



Wisconsin Water Science Center



Capabilities Summaries

Geographic Information Systems

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Geographic Information Systems and spatial data

The USGS Wisconsin Water Science Center (WI WSC) office in Middleton, Wisconsin includes staff with expertise in using geographic information systems (GIS) for scientific investigations. Our expertise includes the creation and publication of spatial data as well as spatial data analysis and mapping at local, regional and national scales. The WI WSC staff has the expertise to convert spatial data into model input for many of the surface-water and ground-water models used in scientific investigations. They also have the expertise to link spatial themes to regional and national databases that can be displayed and queried via the Web.

Spatial data development, mapping, analysis, and publishing

Spatial data are used routinely by WI WSC staff in scientific investigations for characterizing and understanding hydrologic and ecological resources in relation to natural and anthropogenic factors. WI WSC staff has expertise with a variety of software programs that can be used for spatial data creation, mapping, analysis, and modeling including the widely used ArcGIS programs (ArcInfo Workstation, ArcMap, Arcview). WI WSC staff has extensive experience with creating maps for use in USGS and non-USGS publications as well as experience in preparing and publishing spatial data and associated metadata as USGS Digital Data Series reports.

Spatial data and modeling

Many of the scientific investigations undertaken by the USGS include models that simulate the environment. These models typically require a variety of spatial data for input. The WI WSC staff has the expertise to quickly and efficiently process spatial data to create input for local and regional ground-water models such as MODFLOW and GFLOW as well as surface-water models such as PRMS

and SWAT. The staff also has expertise to process spatial data at regional and national scales for use with large-scale surface-water-quality models such as SPARROW and SPARTA, and for regional ecological and landscape models, such as those used as part of the Great Lakes Aquatic GAP project.

Display and query spatial data via the Web

The WI WSC Middleton Data Center staff develops web-based GIS data discovery and model-based decision support tools for local, regional and national cooperators. These interfaces generally follow an approach where project specific information is anchored in a data warehouse and supporting spatial information is provided through web services from the USGS National Map. This design allows for extending existing applications for a broad user base or into new areas of spatial information and leverages the USGS investment in a national seamless spatial data catalog. Current WI WSC projects that use these tools include: USGS NAWQA Data Warehouse, USGS NAWQA Watershed Regressions for Pesticides (WARP) Model and USGS NAWQA SPATIally Referenced Regressions On Watershed attributes (SPARROW) Decision Support Tool, WDNR Wisconsin Fish Mapper, Wisconsin Beach Health program, and Milwaukee Metropolitan Sewerage District water quality database.

