

Assessing the Western Caminada-Moreau Headland's Shoreline, Elevational, Vegetative, and Avian Response to Beach, Dune, and Marsh Creation

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CPRA-Coastal Resources Scientist

State of Coast Conference (SOC18)
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New Orleans, LA



Coastal Protection and
Restoration Authority of Louisiana



committed to our coast

WEST BELLE PASS BARRIER HEADLAND RESTORATION (TE-52)

TIMELINE & HISTORY

- **PPL-16 CWPPRA PROJECT**
 - SPONSORED BY NOAA FISHERIES & CPRA
 - HIGH RATE OF SHORELINE EROSION
 - E&D (OCT 2006) & CONSTRUCTION (JAN 2010) FUNDING
 - STUDY INTERVAL (2008-2017)
- **GOALS**
 - REESTABLISH AND INCREASE HEADLAND LONGEVITY
 - INCREASE HABITAT USE BY FISH AND WILDLIFE SPECIES
 - PREVENT BREACHING ALONG 9,300 FOOT HEADLAND
- **CONSTRUCTION**
 - OCT 2011-MAR 2013
 - DUNE 6.5-7.5 FEET – 183 ACRES CREATED OR ENHANCED
 - MARSH 4.0 FEET – 334 ACRES CREATED OR ENHANCED
 - HURRICANE ISAAC – AUG 29, 2012



1.5 0.75 0 1.5 3 4.5
Kilometers

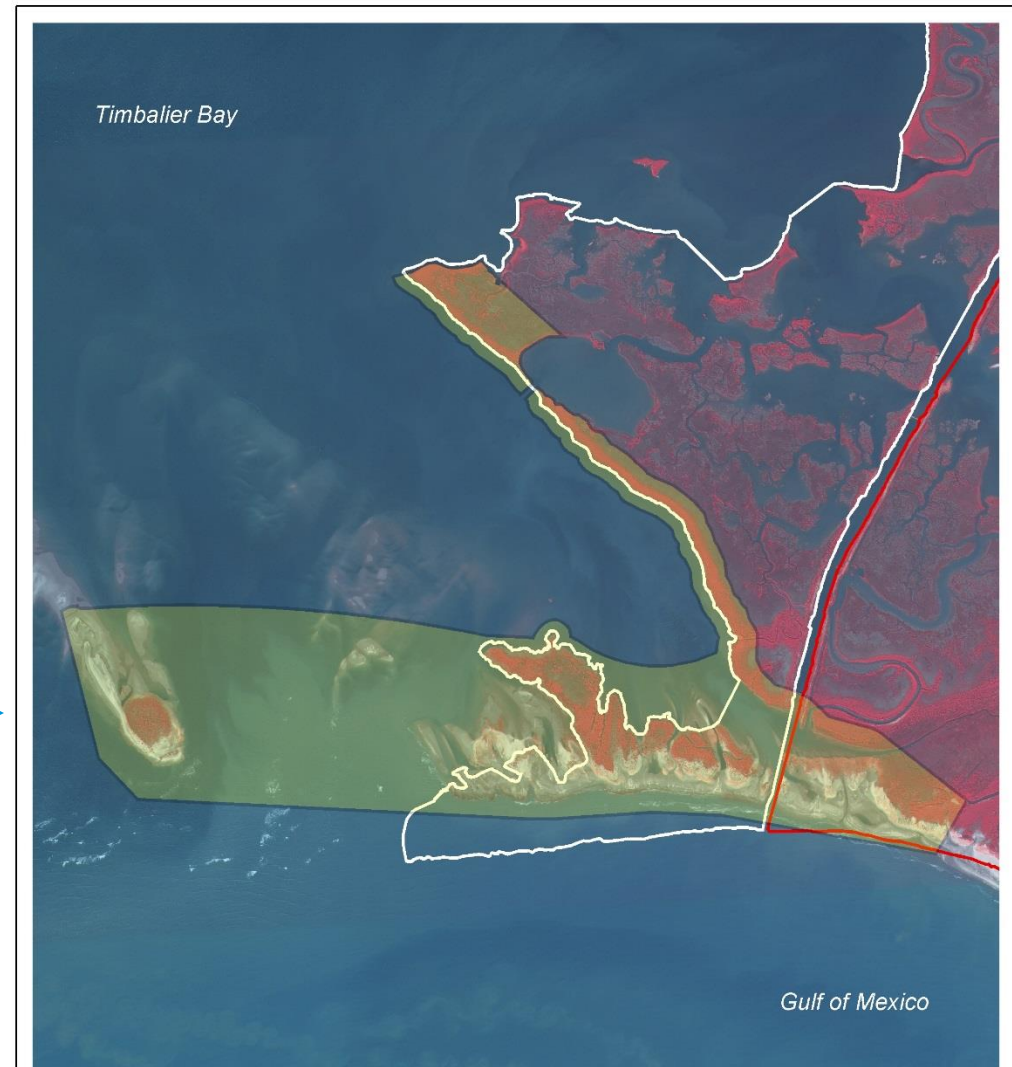
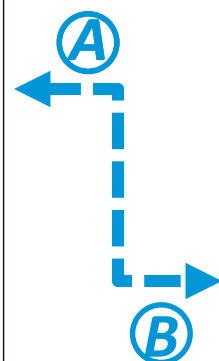
1.5 0.75 0 1.5 3 4.5
Miles

Data Source:
Coastal Protection and Restoration Authority of LA Operations

1998 DOQQ

Date: December 4, 2006
Map ID: 2006-TFO-027

- Net Longshore Transport
- Belle Pass Rock Jetties
- LA Hwy. 1
- LA Hwy. 3090
- TE-52 Project Area
- TE-23 Project Area
- TE-23 Reference Area



875 437.5 0 875 1,750 2,625
Feet

300 150 0 300 600 900
Meters

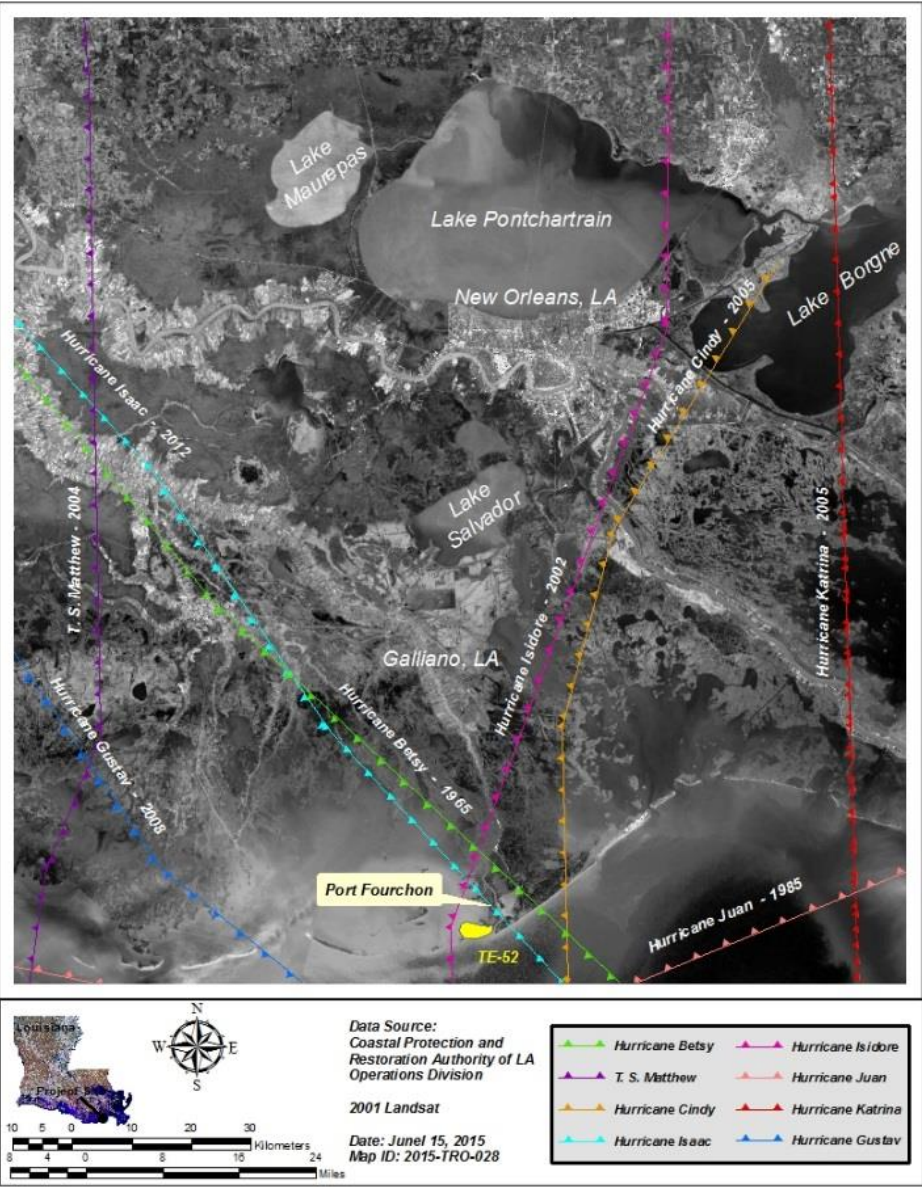
Data Source:
LA Dept. of Natural Resources
Coastal Restoration Division
Biological Monitoring Section

2005 DOQQ

Date: November 30, 2006
Map ID: 2006-TFO-025

- TE-52 Project Area
- TE-23 Project Area
- TE-23 Reference Area

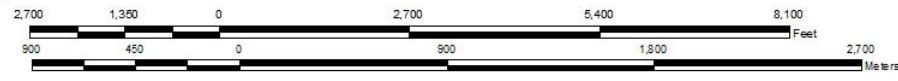
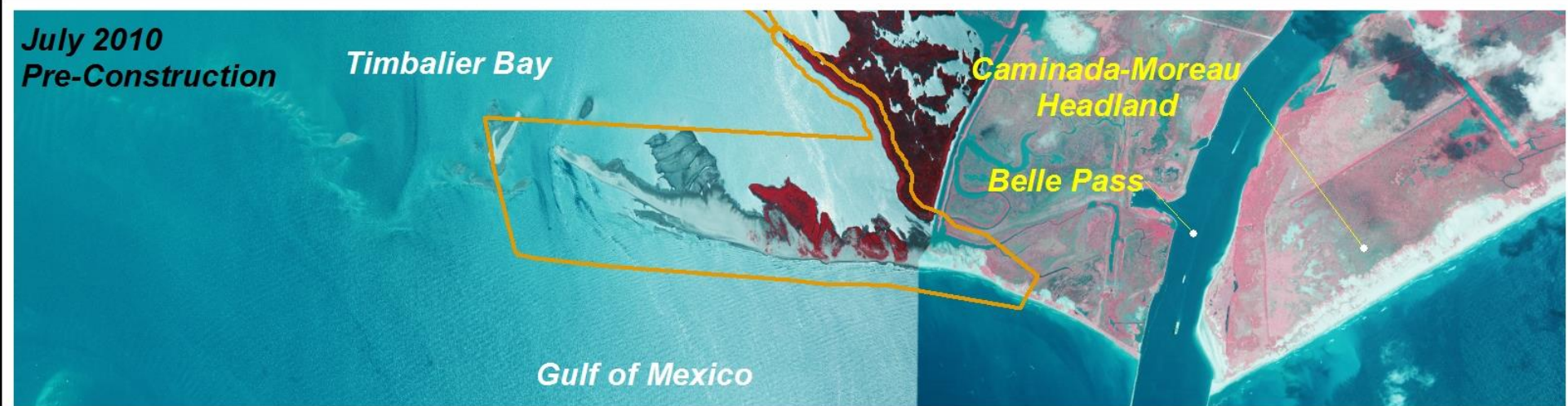
HURRICANE TRACKS



HURRICANE ISAAC IMPACTS



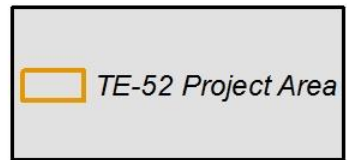
PRE- (2010) & POST-CONSTRUCTION (2013) IMAGERY



Data Source:
Coastal Protection and
Restoration Authority of LA
Operations Division

2010 NAIP
2013 NAIP

Date: January 30, 2015
Map ID: 2015-TFO-001



RTK ELEVATION SURVEYS (NAVD88)



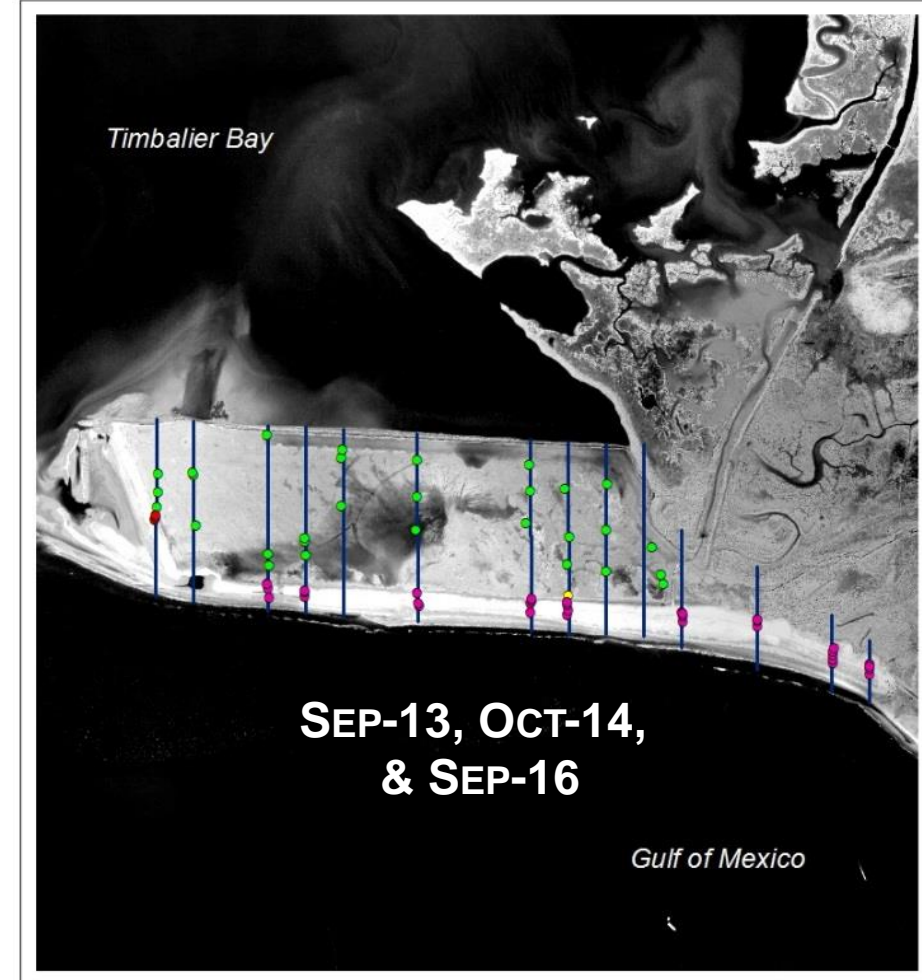
Data Source:
Coastal Protection and Restoration Authority of LA Operations

2013 NAIP

Date: August 29, 2016
Map ID: 2016-TRO-018

- End Points
- Extended End Points
- TE-52 Survey Transects
- TE-52 Extended Transects

DUNE & MARSH VEGETATION SURVEYS

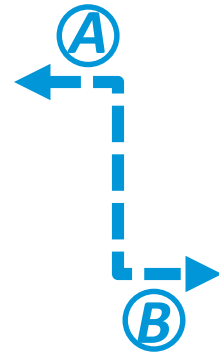


Data Source:
Coastal Protection and Restoration Authority of LA Operations

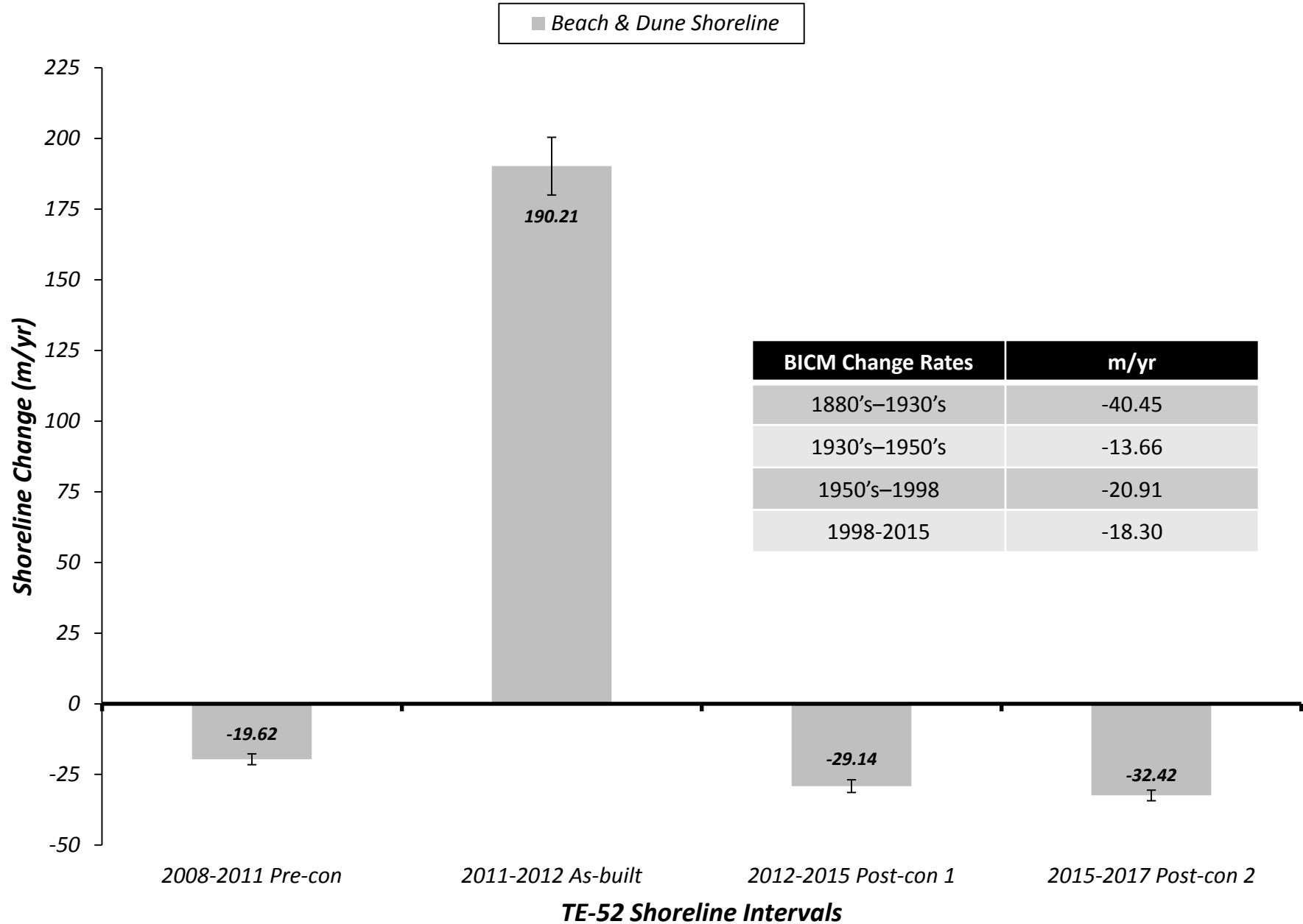
2012 DOQQ

Date: April 4, 2017
Map ID: 2017-TRO-018

- Dune Plots
- Marsh Plots
- Eroded Dune Plots
- Eroded Marsh Plots
- Vegetation Transects

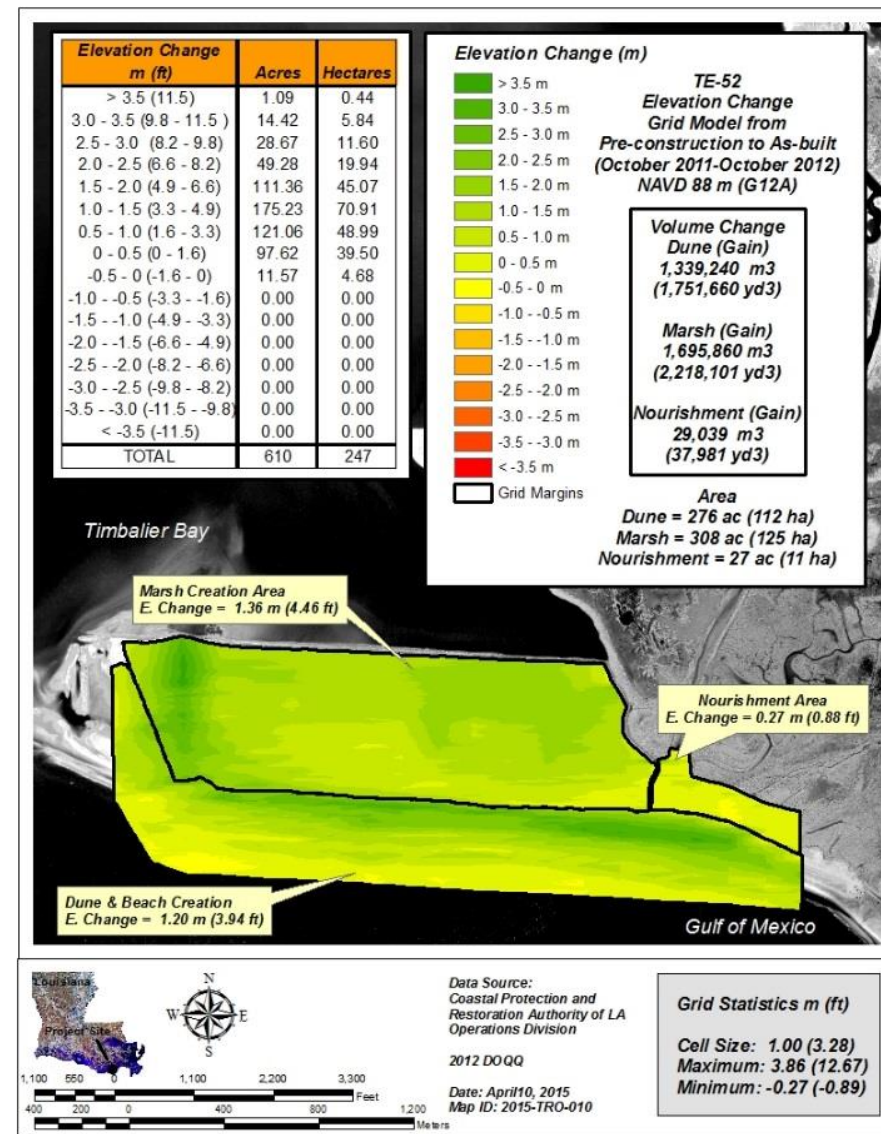
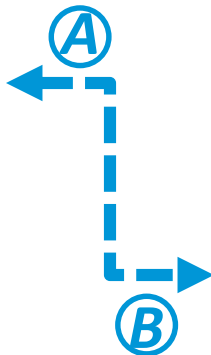
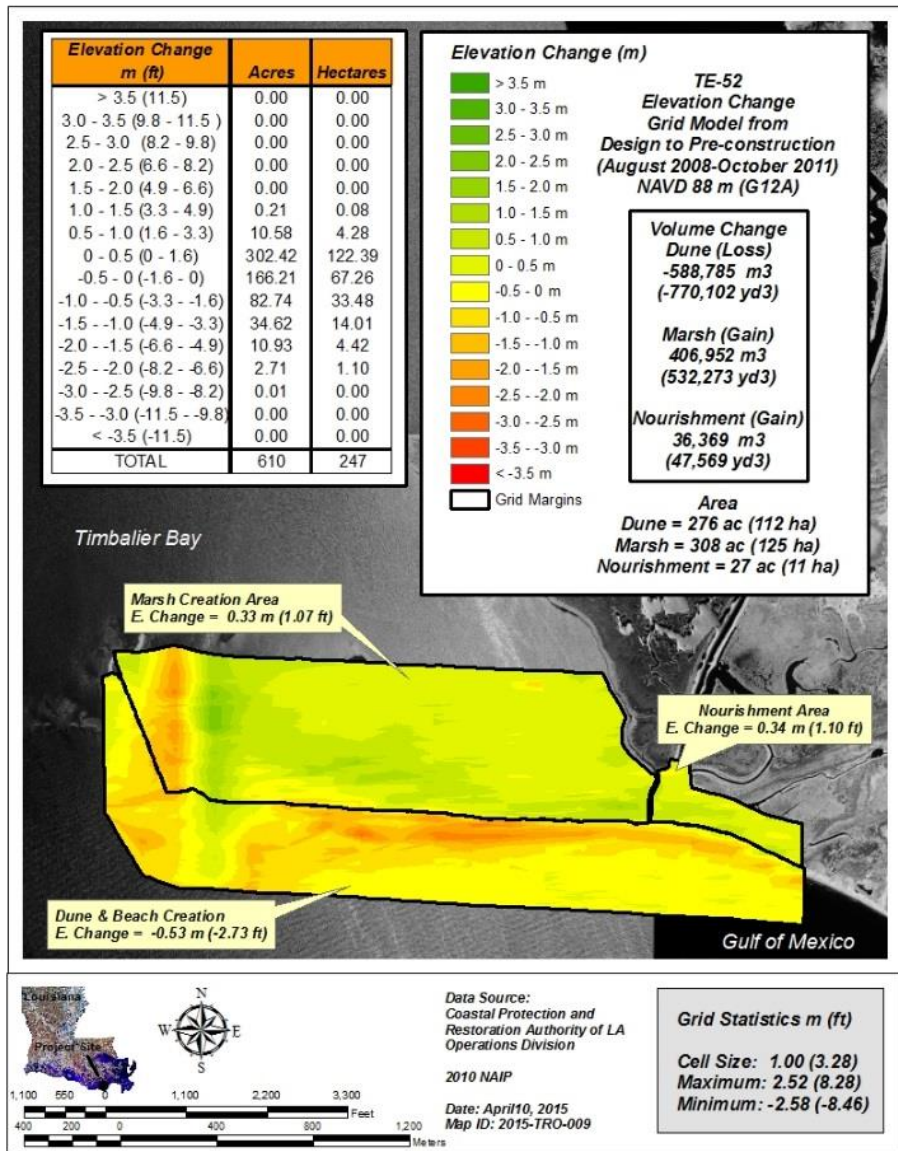


SHORELINE CHANGE 2008-2017 (m/yr)

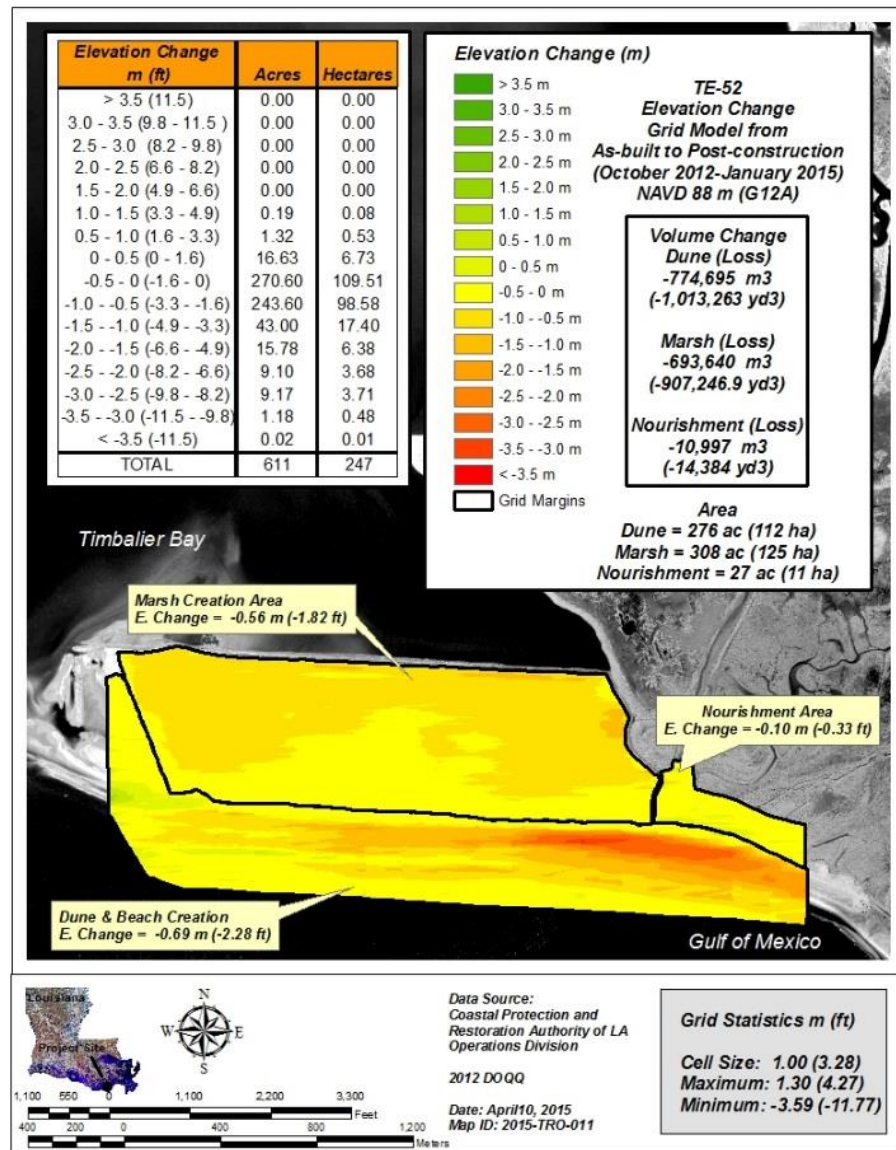


ELEVATION CHANGE (PRE) 2008-2011

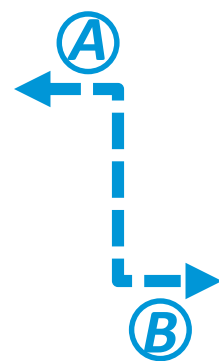
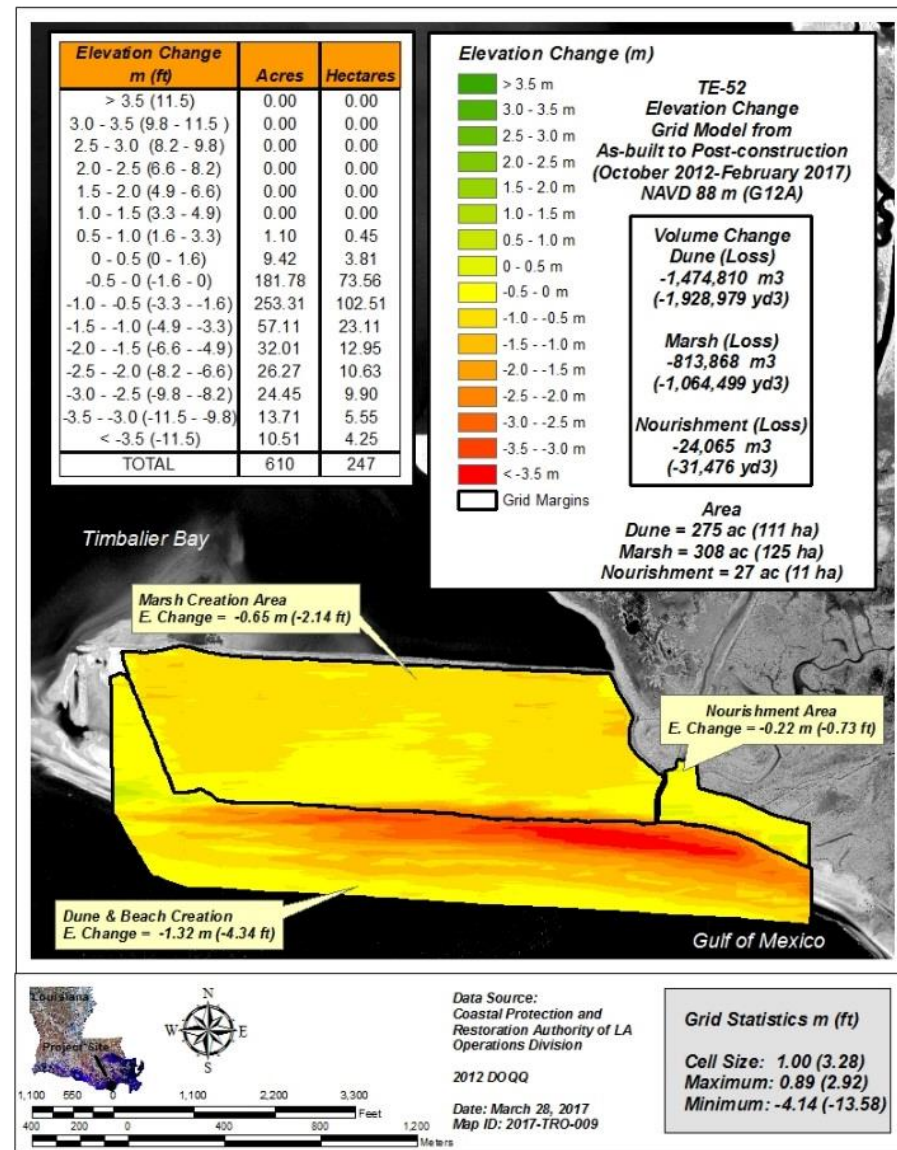
ELEVATION CHANGE (AS) 2011-2012



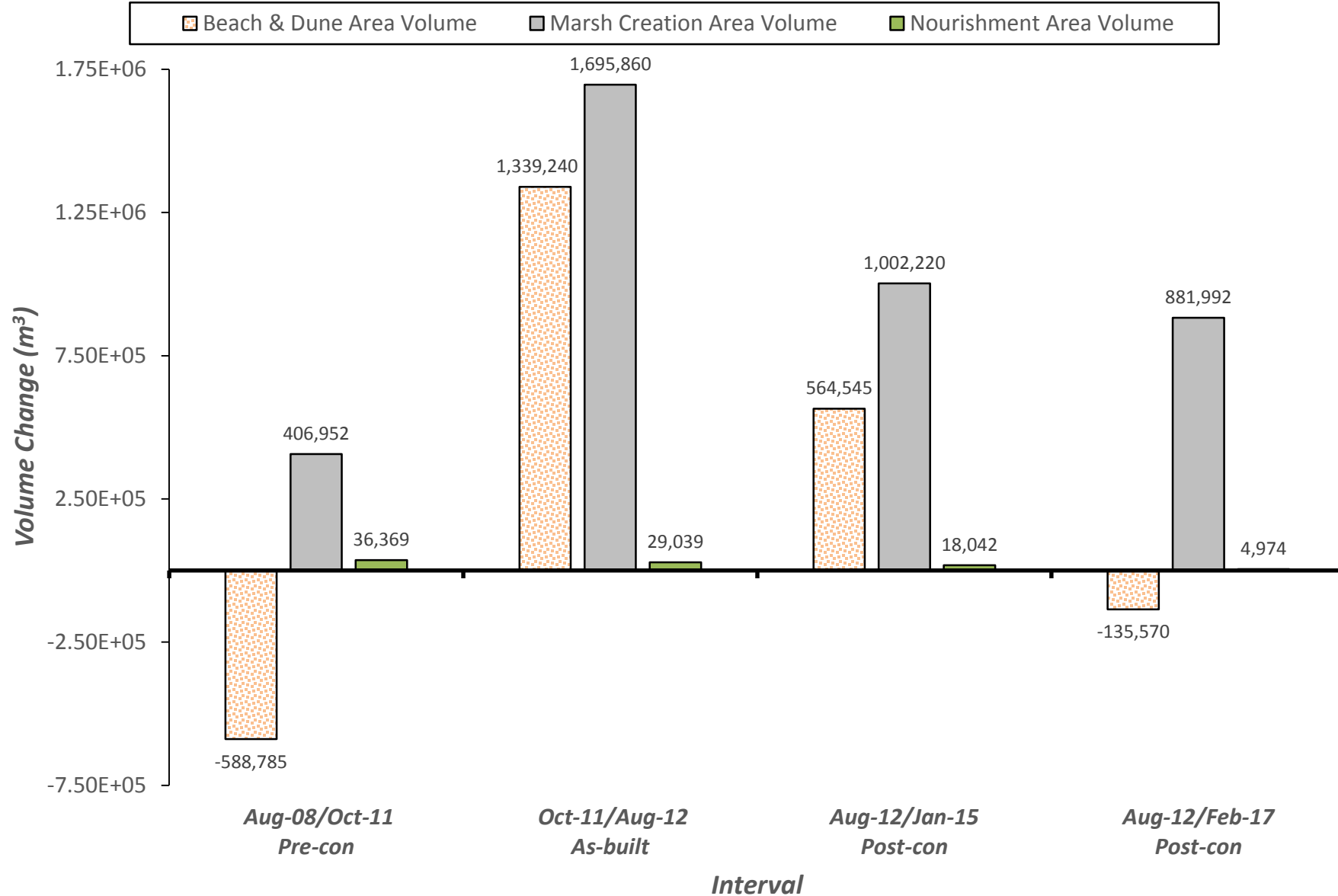
ELEVATION CHANGE (POST) 2012-2015



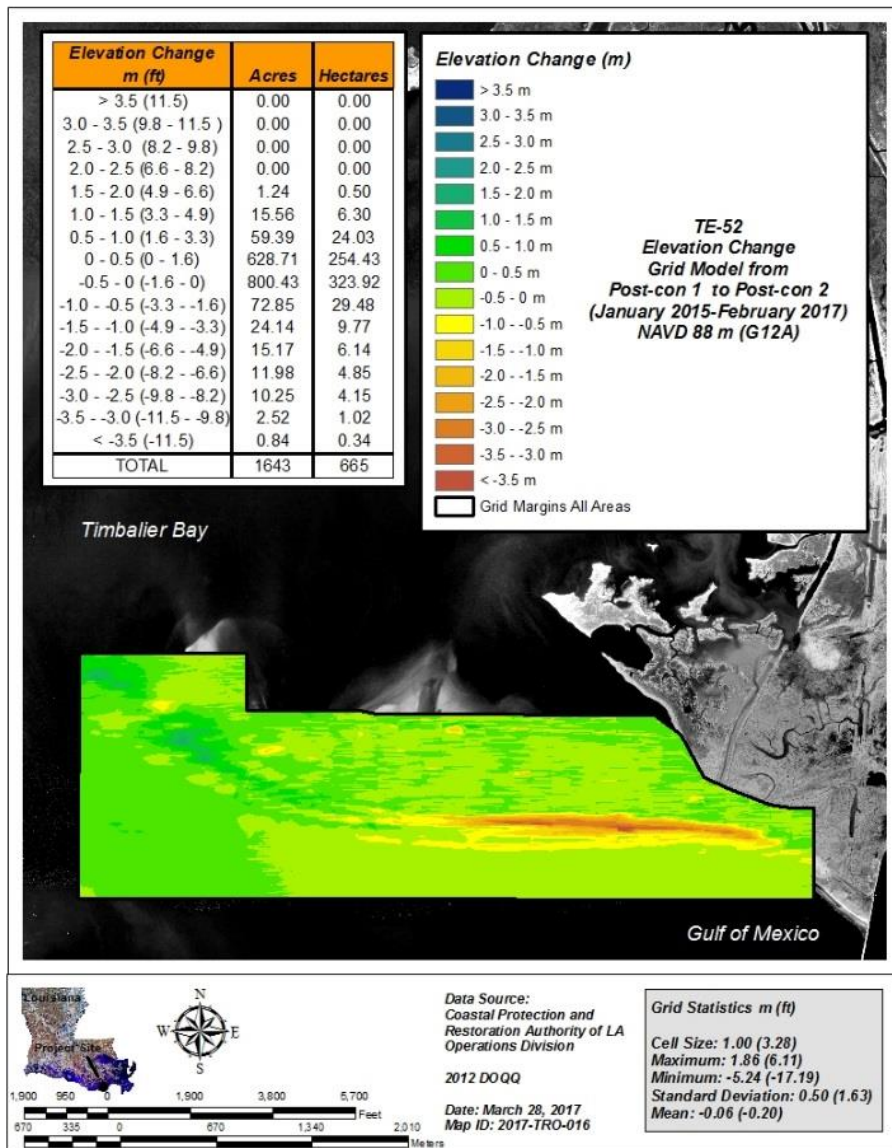
ELEVATION CHANGE (POST) 2012-2017



VOLUME CHANGE 2008-2017 (m³)

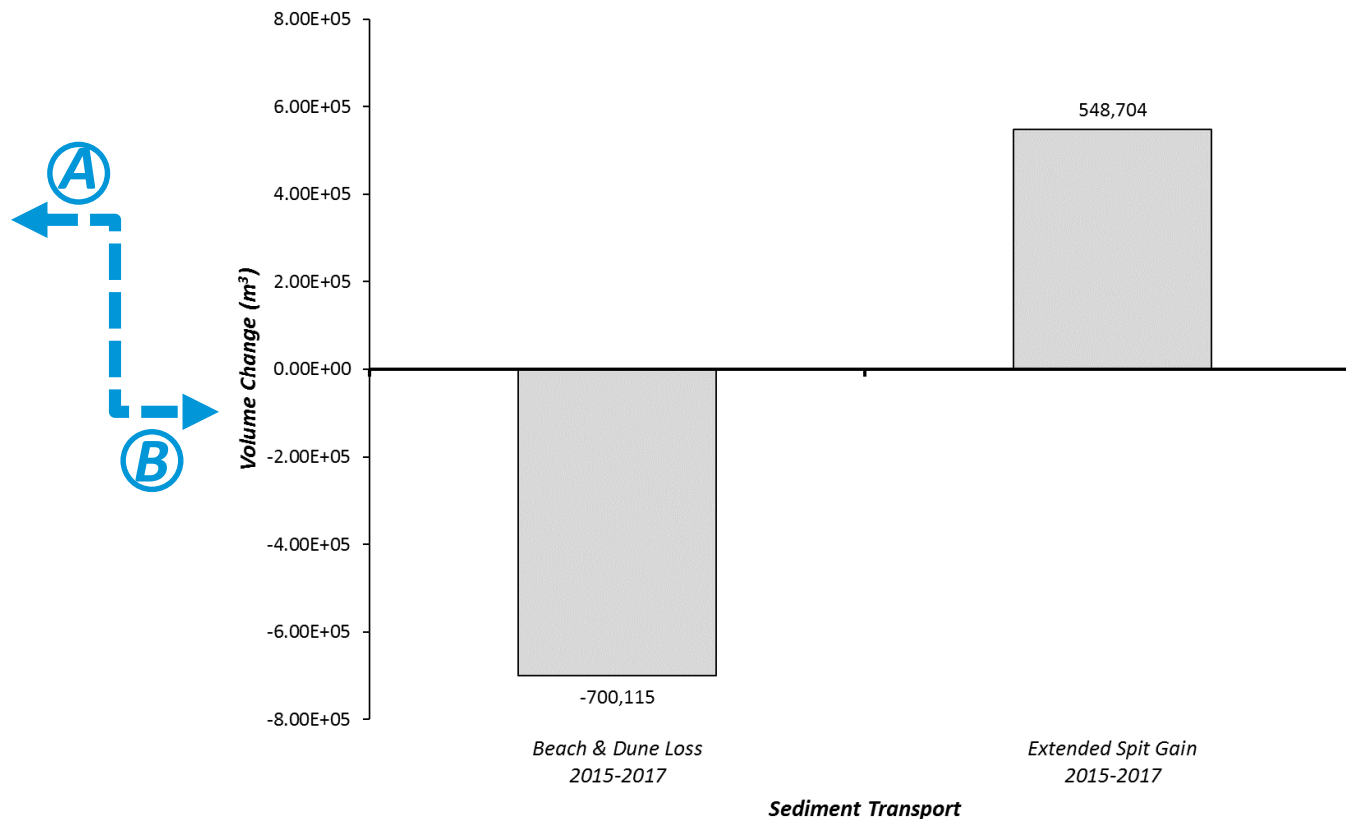


ELEVATION CHANGE (POST) 2015-2017

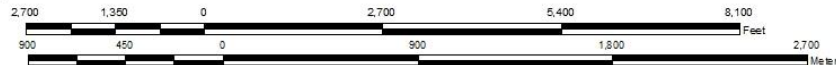
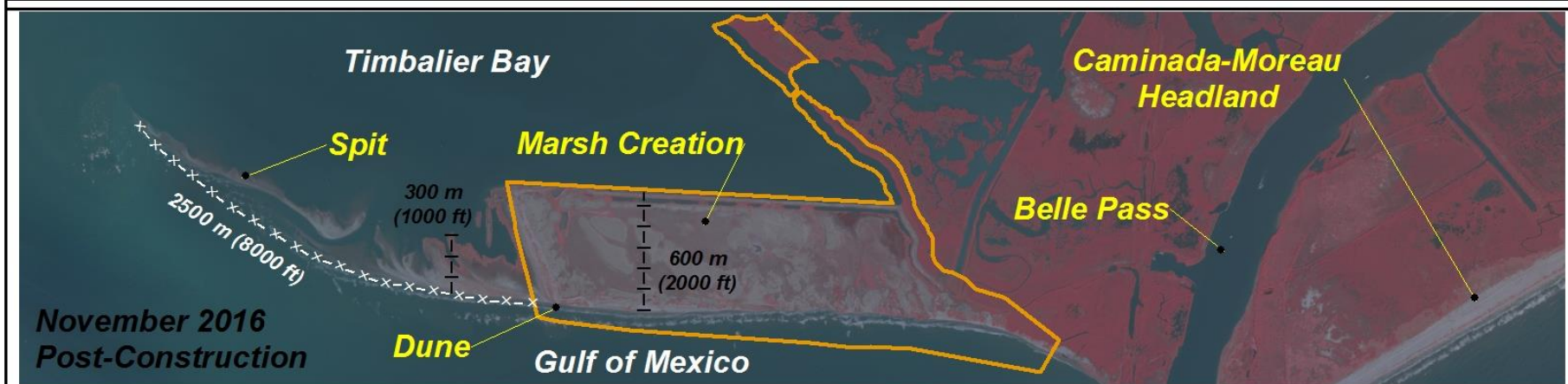


SEDIMENT TRANSPORT 2015-2017

78% SEDIMENT RETENTION RATE



SHORELINE EROSION & SPIT ELONGATION 2012-2016



Data Source:
Coastal Protection and
Restoration Authority of LA
Operations Division

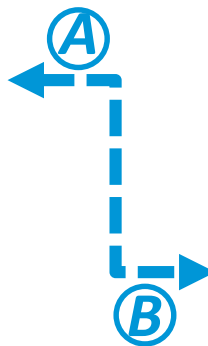
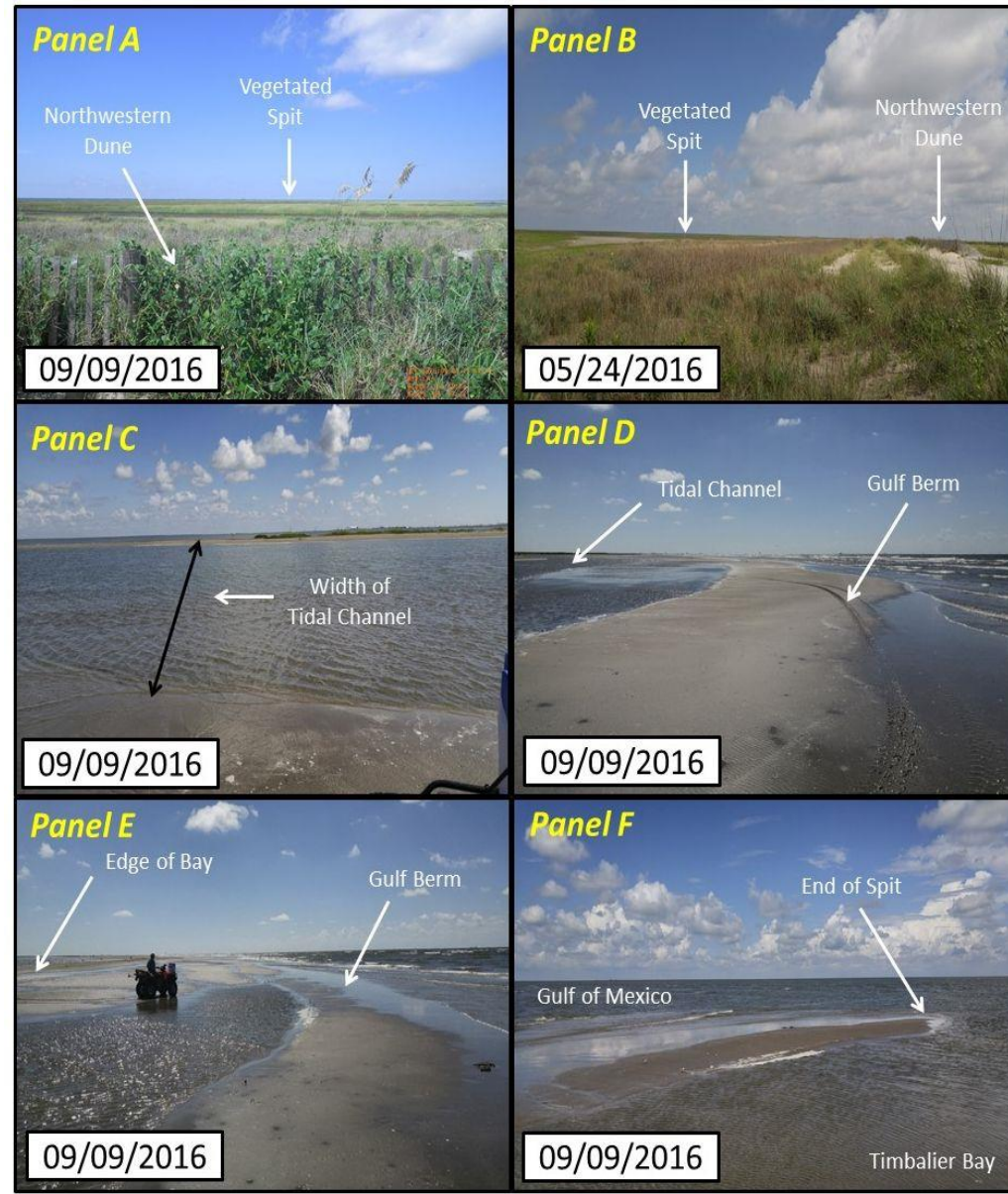
2012 DOQQ
2016 DOQQ

Date: April 26, 2018
Map ID: 2018-TRO-012

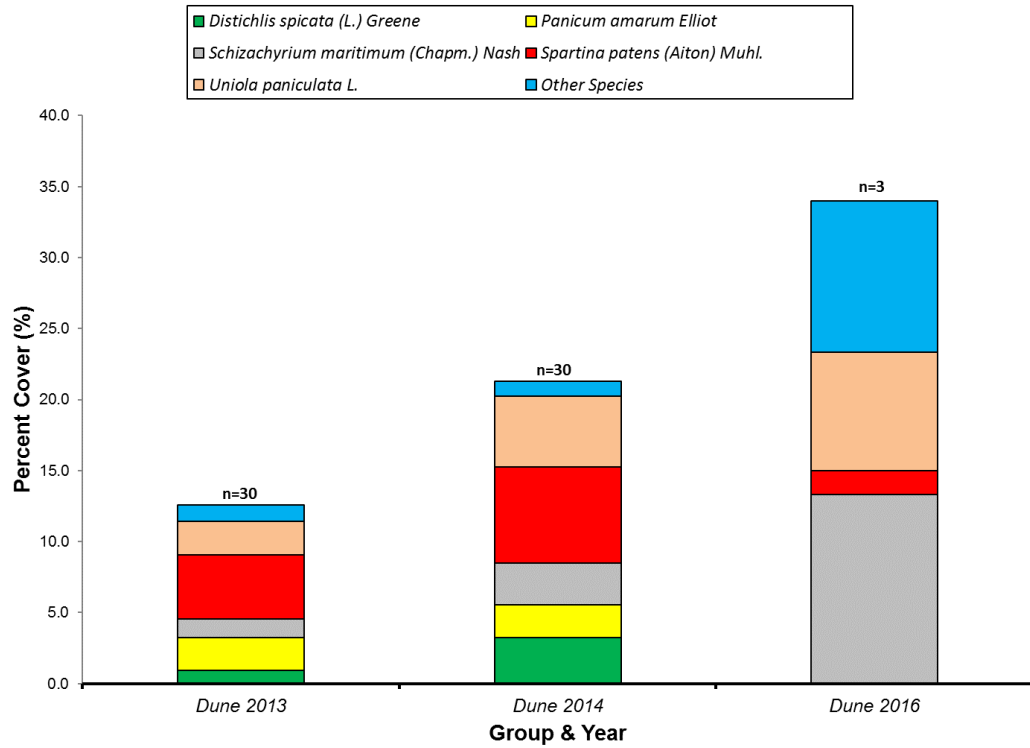
---x---	Length
--- ---	Width
	TE-52 Project Area

DUNE SCARPING & LEVELING 2013-2016

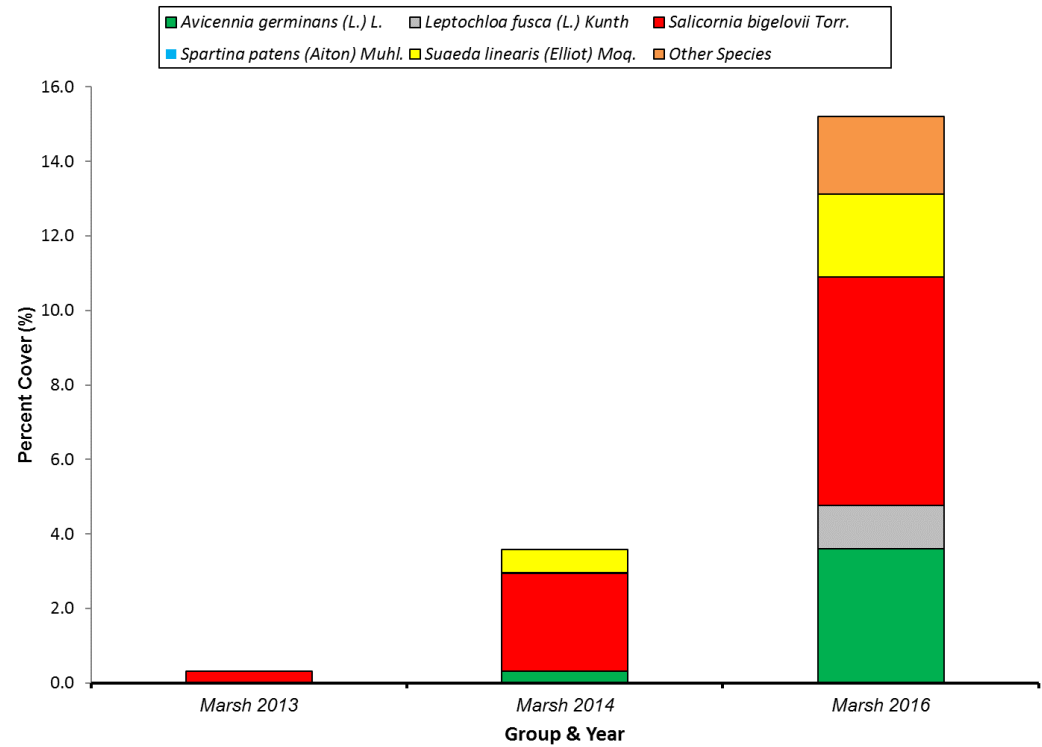
SPIT HABITATS 2016



DUNE MEAN (%) VEGETATIVE COVER 2013-2016

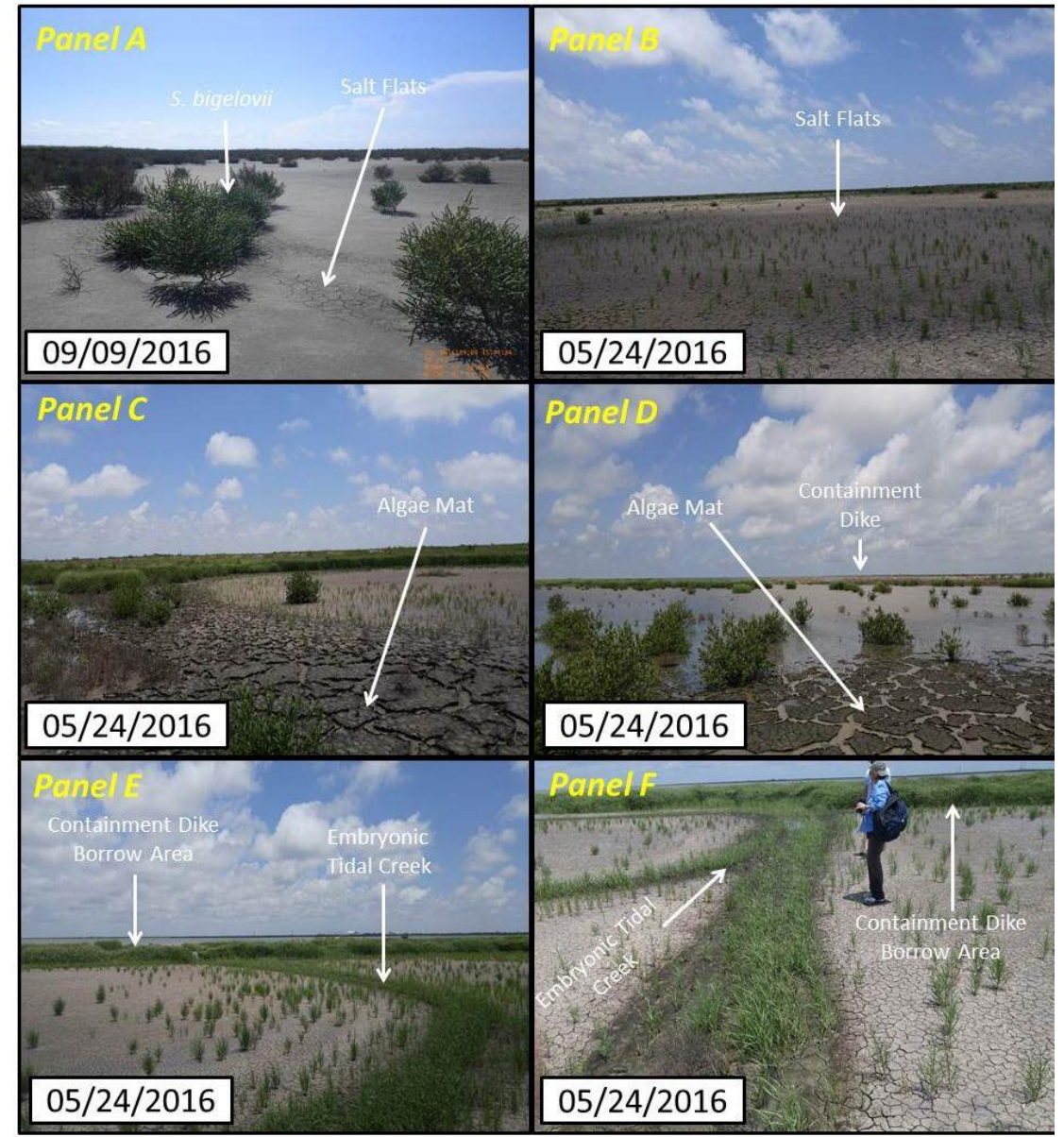


MARSH MEAN (%) VEGETATIVE COVER 2013-2016

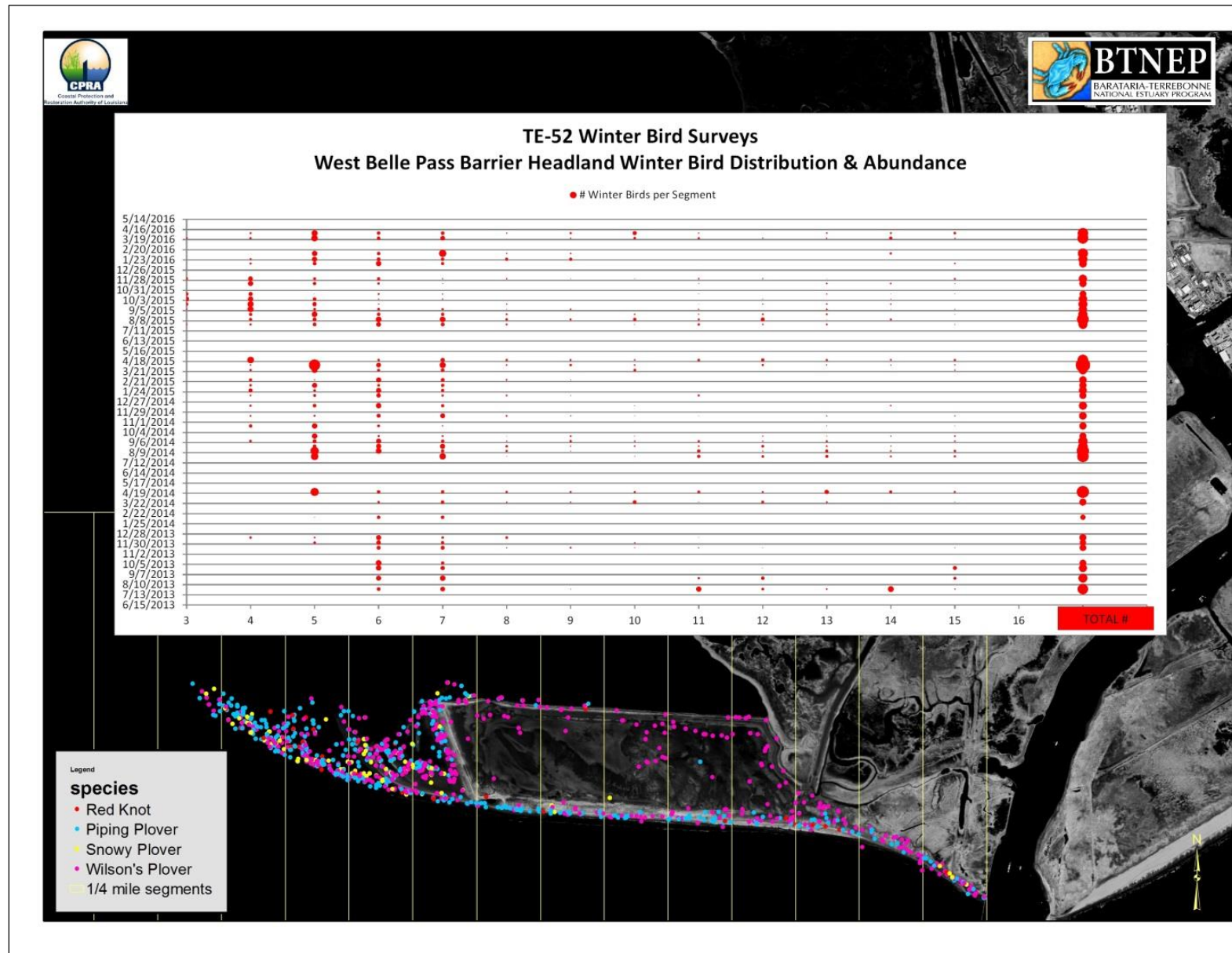


MARSH HABITATS 2016

GAPPED CONTAINMENT DIKE TIDAL CREEK 2014-2016



WINTER SHOREBIRD DISTRIBUTION & ABUNDANCE 2013-2016



TE-52 CONCLUSIONS AND RECOMMENDATIONS

- Longevity & Breaching Goals Achieved
- Habitat Goal Attained for Wildlife but not for Fisheries
- The Beach has Eroded & the Dune has been Leveled
- Longshore Transport, Belle Pass Jetty, & Hurricane Isaac Influenced Erosion
- The Spit has Added Sand Volume & Elongated the Shoreline by 80%
- Marsh Creation Area Predominately Dry Salt Flat Habitat
- Recently Gapped Marsh Creation Containment Dike to Improve Tidal Connectivity
- Winter Shorebird Abundance Increased After 1st Post-construction Year
- Recommend Beach Nourishment Event for West Belle Pass
- Recommend Extending Pre & As-built Elevation Surveys on Sandy Shorelines to Better Capture Longshore Transport Effects
- Recommend Sediment Budget & Process Data Assessments for All Sandy Shorelines to Improve Geomorphic Model Predictions

ACKNOWLEDGEMENTS



Coastal Protection and
Restoration Authority of Louisiana

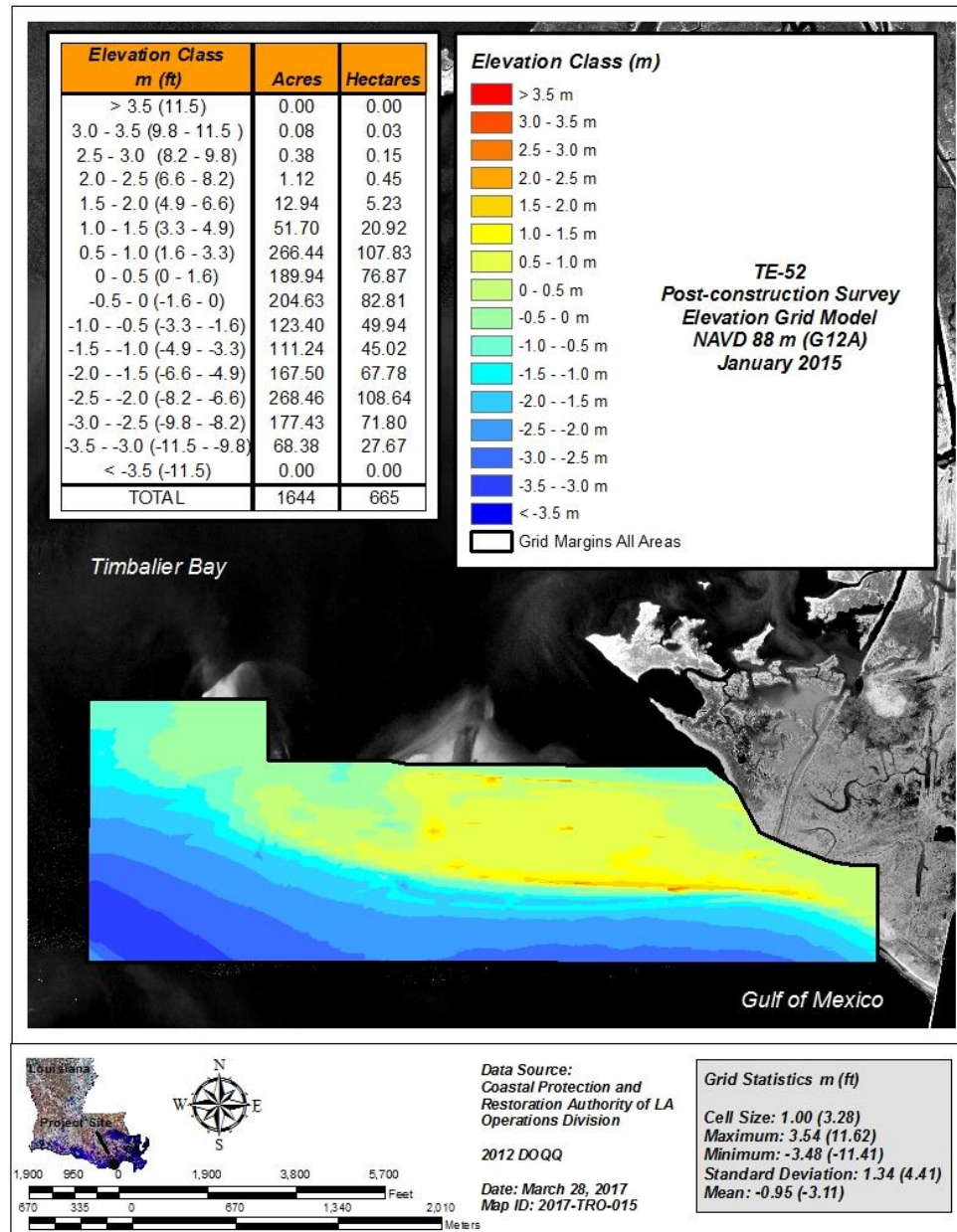


NOAA FISHERIES
National Oceanic and Atmospheric Administration

Darin Lee
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Travis Byland

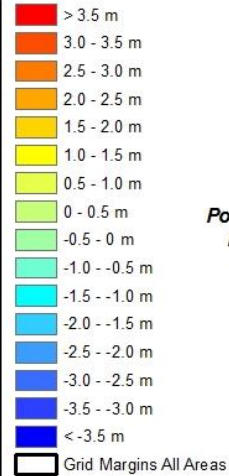


Donna Rogers
John Foret
Cheryl Brodnax
Patrick Williams



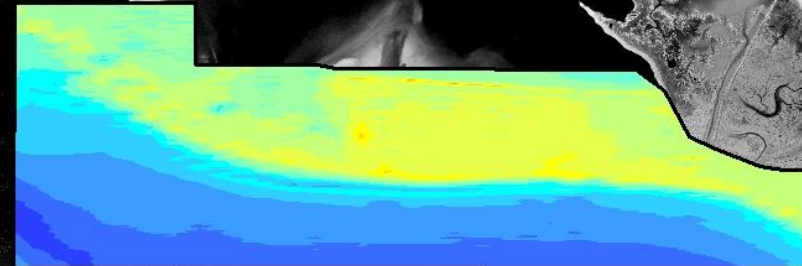
Elevation Class m (ft)	Acres	Hectares
> 3.5 (11.5)	0.00	0.00
3.0 - 3.5 (9.8 - 11.5)	0.00	0.00
2.5 - 3.0 (8.2 - 9.8)	0.00	0.00
2.0 - 2.5 (6.6 - 8.2)	0.04	0.02
1.5 - 2.0 (4.9 - 6.6)	1.02	0.41
1.0 - 1.5 (3.3 - 4.9)	19.00	7.69
0.5 - 1.0 (1.6 - 3.3)	256.60	103.84
0 - 0.5 (0 - 1.6)	250.49	101.37
-0.5 - 0 (-1.6 - 0)	212.06	85.82
-1.0 - -0.5 (-3.3 - -1.6)	78.75	31.87
-1.5 - -1.0 (-4.9 - -3.3)	87.76	35.51
-2.0 - -1.5 (-6.6 - -4.9)	162.18	65.63
-2.5 - -2.0 (-8.2 - -6.6)	322.57	130.54
-3.0 - -2.5 (-9.8 - -8.2)	232.02	93.90
-3.5 - -3.0 (-11.5 - -9.8)	21.42	8.67
< -3.5 (-11.5)	0.00	0.00
TOTAL	1644	665

Elevation Class (m)



TE-52
Post-construction Survey
Elevation Grid Model
NAVD 88 m (G12A)
February 2017

Timbalier Bay



Gulf of Mexico



Data Source:
 Coastal Protection and
 Restoration Authority of LA
 Operations Division

2012 DOQQ

Date: March 28, 2017
 Map ID: 2017-TRO-015

Grid Statistics m (ft)

Cell Size: 1.00 (3.28)
 Maximum: 2.39 (7.83)
 Minimum: -3.29 (-10.79)
 Standard Deviation: 1.29 (4.24)
 Mean: -1.01 (-3.31)