

Temporal Dissolved Organic Carbon Flux in a Georgia Saltmarsh

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Dissolved organic carbon (DOC) is one of the largest and most ecologically relevant pools of carbon in the world, and the Georgia coast houses some of the world's most productive saltmarshes. While the productivity of these marshes is well established, there is a lack of long-term organic carbon studies in Georgia's tidal saltmarsh systems. Furthermore, there is disagreement on the net organic carbon exchange between saltmarshes and the adjacent estuarine system [1, 2], raising the question: Do Georgia saltmarshes outwell DOC? If so, how does carbon export vary throughout the year?

To address the question, Groves Creek, a saltmarsh creek in Skidaway Island, GA was monitored for 18 months (Aug 2013- Feb 2015). Over this time, an in-situ spectrophotometer captured colored-DOM attenuation spectra every 15 minutes (>37,000 readings). Discrete water samples were collected with an autosampler 14x/tidal cycle once every two weeks (>400 discrete samples) and analysed for DOC, dissolved black carbon (DBC), and lignin. Partial Least Squares Regression (PSLR) and the in-situ spectrophotometer data were used to predict the concentrations of DOC, DBC, and lignin at high temporal resolution. Predicted DOC parameters were then coupled to a hydraulic model of Groves Creek allowing fluxes of DOC to be assessed.

[1] Teal (1962), *Ecology* 614-624. [2] Odum (1968), *Proceedings of the Second Sea Grant Conference*, 63-64.