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Soil and Water Sciences Department

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Soil and Water Sciences Graduate Student Exit Seminar

Speaker: **Lorae Simpson**
Ph.D. Degree Candidate

Advisor: Dr. Todd Osborne

Title: **The Impacts of Global Climate Change on Carbon Storage in the Salt-Marsh - Mangrove Ecotone in Florida**

Date: Monday, December 5th

Time: 3:00 pm – 4:00 pm

Location: McCarty Hall D, Room G001

Globally, coastal wetland vegetation distributions are changing in response to climate change. In the southeastern United States, increased winter temperatures have resulted in poleward expansion of mangroves at the expense of saltmarsh, likely altering mangrove productivity, detrital turnover and ultimately ecosystem carbon (C) storage. I hypothesized that increases in mangrove expansion would lead to increases in C storage due to spatial and temporal drivers. To test this hypothesis, mangrove seedling establishment and productivity, and C pools and fluxes were measured along the Atlantic coast of Florida. Findings from this research suggest that floating propagules have optimal establishment after 1 – 3 weeks in wet conditions. Additionally, establishing in full sunlight as compared to partial shade increased seedling total biomass. Current ecosystem C stocks, including aboveground, belowground and soil to a depth of 50 cm, was measured in coastal wetlands across a latitudinal gradient (26° – 29°) of mangrove – to – saltmarsh along Florida's east coast. Interior mangroves had the highest C stocks, followed by fringing mangroves, then the salt-marsh – mangrove transitional zone and then salt-marshes. Soil C comprises the majority of each ecosystem C stock (51 – 98%). At the landscape scale, the coastal wetlands investigated along the Atlantic coast cover 38,532 ha, and may store ~4.8 million Mg of C. Additionally, soil respiration was higher in mangrove plots than in transitional or salt-marsh habitat and was 2.5 times greater in July than in January. Soil CO_2 efflux increased aboveground with nutrient enrichment, while decreasing belowground decomposition. In conclusion, increases in mangrove area and extent will increase total ecosystem C storage, however the magnitude and direction of change is dependent on spatial and temporal drivers.

For our off-campus students, off-campus faculty, and on-campus students who cannot attend, this seminar can be viewed via live this link: Lorae Simpson. In addition, all seminars are archived for viewing at http://soils.ifas.ufl.edu/academics/seminars.shtml.