https://doi.org/10.59691/DMVV2387

Montana Bureau of Mines and Geology STATEMAP Program 2024

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The primary objective of the **USGS STATEMAP** program is to establish the geologic framework of areas determined to be vital to the economic, social, or scientific welfare of individual states. Mapping priorities are established by State Geological Surveys in consultation with a multi-representational **State Mapping Advisory Committee** (SMAC).

Project Summaries—Fiscal Year 2023

Delivered for June 30, 2024 USGS submittal deadline:

- Detailed geologic maps of the Christensen Ranch, Elk Gulch, and Home Park 7.5' quadrangles within the Dillon 30' x 60' quadrangle.
- Detailed geologic maps of the Murr Peak, East Bay, and Ronan 7.5' quadrangles in the Polson 30' x 60' quadrangle.
- Integration of the Wisdom 30' x 60' quadrangle into 1:100,000-scale seamless geologic map of Montana.
- Surficial deposit compilation of the Havre, Harlem, Whitewater, Rocky Boy, Dodson, and Malta 30' x 60' quadrangles.
- Detailed geologic map of the Lost Trail Pass 7.5' quadrangle on the Montana–Idaho border in collaboration with the Idaho Geologic Survey.
- New subsurface maps of the top of the Madison Group, and Swift, Fall River, Kootenai, and Judith River formations in central and eastern Montana.

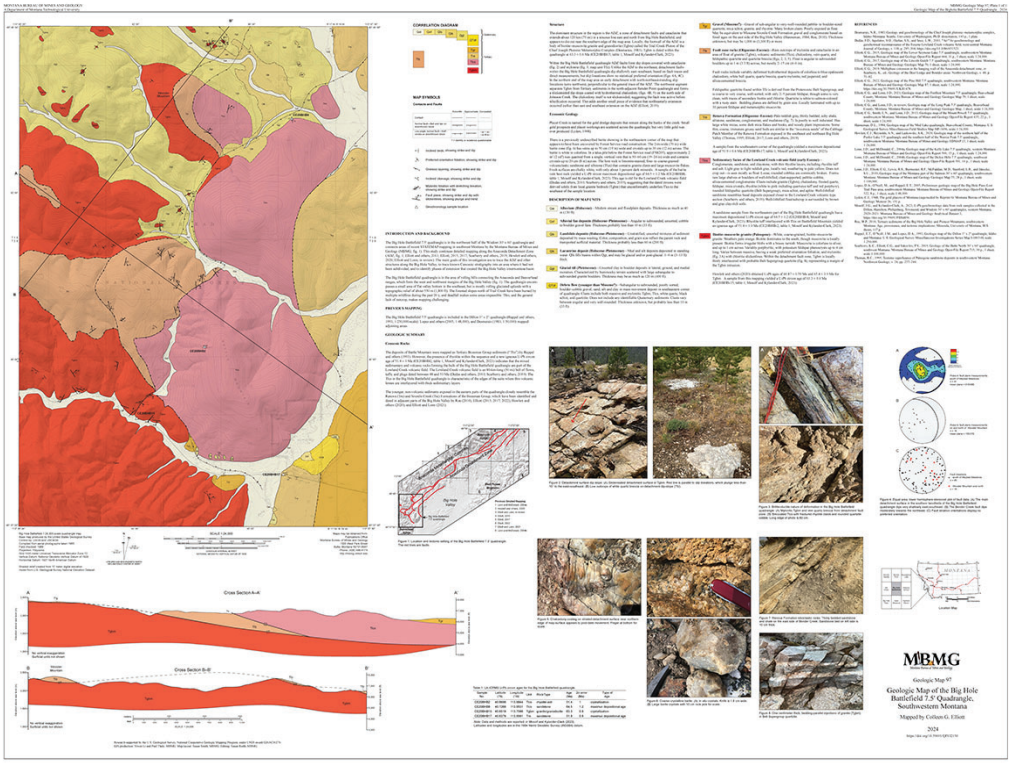

Figure 1. A thumbnail image of GM 97, the Big Hole Battlefield map, released this year.

Project Summaries—Fiscal Year 2024

In progress for June 30, 2025 USGS submittal deadline:

Project 1: Mapping and final compilation of the Dillon 30’ x 60’ quadrangle.

Project 2: Detailed geologic mapping in the Polson 30’ x 60’ quadrangle including the North ½ of the Weeksville and the South ½ of the Loneman Creek 7.5’ quadrangles, and the Shroder Creek 7.5’ quadrangle.

Project 3: Detailed geologic mapping of the Fort Connah 7.5’ quadrangle and the southern Mission fault.

Project 4: Completion and publication of Buxton and Tucker Creek 7.5’ quadrangles (I-15 corridor south of Butte).

Project 5: Landslide map of the historic Virginia City area, southwest Montana.

Project 6: Surficial deposit compilation for the 1:100,000-scale seamless geologic map of Montana.

Project 7: Subsurface mapping of the Glendive and Glasgow 1° x 2° quadrangles, northeast Montana.

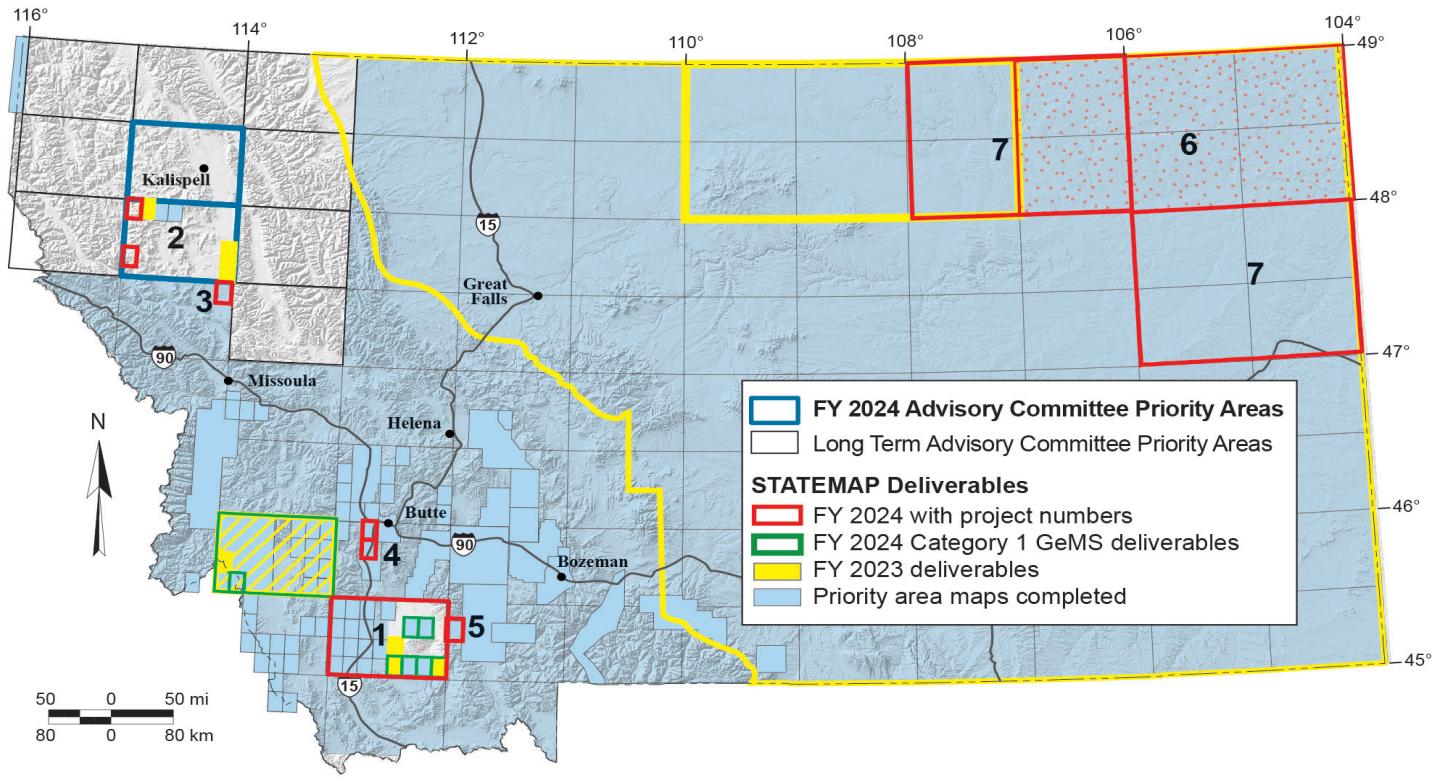

Figure 2. Locations of the seven MBMG STATEMAP projects for FY 2024 shown in red. Green outlines indicate the location of GIS datasets (GeMS, “Geologic Map Schema”) also to be delivered in FY 2024. Locations of MBMG STATEMAP projects completed in FY 2023 are shown in yellow.

Other Geology Projects that Involve MBMG Mappers:

Economic Geology

USGS Earth MRI—Collaborative Geologic Mapping across the Montana–Idaho border: Alta and Horse Creek Pass 7.5' quadrangles

Three-year project to characterize potential for critical commodity occurrences in Sheep Creek–ID Cobalt Belt in collaboration with the Idaho Geological Survey.

Geohazards and Earthquake Studies

FEMA-MTDES—Quaternary Fault and Landslide Maps of Park County and other various counties, and 2024 Montana Geohazards Workshop in Missoula

Identification of faults and landslides using new LiDAR coverage for Ravalli County, Powell County, and Park County, creation of geohazard maps for public education, creation of Quaternary Fault and Landslide Databases, annual MT Geohazards Workshop held in Missoula, and creation of the Montana Earthquake Working Group.

USGS NEHRP (2023–2024)—Probabilistic Fault Displacement Hazard Mapping of Montana: Collaborative Research with Cal Poly and Montana Technological University

Constrain seismic source characterization along the Bitterroot fault by collecting new slip rate data and probabilistic fault displacement hazards analysis to generate contour hazard maps of surface fault displacement for the Bitterroot Valley.

USGS NEHRP (2022–2024)—Paleoseismic and seismotectonic investigations of the Bitterroot fault

Completion of the Bitterroot Fault study involving paleoseismic trenching and Quaternary age dating to obtain Holocene paleo-earthquake chronology, earthquake frequency, slip per events, and slip rates.

MBMG STATEMAP Personnel

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2023–2024 STATEMAP Publications

Brennan, D.T., Sears, J.W., and Mosolf, J.G., 2024, Geologic map of the Belmont Park Ranch 7.5' quadrangle, Madison County, Montana: Montana Bureau of Mines and Geology Geologic Map 99, 1 sheet, scale 1:24,000, https://doi.org/10.59691/TJCH2055

Elliott, Colleen G., 2024, Geologic map of the Big Hole Battlefield 7.5' quadrangle, southwestern Montana: Montana Bureau of Mines and Geology Geologic Map 97, 1 sheet, scale 1:24,000, https://doi.org/10.59691/QIYJ2150

Gunderson, Jay A., 2024, Digital structure map of the Precambrian surface, central and eastern Montana: Montana Bureau of Mines and Geology Digital Publication 5, 9 p., https://doi.org/10.59691/EVRG2202

Lonn, J.D., Elliott, C.G., Burmester, R.F., and Lewis, R.S., 2024, Geologic map of the Big Hole Pass 7.5' quadrangle, southwestern Montana and eastern Idaho: Montana Bureau of Mines and Geology Geologic Map 94, 1 sheet, scale 1:24,000, https://doi.org/10.59691/PBOA7465

McDonald, C., and Thomas, R.C., 2024, Geologic map of the Argenta 7.5' quadrangle, southwest Montana: Montana Bureau of Mines and Geology Geologic Map 100, 1 sheet, scale 1:24,000, https://doi.org/10.59691/ESAY9062

Mosolf, J. G., 2024, Geologic map of the Burns Mountain 7.5' quadrangle, Beaverhead County, Montana: Montana Bureau of Mines and Geology Geologic Map 96, 1 sheet, scale 1:24,000, https://doi.org/10.59691/JCEN9713

Mosolf, J.G., and Kylander-Clark, A., 2023, U-Pb geochronology data from rock samples collected in the Dillon, Hamilton, Philipsburg, Townsend, and Wisdom 30' x 60' quadrangles, western Montana, 2020-2021: Montana Bureau of Mines and Geology Analytical Dataset 3, https://doi.org/10.59691/FIIS4856

Mosolf, J.G., and Kylander-Clark, A., 2023, U-Pb geochronology data from rock samples collected in the Dillon and Wisdom 30' x 60' quadrangles, western Montana, 2021-2022: Montana Bureau of Mines and Geology Analytical Dataset 4, https://doi.org/10.59691/CBJJ3933

Mosolf, J.G., and McDonald, C., 2024, Major oxide and trace element analyses of rock samples collected in the Dillon 30' x 60' quadrangle, southwest Montana, 2019-2020: Montana Bureau of Mines and Geology Analytical Dataset 9, https://doi.org/10.59691/OUKW4846

Mosolf, J.G., and Sears, J., 2024, Geologic map of the Red Canyon 7.5' quadrangle, Beaverhead and Madison counties, Montana: Montana Bureau of Mines and Geology Geologic Map 95, 1 sheet, scale 1:24,000, https://doi.org/10.59691/UJZS2764

Mosolf, J.G., Hanson, A.E.H., McDonald, C., Parker, S., and Scarberry, K., 2023, Major oxide and trace element analyses of rock samples collected in the Dillon and Wisdom 30' x 60' quadrangles, southwest Montana: Montana Bureau of Mines and Geology Analytical Dataset 1, https://doi.org/10.59691/TEOF5831

Mosolf, J.G., Brennan, D.T., Gavillot, Y., Parker, S., and Sears, J., 2023, Major oxide and trace element analyses of rock samples collected in the Dillon and Hamilton 30' x 60' quadrangles, southwest Montana: Montana Bureau of Mines and Geology Analytical Dataset 2, https://doi.org/10.59691/WFDT5933

Mosolf, J.G., Brennan, D.T., and Kylander-Clark, A., 2023, U-Pb geochronology data from rock samples collected in the Dillon, Ennis, Gardiner, Hamilton, Hebgen Lake, Lima, and Wisdom 30' x 60' quadrangles, western Montana, 2022–2023: Montana Bureau of Mines and Geology Analytical Dataset 5, https://doi.org/10.59691/ZQRI9918

Parker, S.D., and Gavillot, Y.G., 2024, Geologic map of the Laurin Canyon 7.5' quadrangle, Madison County, Montana: Montana Bureau of Mines and Geology Geologic Map 98, 1 sheet, scale 1:24,000, https://doi.org/10.59691/WMJR3264

Scarberry, Kaleb C., 2023, Geologic map of the Hubbart Reservoir 7.5' quadrangle, Flathead and Sanders Counties, Montana: Montana Bureau of Mines and Geology Geologic Map 92, 1 sheet, scale 1:24,000, https://doi.org/10.59691/DKUV6756

Scarberry, K.C., McDonald, C., and Coppage, E.L., 2023, Geologic map of the Kofford Ridge 7.5′ quadrangle, Flathead and Sanders Counties, Montana: Montana Bureau of Mines and Geology Geologic Map 93, 1 sheet, scale 1:24,000. https://doi.org/10.59691/IJSX9724

MBMG
Montana Bureau of Mines and Geology

Established in 1919, the Montana Bureau of Mines and Geology (MBMG) continues to fulfill its mandate to collect and publish information on Montana's geology to promote orderly and responsible development of the energy, groundwater, and mineral resources of the State. A non-regulatory state agency, the MBMG provides extensive advisory, technical, and informational services on the State's geologic, mineral, energy, and water resources. The MBMG is the principal source of earth science information for the citizens of Montana.