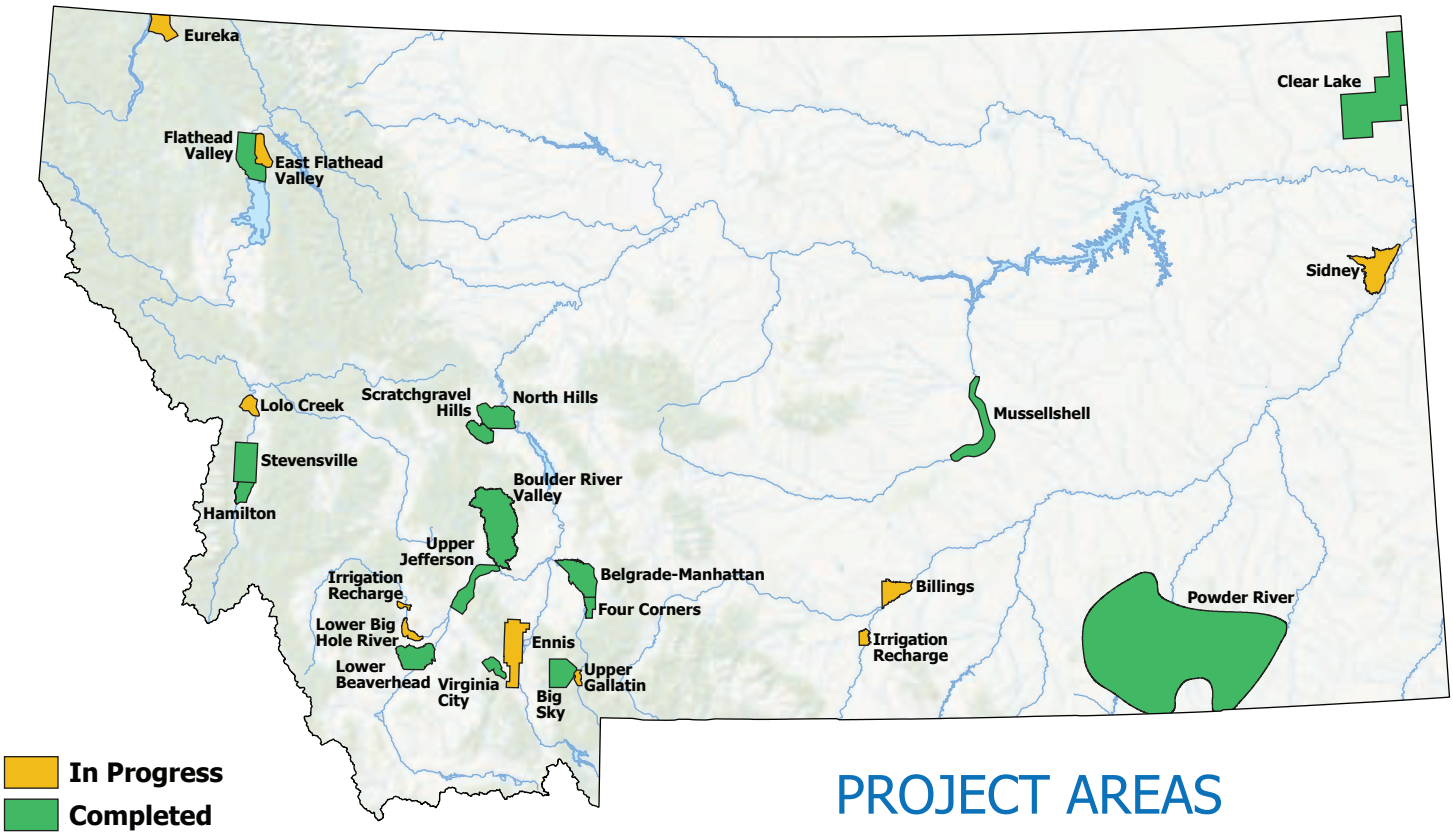
Montana Bureau of Mines and Geology

Ground Water Investigation Program

October 2024



PROJECT AREAS

PUBLICLY AVAILABLE RESULTS INCLUDE:

- ⇨ Detailed, peer-reviewed MBMG published reports.
- ⇨ Computer models of site-specific groundwater flow available for use.
- ⇨ Answers to public inquiries regarding the hydrogeology of GWIP areas.
- ⇨ Comprehensive sets of hydrogeologic data for each investigation available in GWIC database.
- ⇨ Presentations to stakeholders and other interest groups.

The **Ground Water Investigation Program (GWIP)** answers locally identified, site-specific questions prioritized by the Montana Ground Water Steering Committee (MCA 85-2-525). As mandated by the Montana Legislature, GWIP conducts research on the most urgent water issues in the state.

FOR MORE INFORMATION CONTACT:
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ACTIVE PROJECTS

Lower Big Hole River Beaverhead, Madison, and Silver Bow Counties

Purpose: Investigate the effects of irrigation return flows on the Big Hole River near Glen. The project focuses on measurement and modeling of the groundwater surface-water interactions. Hydrogeologic and atmospheric effects on river temperature are being assessed.

Status: Groundwater and surface-water monitoring will be completed this fall. Currently developing water budget and hydrogeologic framework for the groundwater model.

Personnel: Mary Sutherland, Principal Investigator

Eureka Lincoln County

Purpose: Understand how groundwater development will affect the availability of groundwater and surface water in the Tobacco Valley, Eureka.

Status: The aquifer test report has been published (MBMG Open-File 764). The groundwater budget has been developed. The steady state groundwater flow model has been calibrated and we are currently working on calibrating the transient version of the model.

Personnel: Andy Bobst, Principal Investigator

Irrigation Recharge Carbon and Beaverhead Counties

Purpose: Quantify the infiltration of groundwater beneath fields subjected to flood and pivot irrigation. The project focuses on direct measurement of infiltration through the vadose zone to determine the potential for irrigation-derived groundwater recharge under different operational conditions.

Status: Data collection will be ongoing through 2025. An Informational Pamphlet is planned for winter 2025 describing the project scope and some preliminary findings.

Personnel: Shawn Kuzara, Principal Investigator

Billings Yellowstone County

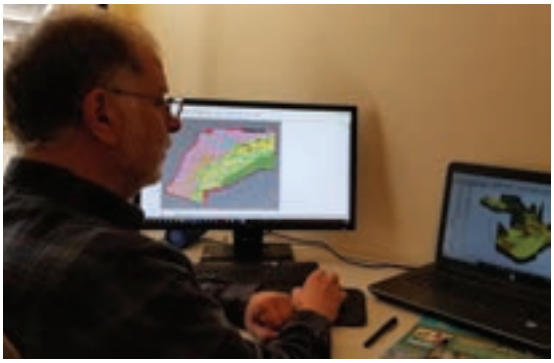
Purpose: Identify and quantify recharge sources and controls on groundwater quantity and quality in the Billings area to support future development decisions.

Status: A report describing the chemistry aspects focused on nitrates is being prepared. A goundwater model is being developed to address water availability as residential and commercial development continues.

Personnel: Liddi Meredith, Principal Investigator

Site visit to public water supply well.

Measuring canal discharge.



Building groundwater models.

UPCOMING REPORTS

East Flathead Valley — Flathead County

Purpose: Determine the connection between the shallow aquifer, deep alluvial aquifer, and surface water. This information will be used to evaluate the effects of pumping on these aquifers and on surface water.

Results: Published reports include the groundwater modeling report (RI 36) and an aquifer test report (Open-File 727). The hydrogeogic interpretative report is in peer review.

Personnel: Andy Bobst

Sidney Area-West Crane Buried Valley Aquifer — Richland County

Purpose: Determine the availability of water from the buried channel aquifer in the Sidney area and the aquifer's ability to meet the needs for future irrigation development.

Results: The hydrogeologic interpretative report has been published (Open-File 760). The peer review of the groundwater modeling report is complete, revisions are being addressed.

Personnel: Kurt Zeiler, Jon Reiten (Retired)

Lolo Creek — Missoula County

Purpose: Determine the cause of changes in streamflow character that occur in the lowest reaches of Lolo Creek which result in the channel occasionally being dry (de-watered).

Results: The aquifer test report has been published (Open-File 754). The peer review of the main report is complete. Revisions to the groundwater model and the main report are being addressed.

Personnel: Ali Gebril and Mary Sutherland

Upper Gallatin — Gallatin County

Purpose: Evaluate the effects of existing and future residential/commercial development in the Upper Gallatin Valley on water quantity and quality.

Results: The groundwater model was revised and the modeling report and the hydrogeologic interpretative report are being edited.

Personnel: Liddi Meredith, Kurt Zeiler

Training to measure surface-water discharge.

Collecting surface-water isotope samples.

Using thermal infrared to find groundwater discharge to rivers.

PUBLISHED REPORTS (2023–2024)

A groundwater flow model for the East Flathead Valley, Flathead County, Montana, 2024, Report of Investigations 36.

Three aquifer tests in the Tobacco Valley, near Eureka, Montana, Open-File 764.

Groundwater inputs to rivers and streams: Using temperature and visual cues on the Big Hole River, southwestern Montana, 2024, Informational Pamphlet 17.

Analyses of constant-rate aquifer tests in the Quaternary-Tertiary basin-fill sediments and the Tertiary-Archean fractured bedrock near Ennis, Montana, 2024, Open-File 763.

Sources of salinity to the Musselshell River: Executive summary, 2023, Informational Pamphlet 15.

Hydrogeology and irrigation potential of the West Crane aquifer, Richland County, 2023, Open-File 760.

Groundwater/surface-water study in the Upper Jefferson Valley, 2023, Informational Pamphlet 14.

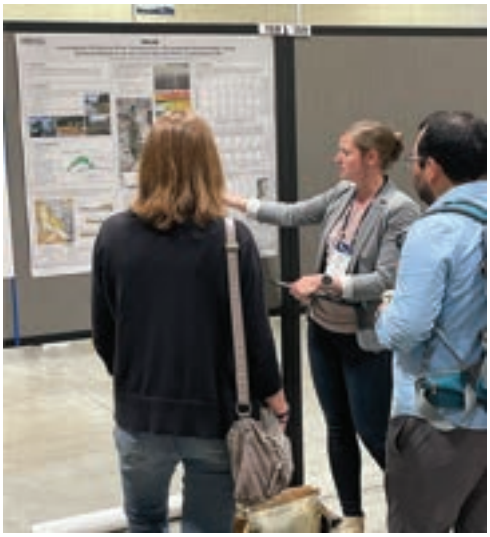
Analyses of three constant-rate aquifer tests, East Flathead Valley, 2023, Open-File 757.

Groundwater quantity and quality near Hamilton, Montana, 2023, Open-File 759.

Hydrogeologic investigation of the Belgrade-Manhattan area, Gallatin County, Montana: Superposition groundwater modeling report, 2023, Open-File 754.

Sources of salinity to the Musselshell River, Musselshell County, Montana, 2023, Report of Investigation 35.

Investigation of the inorganic groundwater quality in the West Yellowstone Basin, Gallatin County, Montana, 2023, Open-File 755.



Communicating results to the public.