

DIGGING HOLES IN PEOPLE'S YARDS: QUANTIFYING NITROGEN LEACHING FROM RESIDENTIAL SOILS IN ALACHUA COUNTY, FL

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Excess nitrogen (N) entering surface waters and groundwater can cause a range of environmental (i.e., eutrophication) and social (i.e., drinking water contamination) concerns. There are a range of sources and pathways for excess N to reach these ecosystems, broadly split between agricultural or urban sources and surface water or groundwater pathways. Groundwater leaching is particularly concerning in north-central FL where sandy soils overlying karst geology means that water can rapidly move from the surface into the Floridan aquifer. In urban areas, management of residential landscapes has the potential to be a major N source. For this study, we quantified N leaching from residential landscapes throughout Alachua County, FL. We installed 20 lysimeters under either turfgrass lawns or mulched beds within landscapes spanning various socioeconomic gradients (i.e., home age, property value, fertilization frequency). We collected leachate at these sites ~weekly throughout the year, quantifying total leachate volume and N concentrations of the leachate. We estimated total N loads based on the volume and N concentration of leachate. Preliminary data suggest that leaching events vary throughout the year and across locations. Certain lysimeters have never obtained any leachate sample, whereas other lysimeters are full every week regardless of precipitation. Although N loads are dominated by nitrate (NO₃⁻), a non-negligible (up to 20%) of N loads from leachate is organic N. Overall, it appears that N loads leaching from residential landscapes exhibit a bi-modal distribution, with landscapes exhibiting either low or high nutrient export to groundwater. For example, during a 2-month period in Spring 2019, 90% of landscapes leached less than 0.5lbs N/1000 ft², but the remaining 10% leached >2.5lbs N/1000 ft². Identifying the social, economic, and/or environmental factors driving this variability in leaching is essential for developing recommendations to reduce environmental impacts of residential landscapes in rapidly expanding north-central FL urban environments.

PRESENTER BIO: AJ Reisinger is an assistant professor and extension specialist at the University of Florida. His background is primarily in aquatic ecosystem ecology and water quality, and he has been working in urban and urbanizing environments throughout his time at UF.