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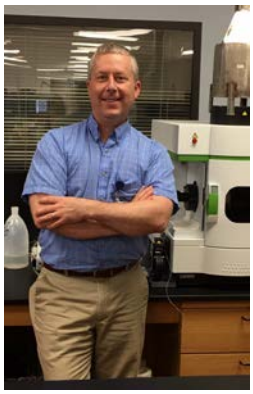
Soil and Water Sciences Department
Graduate Student Exit Seminar



Speaker: **Matt Jablonski**
M.S. Thesis Degree Candidate

Advisor: Dr. Gurpal Toor

Title: Exploring the Efficacy of a Natural Wetland to Attenuate Nutrients and Trace Metals from Urban Stormwater Runoff

Date: Monday, July 31, 2017

Time: 3:00 pm – 4:00 pm

Location: McCarty Hall A, Room G186

A number of natural wetlands have been modified for stormwater treatment in Florida. However, the long-term efficacy of natural wetlands in treating stormwater runoff remains relatively unknown. The study objectives were to investigate the efficacy of a natural wetland to treat nitrogen (N), phosphorus (P), and trace metals originating from urban stormwater runoff and determine the spatial variability of trace metals in the wetland sediments. Water samples were collected from three wetland inlets using grab sampling and outflow (outlet) samples were collected using an autosampler during the 2013 wet season (June to September). Sediment cores were collected from the wetland in May 2013. Concentration of total N in the wetland inlets were 0.13–0.55 mg/L, as compared to 0.35–0.71 mg/L at the outlet. Among N forms, organic N was the most dominant form ranging from 37 to 69% at inlets and 88 to 99% at outlet. The increase in N concentration and proportion of organic N from inlets to outlet suggest that wetland acted as a source of N in outflowing waters. Conversely, total P concentrations were greater in the inlets (0.044–0.073 mg/L) than outlet (0.014–0.037 mg/L) indicating that the wetland was a P sink. Among P forms, PO_4–P was the most dominant form at inlets (52–60%) and other–P was the most dominant form at outlet (71–92%). Concentrations of trace metal were close to detection limits at inlets except Al, Fe, and Mn, where Al were greater in the inlets (142–241 ug/L) than outlet (8–92 ug/L), Fe lower at the inlets (52–97 ug/L) than outlet (93–176 ug/L), and Mn lower at inlets (3–8 ug/L) than outlets (9–39 ug/L) suggesting the wetland was a sink for Al and a source for both Fe and Mn. Trace metals in sediments were greatest in two inlet areas, notably Cu was 481 and 1,097 mg/kg and Zn was 173 and 63 mg/kg at the 0–5 cm depth likely due to the origin of Cu and Zn in stormwater runoff from vehicle tires and brake dust. We conclude that urban stormwater runoff was a source of various pollutants and that the efficacy of wetland systems to attenuate pollutants dependent upon the pollutant type, flow dynamics, and wetland characteristics.

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: Matt Jablonski. In addition, all seminars are archived for viewing on our SWSD Seminar Page.