

## **The Use of Spatial Analysis of Water Well Data and Hydrogeologic Modeling to Evaluate Land Use Planning Decisions**

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Water resource issues within the Little Spokane River Basin highlight the need for the integration of science and planning. In 2009 Spokane County Water Resources completed a project that synthesized and analyzed existing water well and hydrogeologic data to evaluate the relationship of existing and future land use policy and water resources.

In 1976 an instream flow was established for the Little Spokane River. Since that time junior water rights have been shut off 21 of 32 years. During that same time frame approximately 8,900 domestic water wells have been drilled that are not subject to interruption. How do these wells impact stream flows? What undeveloped locations will have the greatest impact on stream flow? In addition to stream flow concerns, questions of water availability for new development and impacts to existing uses have come to the fore. What areas are potentially water scarce? Can increased density be supported?

This project utilized existing information sources to analyze and create a GIS layer of the spatial distribution of water well yield, water well total depth, and static water level; to develop a geologic database and create a stratigraphic model of the basin; and to analyze full build out of the basin given existing zoning.

With the products of this project Spokane County has gained the following insights:

- Identification of areas that have high well yields and shallow wells in close proximity to the river, indicating high potential to impact base flow;
- Identification of areas that have low well yield and deep wells in close proximity to the river, indicating low potential to impact base flow;
- Areas within the basin that have very low well yields, indicating additional water supply scrutiny for new development may be warranted; and
- The number of new potential residential units that could potentially be built within low well yield areas.

There are many applications of the products of this project including water supply infrastructure planning, stream flow mitigation strategy, review of proposed comprehensive plan changes, and the development and prioritization of field studies. This project was completed with existing data on a modest budget and has provided new insight into water resource management now and in the future for the Little Spokane River Basin.

### **Mike Hermanson**

Mike Hermanson is a 1994 graduate of Western Washington University with a degree in environmental science. Since 1994 he has worked in the environmental field in industry, consulting, and local government. He is currently a water resources specialist at Spokane County and focuses on watershed planning and implementation, Spokane Valley Rathdrum Prairie groundwater monitoring and analysis, coordinated water system planning, and various water resources projects.