

A PRELIMINARY STUDY ON BIOLOGICAL INDICATORS AND WATER QUALITY OF OXBOW LAKES IN THE MIDDLE AND LOWER SAVANNAH RIVER BASIN

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Studies have shown that oxbows are important to riverine ecosystem biodiversity, stability, and productivity. Over time oxbows become disconnected from the main river channel resulting in prolonged periods of poor water quality. In this preliminary investigation we sampled two disconnected Savannah River oxbows (Conyers Lake, Possum Eddy), and one connected oxbow (Whirligig) during Fall 2015 for biological, physical and chemical parameters to understand oxbow ecosystems and water quality. We assessed the following: temperature (°C), specific conductance (uS/cm), pH, dissolved oxygen (DO)(mg/L), chlorophyll a (ug chl a/L), and biological indicators such as diatoms and macroinvertebrates. We found that Conyers Lake had the highest Hilsenhoff biotic index (HBI=8.15), the lowest average temperature (M=22.49, SD=5.83), specific conductance (M=72.9, SD= 2.28), chlorophyll a concentrations (M=27.79, SD=2.28) and no diatom species indicative of eutrophic conditions. Whirligig had the lowest HBI (7.44), average DO (M=4.41, SD= 2.09); 51.27% saturation, and average pH (M=7.29, SD=1.34), but the highest mean specific conductance (M=94.43, SD=2.92), and diatom species indicative of eutrophic conditions (*Nitzschia amphibia* and *Discostella stelligera*). Possum Eddy had the highest average temperature (M=26.26, SD=5.22), pH (M=9.31, SD= 1.29), DO (M=7.25, SD= 2.60 mg/L); 89.07% saturation, chlorophyll a concentrations (M=84.35, SD= 2.11) and the most abundant diatoms indicative of eutrophic conditions (*Aulacoseira ambigua*, *A. granulata*, and *A. granulata* var. *angustissima*). Because chlorophyll a concentrations and eutrophic diatom species were not reflected in the HBI values and low DO values were found in the oxbow with the lowest HBI values, the HBI may not be the best index for measuring water quality when investigating nutrients in oxbow habitats. Given the HBI is traditionally used for evaluating streams and rivers, and the data in this study were taken from one sampling event close to the end of a flood, a more extensive study is recommended to draw conclusions about correlations between biota and nutrients.

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