

Measuring the Settlement and Shoreline Change of a Large Marsh Creation and Foreshore Rock Dike Project Over Time and Hurricane Disturbance

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CPRA-Coastal Resources Scientist

State of Coast Conference (SOC25)
May 20-May 22, 2025
Ernest N. Morial Convention Center
New Orleans, LA

GLENN LEDET, CPRA EXECUTIVE DIRECTOR



LITTLE LAKE SHORELINE PROTECTION/DEDICATED DREDGING NEAR ROUND LAKE (BA-37)

TIMELINE & HISTORY

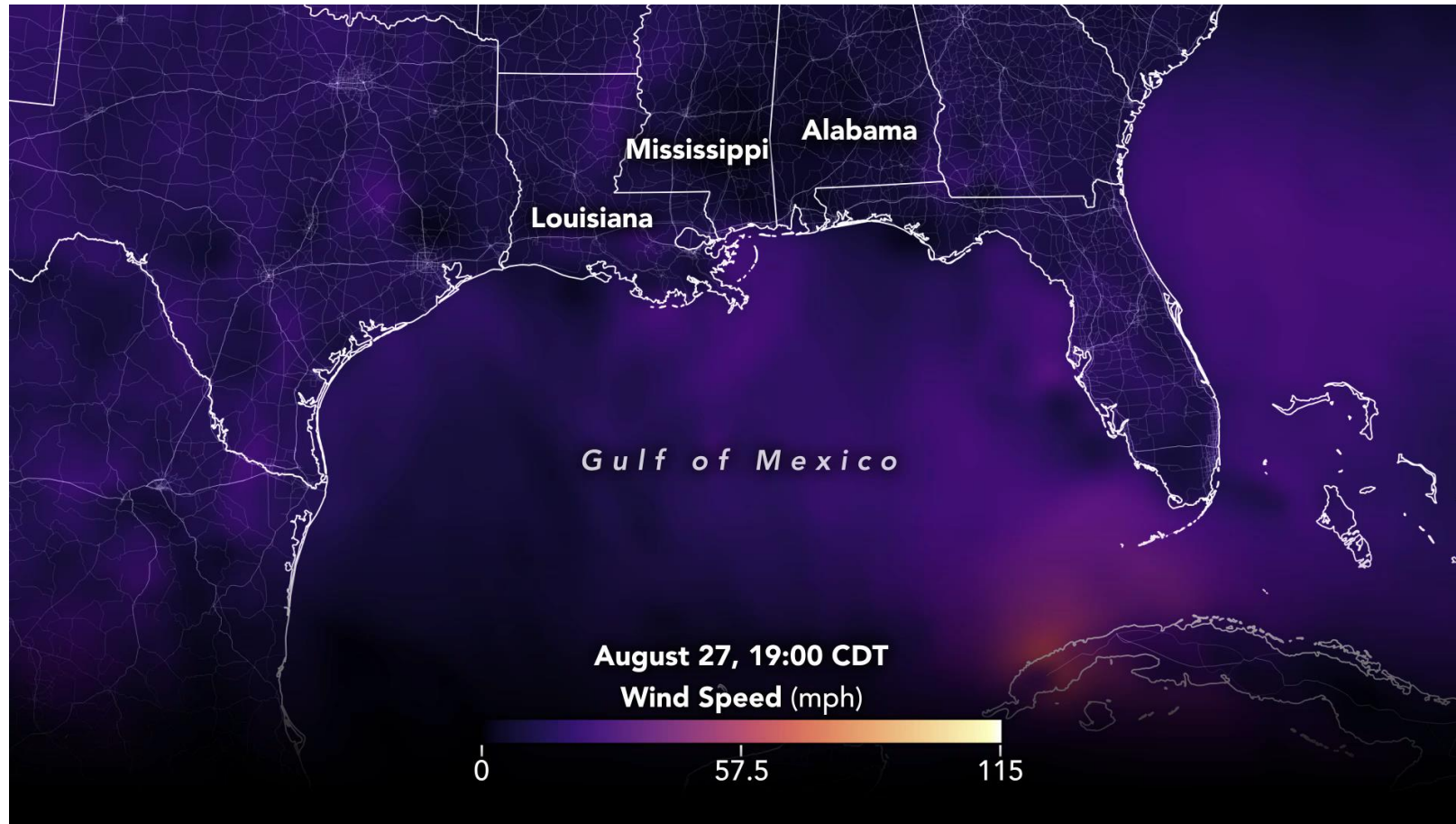
- **PPL-11 CWPPRA PROJECT**
 - SPONSORED BY NOAA FISHERIES & CPRA
 - UNIQUE THICK MAT INTERMEDIATE FLOATING MARSHES
 - MARSH LOSS DUE TO TIDAL SCOURING & VEG DIE-BACK
 - STUDY INTERVAL (2005-2022)

- **GOALS & CONSTRUCTION**
 - REDUCE THE MARSH EDGE EROSION RATE
 - MAINTAIN 799 ACRES (323 HA) OF MARSH FOR 20-YEARS
 - NOV 2005-FEB 2007
 - FORESHORE ROCK DIKE 2.5-4.0 FEET – 5 MILES IN LENGTH
 - MARSH 2.36 FEET – 920 ACRES CREATED OR ENHANCED

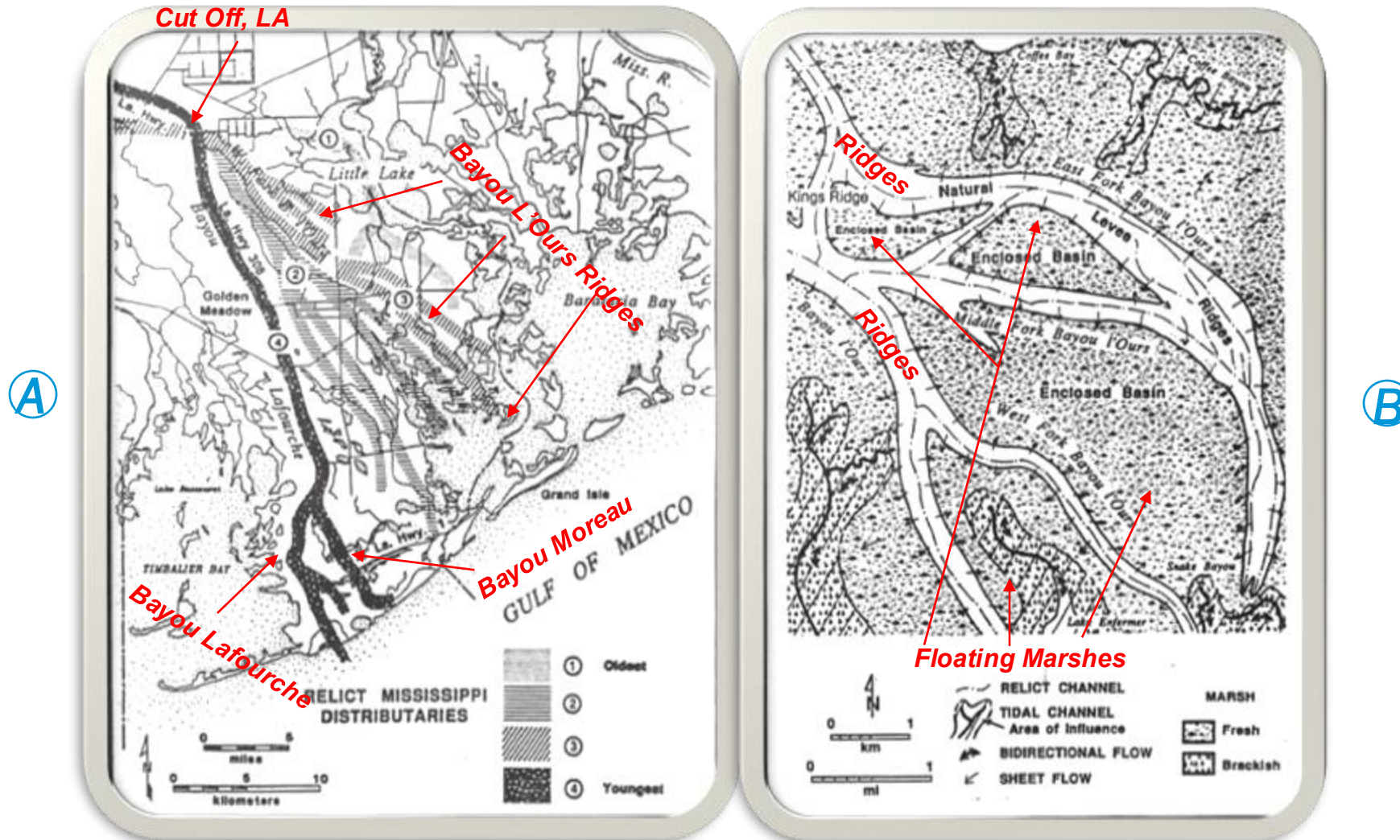
- **HURRICANE IMPACTS**
 - BA-37 PROJECT & CRMS SITE IMPACTS
 - HURRICANE IDA IMPACTS

Hurricane Ida Aug 29, 2021 (Cat 4)

GIF Obtained from NASA's Earth Observatory



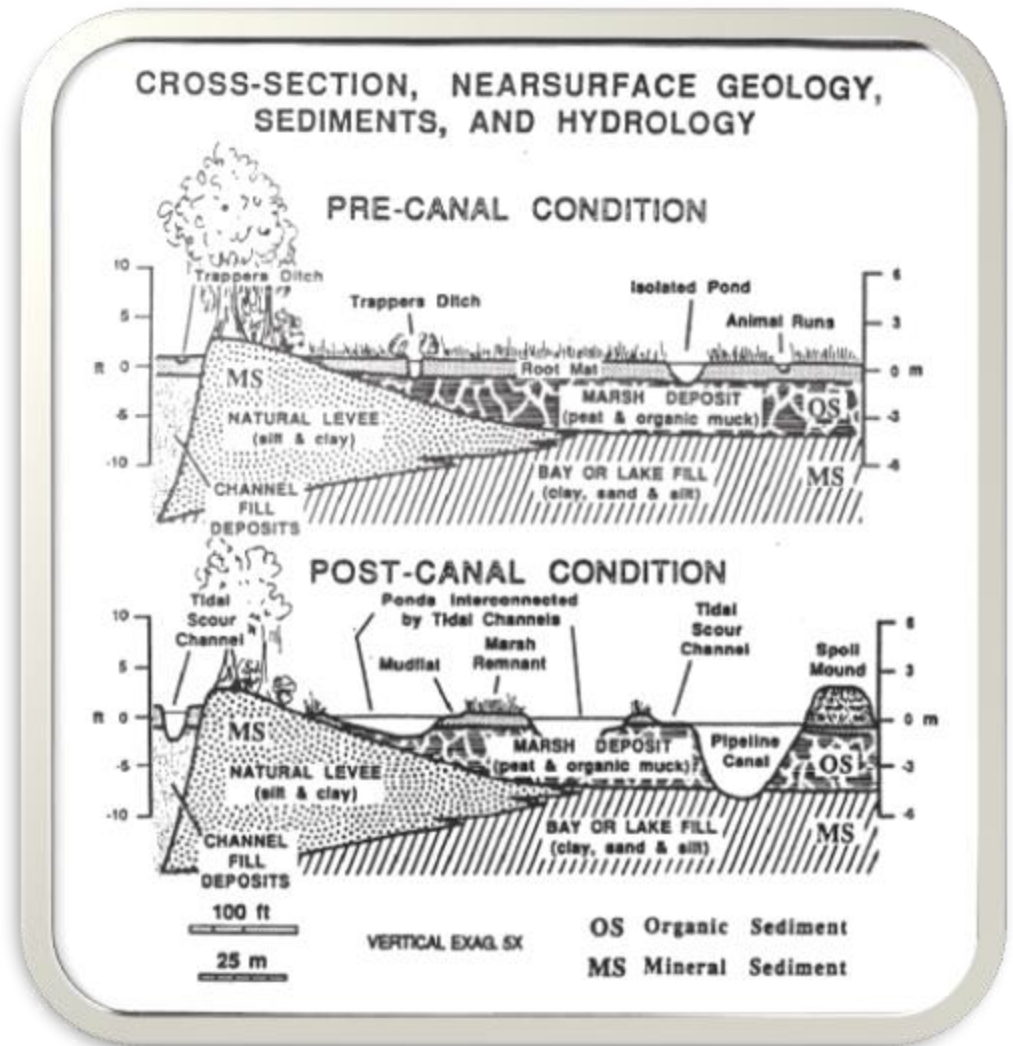
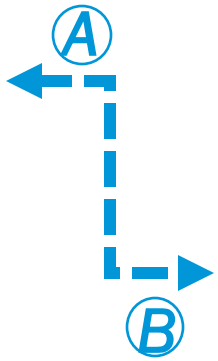
Bayou L'Ours Subdelta Formed (100-700 AD) During the Late Lafourche Deltaic Lobe Period Drawings Obtained from Gagliano and Wicker 1989



Pipeline Canal Construction, Tidal Scouring, & Vegetation Die-back Drawings Obtained from Gagliano and Wicker 1989

BA-37 Vicinity & Land Loss

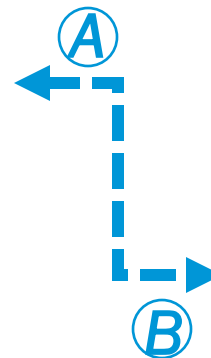
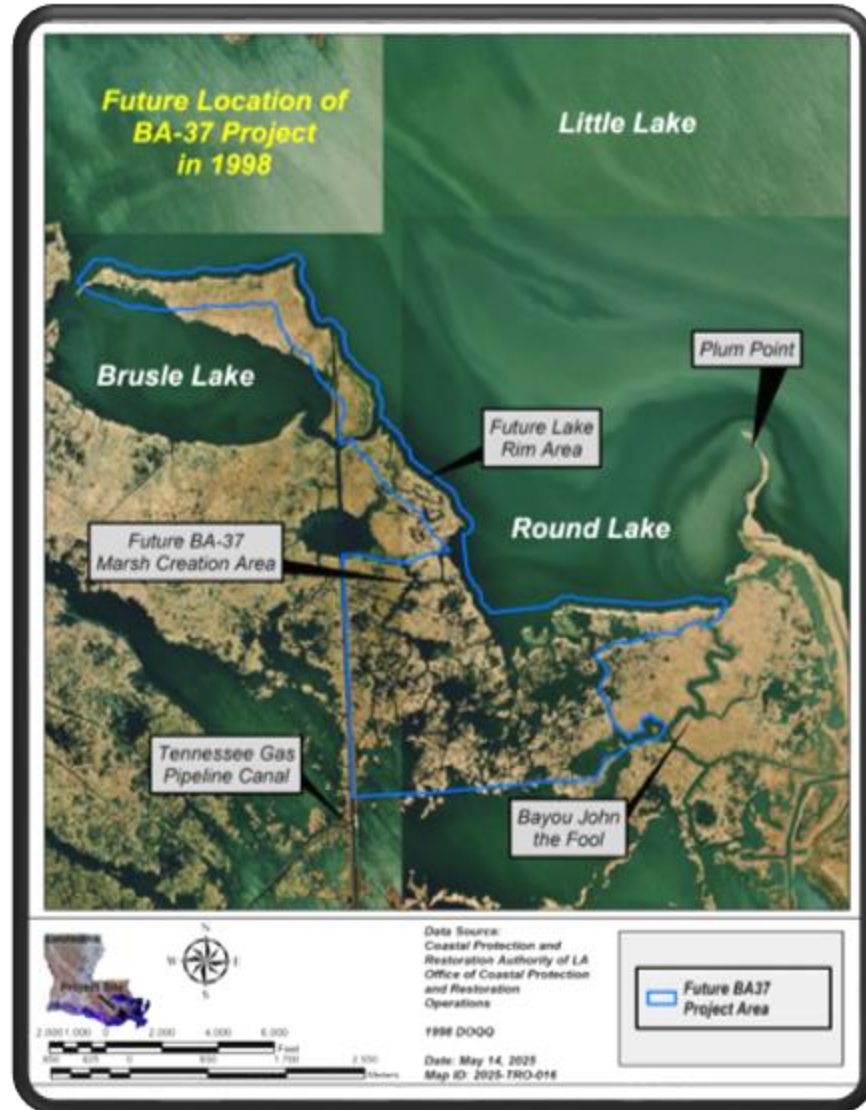
Tidal Scouring



BA-37 Pre-con & As-built Project Features

Pre-con Marshes

Project Features



BA-37 2006-2009 Elevation Change Models

A



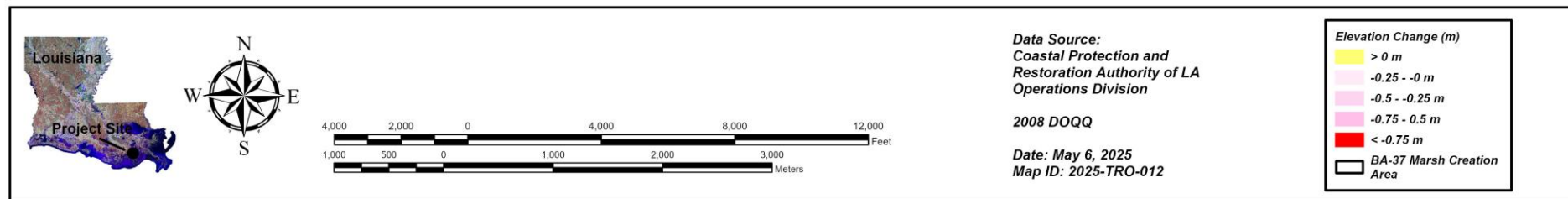
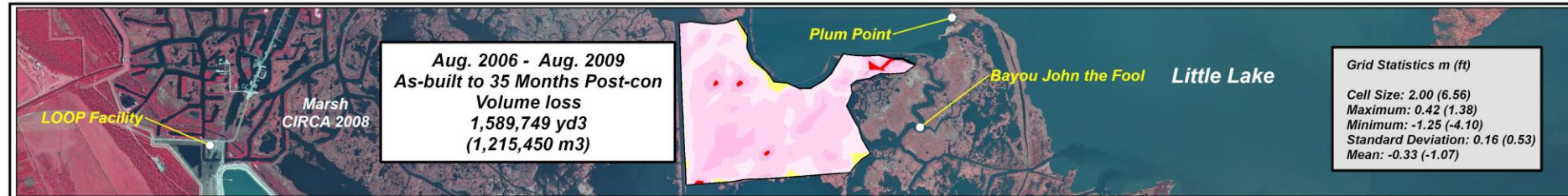
B



C

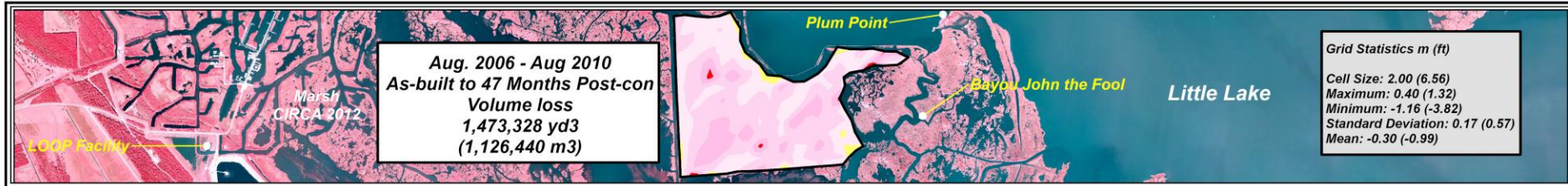


D



BA-37 2010-2022 Elevation Change Models

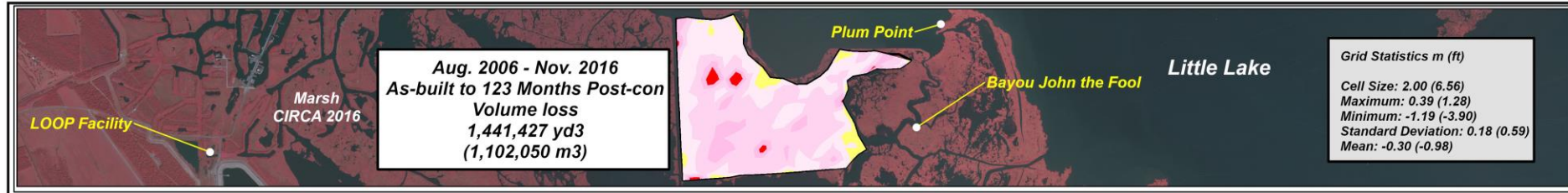
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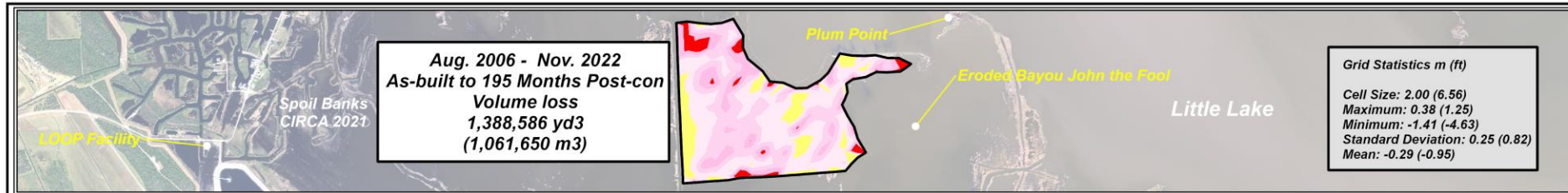
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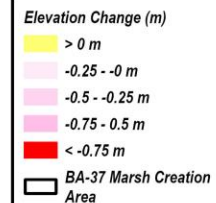
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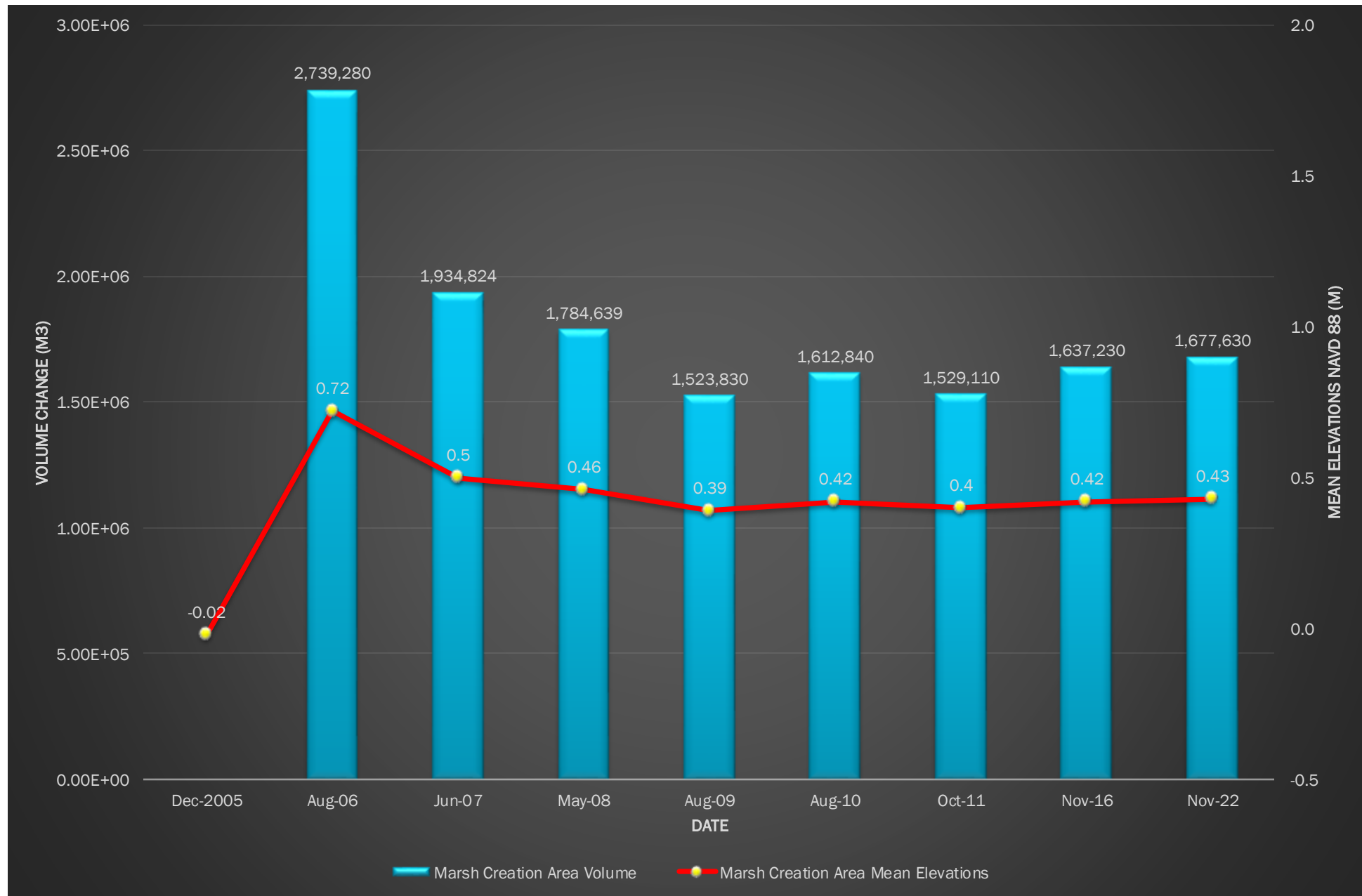


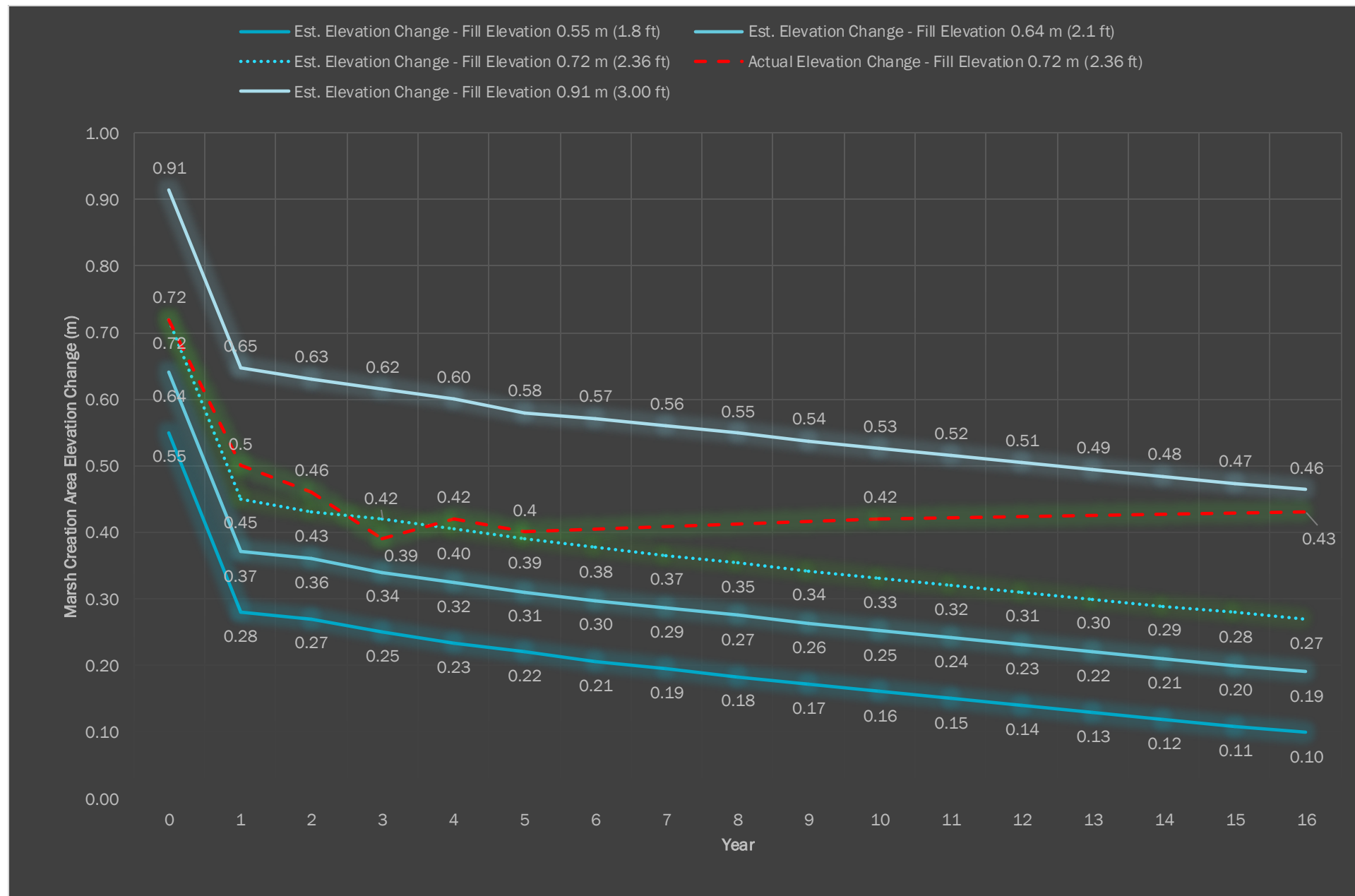
Data Source:
Coastal Protection and
Restoration Authority of LA
Operations Division

2012 DOQQ
2016 DOQQ
2021 DOQQ

Date: May 6, 2025
Map ID: 2025-TRO-014

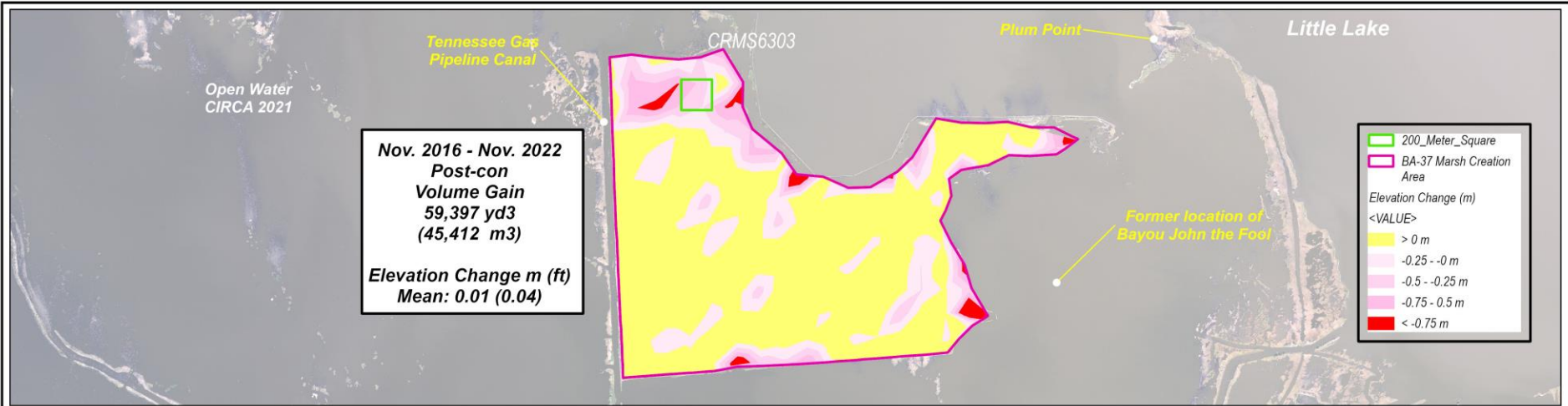




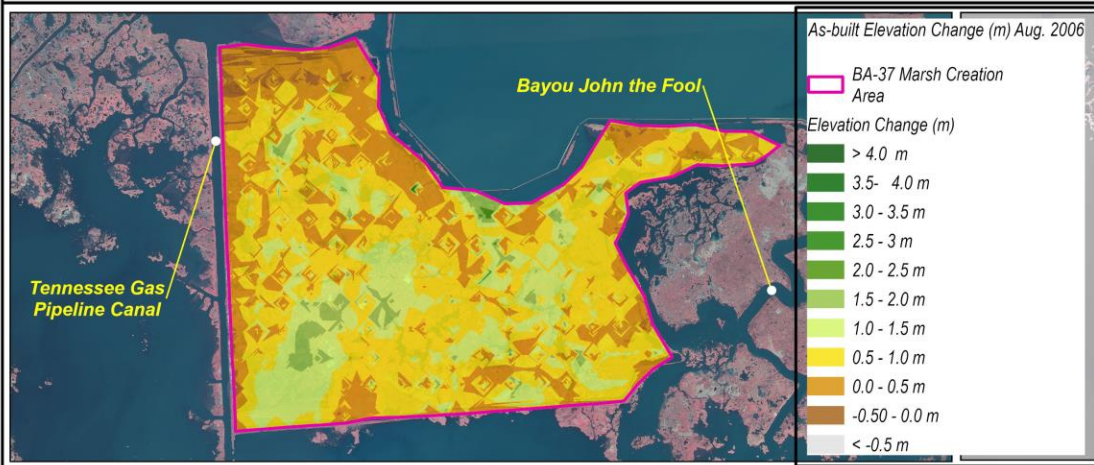


BA-37 2016-2021 Elevation Change Model & As-built Fill Analysis

A



B



C

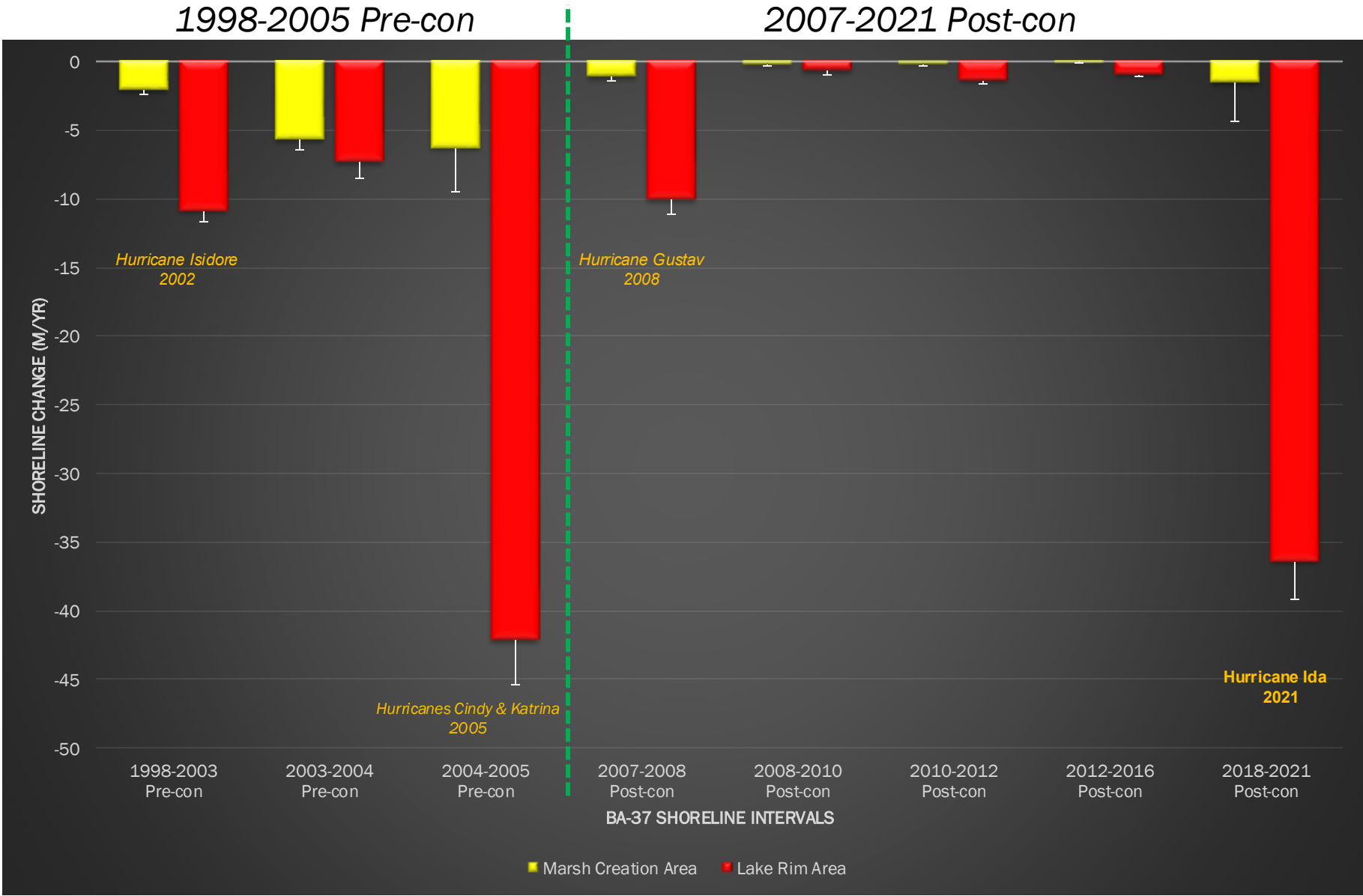


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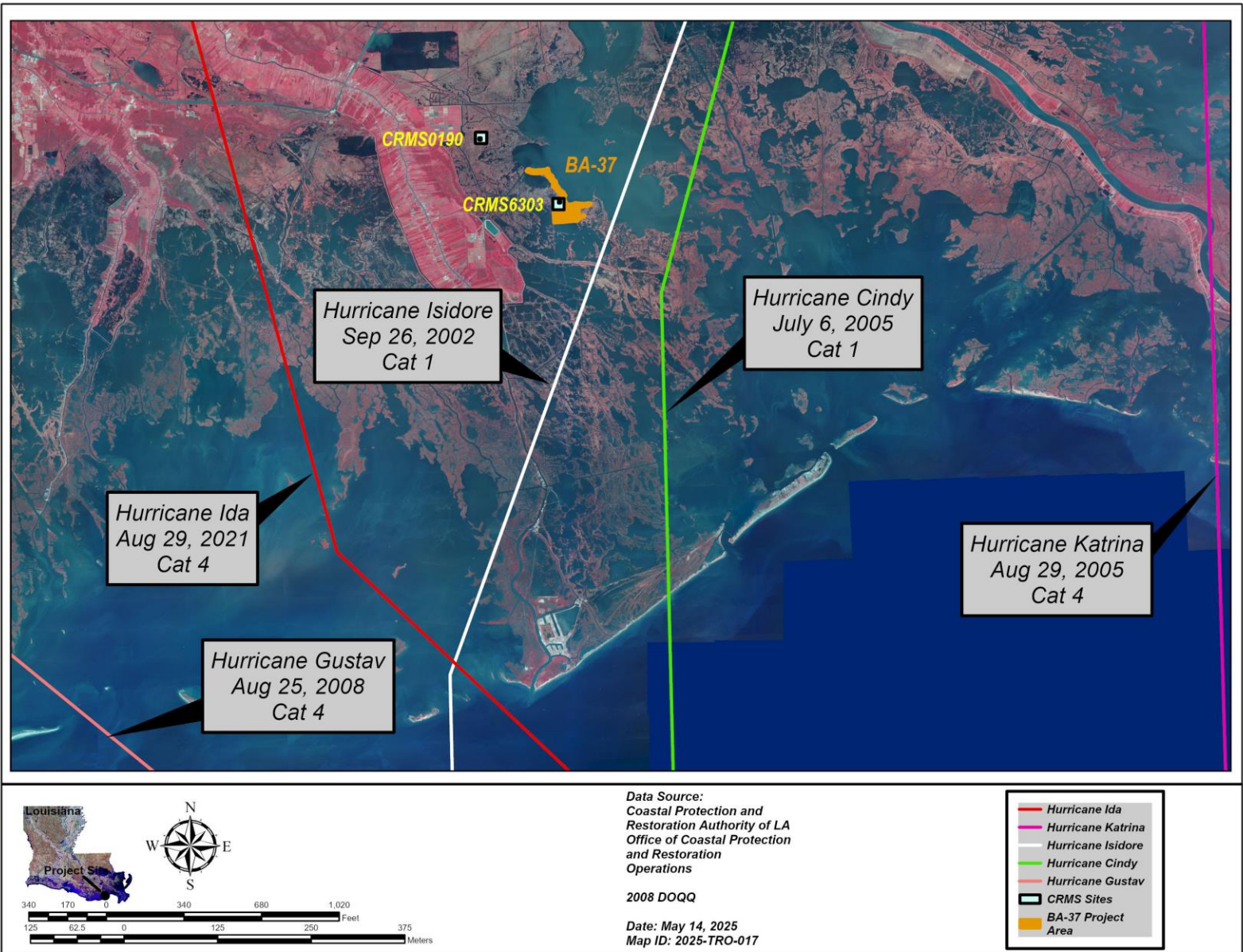
2008 DOQQ
2021 DOQQ

Date: May 6, 2025
Map ID: 2025 TRO-015

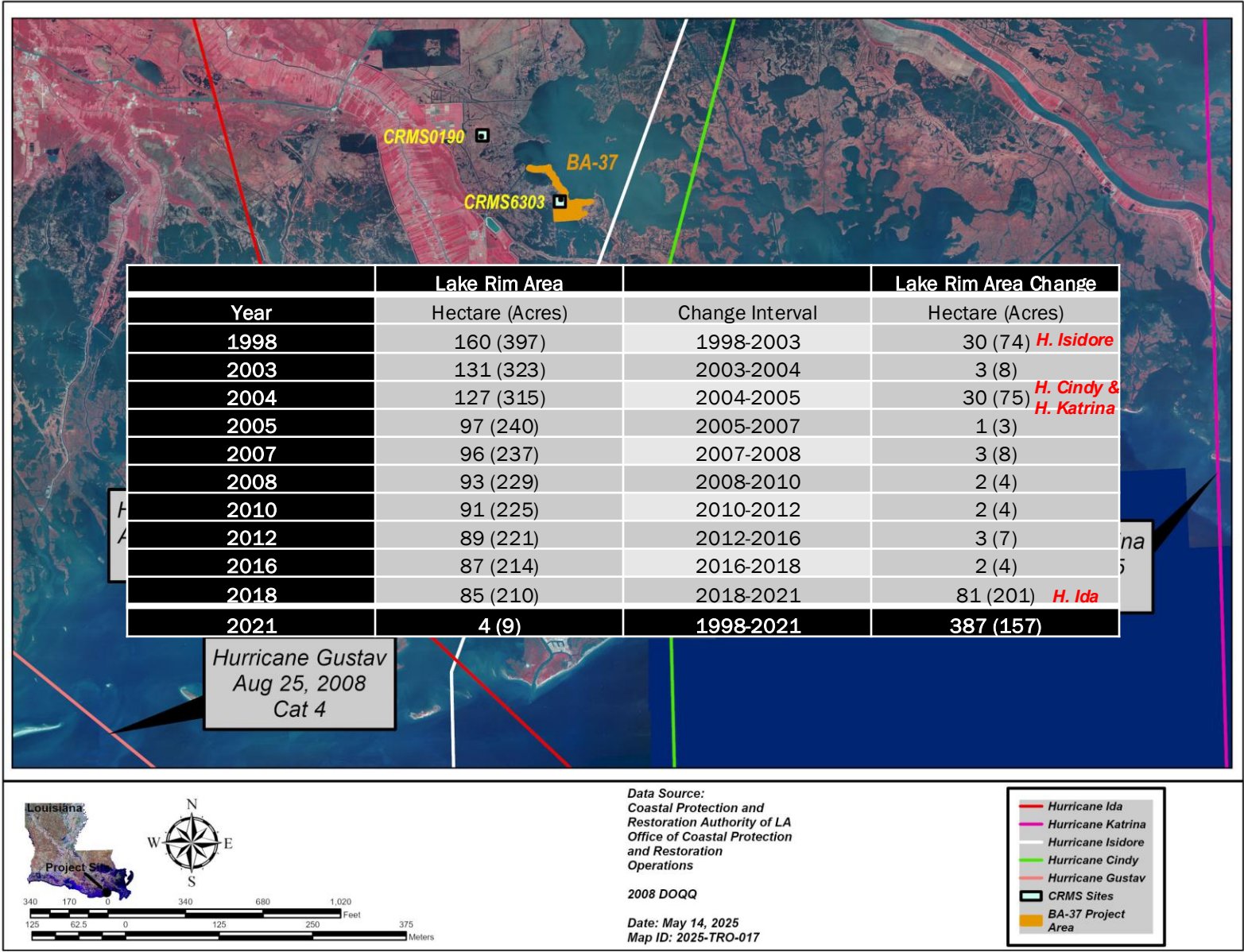
BA-37 Shoreline Change m/yr



Hurricanes Inducing BA-37 Shoreline Change

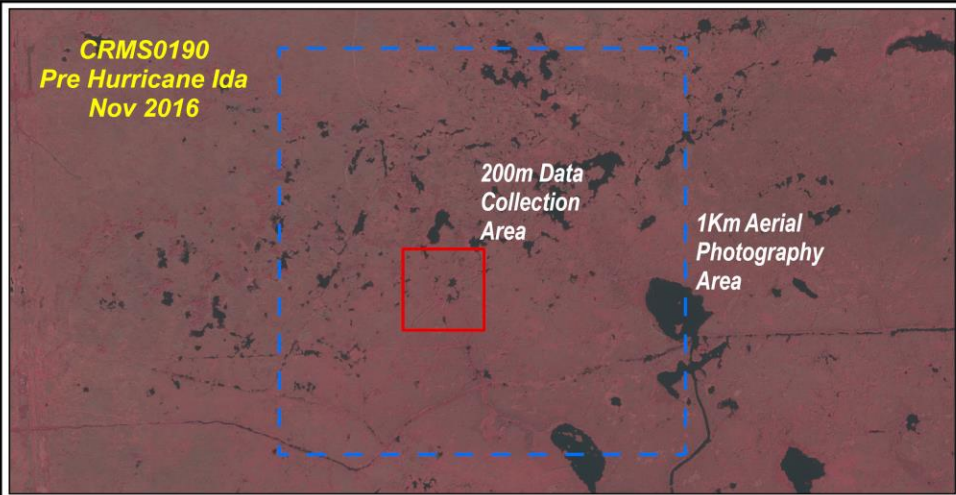


Hurricanes Inducing BA-37 Shoreline Change

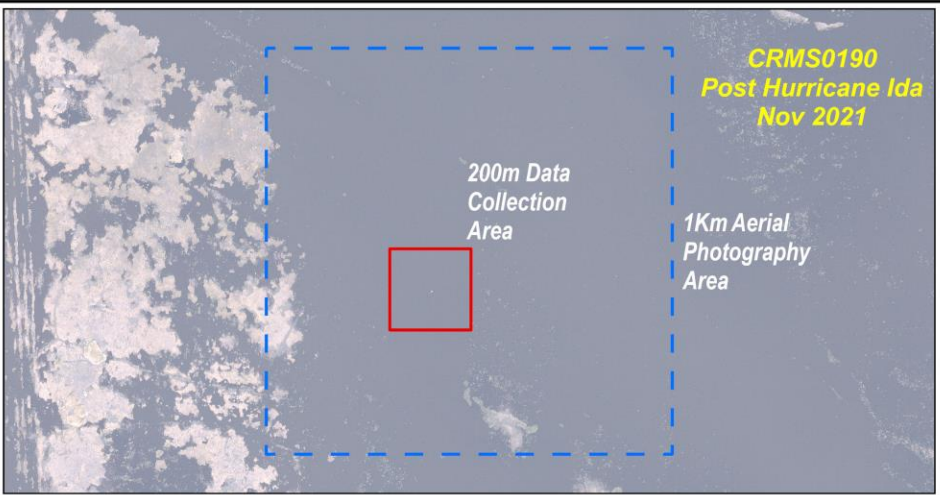


CRMS6303 & CRMS0190 Analysis

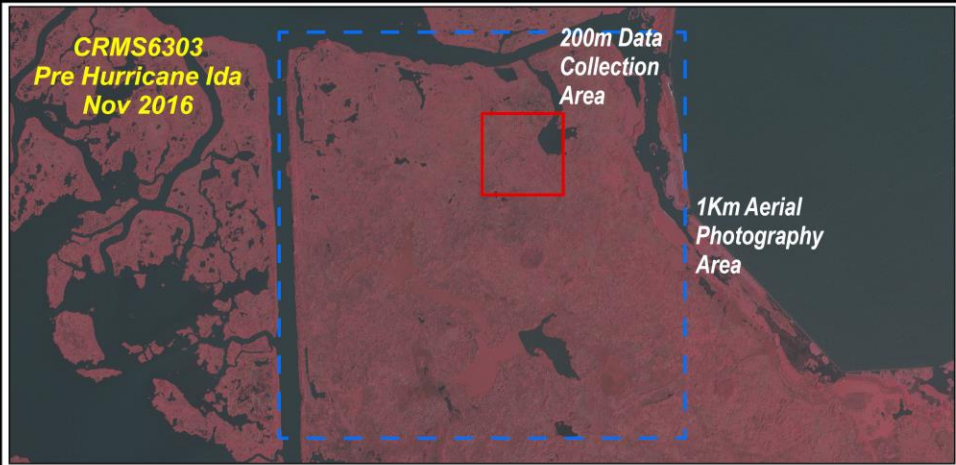
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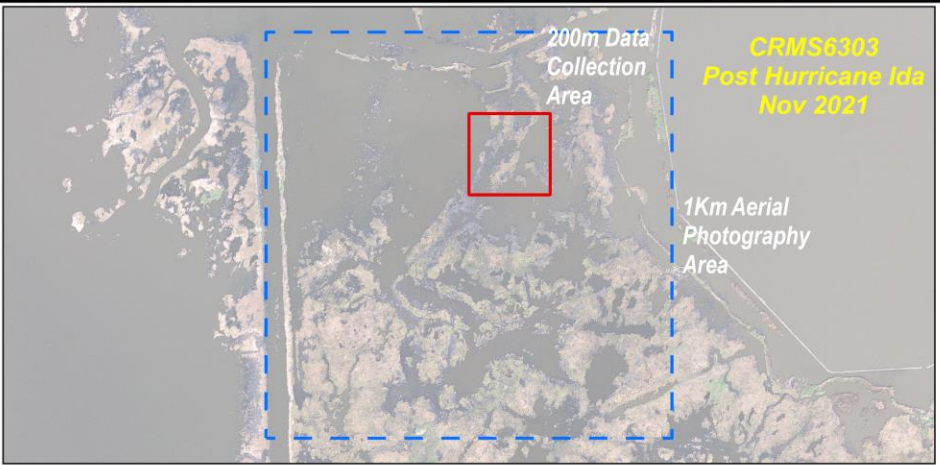
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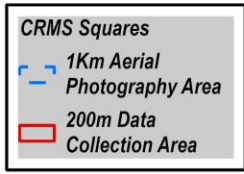
D



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2016 DOQQ
2021 DOQQ

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CRMS6303 & CRMS0190 Analysis

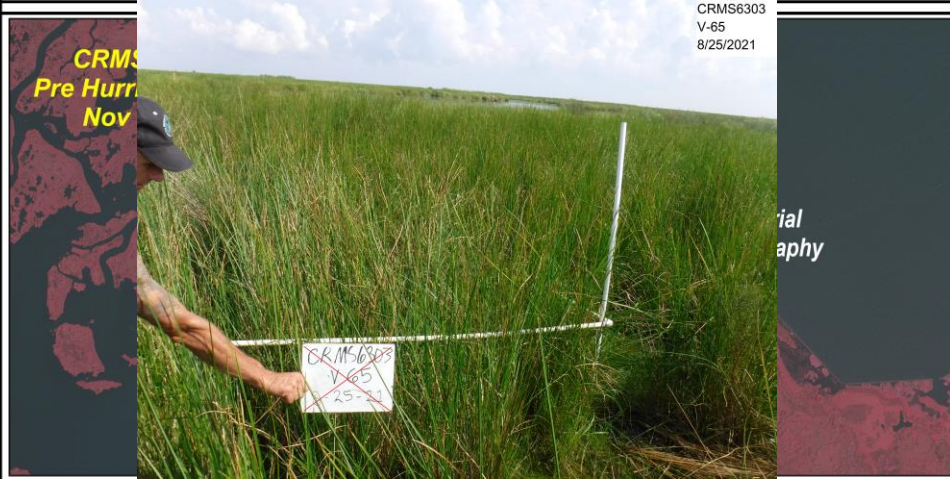
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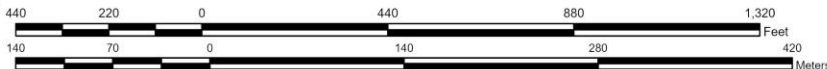
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CRMS Squares
1Km Aerial
Photography Area
200m Data
Collection Area

CRMS6303 & CRMS0190 Analysis

A



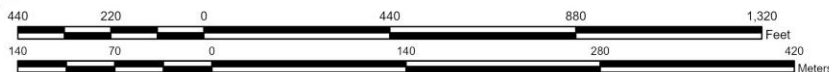
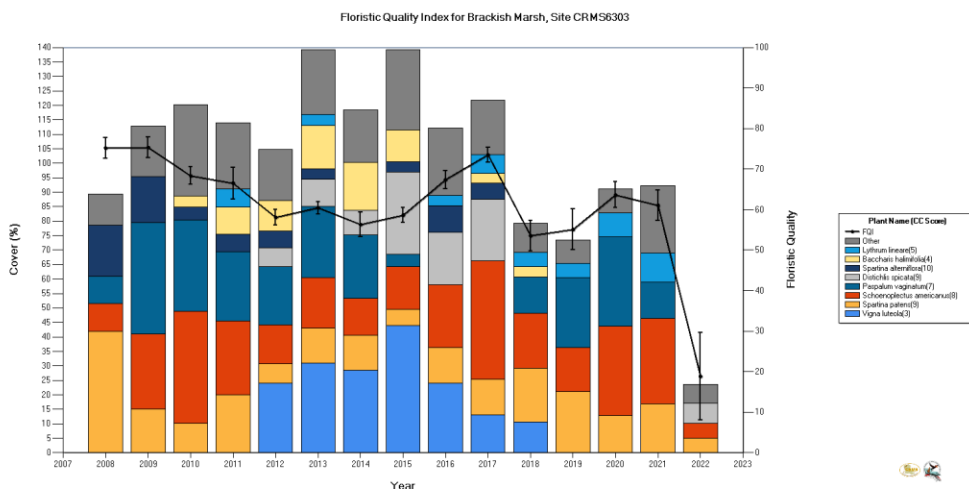
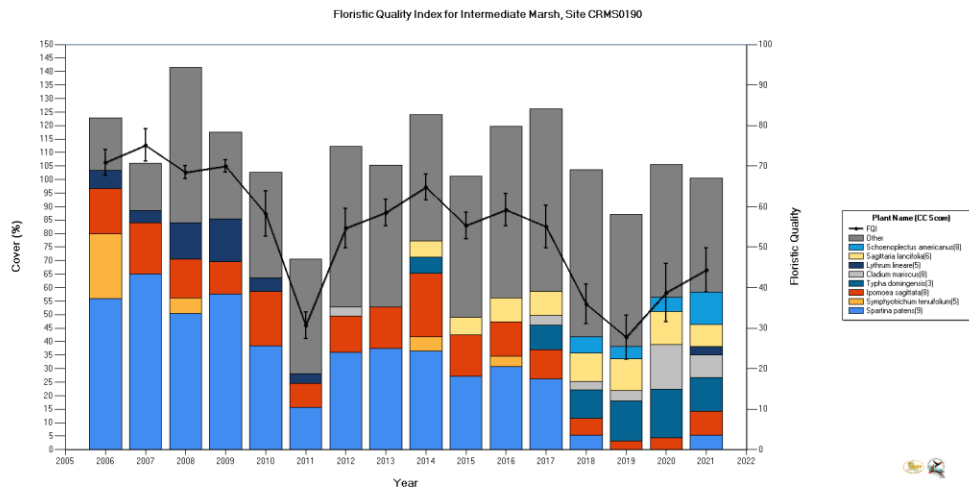
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B



D



Restoration Authority of LA
Operations Division

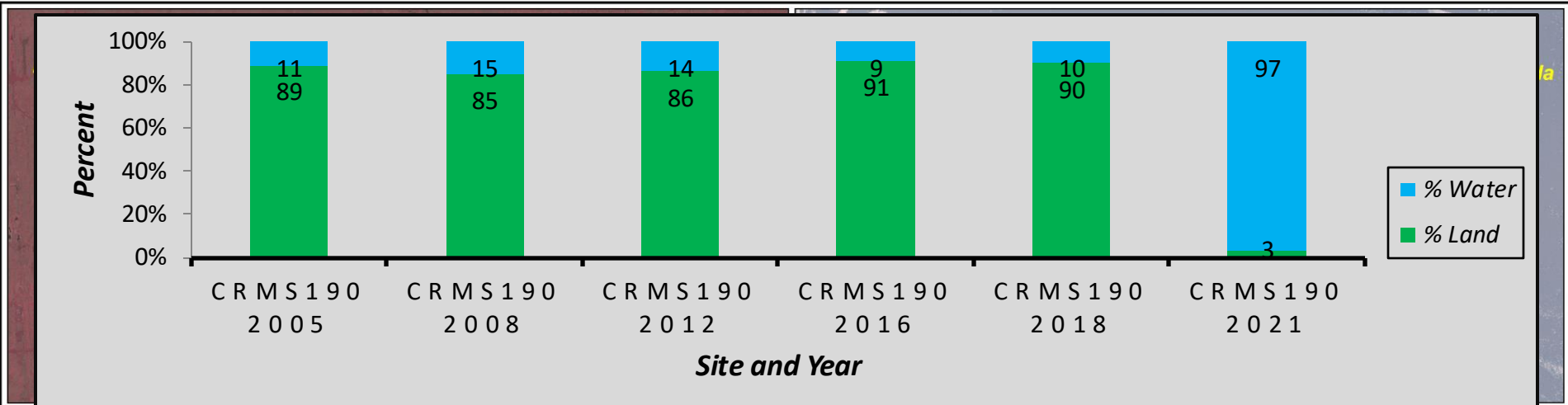
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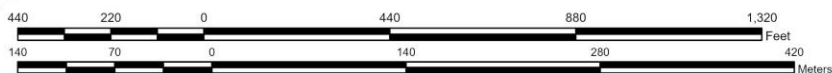
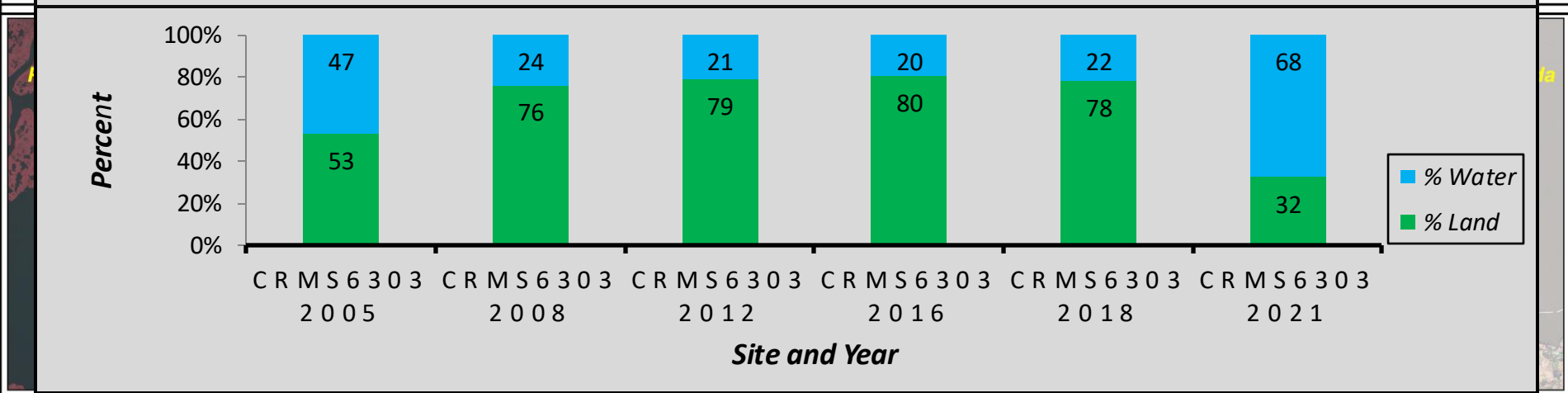
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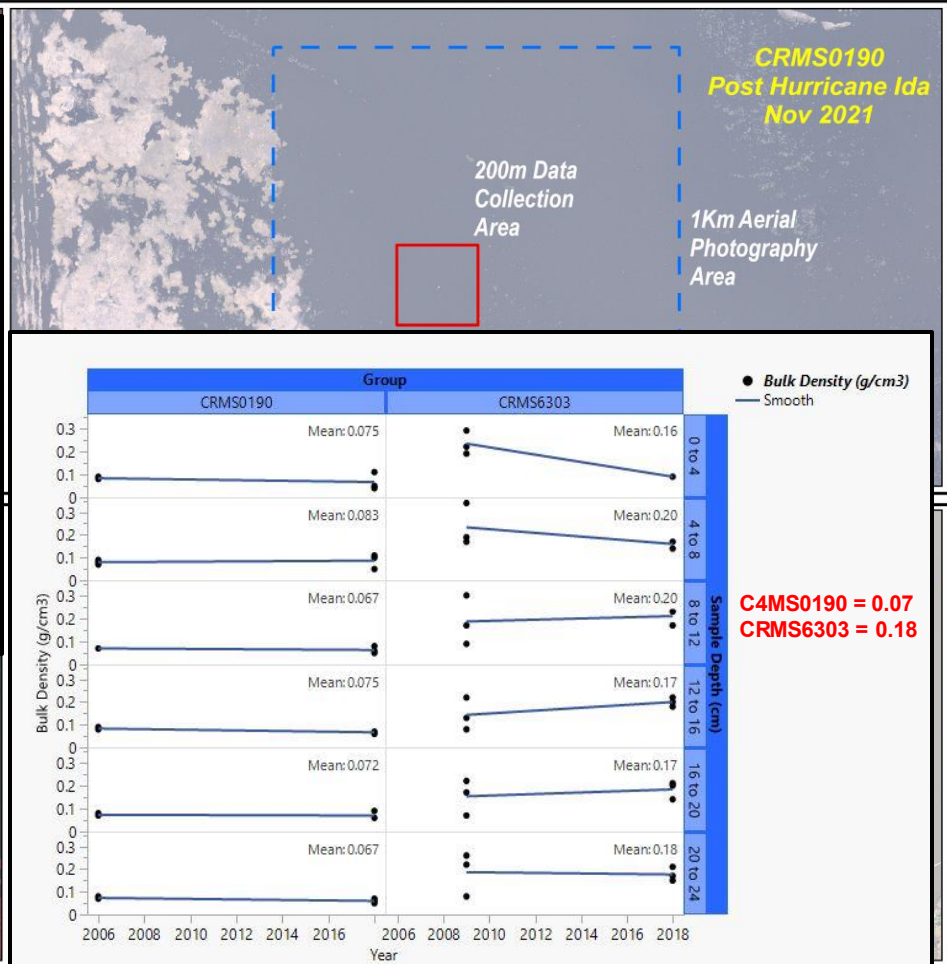
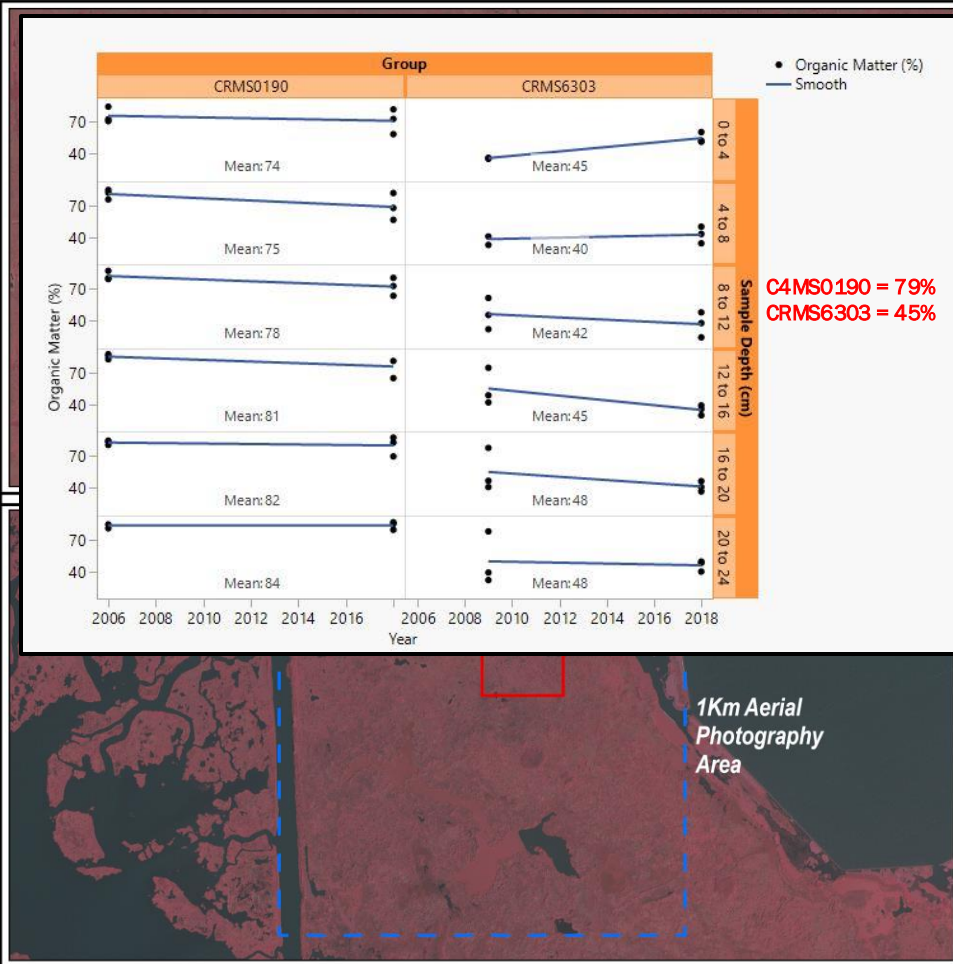
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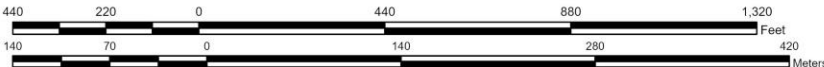
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CRMS Squares

- 1Km Aerial Photography Area
- 200m Data Collection Area

Hurricane Ida Clovelly Marsh Loss

Pre/Post Visual Comparisons

August 21, 2021 (Sentinel-2)

September 24, 2021 (Sentinel-2)

A



Image Courtesy of the European Space Agency



B



Image Courtesy of the European Space Agency

Preliminary Information - Subject to Revision. Not for Citation.

Hurricane Ida Clovelly Marsh Loss

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August 21, 2021 (Sentinel-2)

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Image Courtesy of the European Space Agency



B

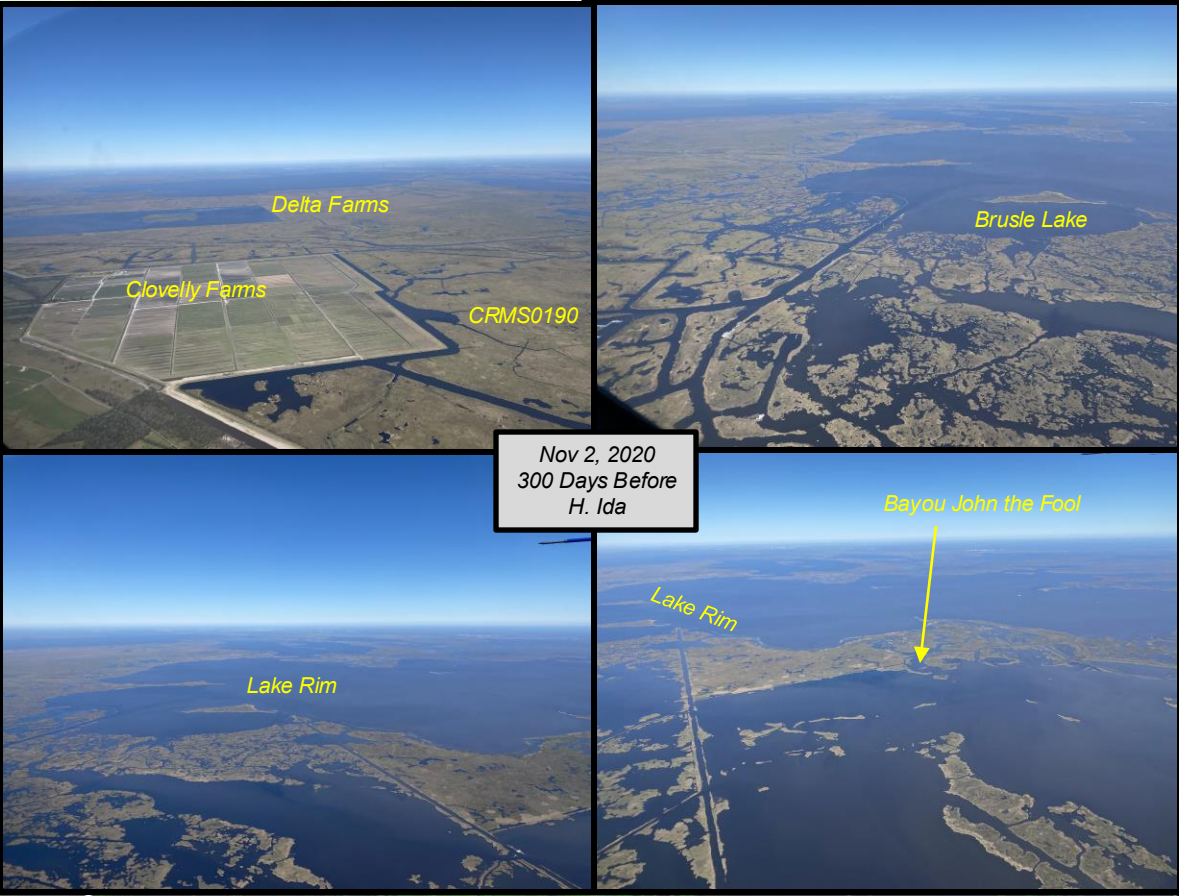


Image Courtesy of the European Space Agency

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BA-37 CONCLUSIONS

- Pre Hurricane Ida
- Created 920 Acres of Intermediate Marshes
- Subsided at a Slower Rate Than Predicted Settlement Curve
- MC Area Erosion Rates Significantly Different from Pre & Lake Rim
- LR Erosion Rates Lowered Except During High Energy TS Events
- Post Hurricane Ida
- MC Area Lost Acreage but Approx. 650 Acres Remain Due to Mineral Additions
- MC Area Gained Elevation After the Storm
- Only 9.0 Acres of the LR Remains
- Surrounding Marshes Lost Approx. 25,000 Acres
- All that Remains of the Clovelly Marshes are Ridges, Spoil Banks, & BA-37
- Two Restoration Projects Planned but Comprehensive Restoration Plan Needed

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