

VEGETATION EFFECTS ON GREENHOUSE GAS PRODUCTION IN SUBTROPICAL WETLAND SOILS OF THE NATIONAL ECOLOGICAL OBSERVATORY NETWORK

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Wetlands are a major source of global greenhouse gases including carbon dioxide (CO₂) and methane (CH₄) and are very sensitive to climatic changes such as warming and precipitation. The National Ecological Observatory Network (NEON) provides long-term data on ecosystem processes including greenhouse gas production rates of various ecosystems. The UF Ordway Swisher Biological Station (OSBS) is a NEON site with a variety of wetland system types including lake fringe, emergent marsh, and riverine forest. Currently, there are no greenhouse gas production estimates for the OSBS wetland types. This study sought to determine rates of CO₂ or CH₄ production for various OSBS wetlands, with a hypothesis that CO₂ and CH₄ production rates will differ as a function of vegetation-related soil characteristics. In support of our hypothesis, both soil (total and extractable carbon and nitrogen) and microbial (microbial biomass carbon and nitrogen) were significantly different between the different wetland types with higher values observed for more continuously flooded zones of the emergent marsh or hardwood swamp. Similarly, differences were also seen in greenhouse gas production rates between the sites with highest rates being found for sites with highest overall soil carbon (total and extractable), and in the case of CO₂ production, N availability. Results of this study provide baseline data for long-term monitoring of greenhouse gas production at these sites where changing climate may affect hydrology and vegetation of these sites leading to altered greenhouse gas emissions.

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