

STATEWIDE NETWORKING: MONITORING GROUND-WATER QUANTITY AND QUALITY IN MONTANA

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ABSTRACT

Montana's 900-well statewide monitoring network is part of the Ground-Water Assessment Program at the Montana Bureau of Mines and Geology (MBMG). The network was designed to generate long-term data to monitor change in the quantity and quality of Montana's ground water. MBMG employees travel to network wells each calendar quarter to measure water levels, service about 100 water-level recorders, and collect water-quality samples. Data are stored in Montana's Ground-Water Information Center (GWIC) database and are available through the GWIC website at <http://mbmggwic.mtech.edu>.

In western Montana, monitoring wells are distributed within the relatively heavily developed intermontane basin aquifers. Potentiometric surface and geologic maps helped guide monitoring well selections so that up-gradient recharge, mid-basin storage, and down-basin discharge areas were represented. In eastern Montana, wells completed in the Fort Union Formation, Judith River Formation, Madison Group, Fox Hills Hell Creek, and other aquifers represent recharge areas and where these regional aquifers are relatively near land surface.

MBMG staff and cooperators use standardized field methods to make sure that static-water levels are correctly measured, but some wells produce data that at times are influenced by nearby pumping or other factors. Non-static water-level data are flagged so that data users, depending on their purposes, can choose whether or not to include them. Water-quality samples are collected after wells are purged and field parameters have stabilized. Between 60 and 70 samples for inorganic constituents and trace metals are collected annually and wells are re-sampled every 10-12 years.

MBMG personnel conduct most network operations but water-level data from about 200 wells are obtained through cooperative agreements between MBMG and local water-quality districts and the U.S. Geological Survey. Most statewide network wells monitored by cooperators are also within local or regional networks dedicated to other purposes.

KEYWORDS

monitoring, network, quantity, quality