



WATER RESOURCES RESEARCH GRANT PROPOSAL

Title: Protecting Water Quality with an Integrated Rural Watershed Analysis System

Duration: August 1997-August 1999

Federal Funds Requested: \$55,000

Non-Federal (matching) Funds Pledged: \$110,000

Investigator(s):

Joe Ritchie, Nowlan Chair Water Sci, Michigan State University; Joseph Ervin, Supervisor of Research, Institute of Water Research, Michigan State University; Yung-Tsung Kang, Visiting Specialist, Institute of Water Research, Norman Grannemann, Hydrologist, Water Resources Division, U.S. geological Survey; Tom Moen, Institute of Water Research

Congressional District: Eighth

Statement of Critical Regional or State Water Problems:

A need for integrating mechanistic models incorporating the various functions within watersheds is in great demand. Increasingly, producers are involved in whole-farm planning from a watershed perspective to protect drinking water supplies and water quantity. Numerous community water supplies have been contaminated from agricultural, and other activities. Local officials involved with watershed planning and management need tools which integrate runoff and groundwater quality and quantity changes resulting from alternative landscape development options. Additionally, the stream flow is diminished as water is utilized in irrigation and this can impact the biological ecosystem. The National Pollution Discharge Elimination System (NPDES) permits, which are based in part on minimum flows are directly affected. Permit criteria can be negated if excessive water is withdrawn upstream. Besides water quantity, nonpoint sources of pollution including agricultural waste may adversely impact the available water resources and permitting. Many states are now looking at water pollution credit systems. Such approaches require integrated models for assessing the impacts of management practices on pollutants reaching groundwater and streams. Research funding has supported the development of excellent component models, however, there is a need to integrate these component models into a Watershed Analysis System. Then there is a need to rapidly make the results readily available for use in indexing, assessing, and ultimately planning and managing on a watershed basis.

Statement of Results or Benefits:

With increasing pressures for urbanization, food production, recreational and/or ecological priorities for intensive multiple use of land in the watershed, a better integrated systems approach for facilitating decisions is crucial. The results of this proposed work will provide a tool to address the impact on drinking water resulting from changes in the landscape and management priorities to be used by NRCS, Extension, the agriculture industry, and whole-farm planners. The analysis system can be used by organizations such as the Department of Environmental Quality and Public Health agencies as they look at drinking water protection, pollution credits, wetland banking, and other creative management options. The analysis system can assist in broad long range land use planning to protect surface and groundwater quality and quantity. The Clean Water Act, the recently passed Farm Bill, and federal and state legislation are considering watersheds as the integrating and planning unit. Further the 1996 Safe Drinking Water Act requires source water protection plans. This proposal will provide a system that meets those needs. The Analysis System will be evaluated by utilizing an intensively studied site where nearly \$1 million in federal and state grants have produced water quality and quantity data sets characterizing surface and groundwater.