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**Instream Swamps and their Influence on Dissolved Oxygen Levels
within Blackwater Streams on the Southeastern Coastal Plain**

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Abstract:

Blackwater streams on the southeastern Coastal Plain are distinguished by violation of the state's dissolved oxygen (DO) standard leading to the requirement of TMDL development. These streams are characterized by low slopes, high summertime temperatures, and extensive inundation of surrounding floodplains. Typically lasting from winter to early spring, the long inundation period creates a multitude of instream floodplain swamps that play a vital role in overall water quality. This project investigated the influence of these instream swamps on a watershed scale and specifically the influences of sediment oxygen demand, distribution of organic sediments and role of hydrology sediment oxygen demand. One of the hypothesized reasons for the lowered DO levels in this system is the slow movement of water and extended contact with the underlying sediments. This talk investigates the movement of water through two representative instream swamps using hydrologic tracers and modeling through a one-dimensional solute transport model with components for inflow and storage (OTIS). Preliminary analysis supports the idea of extended travel times through these instream swamps with prominent transient storage. When coupled with intense oxygen demand in the underlying sediments, these instream swamps play a critical role in overall watershed oxygen dynamics and lend support to these systems being naturally low in DO.

Impact Statement:

Our results will assist environmental decision makers to establish dissolved oxygen standards that reflect natural conditions of the Coastal Plain. Without a good understanding of these complex processes, we will never be able to truly understand, nor predict DO concentrations. Our regulatory agencies may continue investing taxpayer funds to solve a water quality problem that may not be a problem after all.

Category: Watershed Assessment and Restoration

Type of Presentation: Oral Presentation