



## WATER RESOURCES RESEARCH GRANT PROPOSAL

**Project ID:** 2003MI30B

**Title:** Interactive and Hierarchical Modeling of Groundwater Systems in Tri-County Area: a Pilot Study

**Project Type:** Research

**Focus Categories:** Groundwater, Models, Solute Transport

**Keywords:** Groundwater, Groundwater Modeling, Groundwater Flow and Transport

**Start Date:** 03/01/2003

**End Date:** 02/28/2004

**Federal Funds:** \$15000.00

**Matching Funds:** \$30446.00

**Congressional District:** Eighth

**Principal Investigators:** Li, Shu-Guang

**Abstract:** With the recent national emphasis on wellhead protection, municipalities, governmental agencies, and planning commissions have been concerned about how the various contamination sites throughout the Tri-County area may impact the drinking water supply, and how well-field pumping may complicate the on going characterization and remediation activities at the various contamination sites and potentially draw more contamination into the aquifers from the overlying pollution sources. To systematically address these issues, the Tri-County Regional Planning Commission, in collaboration with the U.S. Geological Survey (USGS), recently developed a two layer, three dimensional, MODFLOW model for the Tri-County area. The model was intended to delineate the contributing areas for each well field. Although the regional model was able to characterize the general behavior of the basin scale dynamics, it proved to be inadequate for simulating the more detailed local and site scale flow and transport dynamics at individual well fields. We will demonstrate a new technology that can be used to model an aerially expansive area while at the same time, easily, freely, and interactively zooming into a hierarchy of nested sub-areas, or patches, across one or more aquifer layers. In particular, we will demonstrate this concept on a pilot study involving the modeling and characterization of groundwater flow and contamination at wells within municipal well fields in the Tri-County area (Ingham, Eaton, and Clinton Counties) in the central Lower Peninsula of Michigan.

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