CREATING DIATOM VOUCHER FLORA, INVESTIGATING SAMPLING METHODS AND POSSIBLE *GOMPHONEMA PARVULUM* MORPHOTYPES FOR SOUTHEASTERN TRIBUTARY UPPER THREE RUNS CREEK.

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Water quality monitoring through biological assessments is important for collecting and analyzing data concerning nutrient enrichment. Nutrient loading has lead to degradation of fresh water ecosystems and surface water resources. The mediation of impacts caused by nutrient enrichment has cost the United States billions of dollars annually. Due to the scarcity and necessity of these resources to provide potable water, productive fisheries, and safe recreational areas, it is imperative that the water quality of these systems is protected. Diatoms have been found to indicate changes in water quality better than other biota (fish and macroinvertebrates) currently used in biological assessments. Therefore, understanding diatom biodiversity would yield insight about the eutrophication of an ecosystem and consequently its protection. However, diatom biodiversity in the southeastern United States remains largely unknown. To better understand diatom communities and condition gradients, the U.S. Geological Survey and other North American institutions have created "voucher flora" consisting of light micrographs of samples with corresponding names associated with each diatom and project. The Savannah River is one of Georgia's largest rivers, which provides potable water to an estimated 1.4 million people. Upper Three Runs Creek (UTRC) is a tributary of the Savannah River, and is known as a southeastern biodiversity hotspot. This creek is designated by the Savannah River Site to receive minimal anthropogenic impacts and serve as a control site in scientific studies. The Academy of Natural Sciences of Philadelphia used diatometers in past water quality assessments of UTRC. These studies found and overwhelming dominance (75%) of *Gomphonema parvulum*, making conclusions about water quality difficult. In this study: 1) we created a voucher flora for an upstream site along UTRC, 2) compared algal biodiversity estimates from different sampling methods, and 3) assessed possible *G. parvulum* morphotypes from this study and past studies. Our methodologies consist of collecting samples from two periphytometers (deployed from both the right and left banks of the creek) and composite samples. High diatom biodiversity at our site and species richness similarities across collection methods are discussed.