DIFFERENCES IN NET PRIMARY PRODUCTION AND BIOGEOCHEMISTRY BETWEEN CONTRASTING FLOODPLAIN FORESTS

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A firm understanding of the driving forces controlling variation among wetland forests continues to elude scientists and land managers—specifically the biogeochemical processes controlling vegetation production. Within contrasting wetland forests, insight into the biogeochemical processes driving productivity levels may be found by examining the degree to which nitrogen and phosphorus are balanced within the wetland vegetation. Lockaby and Conner (1999) suggest that there exists a biogeochemical continuum for wetland forests based on the relationship between N:P ratios. Koerselman and Meuleman (1996) have indicated that N:P ratios in forest vegetation may serve as a measure of the biogeochemical constraints on vegetation net primary production (NPP). Thus, the position of a particular wetland forest on this N:P continuum reflects the integration of its geomorphic position and biogeochemical history and may have a predictive value with regard to levels of NPP (Lockay and Conner 1999). Ultimately, the synchrony of nutrient availability and plant uptake influences the levels of NPP within wetland forests.

In the Southeastern United States, riverine systems are often broadly characterized as either red-water or black-water systems. Red-water rivers have their origins in the Piedmont and are characterized hydrochemically as rich in nutrients and suspended organic matter. Conversely, black-water rivers, having their origins within the Coastal Plain, are poorer in both. Within these systems, the contrasting quality of detrital inputs influences the mineralization and immobilization patterns governing nutrient availability.

The purpose of this study is to examine and characterize the biogeochemical processes influencing nutrient availability and levels of NPP within two wetland forest types. The river systems being used for this study are the Altamaha River, a red-water river system, and the Satilla River, a black-water river system. In 1999, annual litterfall mass for the Altamaha and Satilla Rivers totaled 8.3 and 6.1 t per hectare per year, respectively. Other data to be presented from this study include: aboveground woody biomass, litter decomposition, microbial biomass C, N, and P, retranslocation efficiency, and soil nutrient availability.

Data to be presented for each of the aforementioned foci are the year-one results of an ongoing study.

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