



Science Advisory Committee

September 22nd, 2023

In-person attendees: Please write your name and affiliation on the sign-in sheet

Virtual attendees: Please type your name and affiliation in the chat

Today's Agenda

- Welcome Back - *SAC Co-chairs Drs. John Lehrter and Amy Hunter*
- Review and Approval of Minutes
- Updates and Presentations
 - **Baykeeper Scope Presentation and Feedback**– Cassie Bates, Mobile Baykeeper
 - **State of the Bay Progress Update** – Chris Warn, Environmental Science Associates
 - **Fowl River Marsh Study Synthesis Presentation and Updates** - Blair Morrison, MBNEP
 - Vote to accept technical report
 - **SAC Co-chair Nominee Announcements** - Dr. John Lehrter, Dauphin Island Sea Lab; Dr. Amy Hunter, ADCNR-DWH Restoration; Blair Morrison, MBNEP
 - **Management Conference Organizational Feedback Session** - Mary Mullins
- Announcements
- Adjourn

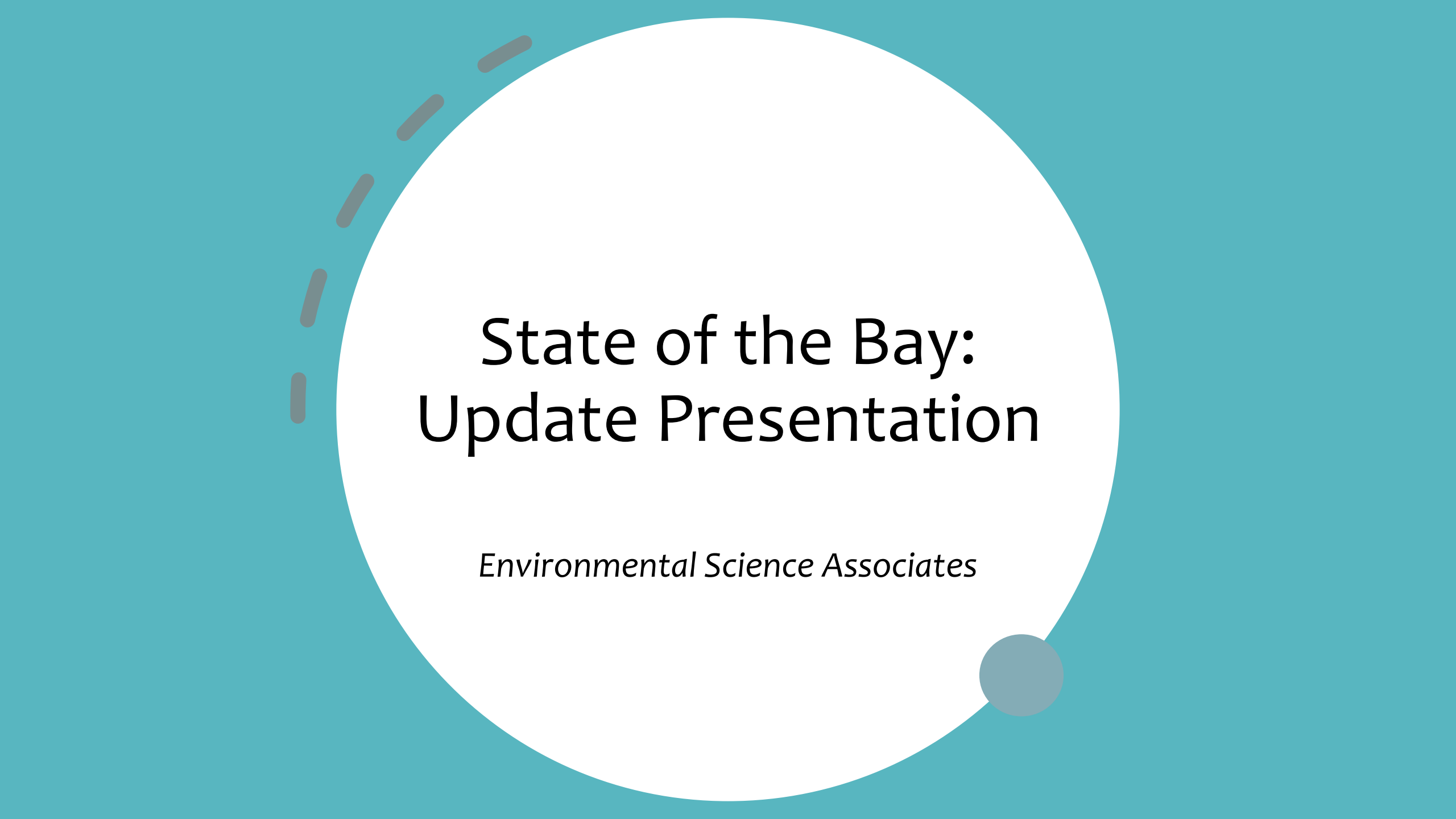




Mobile Baykeeper: Scope Update

Cassie Bates





State of the Bay: Update Presentation

Environmental Science Associates





State of Alabama's Estuaries and Coast

SAC Meeting

September 22, 2023



Barry Vittor &
Associates



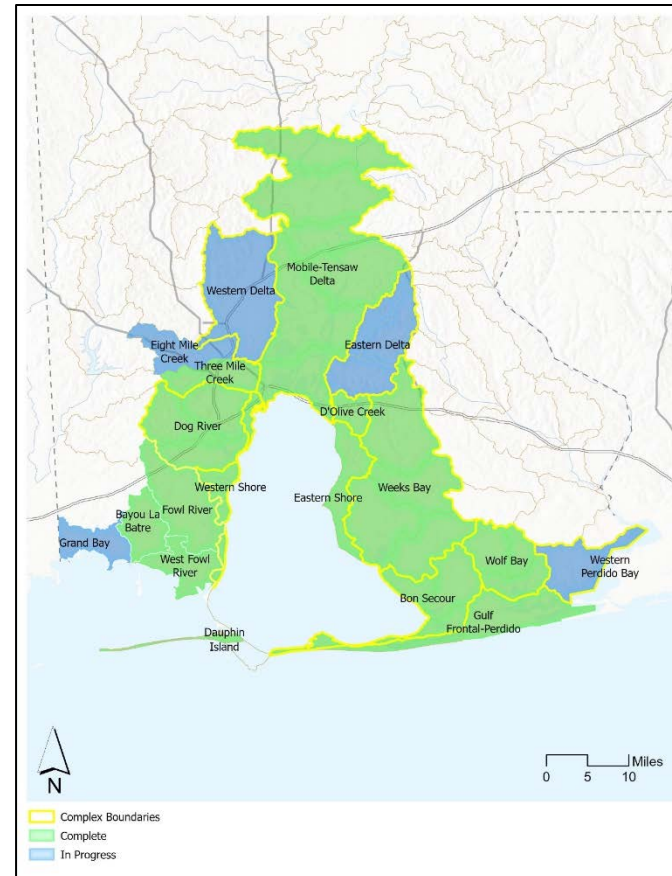
Overall Approach



- Perform data and literature review
 - Review other NEP State of the Bay and Annual Reports
 - Gather and review available long-term data sets for status and trends analysis

- Identify and fill data gaps

- Develop the SAEC



Review other NEP State of the Bay and Annual Reports

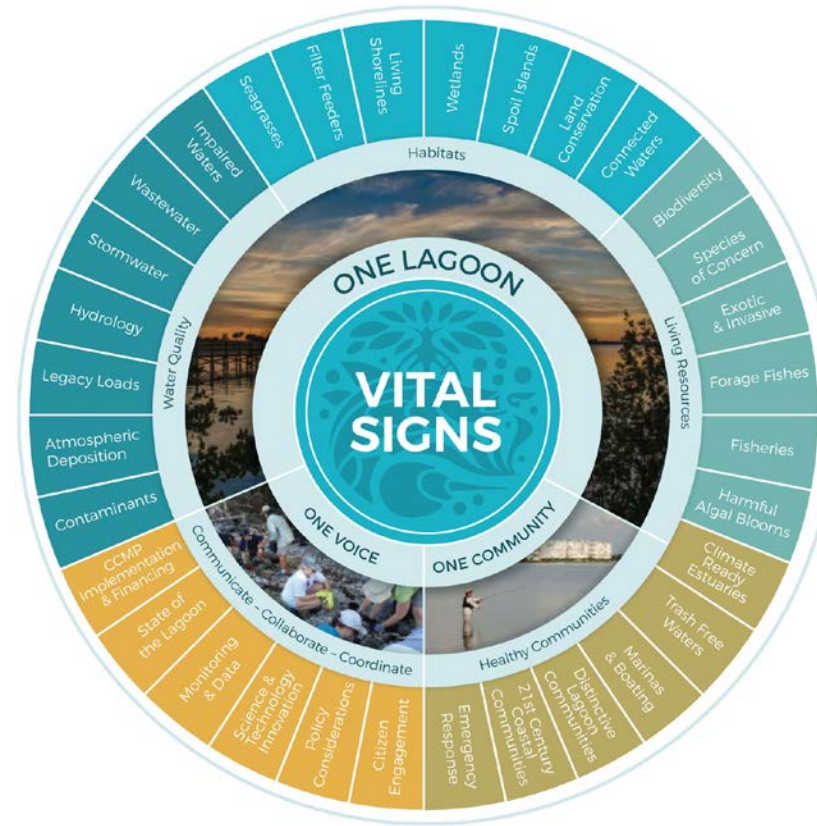


Estuary Program	State of the Bay	Annual Report
Tampa Bay	✓	
Puget Sound	✓	
New York-New Jersey Harbor	✓	
Indian River Lagoon		✓
Maryland Coastal Bays		✓
Chesapeake Bay		✓
Barataria-Terrebonne		✓
Sarasota Bay		✓
Coastal and Heartland	—	—

Review other NEP State of the Bay and Annual Reports



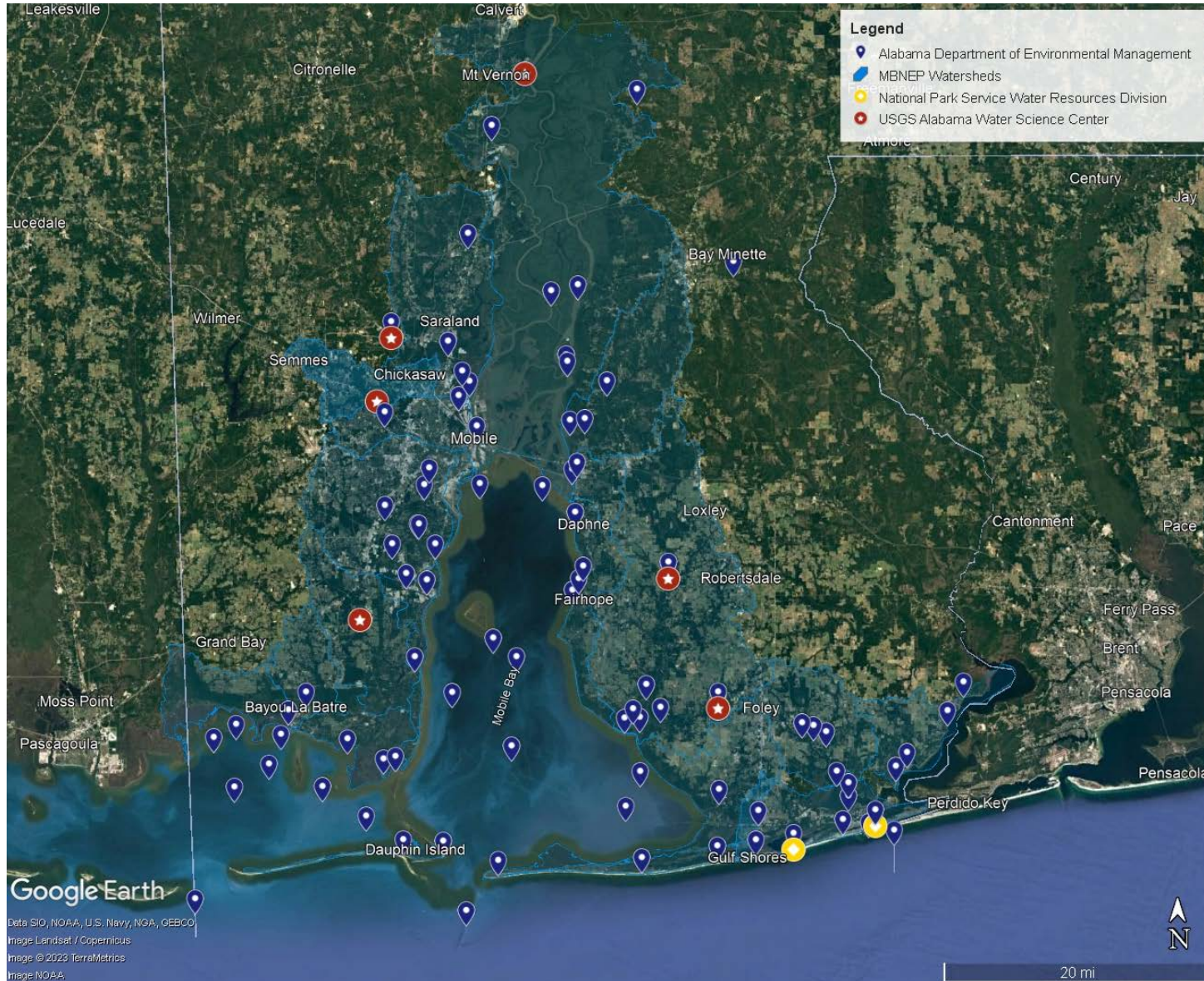
- TBEP for overall presentation – good mix of quantitative and qualitative information
- PSPNEP and IRLNEP for overall elements



MBNEP Approach

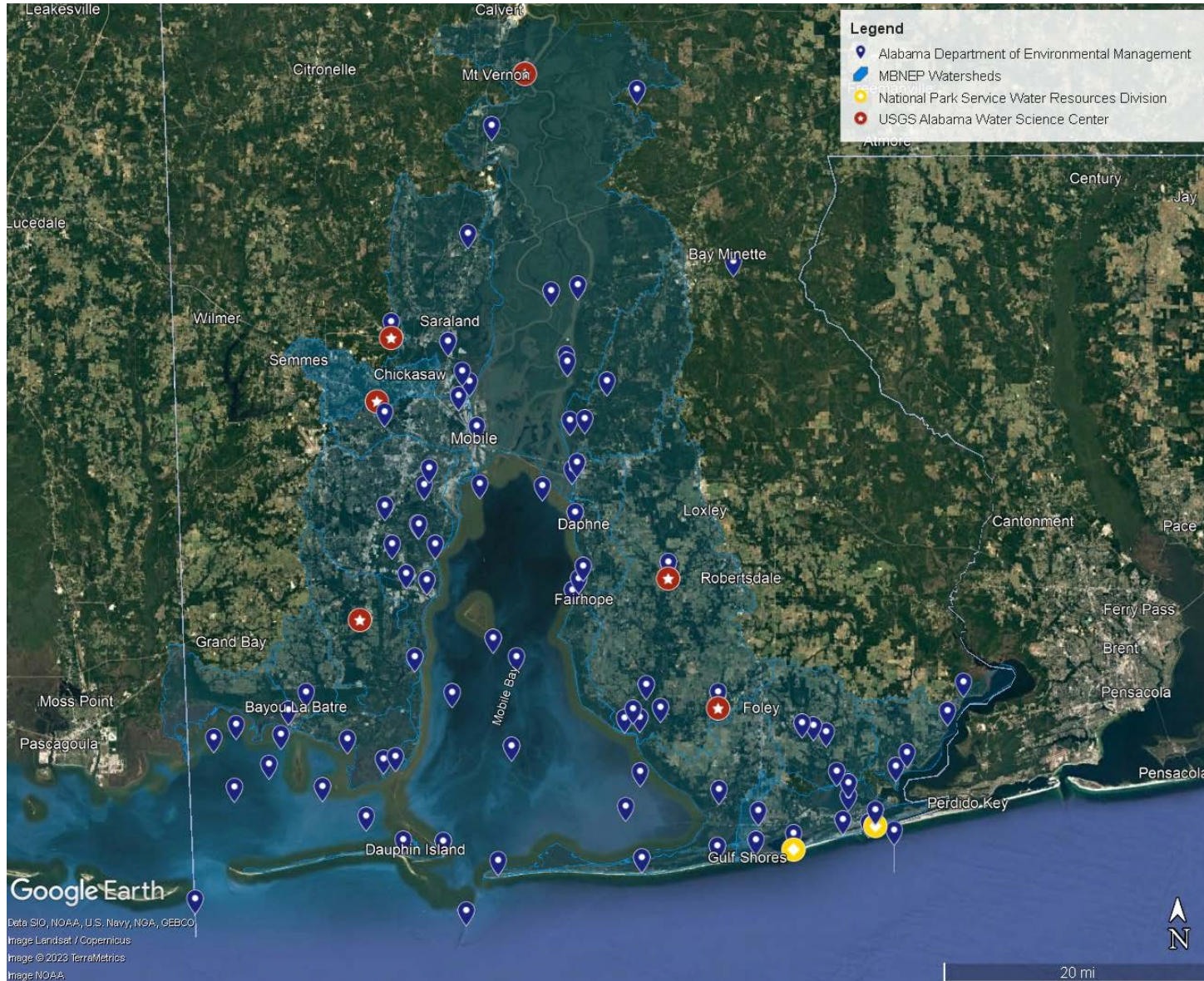


Water Quality Data



- National Water Quality Monitoring Council Data Portal (NWQMC)
- 94 Sites
- At least 36 months of data
- Surface water

Water Quality Data

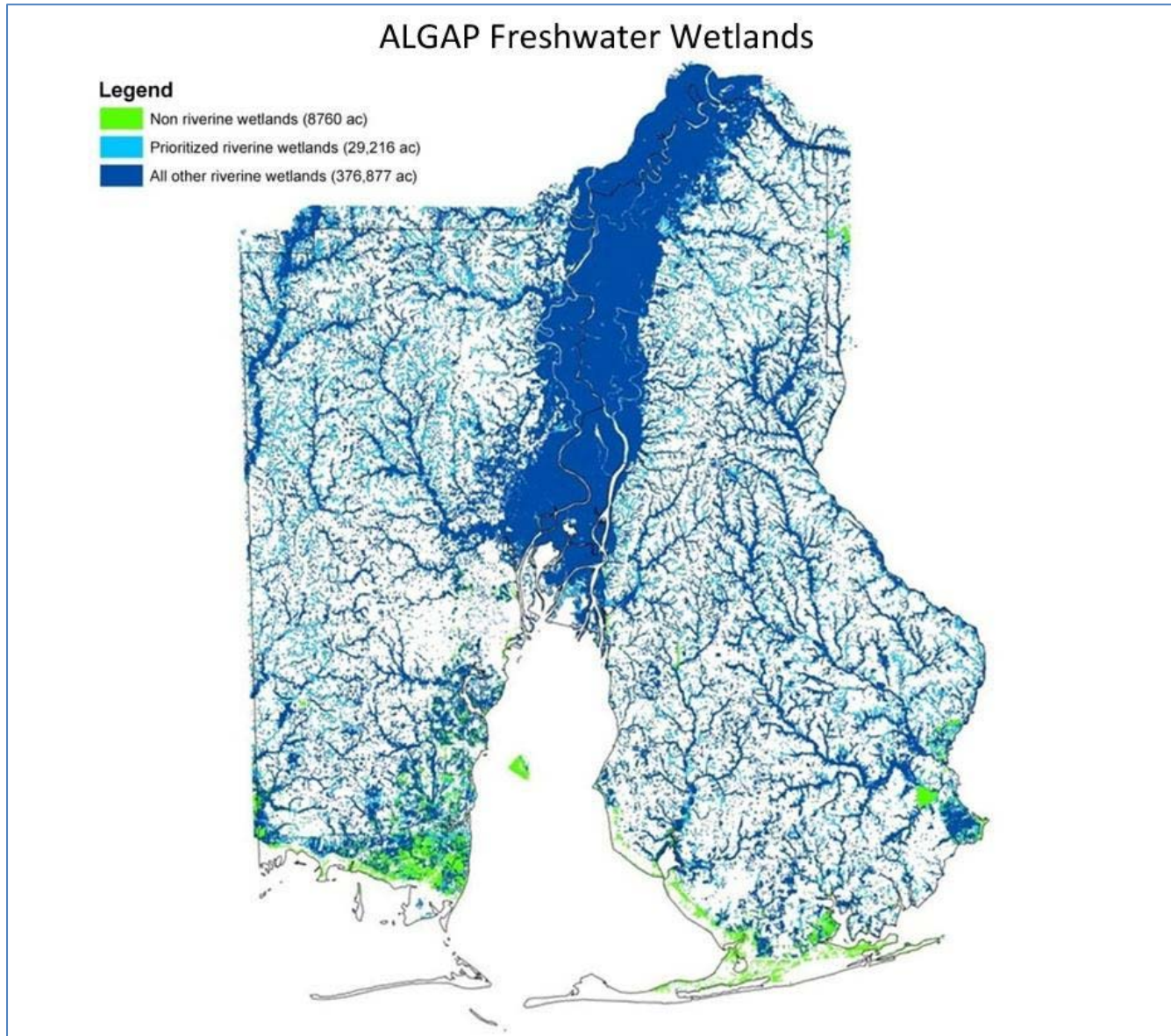


Parameters Available:

- Salinity
- Specific Conductance
- Dissolved Oxygen
- Total Hardness
- pH
- Turbidity
- Dissolved Oxygen Saturation
- Total Nitrogen
- Fluoride
- Dissolved Sulfate
- Dissolved Iron
- Dissolved Arsenic
- Dissolved Selenium
- Dissolved Manganese

Google Earth
 Data SIO, NOAA, U.S. Navy, NGA, GEBCO
 Image Landsat / Copernicus
 Image © 2023 TerraMetrics
 Image NOAA

Habitat Data



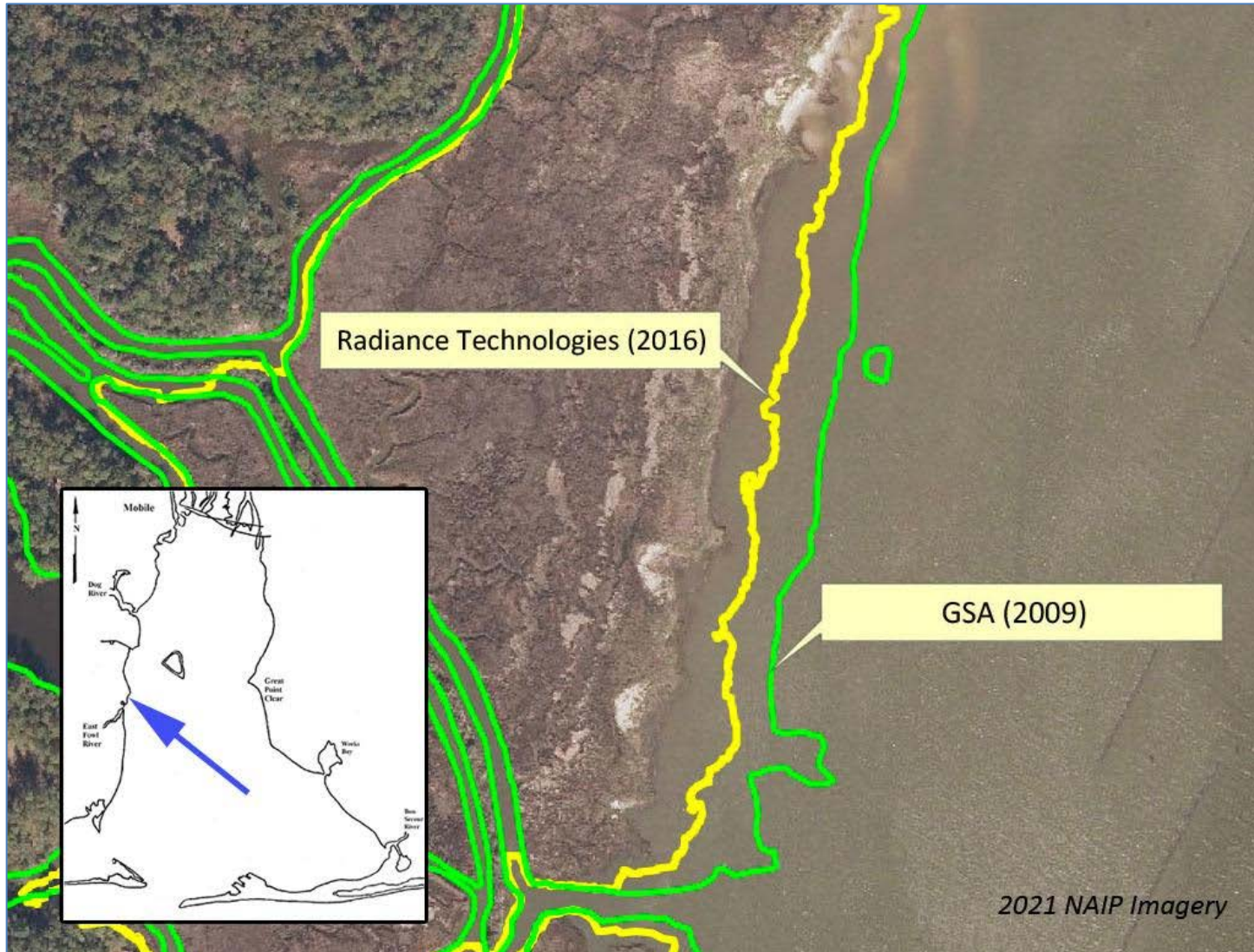
Available Datasets:

- ALGAP (2001)
- NLCD (2001-2021)
- NWI
- GSA (2009-2012)
- Radiance Technologies (2016)
- MBNEP Habitat Trends (2020)
- SAV (2009, 2015, 2019)
- Oyster reefs (TBD)

Habitat Data



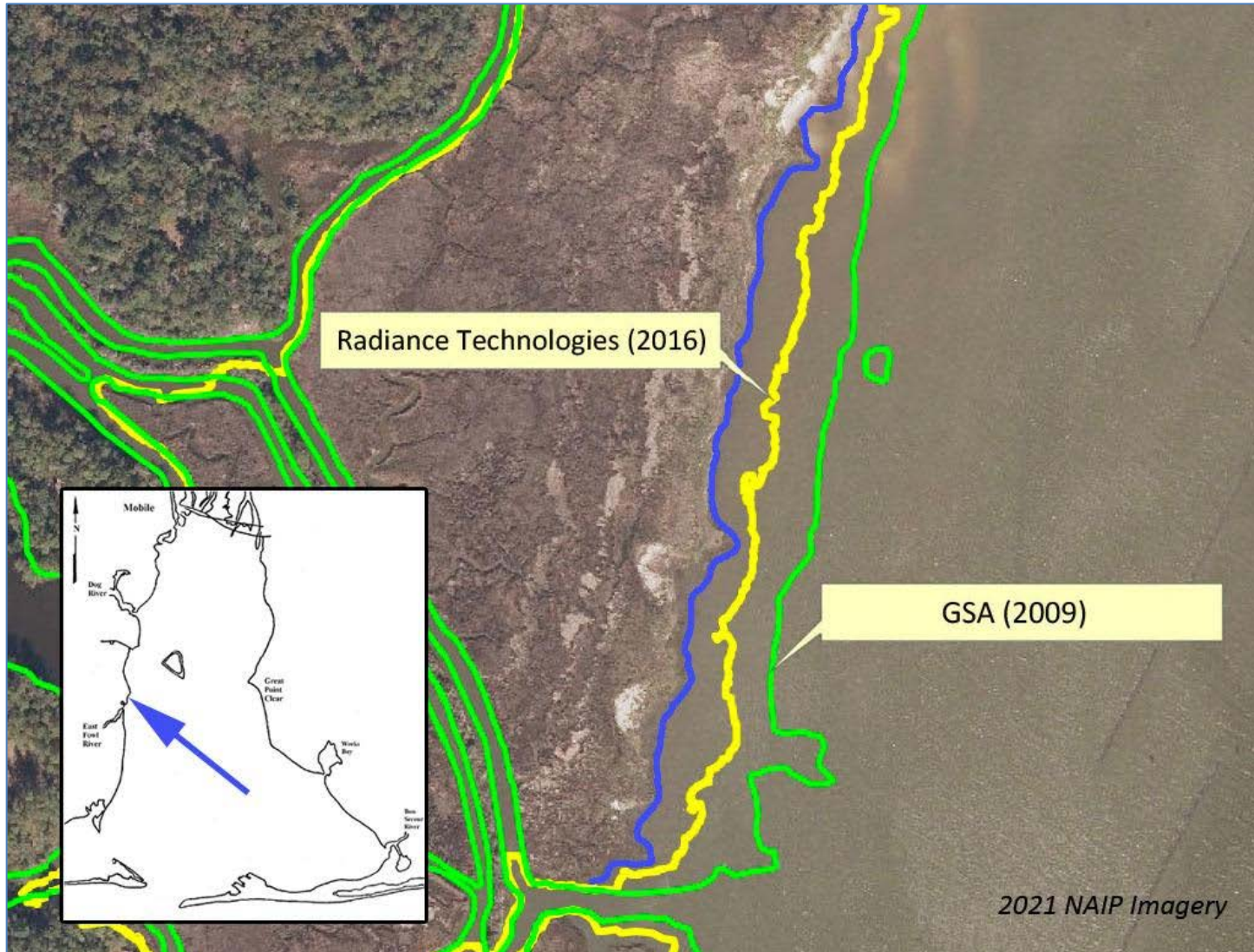
Update bay shorelines and adjacent marshes



Habitat Data



Update bay shorelines and adjacent marshes



Questions?



SAC Meeting September 22, 2023



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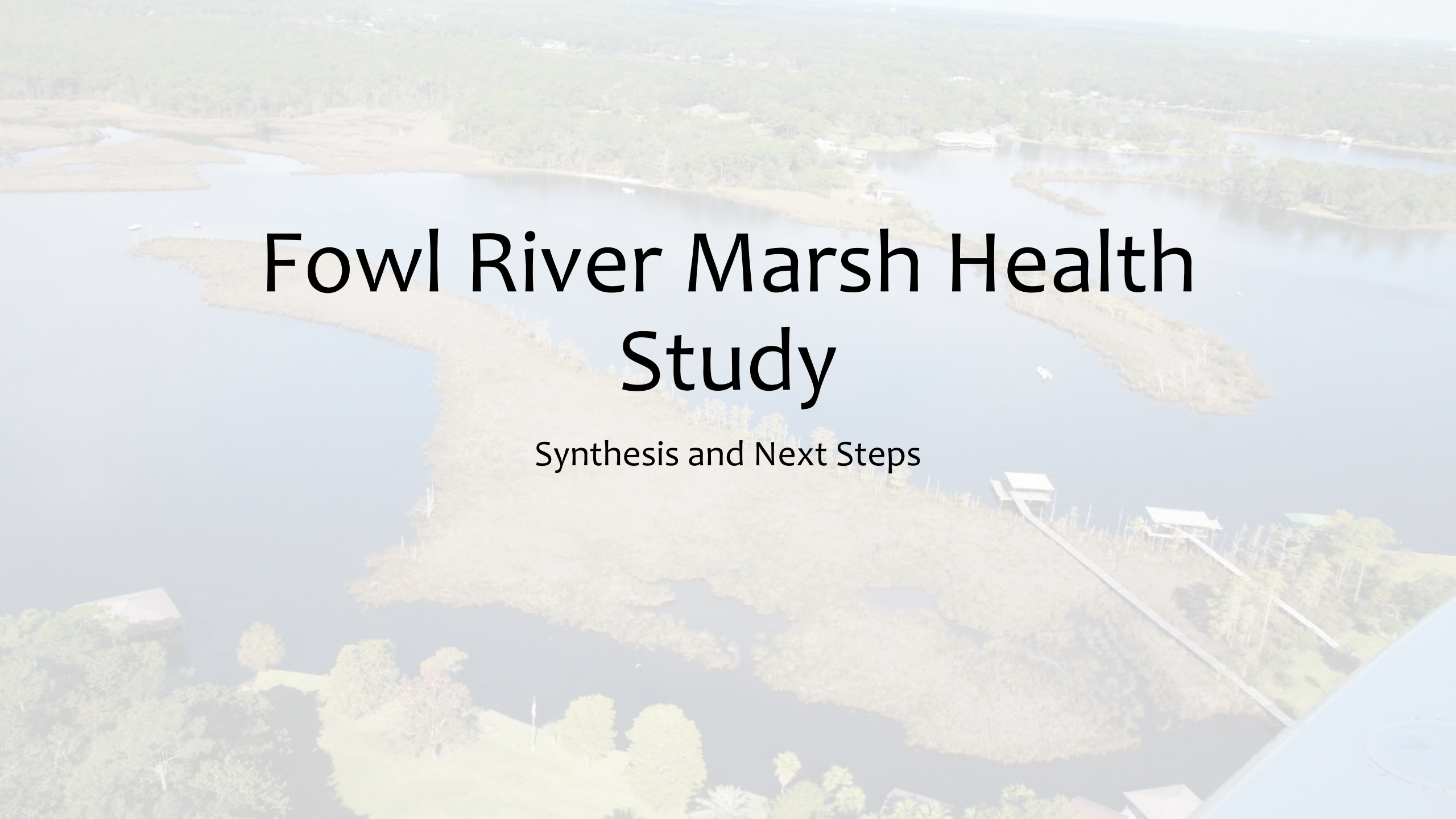




Fowl River Marsh Study: Update Presentation

Blair Morrison



An aerial photograph of a marshy area with a large body of water in the center. The marsh is surrounded by dense green trees and some buildings. The water is a light blue color. The overall scene is a natural landscape with some human-made structures.

Fowl River Marsh Health Study

Synthesis and Next Steps

Overview

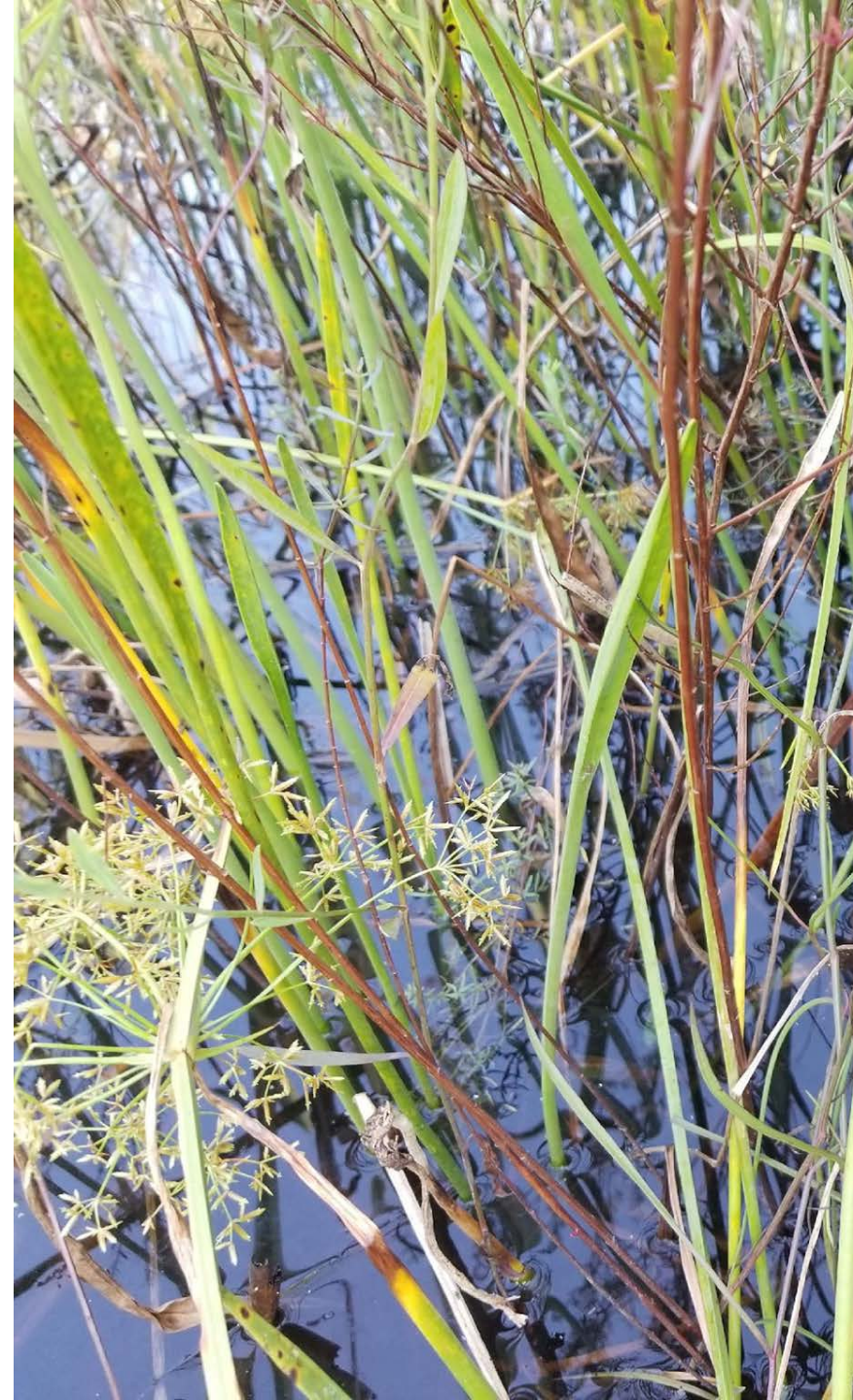
- Section Summaries
 - Vegetation
 - Sediments
 - Waves
 - Hydrology
- Overall Synthesis
- Restoration Plans
- Next Steps



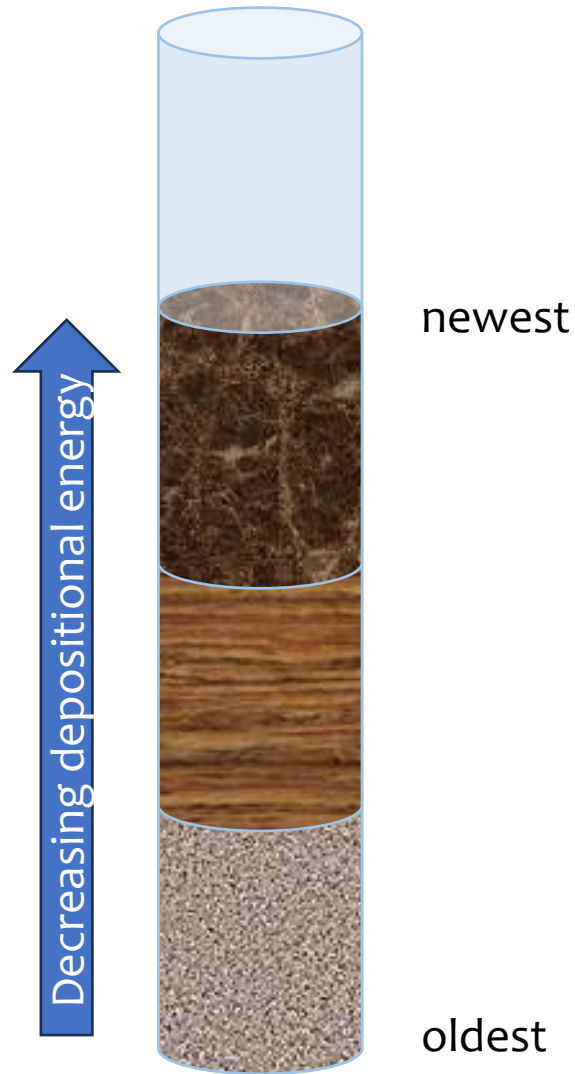


Vegetation

- Percent cover was lower than high-quality reference marshes, but not outside of standard metrics for lower Alabama
- Higher diversity in upper reaches
- Transition from Tupelo-Cypress swamp to herbaceous marsh in the past 50 years
- Mean elevation is low, leading to increased inundation
- Armored shorelines halt marsh migration along river
- SAV resources identified around marsh spits



Sediments



- Coarse sediment starved, retrograding system
- Accretion is roughly equivalent across all marsh spits, suggesting a singular driving factor (SLR)
- Rate of accretion increasing over past few decades, still lower than rate of sea level rise
- Upstream sites have some allochthonous sediment, but downstream marshes mostly feature sediments created in place
- Changes in C:N ratios indicate land use change and increased wastewater/stormwater runoff since 1900

Waves

- Almost 100% of the wave energy in the study area is attributed to boat wakes (7 am – 7 pm)
- Significant wave heights are small and range from 8 cm to 18 cm; (average period 1.4 to 2.5 s)
- Wave heights are generally larger on the upstream sides of spits
- Significant wave heights routinely exceed the threshold for vegetation tolerance (0.33 m)
- Boat wakes present a chronic stressor that contributes to eroding marsh edge

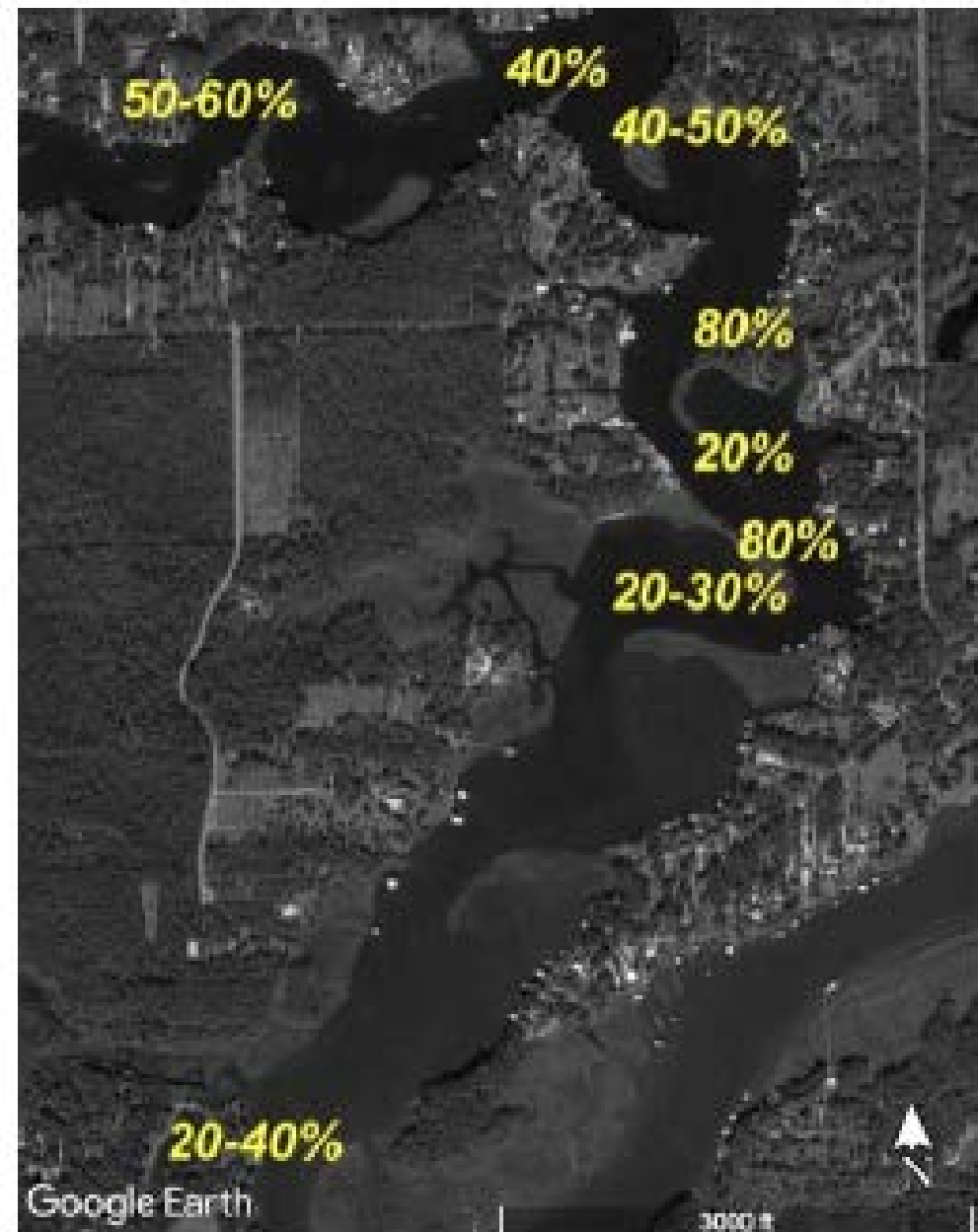
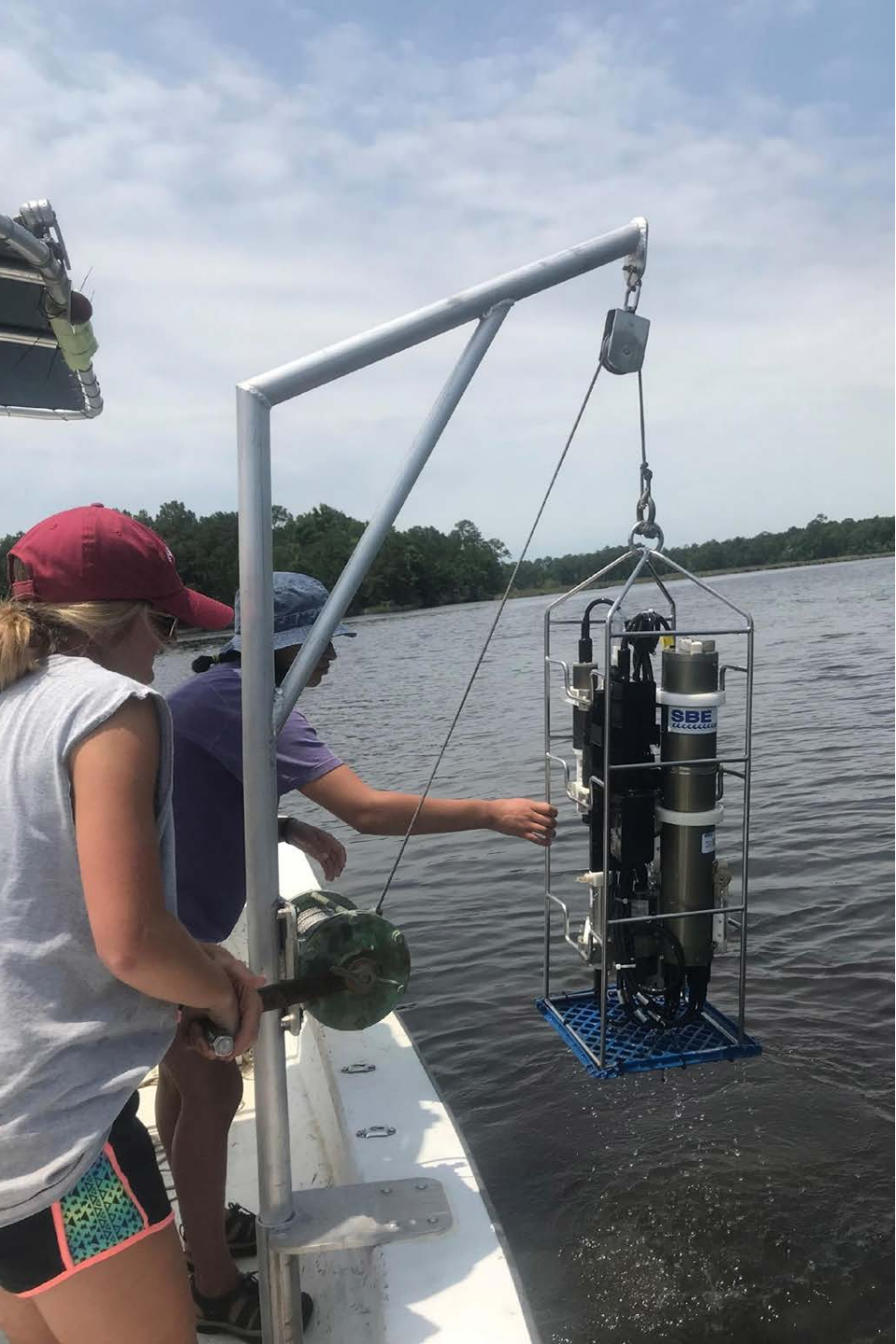
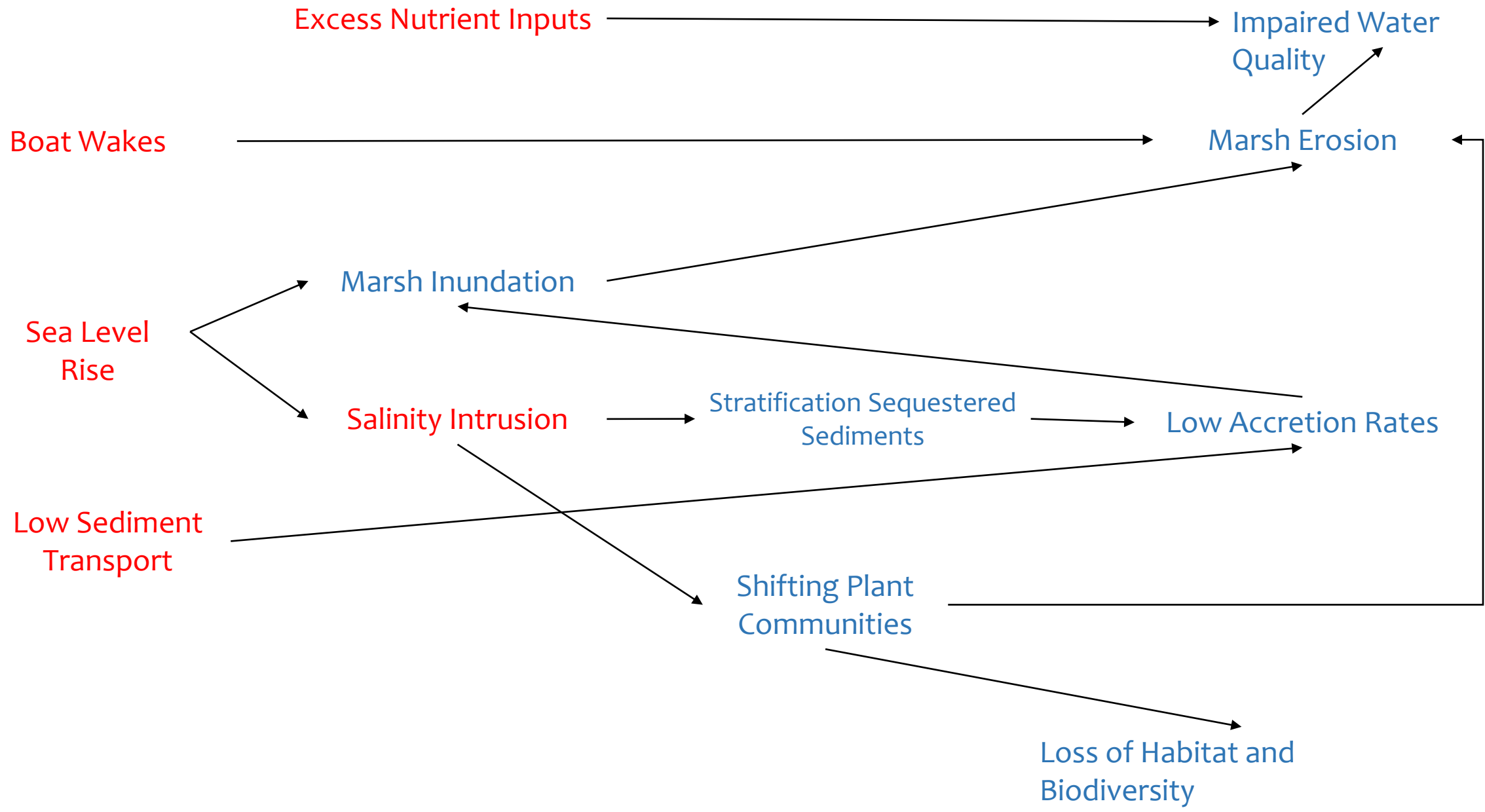


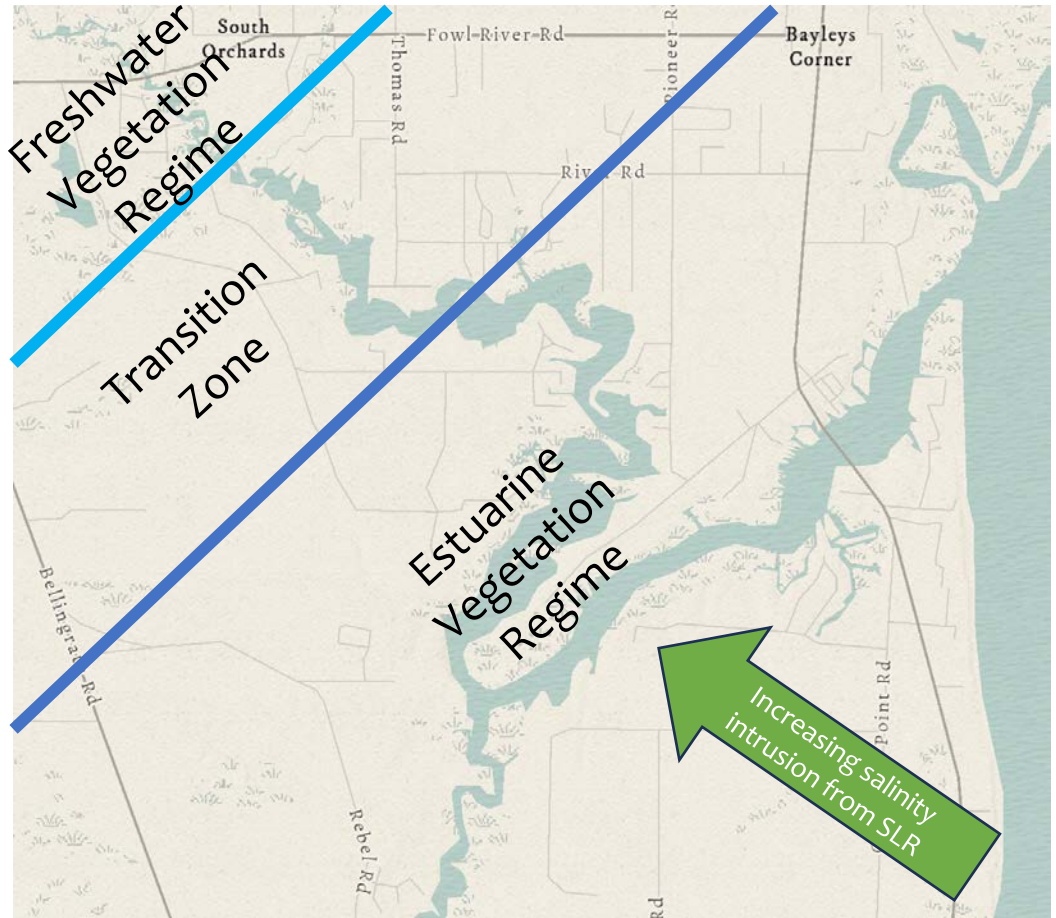
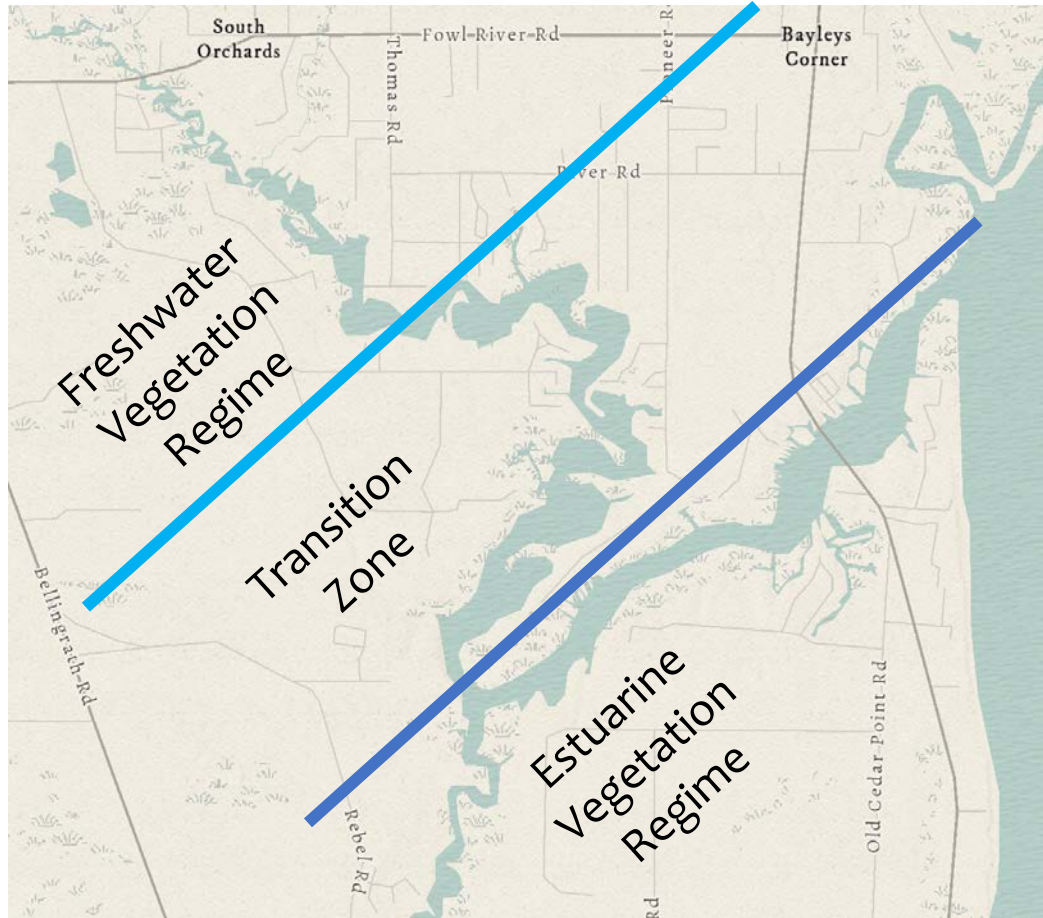
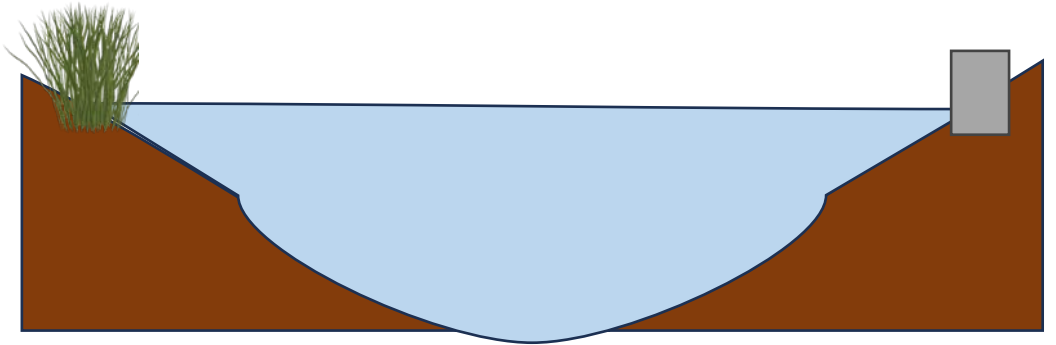
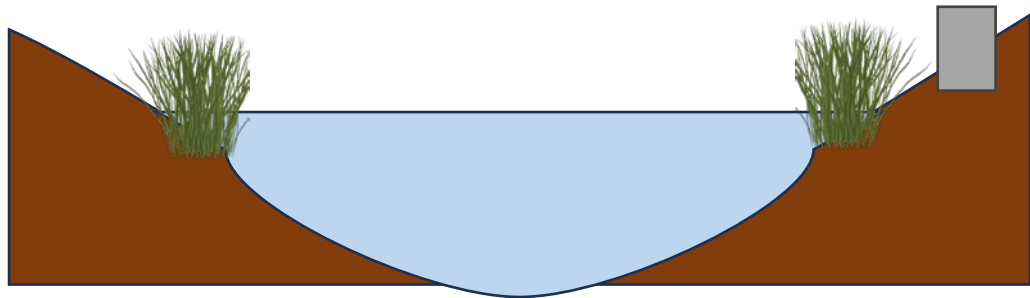
Figure 4. Summary of Tolerance Exceedance Values



Hydrology

- SLR = greater salinity intrusion
- Turbidity trended with salinity
- Salt wedge traps sediments – preventing them from accreting on marsh surface
- Highest marsh porewater salinity – in marsh interiors
- Nutrient, chl a, and oxygen observations suggest that Fowl River is eutrophic
- SW wind conditions can push salt into the system via West Fowl River





Upstream
Freshwater

Transitional
Ecotone

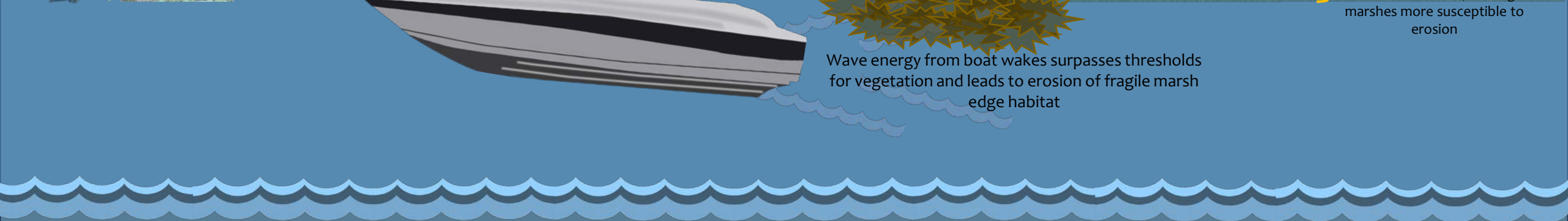
Downstream
Estuarine/Marine

Ecotone and vegetation communities will shift upstream with increased saltwater intrusion



Sea level rise enhances current marsh inundation, making marshes more susceptible to erosion

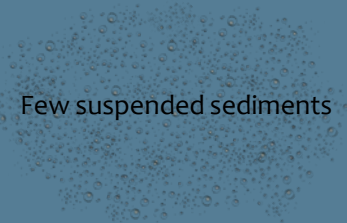
Wave energy from boat wakes surpasses thresholds for vegetation and leads to erosion of fragile marsh edge habitat



Fresh, less turbid water from Fowl River headwaters



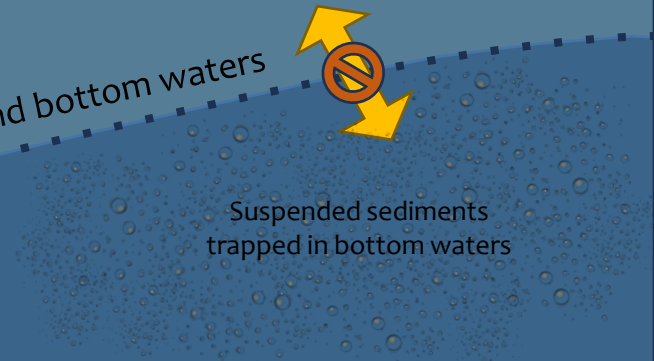
Few suspended sediments



Density stratification prevents mixing between surface and bottom waters



Suspended sediments trapped in bottom waters



Salty, turbid water from Mobile Bay (and West Fowl River under wind forcing conditions)



How is this information being used in restoration strategy?

- Thin layer placement to increase marsh elevation
- Potential doming of sediments in marsh interior to avoid future ponding
- Addition of wave attenuation devices around restoration sites
- Outreach and education about effects of boat wakes
- Restoration activities will avoid impacts to SAV resources





Next Steps

- Finalizing Technical Report
- Reformatting to a manuscript
 - Potential Journals:
 - Regional Studies in Marine Science (~6000 words)
 - Restoration Ecology (<8000 words)
 - Frontiers in Environmental Science – Conservation and Restoration Ecology (<12000 words; <15 figures/tables)



SAC Co-Chair Nominee Introductions:

Steve Jones, Dottie Byron



Management Conference Organizational Feedback :

Mary Mullins





Announcements



Thank You For Attending!