Evolution of Barrier Island Restoration in Coastal Louisiana

Restore America’s Estuaries
8th National Summit
On Coastal and Estuarine Restoration & the 25th Biennial Meeting of the Coastal Society
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Importance of Barrier Islands

- First line of defense
- Storm surge reduction
- Wave and Wind energy reduction
- Provide various habitats (beach, dune, and marsh)
- Critical habitat for flora and fauna
- Wildlife refuges (Terrebonne Barrier Islands Refuge, Breton National Wildlife Refuge)
- Local community & tourism
Isle Dernieres Restoration – East Island (TE-20)

- 13 miles south of Cocodrie, LA
- Completed in 1999
- Cost $12.5 mil (2016 $)
- 3.9 MCY of material
- Distance to borrow area ~2 miles
Timbalier Island Restoration (TE-40)

- 15 miles west of Port Fourchon, LA
- Completed in 2005
- Cost $15.2 mil (2016 $)
- 4.1 MCY of material
- Distance to borrow area ~5 miles
Timbalier Island Restoration (TE-40)
Pass Chaland to Grand Bayou Pass Barrier Shoreline Restoration Project (BA-35)

- 15 miles east of Grand Isle, LA
- Completed in 2009
- Cost $39 mil (2016 $)
- 3 MCY of material
- Distance to BA ~8 miles
Pass Chaland to Grand Bayou Pass Barrier Shoreline Restoration Project (BA-35)
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Pass Chaland to Grand Bayou Pass Barrier Shoreline Restoration Project (BA-35)
Riverine Sand Mining/ Scofield Island Restoration (BA-40)

- 11 miles west of Venice, LA
- Completed in 2014
- Cost $54.3 mil (2016 $)
- 3.4 MCY of material
- Distance to BA ~22 mile pipeline to MS River; 2.5 miles to offshore BA
Riverine Sand Mining/ Scofield Island Restoration (BA-40)
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Concept of Geomorphic and Ecological Form and Function (GEFF)

- Acts as buffer to reduce full effects of wave action, saltwater intrusion, storm surge, and tidal circulation on interior ecosystems and communities.

- Back-barrier marsh serves as roll-over platform as islands migrate landward, thus maintaining habitat value.

- Provides critical habitat for flora and fauna
  - T&E species, migratory and overwintering bird foraging and resting, shorebird nesting, dune stabilizing vegetation.
  - Essential Fish Habitat, fisheries nursery area, shellfish habitat.
NRDA Caillou Lake Headland Restoration (TE-100)

- 11 miles SE of Cocodrie, LA
- Est. complete in 2017
- Cost $103 mil (2016 $)
- 9.7 MCY of material
- Distance to borrow area ~9.4 miles - Ship Shoal
NRDA Caillou Lake Headland Restoration (TE-100)
NRDA Caillou Lake Headland Restoration (TE-100)
Restoration Template Comparison

TYPICAL SECTION COMPARISON

LEGEND:
EAST ISLAND

DISTANCE ALONG TRA NSECT (FEET)
Restoration Template Comparison

TYPICAL SECTION COMPARISON

LEGEND:
- EAST ISLAND
- TIMBALIER ISLAND

ELEVATION (FT NAVD88)

DISTANCE ALONG TRANSECT (FEET)
Restoration Template Comparison

TYPICAL SECTION COMPARISON

LEGEND:
- EAST ISLAND
- TIMBALIER ISLAND
- PASS CHALAND

ELEVATION (FT NAVD88)

DISTANCE ALONG TRANSECT (FEET)
Restoration Template Comparison

TYPICAL SECTION COMPARISON

LEGEND:
- EAST ISLAND
- TIMBALIER ISLAND
- PASS CHALAND
- SCOFIELD ISLAND

ELEVATION (FT NAVD88)

DISTANCE ALONG TRANSECT (FEET)
Restoration Template Comparison

Typical Section Comparison

Legend:
- EAST ISLAND
- TIMBALIER ISLAND
- PASS CHALAND
- SCOFIELD ISLAND
- CAILLOU LAKE

Elevation (ft NAVD88)

Distance along transect (feet)
Project Cubic Yards/Linear Foot

Cubic Yard/Linear foot

- Caillou Lake
- Timbalier Island
- East Island
- Pass Chaland
- Scofield Island

Year


Cubic Yards/Linear Foot

0 50 100 150 200 250 300 350 400 450
Average Distance to Borrow Area

- Caminada II
- Caminada I
- Scofield
- Shell Island East
- Pelican Island
- West Belle Pass
- Caillou Lake
- East Grand Terre
- East Island
- Chaland Headland
- Pass Chaland
- Timbalier Island

Year:
- 1998
- 2000
- 2002
- 2004
- 2006
- 2008
- 2010
- 2012
- 2014
- 2016
- 2018

Average Distance (miles):
- 0
- 5
- 10
- 15
- 20
- 25
- 30
- 35
- 40
Barrier Island Evolutionary Notes

- More robust geotechnical investigation on both the borrow area and the island
- Larger diameter sand grain
- Increased measures to mitigate impacts to wildlife (nesting birds and sea turtles)
- Cultural resource survey spacing decreased from 50m to 30m increasing survey requirements.
- Permitting construction pipeline corridors from BA to island
- More options to Contractor
Summary

- Barrier islands serve a vital role to coastal Louisiana
- Barrier island restoration has grown in both size and scope over the past 20 years
- Limited nearshore sand availability for beach compatible sand has driven borrow areas 30+ miles away from the restoration site
- Advancements in barrier island restoration templates have lead towards increased longevity through the creation of robust marsh habitats as well as beach and dune features to restore the Geomorphic and Ecologic Form and Function of the barrier islands
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Questions?