HOW DO URBAN STORMWATER INFILTRATION BASINS TREAT NITROGEN ALONG A HYDROLOGIC FLOW PATH GRADIENT?

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Stormwater infiltration basins are designed to mitigate the potentially negative effect of excess stormwater runoff and pollutant loads in urban environments. The main and original purpose of infiltration basins is flood control, but they may also serve to transform and remove pollutants such as nitrogen (N), though the N removal function of infiltration basins is highly variable and needs further study. So, in this research project, the N cycle processes (mineralization, nitrification, denitrification) and the N removal efficiency in sediments of urban stormwater infiltration basins will be identified and compared along a hydrologic flow path from the inlets of the basins' outward—with the hypothesis that increased sedimentation near the inlet pipe will result in a gradient of soil properties that will in turn lead to a gradient in N cycling and N transport to the underlying groundwater. We present preliminary data of soil physical and chemical properties associated with denitrification, a major process of soil N removal, and demonstrate variability of these properties along the basins' hydrologic flow path and with depth. This data suggests that N-removal treatment by infiltration basin soils will be spatially variable and that stormwater interacting with soils near the basins' inflows may be treated differently than that interacting with soils near the basins' centers. To test this, we combine the investigation of soil N cycling processes with a comparison of basin inflows (stormwater) and outflows (subsurface leaching) during dry and wet seasons and during storm events of various sizes. We will discuss N removal efficiency along basin hydrologic flow paths and relate this removal to soil physical and chemical properties. By identifying the N removal ability of infiltration basins, we could improve their design for increased N removal with solid data support.

PRESENTER BIO: Qianyao is a master student in Soil and Water Sciences major at the University of Florida. She is now studying the pollution of urban soil and water resources. Her dream job is to be an environmental surveyor, but before this, getting a PHD degree is her academic goal