



PLAQUEMINES PARISH BARRIER ISLAND RESTORATION & SUSTAINABILITY

MVD/Gulf Coast Regional Dredging Meeting
November 5, 2013



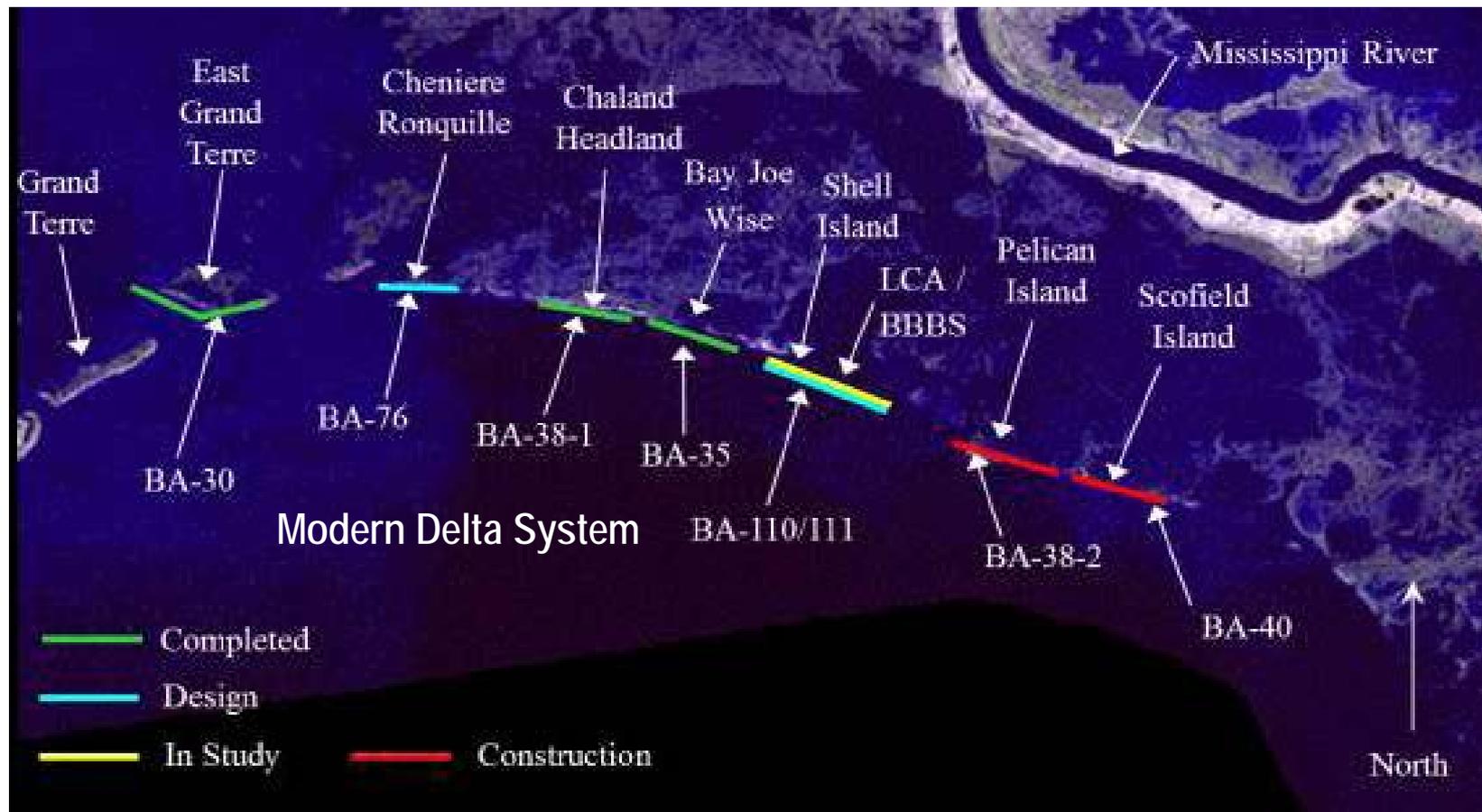
OVERVIEW



1. Barrier Island Restoration Projects in Plaquemines Parish
2. Plaquemines Parish Conceptual Restoration Plan: ERDC Modeling Results
3. Plaquemines Parish Sustainability Study
4. Innovative Dredging Opportunities: A Programmatic Approach
5. Questions

BARRIER ISLAND RESTORATION PROJECTS

EAST GRAND TERRE TO SCOFIELD ISLAND



Source: CPRA, Barrier Island Status Report, FY2014 Annual Plan.

EAST GRAND TERRE ISLAND RESTORATION



East Grand Terre, 2013.

- 621 acres of barrier island created
- 2.8 miles of barrier shoreline restored
- +6 ft dune from 4.6 MCY of sediment



BARATARIA ISLAND COMPLEX PROJECT

PELICAN ISLAND & PASS LA MER TO CHALAND PASS



Pass La Mer to Chaland Pass

- 484 acres created including 254 acres of back barrier marsh

Pelican Island

- Used 4.6 MCY of mixed sediment from 4 borrow sources to create 192 acres of beach-dune habitats and 398 acres of marsh platform



Pelican Island with Emergency Berm W9, before restoration.



BAY JOE WISE SHORELINE RESTORATION



Bay Joe Wise, under construction, 2009.

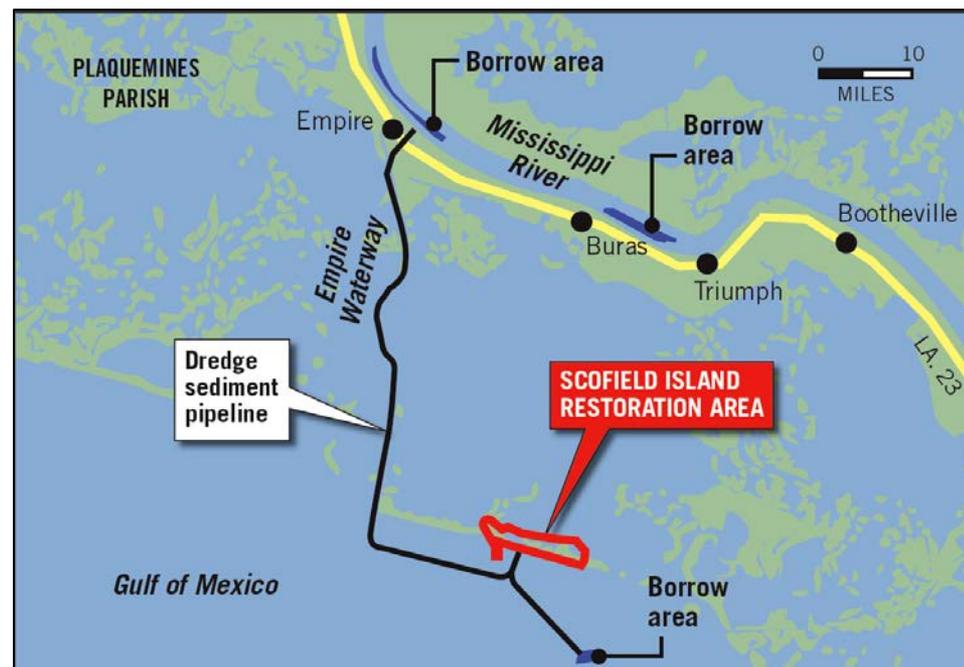
- Created 350 acres of marsh platform, ~1,000 ft wide
- Dredged 3 MCY of sediment from 3 borrow sources
- Included tidal creeks, ponds and vegetation plantings



RIVERINE SAND MINING SCOFIELD ISLAND RESTORATION



- Constructed by sand dredged from the Mississippi River via 22 mile long pipeline
- Created ~11,400 ft long beach and dune fill
- Dune includes 50 ft wide crest at +6 ft
- Created 11,800 ft long marsh platform on the bay side of the island; 375 acres



Berm to Barrier

SHELL ISLAND RESTORATION



Shell Island East restored •

Shell Island East

- Constructed with 2.265 MCY of sand from Lower Mississippi River (Same source as Scofield)
- Created an 8 foot high dune with a crest width of 340 feet, and a 5 foot high and 1,100 foot wide beach over a project length of about 5,380 feet



Berm to Barrier

FUTURE PROJECTS



Shell Island West

- In design phase and proposed for NRDA funding
- Design includes 15,750 feet of shoreline with a dune elevation of 8 feet, creating a surface area of about 277 acres with 7.6 MCY of riverine sand; 308 acres of marsh with 2.1 MCY



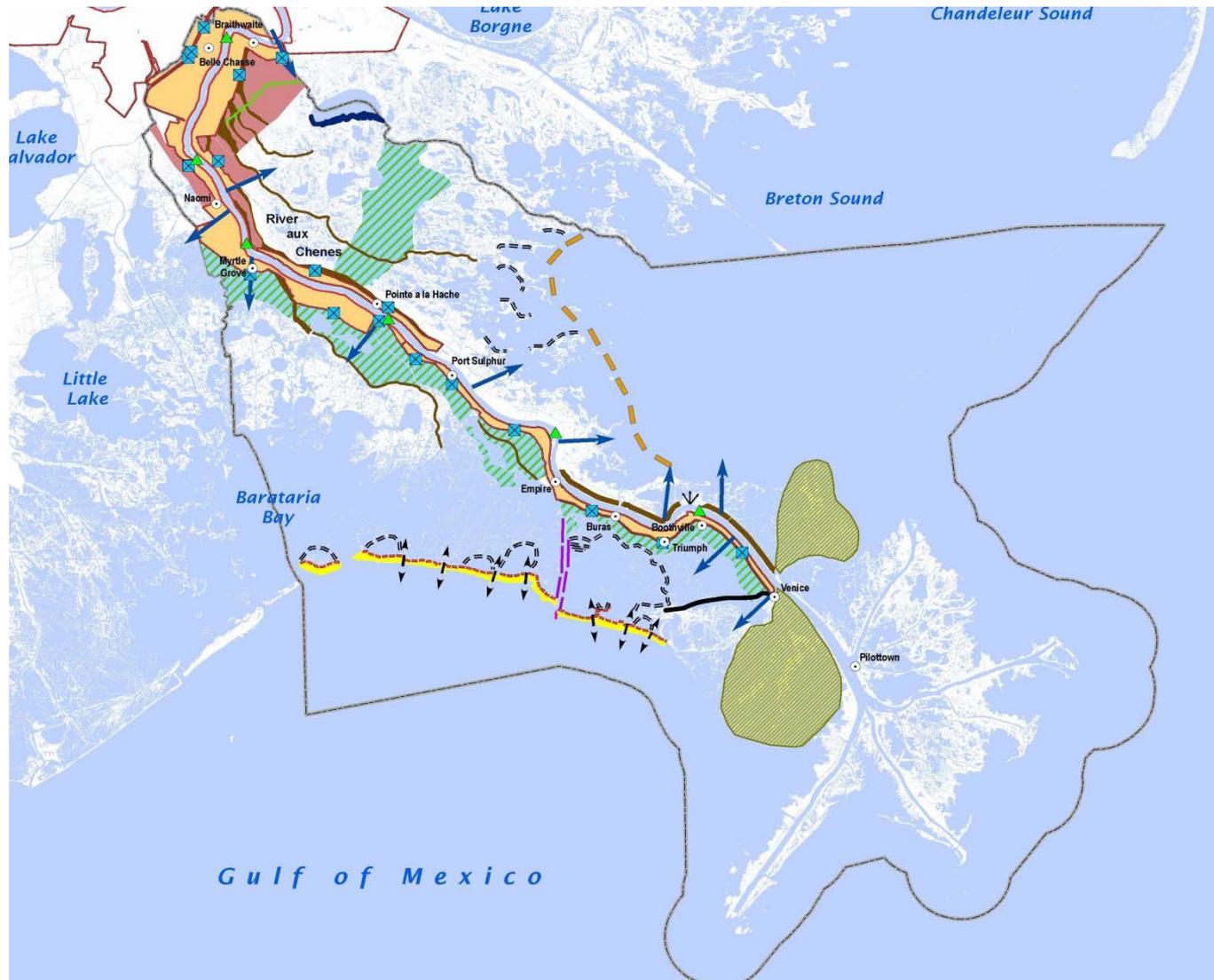
Cheniere Ronquille today.

Cheniere Ronquille Barrier Island Restoration

Goal: expand gulf shoreline structural integrity by tying into adjacent completed projects to the east; will create 127 acres beach/dune & 259 acres back marsh

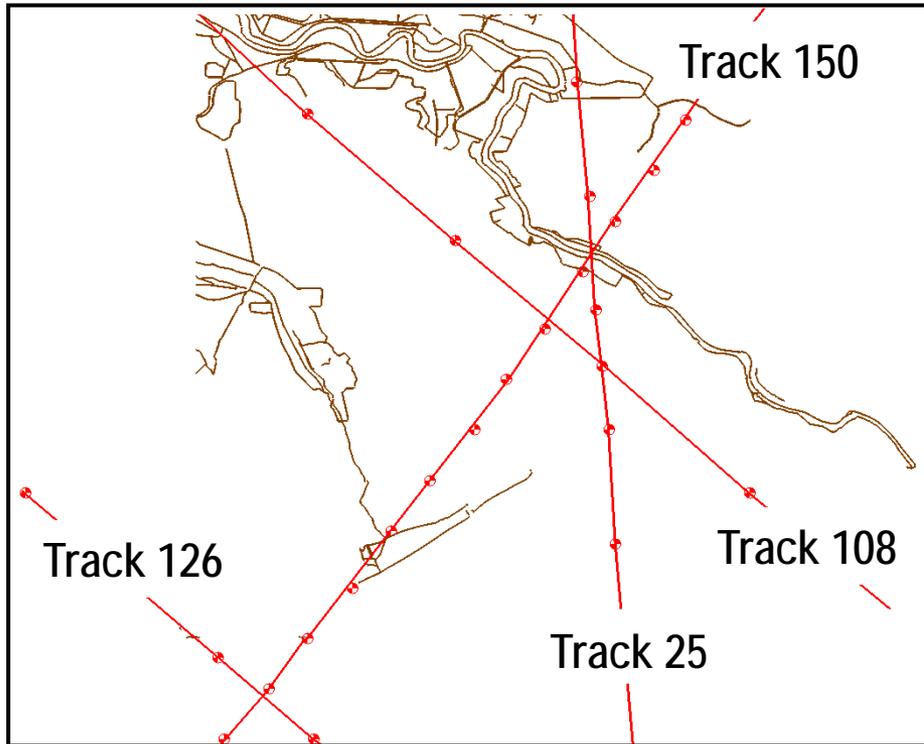


PLAQUEMINES PARISH CONCEPTUAL RESTORATION PLAN

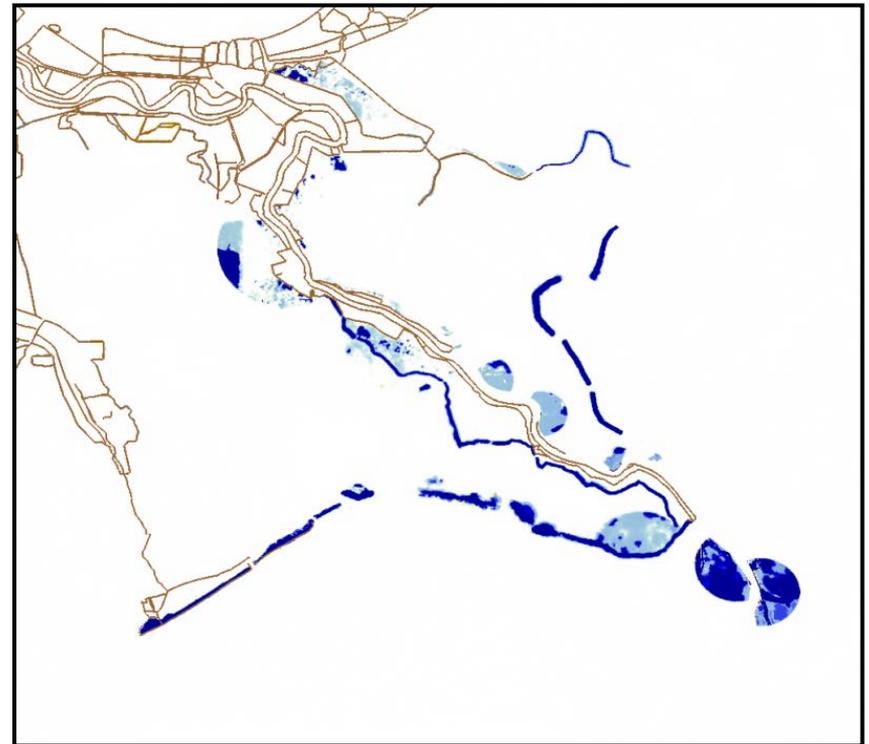


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|--|------------------------------|--|-----------------------------|
| | Parish Boundary | | Bay Fringe Barriers |
| | Protection Levees | | Channel Islands |
| | Fastland | | Fresh Water Diversion |
| | Wetland Forest | | Sub-Delta Enhancement |
| | Mangroves | | Shoreline Restoration |
| | Ridge Forest | | Crevasse Splays |
| | Marsh Creation / Enhancement | | Freshwater Training Channel |
| | Barrier Island Restoration | | Stabilized Passes |
| | Barrier Ridge | | Sediment Dredging |
| | Shoreline Protection | | Pump Station |

SELECTED STORM TRACKS (~100 yr)

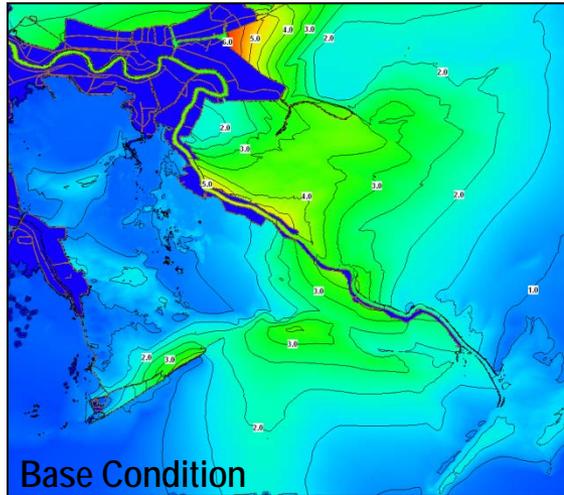


BARRIERS PLANNED TO BE RESTORED

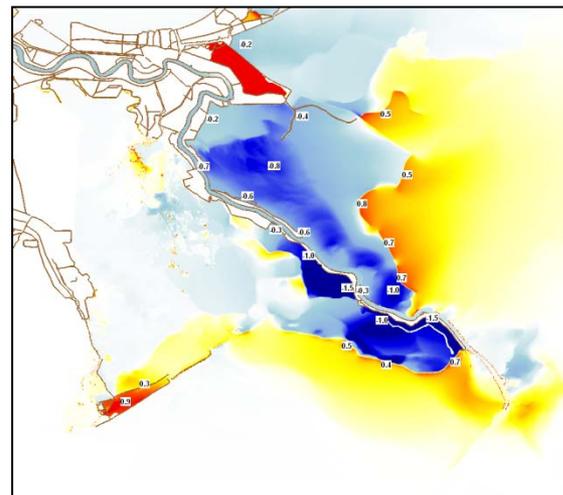
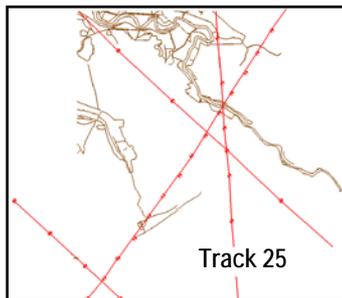
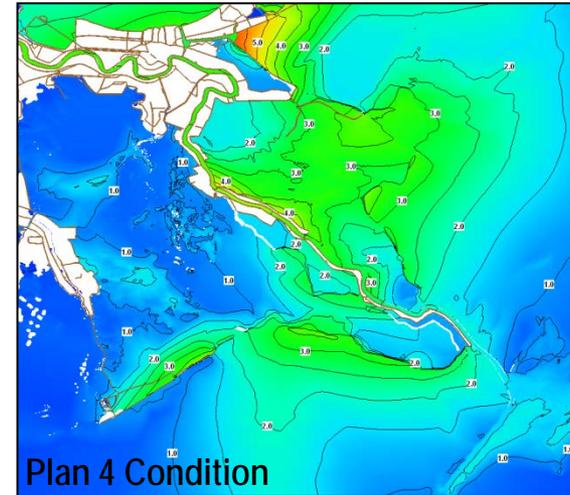
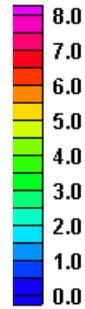


- Demonstrated the benefits of coastal restoration projects on reducing storm surge.
- Barrier islands were most effective type of project.
- Reduction of storm surge by 3 to 4 ft is possible.
- Benefits are related to barrier heights of 10 to 12 ft.
- Barrier islands also reduce storm wave heights behind islands.

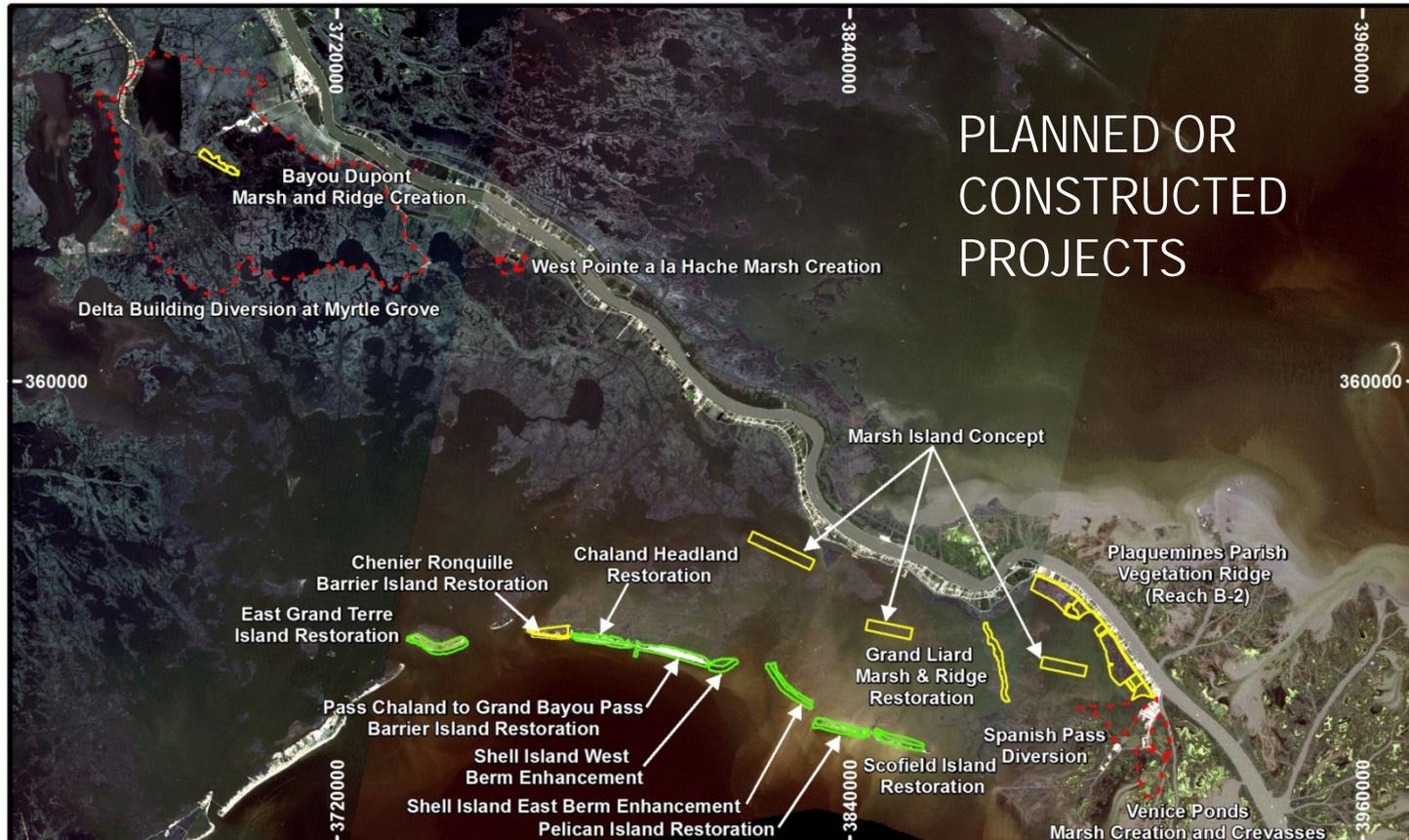
Maximum Surge Envelope – Storm Track 25



Peak Water Level, m



PLAQUEMINES PARISH SUSTAINABILITY STUDY



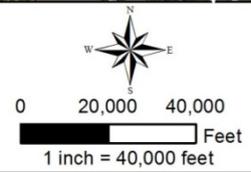
PLANNED OR CONSTRUCTED PROJECTS

Notes:

1. Coordinates are in feet based on the Louisiana State Plane Coordinate System, South Zone, North American Datum of 1983 (NAD 83).
2. Background imagery is the USGS Landsat imagery, date flown October 2010.

Legend:

- Barrier Island Projects
- Projects to Be Examined in Detail
- Other Projects



FINDINGS: BARRIER ISLAND ELEVATION

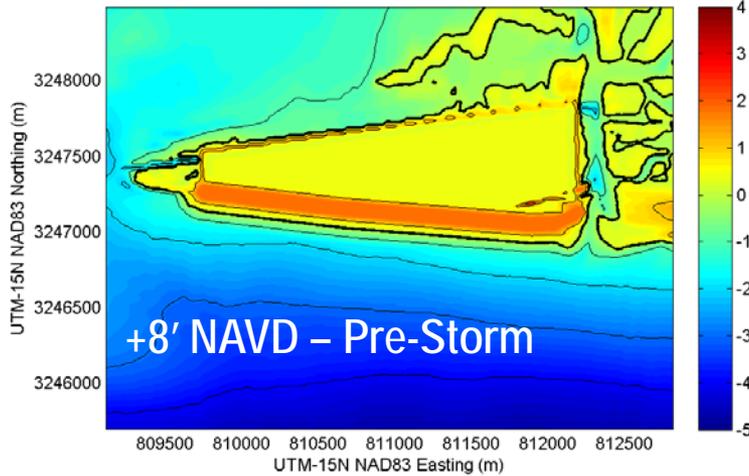


- A relatively high dune cross-section (~ +14 feet NAVD) is a more sustainable barrier island design than the +6 or +8 foot NAVD dune cross-sections that have been used for previously designed or constructed projects.
- A barrier island project with a high dune cross-section is more likely survive and provide benefits after powerful Category 3 hurricane than one with a lower dune cross-section.
- The higher dune cross-sections will have, at most, minor effects on regional storm surge, wave, and salinity plume propagation.

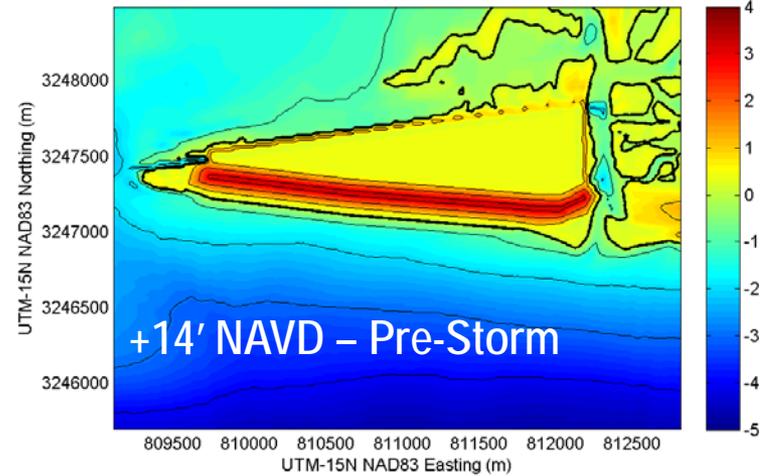
BARRIER ISLAND – CHENIER RONQUILLE



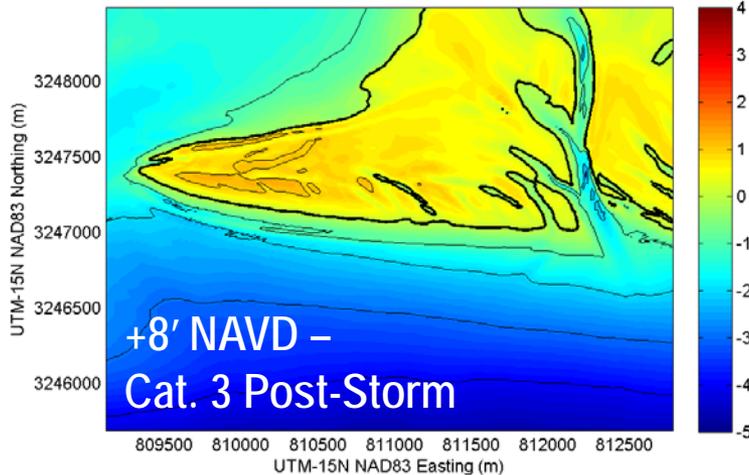
Chenier Ronquille, Pre-Storm Bathymetry (m NAVD), Category 3 Hurricane, 08 foot NAVD Design Dune



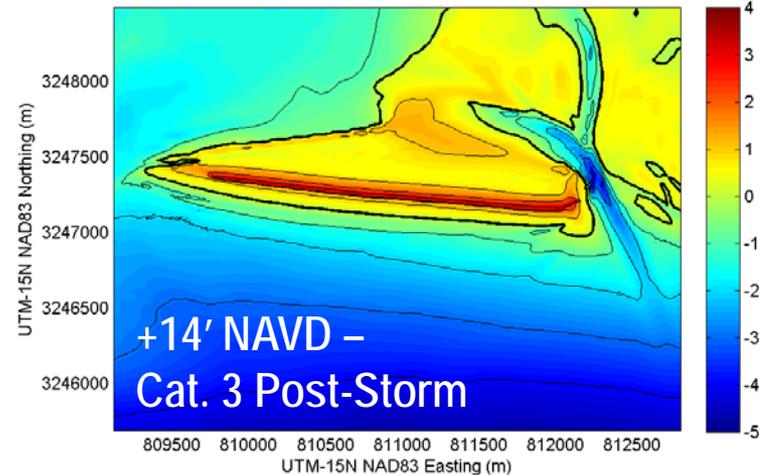
Chenier Ronquille, Pre-Storm Bathymetry (m NAVD), Category 3 Hurricane, 14 foot NAVD Design Dune



Chenier Ronquille, Post-Storm Bathymetry (m NAVD), Category 3 Hurricane, 08 foot NAVD Design Dune



Chenier Ronquille, Post-Storm Bathymetry (m NAVD), Category 3 Hurricane, 14 foot NAVD Design Dune



INNOVATIVE DREDGING OPPORTUNITIES



Purpose: Assess efficiencies that could be achieved through alternative dredging practices.

1. Innovative contracting and bidding practices to provide for long-term leasing of dredges for coastal restoration;
2. A comprehensive approach to sediment availability and budgeting based on protection/restoration priorities;
3. A multi-project, or programmatic, approach to permitting, scheduling and construction of coastal restoration projects.



PLAQUEMINES PARISH PROPOSES A MULTI-PROJECT, PROGRAMMATIC APPROACH



- Sustainable, low-cost source of sediment via a long-term contract dredge in the Mississippi River
- Adoption of new construction methodologies, e.g. separate dredging and shaping contractors
- Coordination and streamlining of permitting multiple projects
- Sustainable source and commitment of funds to a multi-project program



Discussion?