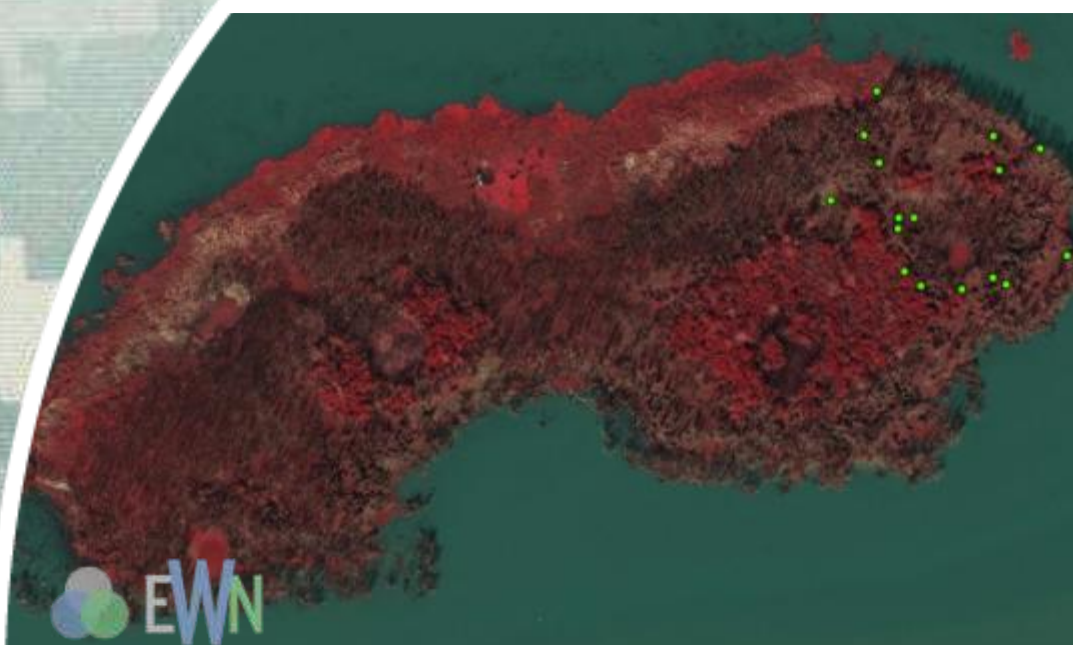


Horseshoe Island - A Working with Nature Case Study

Burton Suedel
Research Biologist

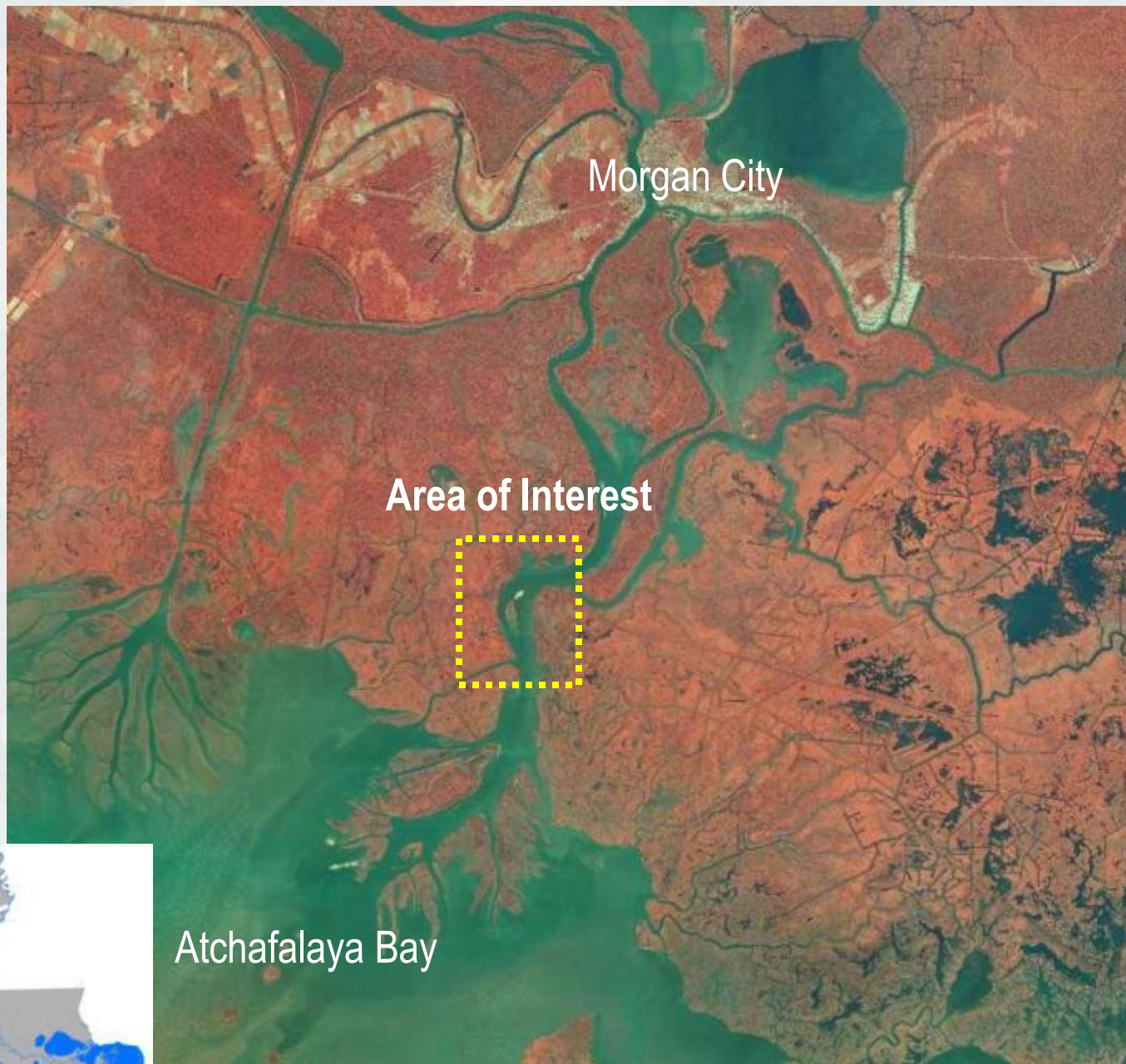
EWN/LRB Collaboration Meeting
Buffalo, NY
1-3 December 2014



EWN Case Study

- Wetland island creation
- Multi-factor assessment
 1. Habitat classification
 2. Vegetation
 3. Invertebrates
 4. Avian community
 5. Water quality improvement
- Navigation benefits



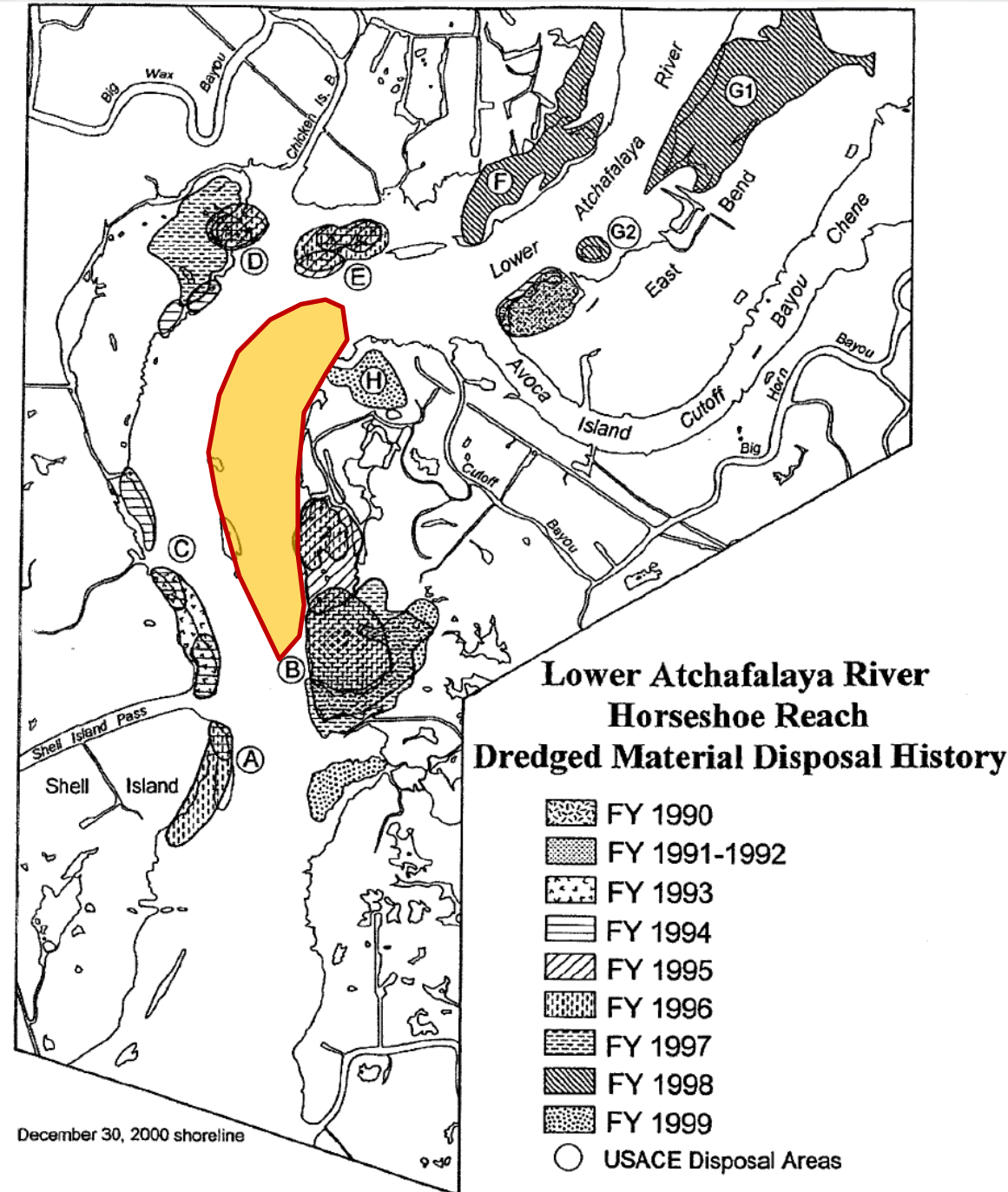


Problem

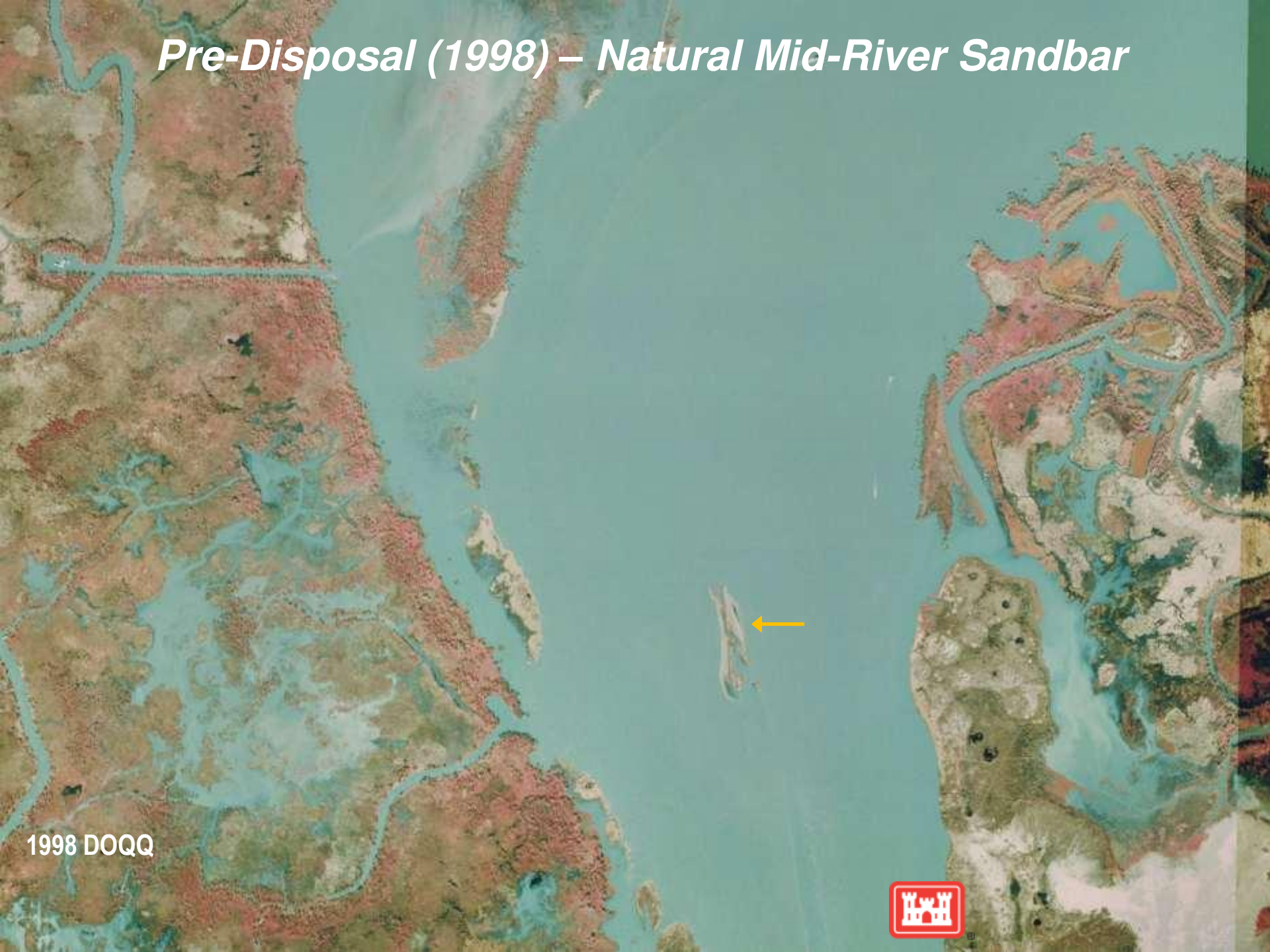
Capacity of shoreline
Disposal Areas Exhausted

Alternatives

- ~~1. Conversion of Wetland Disposal Areas into Upland~~
- ~~2. Open Water Disposal in Atchafalaya Bay~~
3. Mid-River Mounding of Dredged Material



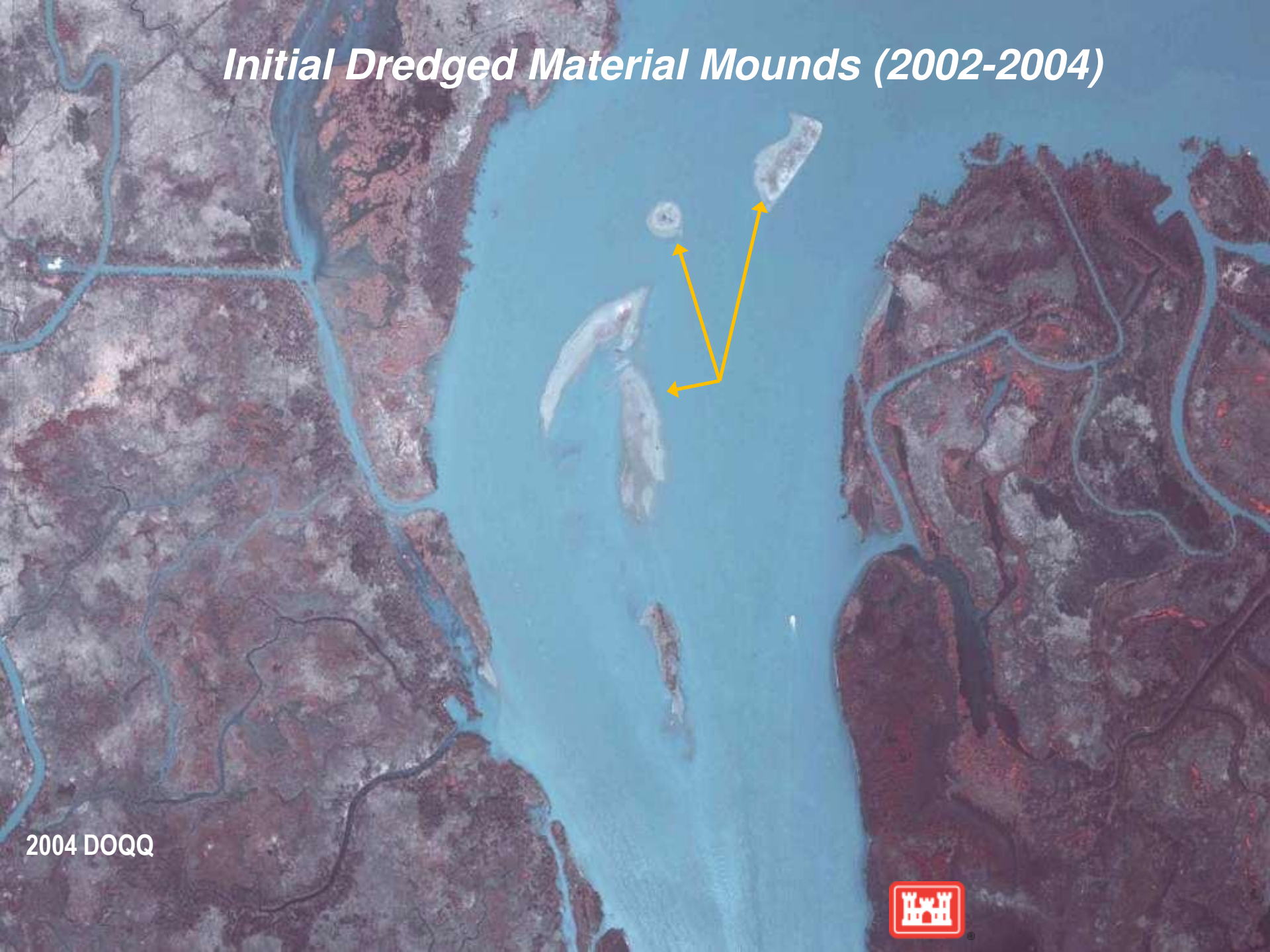
Pre-Disposal (1998) – Natural Mid-River Sandbar



1998 DOQQ



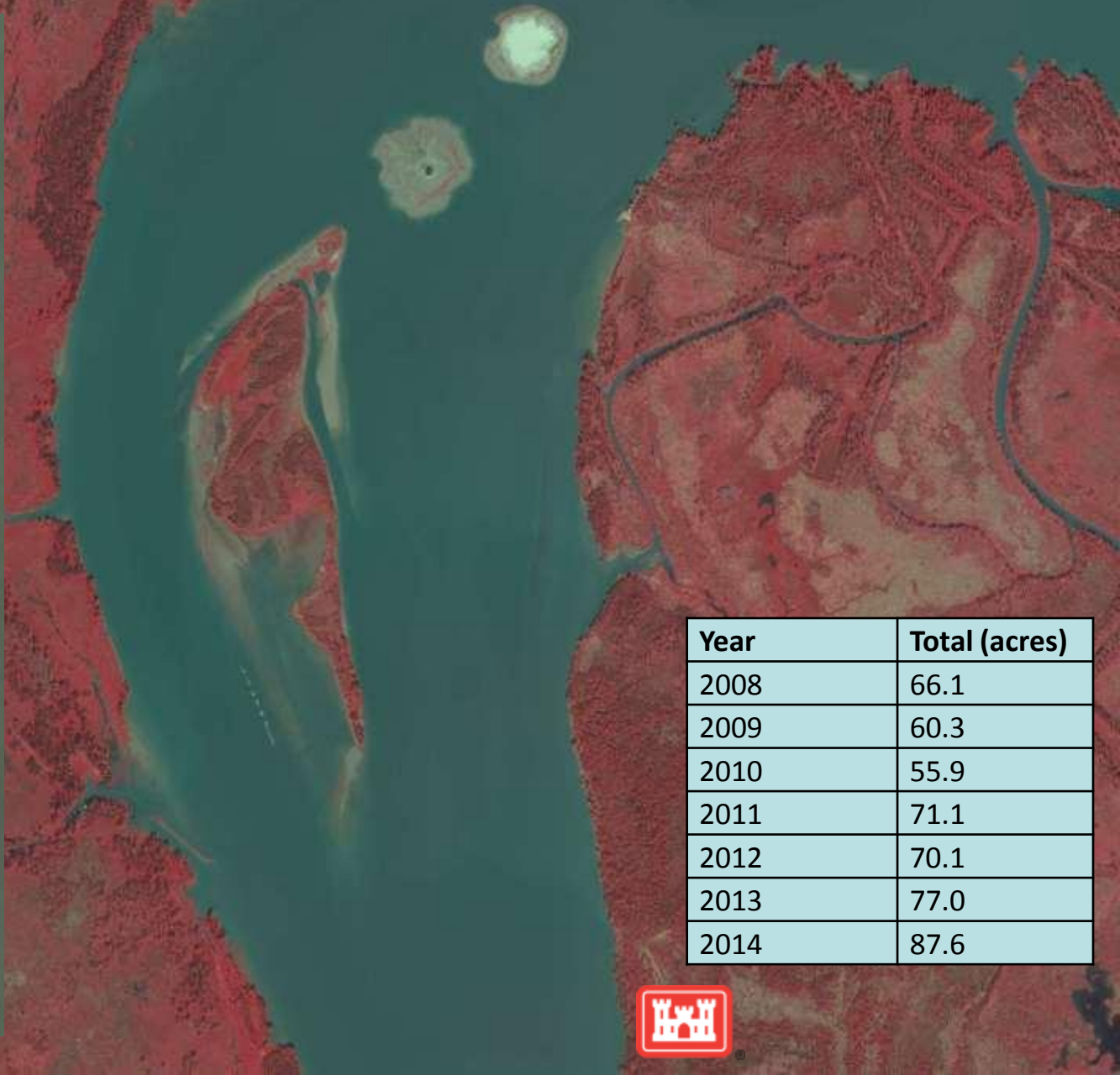
Initial Dredged Material Mounds (2002-2004)



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

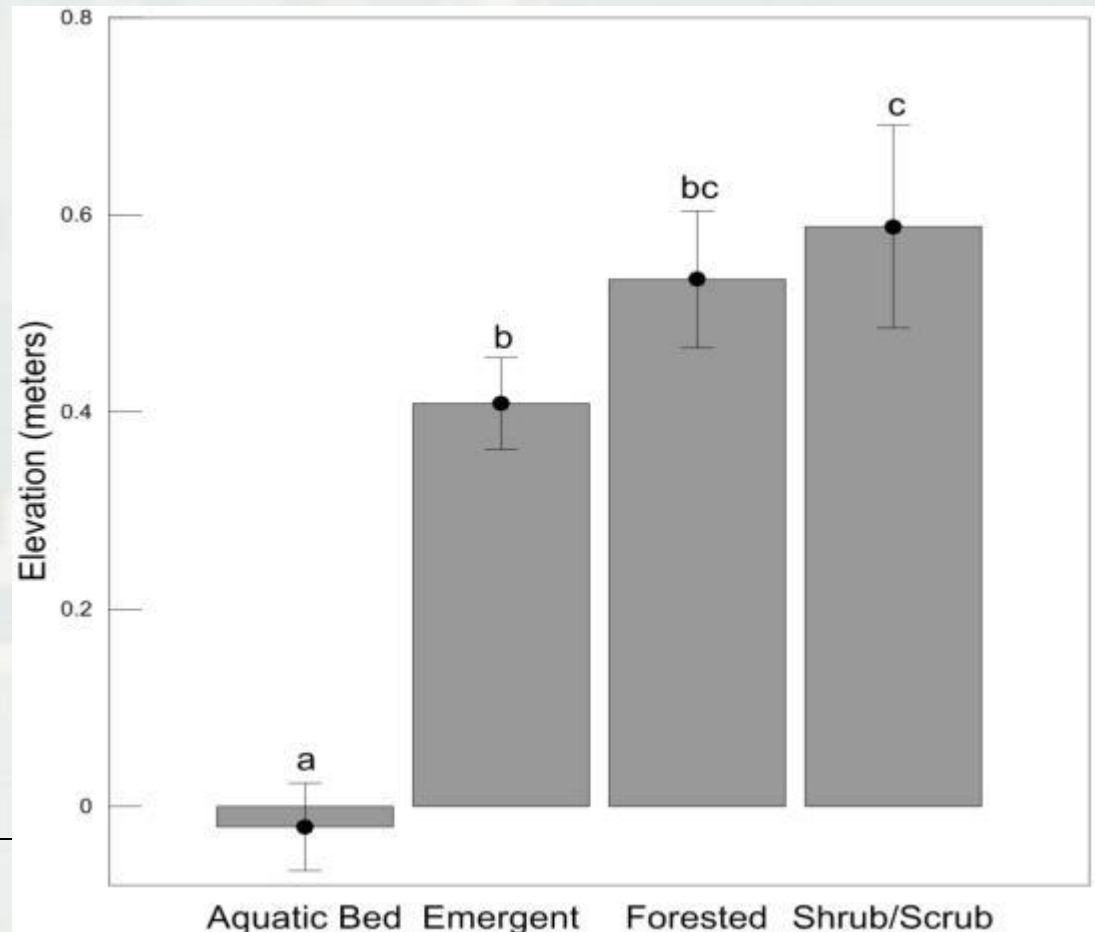


Quantification of the *Environmental Benefit*



1. Habitat classification

- 4 distinct habitats – driven by elevation gradient
- Provide diversity for plants and animal habitats
- Similar distribution to natural wetlands



2. Vegetation

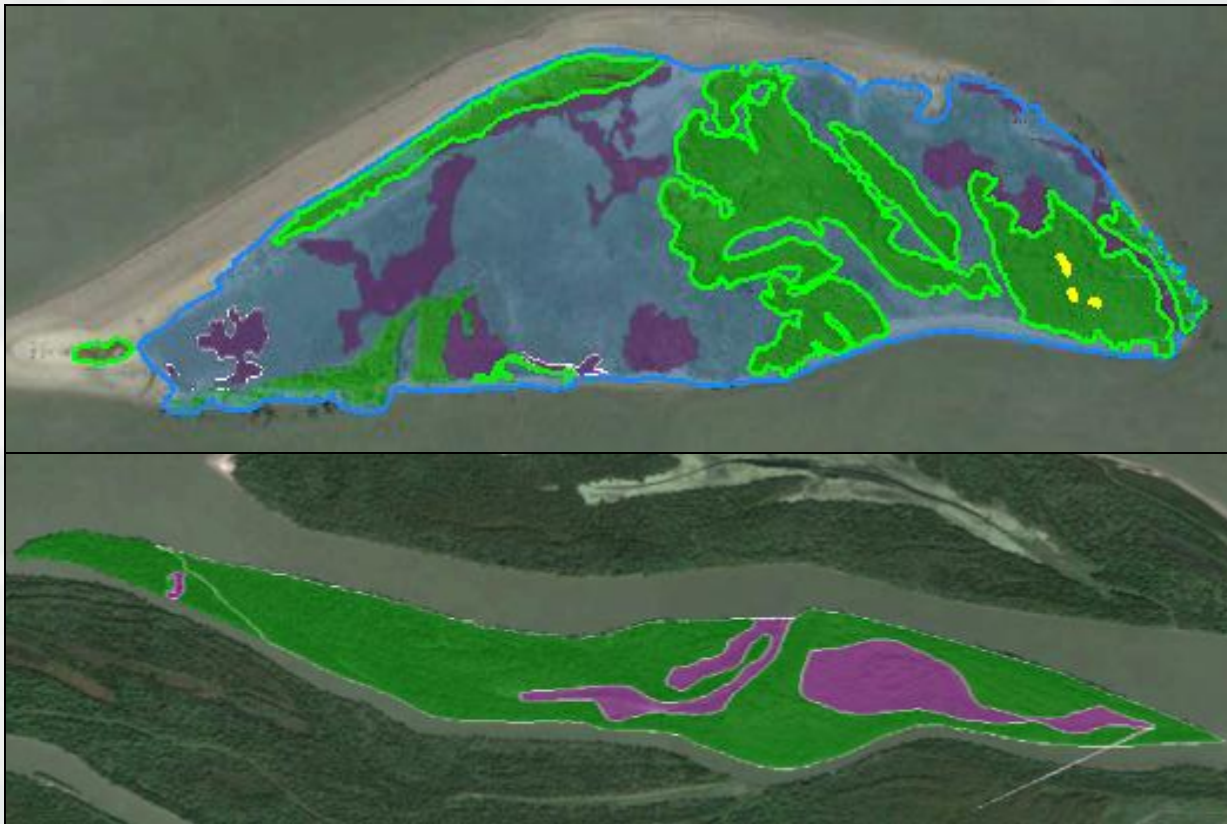
- 81 species identified
- Majority native species
- Development and species composition comparable to other area wetlands



Cephalanthus occidentalis

3. Infaunal community

- High invertebrate density (2,777-19,104 oligochaetes/m²)
- Significantly higher species richness than natural reference island
- High concentrations in Aquatic Bed habitats





4. Avian community

- 9 species of wading birds
- >78% juveniles
- 0.27 birds/ transect m in rookery
- Island design favorable to rookery establishment

Glossy ibis



Snowy egret

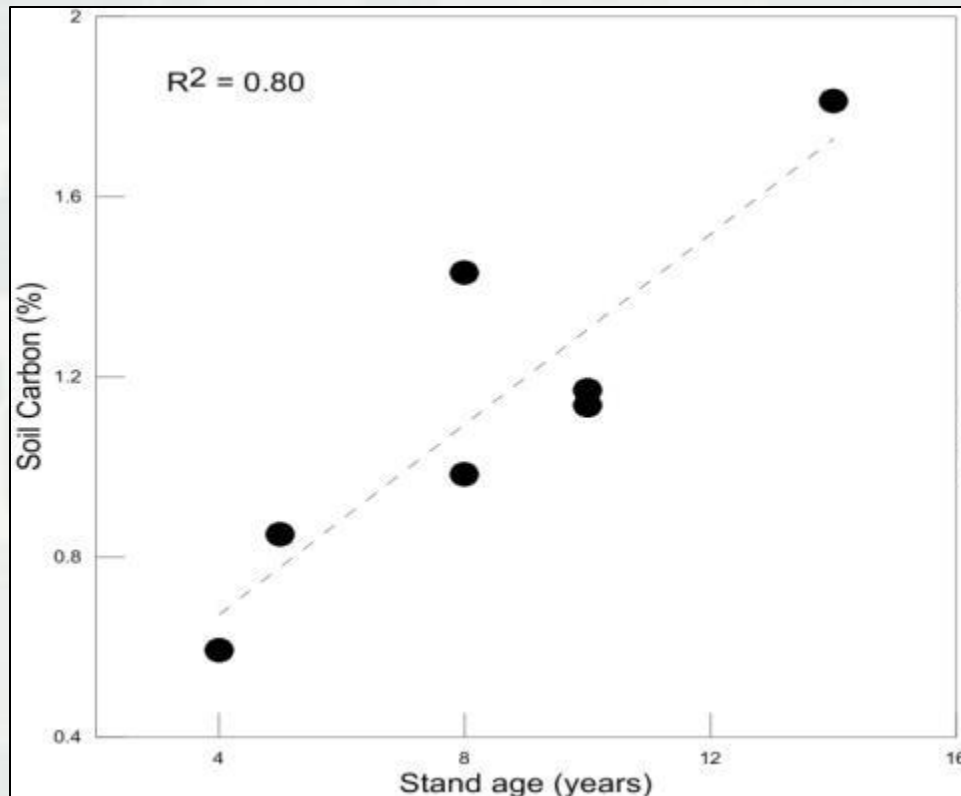


Tri-colored heron



5. Water quality improvement

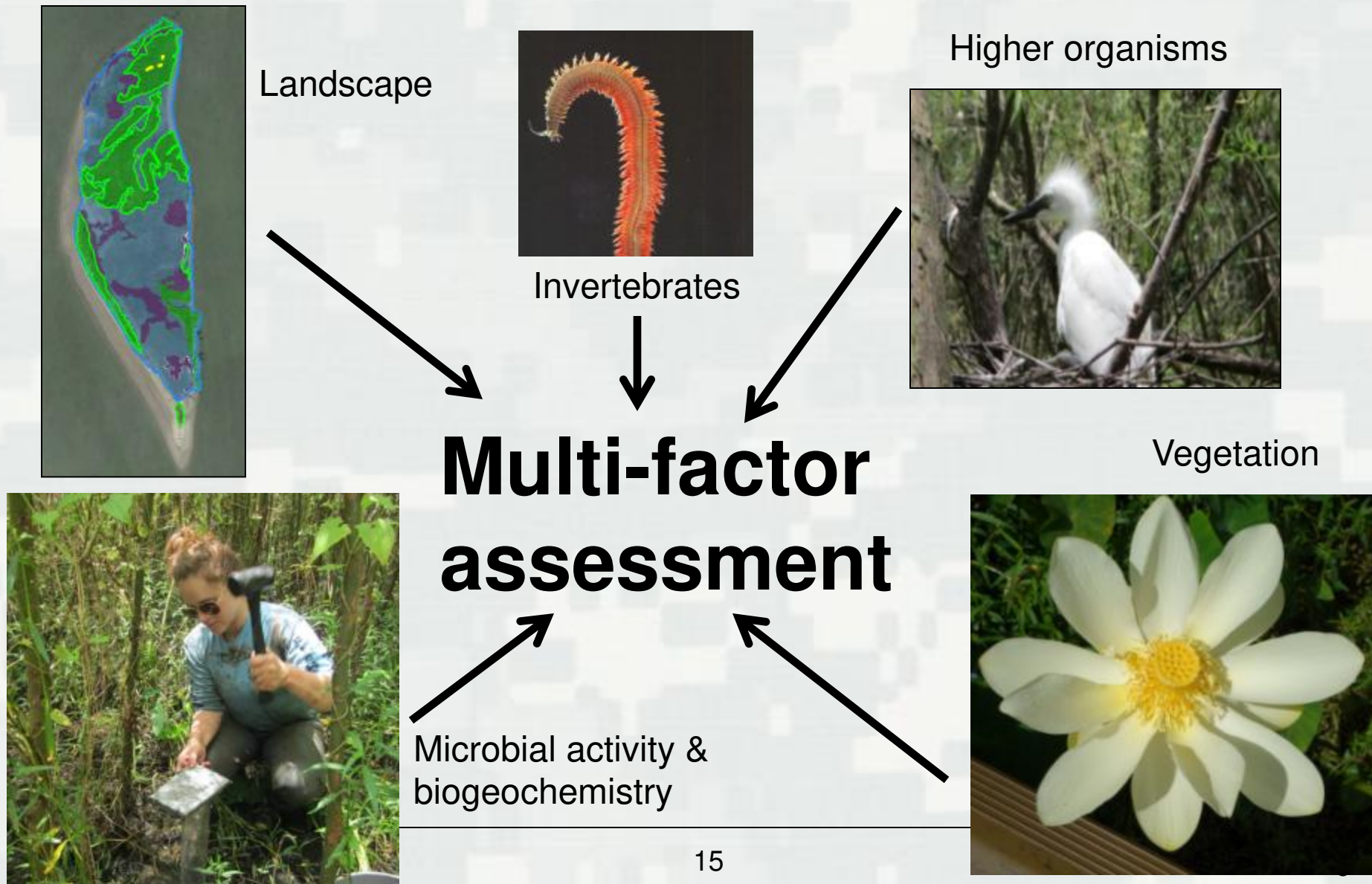
- Soil nutrients increasing with stand age
- Microbial biomass comparable with natural Atchafalaya wetlands
- Created wetland removed estimated 2016 kg of nitrate-nitrogen during 2013



Summary of Environmental Benefits

- Four distinct wetland habitats support a large variety of plants and animals
- Island performs habitat and biogeochemistry wetland functions similar to a natural wetland
- Engineering With Nature approach resulted in increased avian habitat and nutrient removal capacity

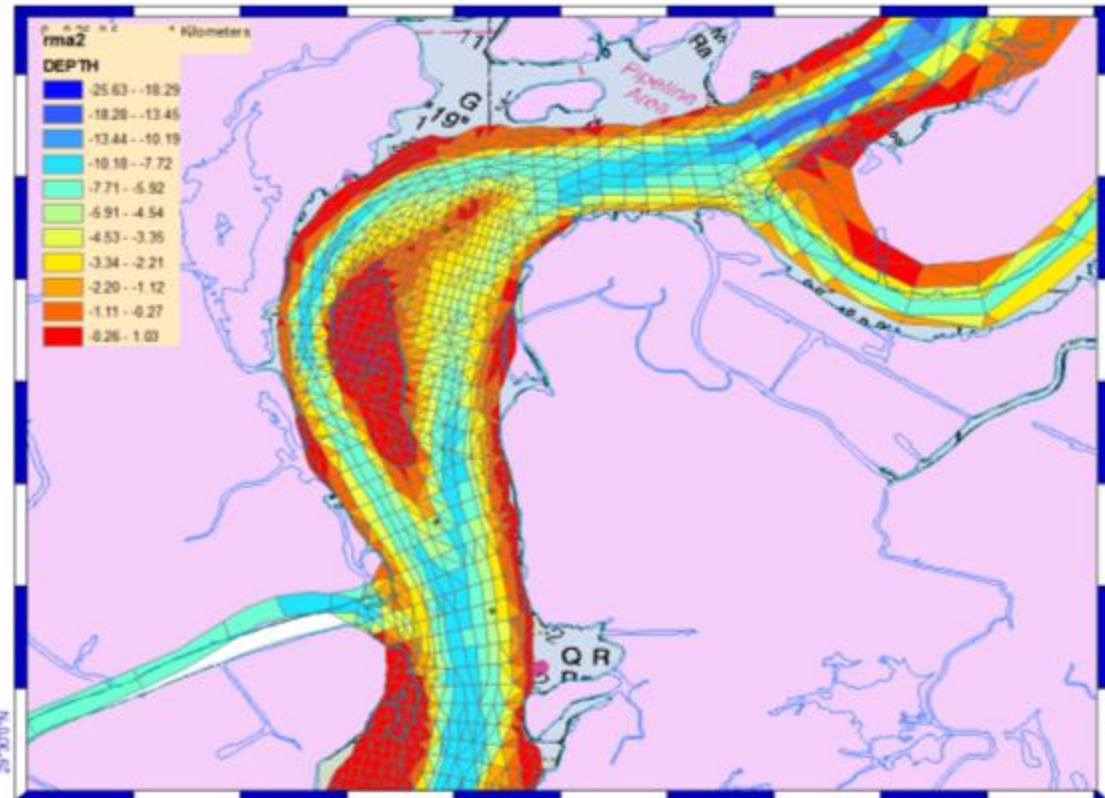
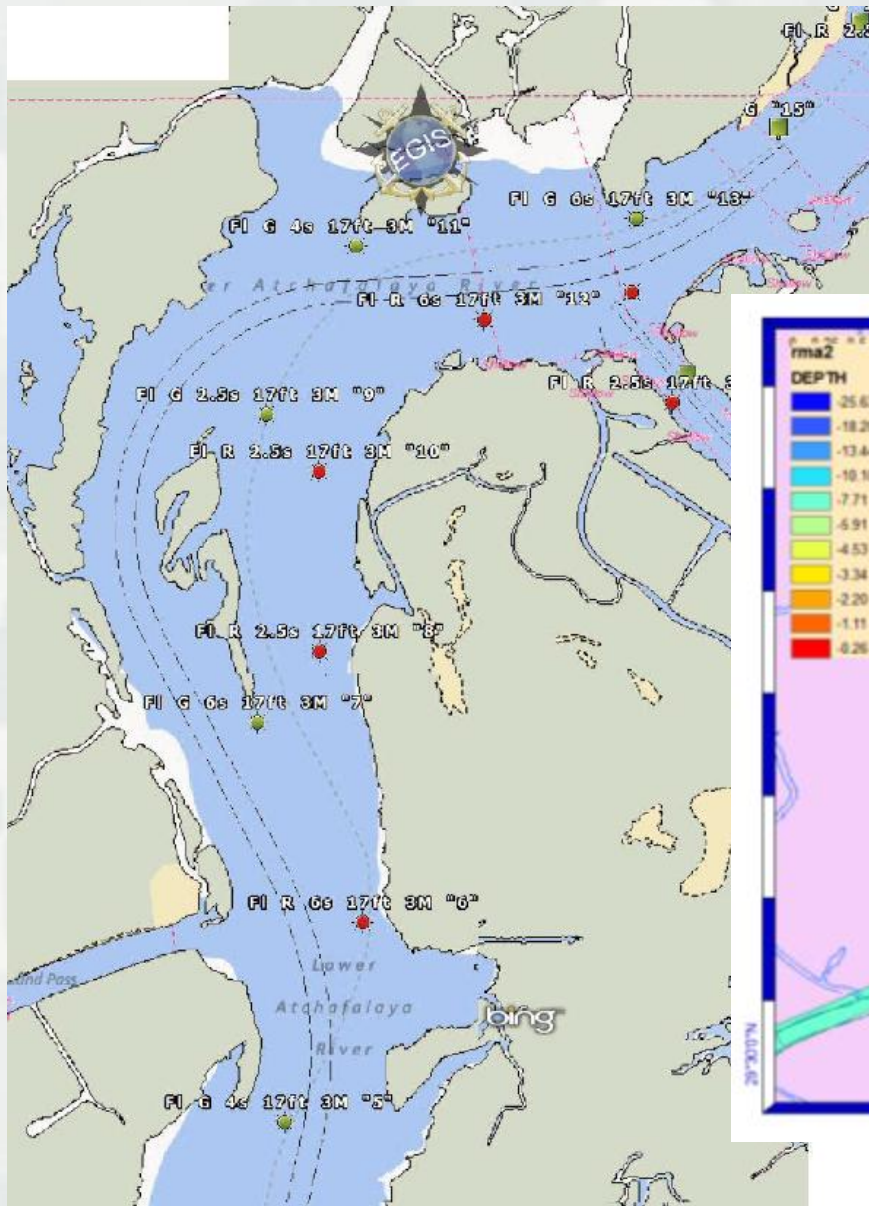
*All assessment metrics functioned at or above reference wetland conditions



Navigation Benefit



Modeling: Implement LTFATE to characterize study area hydrodynamics



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Next Steps



- Quantify project benefits
- Communicate findings widely (publications, conferences, press releases)
- Seek other applications for this novel placement practice



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Contacts and Acknowledgements

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