



MITIGATION Minute

APRIL 2024

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Sara Hartley and Jake Ganieany Receive Lewis and Clark Awards



Above L-R: Sara Hartley and Jake Ganieany at the 2024 AM/FM Conference.

Montana Disaster and Emergency Services' Sara Hartley, State Hazard Mitigation Officer, and Jake Ganieany, Mitigation & Recovery Bureau Chief, both received the "Lewis and Clark Award" for being Floodplain Program Ambassadors.

The awards were presented at this year's Association of

Montana Floodplain Managers (AMFM) Conference in recognition of their work in response and recovery during the June 2022 Flooding event.

The Association of Montana Floodplain Managers seeks to bring floodplain professionals of all areas together to promote common sense floodplain development in Montana and support floodplain managers across the state by providing helpful training and resources.



Above: MT DES Mitigation team conducts site visits of Helena south hills IRC and Defensible Space project.

WEBSITE: DES.MT.GOV

Mitigation Funding Opportunities for 2024

Funding Opportunity	Funds Available	Application Deadline
FM-5480	\$918,774.00	May 28, 2024
DR-4726	*\$122,281.00	July 12, 2024
DR-4745	*\$402,688.00	September 2, 2024
Nationally Competitive Funding		
BRIC 24	TBD NOFO ~September 2024	~December 12, 2024
FMA 24	TBD NOFO ~September 2024	~December 12, 2024

**Current estimated amounts.*

If you are interested in any open mitigation funding opportunity, please complete a NOI (Notice of Intent) located on the [Mitigation Grants page](#) on the MT DES website and submit it to the Mitigation team. Once we receive your NOI, we will reach out to you to further discuss project eligibility and the application process.



State & Regional Hazard Mitigation Plan Updates

State Plan Update:

- Approved and Adopted

Western Regional Plan Update:

- At State DES for Review

Central Regional Plan Update:

- At FEMA Region VIII for Review

Eastern Regional Plan Update:

- Draft Base Plan complete, and public comment on county annexes is completed.



Lidar Data Reveals “Hidden” Geological Hazards Near Yellowstone National Park Northern Entrance

By Yann Gavillot, Montana Bureau of Mines and Geology

For the first time, LIDAR data has been released for Paradise Valley and the northern gateway corridor to Yellowstone National Park. These high-resolution topographic data are revealing new details of the landscape.

Geological surface mapping has traditionally used aerial photos and direct observations through fieldwork, but the land surface is often obscured by vegetation. Recent advances in high resolution topographic datasets that use lidar have enabled geologists and earth scientists to virtually “remove” vegetation and reveal the bare earth ground surface—including, for example, active [faults on the fringes of Yellowstone National Park](#). In 2022, a new lidar dataset for Park County, Montana, was [released to the public](#).

Lidar stands for Light Detection and Ranging and uses a sensor commonly mounted on an airplane for large surveys. The lidar sensor rapidly emits laser pulses (>100,000 per second) that are reflected back from the ground surface or any object along their paths.

Although Yellowstone is more well known for its past volcanic eruptions and active hydrothermal systems, large damaging earthquakes and landslides have occurred in the region. [The 1959 M 7.3 Hegben Lake event](#) was the largest historical earthquake in the Intermountain West region, and it caused one of the largest seismically triggered landslides at [Earthquake Lake](#), created [extensive fault scarps](#), and altered geyser and hot spring activity through the park. These “cascading” natural disasters, like that of 1959, which caused nearly 30 fatalities and temporarily trapped about 250 people from blocked roads, provide an example of what could happen if a large earthquake were to occur in Paradise Valley. Geologists have recognized that the southwest limit of Paradise Valley had topographic steps, or scarps, which offset deposits that were less than 2.6 million years old. These are collectively referred to as the Emigrant fault and provide evidence that past earthquakes have happened in the area.

The recent lidar data have, for first time, revealed in greater detail an extensive and complex distribution of fault scarps of the Emigrant fault that extends nearly continuously for more than 33 miles (54 km) between Tom Miner Creek Road and Livingston, Montana. Fault scarps like these typically form when the ground ruptures during large earthquakes of magnitude ~6.5 or greater. Lidar data have also revealed numerous fault scarps close to Gardiner in Montana that are likely associated with the East Gallatin-Reese Creek fault system that extends into Yellowstone National Park. Many large landslides also scar the landscape, and these are shown with exceptional clarity in the high-resolution lidar data. Some of these prehistoric landslides were so large that their run out extended for miles downslope and even blocked the Yellowstone River at Yankee Jim Canyon along highway 89, forming a temporary lake.

LIDAR Data continued from previous

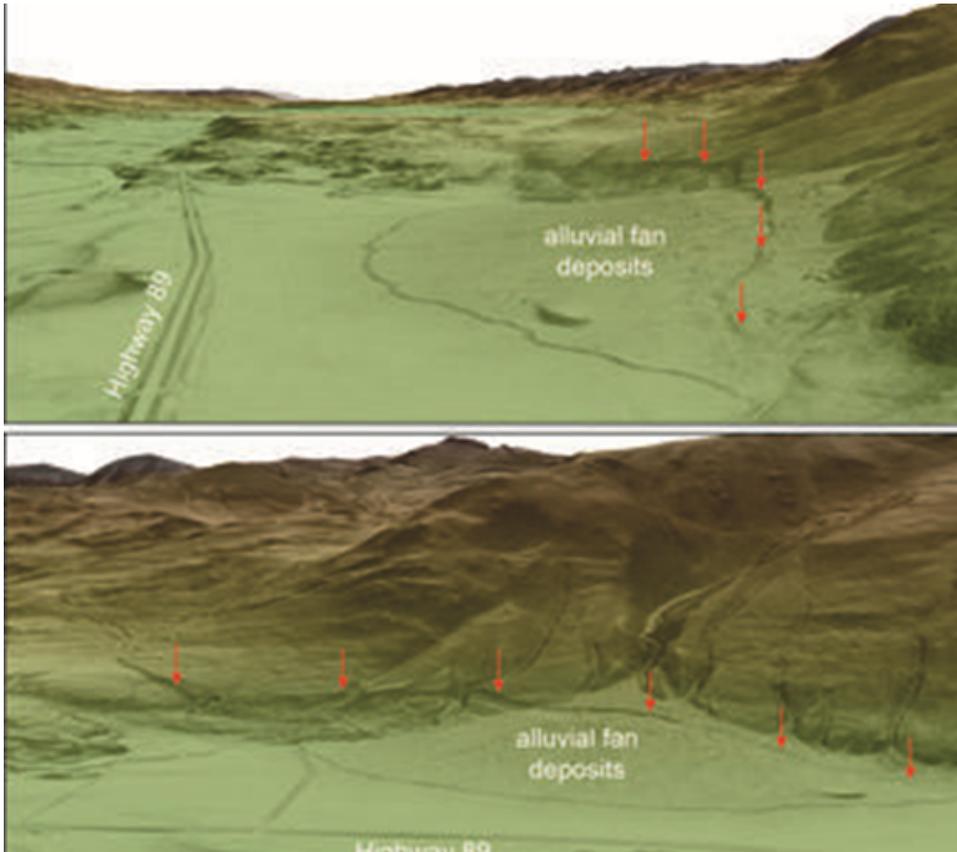


Image Sources/Usage: Public Domain. Shaded relief maps based on lidar data and showing fault scarps in Paradise Valley, Montana. Lidar imagery is given as a colored, shaded slope map, with higher elevations in brown and white, and lower elevations in green. Darker shading indicates steeper slopes. Top image is a northwestward view (toward Livingston) of Paradise Valley near Carbella. The right side of the image shows an oblique perspective of the Emigrant fault scarp (shown by red arrows) that vertically offsets young alluvial fan deposits. Highway 89 is visible on the left side of the image as a pair of parallel lines. Bottom image is a southeastward view showing the same fault scarp. Subtle flutes and ridges extending horizontally across the hillslopes above the scarps were carved by glacial ice flowing down the Emigrant Valley from the Yellowstone ice cap. (Lidar visualization by Yann Gavillot, MBMG, using 3-D scene in ArcGis Pro).

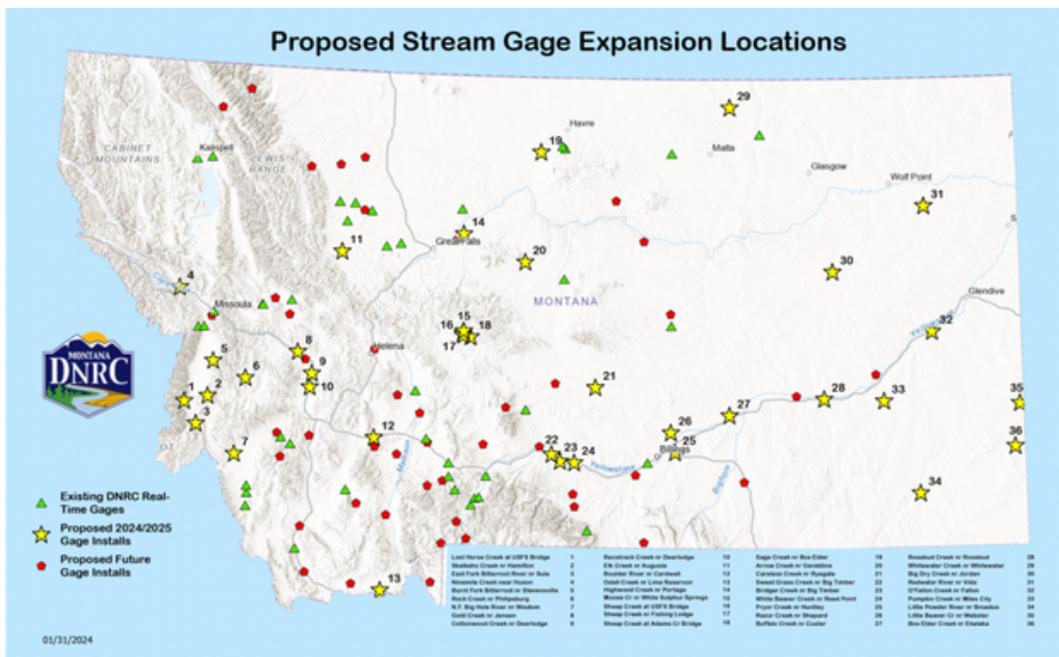
This new lidar dataset offers an opportunity for geologists and hazards specialists to significantly improve hazards maps by allowing better characterization of the location, geometry, and activity of known faults and landslides. The Montana Bureau of Mines and Geology is currently involved in developing and upgrading a statewide [Quaternary](#) fault and landslide database, utilizing newly released high-resolution topographic datasets such as the Park County lidar to generate county-wide hazard maps. These new datasets provide the information needed to improve assessments of potentially hazardous faults and landslides for future updates in county- and state-wide mitigation efforts for Paradise Valley and northern Yellowstone National Park and contribute to the [U.S. Geological Survey National Seismic Hazard Maps](#).

DNRC to Expand Statewide Stream Gage Network

The Montana Department of Natural Resources and Conservation’s Water Sciences Bureau will begin installing about 32 new stream gages across the state this spring after receiving funding from the last legislative session.

Stream-gaging in the US began in the late 1800s to inventory stream flows and assess agricultural irrigation potential. Nearly a decade ago, the DNRC realized that Montana needed its own network of stream gages in addition to the preexisting ones owned by US Geological Survey (USGS).

DNRC set an initial goal of up to 100 gages, but within a few years, funding ran dry, and the program stalled at around 44 gages. Under the new public funding, DNRC will have until June 30 of next year to install the 32 new units. DNRC also received some private funding that should cover the cost of four additional gages.



Map showing current and proposed locations for stream gages in Montana. DNRC

DNRC administer water appropriately by enabling decisions based on real-time data,” Norberg added.

In addition to providing physical water availability for appropriations, supporting water enforcement decrees, and helping water commissioners in their operations, the gages will also provide general information on the state and health of flowing water in the state, which can be used to forecast droughts, floods or conditions for recreation like floating and fishing.

Data and a map from the existing sites can be found at the Stream and Gage Explorer Website, <https://gis.dnrc.mt.gov/apps/stage/>.

In an interview for the *Bozeman Daily Chronicle*, Matthew Norberg, hydrologist and data section supervisor within the Water Science Bureau said that the Montana network, while separate from the USGS and other state and federal programs, fills out gaps in existing networks where monitoring does not exist.

“We’re trying to add more gages and not take away from any other places,” Norberg said. “The program focuses on smaller streams and tributaries and will help the

UPDATE: SUB-APPLICANT GRANT SUBMITTALS

At the end of February, Montana DES had submitted a total of 15 sub-applications worth \$11,777,574.07 of Federal dollars for Building Resilient Infrastructure and Communities (BRIC 23), and two sub-applications worth a total of \$7,780,515.00 of Federal dollars for Flood Mitigation Assistance Grants (FMA 23).

Additionally, Montana DES submitted nine sub-applications for High Hazard Potential Dam Grants (HHPD) worth a total of \$18,375,344.65 Federal dollars. The sub-applications were a mix of project scoping and physical construction projects.

Training Opportunities

2024 Geohazard Workshop: *Earthquake Hazards for the Bitterroot and Missoula valleys - Save the Date!* May 1-2, 2024. DES Missoula Office at the Emergency Operations Center (EOC).
POC: Yan Gavillot, ygavillot@mtech.edu

Procurement Under Grants Training. Live virtual trainings and webinar series available anytime. Training focuses on purchasing in compliance with federal procurement rules. [Procurement Under Grants Training](#).

Floodplain Bootcamp Weekly Workshop: Every Friday through 2024, starting December 1, 2023. Agenda TBD. POC: Traci Sears, tsears@mt.gov.

NFIP 101: Introduction to Floodplain Management: Learn the fundamentals of floodplain management with this free self-paced course developed by FEMA. Perfect for new local floodplain administrators or those looking for a refresher. CECs available with full course completion. Learn more at <https://www.floods.org/training-center/online-training/asfpm-on-demand-learning/nfip101/>.

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