

IMPACT OF HYDROLOGIC REGIME ON SOIL ORGANIC MATTER ACCUMULATION IN A STORMWATER TREATMENT WETLAND

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Despite covering only 6% of Earth's land surface, wetlands store nearly one-third of global soil carbon, making them critically important for global climate regulation. Human-made wetlands, including stormwater wetlands, also store carbon; however, carbon accumulation rates and their primary drivers can vary widely in such engineered systems, prompting additional study. Here, we report the results of a case study of the impact of hydrologic regime on soil organic matter (SOM) content within the Stormwater Ecological Enhancement Project (SEEP) in Gainesville, FL. The SEEP is a three-acre bioretention pond within the Natural Area Teaching Laboratory on the University of Florida campus. The SEEP was designed to improve water quality by increasing stormwater retention and filtration, as well as to provide habitat and interpretative and educational opportunities. Additionally, the SEEP has several designated treatment areas which are typically waterlogged, promoting anaerobic conditions, which facilitate organic carbon accumulation. We hypothesized that low-lying areas with high nutrient loading, dense vegetation, and consistently saturated conditions will have the highest organic matter accumulation rates. Replicate soil samples of at least 25 cm depth were collected across wetland zones, dried, and burned in a Muffle furnace following standard loss on ignition (LOI) procedures to determine organic matter (OM) content. The OM results were compared to studies from 2003 and 2012, as well as between the different SEEP zones, using a two-factor ANOVA. Preliminary results showed the highest OM accumulation rates in the SEEP's initial forebay and in the deepest areas of cypress swamp. Overall, this study aims to compile existing and newly gathered SEEP data into a comprehensive report to document changes in OM% over time and to demonstrate the potential of the SEEP (and other similar stormwater wetlands) to uptake and store carbon.

PRESENTER BIO: Alexandra is an environmental engineering undergraduate at the University of Florida. She is especially interested in manmade wetlands, equity in public policy, and interactions between humans and the environment. In her spare time she enjoys painting and exploring local trails.