

Nitrogen Sources in the Coastal Bays Land-Sea Margin: Flux From Tidal Wetland Creeks and Bottom Sediments

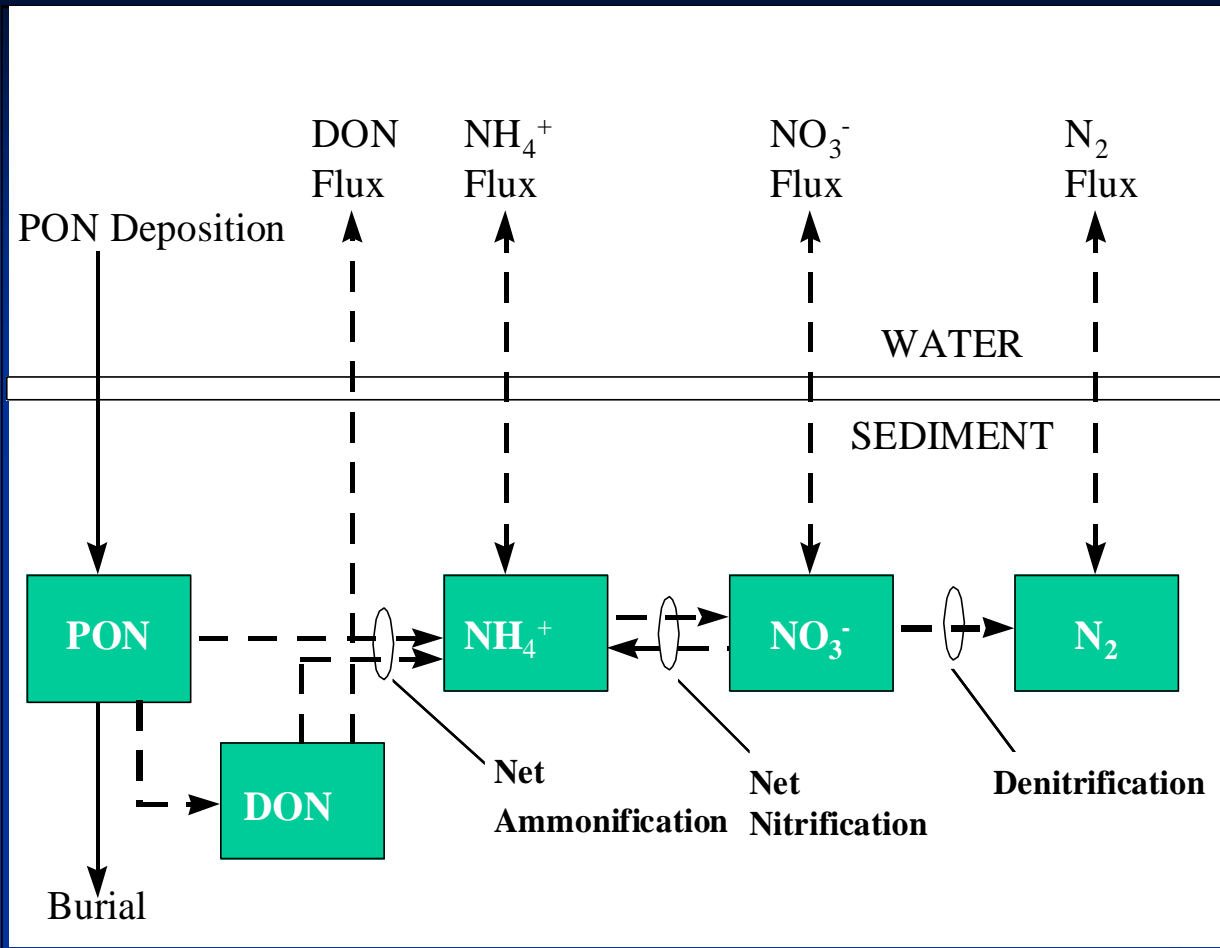
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Questions

- Are wetlands a potential N source, primarily through transformation of NO_3^- to NH_4^+ ?
- Are sediments a key source of internal N for phytoplankton growth in Johnson Bay



Denitrification:



DNRA:





Upper Boxiron

Lower Boxiron

Purnell Hummock

Martin Bay

Brockatonorton Bay

Rattlesnake Island

Rams Horn Tump

Sheldrake Island

Ready Cove Tump

Rowley Cove

Hog Island

Tizzard Island

Robbins Tump

Mink Tump

Assacorkin Island

Sassafras Hammock

Girdletree

Upper Scarborough

Mid Scarborough

Lower Scarborough

JB6

JB5

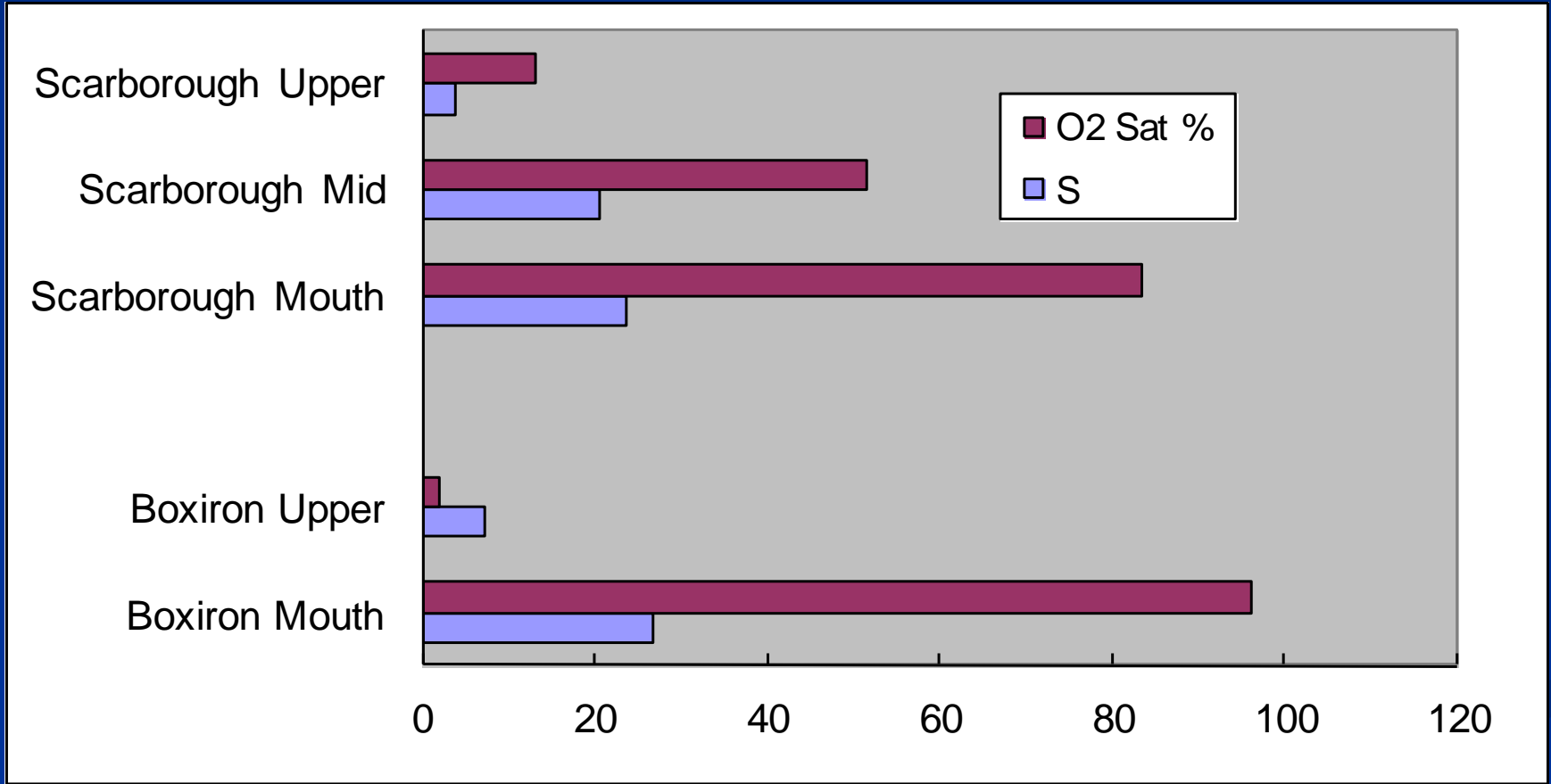
JB4

JB3

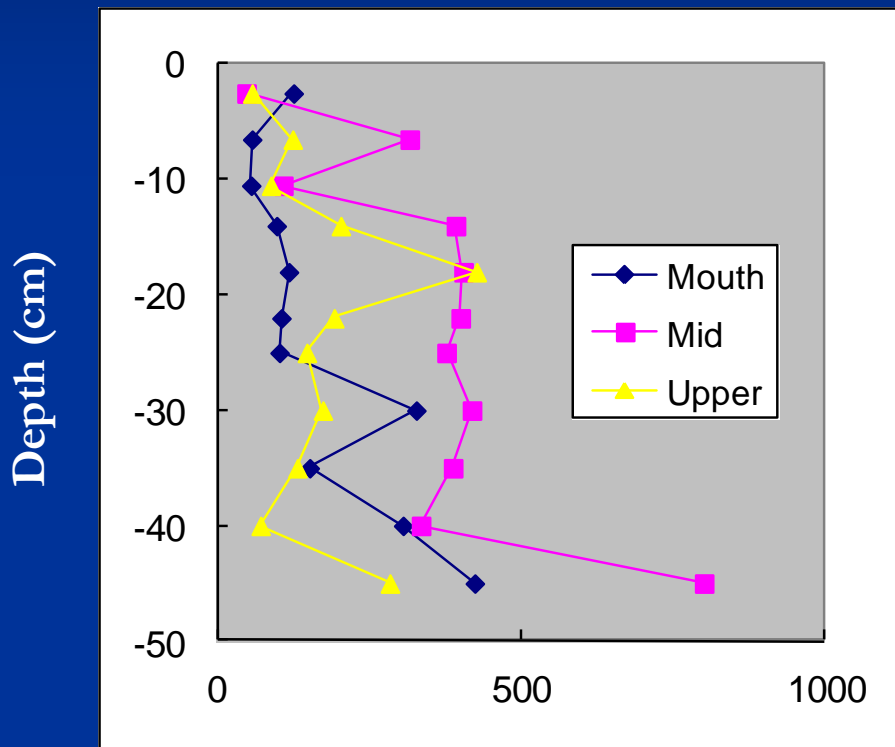
JB2

JB1

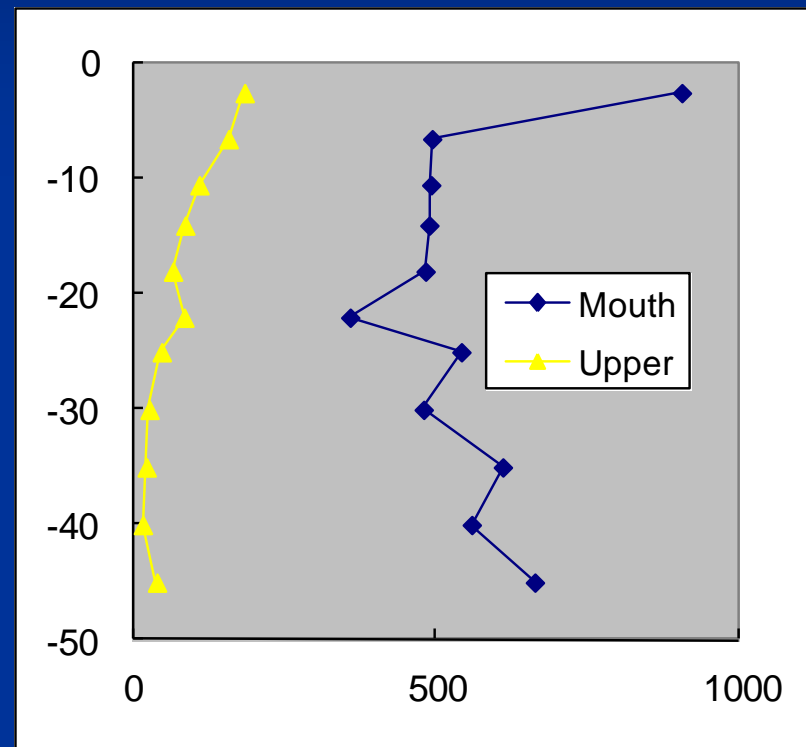
Marsh Environments



Pore Water Ammonium $\mu\text{mol L}^{-1}$



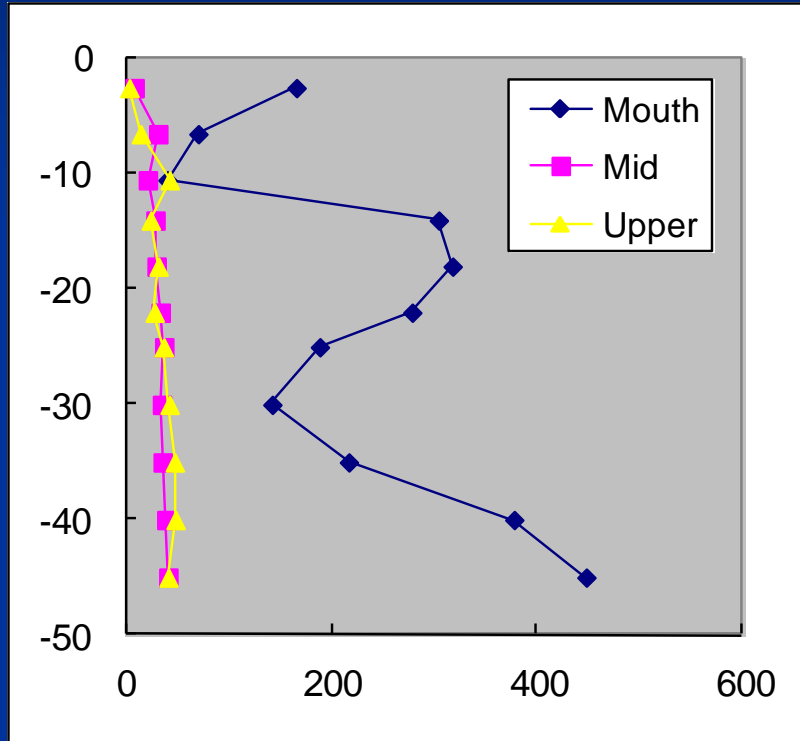
Scarborough Creek



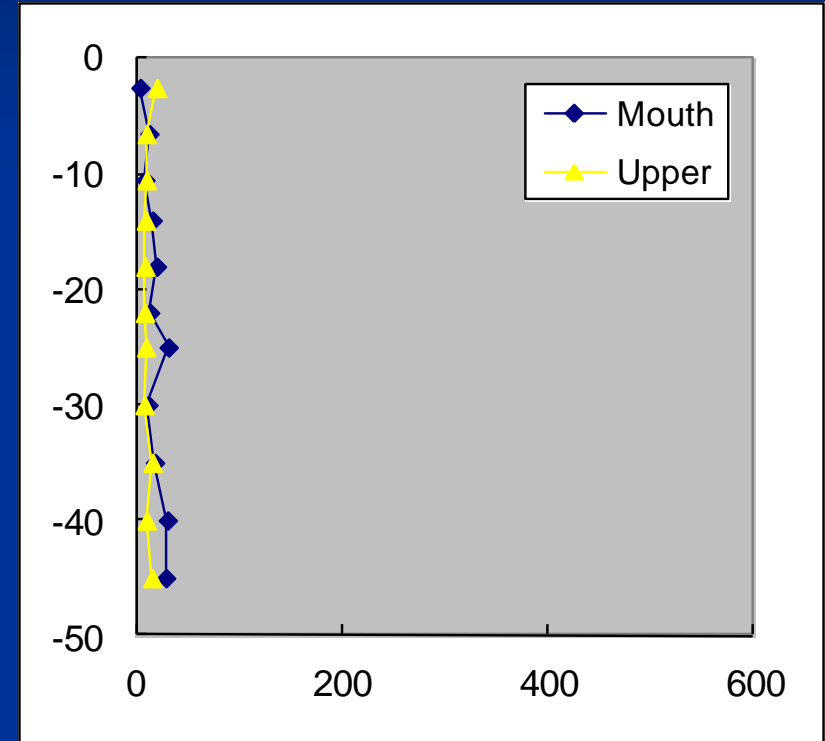
Boxiron Creek

Pore Water SRP $\mu\text{mol L}^{-1}$

Depth (cm)

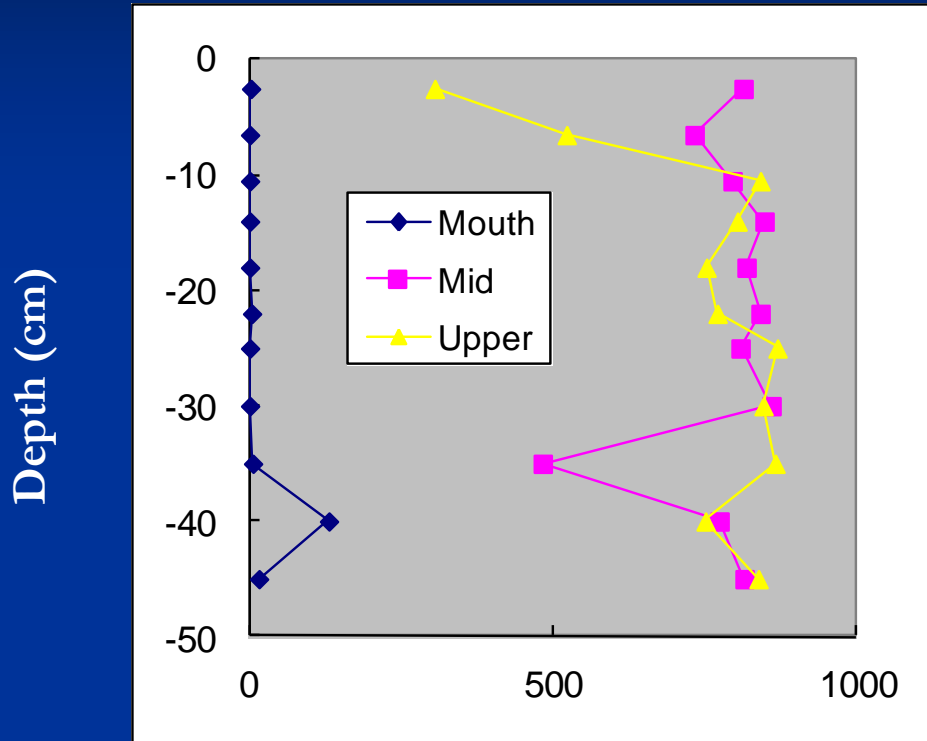


Scarborough Creek

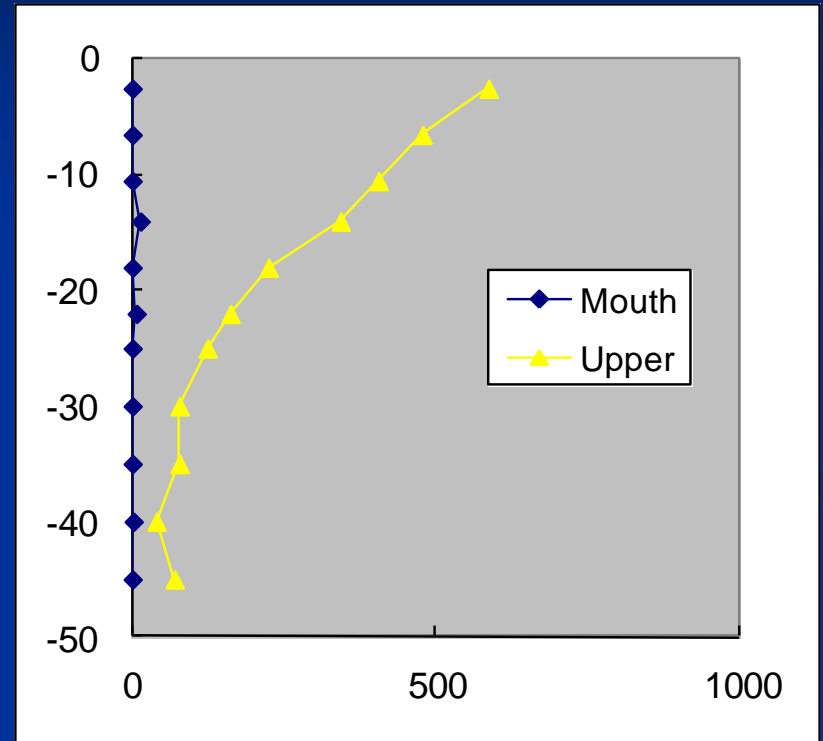


Boxiron Creek

Pore Water Hydrogen Sulfide $\mu\text{mol L}^{-1}$



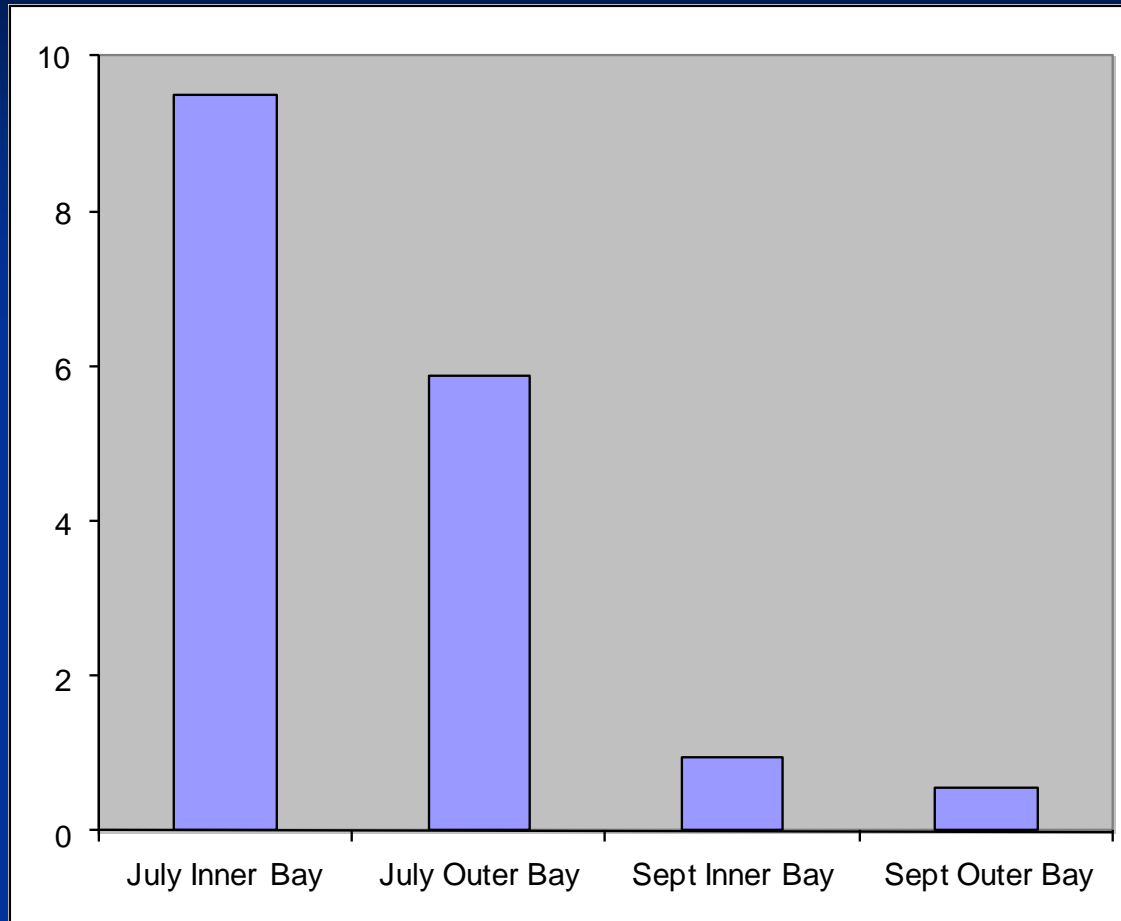
Scarborough Creek



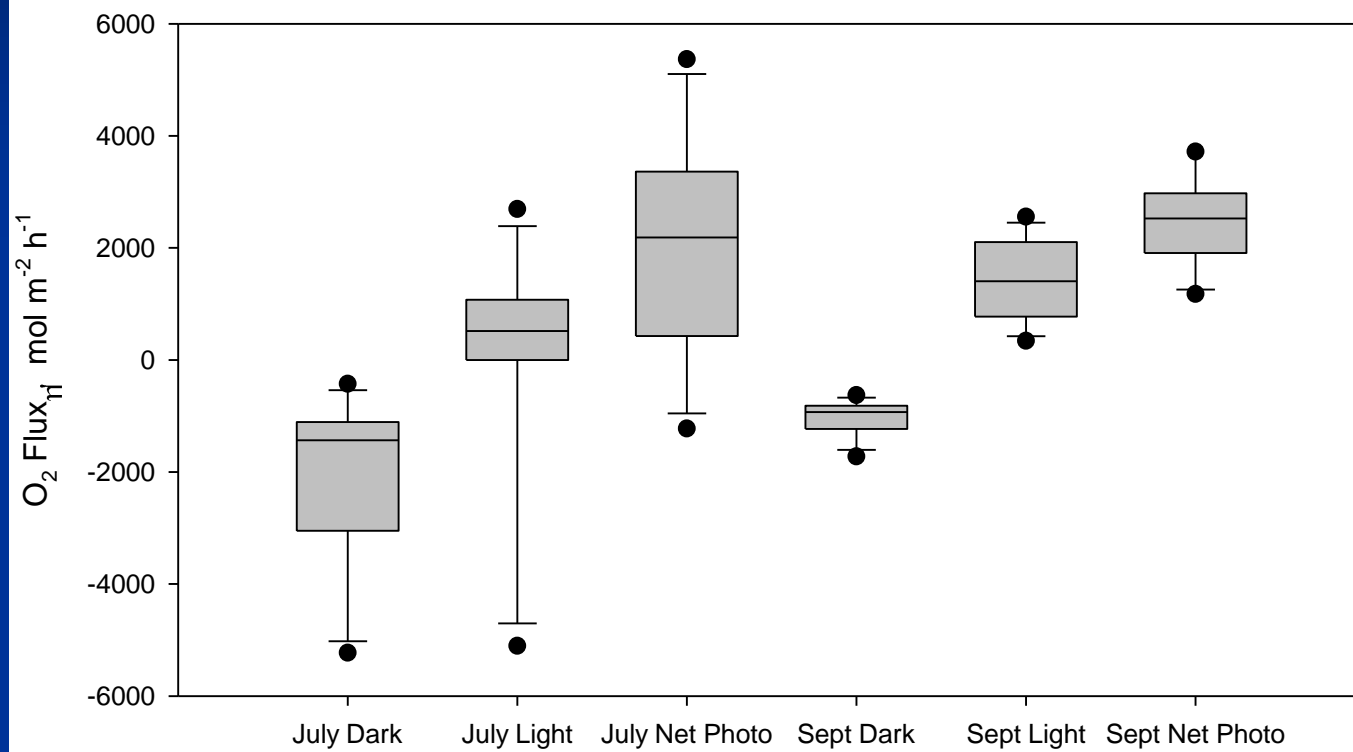
Boxiron Creek

Water Column Respiration (Dark) From Core “Blanks”

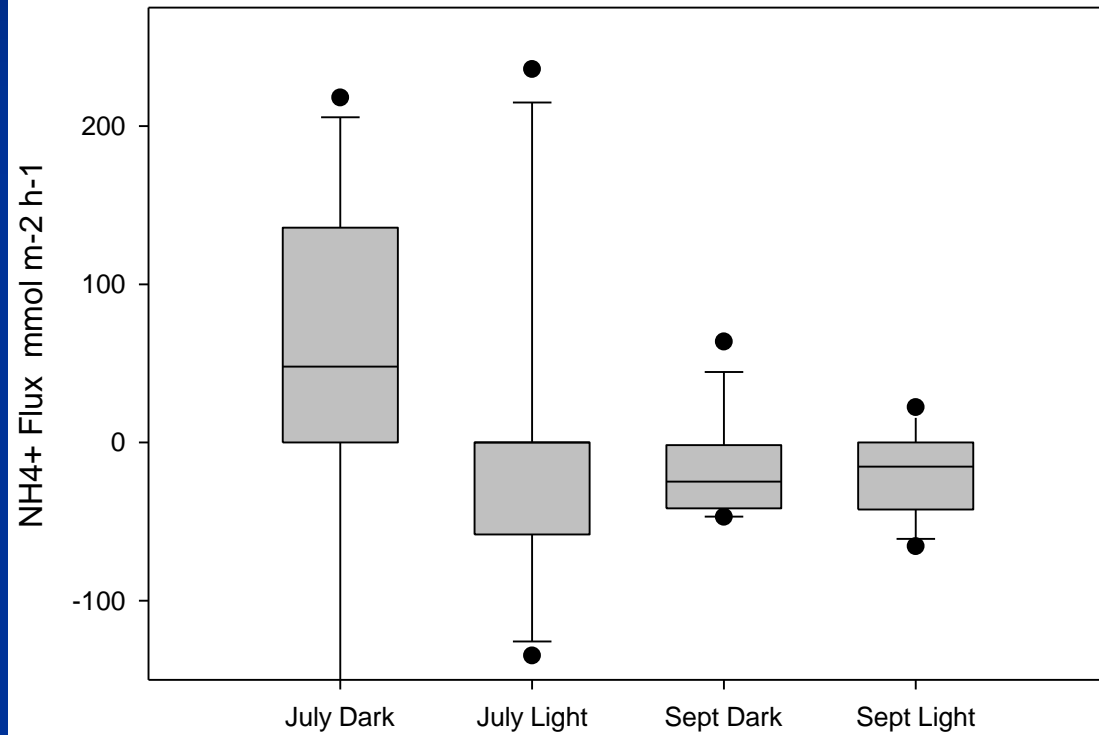
O_2 Uptake $\mu\text{mol L}^{-1} \text{h}^{-1}$



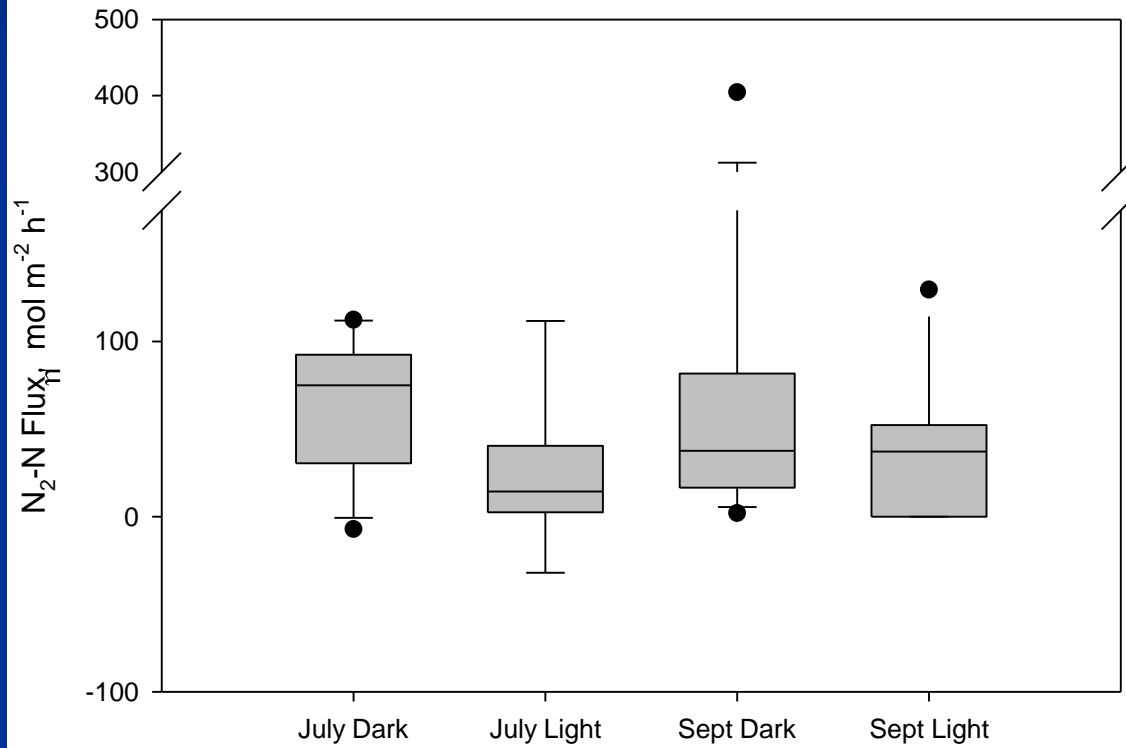
Oxygen Fluxes



Ammonium Fluxes



Denitrification



Conclusions

- The upper marsh environments are highly reducing. They could be important in changing the form of N inputs to the coastal bays
- Ammonium fluxes are moderately high, highly attenuated by benthic photosynthesis by microalgae
- Denitrification rates are generally similar to work in other shallow embayments
- Soluble reactive P fluxes (not discussed) are much higher than observed in typical shallow Chesapeake environments, higher than our observations in other coastal bay environments.