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### RAIN GARDEN NETWORKS: IMPACTS ON WATER QUALITY

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**ABSTRACT** Rain gardens are promoted as a best management practice to reduce overland runoff in communities where impervious surfaces are widespread. Benefits of stormwater mitigation include fewer combined-sewer overflow events, reduction of watershed discharge volume and partial reduction of pollutant loads via biofiltration. There is extensive literature detailing hydraulic and chemical behaviors of individual bioretention cells and a growing number of network models, but currently no peer-reviewed studies on implemented networks of rain gardens. Starting in February 2009, two adjacent neighborhoods of comparable size and residential density (0.05 sq.mi., ~33 homes) in Westerville, Ohio were monitored for storm water discharge before and after the construction of residential rain gardens (14 downspout, 6 street-side) in one neighbourhood. The other neighbourhood was monitored as a control site to provide a reference for each storm event during the three year experiment. Flow data was collected at the outfalls of storm sewers for each neighbourhood. A weather station and rain gage were installed to calibrate flow data to specific storm events. The rain gardens will be installed during a 28-day period starting June 2010, allowing for four months of baseline discharge data collection. Models show rain gardens decreased total runoff in the experimental neighbourhood by 50% or greater (confirmed by data collected in spring of 2010). Water samples were collected from the outfalls and channels during storm events and analyzed for TN, TP and DOC to understand the impact of overland runoff from residential yards and roads on water quality in the drainage channel.

**Keywords:** Rain gardens, Bioretention, Biofiltration, Community networks.