

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

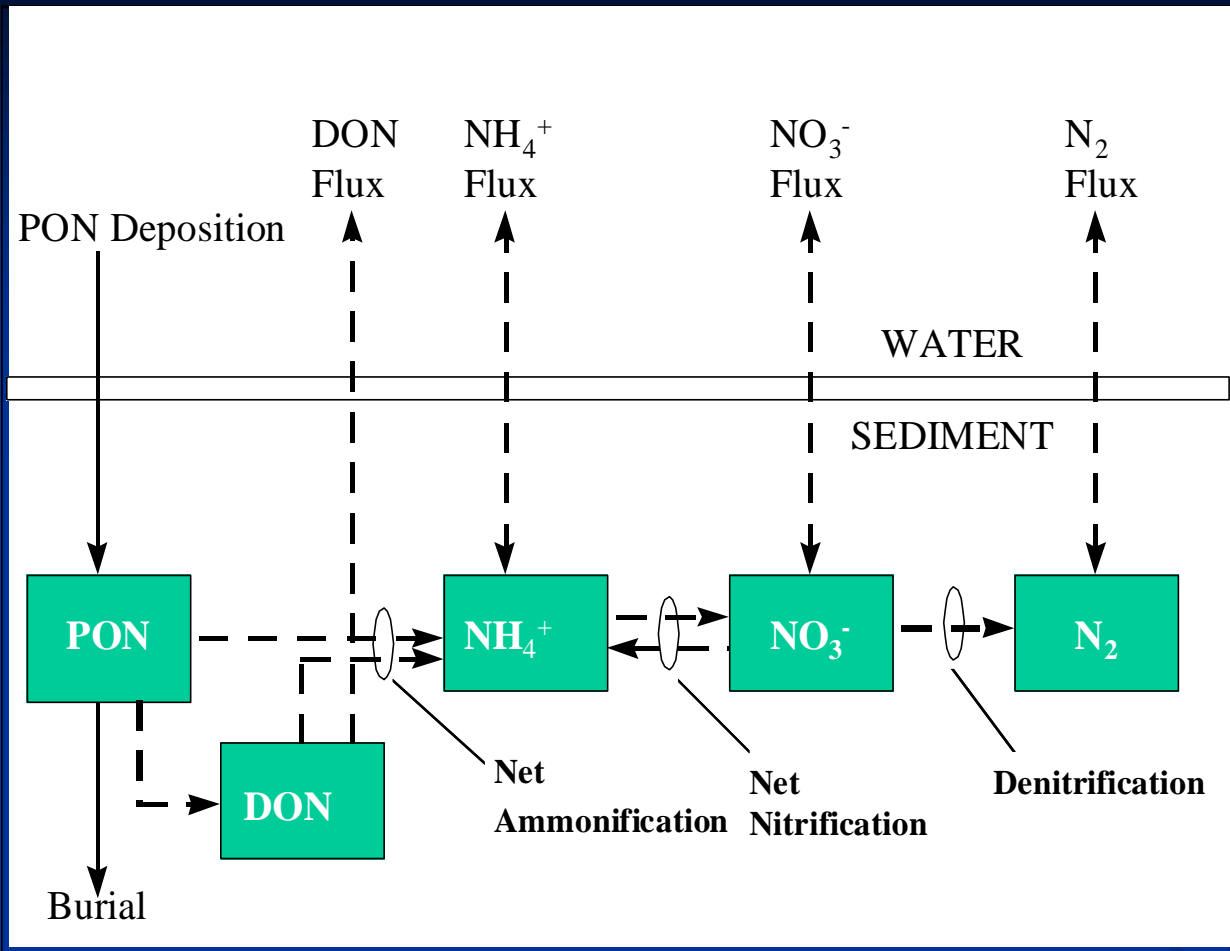
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Questions

- 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

Girdletree

Brockatonorton Bay

Martin Bay

Rattlesnake Island

Upper Scarborough

Rams Horn Tump

Sheldrake Island

Mid Scarborough

Ready Cove Tump

Rowley Cove

Hog Island

JB5

JB1

Robbings Tump

JB6

Tizzard Island

Lower Scarborough

JB4

JB2

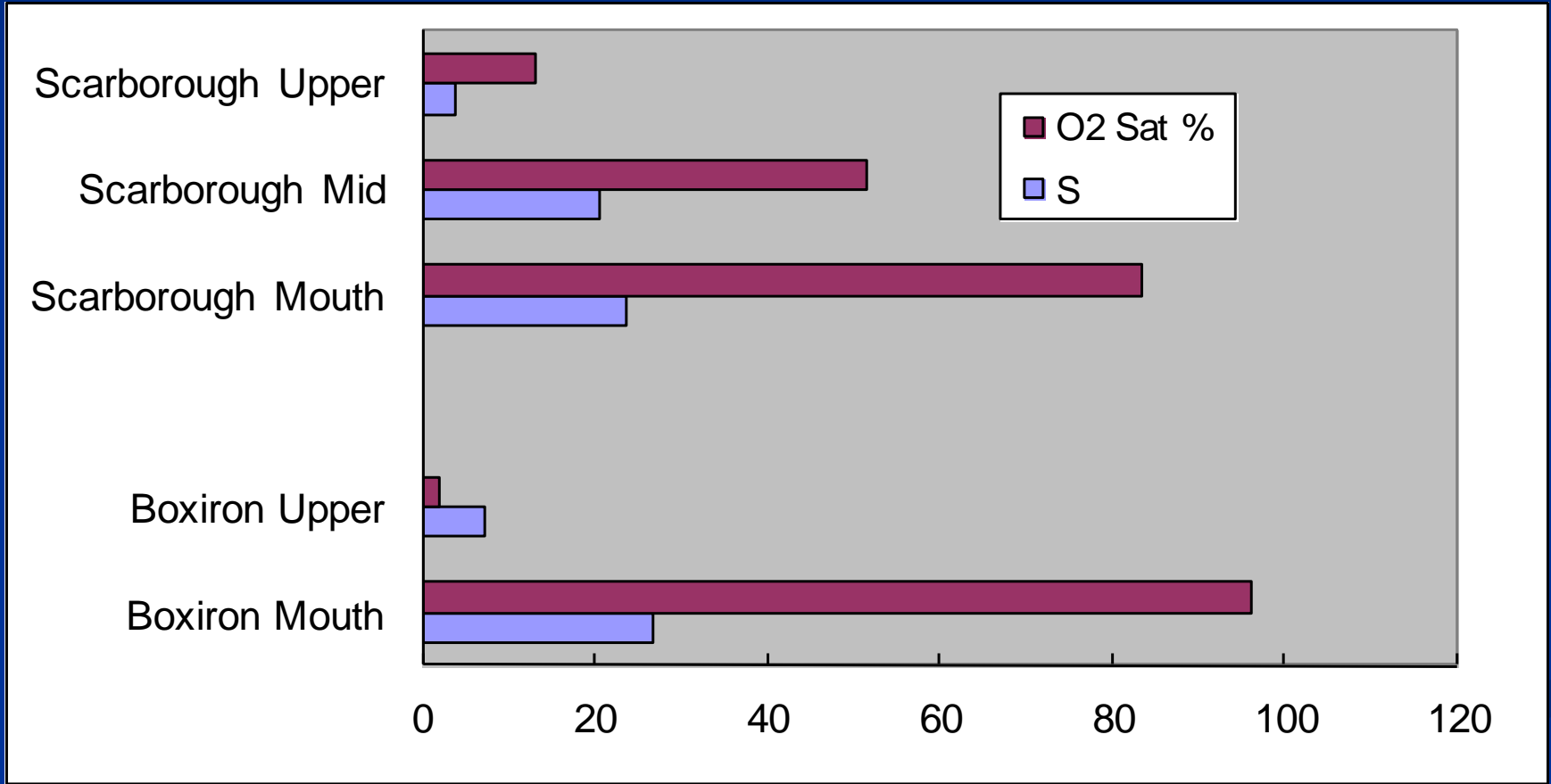
Mink Tump

JB3

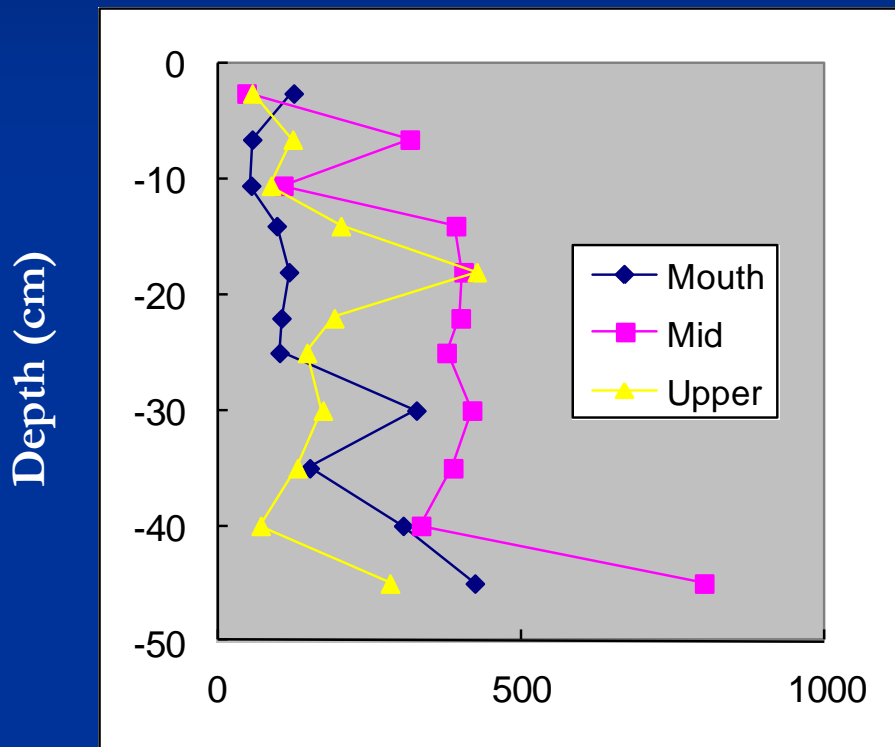
Assacorkin Island

Sassafrae Hammock

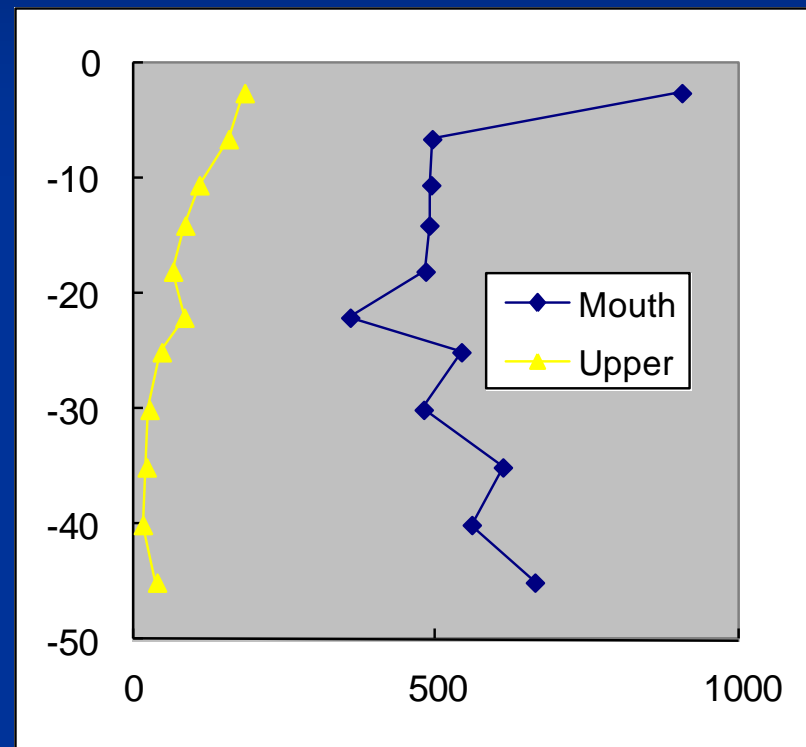
Marsh Environments



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



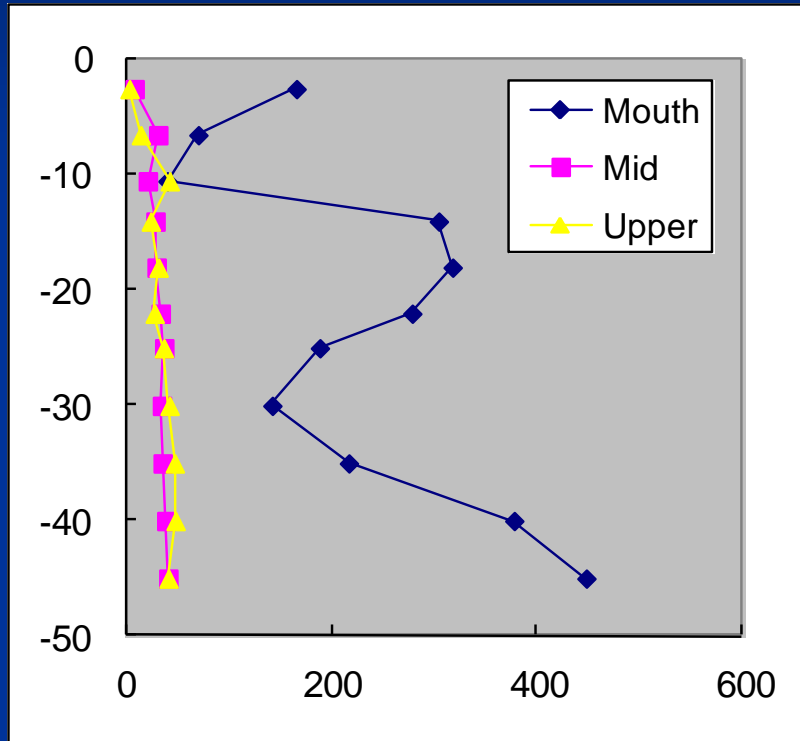
Scarborough Creek



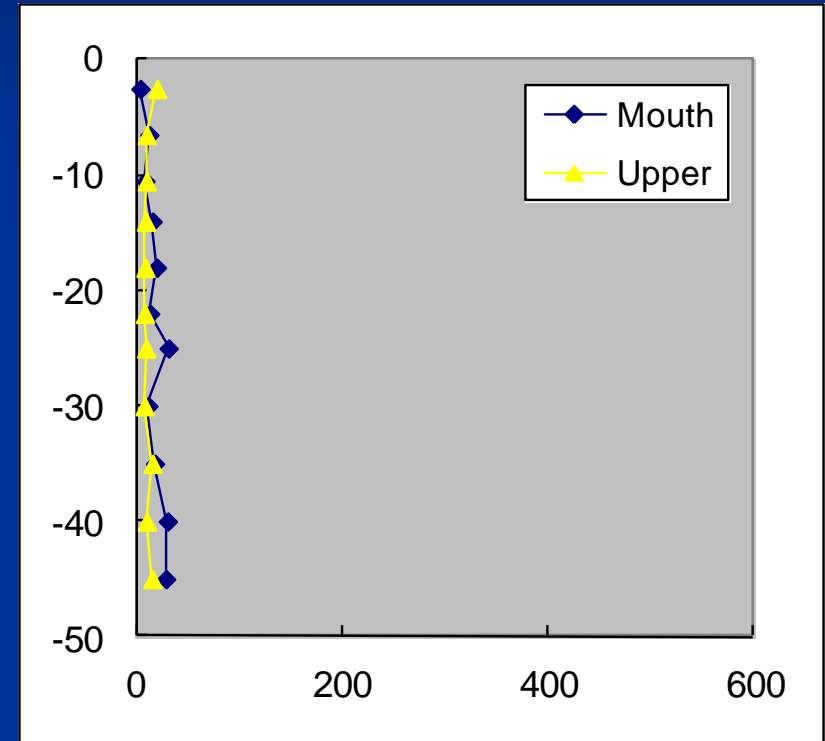
Boxiron Creek

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

Depth (cm)

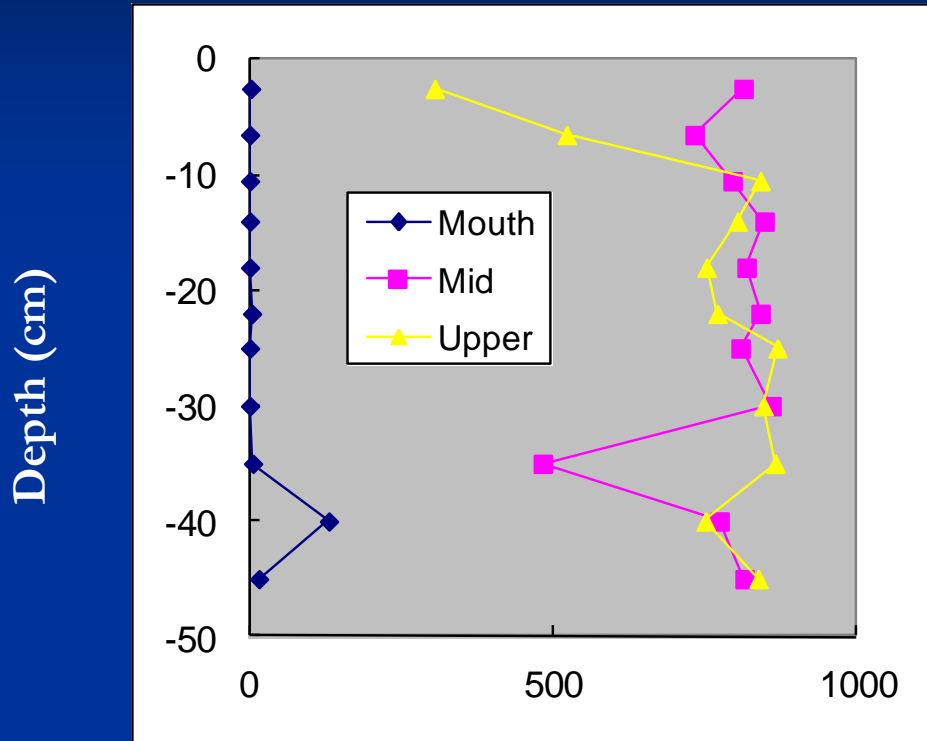


Scarborough Creek

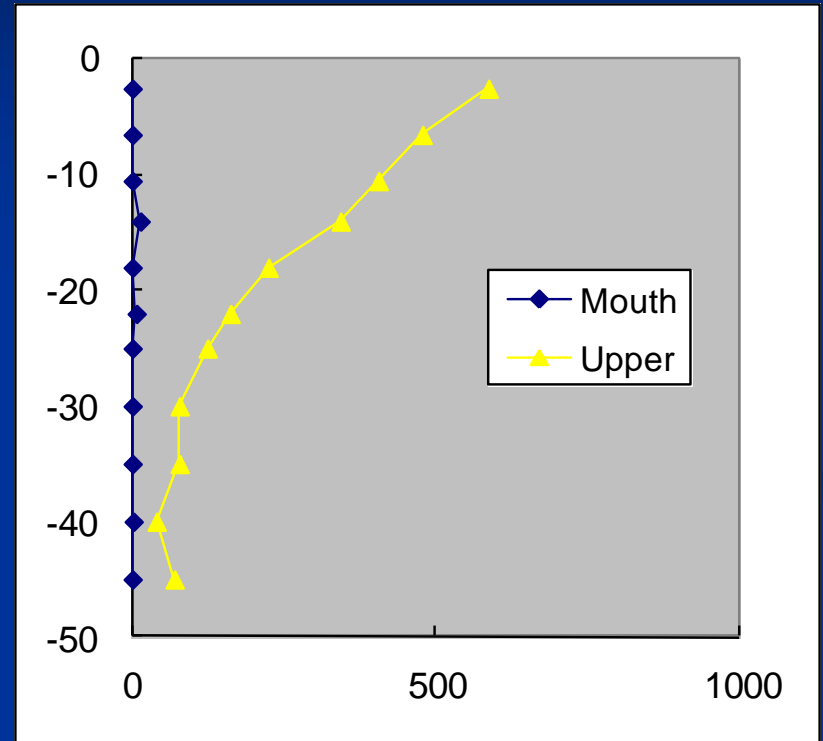


Boxiron Creek

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



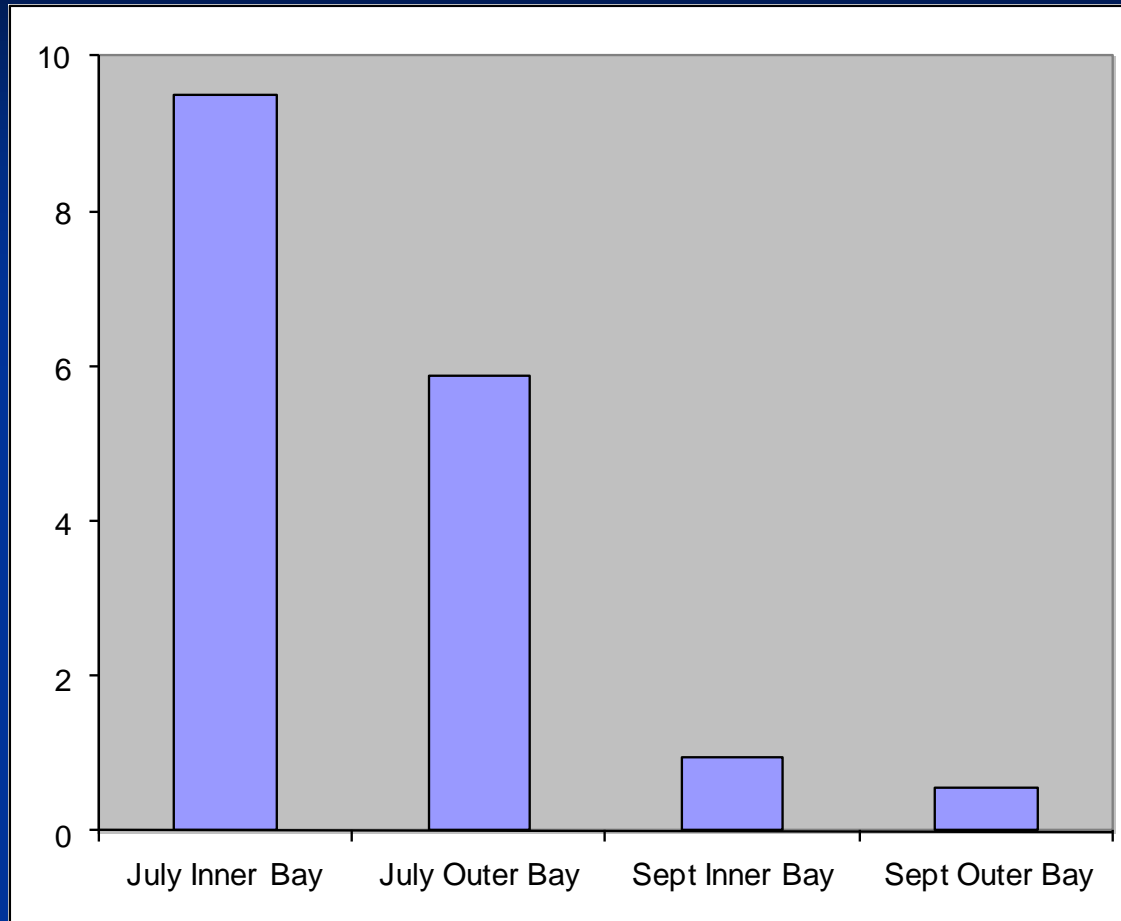
Scarborough Creek



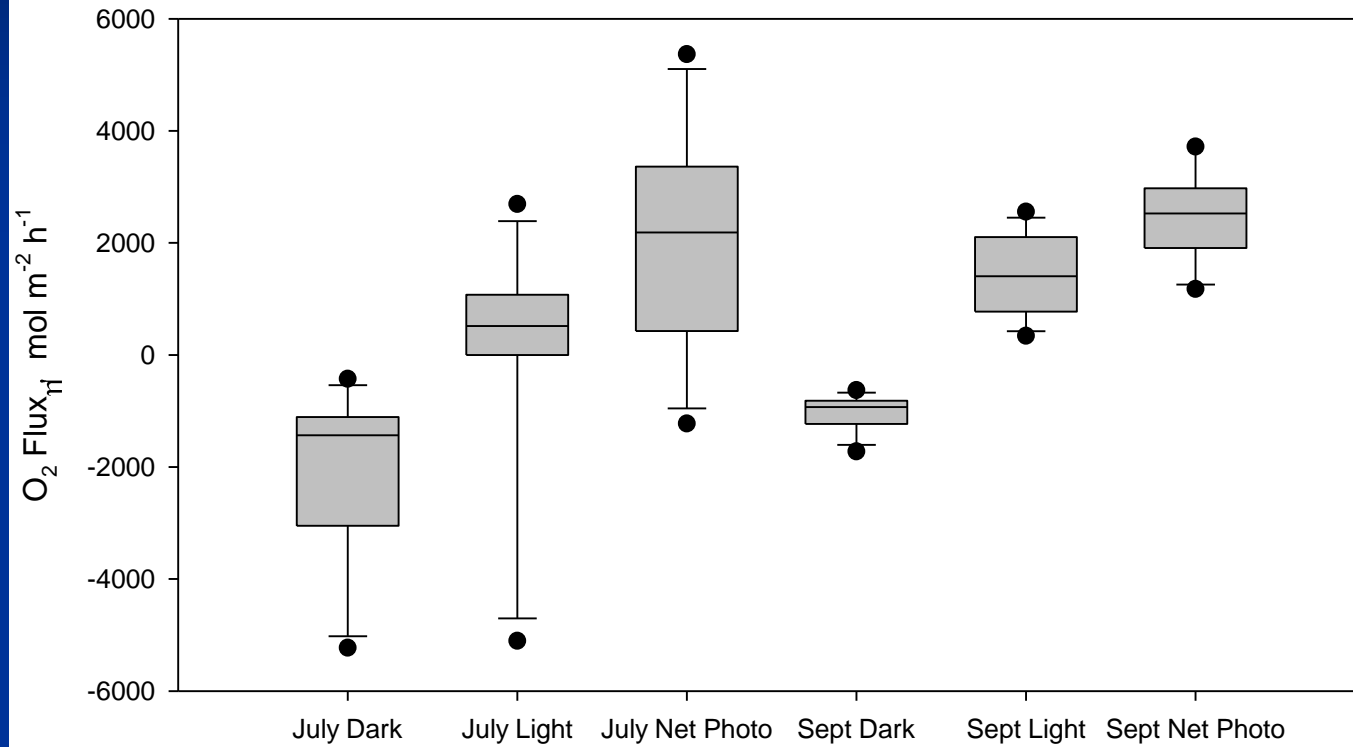
Boxiron Creek

Water Column Respiration (Dark) From Core “Blanks”

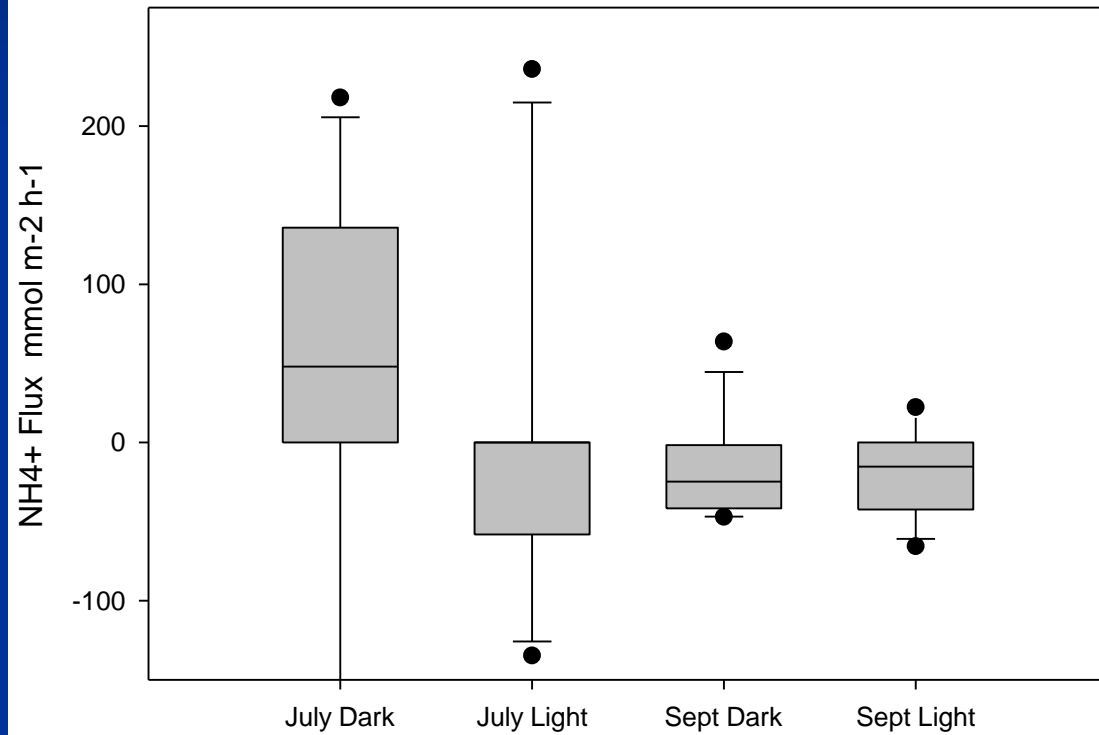
O_2 Uptake $\mu\text{mol L}^{-1} \text{h}^{-1}$



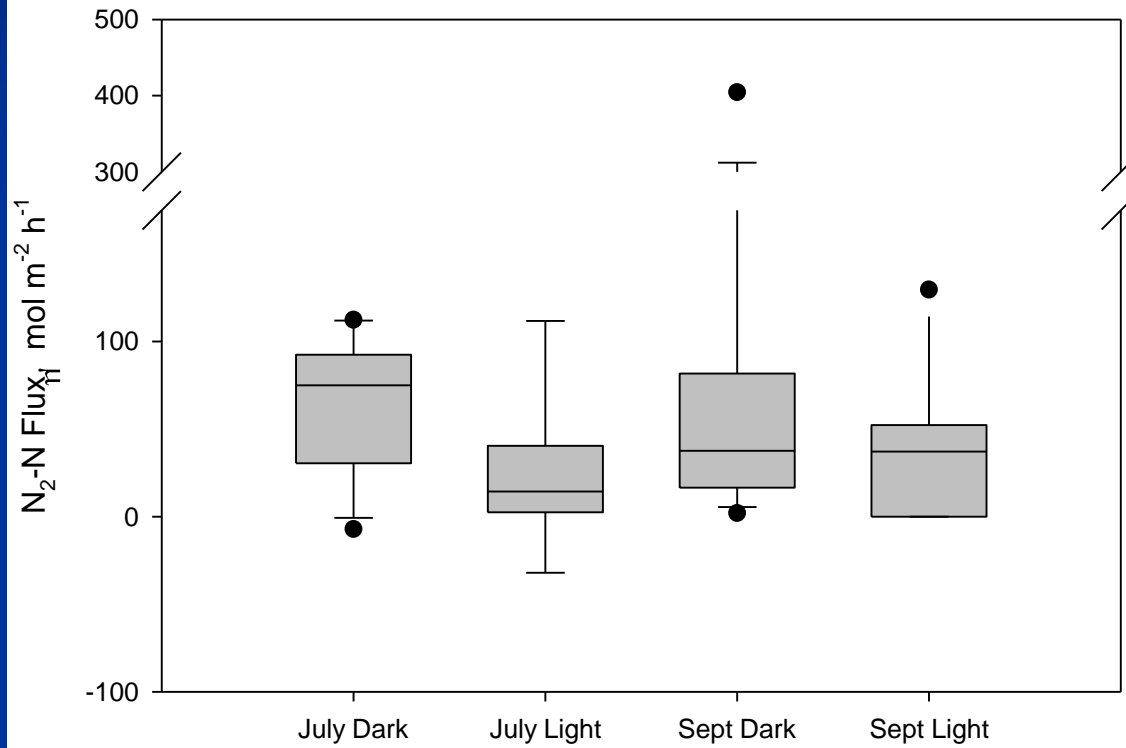
Oxygen Fluxes



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.