

A WATERSHED-SCALE CHARACTERIZATION OF DISSOLVED ORGANIC CARBON AND NUTRIENTS ON THE SOUTH CAROLINA COASTAL PLAIN

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Dissolved organic matter (DOM) is recognized as a major component in the global carbon cycle and is an important driver of numerous biogeochemical processes in aquatic ecosystems, both in-stream and downstream in estuaries. This study sought to characterize chromophoric DOM (CDOM), dissolved organic carbon (DOC), and dissolved nutrients in major rivers and their tributaries of the South Carolina Coastal Plain to assess the impact of land cover, soils, and other factors on water quality. During eight trips from June 11 to July 9 of 2014 throughout the South Carolina Coastal Plain, we visited 54 sites, where we measured field parameters (temperature, dissolved oxygen, pH, and specific conductance) and collected water samples for laboratory analysis of DOM ultraviolet absorbance and concentrations of DOC and dissolved nutrient. Sample sites included headwater wetlands and springs, streams and rivers, and water table monitoring wells. Spectral analysis of the filtered water samples was done from 200-800 nm using a Shimadzu UV-1700 spectrophotometer. We calculated absorption coefficients, spectral slope coefficients, and related metrics to facilitate broad characterizations of the nature of the CDOM in the water based on source and other landscape factors. We performed principle components analysis (PCA) to further understand variability in the data from a landscape perspective. The highest concentrations of CDOM occurred in black waters and in smaller streams and rivers. There were significant differences in spectral ratios, DOC concentration, and pH among the different water types and stream orders. PCA showed that DOC in black water is strongly associated with the occurrence of wetlands. Land cover associations were more variable in brown and clear water. DOC concentration in blackwater streams was higher in the lower Coastal Plain than in the upper Coastal Plain. This presentation will discuss these and other results of dissolved nutrient analysis and the context within the understanding of Coastal Plain ecological linkages with coastal estuaries.

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