USGS

WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2002WI3B

Title: Field Evaluation of Raingardens as a Method for Enhancing Groundwater Recharge

Project Type: Research

Focus Categories: Water Supply, Water Quantity, Water Use

Keywords: groundwater recharge, raingarden, runoff, urban, storm water, experiment, field test, Wisconsin

Start Date: 01/01/2001

End Date: 01/01/2002

Federal Funds: $24,431

Non-Federal Matching Funds: $28,633

Congressional District: WI - 2nd

Principal Investigators:
Anders W. Andren
University of Wisconsin - Madison

Kenneth W. Potter
University of Wisconsin

Abstract

In urbanized areas of Wisconsin that rely on groundwater as the primary source of water, groundwater withdrawals significantly exceed groundwater recharge rates. This can lead to environmental degradation, as it reduces the discharge of groundwater to springs, wetlands, streams, and lakes and their associated ecosystems. Raingardens, sunken gardens that receive stormwater runoff, appear to offer a solution to groundwater loss. In an ongoing research project, the PI has used a numerical model to demonstrate that a raingarden with area equal to 10% of the connected pervious area can double the local groundwater recharge rate. The explanation of this surprising result is that focusing of runoff to a small, highly pervious area greatly reduces losses to evapotranspiration.

Before raingardens are widely implemented, they should be tested through carefully designed demonstration projects. The purpose of the proposed project is to undertake this testing at one or more experimental raingardens. At each experimental raingarden we will monitor precipitation, inflows, soil moisture, outflows, and seepage from the root zone. We will also numerically simulate the performance of the raingarden using a previously developed model. Comparisons of the modeling and experimental results will enable us to verify the accuracy of the former, and correct if necessary.