

# Beneficial Use of Dredge Material in the Texas Chenier Plain

## Improving Future Projects Using Lessons Learned

by

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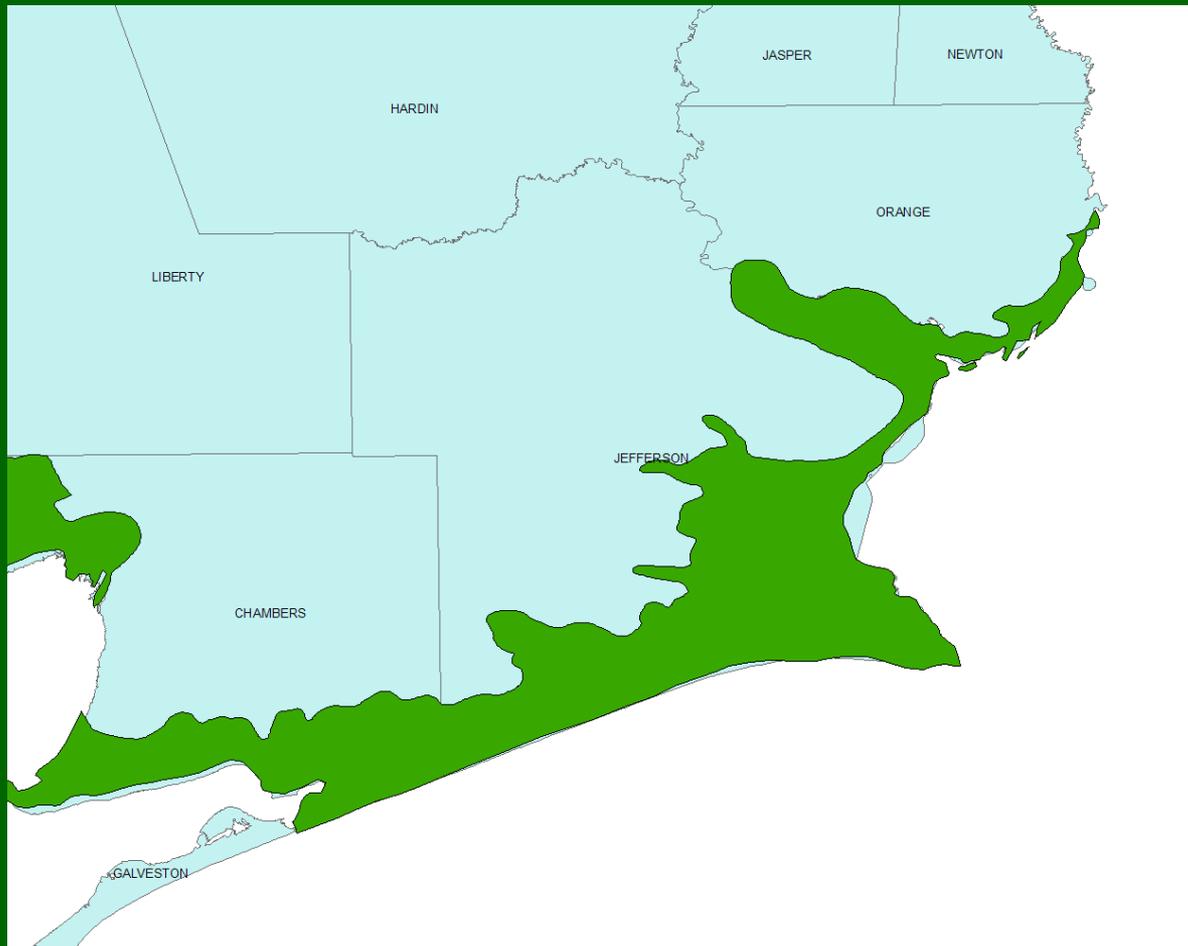
Anna Armitage, PhD

Texas A&M Univ. Galveston

Matthew Hoch, PhD.

Lamar University

# Upper Texas Coast



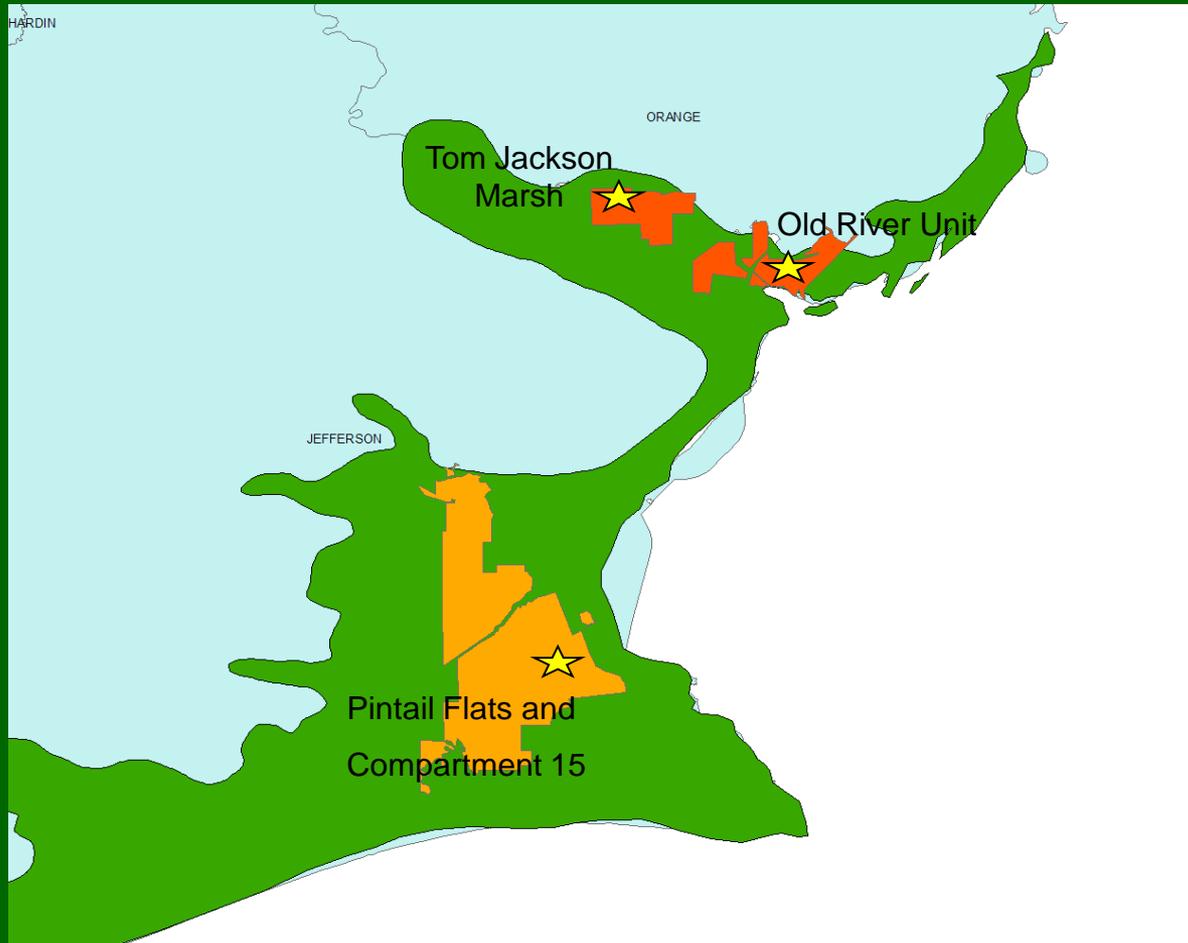
# Upper Texas Coast

- Marsh loss
  - Drop in surface elevation
    - Subsidence
    - Erosion of organic soils
    - Relative sea level rise
  - In some locations up to 133 acres/yr.
  - Losses observed throughout coastal area

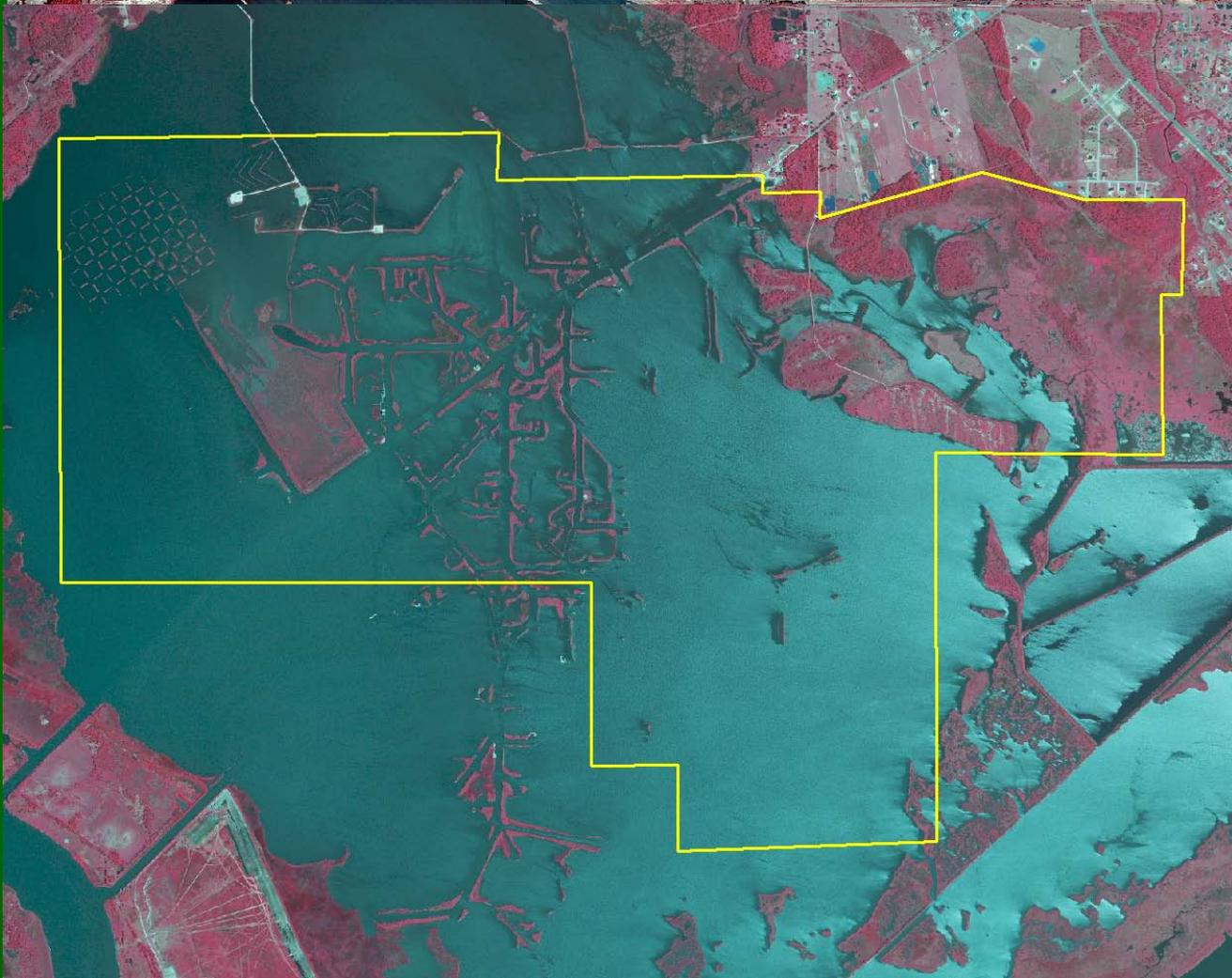
# Beneficial Use of Dredge Material

- Advantages for Marsh Restoration
  - Creates best balance of core emergent marsh to water-marsh edge habitats compared to other methods
  - Can replicate historic structure of lost or degrading marshes
  - Directly addresses loss of surface elevation

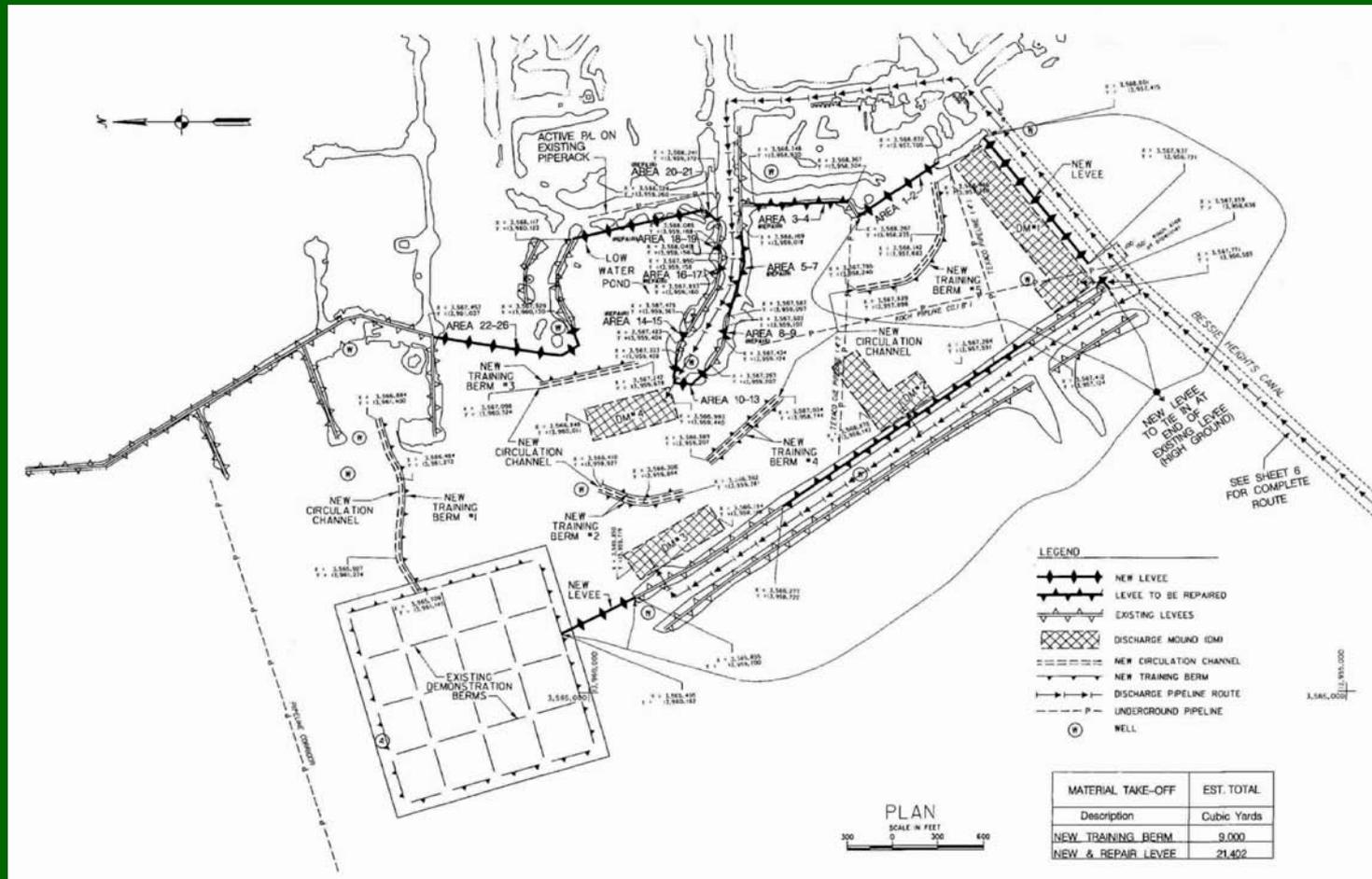
# TPWD and BUDM in Upper Texas Coast



# Tom Jackson Marsh Project



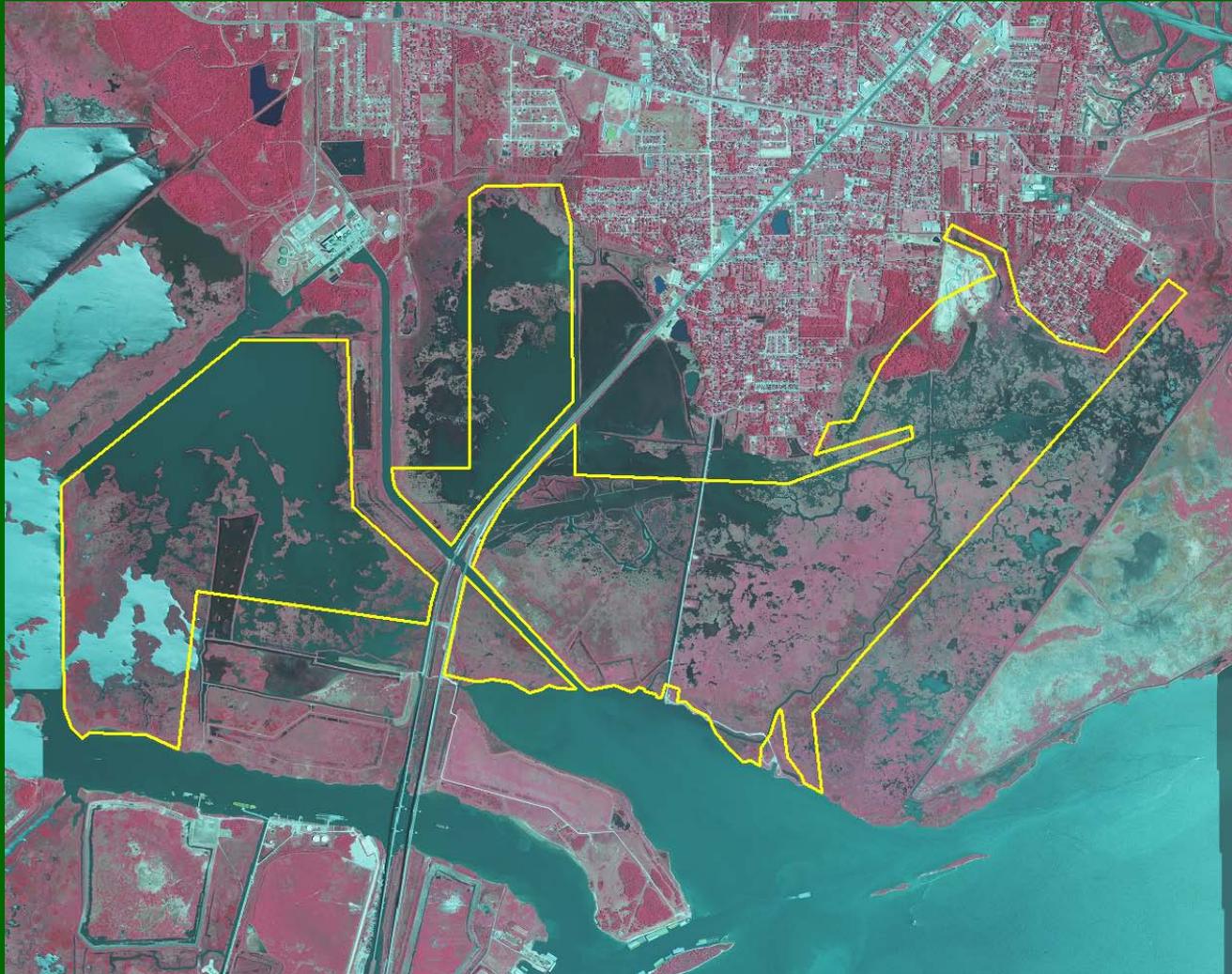
# Tom Jackson Marsh Project



# Tom Jackson Marsh Project



# Chevron's Old River Unit Restoration



# Chevron's Old River Unit Restoration

- Mined old spoil hill
- 4 construction variations
  - Excavated (mounds created using in place soils)
  - Filled (mounds from in place soils with pumped dredge material between)
  - Pumped (mounds created by stacking dredge material)
  - Terraces (built to help dredge material stack)
- Plantings after material consolidated

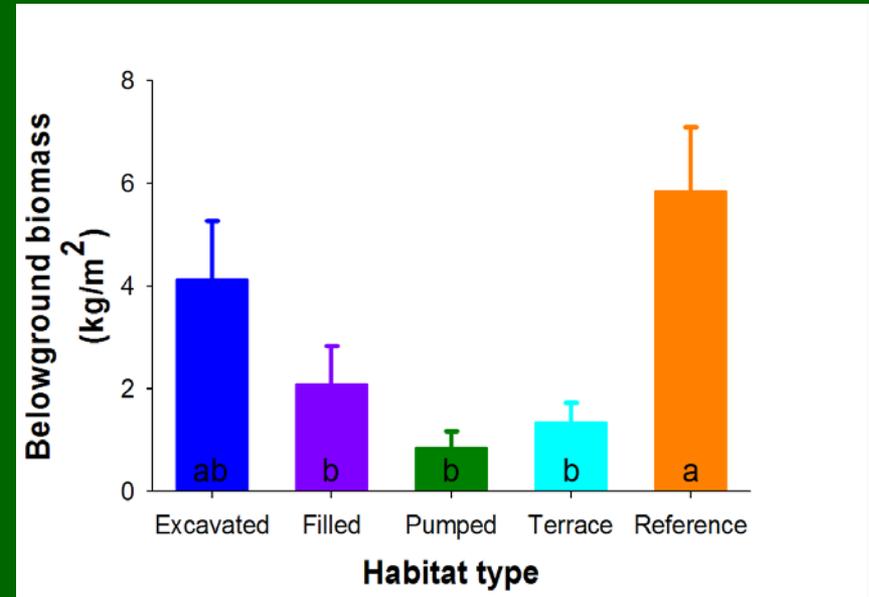
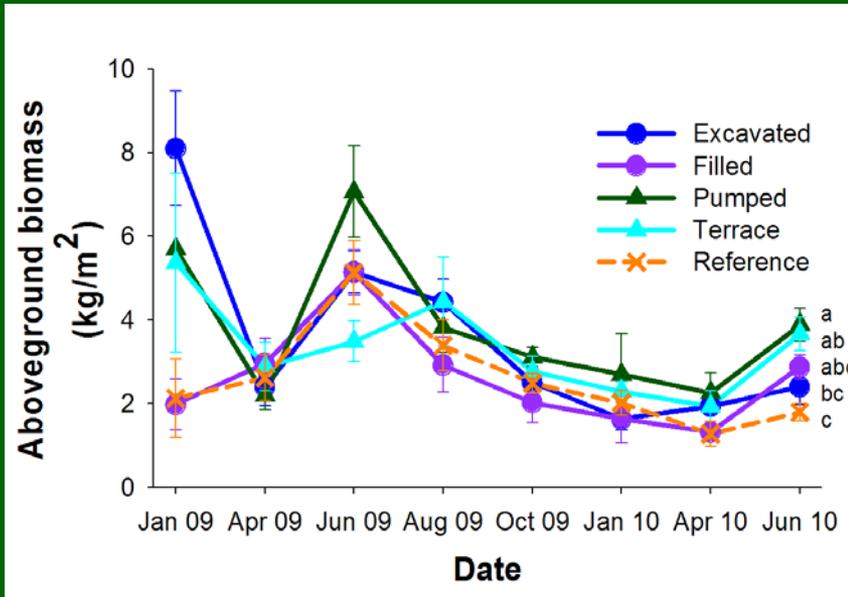
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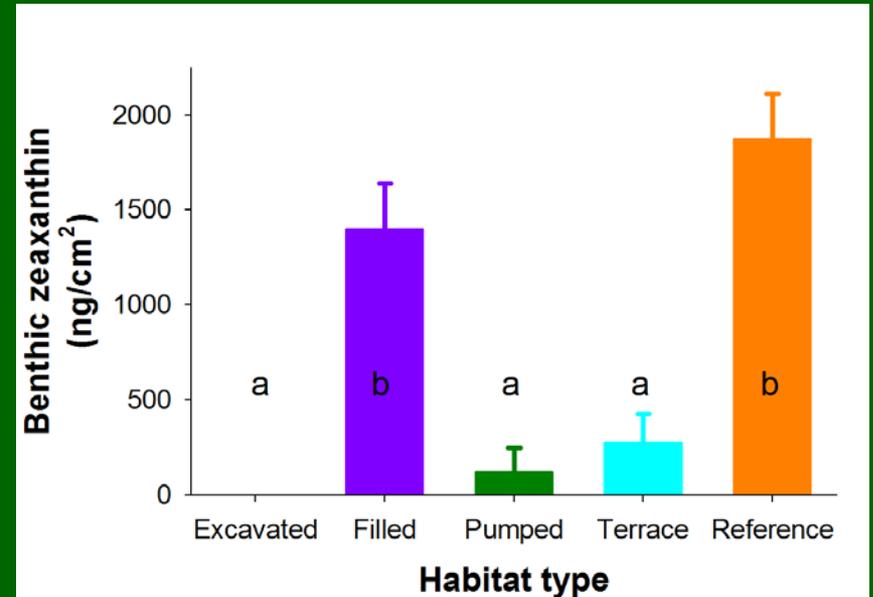
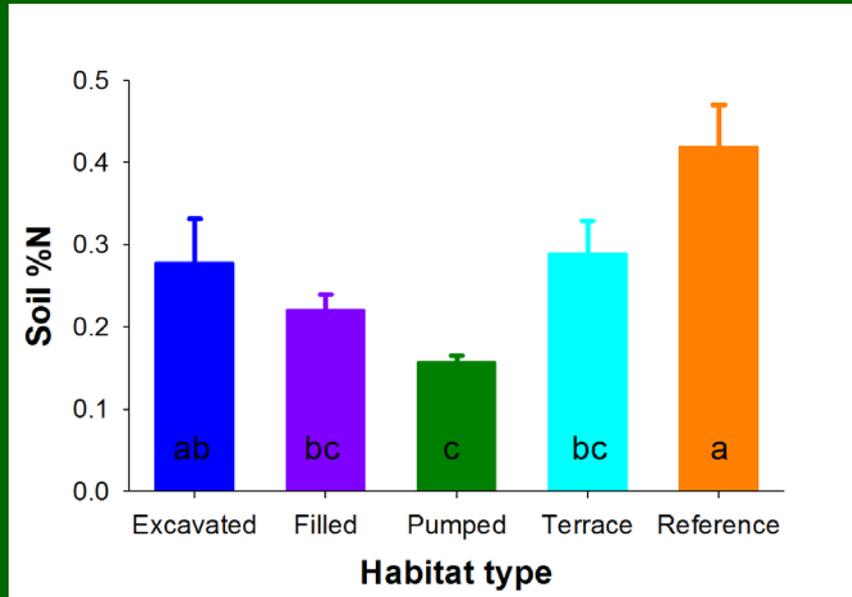


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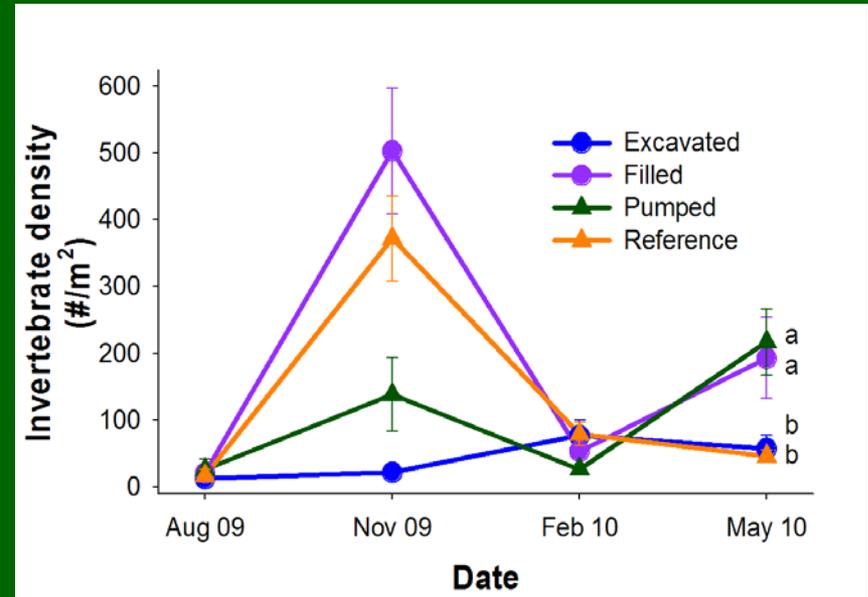
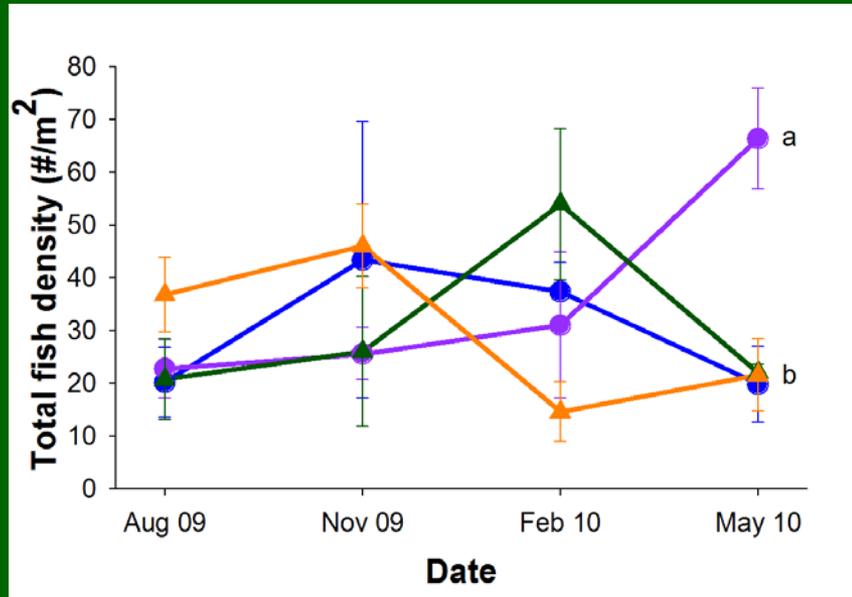
Data provide by Anna R. Armitage, Chuan-Kai Ho, Amanda M. Thronson, Eric N. Madrid, Michael T. Bell, Antonietta S. Quigg, Department of Marine Biology, Texas A&M University at Galveston

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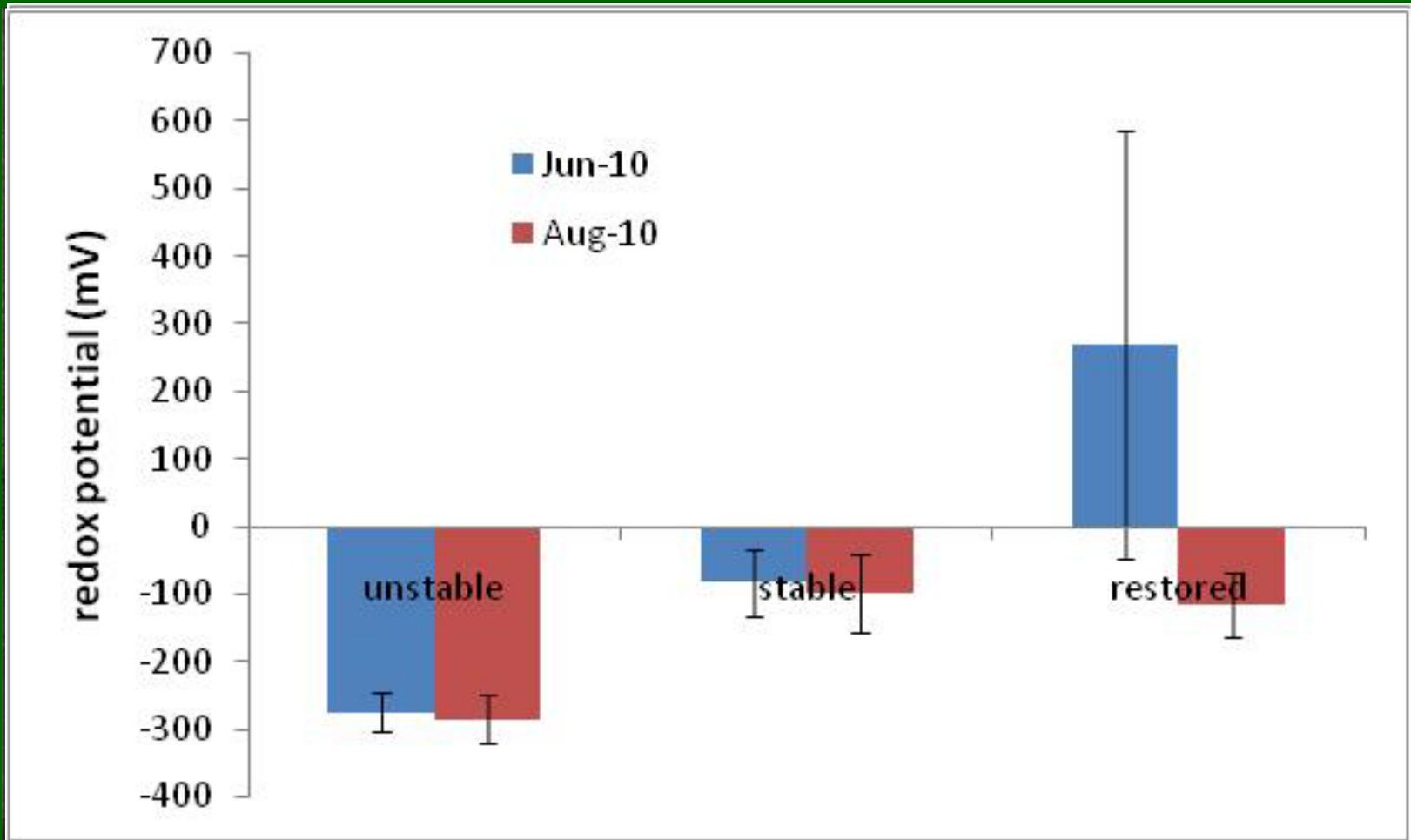
# Pintail Flats/Compartment 15

- Goals
  - Bring elevation up to support plant community
  - Create 80% vegetated marsh, 20% surface water mosaic
- Pintail Flats
  - Constructed 2007-2008
  - Mitigation for Wetland Impacts
- Compartment 15
  - Beneficial Use project, just finished pumping
  - NOAA Fisheries Ike recovery grant

# Pintail Flats/Compartment 15



# Pintail Flats/Compartment 15



Data provided by Dr. Matt Hoch, Lamar University

# Pintail Flats/Compartment 15



# Lessons Learned

- Know where mean sea level is!
- Dedication to project from all involved
- Be able to move sediments easily
  - Where they are needed
  - When target volumes are reached
  - With minimal downtime in dredging

# Lessons Learned

- Chose restoration method based on goals
  - Reference marsh?
  - Specific habitat goals?
- Monitor over long term
  - Different methods give different results
  - Much happening below the surface, too
- Share your results!