Coastal wetland vegetation responses to the closure of Rollover Pass

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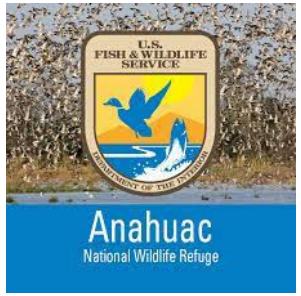

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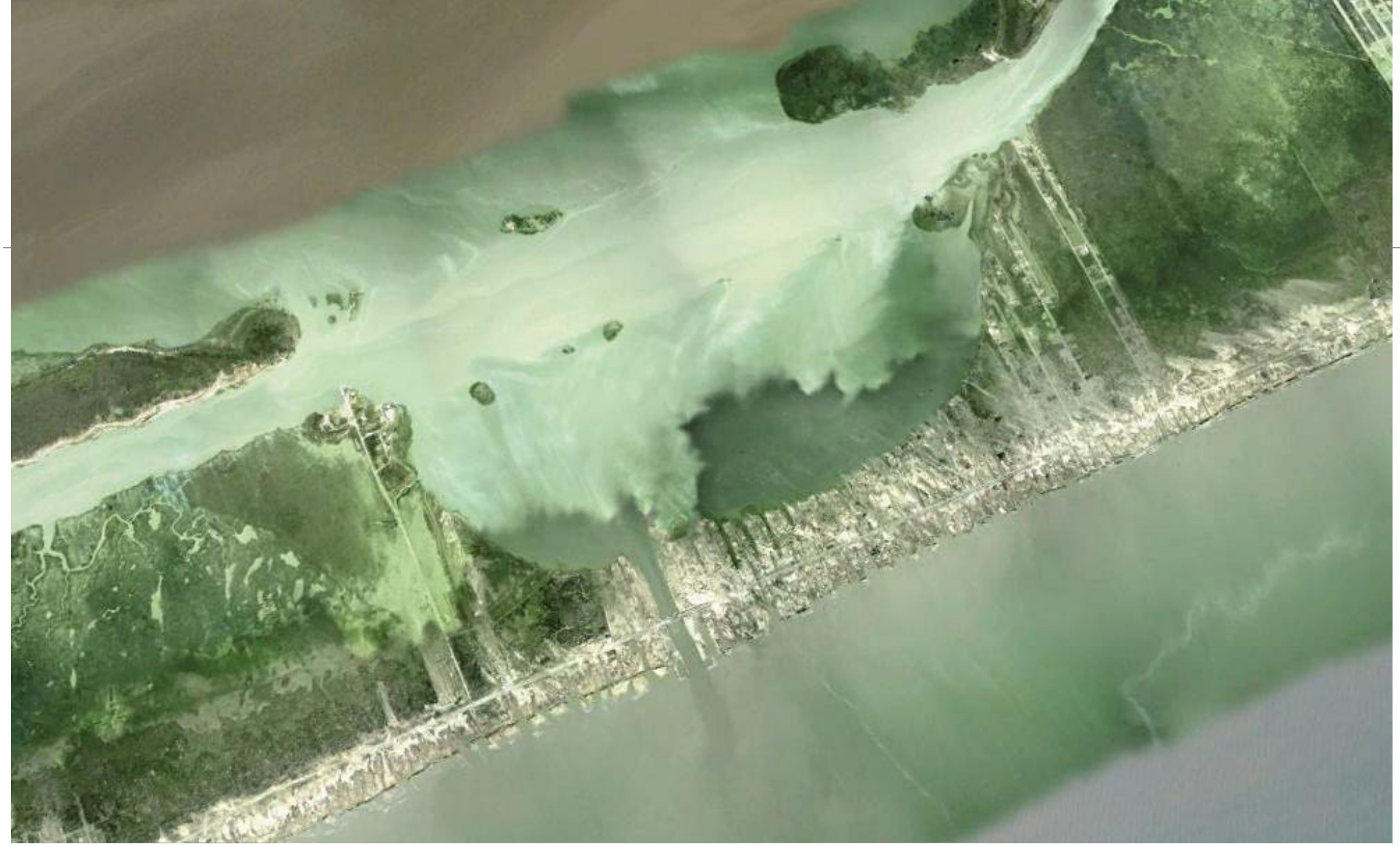
History

- Rollover Pass opened in 1955 to improve local fishing conditions
  - Salinized east Galveston Bay
  - Declines in seagrasses, freshwater emergent plants
  - Erosion along shoreline, intracoastal waterway



History

- Accelerated erosion following Hurricanes Carla (1961), Ike (2008)
- Continued erosion, maintenance challenges
- Closed in December 2019

Understanding ecosystem responses to the closure of Rollover Pass on Bolivar Peninsula

What are the near-term responses of emergent & submerged plants & nekton to the closure of Rollover Pass?

Sampling timeline

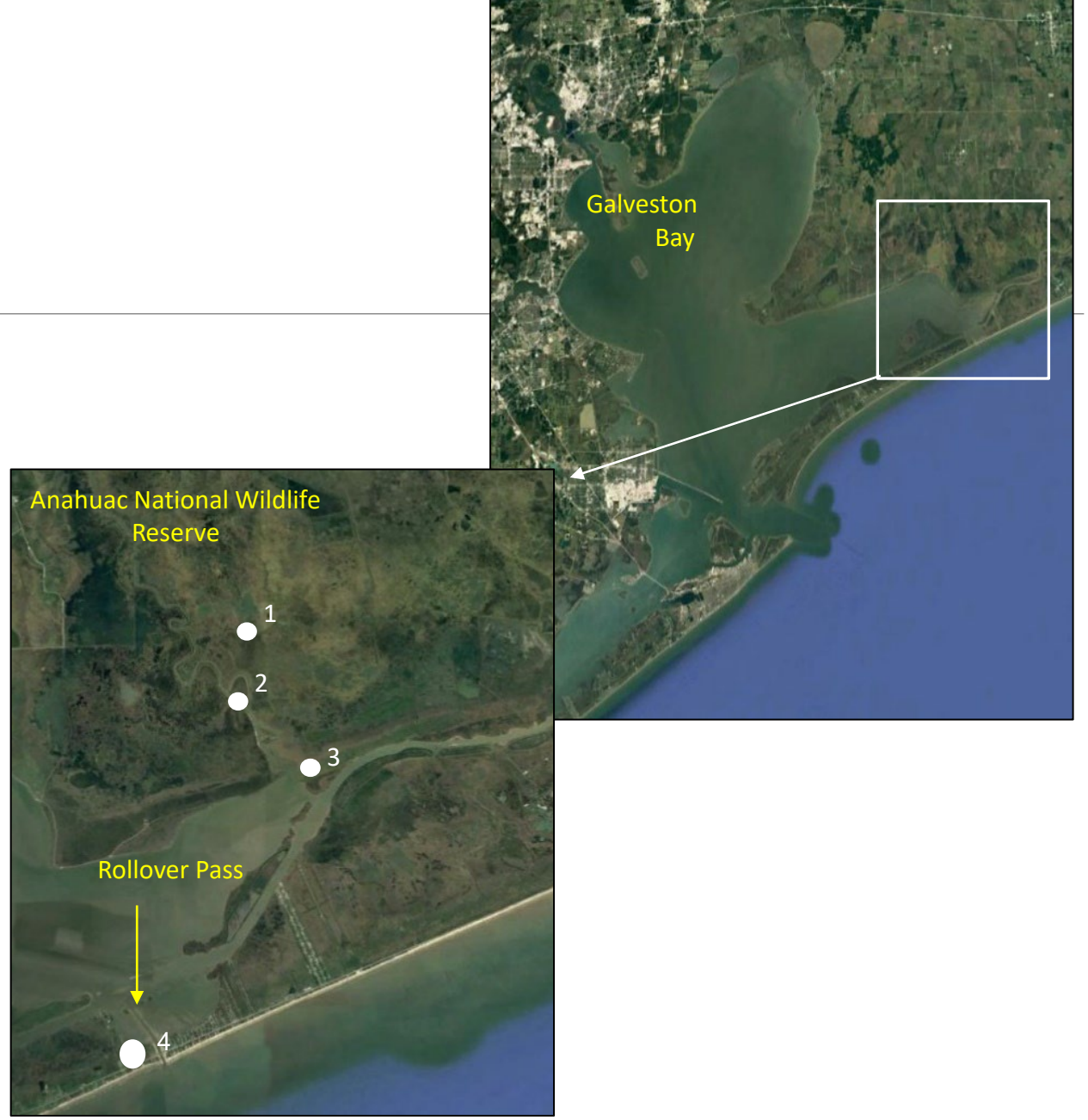
Fall 2019

December 2019: Pass closure

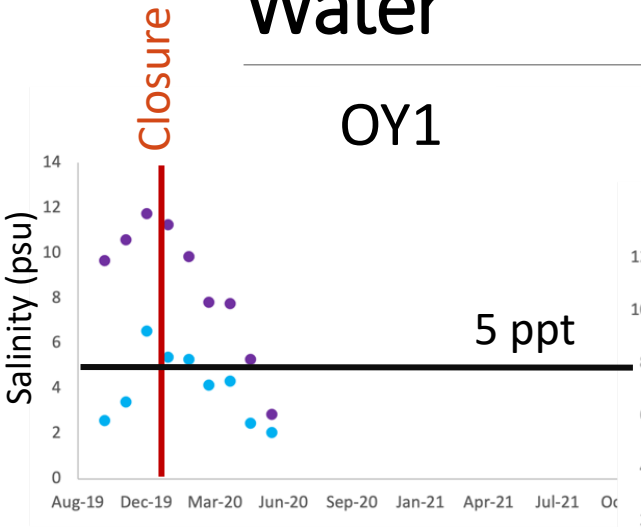
Fall 2020

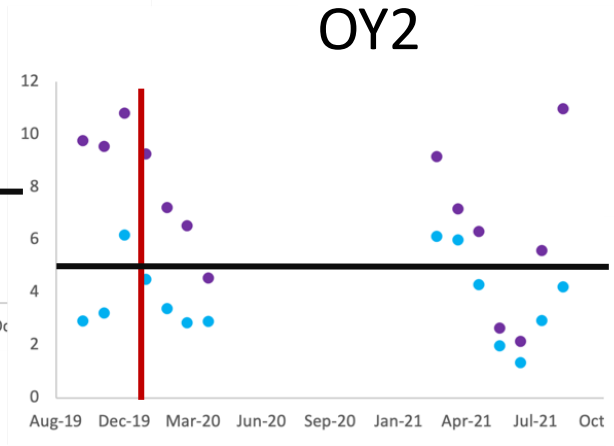
Fall 2021

Fall 2022



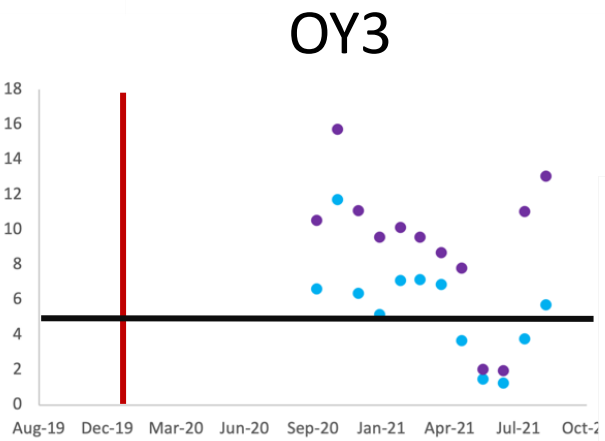
Water

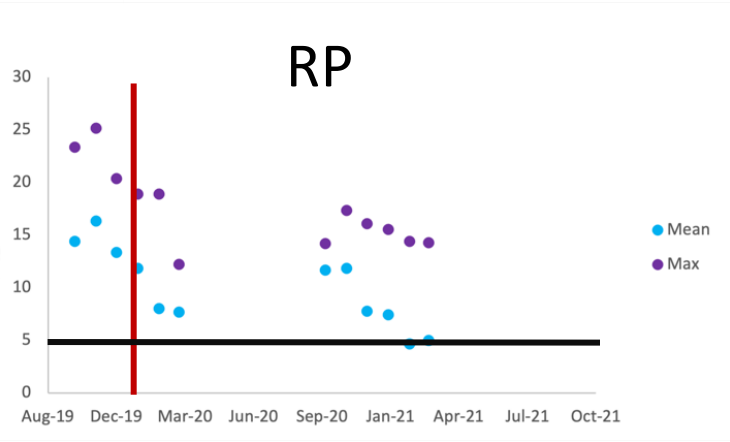




Expected outcome:

- Closure would decrease salinity



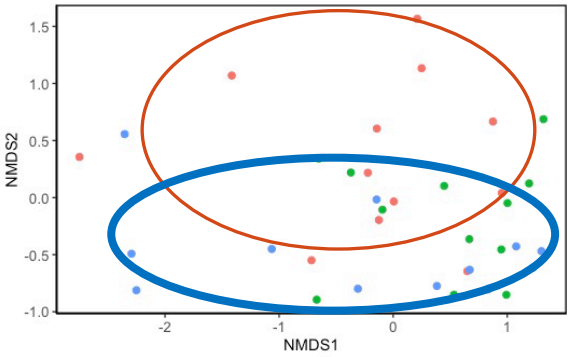


Actual outcomes:

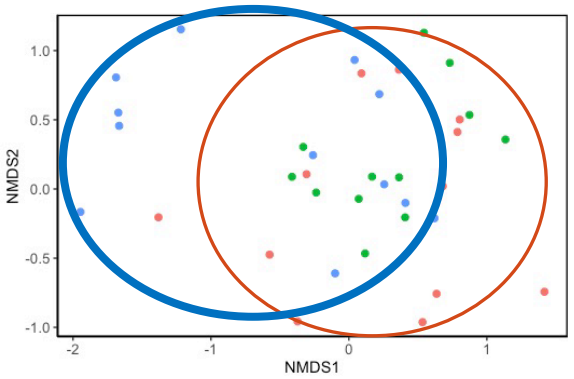
- No immediate effect on salinity
- Salinity was variable within sites
- Salinity gradient persisted across sites

Emergent vegetation

OY1



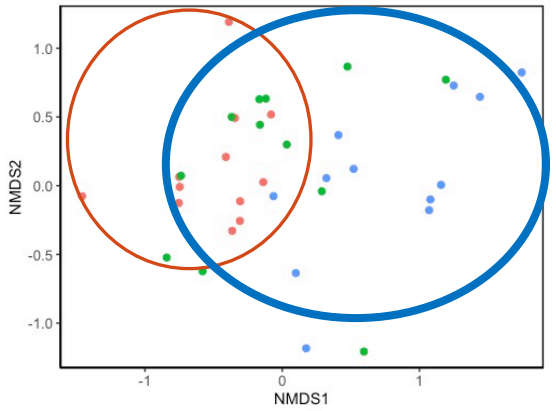
OY2



Expected outcome:

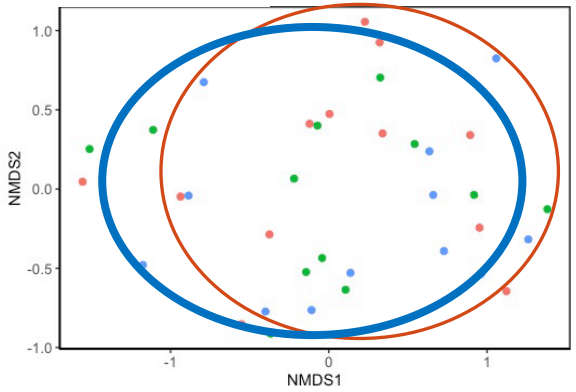
- Closure would shift plant communities towards FW species

OY3



Pre-closure (2019)
Post-closure (2020)
Post-closure (2021)

RP



Actual outcomes:

- Existing species reorganized over time
- No emergence of new FW species

Submerged vegetation

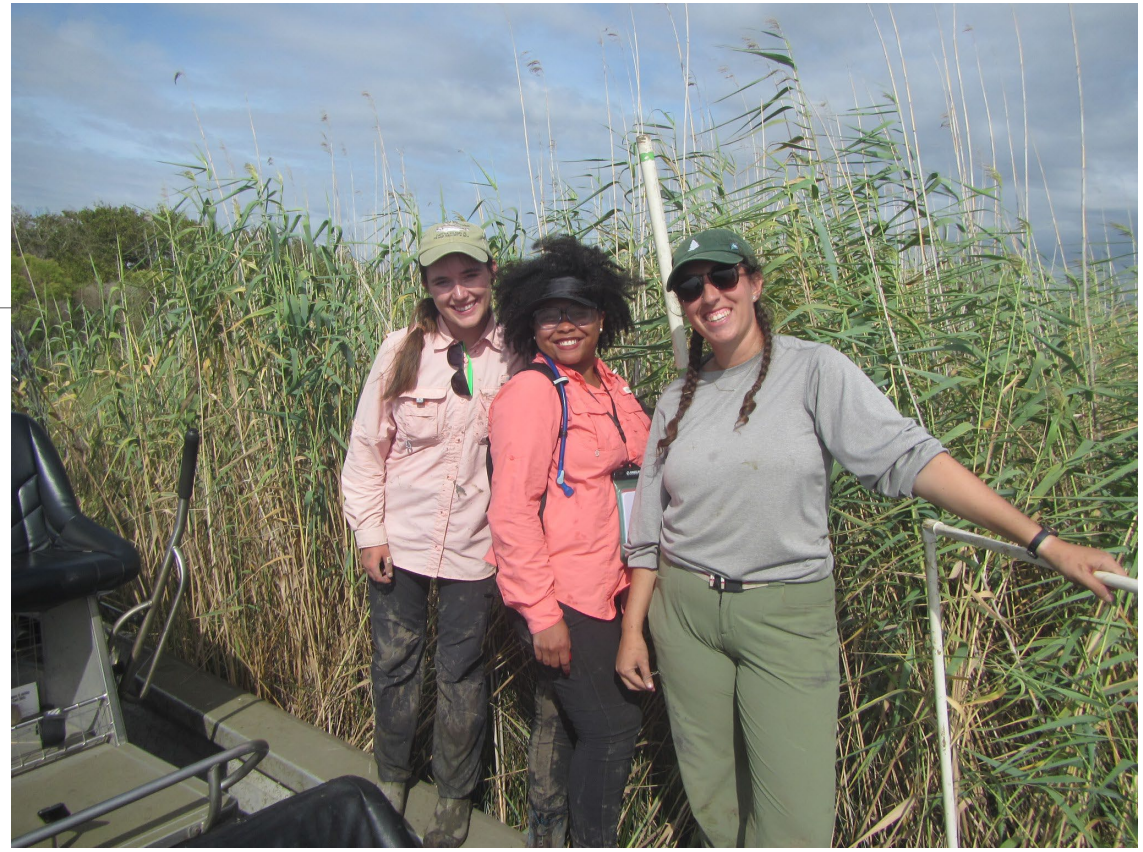
Expected outcome:

- Decreasing salinity would facilitate SAV recovery

Actual outcomes:

- SAV remained rare throughout the study period
- Larger spatial scale needed to assess extent of recovery

Species of management concern



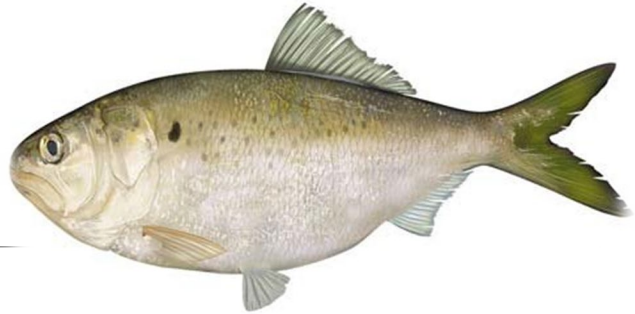
Expected outcome:

- Reduction in salinity would lead to *Phragmites* proliferation

Actual outcomes:

- Stands persisted at all salinities
- Some indication of higher fitness (higher chlorophyll a content) at lowest salinity site

Fauna



Expected outcome:

- Decreasing salinity would alter nekton community composition

Actual outcomes:

- Most species were salt tolerant, occurred at all sites
- Larger temporal & spatial scale needed to assess dynamics of recovery

Take-home and next steps

- Salinity changes gradual, variable over time
- Plant communities are reorganizing, but may not be a direct salinity response
- Fauna are salt-tolerant
- → Long time scale of change
- Decades of alteration = decades of (possible) recovery

Thanks!

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