

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

**Speaker:** Brandy Foley  
M.S. Thesis Degree Candidate

**Advisor:** Dr. Alan Wright

**Title:** Paleolimnological Reconstructions of Two Coastal Dune Lakes  
in Northwest Florida Using Sediment Organic Matter Proxies

**Date:** Monday, April 9th

**Time:** 3:00 pm – 4:00 pm

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

Coastal dune lakes in Northwest Florida frequently exchange seawater with the Gulf of Mexico, but remain undefined in their geomorphology and hydrologic functions due to limited published literature. A 20-year record of surface water quality data indicated that two coastal dune lakes, Eastern and Big Redfish Lake, exhibited significant positive trends in nutrients and chlorophyll indicating shifts towards a more biologically productive system. To gain an understanding of historical changes within Eastern and Big Redfish Lake, paleolimnological analyses of sediment organic matter were conducted. Geochemical signatures of Lead-210, total phosphorus (TP), total carbon (TC), total nitrogen (TN), and stable isotopes  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$  were analyzed to depict historical variability of lake hydrology. Results of these analyses reconstructed historical nutrients, organic matter sources, paleoproductivity and periods of marine or freshwater dominance. Lake sediment cores exhibited significant up core increases ( $p < 0.05$ ) in TP, indicating a change in the lake's nutrient balance. TC/TN ratios demonstrated significant decreases ( $p < 0.05$ ), indicating a shift to autochthonous organic matter sources. A combination of terrestrial C3 plants, freshwater and marine organic matter inputs were revealed through stable isotopes  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$  values. Paleo-productivity inferred from stable isotopes did not correlate with increasing TP indicating that primary productivity may not be the dominant source of organic matter. Periods of marine or freshwater dominance were revealed through stable isotope trends indicating historical variability between both states. This research has improved our understanding of two coastal dune lakes' hydrologic functioning through the last century.

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: [Brandy Foley](#). In addition, all seminars are archived for viewing on our [SWSD Seminar Page](#).