Plan I Master's Thesis Defense

Thursday May 22nd, 2014
9:00 am, Martha Parham Hall 124

" Determining the impact of oil contamination on coupled nitrification-dentirification processes in *Juncus roemerianus* and *Spartina alterniflora* marshes: A greenhouse study "

Diane Schneider

Abstract - Salt marshes along the Gulf of Mexico coast can potentially experience frequent exposure to contamination associated with petroleum hydrocarbons. Oiling may affect rates of coupled nitrification-denitrification (CND) in coastal wetlands, thereby affecting nitrogen cycling and nutrient retention. To examine impacts of oil contamination on CND within different vegetation types, I conducted a greenhouse study using two common salt marsh species, *Juncus roemerianus* and *Spartina alterniflora*. Vegetated mesocosms containing one of the two plant species and exposed to one of three oil addition treatments (none, low, and high) were injected with 15N label to quantify the rate of CND over a 24 hour period. Rates of nitrogen retention and loss were determined from aboveground biomass and sediment. Total loss of N was partitioned into losses due to translocation, diffusion, and CND. Results indicated varying responses depending on oil exposure and plant species. CND rates were higher in mesocosms containing *S. alterniflora* than *J. roemerianus*, and when exposed to oil treatments, CND rates in *S. alterniflora* mesocosms decreased with increasing oil exposure, while they increased with increasing oil exposure for *J. roemerianus*. These species-specific differences were also observed for total loss and diffusion of the tracer from surface to deeper sediments. However, plant uptake of nitrogen did not differ between species, perhaps due to the short timeframe of the experiment limiting translocation. These results inform our understanding of oil impacts and species-specific differences in nitrogen cycling and nutrient retention, and provide insight for determining the fate of excess nutrients in coastal wetlands experiencing eutrophication. Wetlands can mitigate nutrient pollution; however, the extent to which this occurs may depend on the species present and may vary in response to disturbances such as oil contamination.