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Soil and Water Science Department Seminar

Speaker: **Christine VanZomeren**
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Title: **Biogeochemical Cycling of Organic Nitrogen in Subtropical Wetlands**

Date: Friday, April 10, 2015

Time: 3:15 pm

Location: McCarty Hall A Room G186

Wetlands are known to accrete organic nitrogen (N). Approximately 95% of soil total N is in the organic form. The main source of bioavailable N to biological communities is through mineralization of soil organic N (SON). The SON mineralization rate is regulated by a number of external and internal drivers including vegetation type and nutrient loading. Although the importance of SON is widely recognized, less than 50% of SON forms are identified. The overall objective of this study was to determine the biogeochemical controls regulating SON mineralization in subtropical wetlands, using the Florida Everglades as a case example. The SON composition was determined using a modified chemical fractionation and mass spectrometry methods. Vegetation type (emergent and submersed aquatic vegetation) had no significant effect on SON mineralization rates or the relative proportions of gross SON pools. However, vegetation type was important in determining the molecular weights of N-containing formulas present in the SON. The results indicate N limitation, suggested by microbial biomass N to phosphorus (P) ratios, was a more important driver of SON mineralization than vegetation type. Conversely, nutrient loading, especially P increased the rate of SON mineralization. Loss of labile SON pools, mainly amino acid N, and an increase in more recalcitrant SON pools occurred with higher SON mineralization rates. Increased N mineralization reduced the percent of N-containing formulas present as protein-like compounds and increased the percent of N-containing formulas present as aromatic-like compounds, suggesting a selective loss of labile N and concentration of more recalcitrant aromatic molecular N formulas. Despite efforts to decreased P enrichment in the Everglades, increased recalcitrance of SON may result in the release of stored soil P as primary productivity is constrained by N availability, extending the time required for restoration and risks enriching downstream pristine wetlands with excess P.

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