2016 \$)
- 4.1 MCY of material
- Distance to borrow area ~5 miles



Produced by:
U.S. Department of the Interior
U.S. Geological Survey
National Wetlands Research Center
Coastal Restoration Field Station

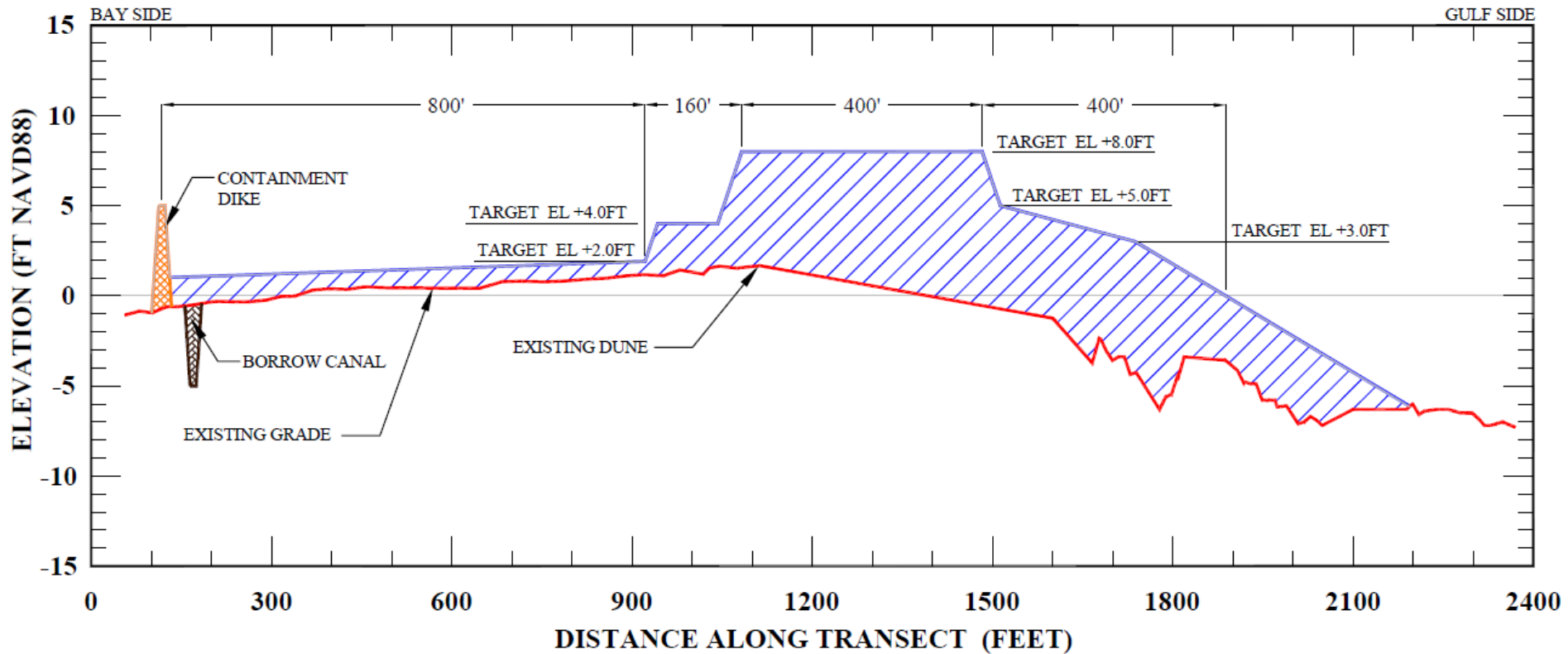
Background Imagery:
2004 Digital Orthophoto Quarter Quadrangle

Map Date: March 31, 2006
Map ID: USGS-NWRC 2006-11-0268
Data accurate as of: March 31, 2006

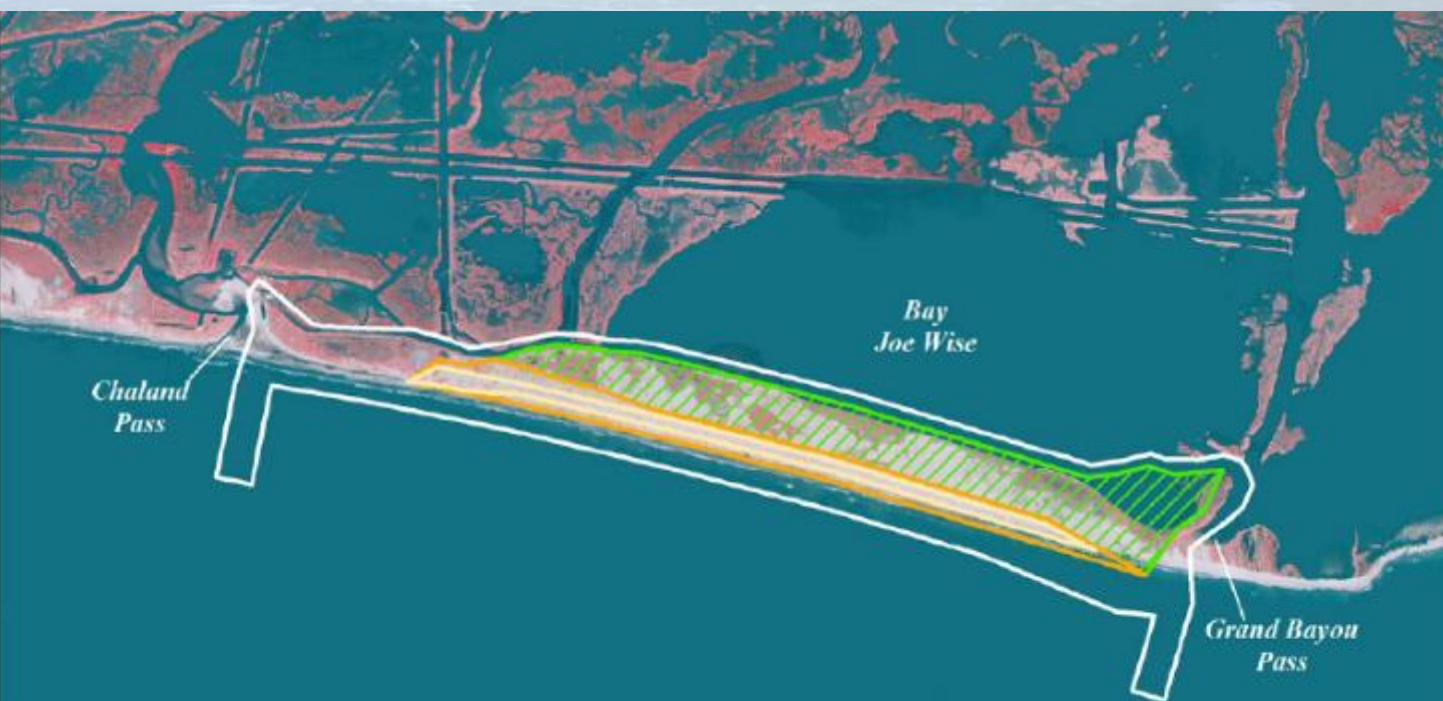
Timbalier Island Restoration (TE-40)



TIMBALIER ISLAND TYPICAL SECTION



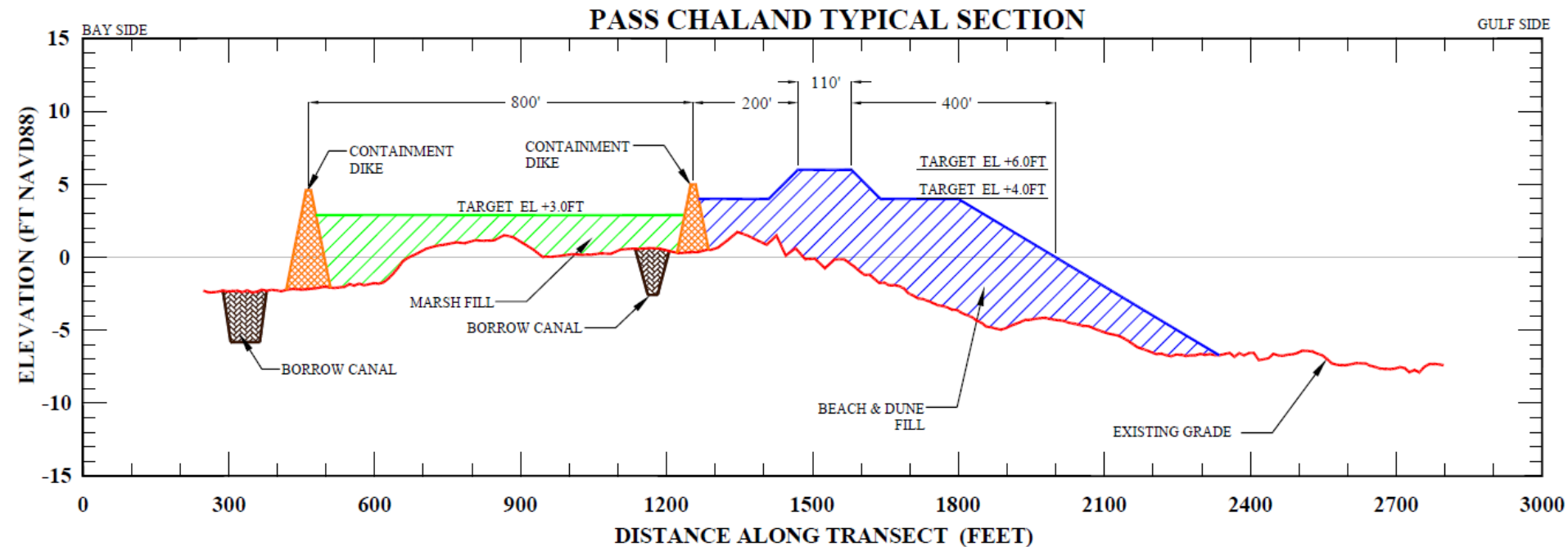
Pass Chaland to Grand Bayou Pass Barrier Shoreline Restoration Project (BA-35)



- 15 miles east of Grand Isle, LA
- Completed in 2009
- Cost \$39 mil (2016 \$)
- 3 MCY of material
- Distance to BA ~8 miles

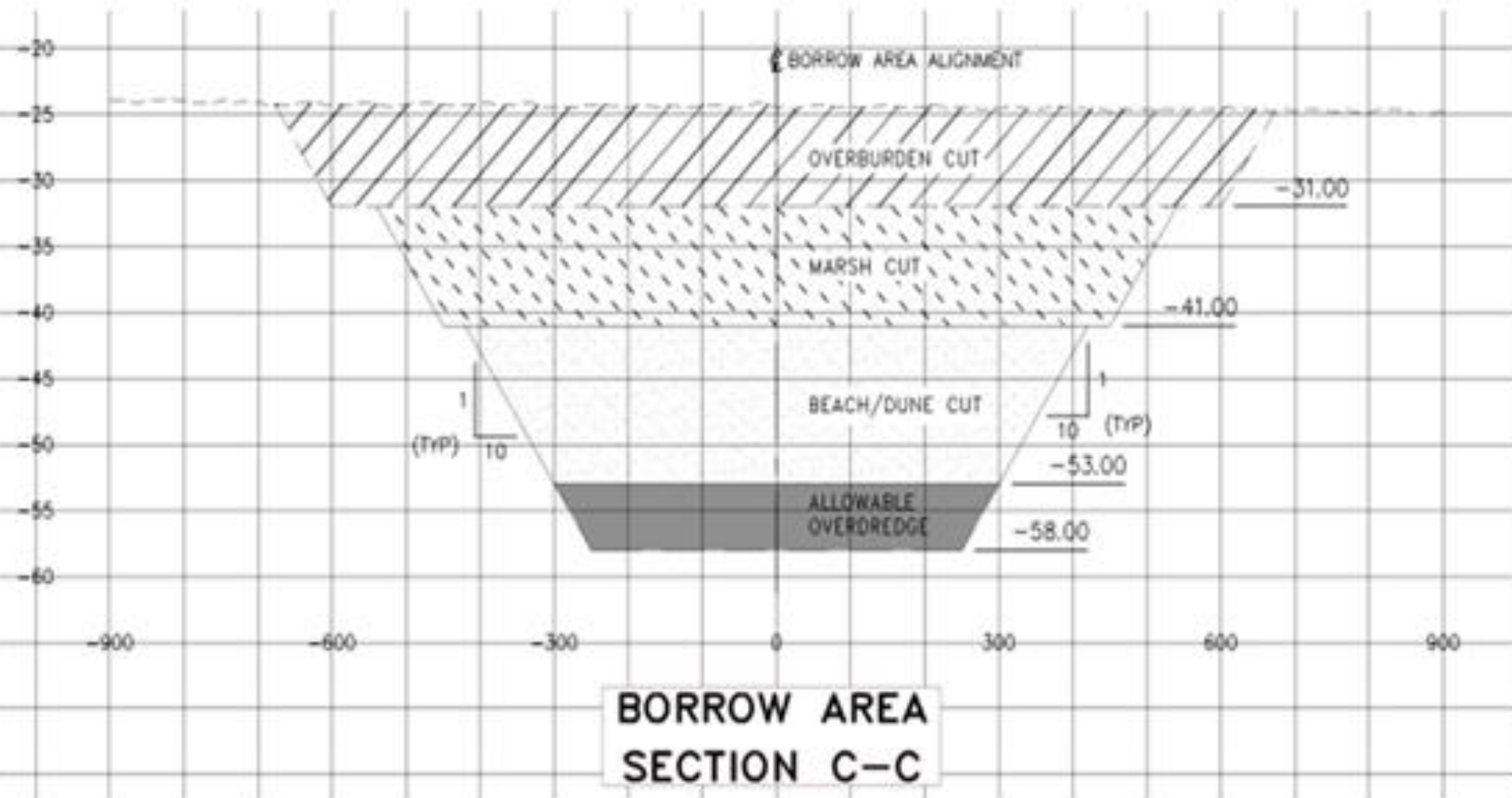


Pass Chaland to Grand Bayou Pass Barrier Shoreline Restoration Project (BA-35)

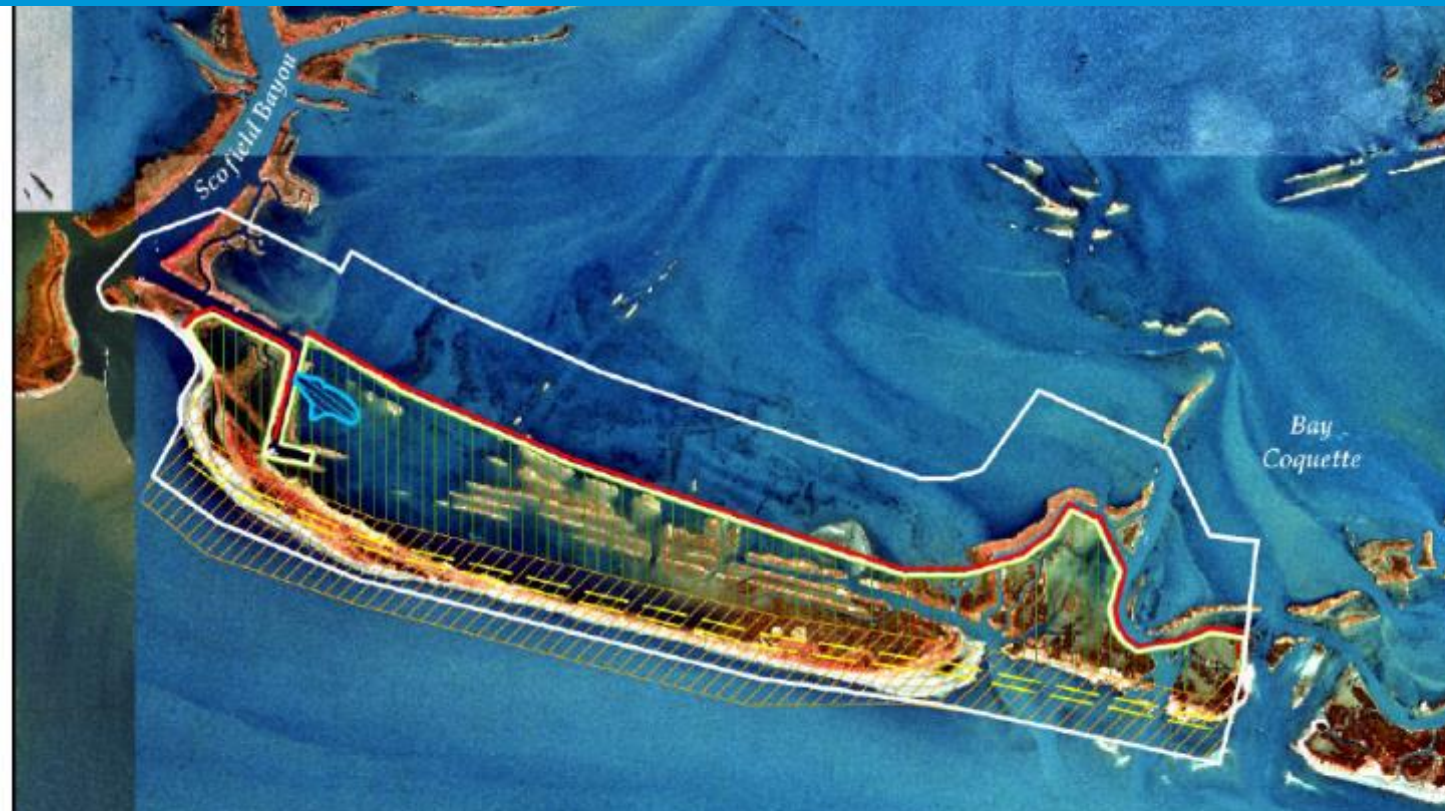




Pass Chaland to Grand Bayou Pass Barrier Shoreline Restoration Project (BA-35)



Riverine Sand Mining/ Scofield Island Restoration (BA-40)



- Sand Fencing *
- Tidal Pond *
- Beach/Dune Fill *
- Borrow Canal *
- Containment Dike *
- Marsh Fill *
- Project Boundary

* denotes proposed features

USGS
science for a changing world



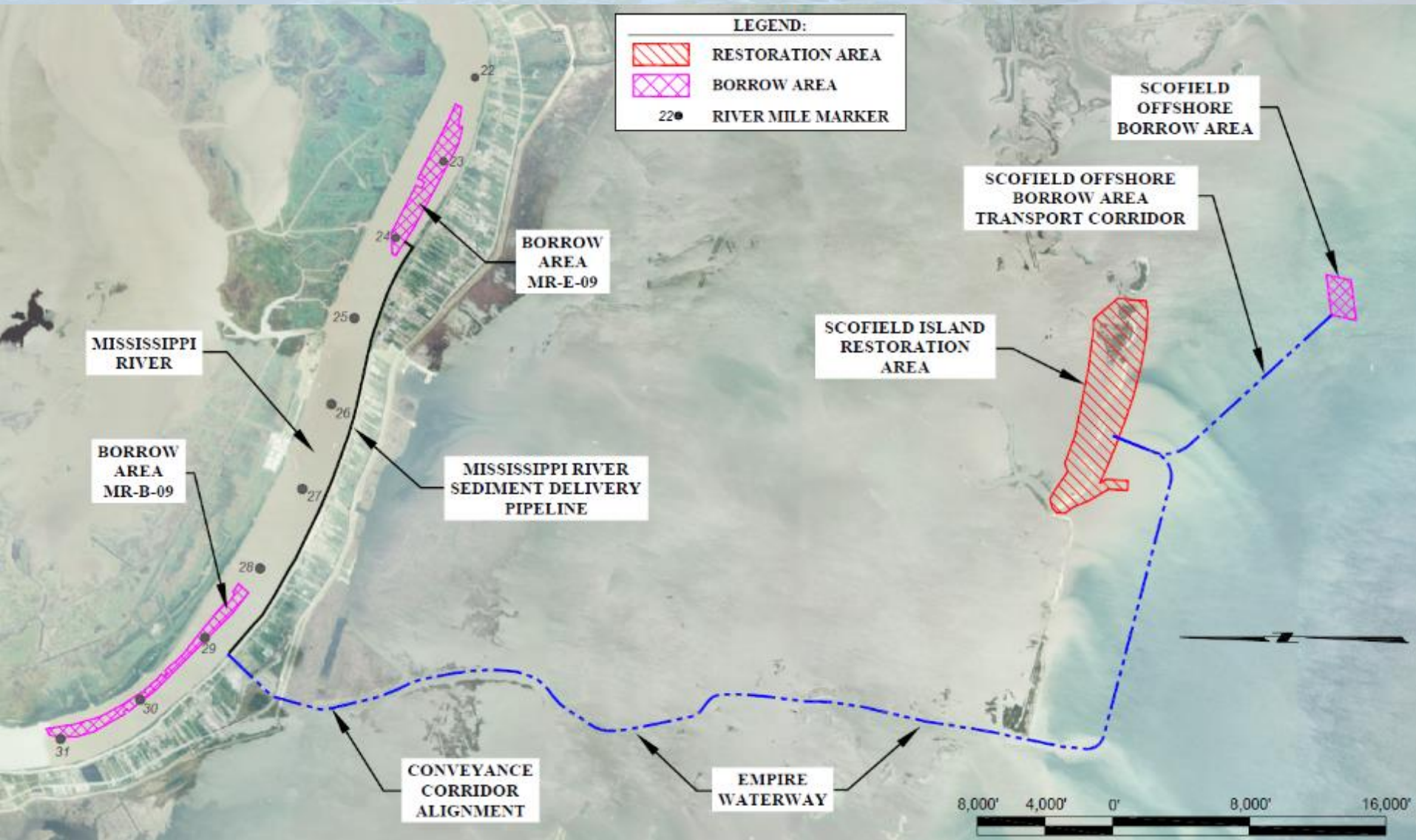
Map Produced by:
U.S. Department of the Interior
U.S. Geological Survey
National Wetlands Research Center
Coastal Restoration Field Station

Background Imagery:
1998 Digital Orthophoto Quarter Quadrangle

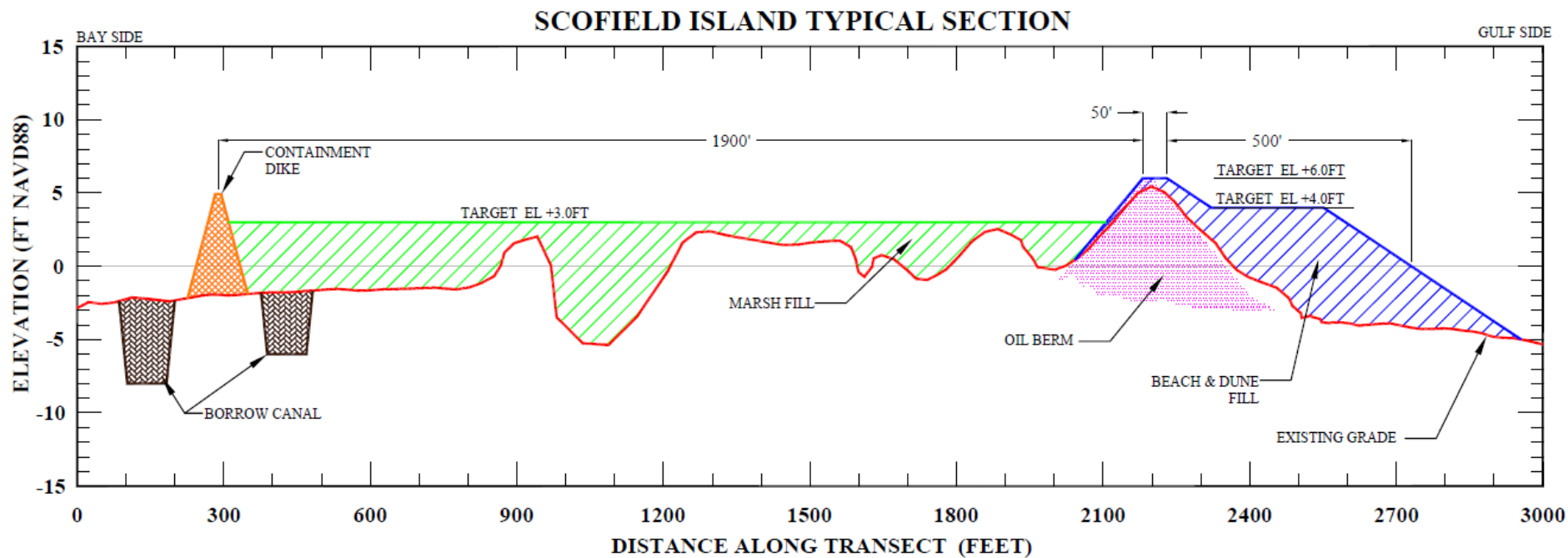
Map Date: January 3, 2005
Map ID: USGS-NWRC 2005-11-0090
Data accurate as of: January 3, 2005

- 11 miles west of Venice, LA
- Completed in 2014
- Cost \$54.3 mil (2016 \$)
- 3.4 MCY of material
- Distance to BA ~22 mile pipeline to MS River; 2.5 miles to offshore BA

Riverine Sand Mining/ Scofield Island Restoration (BA-40)



Riverine Sand Mining/ Scofield Island Restoration (BA-40)

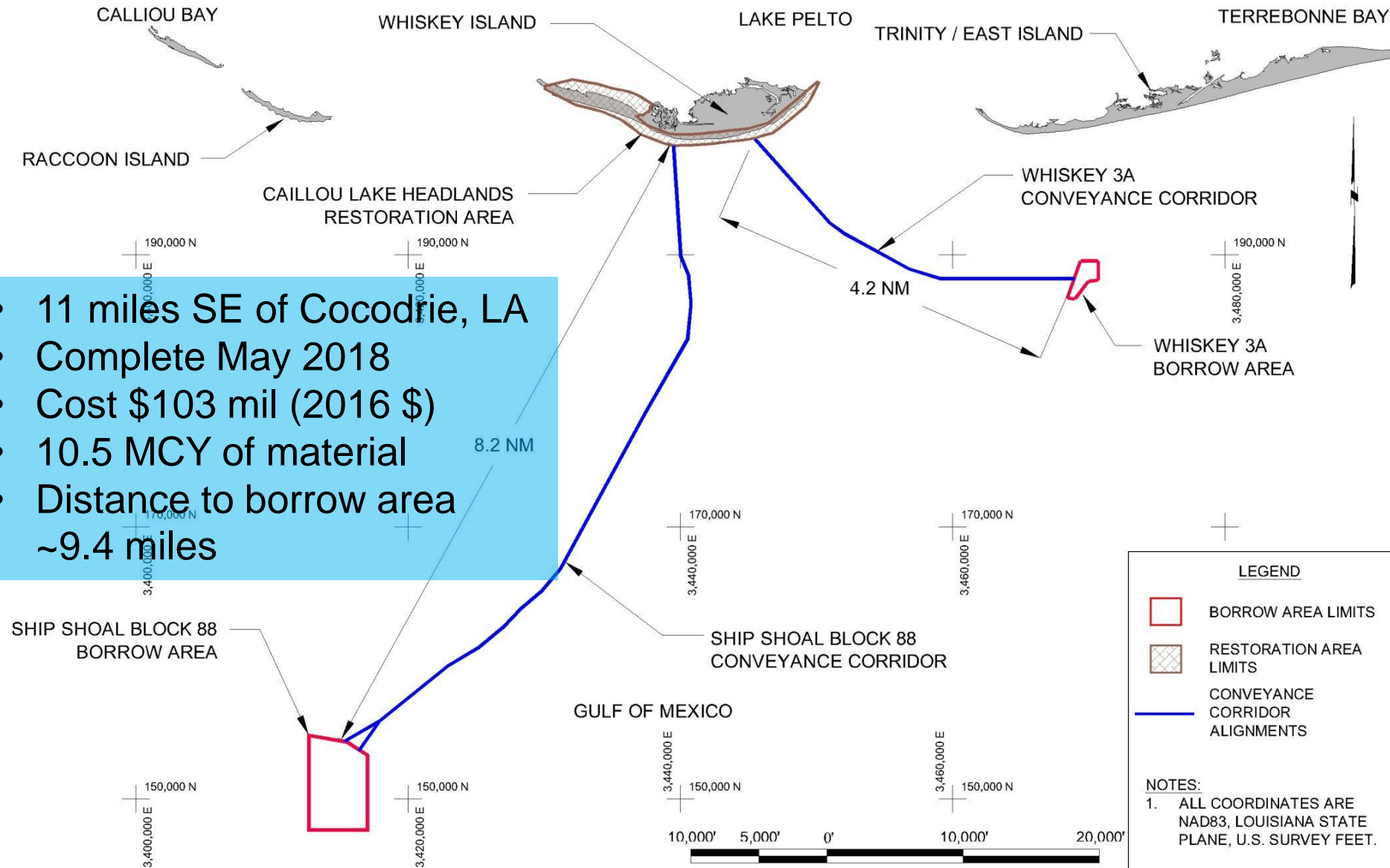


Concept of Geomorphic and Ecological Form and Function (GEFF)

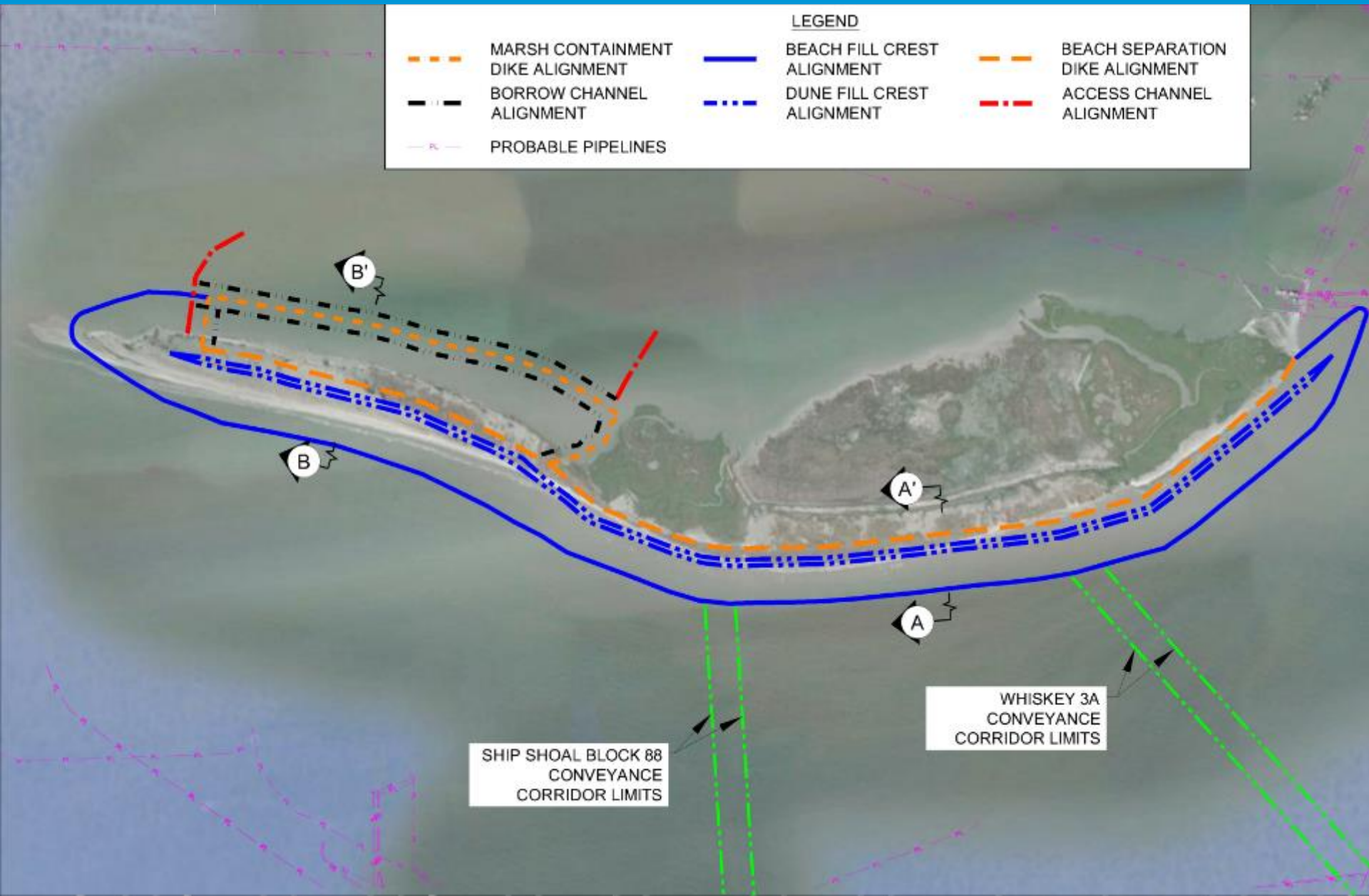


- Acts as buffer to reduce full effects of wave action, saltwater intrusion, storm surge, and tidal circulation on interior ecosystems and communities.
- Back-barrier marsh serves as roll-over platform as islands migrate landward, thus maintaining habitat value.
- Provides critical habitat for flora and fauna
 - T&E species, migratory and overwintering bird foraging and resting, shorebird nesting, dune stabilizing vegetation.
 - Essential Fish Habitat, fisheries nursery area, shellfish habitat.

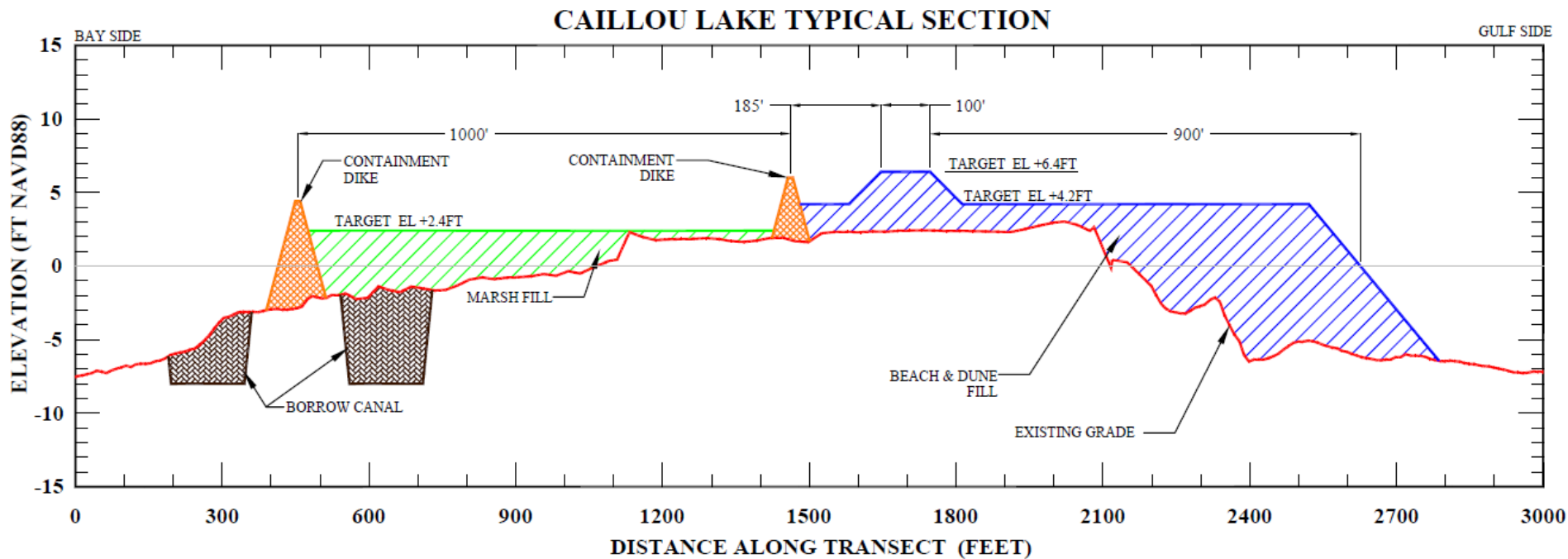
NRDA Caillou Lake Headland Restoration (TE-100)



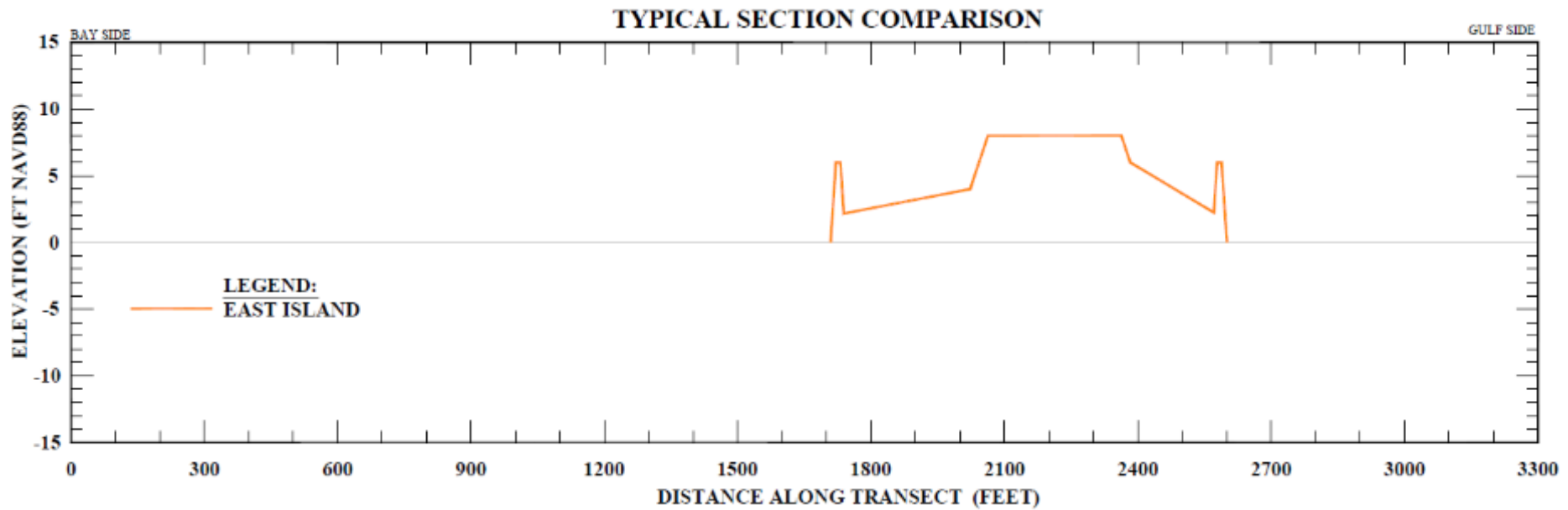
NRDA Caillou Lake Headland Restoration (TE-100)



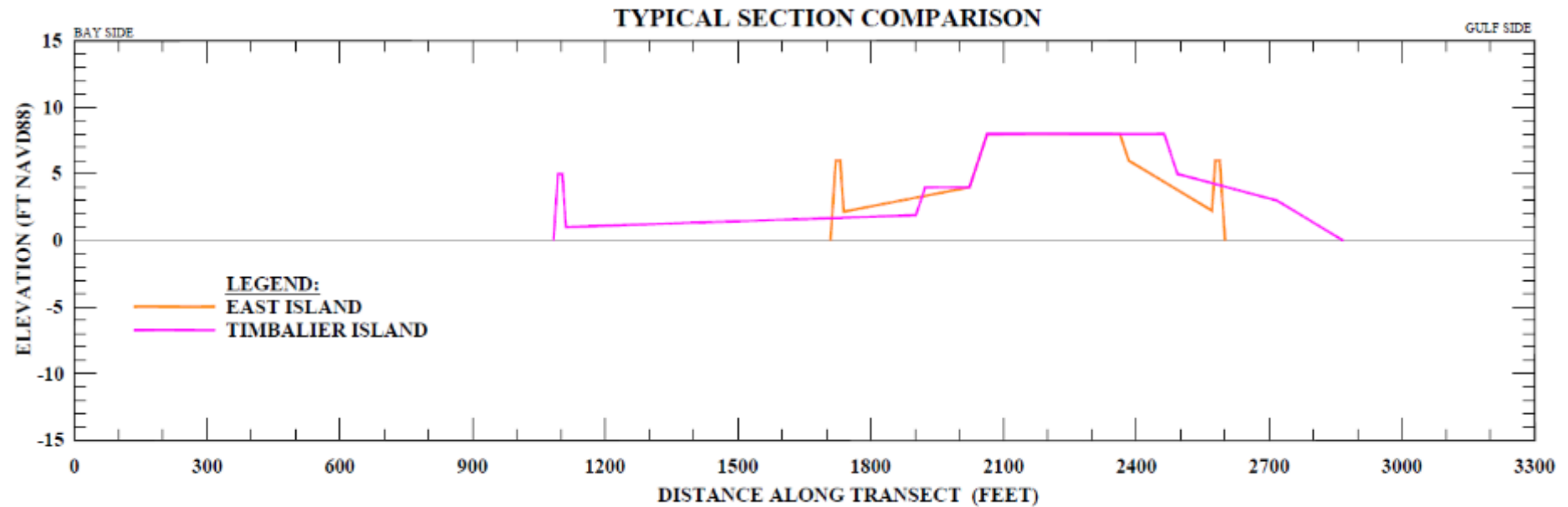
NRDA Caillou Lake Headland Restoration (TE-100)



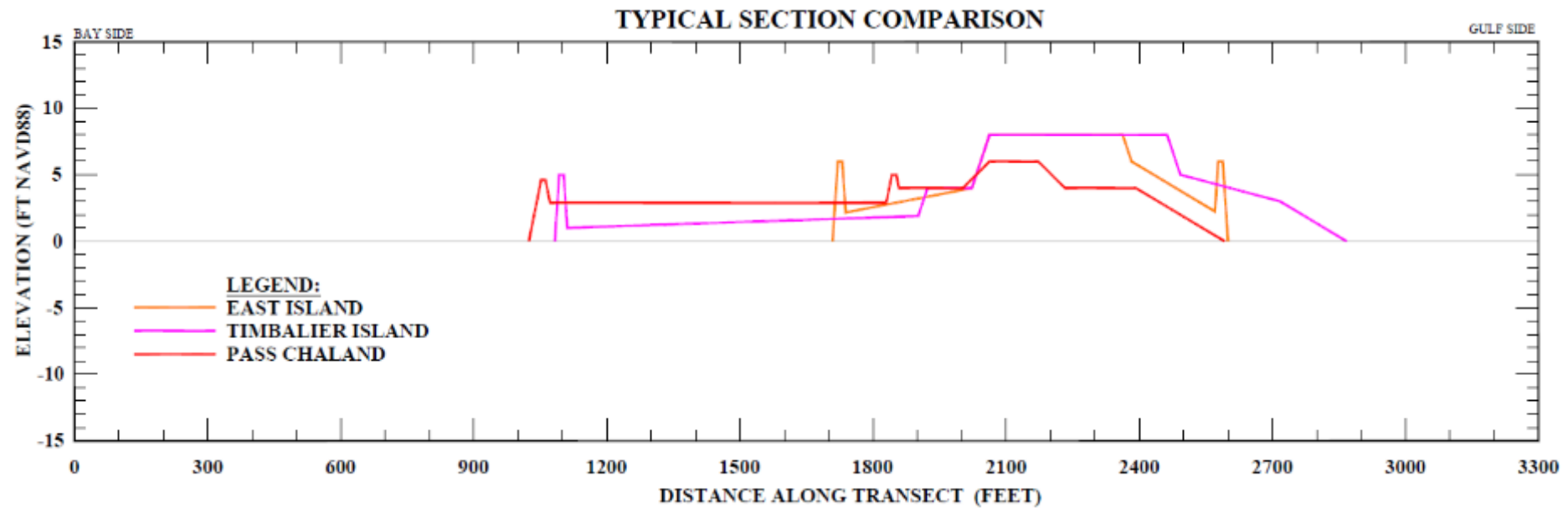
Restoration Template Comparison



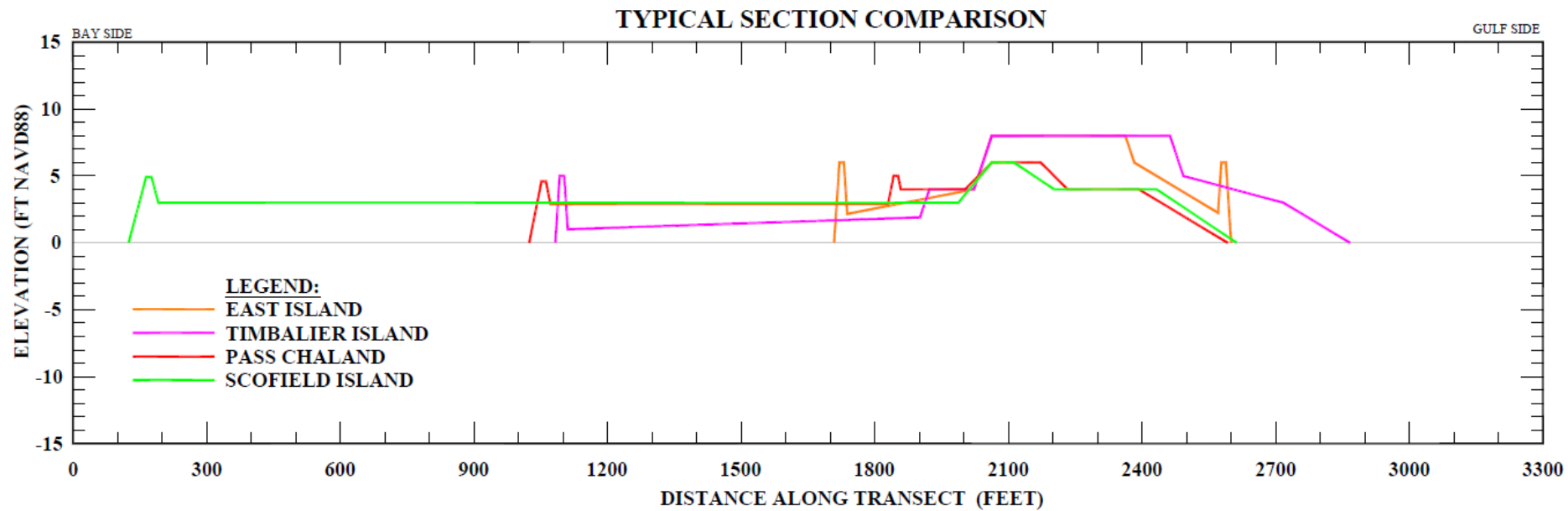
Restoration Template Comparison



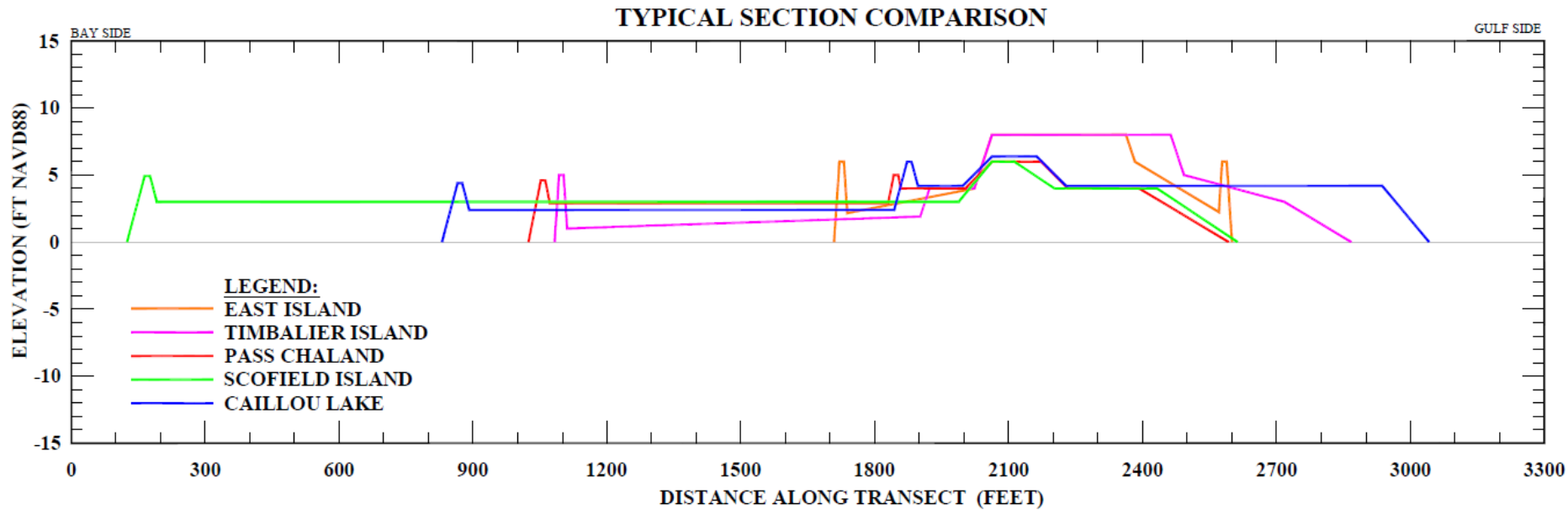
Restoration Template Comparison



Restoration Template Comparison



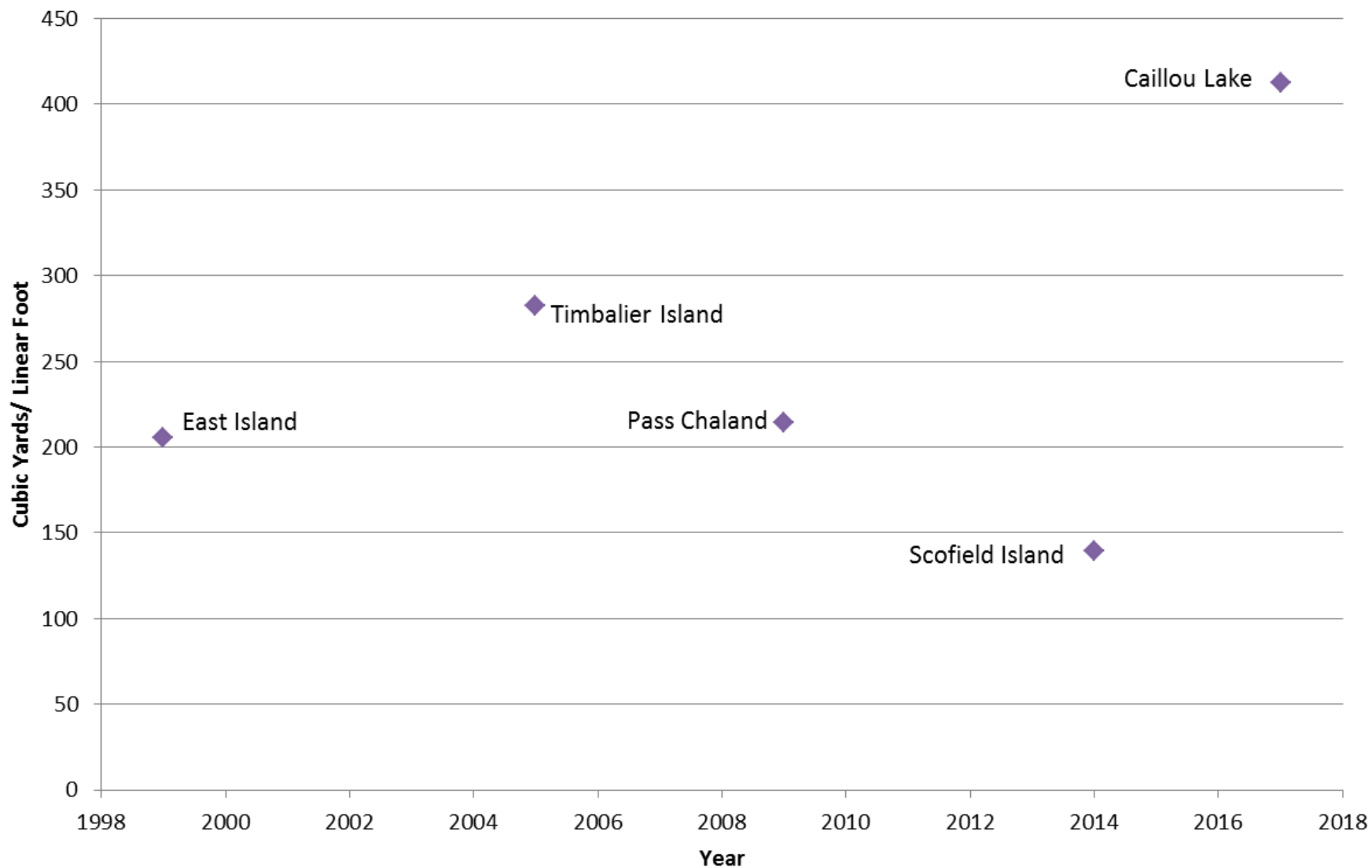
Restoration Template Comparison



Project Cubic Yards/ Linear Foot



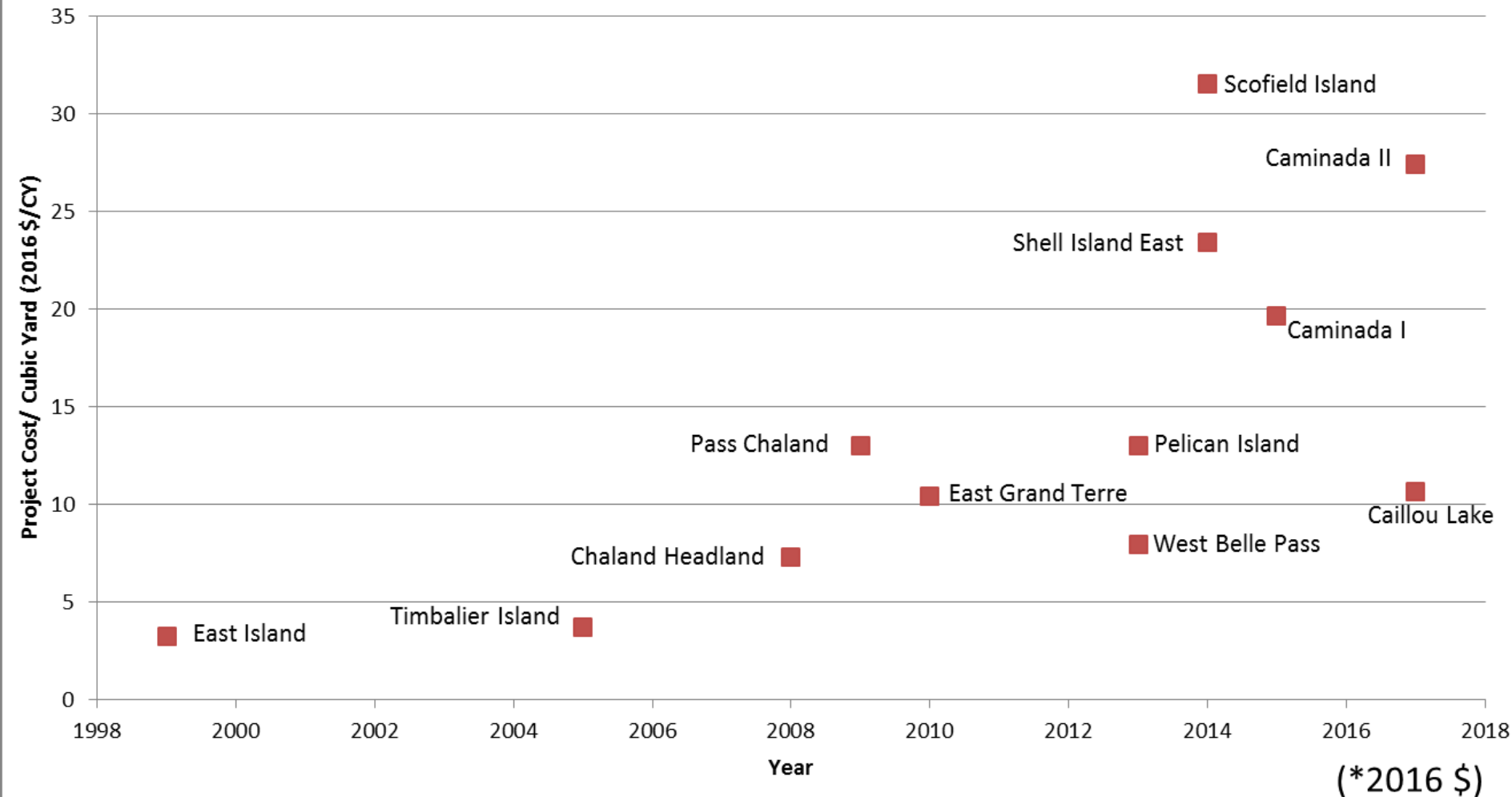
Cubic Yard/ Linear foot



Barrier Island Project Cost/ Cubic Yard



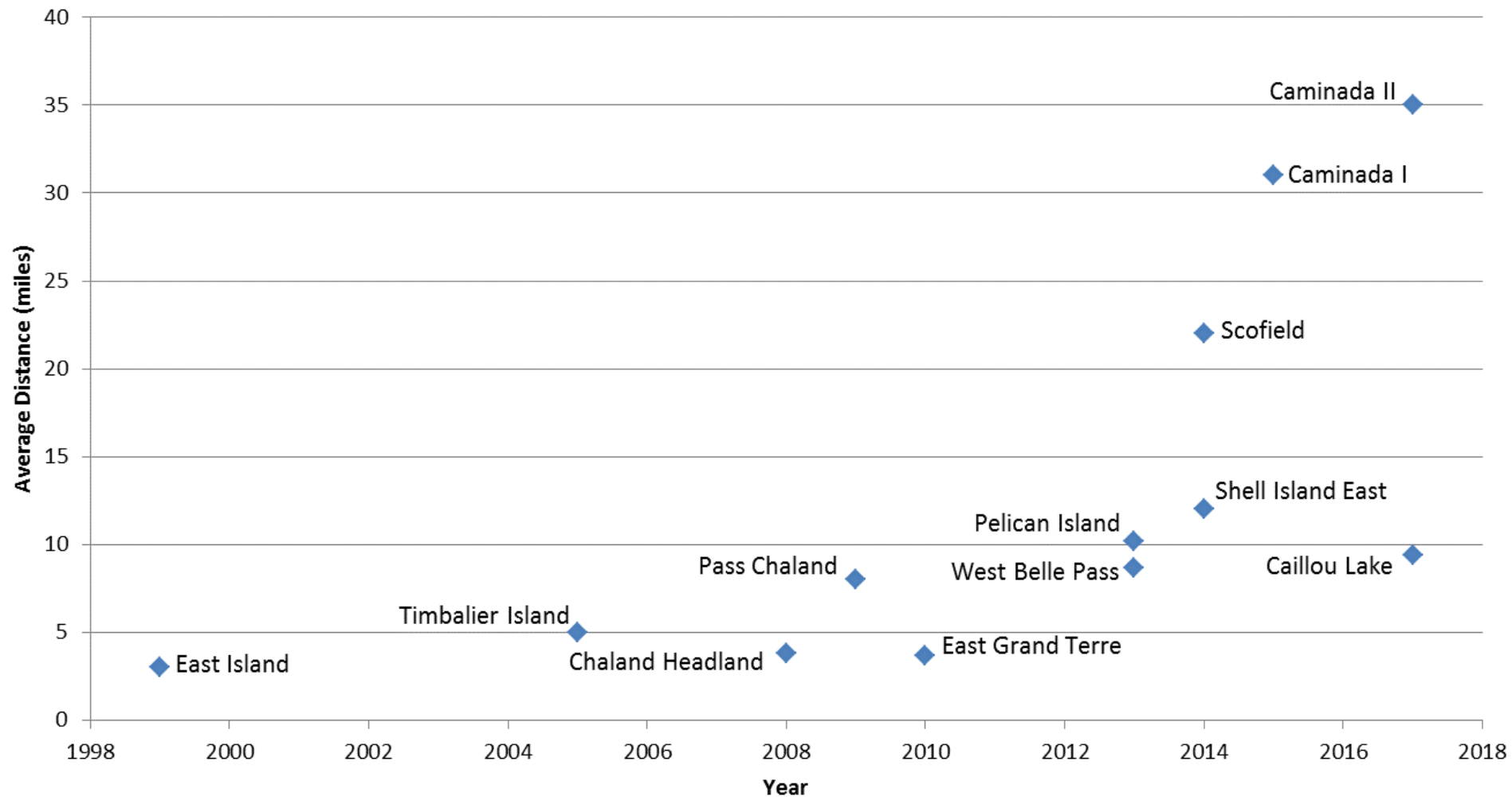
Project Cost*/ Cubic Yard



Average Distance to Borrow Area



Average Distance to Borrow Area



Barrier Island Evolutionary Notes



- More robust geotechnical investigation on both the borrow area and the island
- Larger diameter sand grain
- Increased measures to mitigate impacts to wildlife (nesting birds and sea turtles)
- Cultural resource survey spacing increased from 50m to 30m
- Permitting construction pipeline corridors from BA to island
- More options to Contractor



Summary



- Barrier islands serve a **vital** role to coastal Louisiana
- Barrier island restoration has grown in both **size and scope** over the past 20 years
- Limited nearshore sand availability for beach compatible sand has driven **borrow areas** 30+ miles away from the restoration site
- **Advancements** in barrier island restoration templates have lead towards increased longevity through the creation of robust marsh habitats as well as beach and dune features to restore the Geomorphic and Ecologic Form and Function of the barrier islands



NRDA Caillou Lake Headland Restoration (TE-100)



Photo Credit: CEC & GLDD

NRDA Caillou Lake Headland Restoration (TE-100)



Photo Credit: CEC & GLDD

Acknowledgements



- Colleagues at CPRA and our state, local and federal partners as well as NGO's and researchers.
- Coastal Engineering Consultants (Michael Poff, Brett Borne, Greg Grandy, Steve Dartez)



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