

**Soil and Water Sciences Department  
Graduate Student Exit Seminar**

**Speaker:** Elise Morrison  
**Ph.D. Degree Candidate**

**Advisor:** Dr. Andrew Ogram and Dr. Ben Turner

**Title:** **Microbial Community Dynamics  
Along Peatland Nutrient Gradients**

**Date:** Monday, June 12, 2017

**Time:** 3:00 pm – 4:00 pm

**Location:** McCarty Hall A, Room G186



Tropical and subtropical peatlands are among the most carbon (C) dense terrestrial ecosystems on earth, and sequester approximately 40-90 Gt of C globally. Microbial communities are dynamic, critical components of peatland soils, regulating numerous peatland processes ranging from C degradation to nutrient cycling. Despite their importance for global biogeochemical cycles, our understanding of the structure and function of microbial communities within lower-latitude peatlands is limited. Phosphorus (P) can be a critical driver of ecosystem processes, but the effects of P availability on peatland microbial communities have not been thoroughly investigated. This work analyzes the structures of microbial communities along P gradients within tropical and sub-tropical peatlands to better understand the fundamental microbial community dynamics within these sensitive ecosystems. This research focuses on two peatlands: San San Pond Sak (SSPS) in Bocas del Toro, Panama, and Water Conservation Area-2A (WCA-2A) of the Everglades in South Florida, USA. Our objectives were to: (1) characterize the prokaryotic and fungal community composition along each gradient; (2) identify the key microorganisms within each system; and (3) evaluate trends in microbial diversity and community-level traits for each location. Metabarcoding was conducted to evaluate the composition of prokaryotic and fungal communities along each P gradient. We found that both prokaryotic and fungal community composition shifted along each gradient. Members of the *Alphaproteobacteria* were seen in greater abundance in low-P zones. Additional sequencing of an alkaline phosphatase gene along the WCA-2A gradient found a high proportion of sequences were assigned to *Alphaproteobacteria*, further suggesting that this bacterial class may be an important component of low-P peatland communities. In addition, we found that deep soils of both systems tended to exhibit lower alpha diversities and greater indicators of oligotrophic microorganisms when compared to surface soils. These findings suggest that the fundamental dynamics of microbial communities change along gradients of nutrient availability, which may subsequently impact the global biogeochemical processes that they regulate.

For our off-campus students, off-campus faculty, and on-campus students who cannot attend, this seminar can be viewed via live or watched at a later date via this link: [Elise Morrison](#). In addition, all seminars are archived for viewing on our [SWSD Seminar Page](#).