CAN RESIDENTIAL RAINWATER HARVESTING REDUCE FLOODING IN FLORIDA?

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Rainwater harvesting has gained attention across the globe as a potential method for increasing non-potable water supply and reducing surface flooding during rain events. Effective rainwater harvesting for flood reduction and water supply depends on several logistical factors (e.g., tank size, capture area) and practical factors such as cost of developing the collection infrastructure. Recent attention to eutrophication issues and state-level policy changes in Florida have provided opportunities for existing infrastructure—retired septic tanks—to be accessible for rainwater harvesting. The purpose of this research is to examine whether septic tanks converted to rainwater cisterns could store enough rainwater to appreciably reduce flooding in Florida; and if not, under which set of conditions rainwater cisterns might reduce surface flooding.

I obtained FDOH records that identify methods of wastewater treatment for each parcel in Florida as sewer or septic, and counted the number of parcels on septic in a 10-hectare grid statewide (in approximately 1.7 million cells). Cisterns with volume equal to septic tanks (approximately 5.5 cubic meters, or 1500 gallons) would capture more than 10 percent of a 2-inch rainfall in only a few grid cells statewide, suggesting that rainwater harvesting into retired septic tanks are likely not an efficient means of flood reduction. I then conducted a similar count of parcels in each grid cell on sewer or septic, and examined the potential for rainwater harvesting if all parcels were to store water in cisterns of varying volume. In areas of high housing density, rainwater cisterns of similar magnitude may store 10 to 15 percent of rainfall in a 2- or 4-inch rain event. These results suggest that rainwater cisterns may have some flood reduction benefit under appropriate conditions of parcel density, cistern size, and rain magnitude.

PRESENTER BIO: Dr. Deitch is an Assistant Professor in the Soil and Water Sciences Department located at the IFAS West Florida Research and Education Center in Milton, FL. His research and teaching focus on hydrology, water quality, and watershed management, especially in the Florida Panhandle.