RECOVERY OF NUTRIENT AND ENERGY CYCLING FOLLOWING HYDROLOGIC DISTURBANCES IN SUB-TROPICAL URBAN STREAMS

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Urban streams are under considerable pressure from multiple anthropogenically-induced stressors. Increased impervious surfaces in the watershed associated with ongoing urbanization and subsequent losses of riparian zones result in increasingly flashy hydrology, altered dissolved organic material (DOM) composition, and rising nutrient concentrations. Following storm events in urban areas, run-off enriches streams with anthropogenically-derived nutrients and DOM from sources such as fertilizers, wastewater effluent, and debris. However, these anthropogenic inputs differ in their composition, bioavailability, and cycling across streams. For example, anthropogenically-derived DOM is more labile than natural sources, allowing it to be more easily processed by microorganisms. Additionally, inputs of nitrogen (N) further support microbial activity. Despite, or perhaps because of, these stressors, urban streams maintain high rates of ecosystem functions, including ecosystem metabolism, which is the combination of gross primary production (GPP) and ecosystem respiration (ER). However, the response of stream metabolism following storms is unclear. To test the effects of multiple stressors on urban streams, we continuously monitored dissolved oxygen, light, and temperature from seven streams along an urbanization gradient to estimate ecosystem metabolism and quantified DOM composition and N concentrations bi-weekly. To assess recovery following storm events, DOM and N were sampled twice daily after storms until streams returned to antecedent conditions. We hypothesize that stream metabolic recovery will be subsidized by anthropogenic inputs of N and increased bioavailability of DOM in urban streams and that GPP and ER will recover quickest in more heavily urbanized systems. We believe that ER recovery will be driven by DOM while GPP recovery will be driven by light availability. Preliminary data suggest that DOM bioavailability increases in more urbanized systems as do nutrient concentrations, except in the most urbanized stream. Results from our study will provide information on how landscape practices affect urban streams' ability to recover and withstand hydrologic disturbances.

<u>PRESENTER BIO</u>: Emily Taylor is a PhD student in the Soil and Water Sciences Department working in the Urban Systems Ecology Lab working with Dr. AJ Reisinger. She is researching the impacts of urbanization on stream ecosystem metabolism and nutrient cycling.