

Carbon Composition and Dynamics at the Marsh-Estuary Interface in a Temperate System

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Poster on Tuesday

High-resolution sampling of multiple C pools

Tidal variations in C ~ seasonal variations

Taskinas Creek VA is a sink for estuarine POC

Carbon Measurements at Taskinas Creek VA and Kirkpatrick Marsh MD

Time series: October 2013 – present

Carbon pool concentrations:

25-hour tidal cycle; samples every 2.5 hours
DOC, DIC and POC

Bulk carbon sources: chl a, C:N ratios, $\delta^{13}\text{C}_{\text{POC}}$

Carbon composition (high vs. low tide):

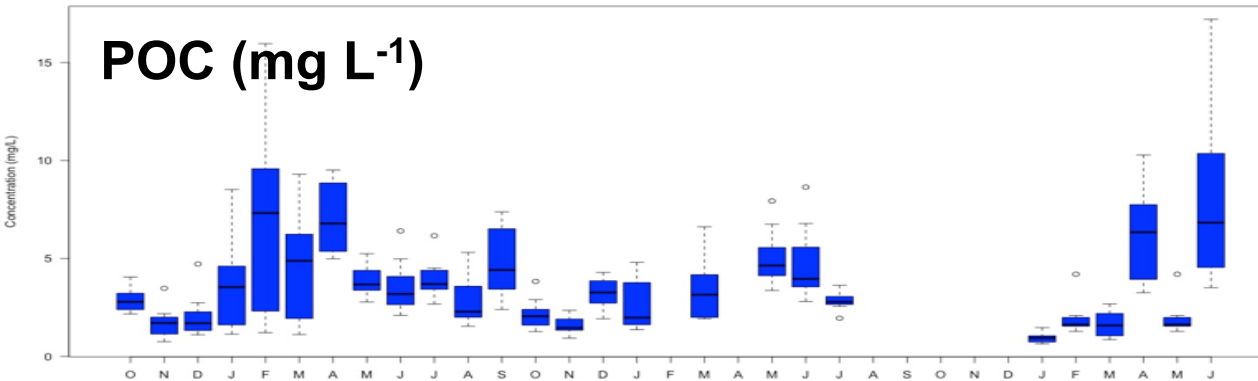
POM: Lipid Biomarker Composition



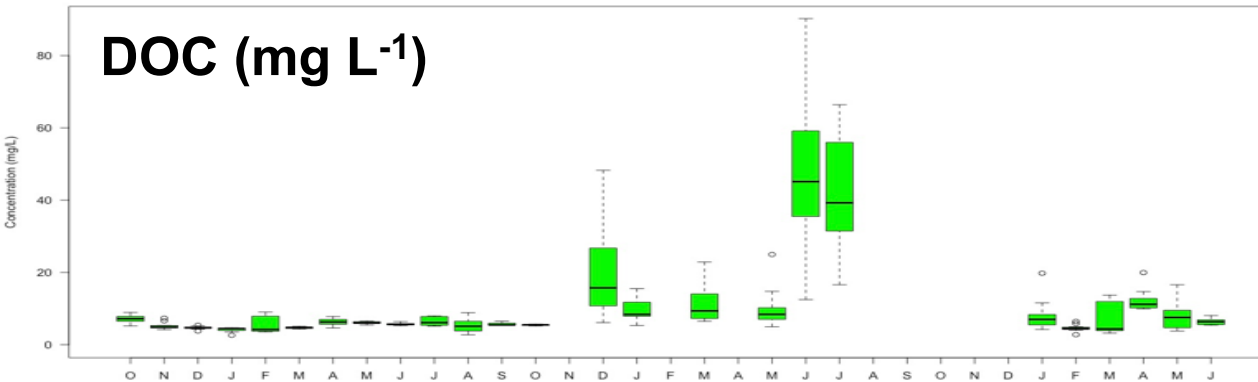
Concentration of Carbon Pools at Taskinas Creek VA

Tidal and Seasonal Differences

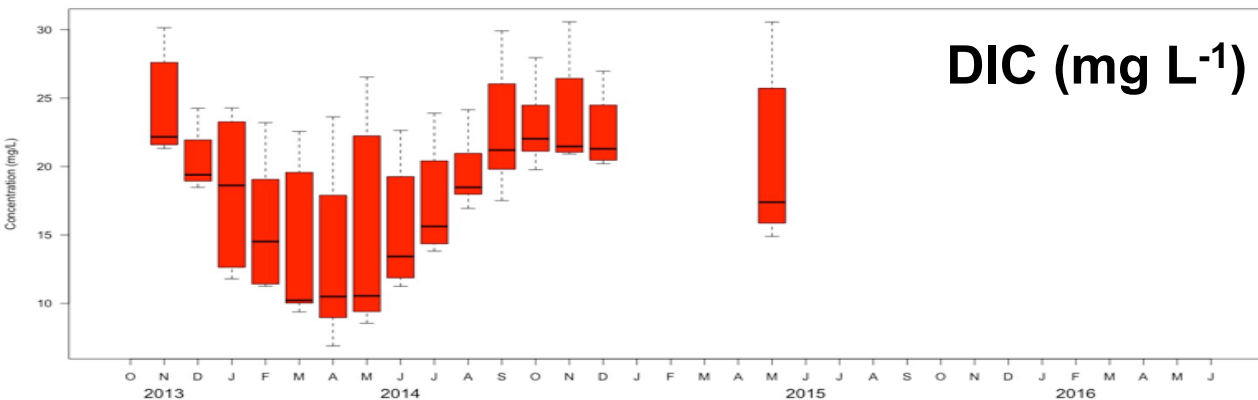
POC (mg L⁻¹)



DOC (mg L⁻¹)



DIC (mg L⁻¹)



Seasonal:

POC: ↑ Spring and Summer

DIC: ↑ Fall

DOC: n/s

Tidal:

POC: HT > LT (estuary source)

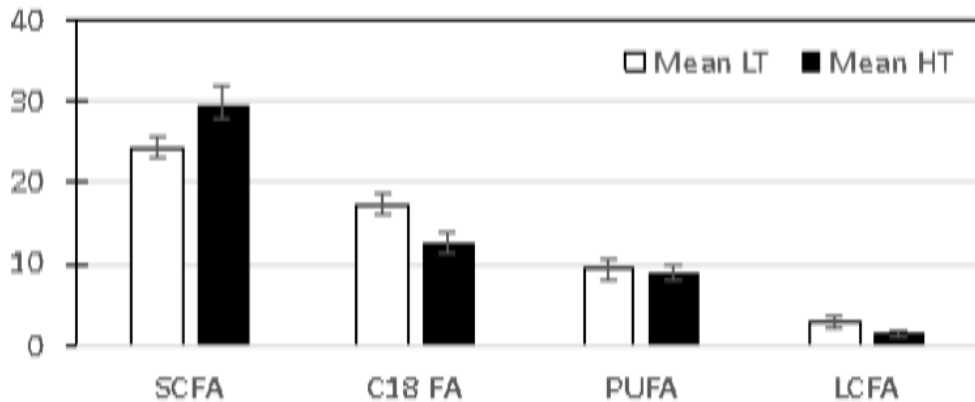
DIC: LT > HT (marsh source)

DOC: HT ~ LT

Tidal variation as great (or greater than) seasonal.

Fatty Acid Composition of POC

Taskinas: % Total FA



aquatic
microbes

marsh,
algal

“fresh”
algal

soil
land plants

POC Sources:

*FA consistent with
estuarine source for POC*

Aquatic microbes (SCFA)
Marsh (C₁₈ fatty acids)

Tidal Effects: HT ~ LT
%C₁₈ FA (marsh): LT > HT

Structural Equation Modeling

