Performance of the Jefferson County, Texas, Section 227 Shoreline Erosion Control Demonstration Project

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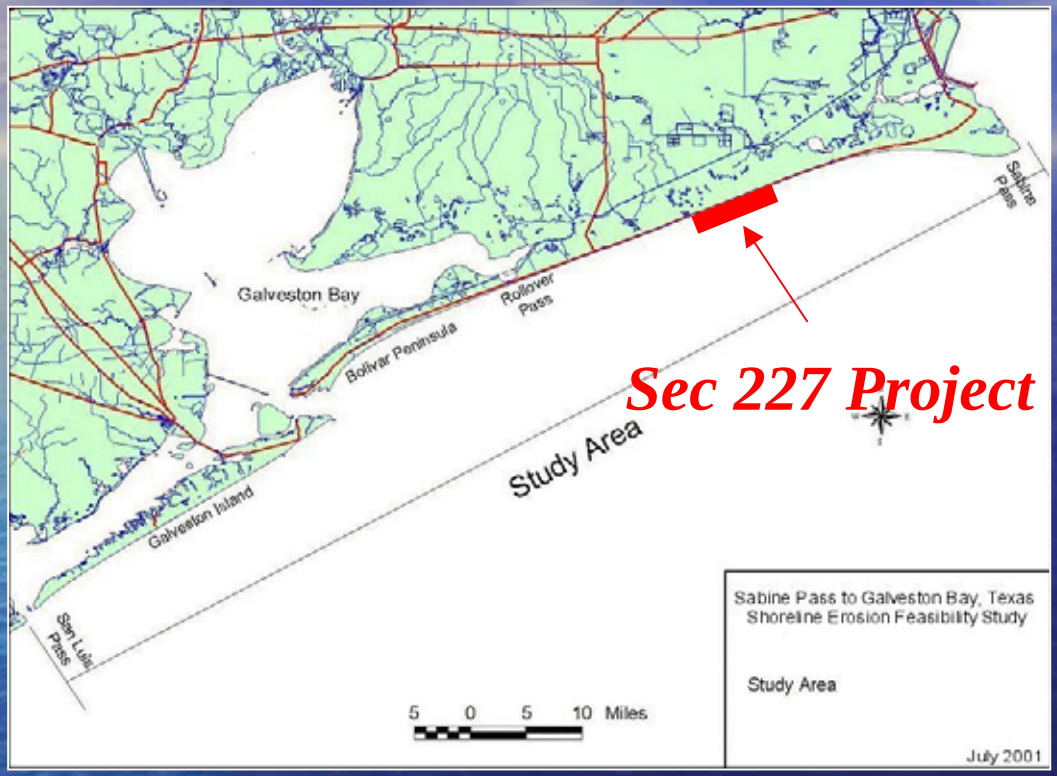
- Ty Wamsley – USACE Coastal Hydraulics Laboratory

Carr Family Outing McFaddin Beach, Circa 1922

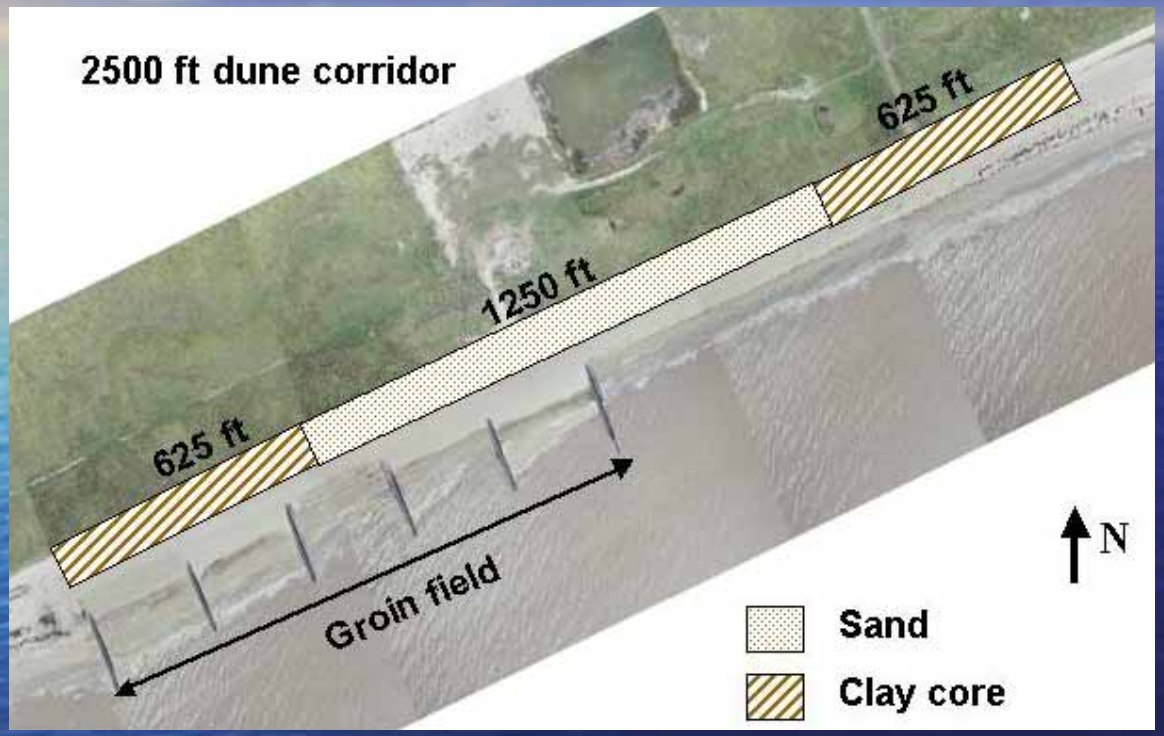
Photos courtesy of the Museum of the Gulf Coast, Port Arthur, Texas

High Island and McFaddin Beach, 2004



Project fronts the McFaddin NWR – area is characterized by a broad salt marsh with a muddy substrate

Project Features



2500 ft Dune

clay cored

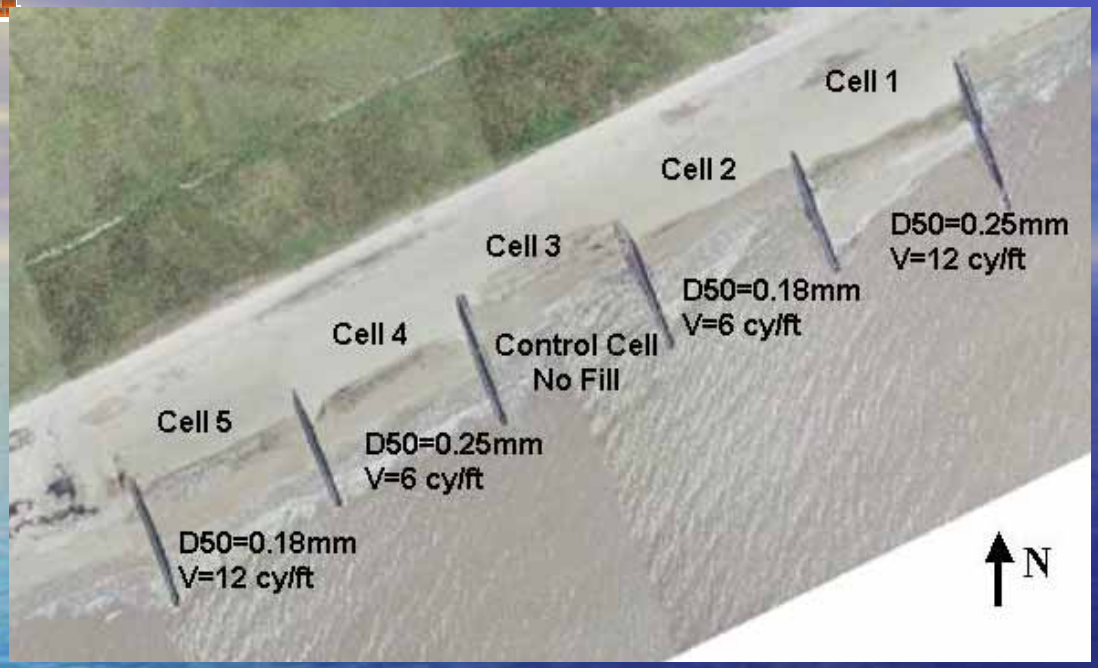
sand cored

5 Low Volume Nourishment Cells

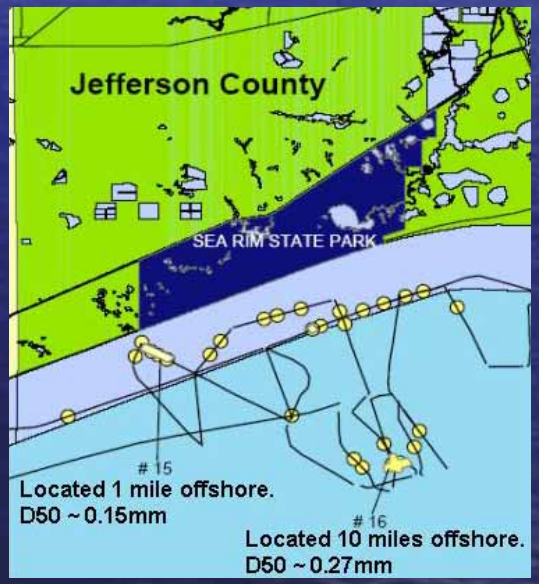
D_{50} = 0.18

D_{50} = 0.25

Geotube Groins



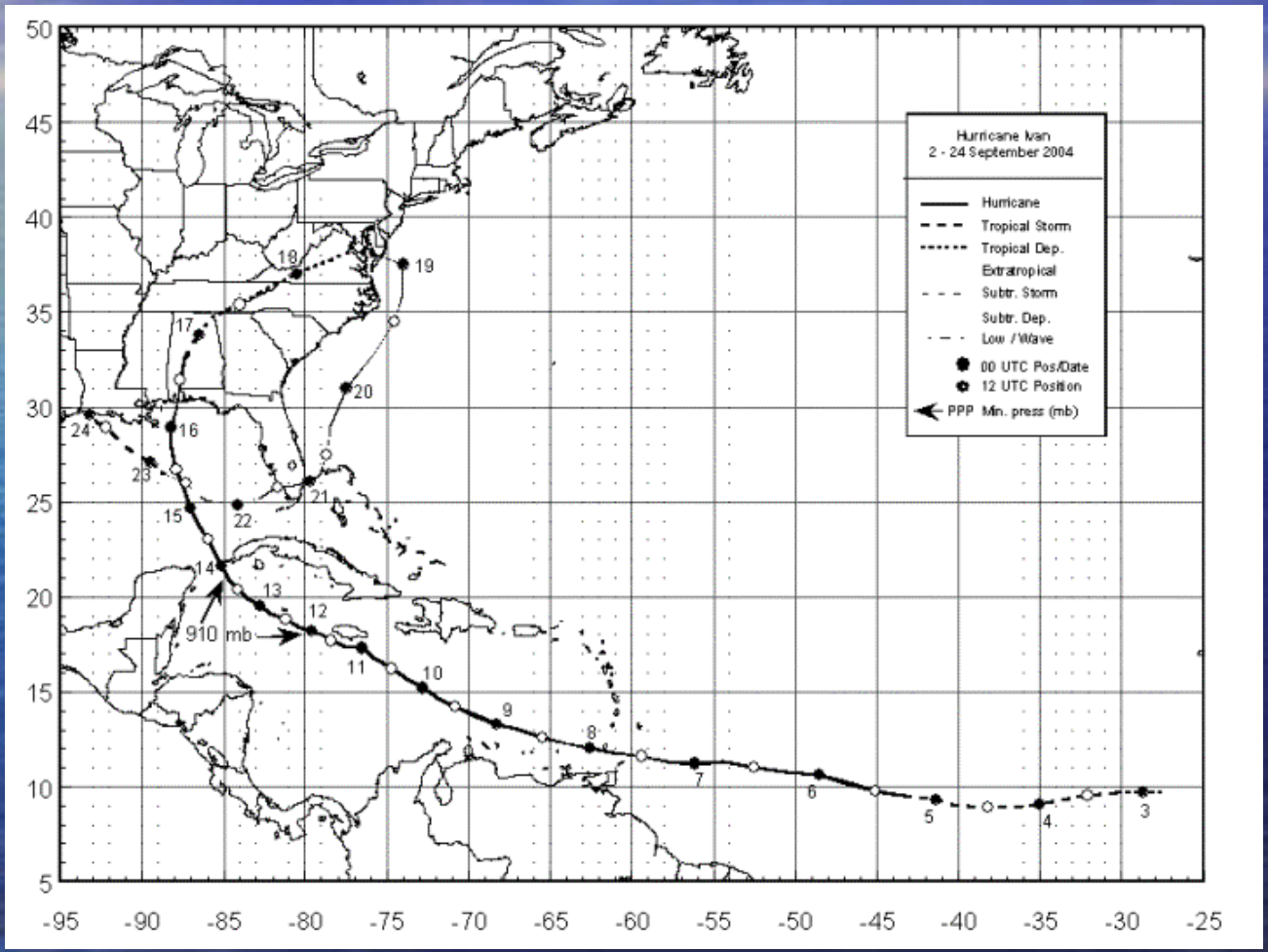
Experimental Cells with Low Volume Beach Fill

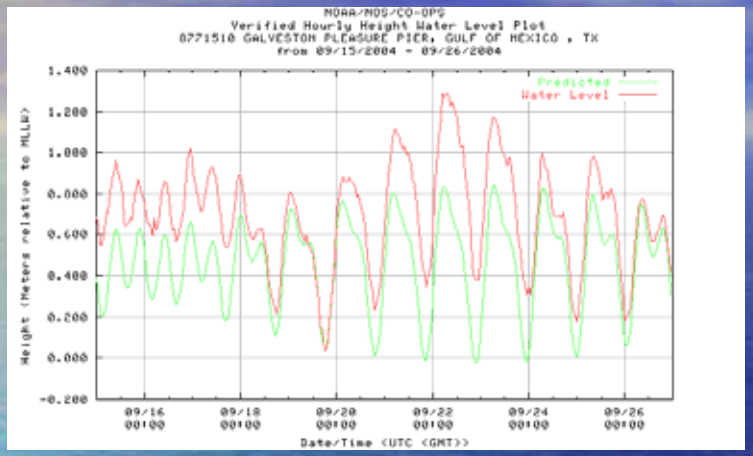


Project Objectives

- Evaluate effectiveness of the dune at reducing overwash and retaining sand in the swash zone
- Assess performance of clay-cored dune and sand dune at both nourished and unnourished sites
- Determine effectiveness of low volume beach fill to reduce erosion of underlying clay layers
- Evaluate effectiveness of different grain sizes and nourishment rates
- Evaluate effectiveness of groins at retaining sand in cells and performance of geotextile structures

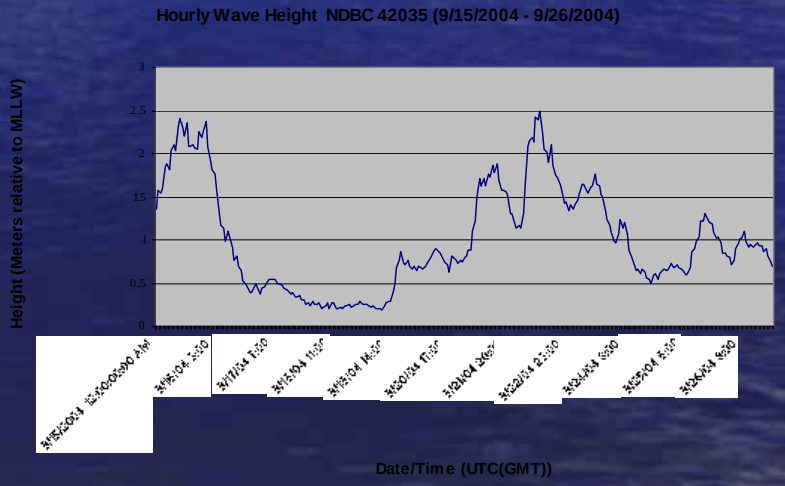
Project Performance – Hurricane Ivan

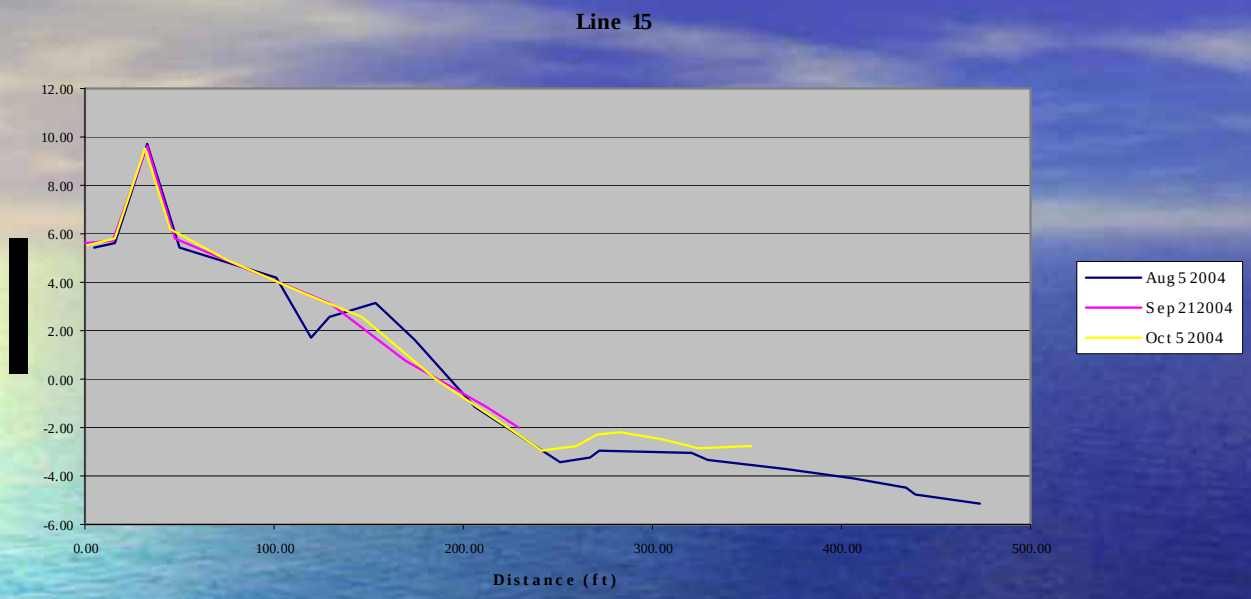




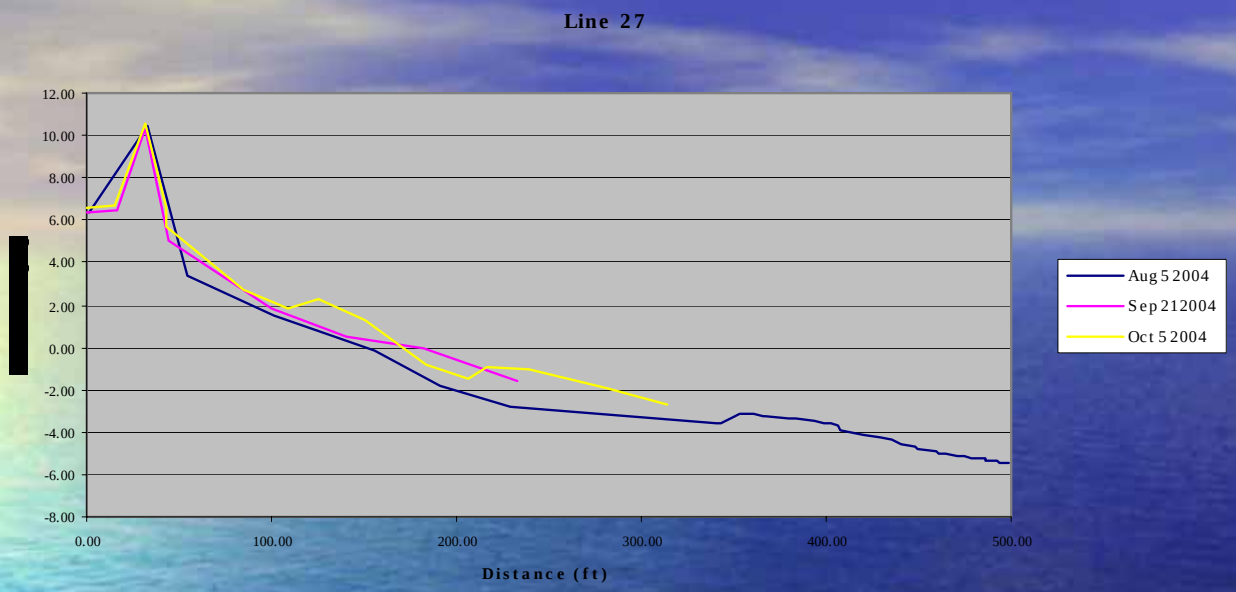
Hourly Water Levels Pleasure Pier, Galveston

Wave Heights NDBC 42035

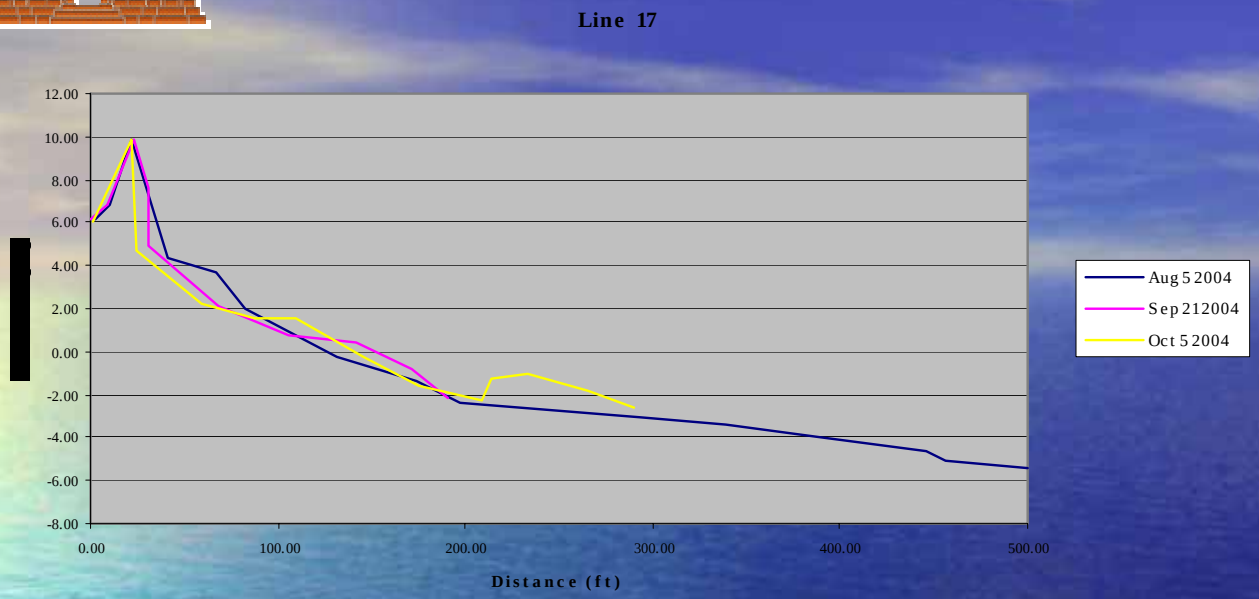




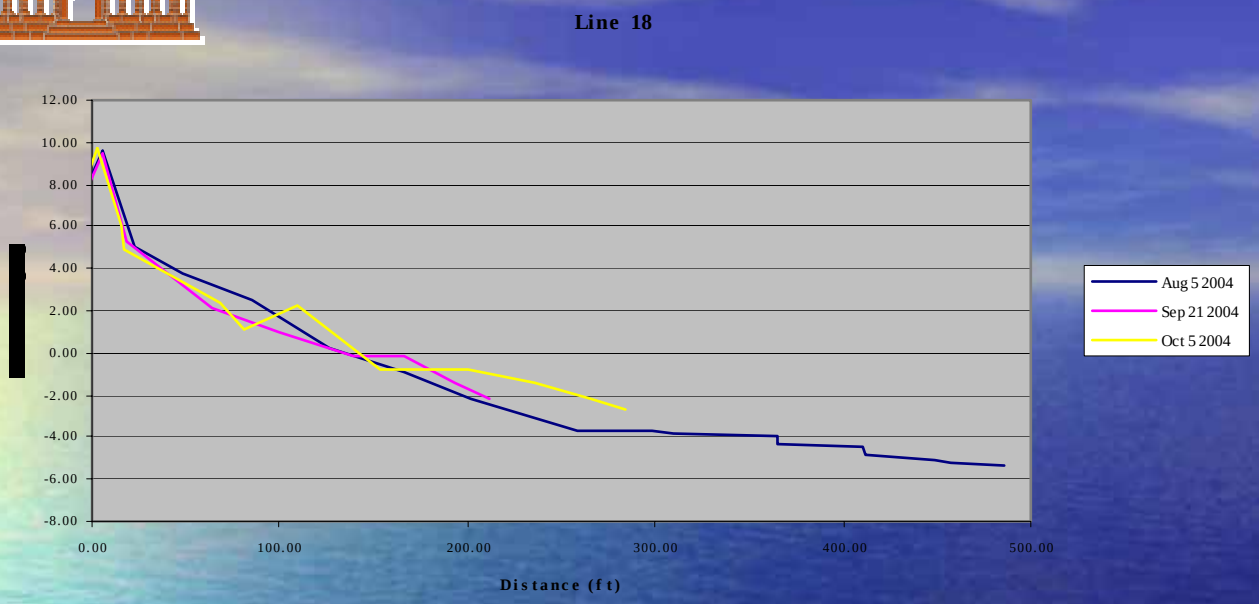
Post-construction and post-event profile data for Cell # 5



Post-construction and post-event profile data for Cell #3



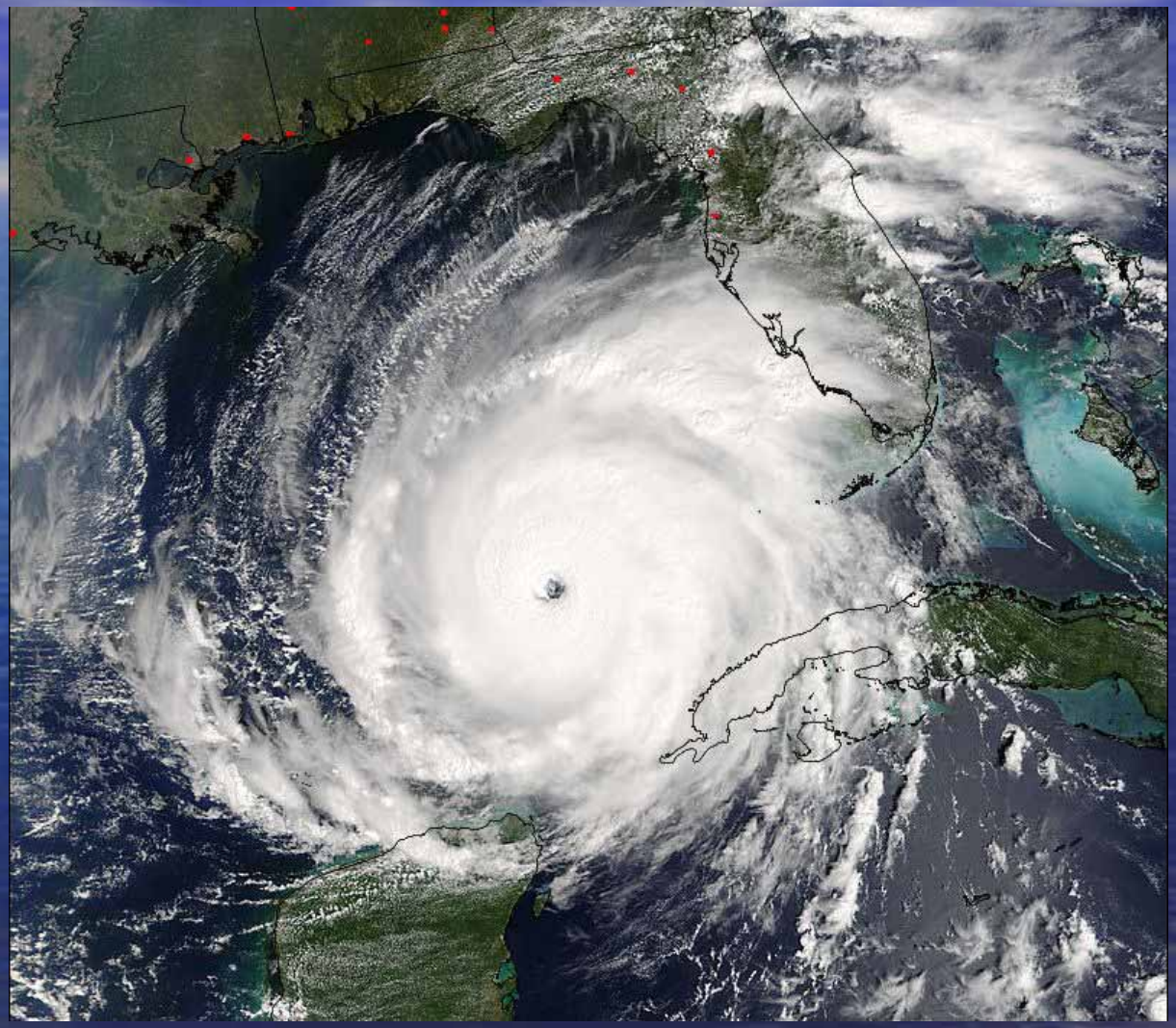
Dune Response
Sand-cored Dune

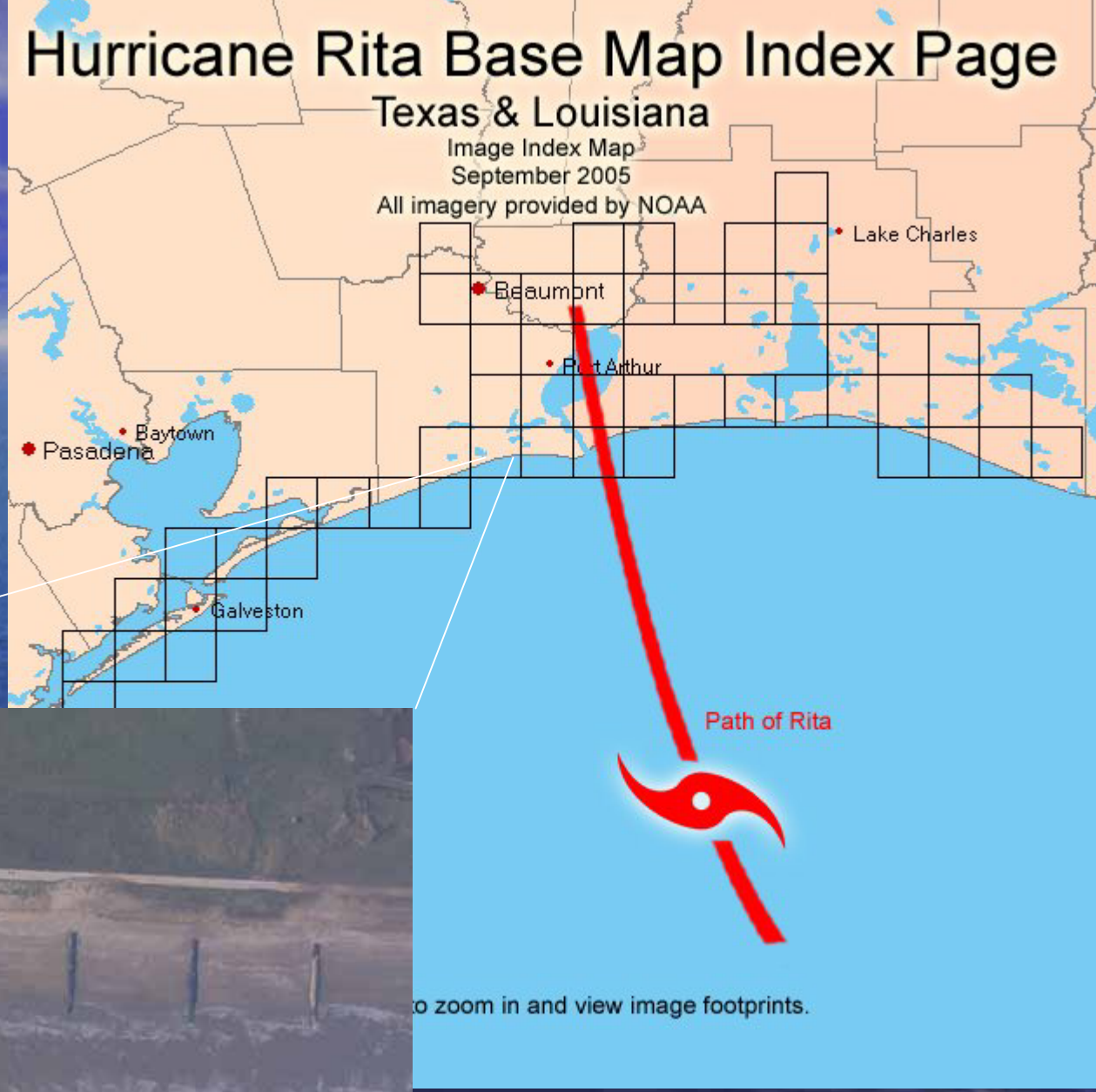


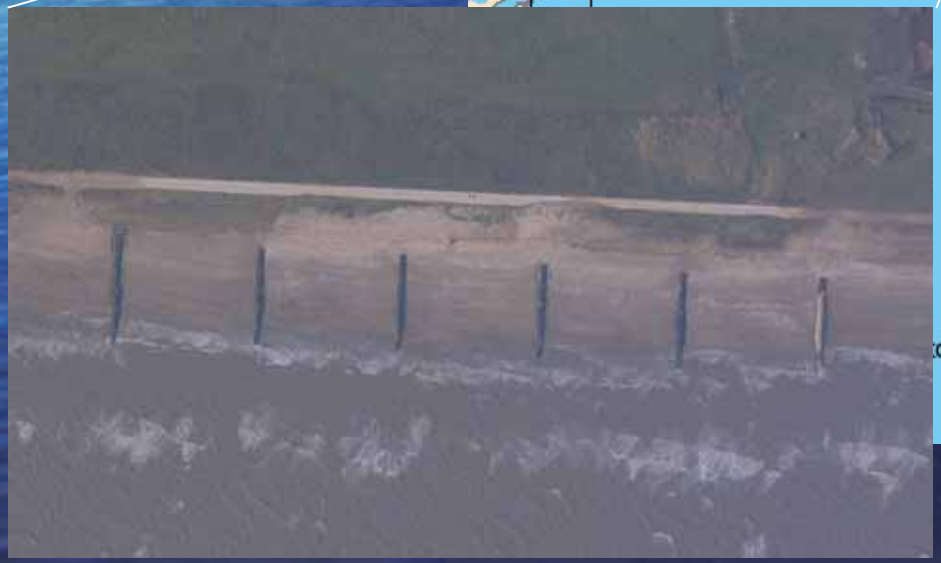
Dune Response
Clay-cored Dune

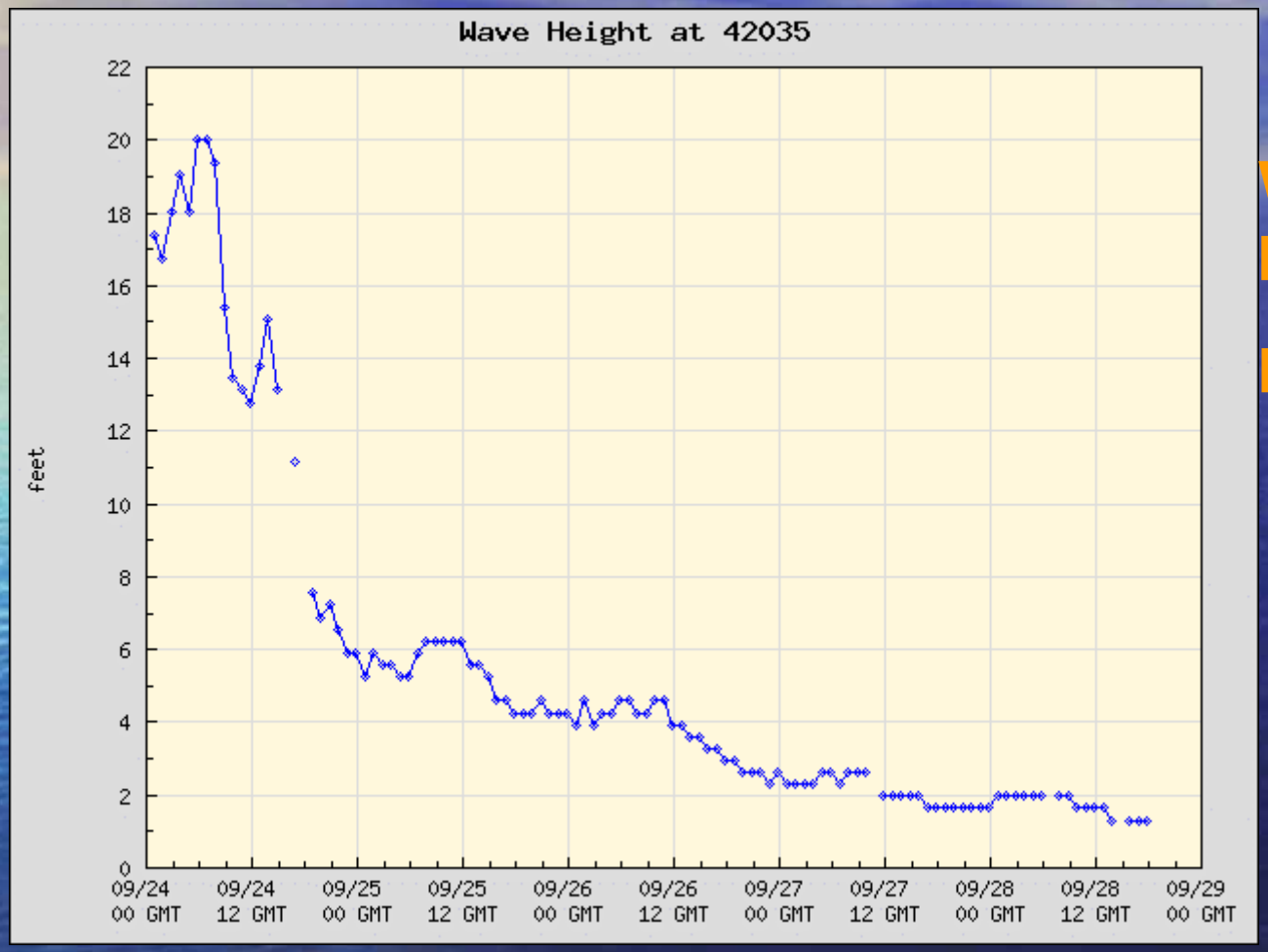
Hurricane Rita

Sep 24-25, 2005




Hurricane Rita Base Map Index Page
Texas & Louisiana
Image Index Map
September 2005
All imagery provided by NOAA
Lake Charles
Beaumont
Port Arthur
Baytown
Pasadena
Galveston
Path of Rita
o zoom in and view image footprints.

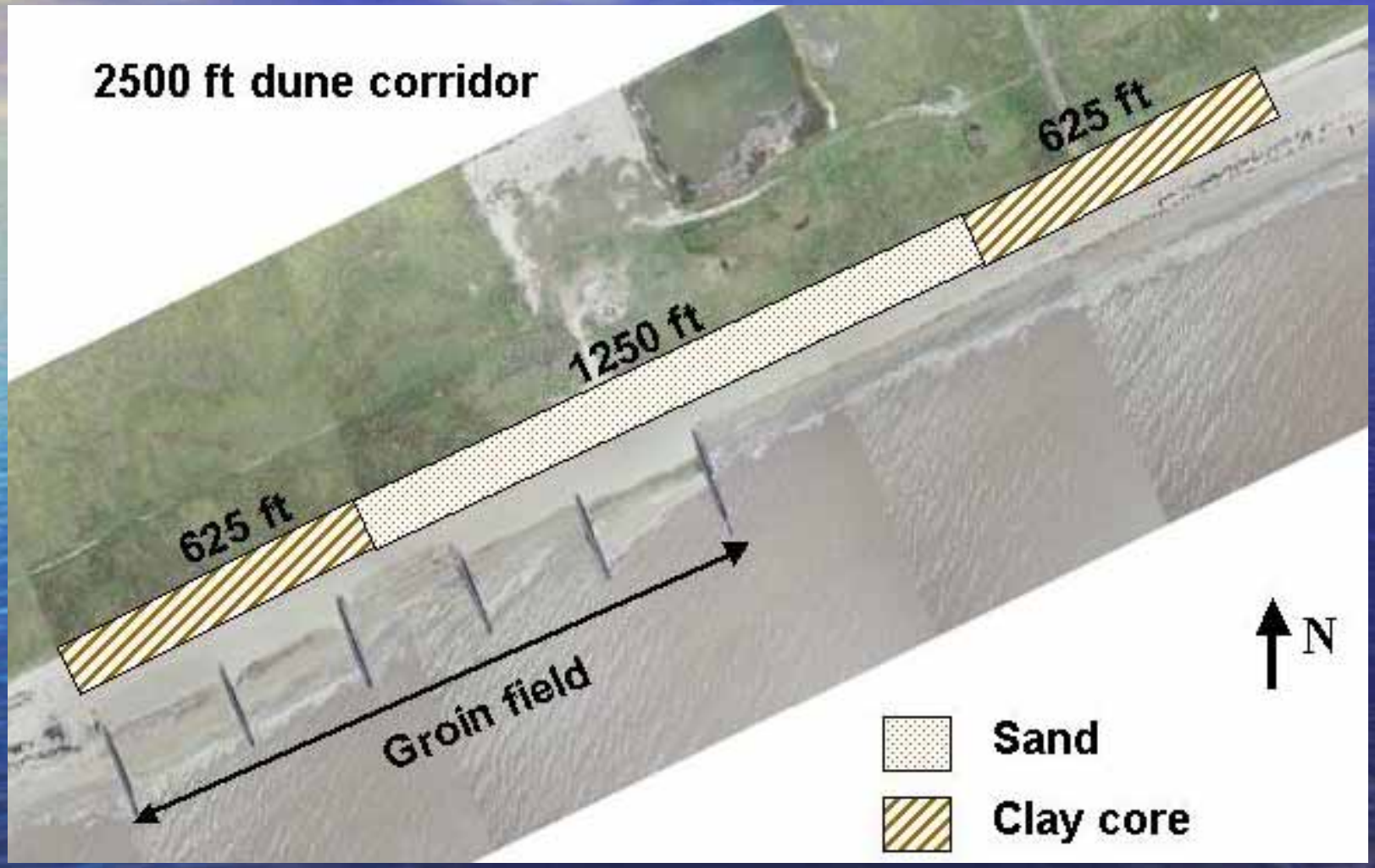




Wave Heights (ft)

NDBC 42035

Project Features



Preliminary Observations

- Clay-cored dunes remained largely intact and prevented overwash retaining sand in the swash zone
- Some volume of the beach fill appears to have been retained in the nourishment cells
- Geotube groins performed better than anticipated