QUANTIFYING THE EFFECTS OF UPLAND PRESCRIBED BURNS ON THE HYDROLOGY OF GEOGRAPHICALLY ISOLATED WETLANDS IN FLORIDA PINE FLATWOODS

Kevin Henson, and ***David Kaplan***
University of Florida, Gainesville, FL, USA

The pine flatwoods ecosystem in the southeastern United States is a fire-dependent mosaic of upland pine savanna and isolated wetlands that comprise approximately 30% of the total land area. These wetlands are important for flora and endemic fauna that depend on them for water use, breeding, and larval development. The hydrology of these wetlands is closely connected to the upland water table and is likely impacted by upland restoration and management, but the magnitude of these connections has yet to be empirically quantified. One such management activity, prescribed burns, are often initiated in flatwoods on a 1- to 5-year cycle and may lower rates of upland evapotranspiration (ET) by removing groundcover plants, with potential effects on embedded wetlands. In this study, we used pressure transducers to measure water level every 15 minutes in three wetlands and their surrounding uplands within a 10-hectare flatwoods plot for one year before and after a controlled burn (i.e., treatment). A similarly sized control wetland with no treatment was also monitored over the course of the two-year experiment and used to develop expected water level and ET response in the experimental plot in absence of the treatment; any deviations were assumed to be caused by the fire. The intensity of the burn was quantified by measuring groundcover and canopy leaf area index before and after the fire, with an average reduction in palmetto groundcover of 12% and shrub groundcover of 19%. We found that all treatment wells had significantly higher water levels in the post-fire period relative to the pre-treatment expectation. We also found an average ET reduction of 108 mm in the treatment block in the year post-fire. This reduction in ET indicates the importance of burns in the fire-dependent pine flatwoods ecosystem for maintaining the hydrology of uplands and isolated wetlands.

PRESENTER BIO: Dr. Kaplan is an Associate Professor of Environmental Engineering Sciences and Director of the H.T. Odum Center for Wetlands. Research in Dr. Kaplan's Watershed Ecology Lab (www.watershedecology.org) focuses on linkages among the hydrological cycle, ecosystem processes, and human activities, with the goal of advancing natural resources conservation and management.