

The U.S. Geological Survey: Providing Ground-Water Information for the Nation

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The U.S. Geological Survey (USGS) was established in 1879 as a permanent government agency with a national mission to, among other things, “provide reliable, impartial, timely information that is needed to understand the Nation’s water resources.” With that national mission as a guide, many water-related activities conducted by the USGS in Montana also are designed to meet the needs of local water-resource agencies through the USGS Cooperative Water Program. Costs for interpretive studies and data collection programs conducted under this program are shared by the USGS and State, local, or tribal partners. USGS employees use nationally-consistent procedures and quality-assurance protocols in conducting cooperative projects. This consistency ensures that all data from the Cooperative Water Program are directly comparable from one part of the country to another and are available to the public from USGS databases. Two examples of interpretive ground-water projects being conducted in Montana as part of the Cooperative Water Program are the ground-water/surface-water interaction study in the Smith River watershed and delineation of brine contamination in the East Poplar oil field.

The USGS also conducts Federally-funded programs that synthesize ground-water data collected from multiple states to provide a national perspective. For example, the USGS Ground-Water Climate Response Network uses data from about 140 wells throughout the country to present a national picture of the response of the Nation’s ground-water systems to climate variations. Another example is the National Water-Quality Assessment (NAWQA) Program that recently synthesized ground-water-quality data collected nationally and discovered the pervasive occurrence of methyl tert-butyl ether (MTBE) in the Nation’s ground water. To facilitate national synthesis of data, all USGS water data are stored in a single, distributed Web-accessible database. Almost all water-quality samples collected by the USGS are analyzed by the USGS National Water Quality Laboratory (NWQL). The NWQL processes tens of thousands of water samples every year and develops and publishes new methods for analyzing water samples for an ever-increasing list of analytes. For example, USGS researchers at the NWQL are leading the development of methods to detect minute concentrations of organic waste-water compounds including human and animal pharmaceutical products.

The USGS has advanced the science of ground-water hydrology from early USGS ground-water hydrologists like O.E. Meinzer, C.V. Theis, and S.W. Lohman, to current USGS ground-water hydrologists like A.W. Harbaugh, D.W. Kolpin, and W.M. Alley. The USGS continues to advance the science of ground-water hydrology through its National Research Program, which funds research by USGS hydrologists in a wide range of topics in the fields of ground-water geochemistry and hydrology. The USGS also funds major research in the development and evolution of ground-water-flow models like MODFLOW-2005 and the development of new geophysical techniques. Through these efforts, the USGS will provide today’s ground-water information to the Nation into the future.