



Simulation of rainfall runoff using the Gridded Surface Subsurface Hydrologic Analysis (GSSHA) model

1. B.J. Schaefer
2. J.L. Nieber
3. G. Eggers
4. G. Johnson

1. Graduate Program in Water Resources Sciences, University of Minnesota
2. Department of Biosystems and Agricultural Engineering, University of Minnesota
3. U.S. Army Corps of Engineers
4. Minnesota Pollution Control Agency

The Whitewater River Watershed Monitoring Project is a U.S. Environmental Protection Agency (EPA) National Monitoring Program (NMP) project. Located in Southeast Minnesota near the town of St. Charles, the watershed area is found in a region of karst limestone geology. Land use in the area is dominated by agricultural cropland and pastureland, which has posed problems to the aquatic life in the coldwater streams of the watershed. The project was established to evaluate the effectiveness of various best management practices (BMPs) using a paired watershed monitoring design. Two paired catchments are currently monitored within this program. Automated sampling equipment was set up at the sites to record precipitation, streamflow, and water quality.

An additional goal of this project is to model the hydrology of the catchment areas. To attain this goal, the sites were established as a beta test for the Gridded Surface Subsurface Hydrologic Analysis (GSSHA) model, developed by Charles W. Downer with the U.S. Army Corps of Engineers. The model is a physically-based, process driven distributed parameter model. Data available from the sites, including surface topography, soils type, vegetative cover, and precipitation, have been processed for

input to the model for performing simulations of runoff events. This presentation will describe the catchment sites, give a brief overview of the GSSHA model, and present comparisons of model simulated rainfall-runoff events to measured flow data.