

Texas Student Involvement in Coastal Monitoring Studies

Tiffany L. Caudle and Jeffrey G. Paine

**Bureau of Economic Geology
Jackson School of Geosciences
The University of Texas at Austin**

American Shore and Beach Preservation Association

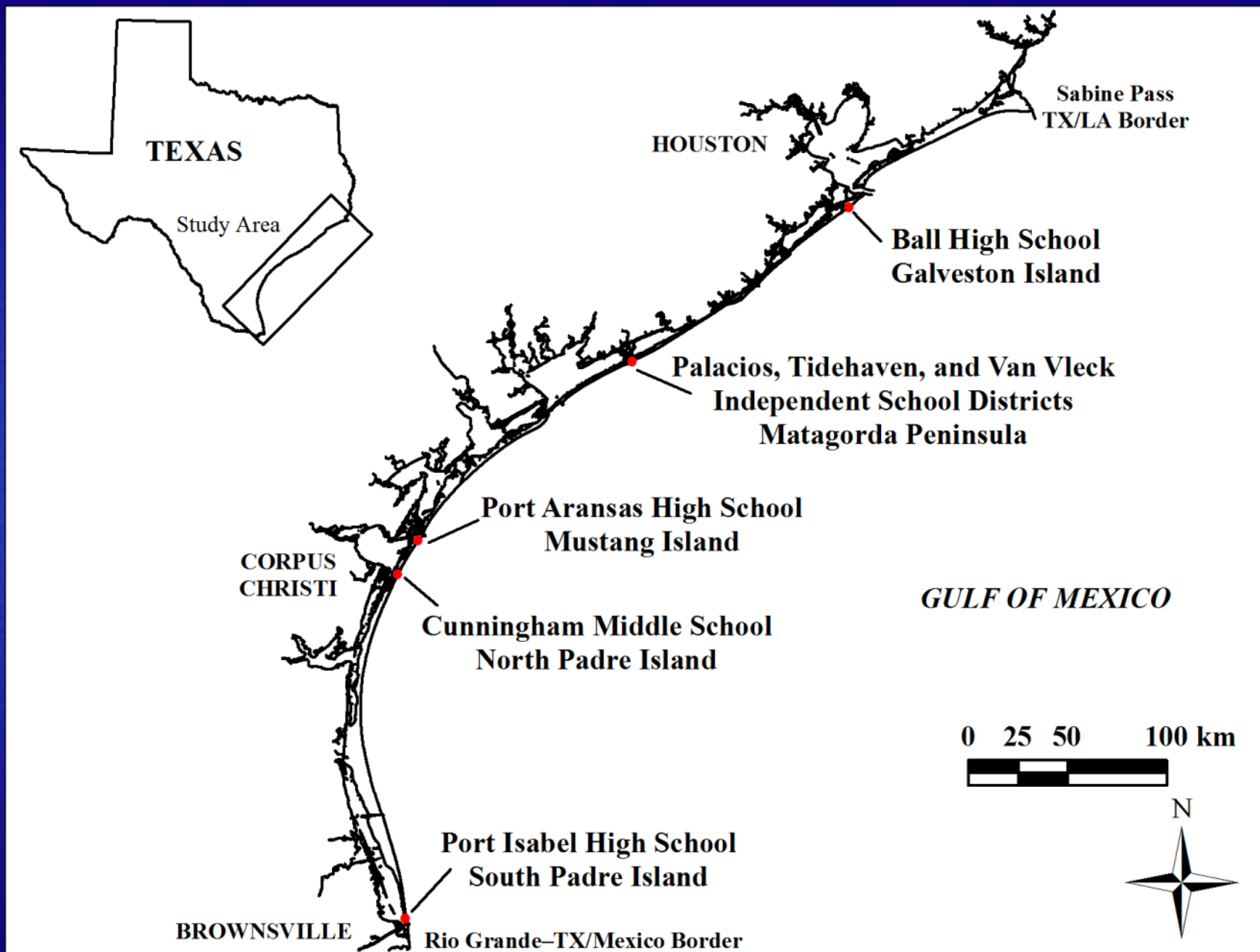
National Coastal Conference

October 2013

Texas High School Coastal Monitoring Program Sponsors



BUREAU OF ECONOMIC GEOLOGY



THSCMP Goals

- Provide high school students with an inquiry-based learning experience through investigation of beach changes.
- Increase public awareness and understanding of coastal processes and hazards.
- Obtain a better understanding of the relationship between coastal processes, beach morphology, and shoreline change, and make data and findings available for solving coastal management problems.

Student Collected Data

- Topographic transect oriented perpendicular to the shoreline
 - measured from the same starting point landward of the foredune and oriented in the same direction.
- Estimates of processes acting on the beach
 - wind direction and speed; wave direction, height, and period; and longshore current direction and speed
- GPS survey of the vegetation line and shoreline
 - quantitative data on the position and trends of the shoreline and vegetation line

Topographic Profile



Determine vertical change between front and back Emory rods using siting level or horizon



Measure horizontal distance between Emory rods

Wind and Wave Observations



Longshore Current Measurement



Shoreline and Vegetation Line Mapping with GPS

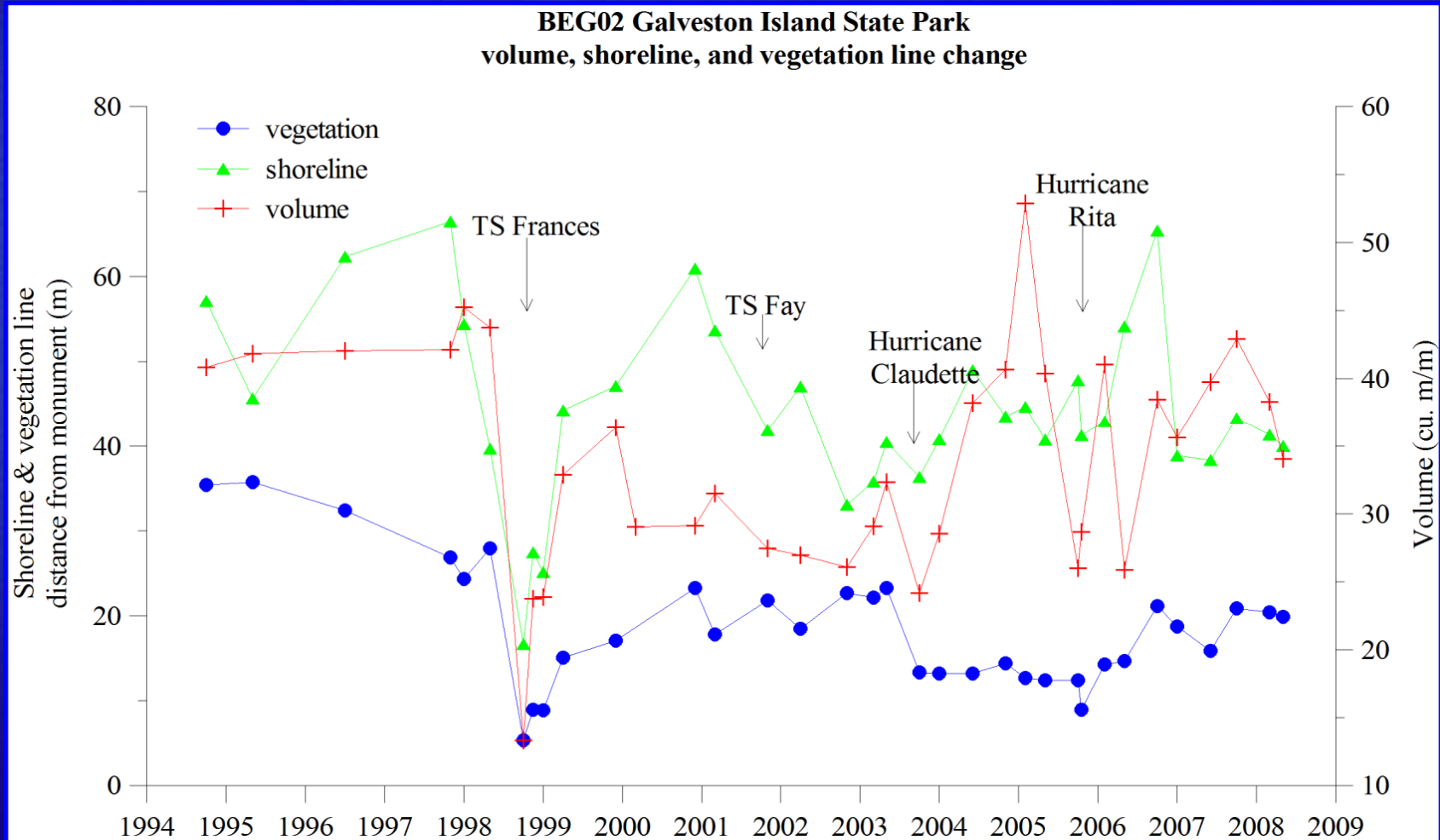


SCIENTIFIC RESULTS

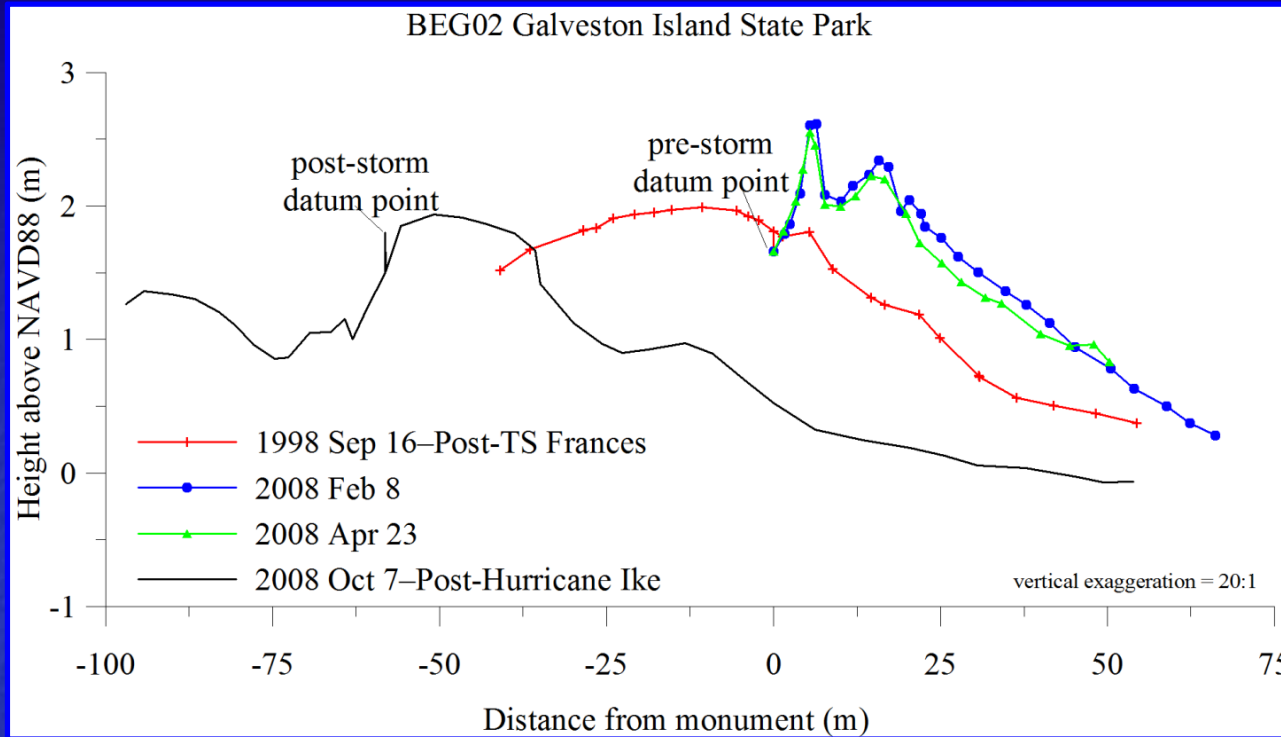
THSCMP Studies

Hurricane Impacts

- 1998 TS Frances
- 2005 Hurricane Rita
- 2008 Hurricane Ike



BEG 02 Hurricane Ike Impact



Shoreline: -53 m
Vegetation line: -56 m

Pre-storm data point
was 1.14 m above
post-storm beach

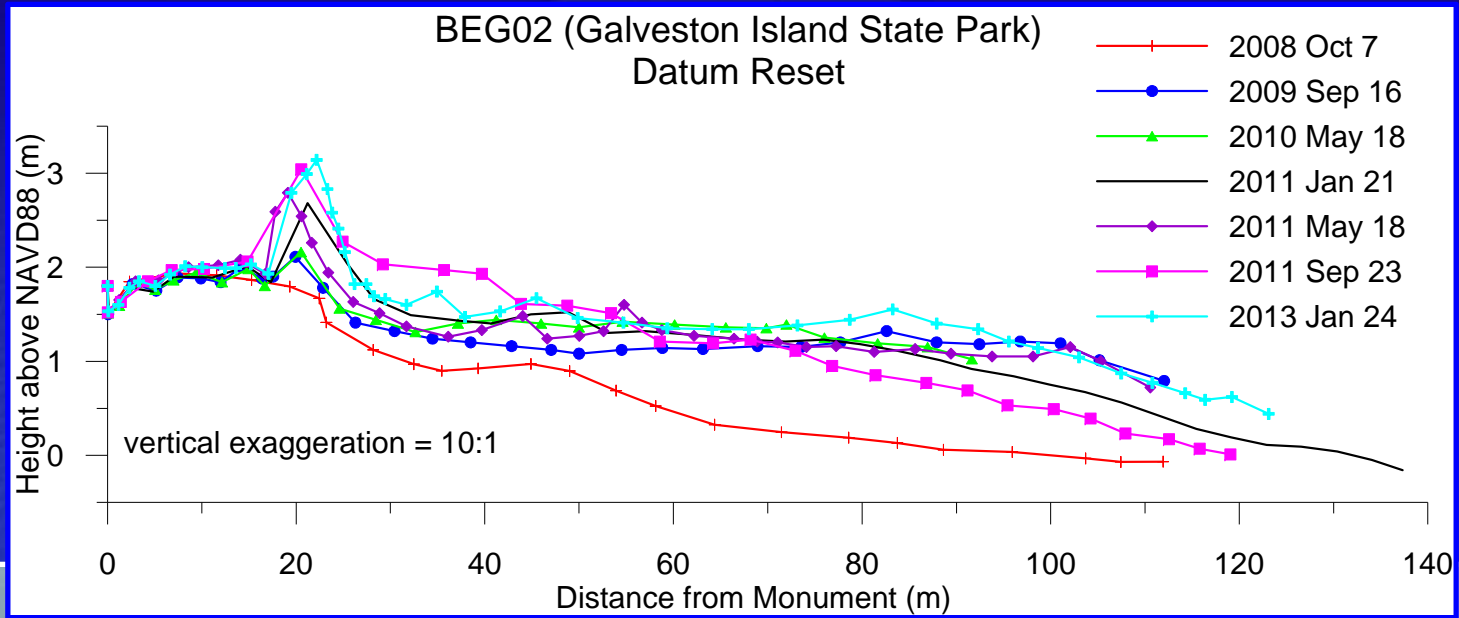
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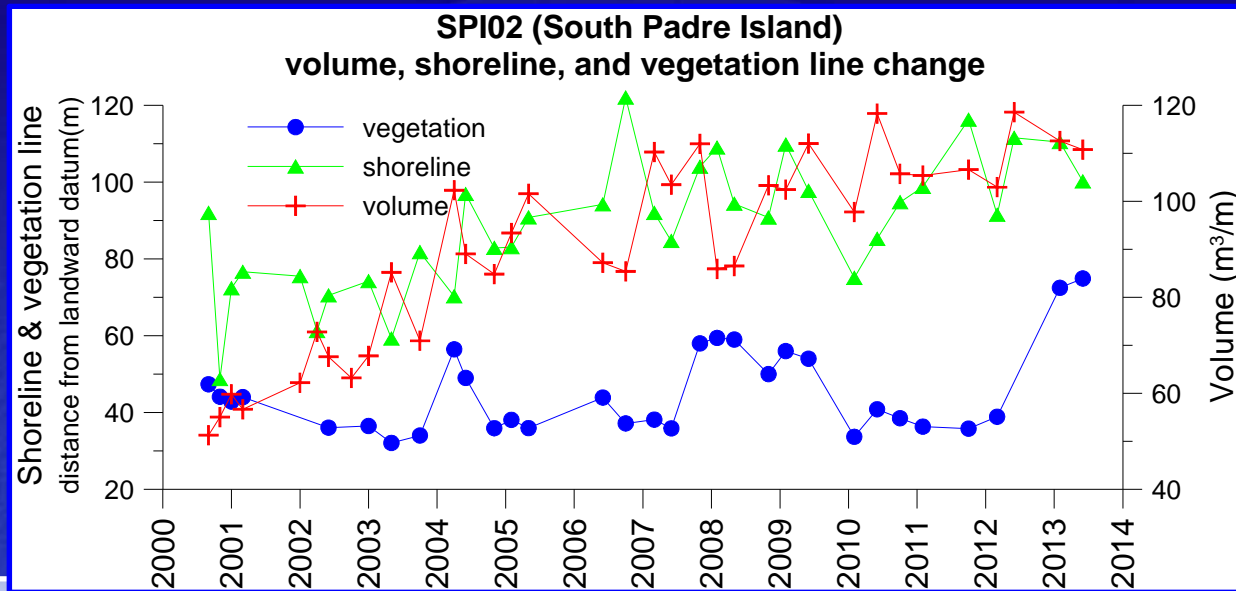
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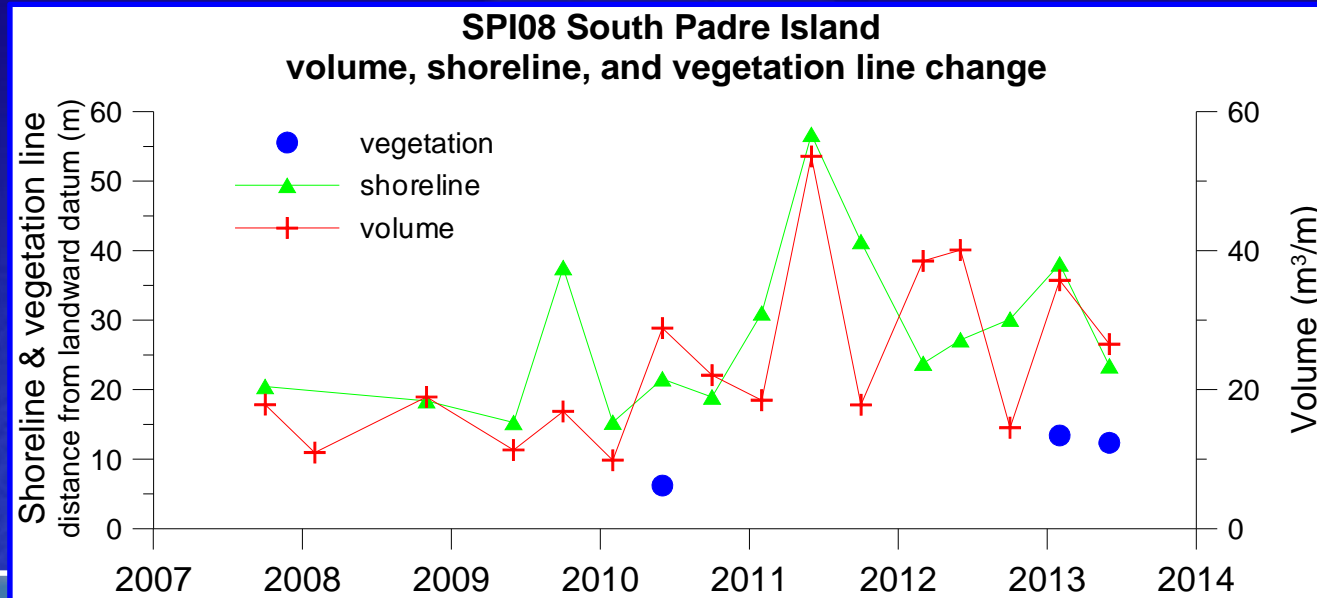
BEG 02 Recovery



South Padre Island Beach Nourishment



South Padre Island Beach Nourishment



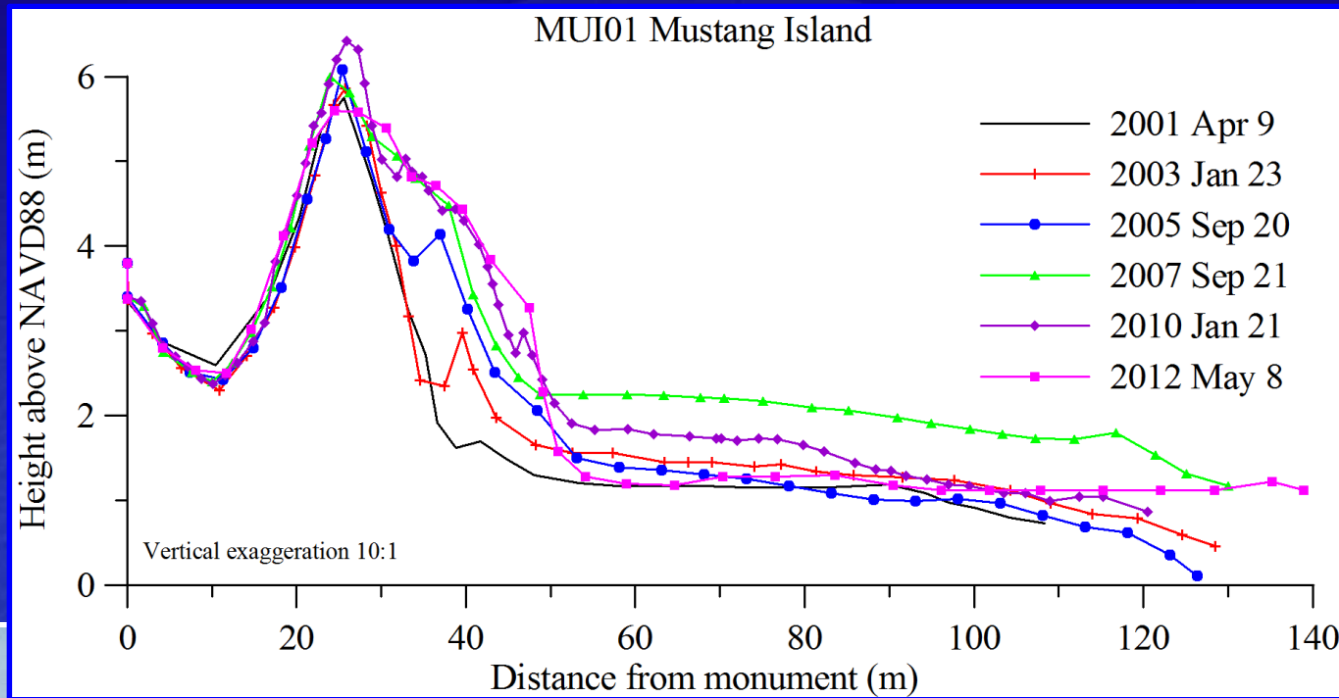
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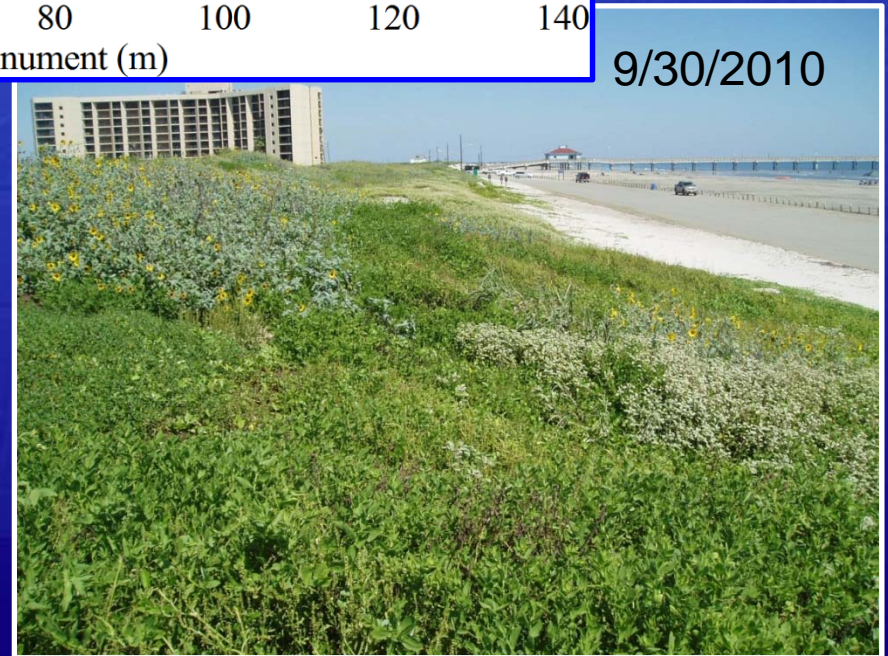
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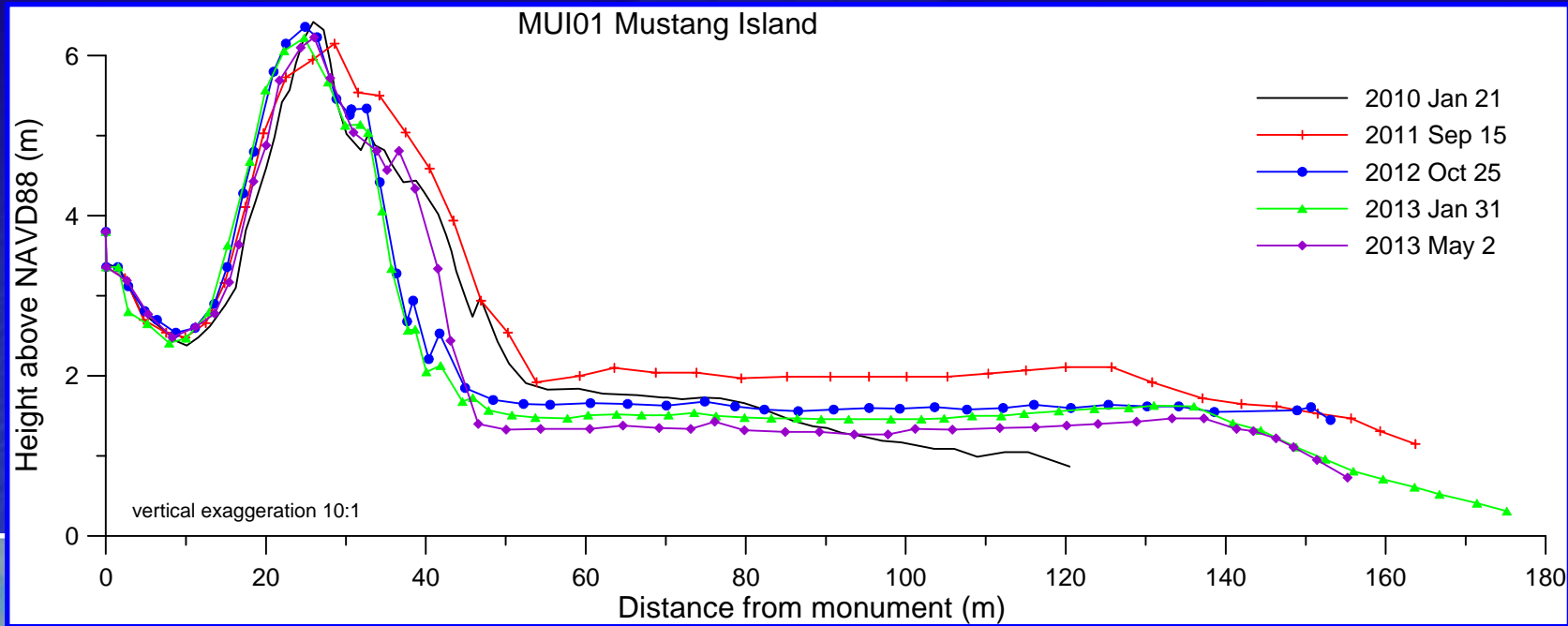
Mustang Island Dune Expansion



9/30/2010



Mustang Island Dune Excavation



10/25/2012



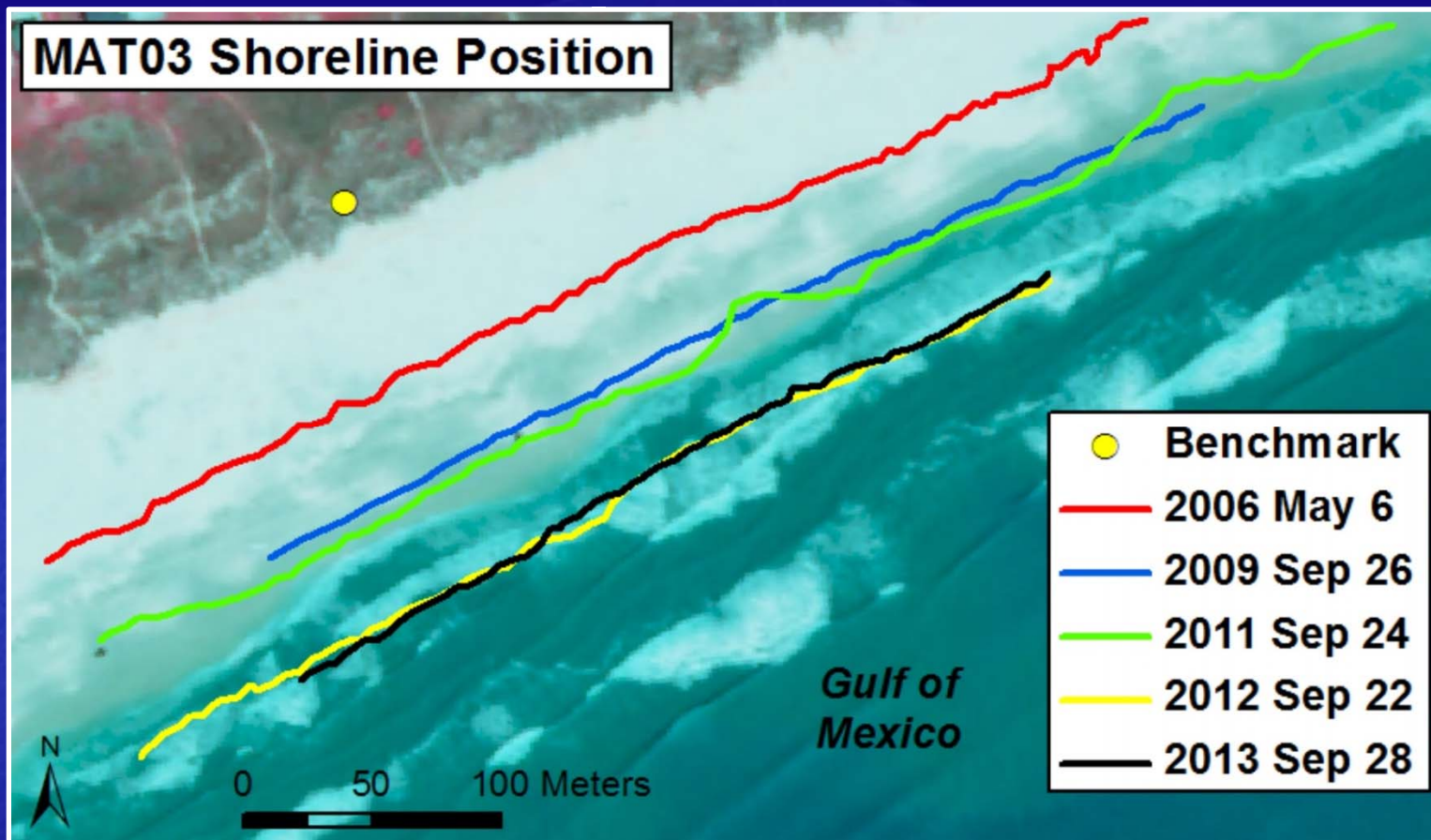
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Matagorda Peninsula



Matagorda Peninsula East Jetty



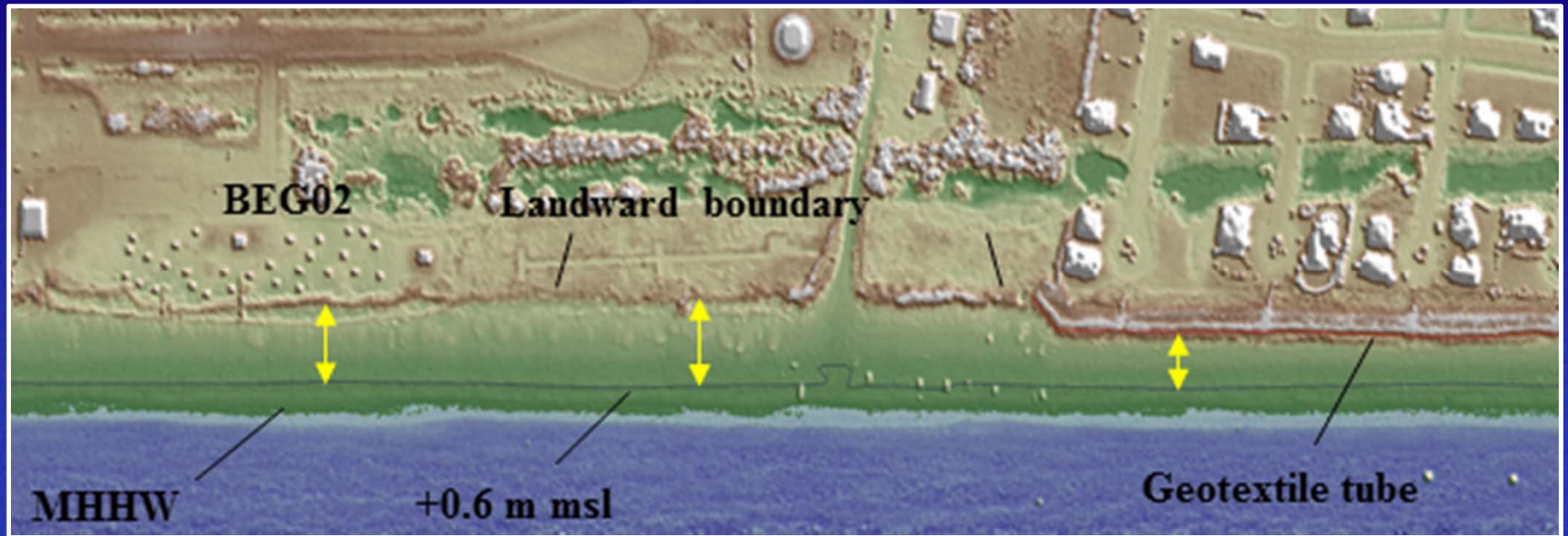
Year	Shoreline Distance from Monument (m)
2006	71.55
2009	108.81
2011	116.03
2012	150.78
2013	156.15

**2006-2013 shoreline change rate:
+12 m/year**

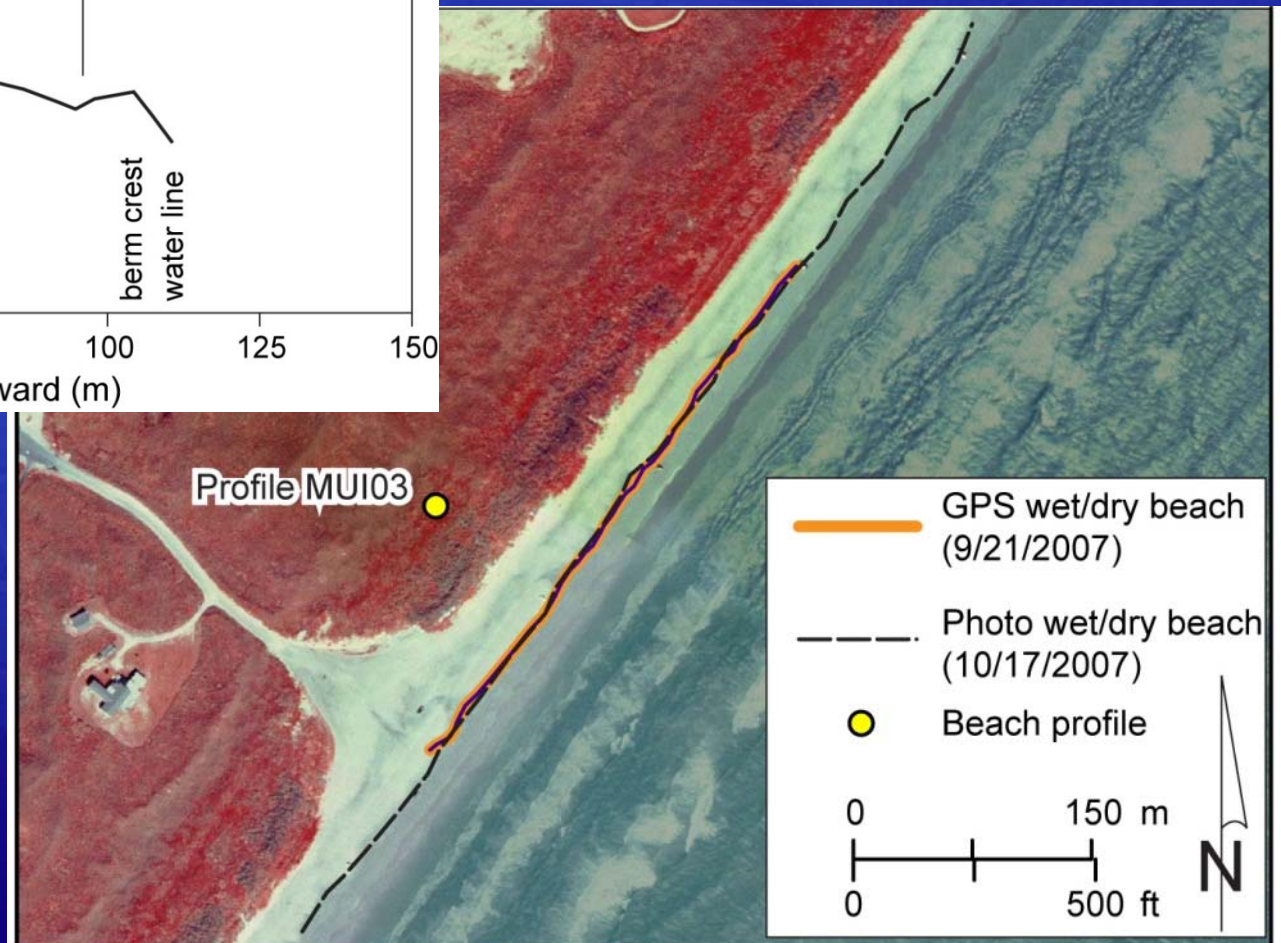
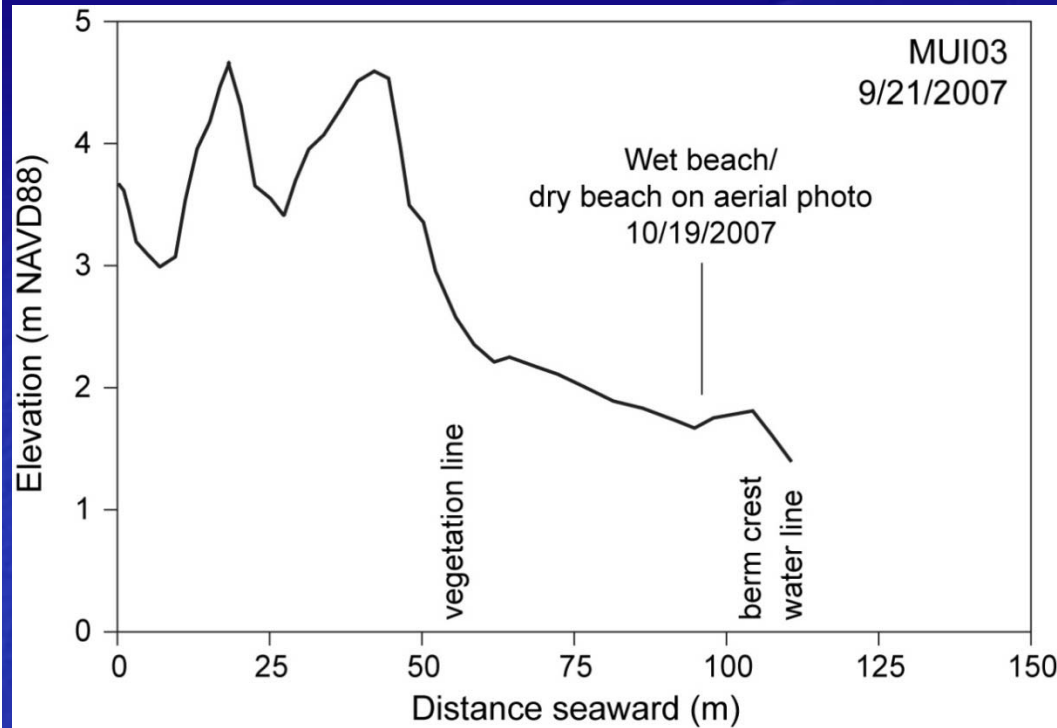
SCIENTIFIC RESULTS

BEG Projects

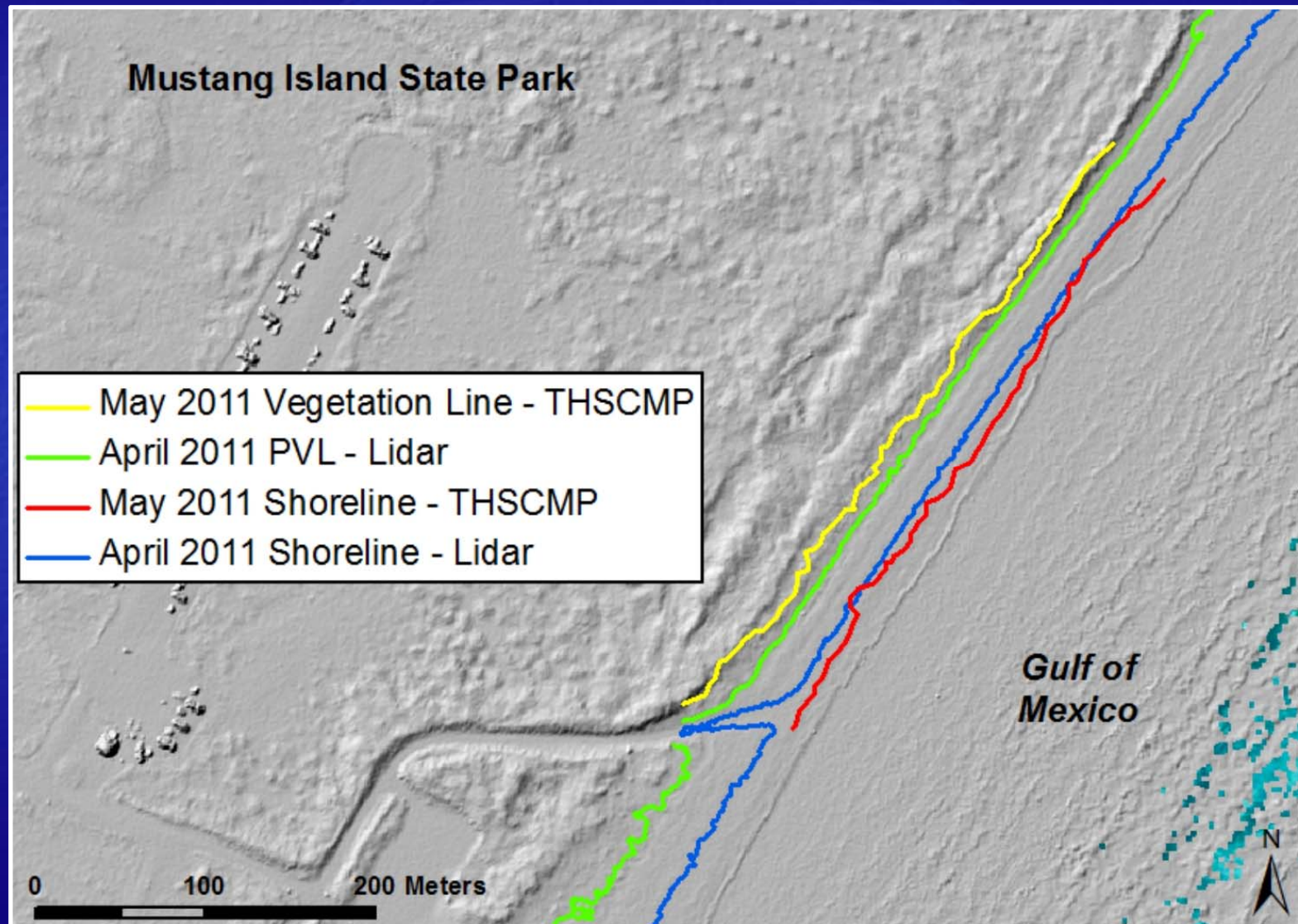
Geotubes Beach Widths



Verification of 2007 Shoreline Position



Verification of Lidar Mapped Shoreline and Potential Vegetation Line



Summary

- THSCMP provides Texas students with a real-world learning experience.
- THSCMP delivers valuable data to the State of Texas for use by students and teachers, scientists, coastal managers, and the general public.
- Data collected by THSCMP has proven beneficial to BEG researchers and coastal managers in numerous scientific studies.
- Future data collection will further enhance our understanding of the Texas coast as well as continue to educate middle and high school students on coastal issues.



Thank you!

THSCMP Website

<http://coastal.beg.utexas.edu/thscmp/>

Tiffany L. Caudle
tiffany.caudle@beg.utexas.edu

Bureau of Economic Geology
John A. and Katherine Jackson School of Geosciences
The University of Texas at Austin