

Deepwater Horizon Oil Spill Principal Investigator 1-Year Update Workshop
St. Petersburg FL, October 25-26, 2011

Field Monitoring of Oiled-Wetland Erosion in South Louisiana

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Funded by GRI/NGI

Field Observation and Modeling of the Impact of Oil Spill on Marsh Erosion in Southern Louisiana

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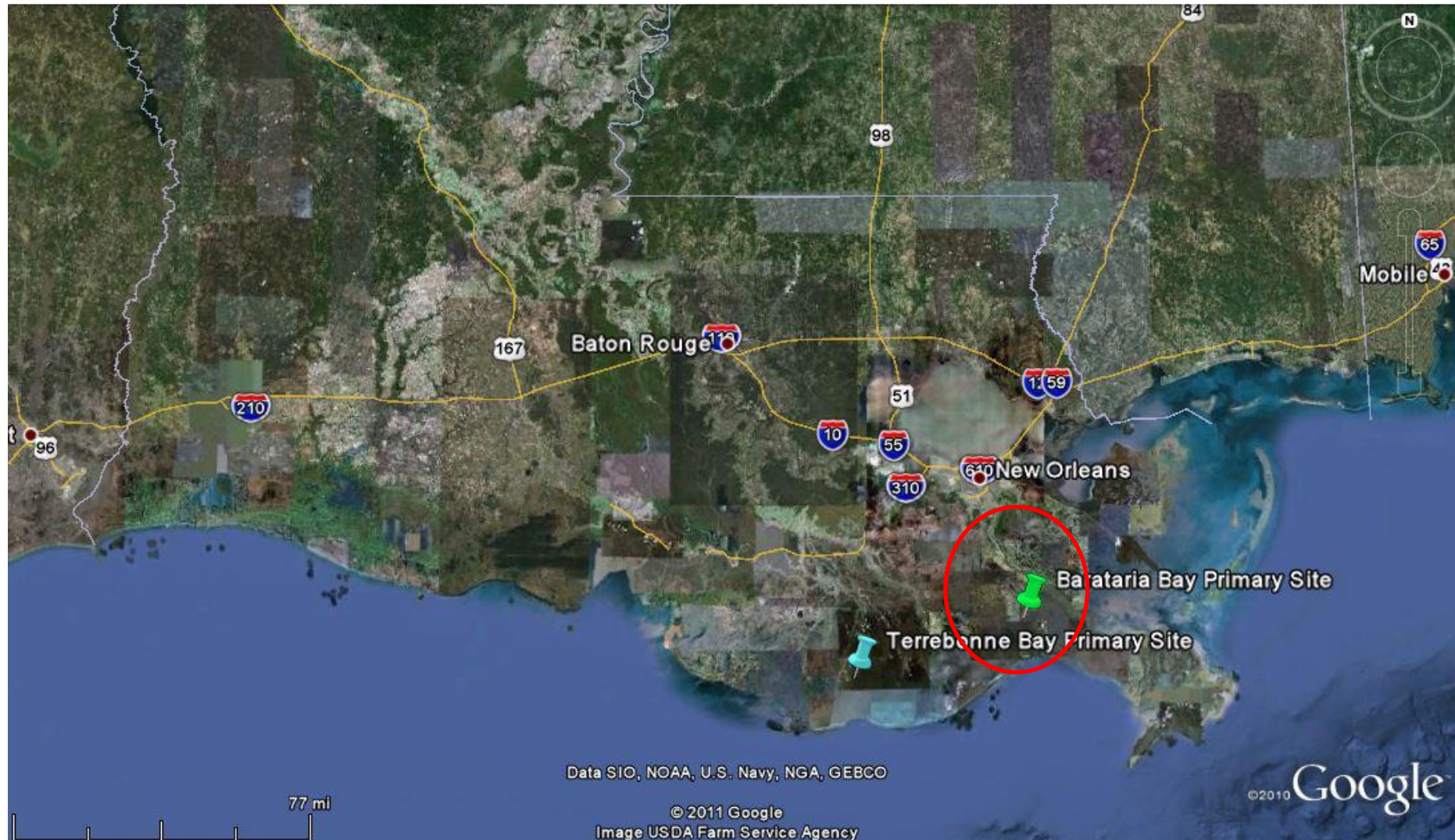
Louisiana State University

Goal and Objectives

- **Goal:** To study and understand the fundamental science of oil-contaminated coastal marsh erosion.
- **Objectives:**
 - (1) to acquire the first datasets on the erosion of coastal marshes with different degrees of oil contamination
 - (2) to understand the physical and biogeochemical mechanisms controlling oil-contaminated marsh erosion via laboratory testing and computational modeling
 - (3) to predict the resilience of the oil-contaminated marsh under storm and hurricane conditions.

Study Site

Barataria Bay, Louisiana



Four Months after Oil Spill (8/20/2010)

Oiled Wetland (8/20/2010)



Damaged vegetation (photo taken in Baratavia Bay, 8/20/2010) after crude oil contamination, despite the extensive use of nearshore booms and other measures for oil confinement or cleanup.

Field Testing



A Cohesive Strength Meter (CSM) test ion a heavily oiled marsh soil.

Thirteen Months after Oil Spill (7/1/2011)

Oiled Marsh after One Year (7/1/2011)



Oiled Marsh (7/1/2011)



Oil on Wetland (7/1/2011)



Shoreline Survey (7/1/2011)



Shoreline Survey (7/1/2011)



Two Weeks after TS Lee
(9/23/2011)

Two Weeks after TS Lee (9/23/2011)



Two Weeks after TS Lee (9/23/2011)



Shoreline Survey (9/23/2011)



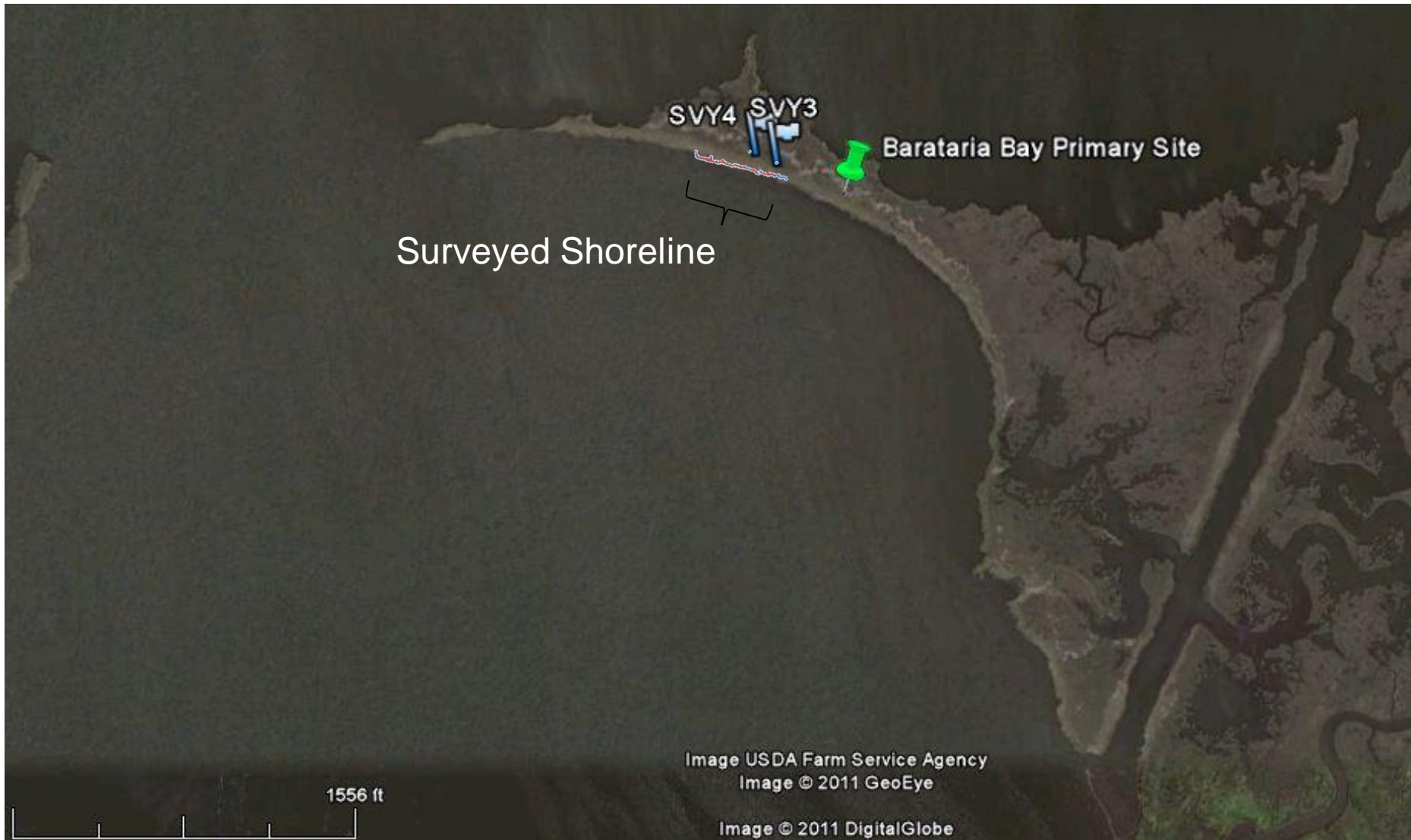
Shoreline Survey (9/23/2011)



Small Pocket of Oil on the Wetland (9/23/2011)



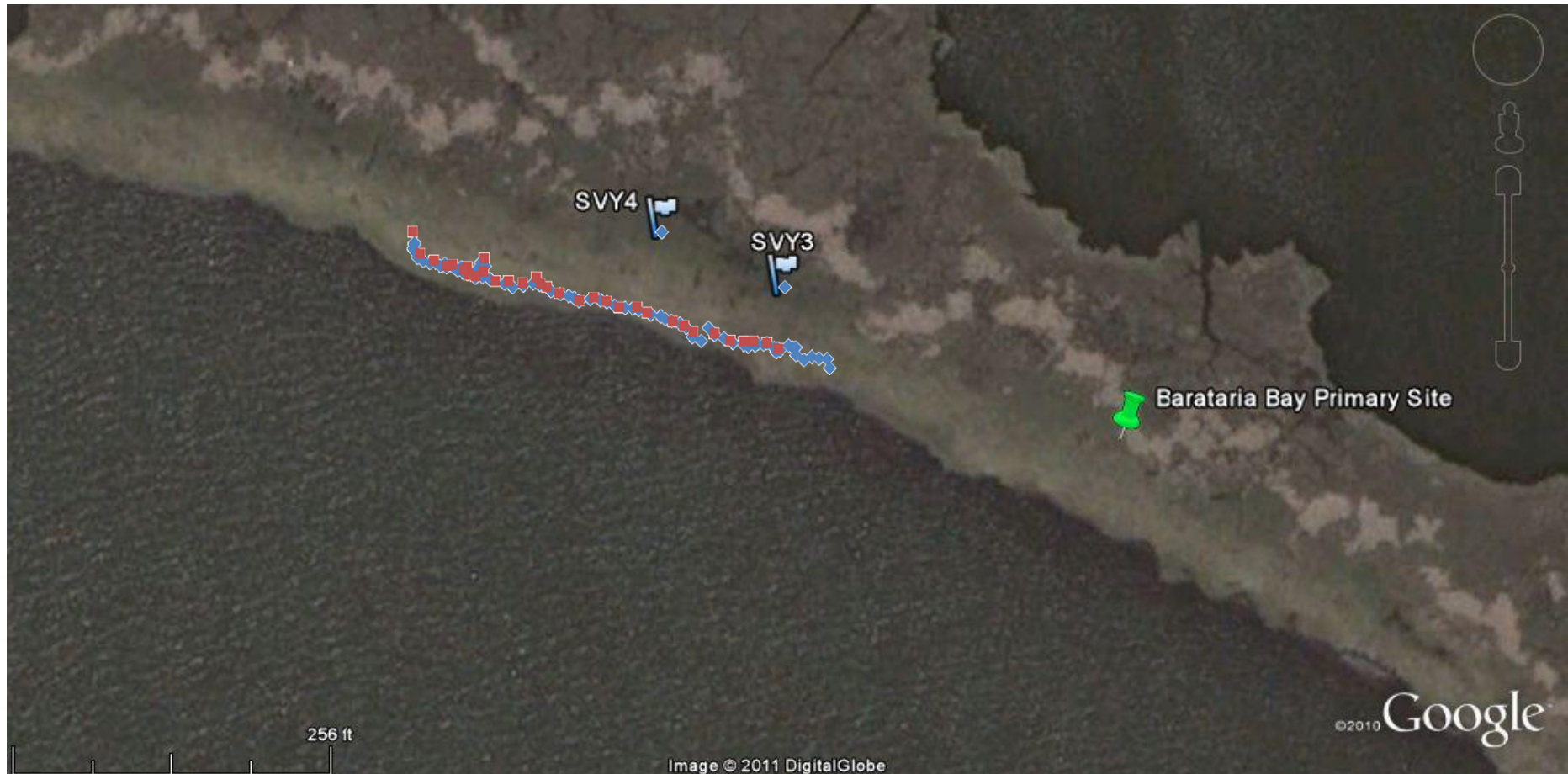
Primary Site: Barataria Bay, LA



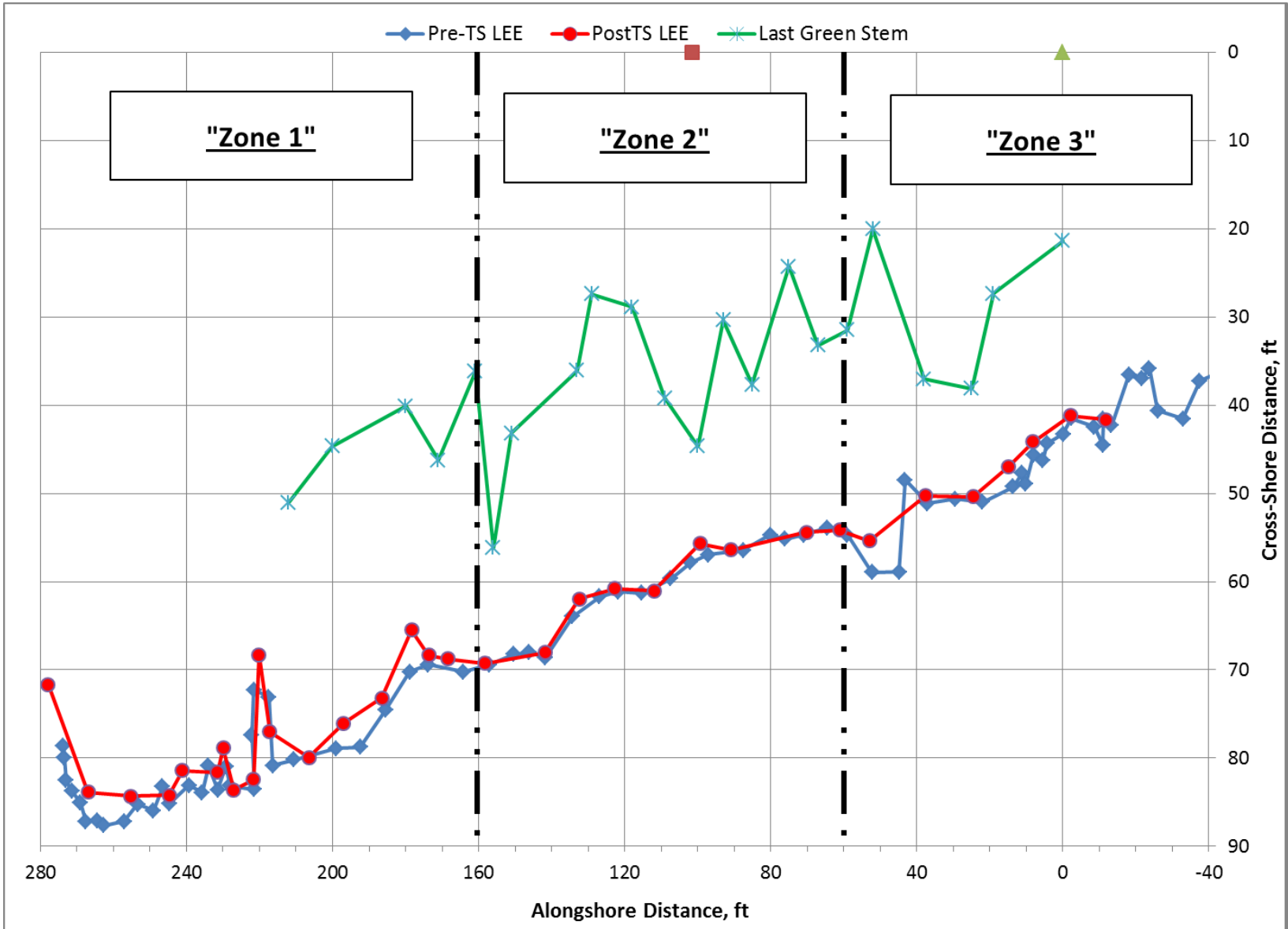
Survey Coverage

Blue: July 1, 2011 (before TS Lee)

Red: Sept. 23, 2011 (after TS Lee)

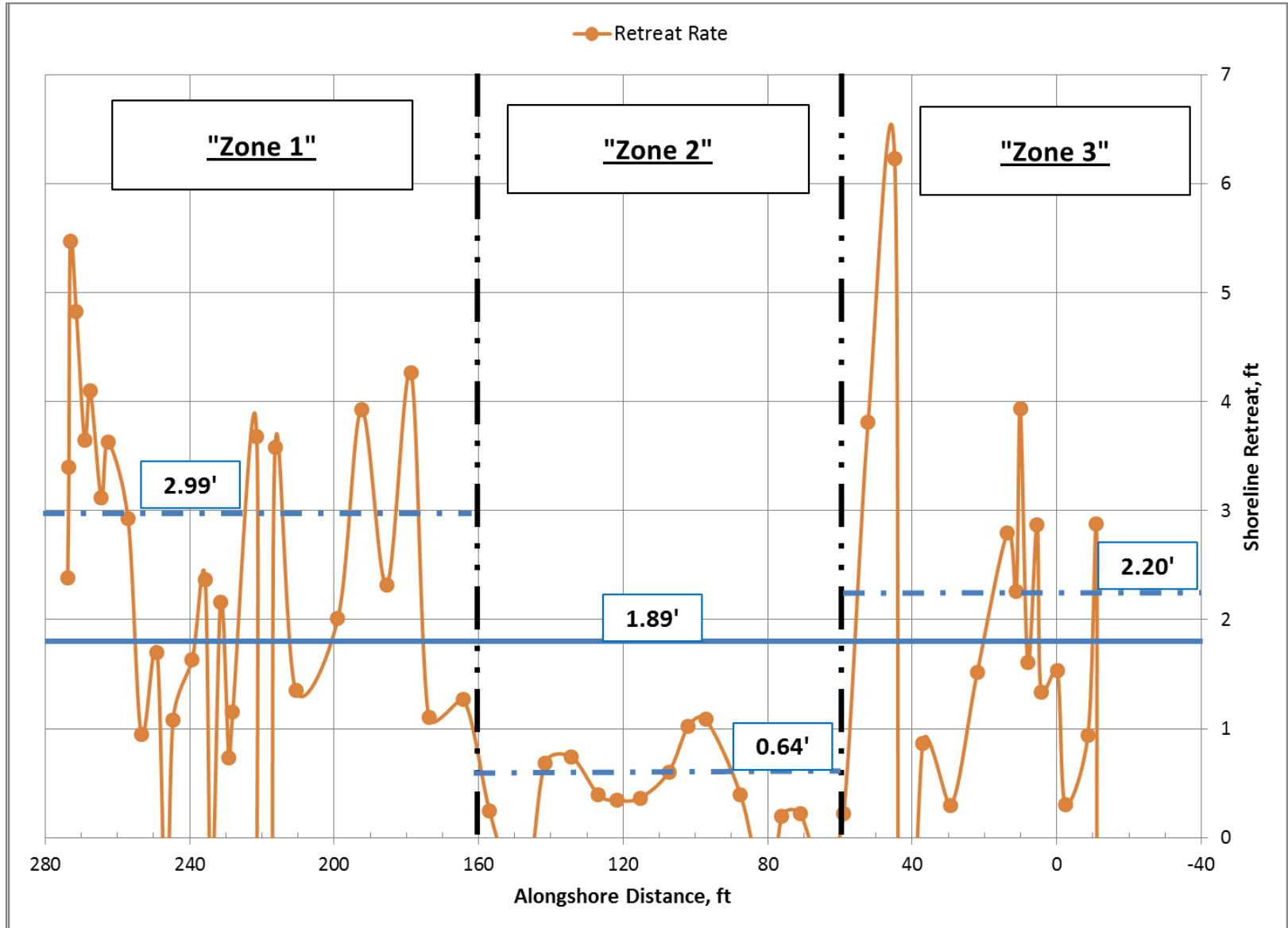


Barataria Bay (Bay Jimmy) Pre and Post TS LEE Surveys



Barataria Bay: Primary Site

Pre and Post TS LEE Surveys



Shoreline in 1998



Historical Long-Term Erosion Rate 1998 (red line) – 2010 Surveyed shoreline: 4 – 5ft/year



Conclusion and Future Work

- Severe erosion and pockets of dark oil were observed on the marshland in Barataria Bay, LA, 16 months after the oil spill.
- Shoreline survey of a heavily-oiled wetland in Barataria Bay, LA was conducted before and after Tropical Storm Lee (2011), and compared with the long-term erosion rate.
- Monthly shoreline survey of both oiled and un-oiled wetlands is planned in the winter season accompanied by the deployment of wave gages to measure the hydrodynamic forcing.
- But the funding will end on December 31, 2011. Additional funds are needed to carry out long-term assessment of oil impact on marshland erosion.