



GROUND WATER INVESTIGATION PROGRAM

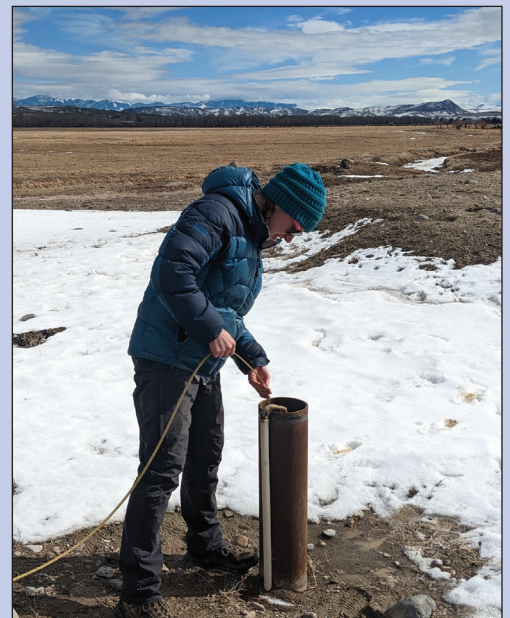
Montana Bureau of Mines and Geology

SUPPORTING SCIENCE-BASED WATER MANAGEMENT FOR MONTANA

The Ground Water Investigation Program (GWIP), established by the 2009 Legislature (HB 52), applies scientific research to answer the most urgent water issues in Montana.

Topics of investigation include:

- The effects of changing to more efficient irrigation methods (i.e., converting from flood to pivot irrigation) on groundwater availability and surface-water flows.
- Aquifer and stream response to changing land use from irrigated agriculture to residential development.
- Groundwater sustainability in response to increasing residential, irrigation, and commercial development.
- Changes in water quality due to increasing subdivisions.
- Groundwater availability of buried river channel aquifers.
- Hydrogeologic suitability for managed aquifer recharge using surface infiltration and/or aquifer storage and recovery (injection wells).



Measuring water levels in the Big Hole River Valley.

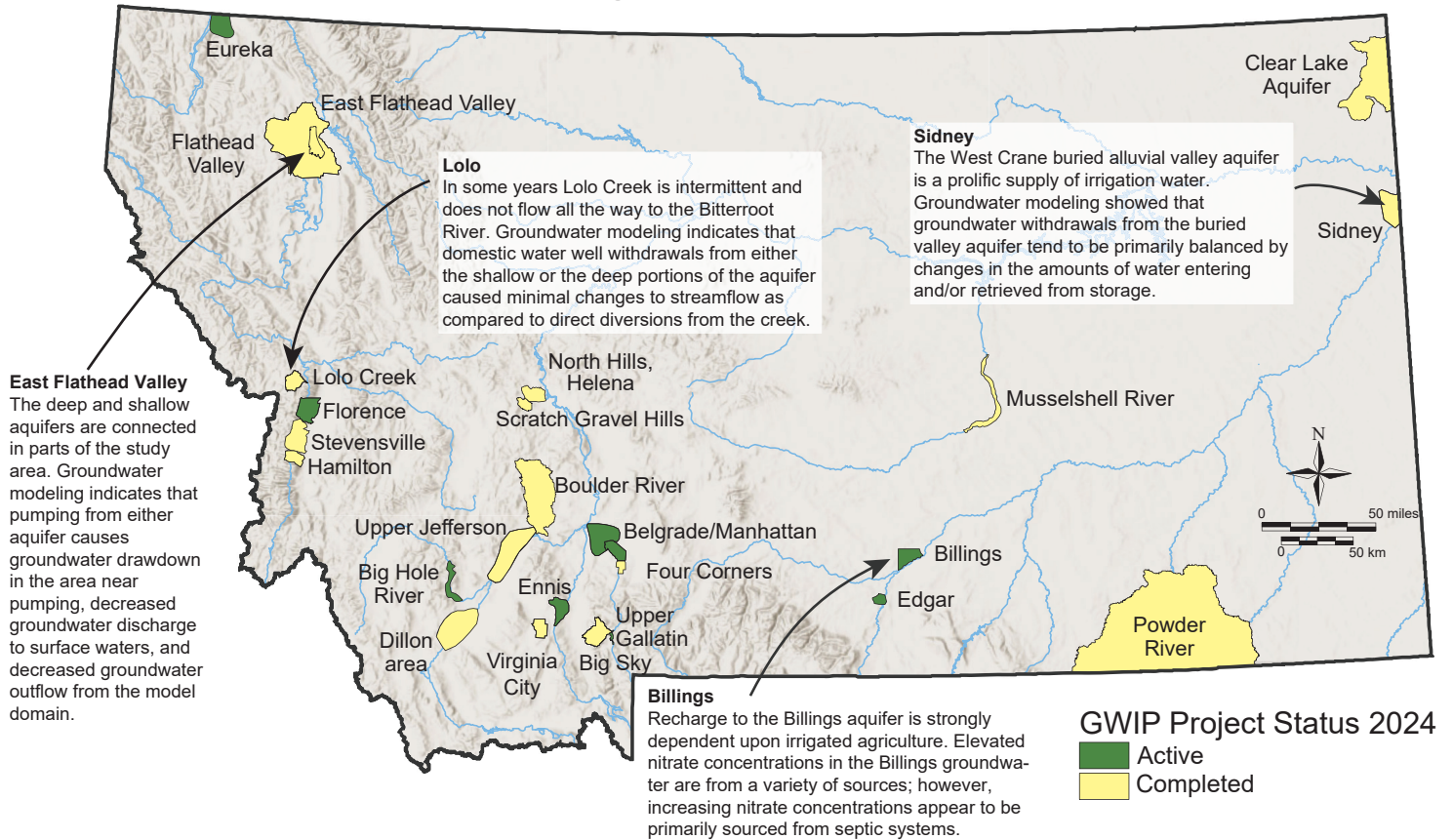
To date, over 95 projects have been nominated and prioritized by the Ground Water Steering Committee. Results of GWIP projects have been used in water rights permit decisions, water resource development, and county planning.

Latest Projects:

- **Billings area** (Yellowstone County)—Evaluate the capacity of the aquifer to support future groundwater development in west Billings and identify the extent and source of nitrate in the study area.
- **Eureka** (Lincoln County)—Investigate how groundwater development will affect the availability of groundwater and surface water in the Tobacco Valley.
- **Big Hole River** (Beaverhead and Madison Counties)—Determine the hydrogeologic influences affecting quantity and temperature of the Big Hole River to inform irrigation practices.
- **Quantified irrigation recharge to groundwater**—Measure soil water flux beneath flood and pivot irrigated fields to quantify groundwater recharge based on irrigation method.

For more information: mbmg.mtech.edu/gwip/gwip.html

Water Management Tools for Montana



Water-Related Education and Outreach

The public receives results in reports, presentations, and individual questions to the scientists:

- Over 48 peer-reviewed MBMG reports have been published to date.
- Computer models of site-specific groundwater flow are available to the public for continued use.
- Scientists are available to the public for questions and presentations.
- Comprehensive sets of hydrogeologic data for each site are permanently stored online.



Presenting groundwater and surface-water information to the public and answering their questions.



GWIP personnel led a field trip for the Water Policy Interim Committee highlighting some results of the Big Hole River investigation.