Our Mission:
"To educate and provide opportunities for people of diverse interests to work together to improve the environmental, recreational, cultural, and economic resources of the Rock River Basin"

Rock River Basin Groundwater-flow Model
Summary of Purpose and Capabilities

This summary of the purpose and capabilities of the groundwater-flow model of the Rock River Basin is intended to give you some ideas about how the model could potentially be used in the future. If you would like additional information about the model, please contact the RRC GFLOW model coordinator, Joe Dorava at: 608-393-2101 or email jdor@vierbicher.com.

Purpose of the Rock River Basin GFLOW model:

The groundwater-flow model of the Rock River Basin was developed to improve understanding of the groundwater-flow-system in the Rock River Basin, and to provide a tool that could be used as a starting point for smaller-scale (county, city, or township) groundwater evaluations. That is, this regional model can be used to produce a better designed local-scale model for less cost than would be possible without the regional model.

What is a GFLOW model and why was it used?

A groundwater-flow model is a computer program that simulates the movement of groundwater through geologic materials such as limestone, sandstone and glacial sediments. Groundwater scientists and planners commonly use models to study and evaluate problems such as groundwater recharge, the movement of water to wells, wellhead protection, and the exchange of groundwater with surface water features such as springs, lakes, streams, and wetlands. A computer program called GFLOW was used to simulate groundwater movement through the Rock River Basin because of its ability to simulate the interaction between groundwater and surface water, and because it is well suited for simulating groundwater flow at a range of scales from regional (the entire Rock River Basin) to local scales (the area around a community) when appropriately refined.

How can you use the GFLOW model?

Regional Model

The GFLOW model of the Rock River Basin is a tool to help communities manage their groundwater resources. The model can be used to evaluate the effects of potential regional changes (such as long-term climatic shifts or large-scale land use changes) on regional water levels and stream flows. The Rock River Basin groundwater model describes the regional characteristics of the groundwater-flow system without including the hydrogeologic detail or data density that would be necessary for answering site-specific questions. The GFLOW model is complex, and municipal staff or board members are encouraged to work with an experienced groundwater-flow modeler to make informed management decisions guided by model results.

Local Refinement

The model can also be refined and recalibrated with new data to produce a local version of the model that can be used to make local water resource management decisions. If a refinement is needed to address local questions, there will be significant cost savings because of the existence of this regional GFLOW model. Thirty-nine contributors (including municipalities, lake associations, consultant firms, and interested citizens) each contributed money to fund the development of the basin-wide GFLOW model. Now, as specific local groundwater questions arise, this funding partnership provides significant cost savings when individual refinement is needed to answer these questions.

When local information is added and the model refined, the model can be used to evaluate questions such as: How would a new large-quantity groundwater withdrawal (such as a well used for public drinking water, irrigation, ethanol production, or factory cooling) affect the existing water table? Would a new withdrawal interfere with existing wells? How much would groundwater discharge to nearby springs or wetlands be reduced? Would it reduce flow or water levels in a stream, lake, spring or wetland? What is the contributing area that supplies water to this well?

The Rock River Basin GFLOW model, or a locally refined version, can help answer these questions (and many others) prior to implementing decisions that may be costly, controversial, or involve alterations to the landscape and water resources (both surface water and groundwater) that would be difficult to undo.