

**THE “BIGGEST,” THE “BADDEST,”**  
**AND THE “BESTEST” – Partie Deux**  
**COASTAL RESTORATION CAJUN STYLE**

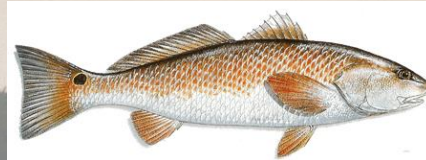
**Presentation for:**  
**Florida Shore and Beach Preservation Association**  
**February 4, 2021**

**Presented by:**  
**Coastal Engineering Consultants, Inc.**



# Welcome Back to Coastal Louisiana

- **37% of the coastal wetlands in the nation**
- **75% of all commercially harvested fish species**
- **20% of all water birds in continental U.S.**
- **#1 commercial fish landings by weight in lower 48**
- **21% of all commercial fisheries' landings**
- **36% of all shrimp harvested in continental U.S.**
- **36% of all oysters harvested in continental U.S.**
- **33% of all fin fish harvested in continental U.S.**
- **20% of all crabs harvested in continental U.S.**



# Welcome Back to Coastal Louisiana

- **\$44B in annual fuel products for the nation**
- **90% of deep water oil and gas activity in Gulf**
- **Asset Value of Delta ~ \$1.3 Tril**
- **\$120 Bil Exported Annually**
- **#1 deep water crude oil port in the U.S.**
- **2 of 4 strategic petroleum reserve sites**
- **#3 U.S. natural gas producer**
- **18% of all domestic natural gas production**
- **Source: 2020 Annual Plan for an Integrated Ecosystem Restoration & Hurricane Protection in Coastal Louisiana**



# *CPRA Milestones (Since 2007)*

- **Completed 76 Restoration and 34 Protection Projects**
- **Placed over 152 MCY of Sediment**
- **Restored, Created or Benefitted over 46,000 AC**
- **Constructed 60 Mi of Barrier Islands and Berms**
- **Improved 315 Mi of Levees**
- **Secured \$21.4 Billion for Protection and Restoration in 20 Coastal Parishes**



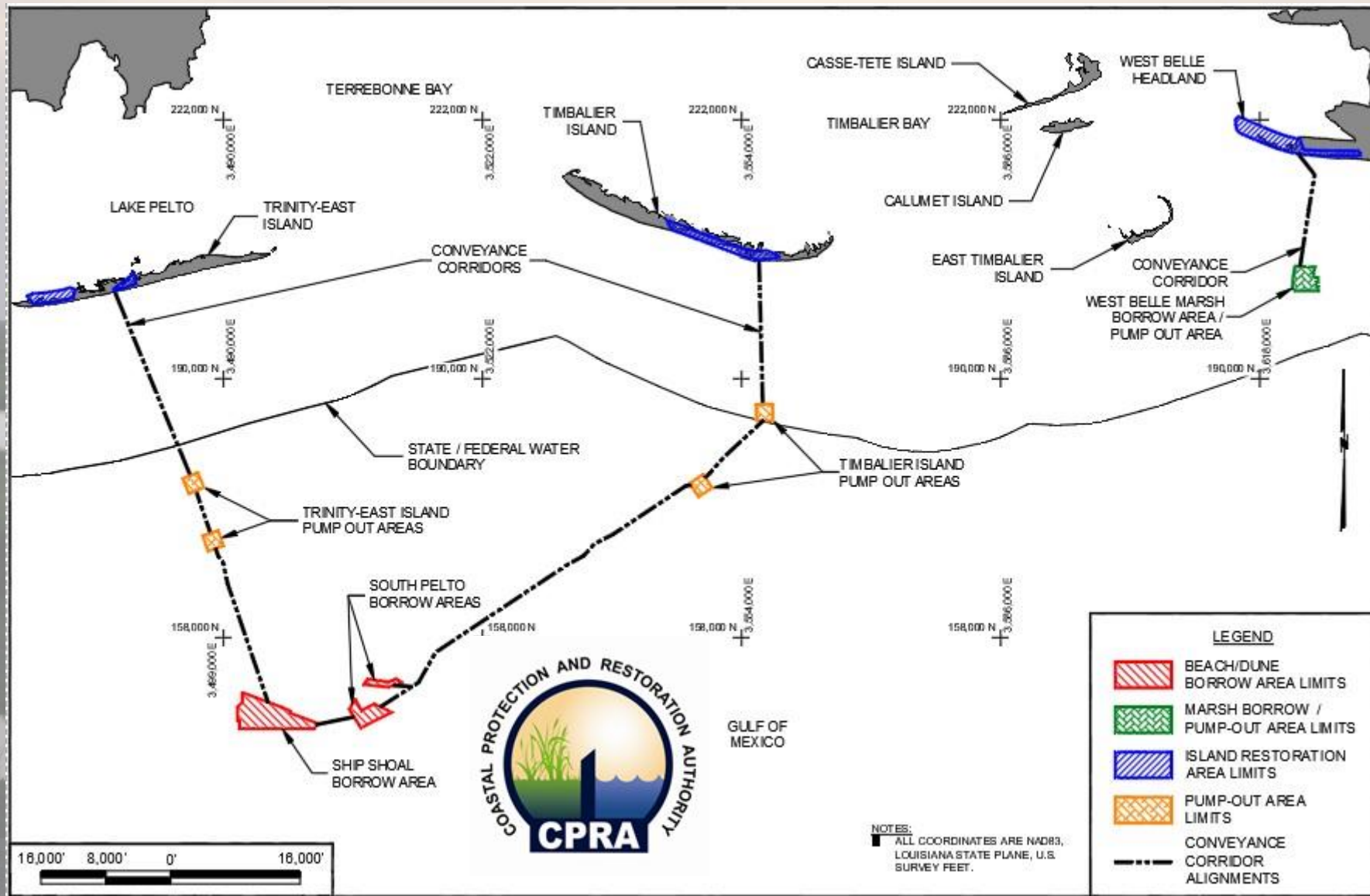
➤ **Source: 2020 Annual Plan for an Integrated Ecosystem Restoration & Hurricane Protection in Coastal Louisiana**

# *Restoration Programs*

- **Coastal Wetlands Planning, Protection and Restoration Act (CWWPRA)**
  - Federally enacted in 1990 - First Major Program to Fund Barrier Islands
- **Water Resources Development Act (WRDA)**
  - Title VII – Louisiana Coastal Area. Addresses Louisiana’s coastal ecosystem, need for long-term restoration program, and State’s Coastal Master Plan
- **Natural Resources Damage Assessment (NRDA)**
  - Consent Decree for Deepwater Horizon (DWH) Oil Spill Settlement Funds
- **National Fish and Wildlife Foundation (NFWF)**
  - Administers the Gulf Environmental Benefit Fund – LA: support barrier island and diversion projects to remedy harm caused by DWH Oil Spill
- **RESTORE Act**
  - Gulf Coast Ecosystem Restoration Council: Restore long-term health of Gulf Coast region’s ecosystems and economy
- **Gulf of Mexico Energy and Security Act (GOMESA)**
  - Dedicated Funding Stream for coastal restoration and risk reduction to Gulf States that permit OCS exploration

# The "NEW BIG"

## Terrebonne Basin Barrier Island & Beach Nourishment



# *Fun Facts*

## ➤ **3-Island / 4-Borrow Area Regional Renourishment Plan**

### ➤ **Construction Cost**

❖ **Engineer's Opinion of Cost = \$151.3 Million (M)**

❖ **Construction Bid Range**

▪ **Low = \$155.0M**

▪ **High = \$287.9M**

▪ **Avg = \$218.3M**



### ➤ **Construction Elements (Three Islands Combined)**

❖ **Total Project Volume: 9.7 MCY**

❖ **Total Beach/Dune Creation: 813 Ac**

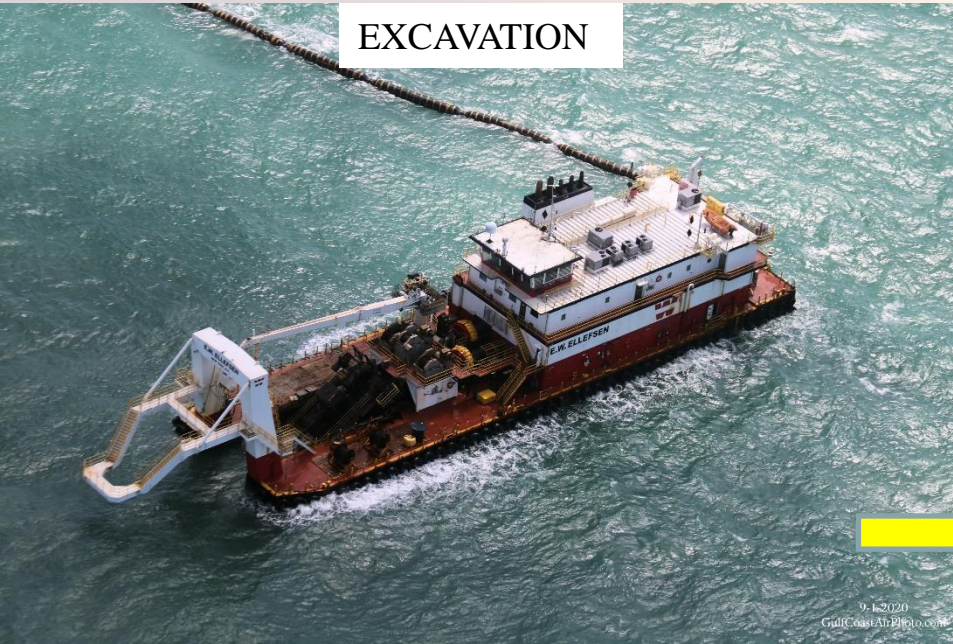
❖ **Total Marsh Creation: 359 Ac**

❖ **Total Project Length: 38,900 Feet**

❖ **Distances from BA to Island: 25.6 Mi, 13.9 Mi, 10.7 Mi**

# Sediment Excavation and Transport

EXCAVATION



9-1-2020  
GulfCoastAirPhoto.com

SCOW LOADING



9-1-2020  
GulfCoastAirPhoto.com



SCOW UNLOADING



9-1-2020  
GulfCoastAirPhoto.com

SCOW HAUL



9-1-2020  
GulfCoastAirPhoto.com

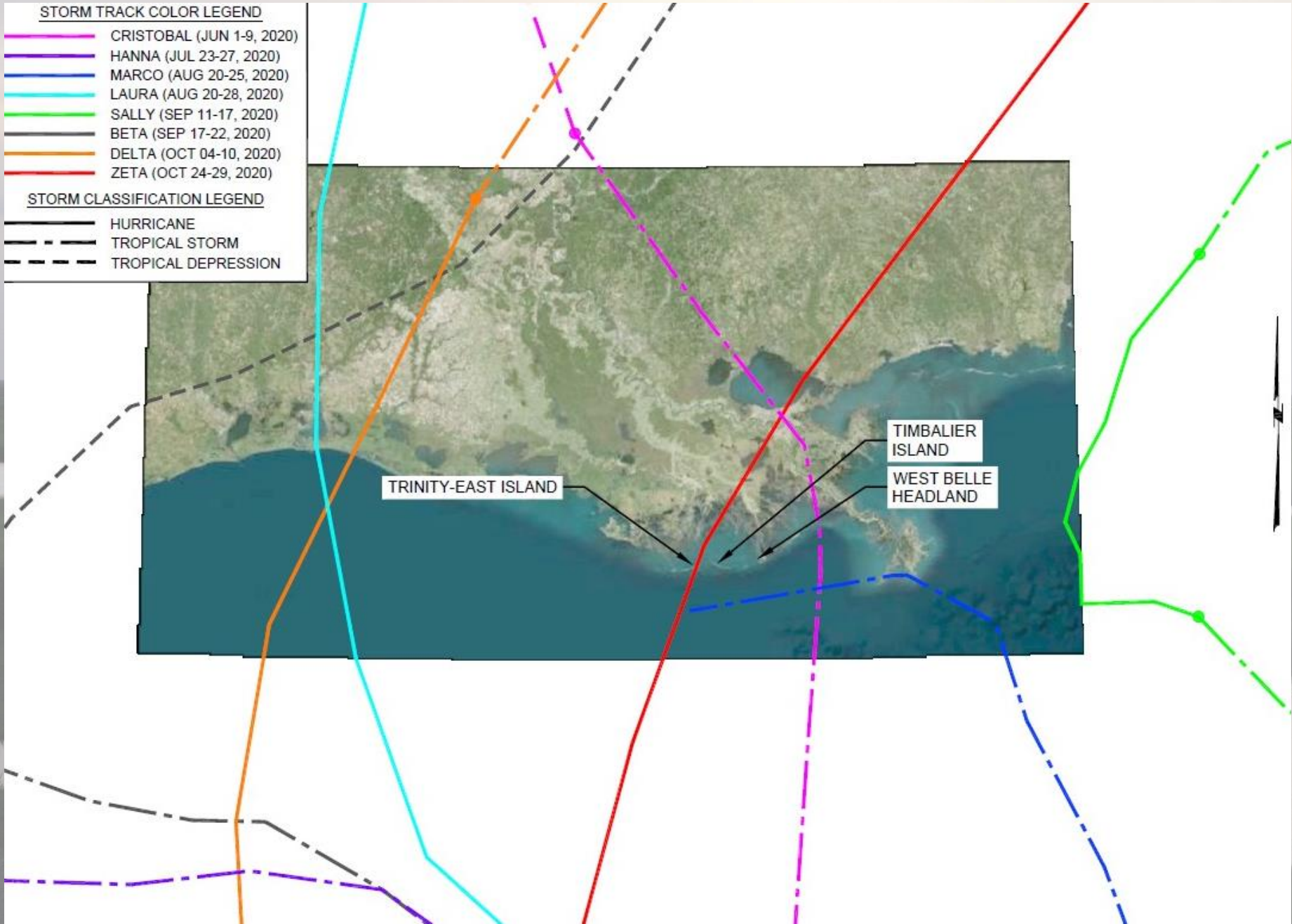


# West Belle Headland Under Construction

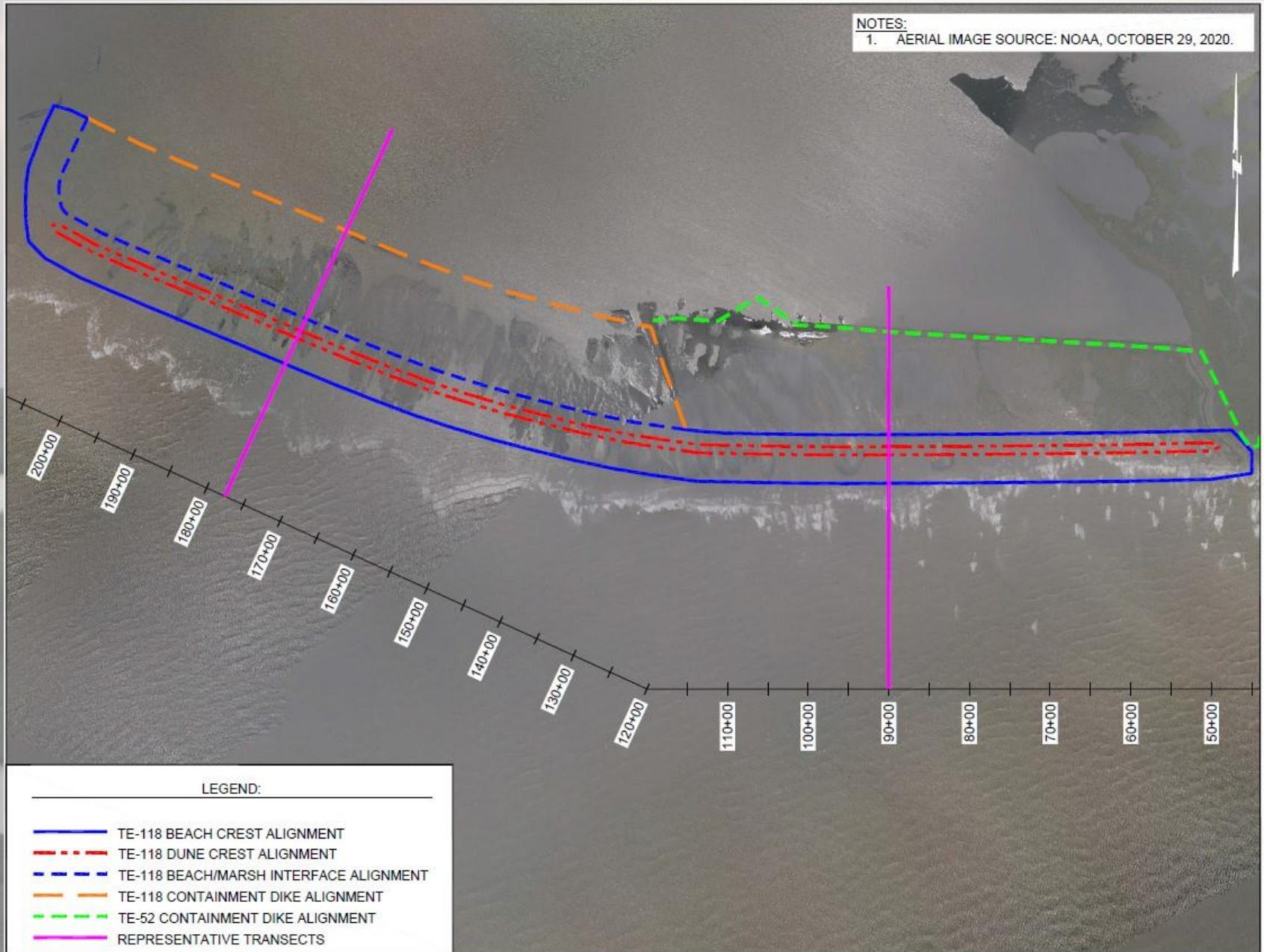


9-1-2020  
GulfCoastAirPhoto.com

# 2020 Hurricanes

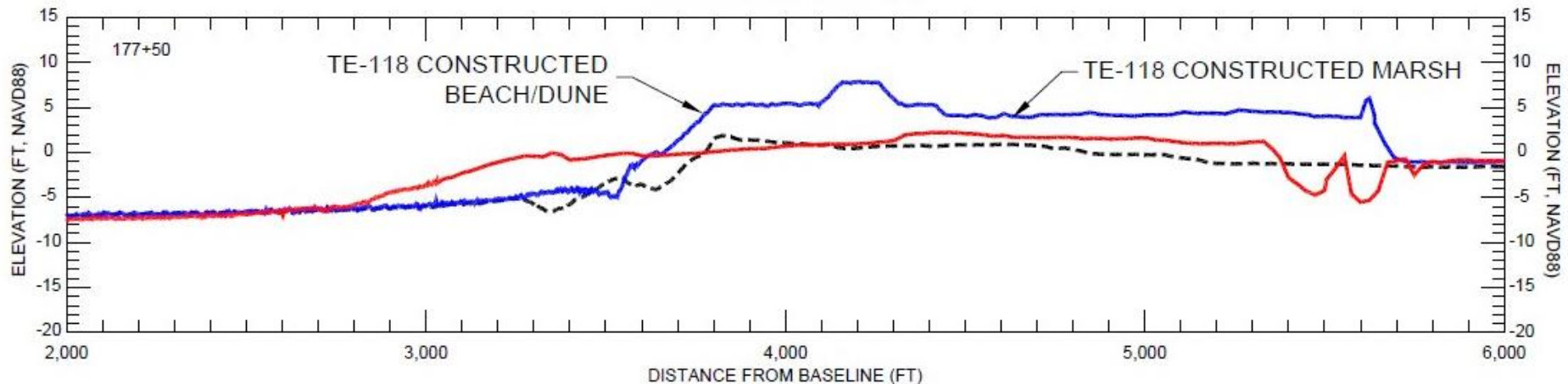
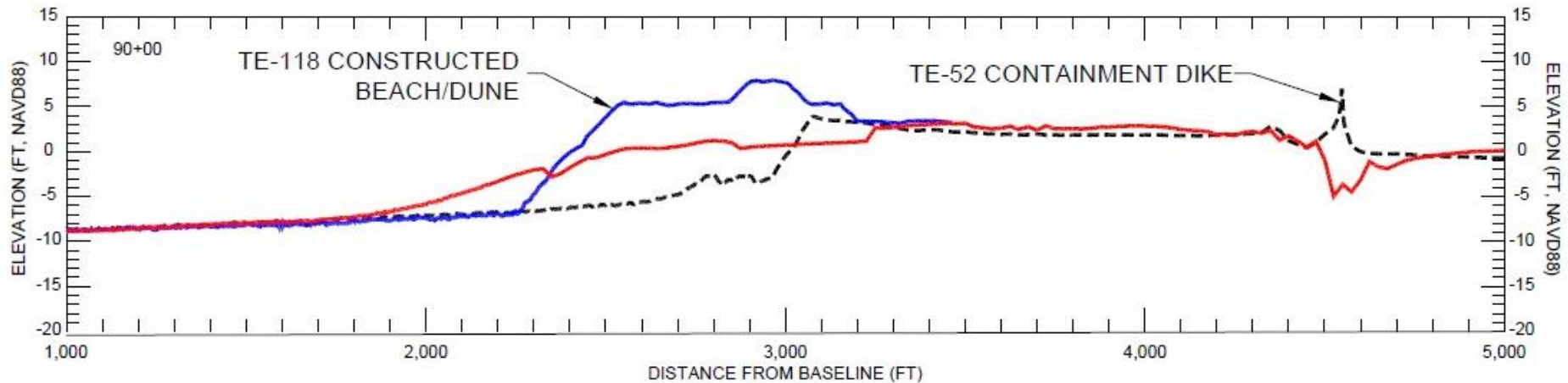


# 2020 Hurricane Impacts: West Belle Headland



# 2020 Hurricane Impacts

## Cross Section Comparison: WBH



### LEGEND:

- PRE-CONSTRUCTION GRADE (JAN. 2020, UPDATED SEPT. 2020)
- PRE-HURRICANE ZETA GRADE - AS-CONSTRUCTED (MAY 2020 - OCT. 2020)
- POST-HURRICANE ZETA GRADE (DEC. 2020)

# Trinity Island Under Construction





# ***The “NEW BAD”***



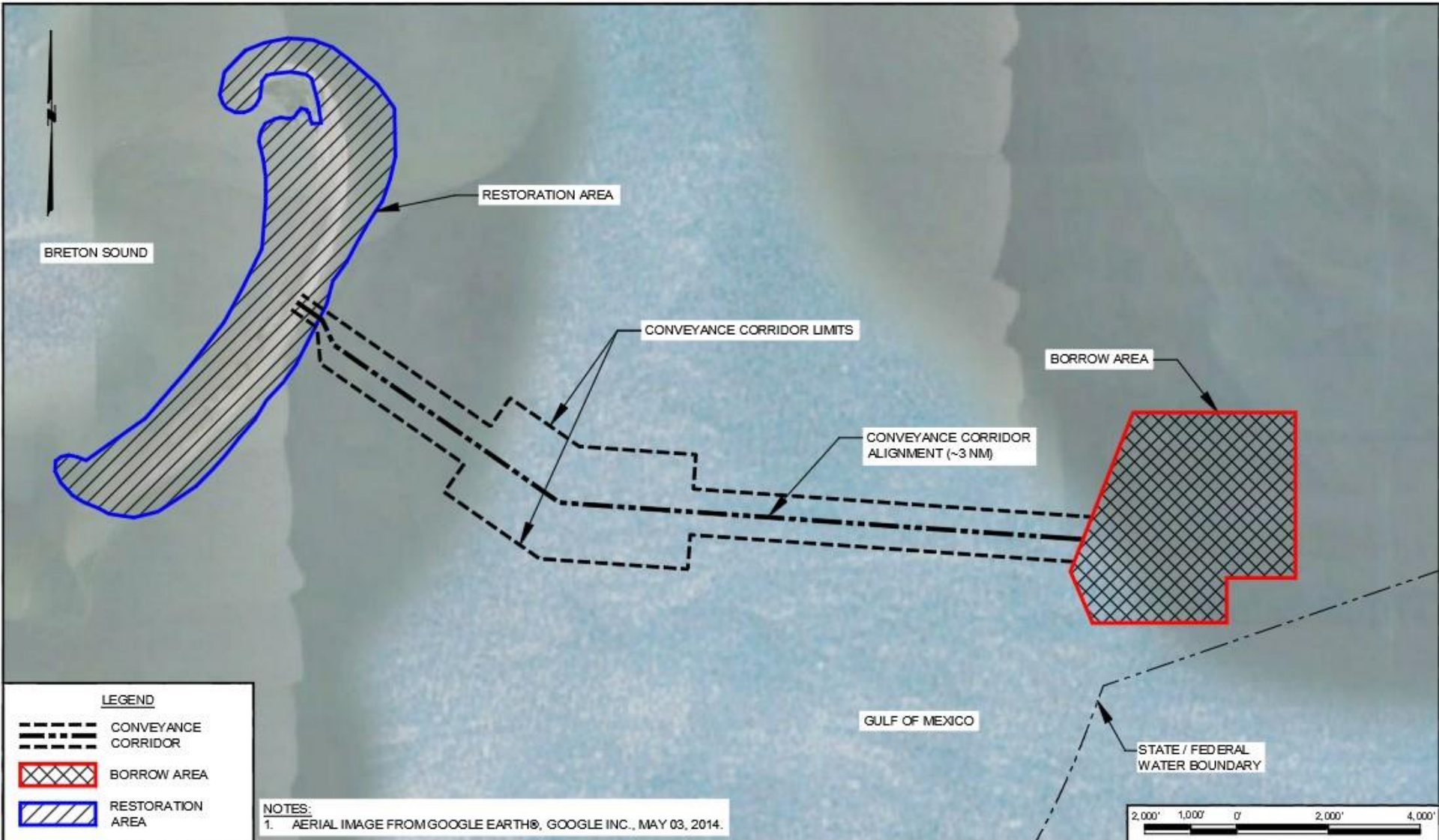
***North Breton Island NRDA  
Phase III Early Restoration***

# Breton National Wildlife Refuge

*Refuge established on October 4, 1904 by an executive order of President Theodore Roosevelt. This is the 2<sup>nd</sup> oldest refuge in the country and the only refuge know to have been visited by **President Roosevelt** in 1915.*



# Project Overview Map





# ***Fun Facts***

➤ **Highlight Reel: 80,000 CY/Day Production Day**

➤ **Construction Cost**

❖ **Engineer's Opinion of Cost = \$59.6 Million (M)**

❖ **Low Bid = \$54.4M**



➤ **Construction Elements**

❖ **Total Fill Volume: 5.9 MCY**

❖ **Beach/Dune Creation: 374 AC**

❖ **Marsh Creation: 185 AC**

❖ **Wetland Creation: 67 AC**

❖ **Project Length: 14,340 Feet**

❖ **Project Density: 410 CY/ LF**

❖ **Borrow Area to Island: 3.5 Miles**

# Alternatives Analysis: Hybrid Modeling Program

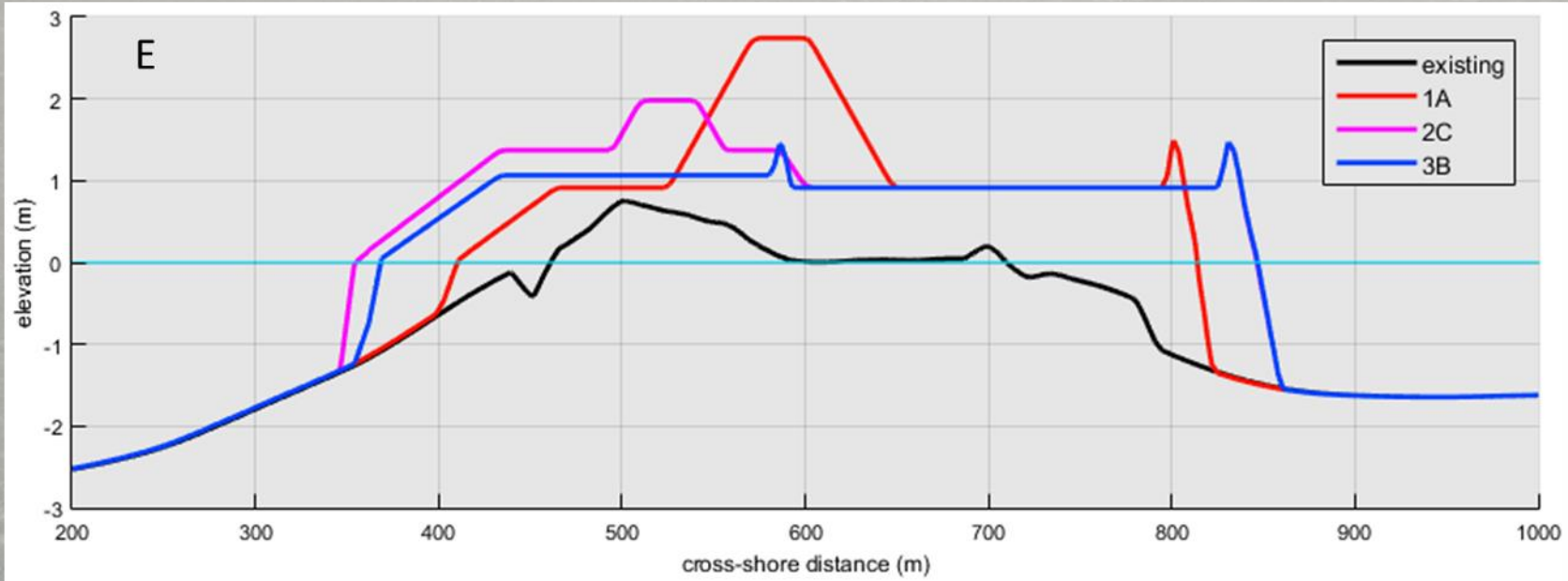
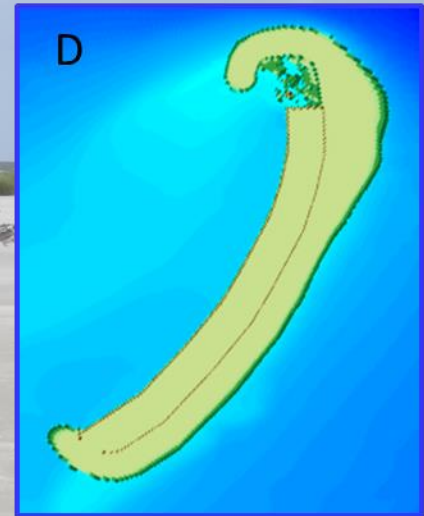
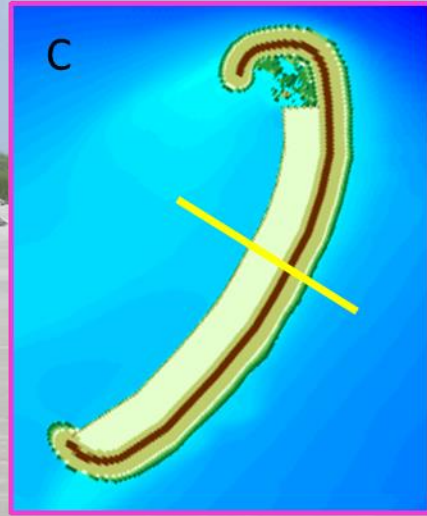
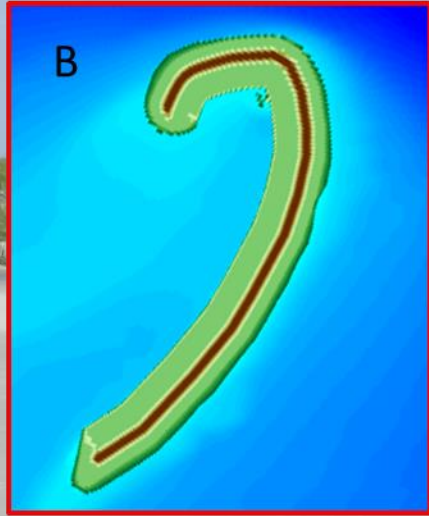
Existing (2014)

Concept 1A

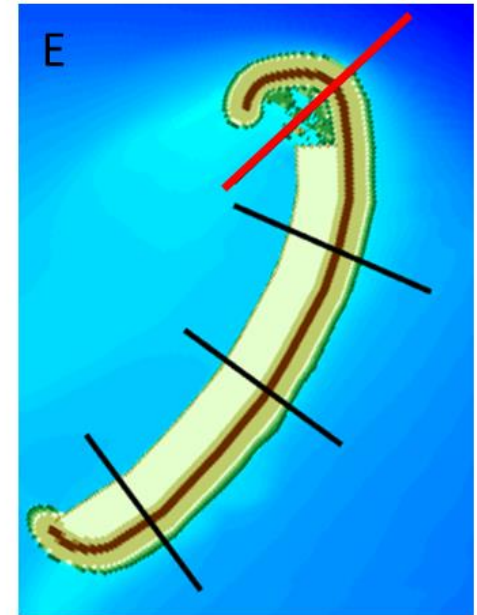
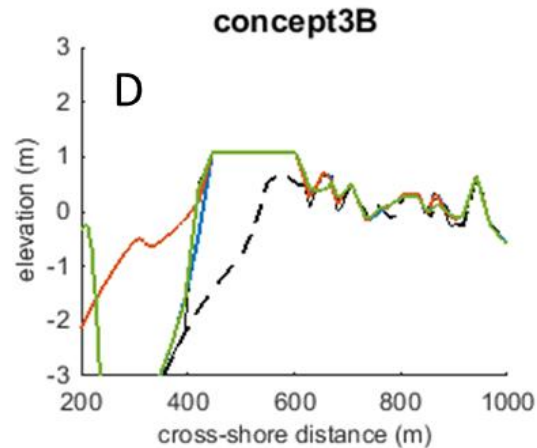
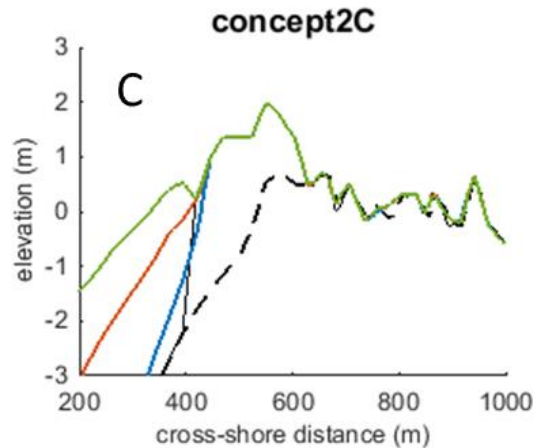
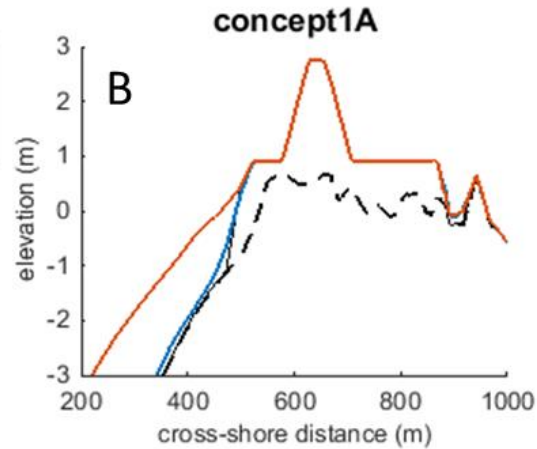
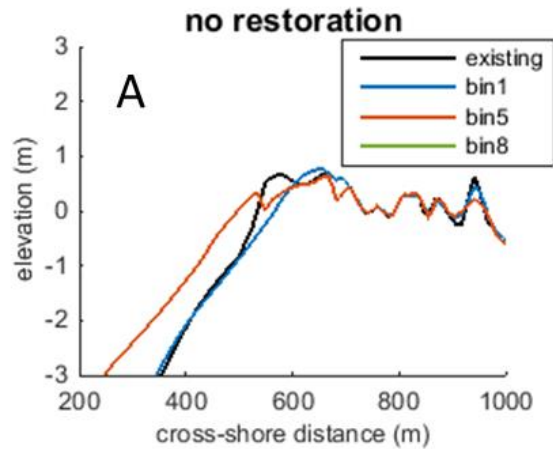
Concept 2C

Concept 3B

Depth [m]



# Cross Section (Northern Profile)

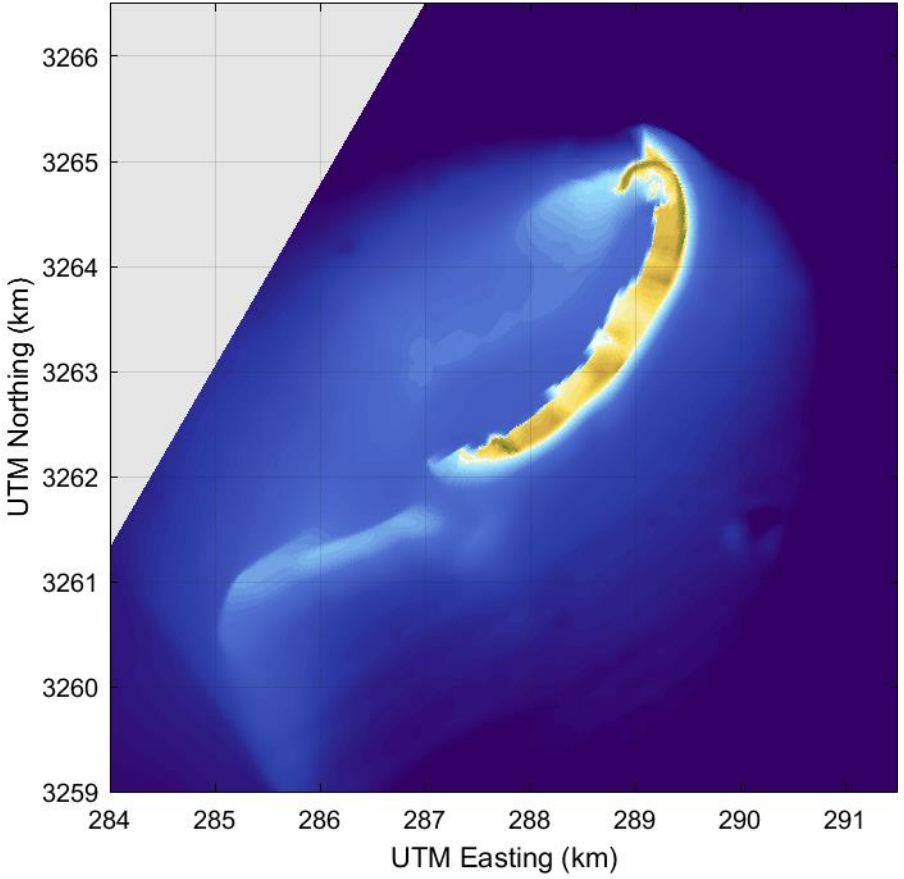


# Storm #3 (TY12): Hurricane Gustav

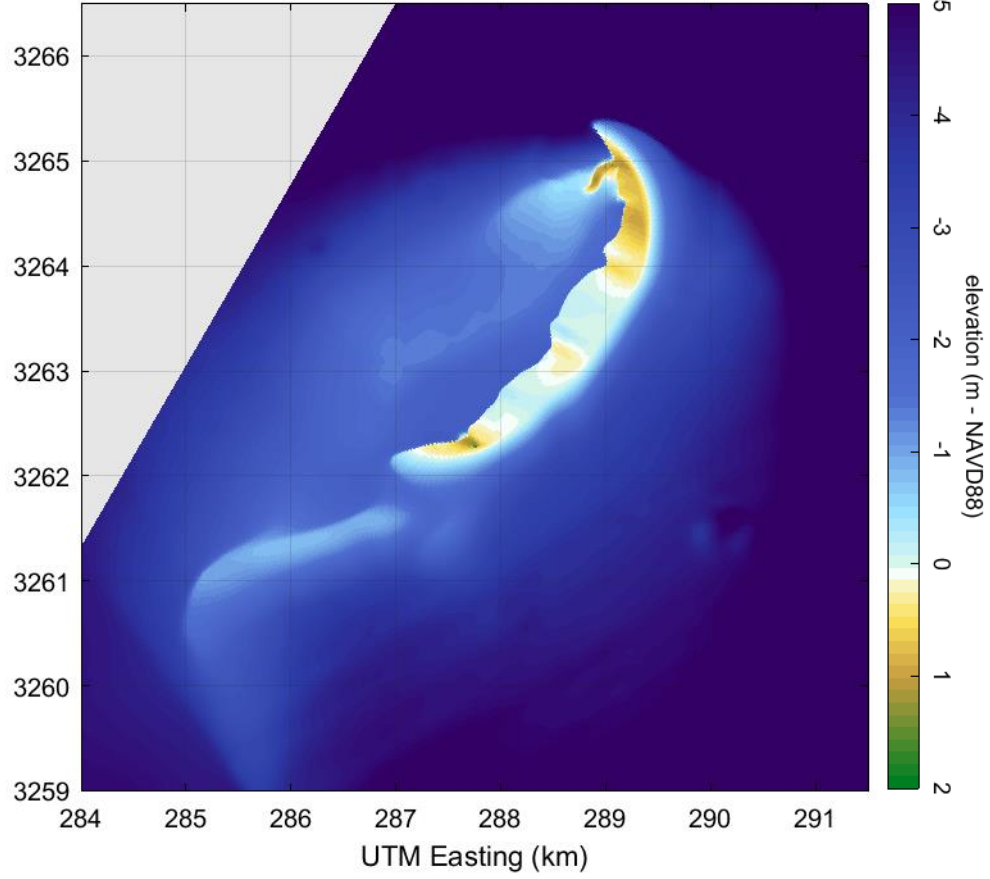
Maximum Wave Height:	6.7 meters (22.0 ft)
Maximum Surge:	1.1 meters (3.6 ft)
Duration:	~48 hours



Pre-Storm

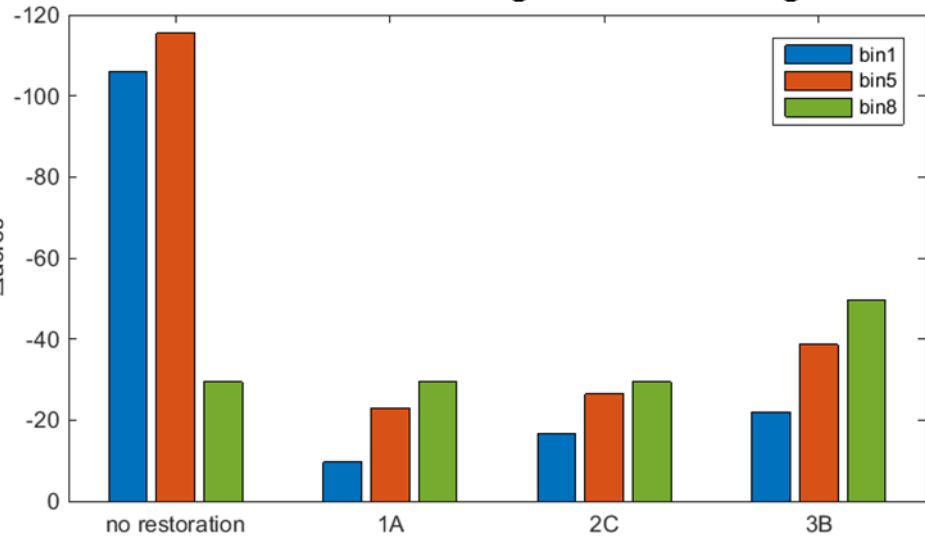


Post-Storm

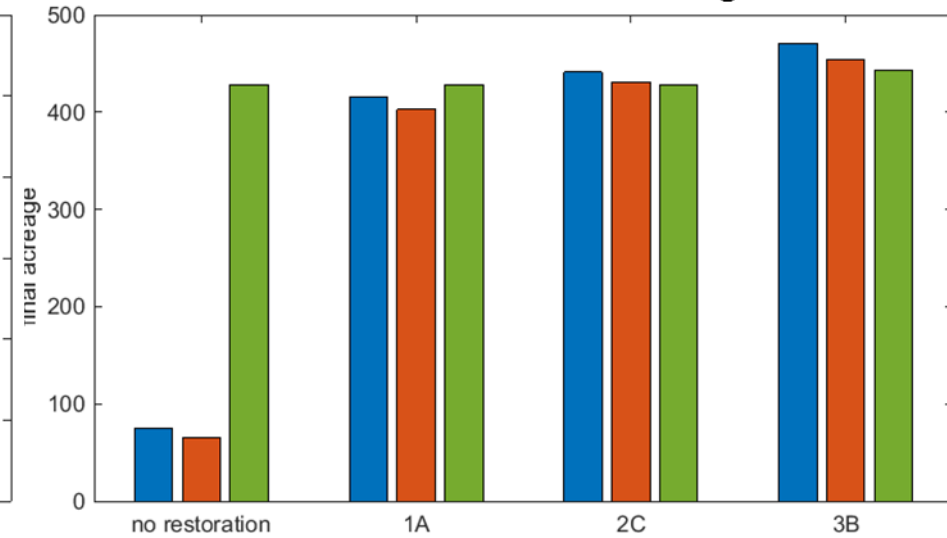


# Calculated Change in Island Acreage

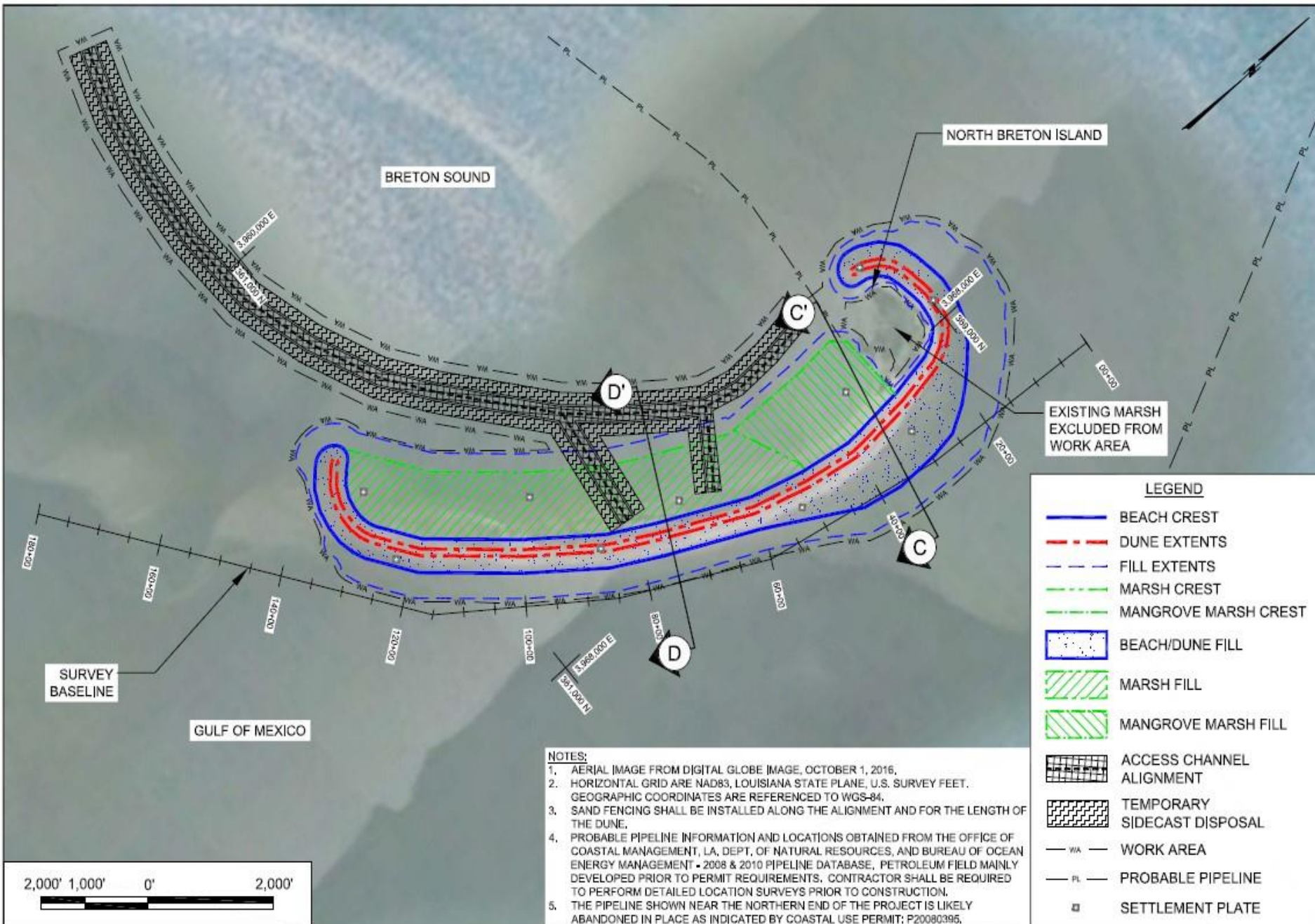
**A** Storm-Induced Change in Island Acreage



**B** Final Post-Storm Island Acreage

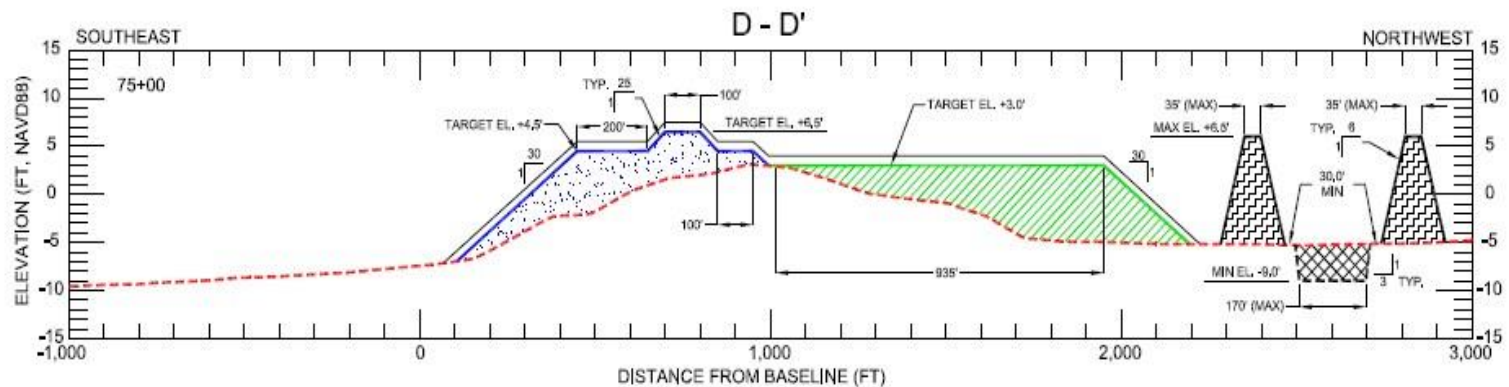
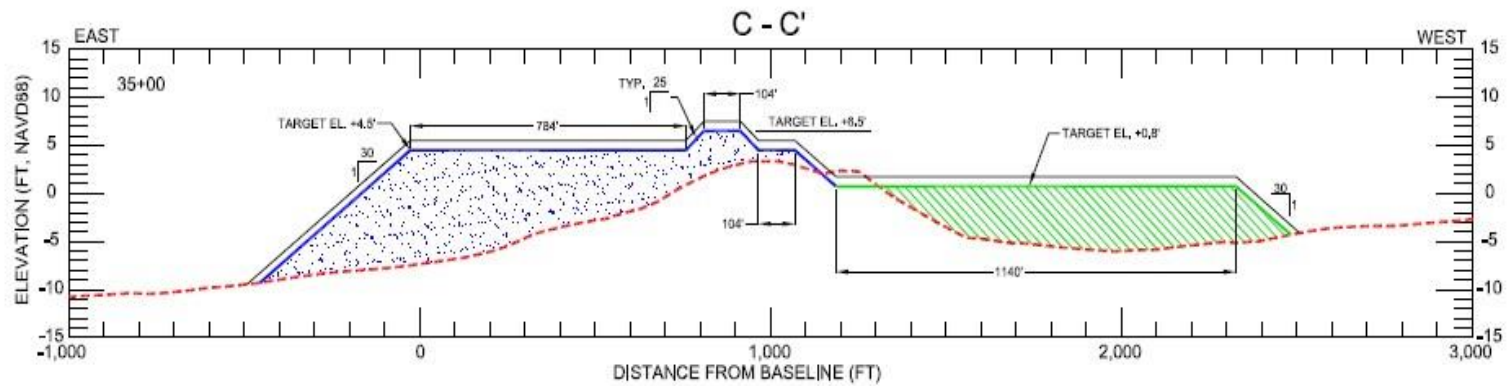


# Design Plan



# Typical Cross Sections

SCALE:  
H: 1" = 500'  
V: 1" = 20'



**NOTES:**

1. SECTIONS ARE VIEWED AS LOOKING SOUTH.
2. EXISTING GRADE SURVEY PERFORMED BY EMC SURVEYS, INC. IN 2018.
3. DIMENSIONS ARE PROVIDED FOR DESIGN PURPOSES AND DO NOT MEASURE ALONG THE SURVEY BASELINE.
4. A +1.0 FT ELEVATION CONSTRUCTION TOLERANCE SHALL BE ACCOMMODATED FOR CONSTRUCTION PURPOSES.

**LEGEND**

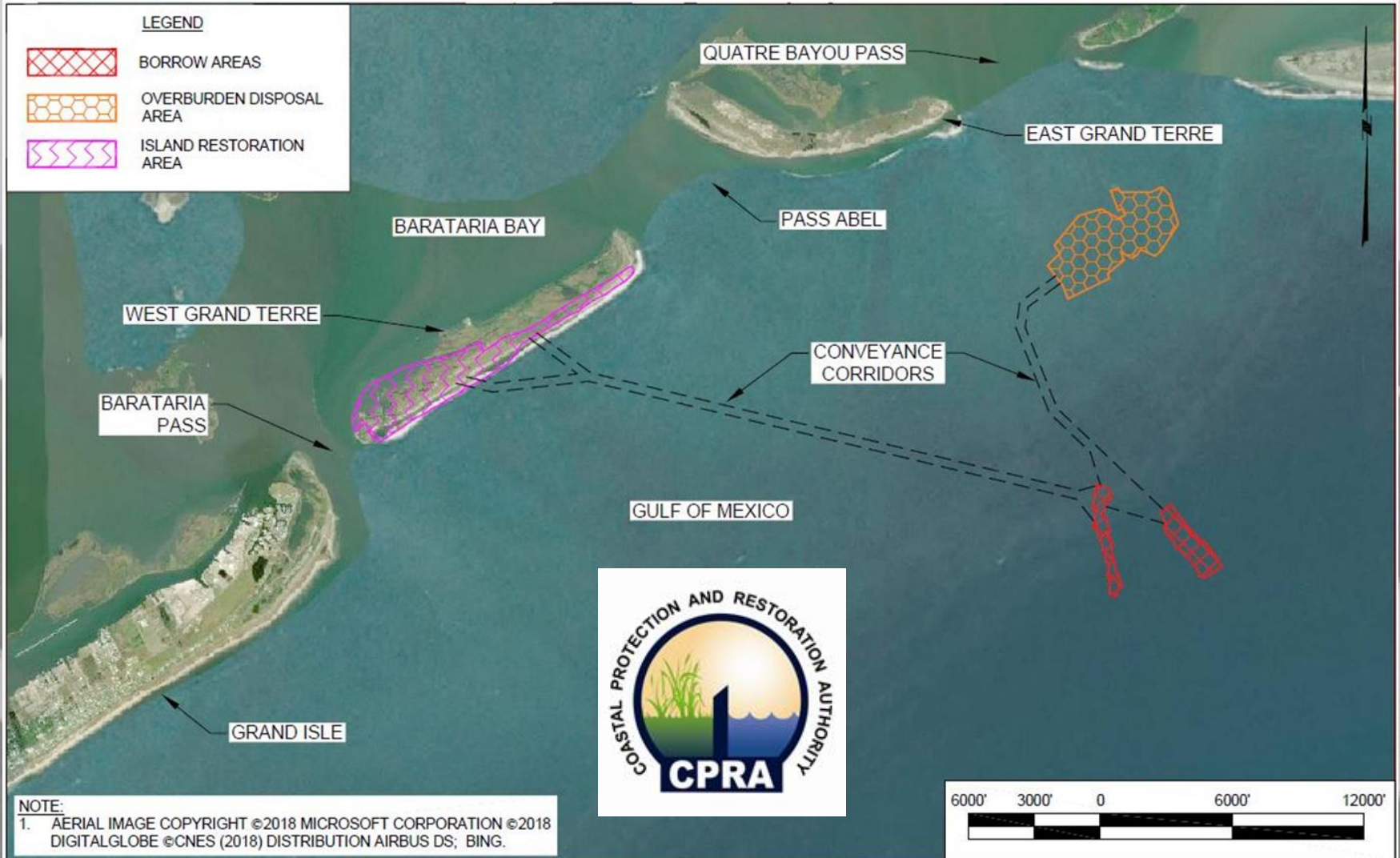
	EXISTING GRADE (2018)		BEACH & DUNE FILL		ACCESS CHANNEL
	CONSTRUCTION TOLERANCE		MARSH FILL		TEMPORARY SIDECAST DISPOSAL

# Breton Island – Under Construction





# The “*NEW BEST*” *WEST GRAND TERRE BEACH* *NOURISHMENT & STABILIZATION*



# ***FUN FACTS***

➤ **Highlight Reel: Two Relic Distributary Channels Providing Sand for Beach, Dune and Marsh; Constructing over 6,000 feet of Rock Revetments for Shoreline Protection of Significant Cultural Resources**

➤ **Construction Cost**

❖ **Engineer's Opinion of Cost = \$65.2 Million**

❖ **Construction Bid Range**

- **Low = \$53.4 Million**
- **High = \$58.8 Million**
- **Avg = \$56.1 Million**



➤ **Construction Elements**

- ❖ **Beach/Dune/Marsh Fill: 2.3 MCY ~ 316 AC**
- ❖ **Overburden: 2.9 MCY**
- ❖ **Project Length: 13,700 Feet**
- ❖ **Project Density: 167 CY/ LF**
- ❖ **Rock Work: 84,000 Tons**

# Fort Livingston



Barataria Waterway

Existing  
Breakwater

Ft. Livingston

March 2020

Looking West



# Restoration Area Cultural Resources



# Structure Demolition (2020)

➤ **LDWF Structures**

➤ **Critical Issues:**

➤ **Access**

➤ **Asbestos**

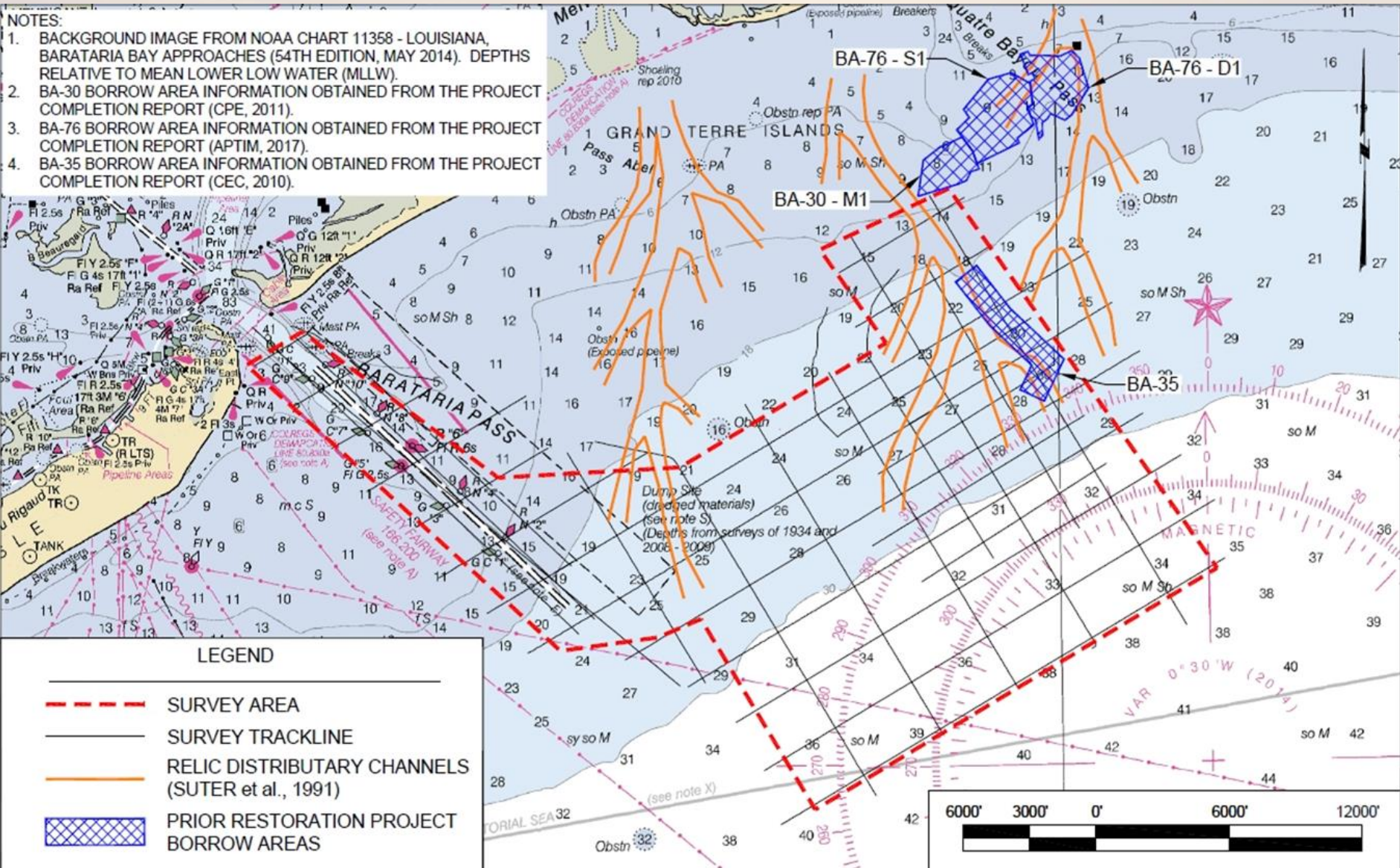
➤ **Deteriorated Conditions**

➤ **Bulkheads & Research Pond Containment left in place**



# Sand Source Search

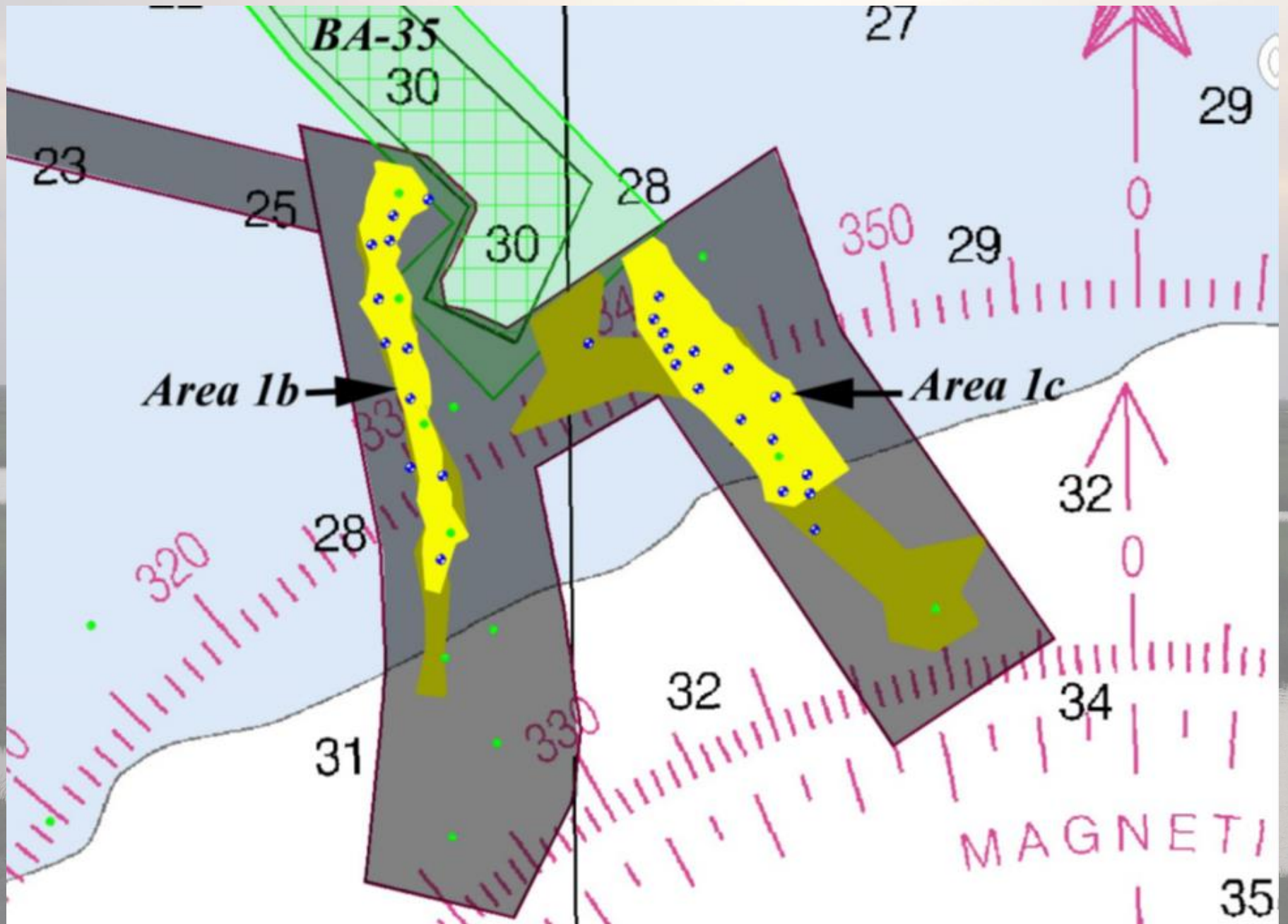
- NOTES:
1. BACKGROUND IMAGE FROM NOAA CHART 11358 - LOUISIANA, BARATARIA BAY APPROACHES (54TH EDITION, MAY 2014). DEPTHS RELATIVE TO MEAN LOWER LOW WATER (MLLW).
  2. BA-30 BORROW AREA INFORMATION OBTAINED FROM THE PROJECT COMPLETION REPORT (CPE, 2011).
  3. BA-76 BORROW AREA INFORMATION OBTAINED FROM THE PROJECT COMPLETION REPORT (APTIM, 2017).
  4. BA-35 BORROW AREA INFORMATION OBTAINED FROM THE PROJECT COMPLETION REPORT (CEC, 2010).



## LEGEND

- SURVEY AREA
- SURVEY TRACKLINE
- RELIC DISTRIBUTARY CHANNELS (SUTER et al., 1991)
- PRIOR RESTORATION PROJECT BORROW AREAS

# Suitable Sand Resources



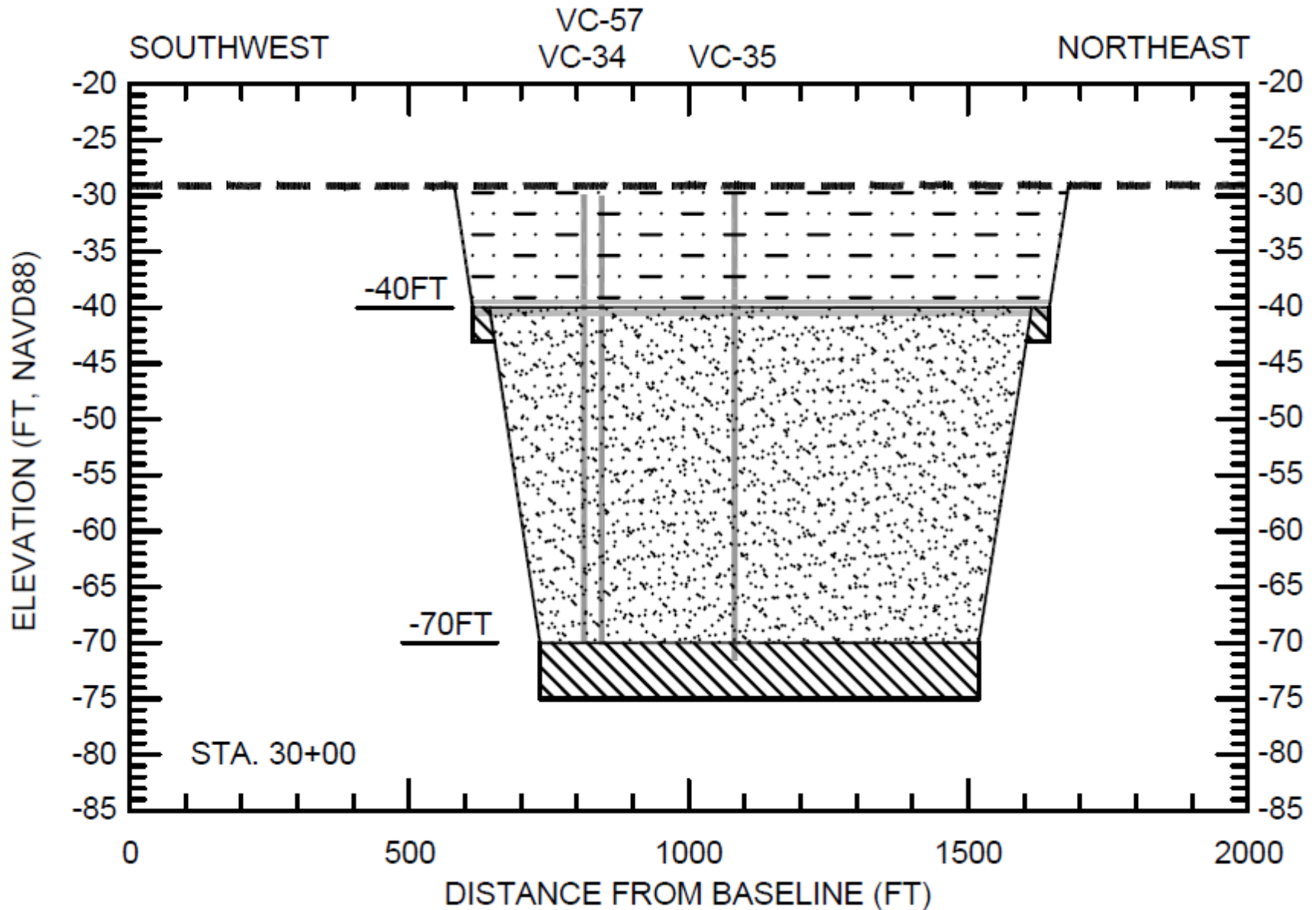
# Borrow Area Core (typ.)



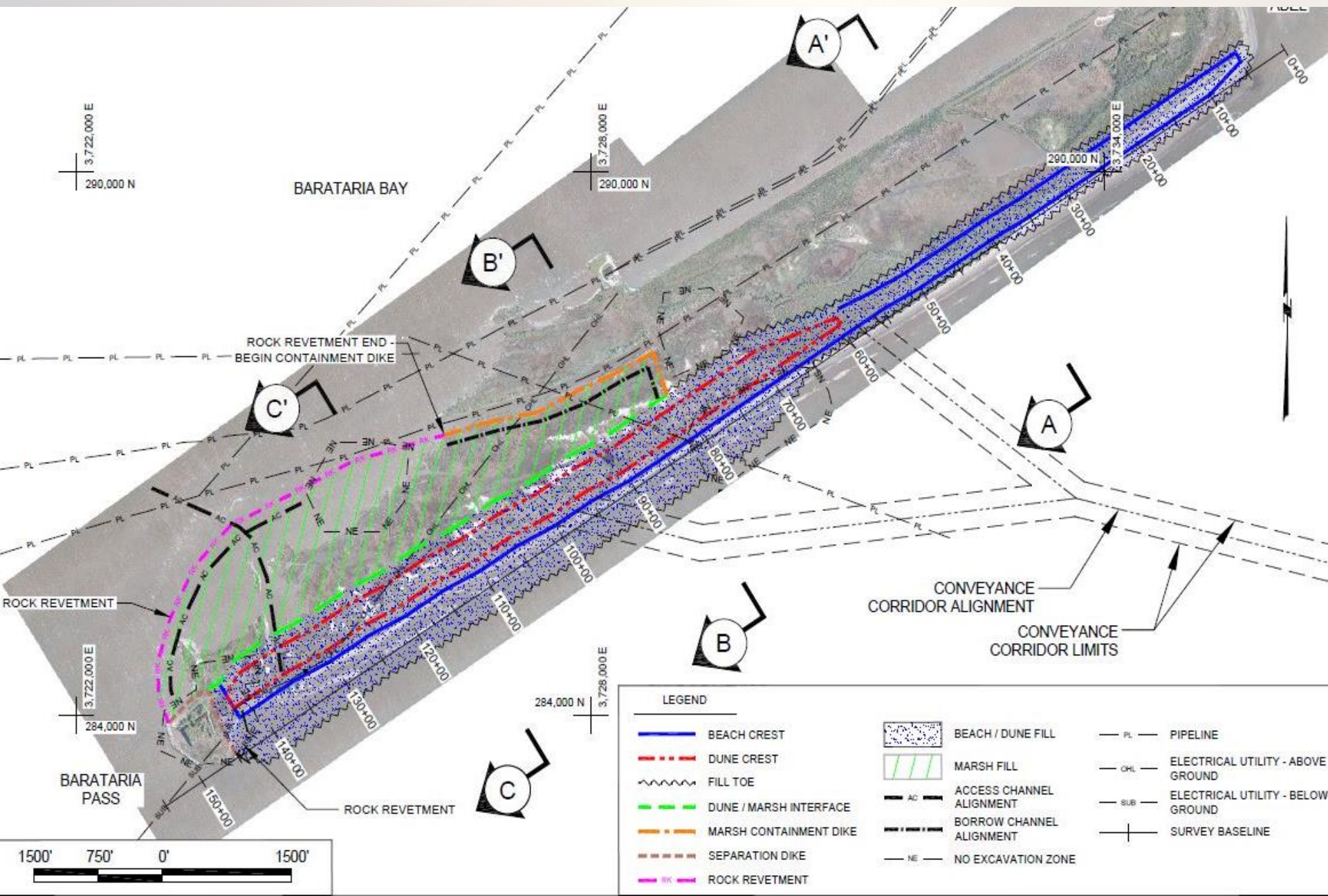
**0-40 FT**



# Borrow Area Typical Section

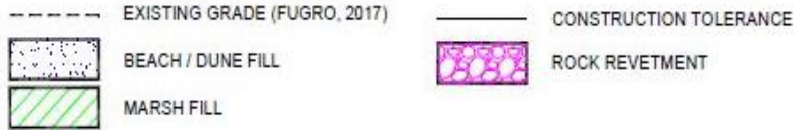


# Restoration Area Overview Map

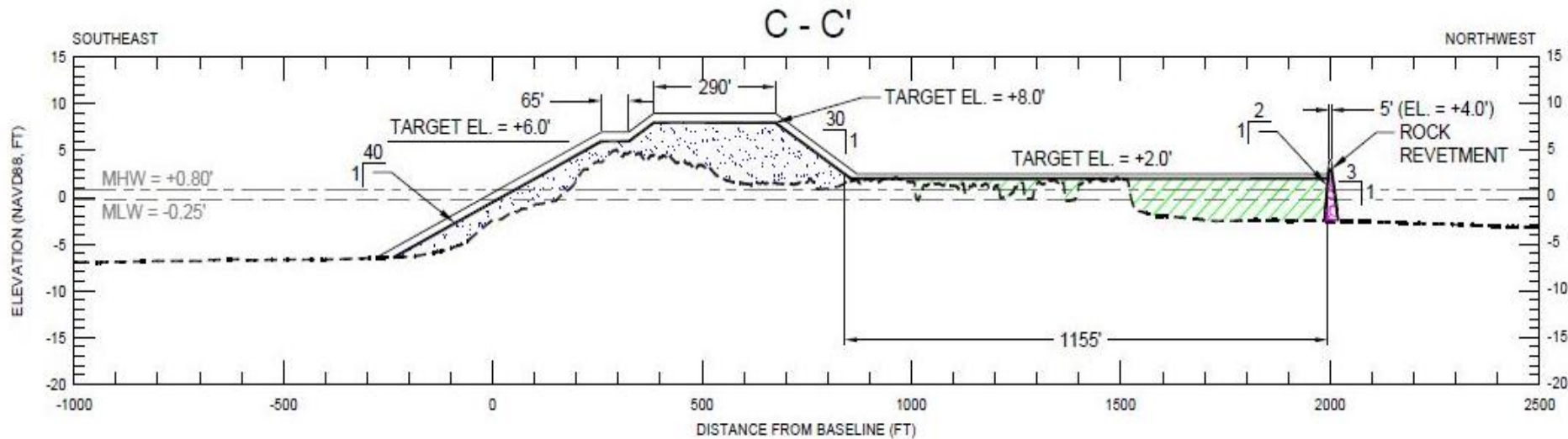


# Restoration Area Typical Section

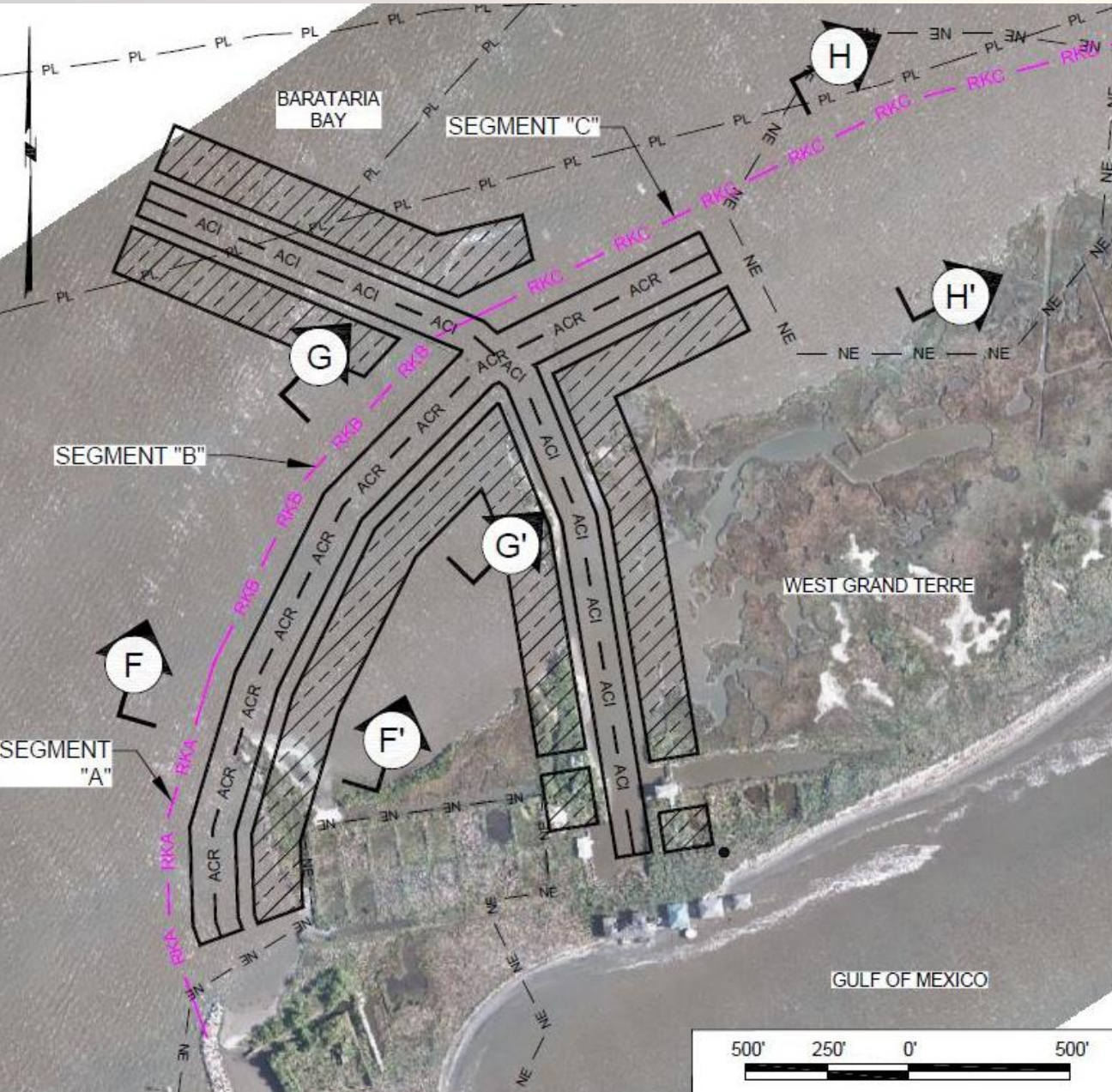
LEGEND:



SCALE:  
H: 1" = 40'  
V: 1" = 20'



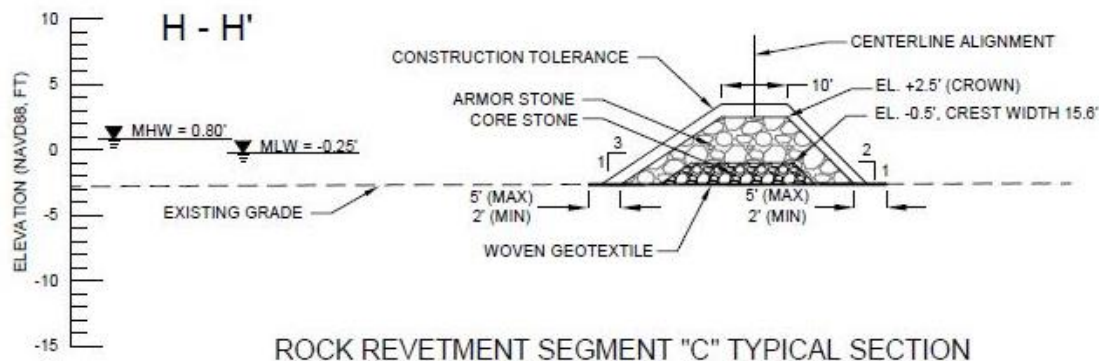
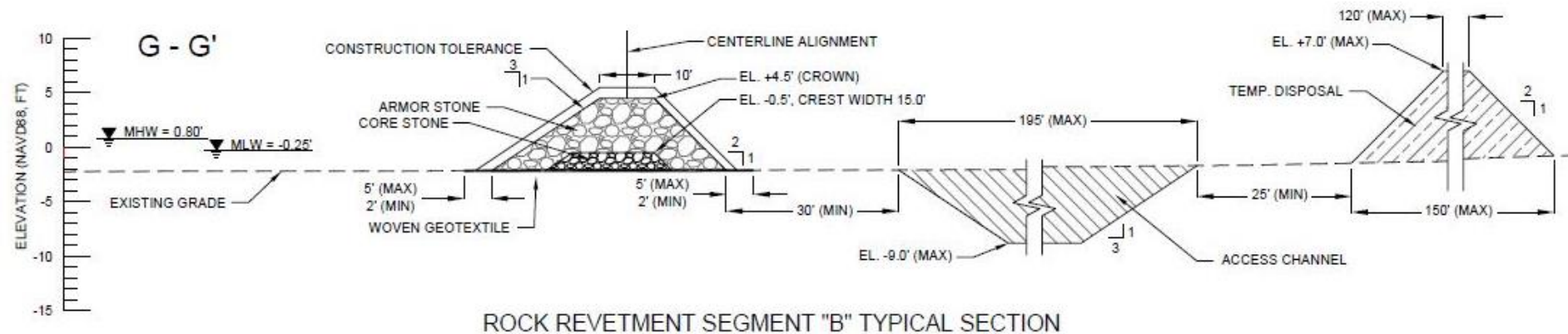
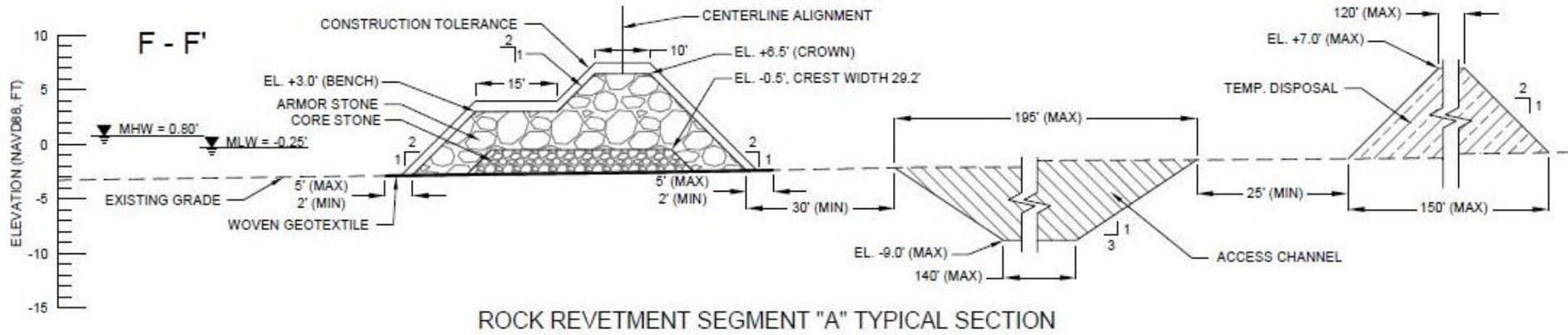
# Rock Revetment Shoreline Protection Plan



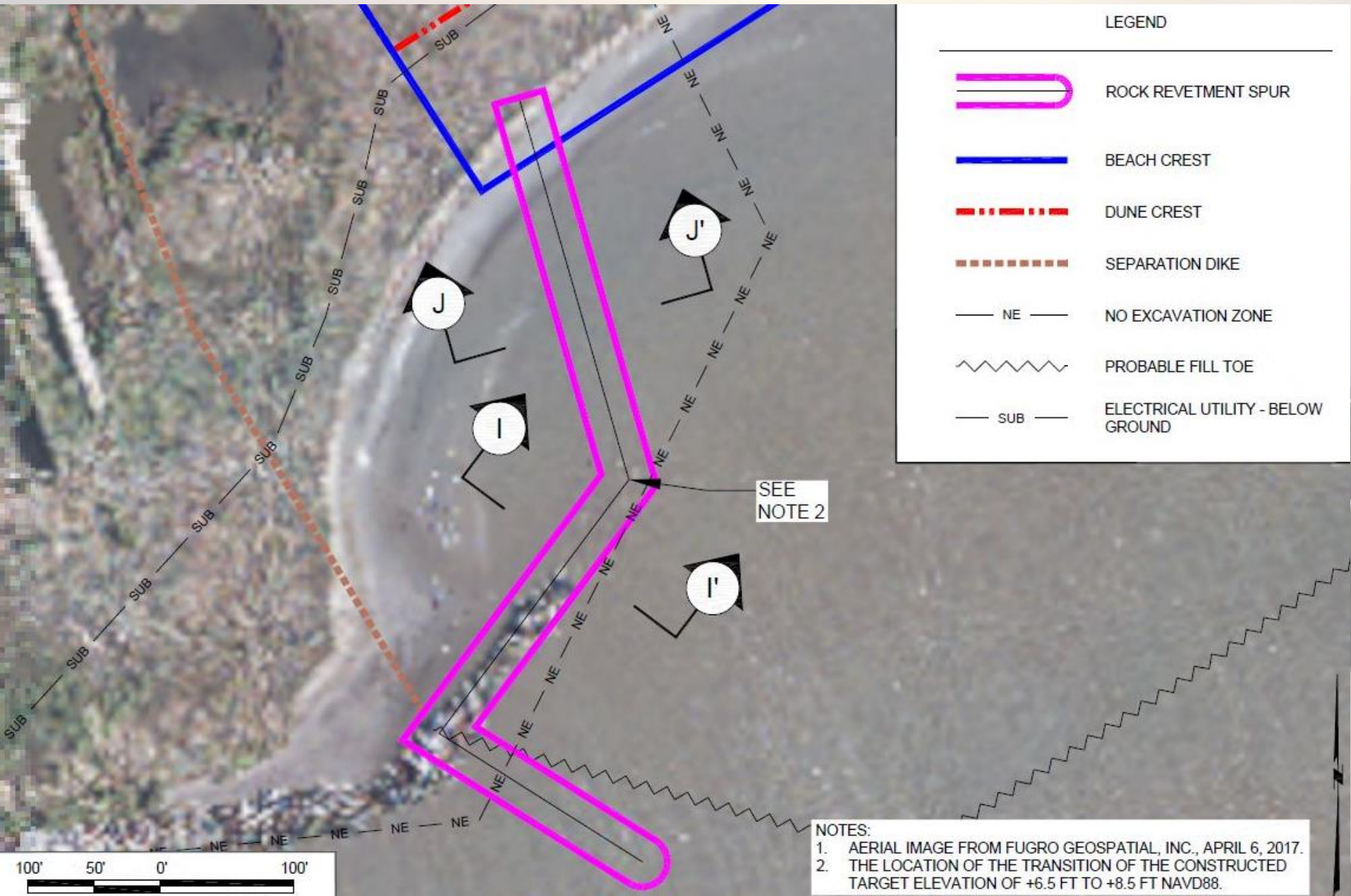
NOTES:  
 1. AERIAL IMAGE FROM FUGRO GEOSPATIAL, INC.,  
 APRIL 6, 2017.

LEGEND		
	RKA	ROCK REVETMENT SEGMENT "A" ALIGNMENT
	RKB	ROCK REVETMENT SEGMENT "B" ALIGNMENT
	RKC	ROCK REVETMENT SEGMENT "C" ALIGNMENT
	ACI	ACCESS CHANNEL - ISLAND
	ACR	ACCESS CHANNEL - ROCK
		TEMPORARY DISPOSAL AREAS
	PL	PIPELINE
		CONTAINMENT DIKE
	NE	NO EXCAVATION ZONE

# Rock Revetment Typical Sections



# Rock Revetment Spur



# Acknowledgements

