

Understanding the Hydrologic Characteristics and Absorption Capacity of Bioretention Areas

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Advanced Crop and Soil Sciences Seminar

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Miller Plant Sciences Building, Room 2401

Historically, stormwater management has focused primarily on flood control and stormwater diversion into local streams and rivers, but with the introduction of low impact development techniques, such as bioretention ponds, management strategies are now able to focus on on-site treatment of both water quantity and quality issues. From a water quantity stand point, bioretention areas are thought to help restore pre-development hydrologic conditions by providing storage for stormwater runoff. A new bioretention area located off New River Rd on the University of Georgia, Athens campus, will be monitored to accurately determine the hydrologic impacts of bioretention areas. We will calculate the water balance of the bioretention area using measured inflow and outflow volumes, time domain reflectometry data, and precipitation records. Hydrographs from each storm event will be measured and used to evaluate the hydrologic impact bioretention areas have on urban areas. From a water quality stand point, bioretention areas have been shown effective in retaining large volumes of runoff pollutants and consistently reducing pollutant concentrations in stormwater runoff although, there is concern surrounding pollutant accumulation and how long optimum pollutant removal can persist. To further investigate this issue, water quality samples will be collected from the inflow and outflow waters of the bioretention area and analyzed for total Kjeldahl nitrogen, oil and grease, total phosphorus, heavy metals, biochemical oxygen demand, *Escherichia coli*, and total suspended solids. Long term pollutant accumulation will be estimated based on soil samples collected from an undetermined number of bioretention areas of different ages. The soil samples will be collected at three different depths and analyzed for pH, cation exchange capacity, organic matter percentage, and particle size distribution. These data will be used to estimate the soil absorption capacity and recommend maintenance practices to ensure that the proper functioning of bioretention areas is maintained over numerous storm events.

REFERENCES

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