Beneficial Use of Dredged Material at Horseshoe Bend: An Engineering With Nature Case Study

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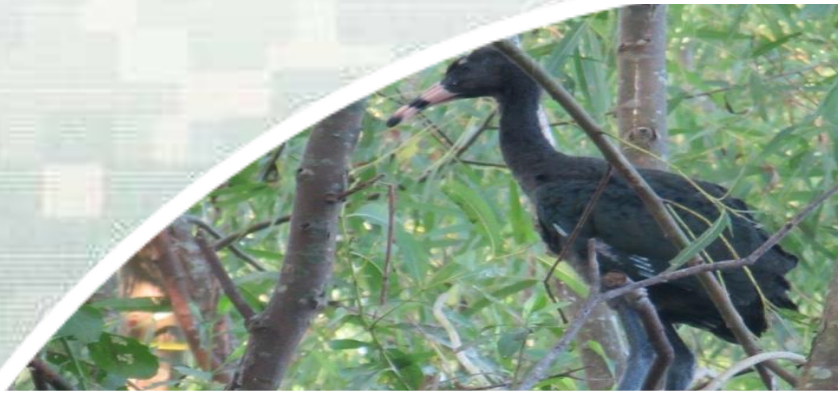
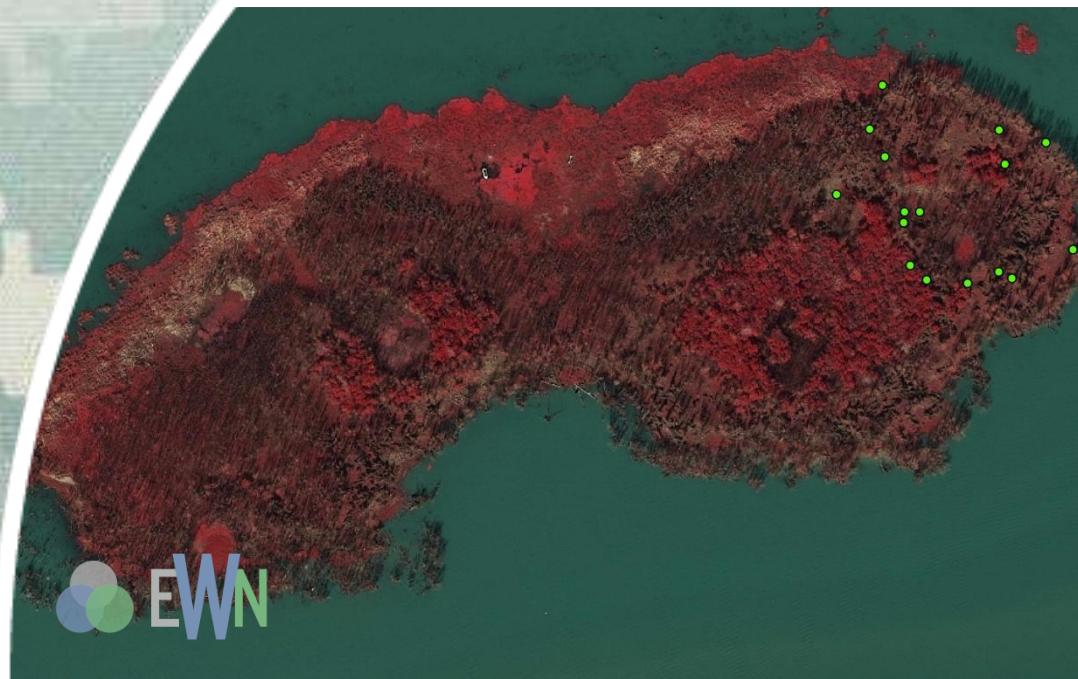
EWN-SWG Collaboration Meeting
Galveston, TX
30 September 2014





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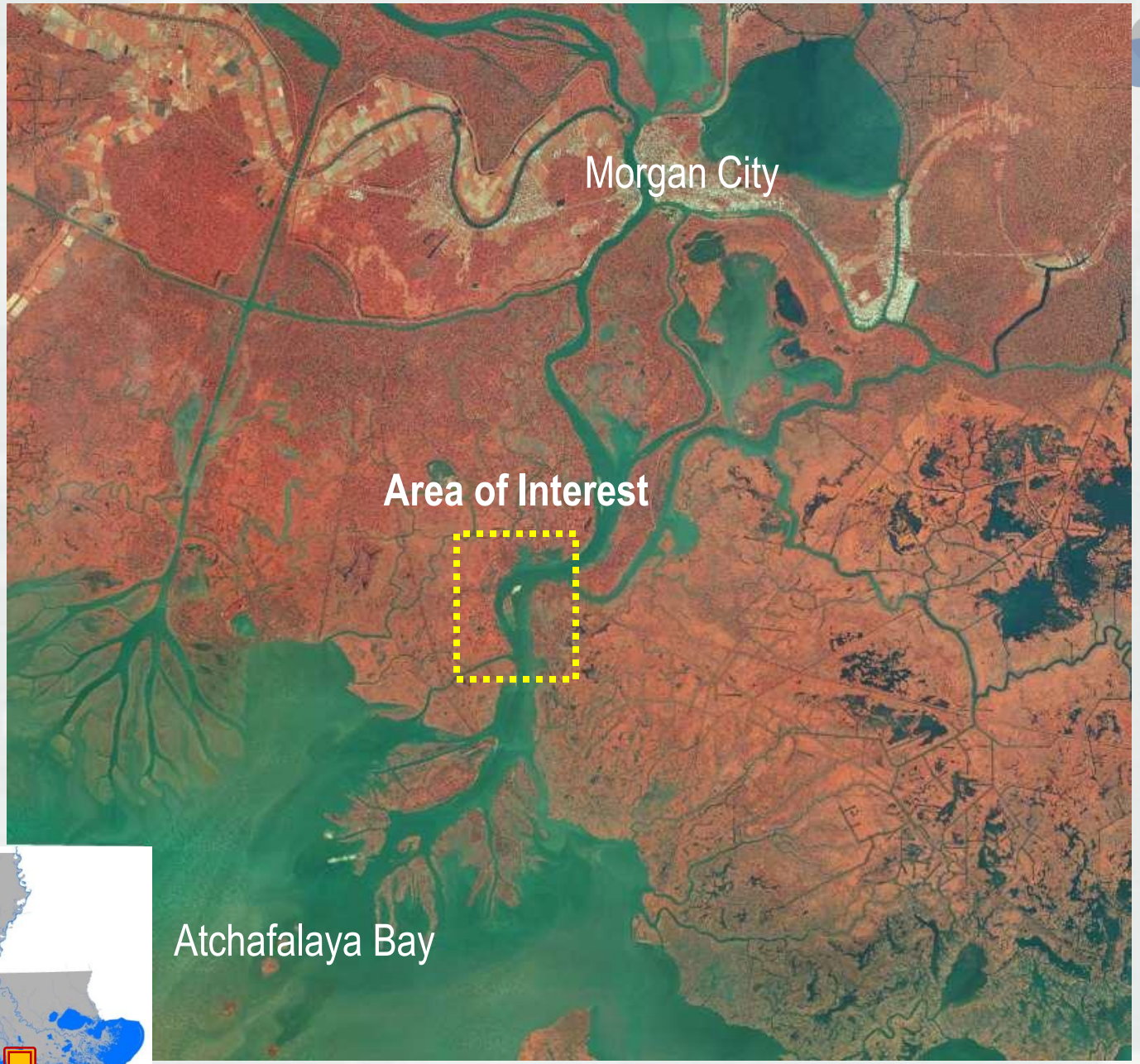
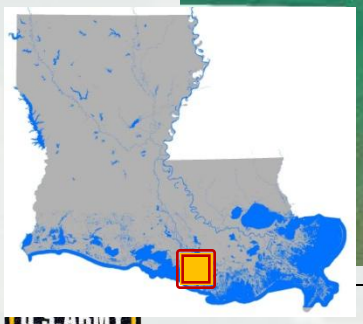
Atchafalaya River Federal Navigation Channel

Environmental Benefits Derived from a Novel Dredged Material Placement Practice at Horseshoe Bend





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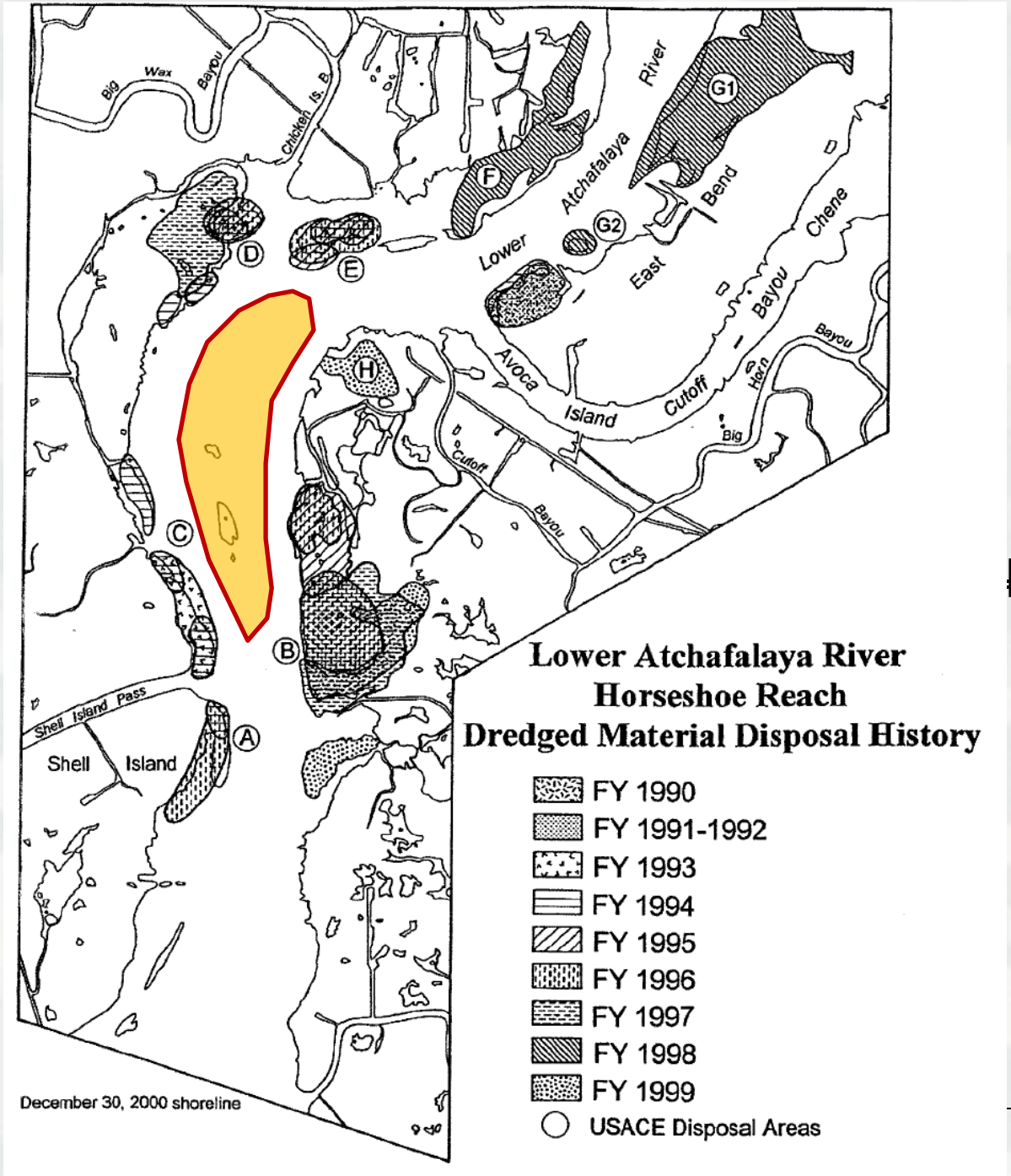

Problem

Capacity of Bankline Disposal Areas Exhausted

Alternatives

~~Conversion of Wetland Disposal Areas into Upland~~

~~Open Water Disposal in Atchafalaya Bay~~

Mid-River Mounding of Dredged Material

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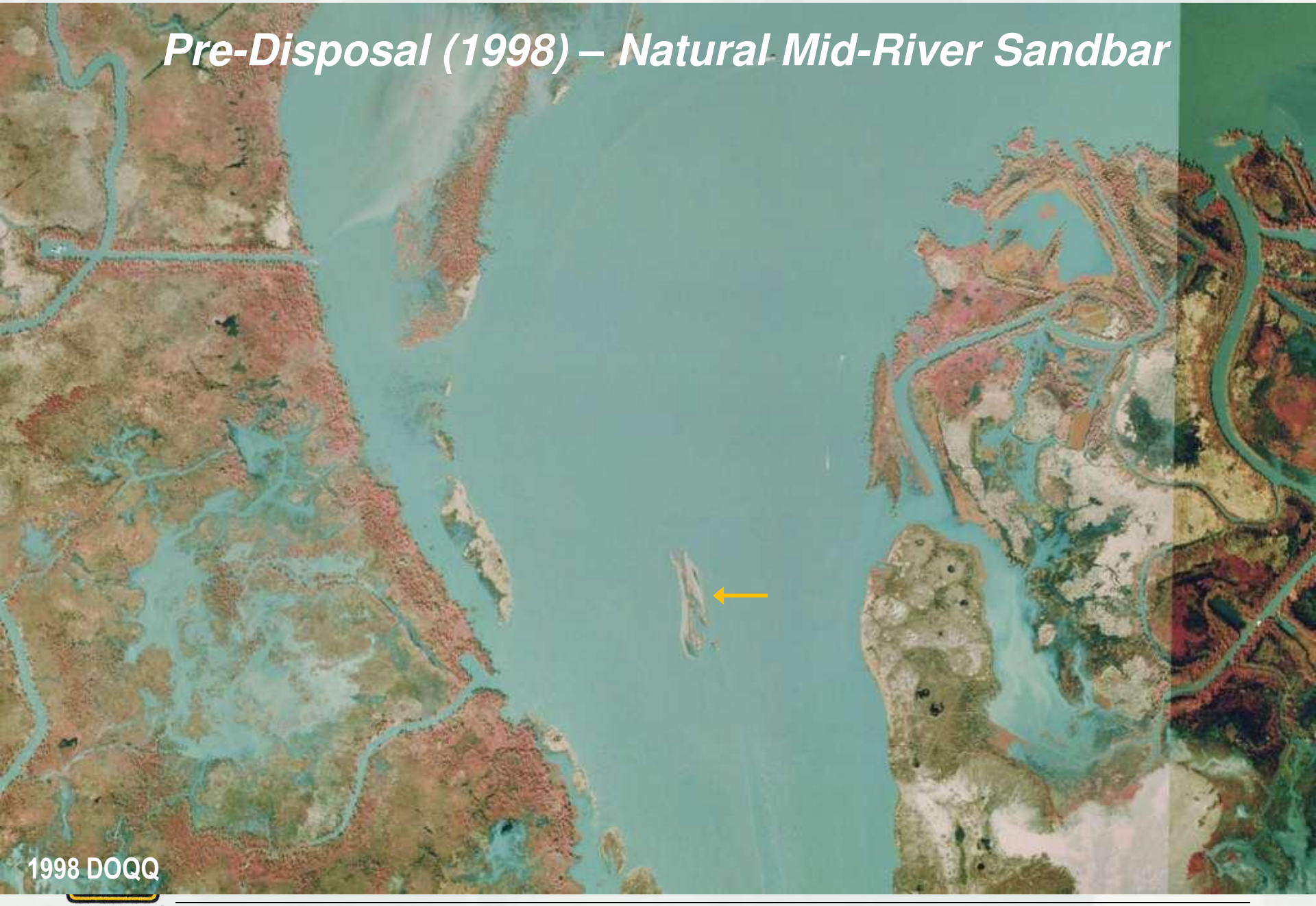
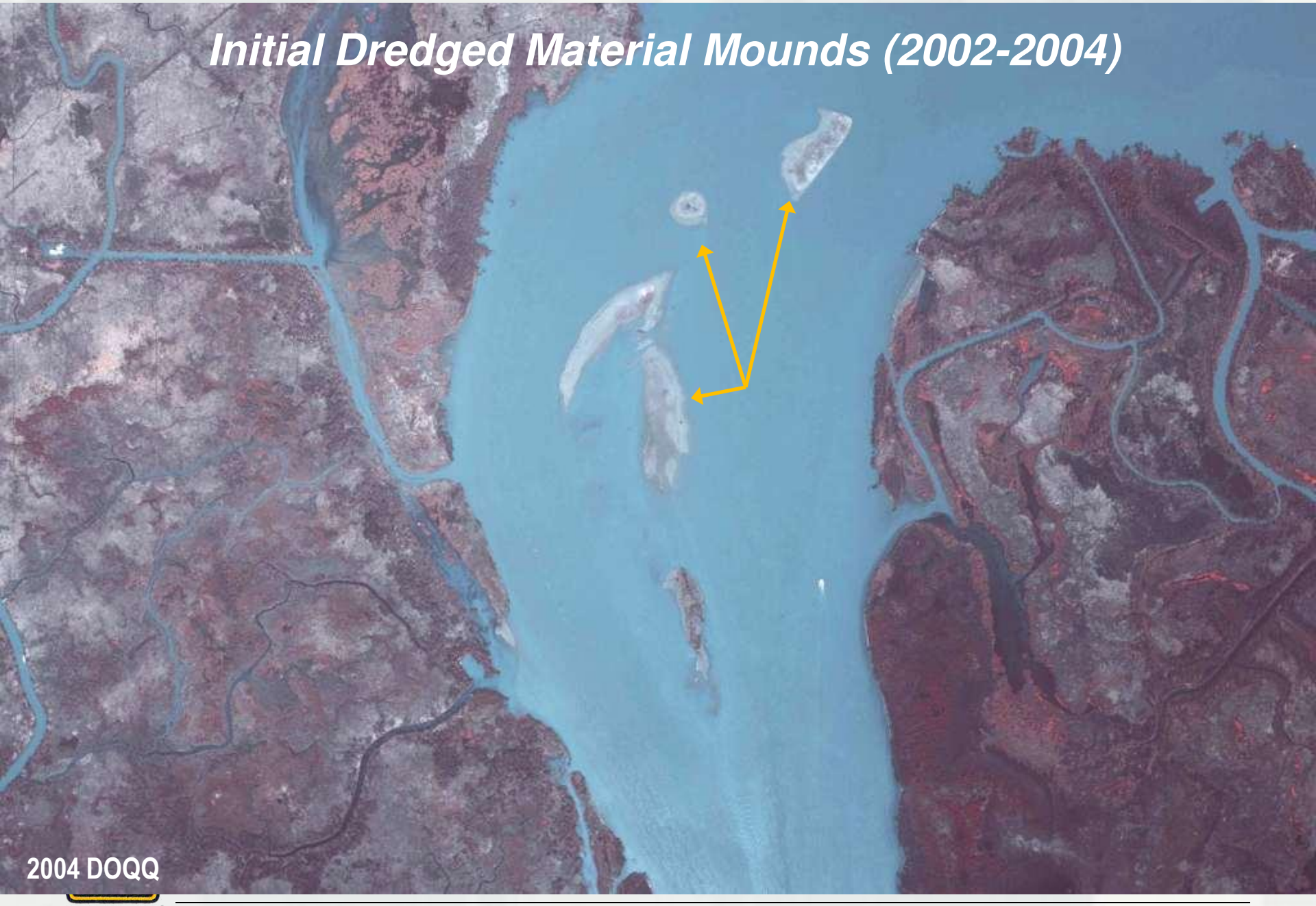
Pre-Disposal (1998) – Natural Mid-River Sandbar

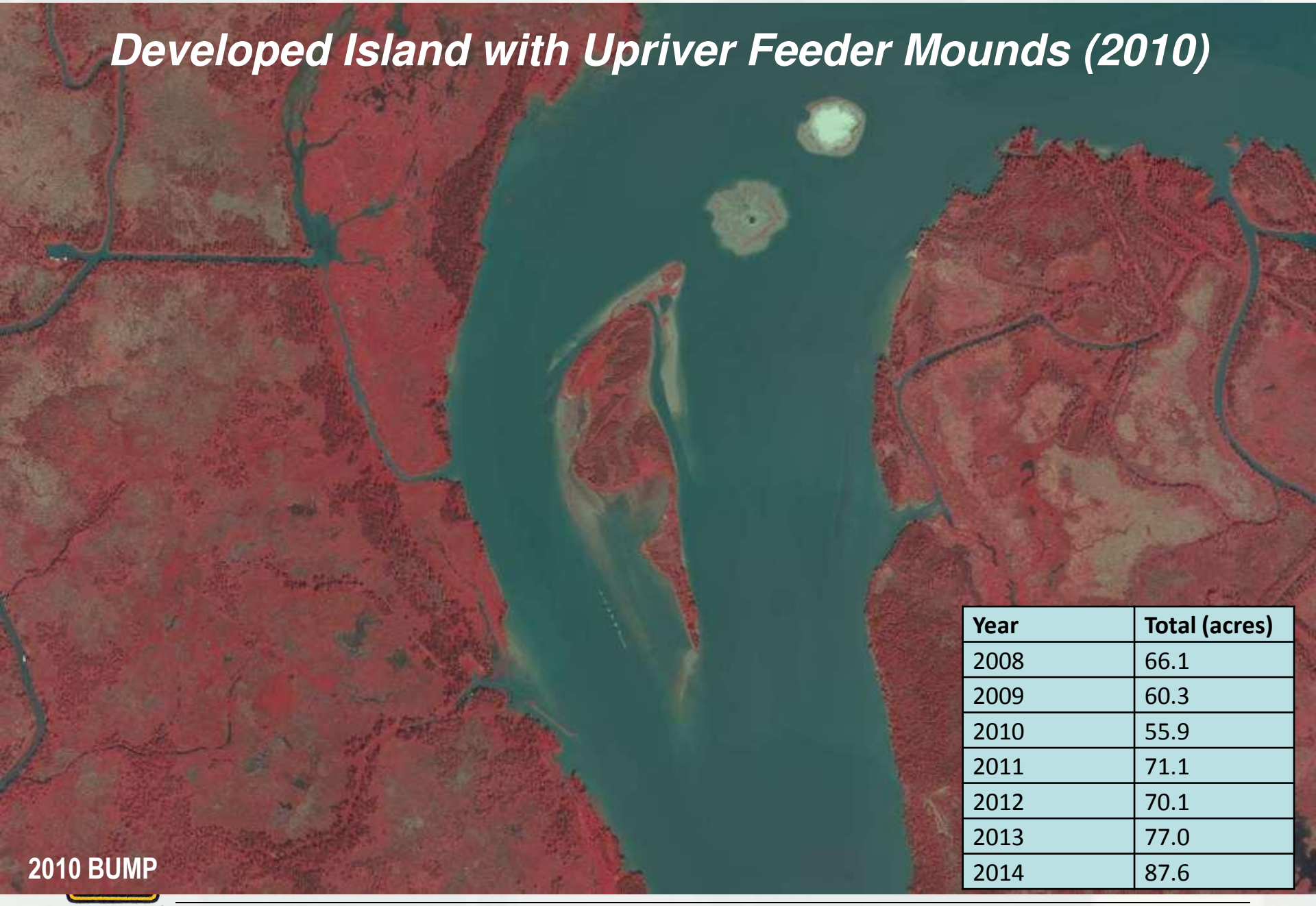


Initial Dredged Material Mounds (2002-2004)



2004 DOQQ

Developed Island with Upriver Feeder Mounds (2010)



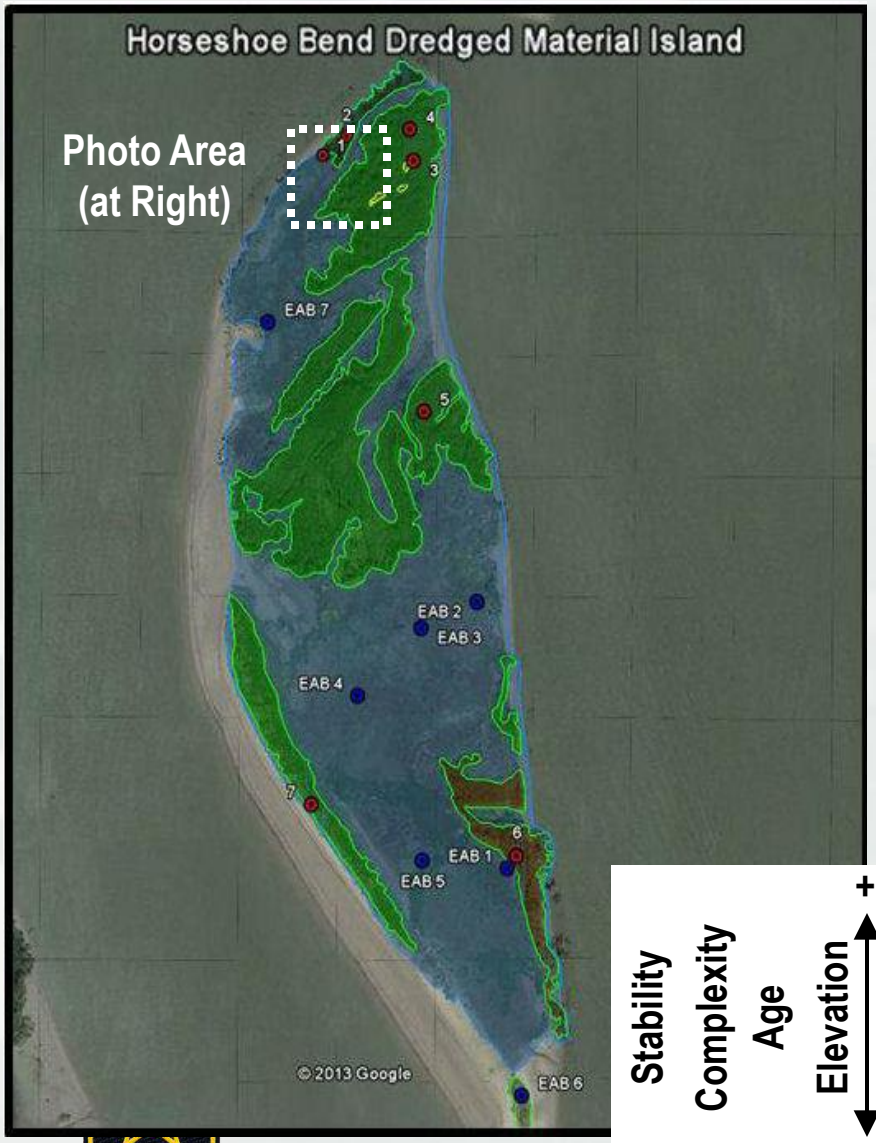
Year	Total (acres)
2008	66.1
2009	60.3
2010	55.9
2011	71.1
2012	70.1
2013	77.0
2014	87.6

2010 BUMP

Quantification of the Environmental Benefit

- Identify and Classify Distinct Habitat Types
- Catalogue Plants and Animals
- Evaluate Soil Horizons

Habitat Classification



Stability
Complexity
Age
Elevation
+
–

- Mature Forested & Scrub-Shrub Wetlands
- Young Forested & Scrub-Shrub Wetlands
- Emergent Wetland Transition Zone
- Aquatic Bed Features

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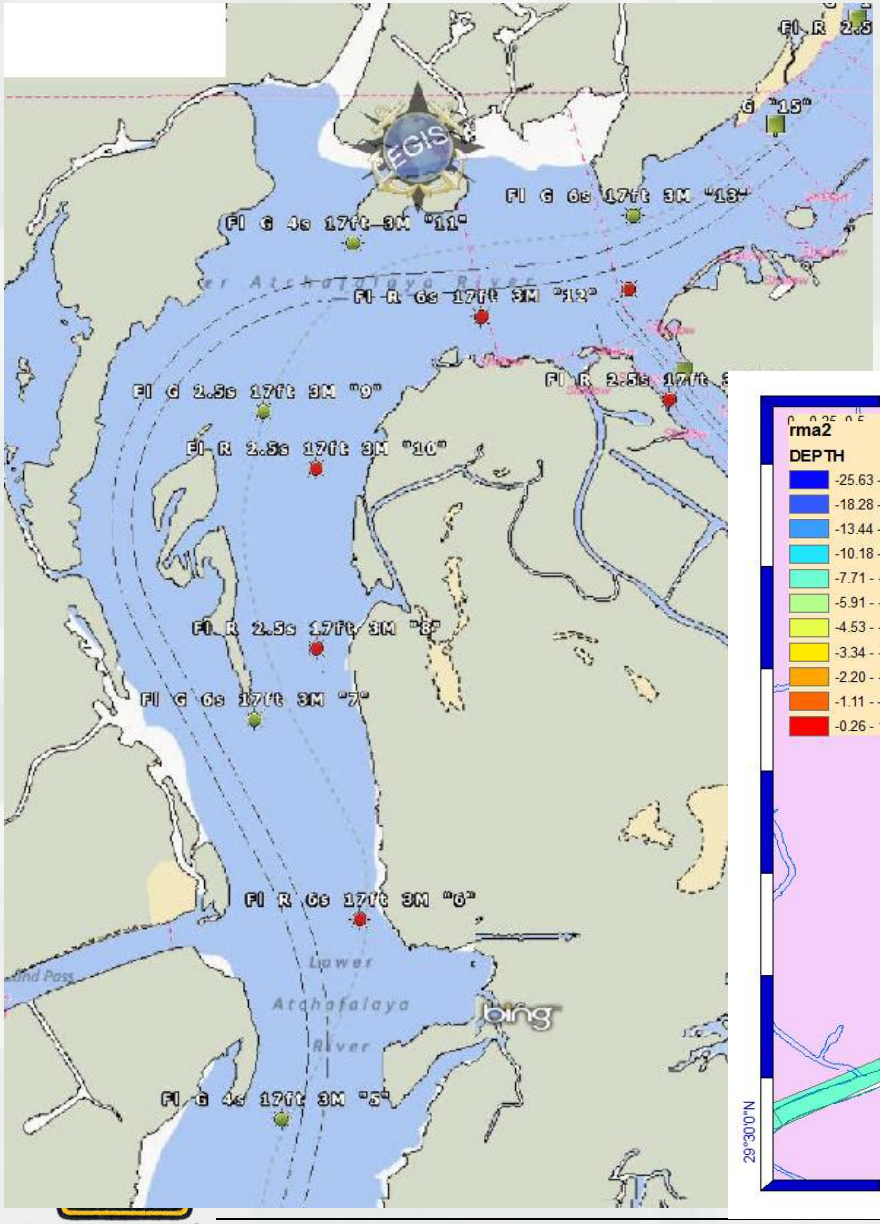
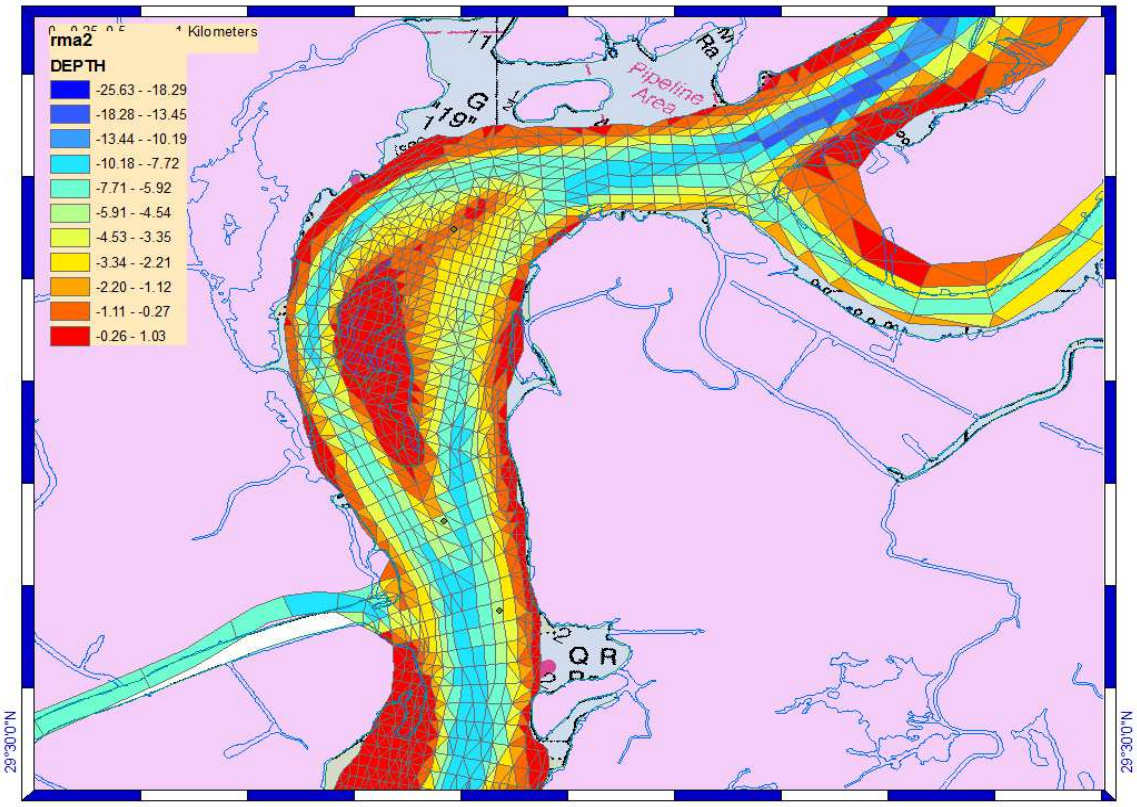
Navigation Benefit



Modeling: Implement LTFATE to characterize study area hydrodynamics



20” Soil Plugs Evaluated for Zonation, Color, Texture & Redox Features

Social Benefit

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Summary of Environmental Benefits

- Four distinct wetland habitats within a small area (35 ha), supporting a larger than expected variety of plants and animals
- 81 plant species observed on island, compared to 53 plant species noted for natural wetlands along the lower river
- Island performs like a natural wetland, traditional dredge and fill wetlands take 5-10 years to develop
- Soils are active, function to cycle nutrients and sequester carbon

What Happens Next?

- Continue scientific research (hydrology and environment)
- Document positive / negative channel maintenance impacts
- Identify and quantify benefits
- Communicate findings widely (publications, conferences, press releases)
- Seek other applications for this novel placement practice