



MONTANA  
**STATE LIBRARY**

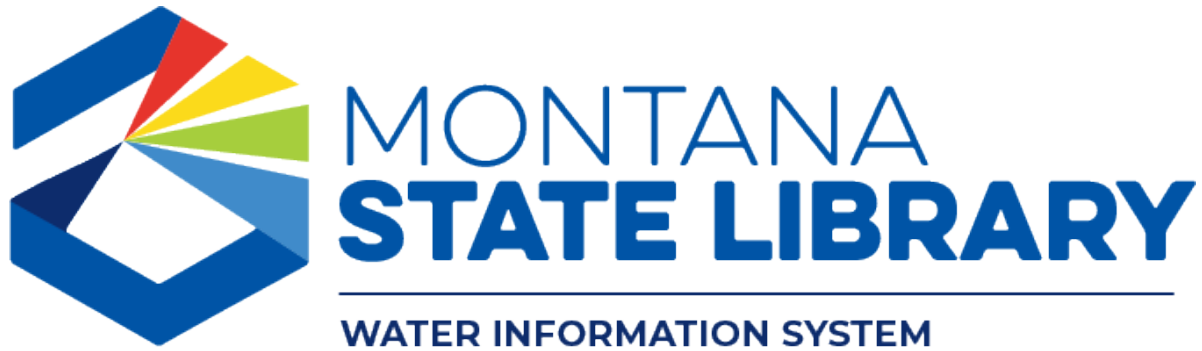
A GREATER STATE OF KNOWLEDGE

# Water Information System

Troy Blandford

Prepared for the Water Policy Interim Committee | Sept. 12, 2024

# AGENDA



- What is the Water Information System and why is it important?
- Featured data, maps and apps
- Mapping Montana's rivers, streams, and lakes (hydrography)
- High-resolution elevation (LiDAR) data and relevance to water resources

# Natural Resource Information System (NRIS)

Natural Heritage Program  
(NHP)

Water Information System  
(WIS)



Watershed health

Precipitation



Temperature

Forecasts



Reservoir storage



Water rights

Flood risk

Streamflow measurement

Drought

Snow



Technical reports



Water quality

Water Supply

Remotely sensed data



Source water

Fish/Aquatic life



Montana Fish, Wildlife & Parks

Groundwater



Agricultural water use

Irrigation Infrastructure



Streamflow measurement



Water quality



US ARMY CORPS OF ENGINEERS

Reservoir storage

# Montana Water Information System

- Coordinate with water data providers
- Facilitate water data discovery and access (neutral and non-regulatory; library patron confidentiality)
- Update and maintain the Montana Hydrography Dataset

TITLE 90. PLANNING, RESEARCH, AND DEVELOPMENT  
CHAPTER 15. NATURAL RESOURCE INFORMATION SYSTEM  
Part 3. Information System

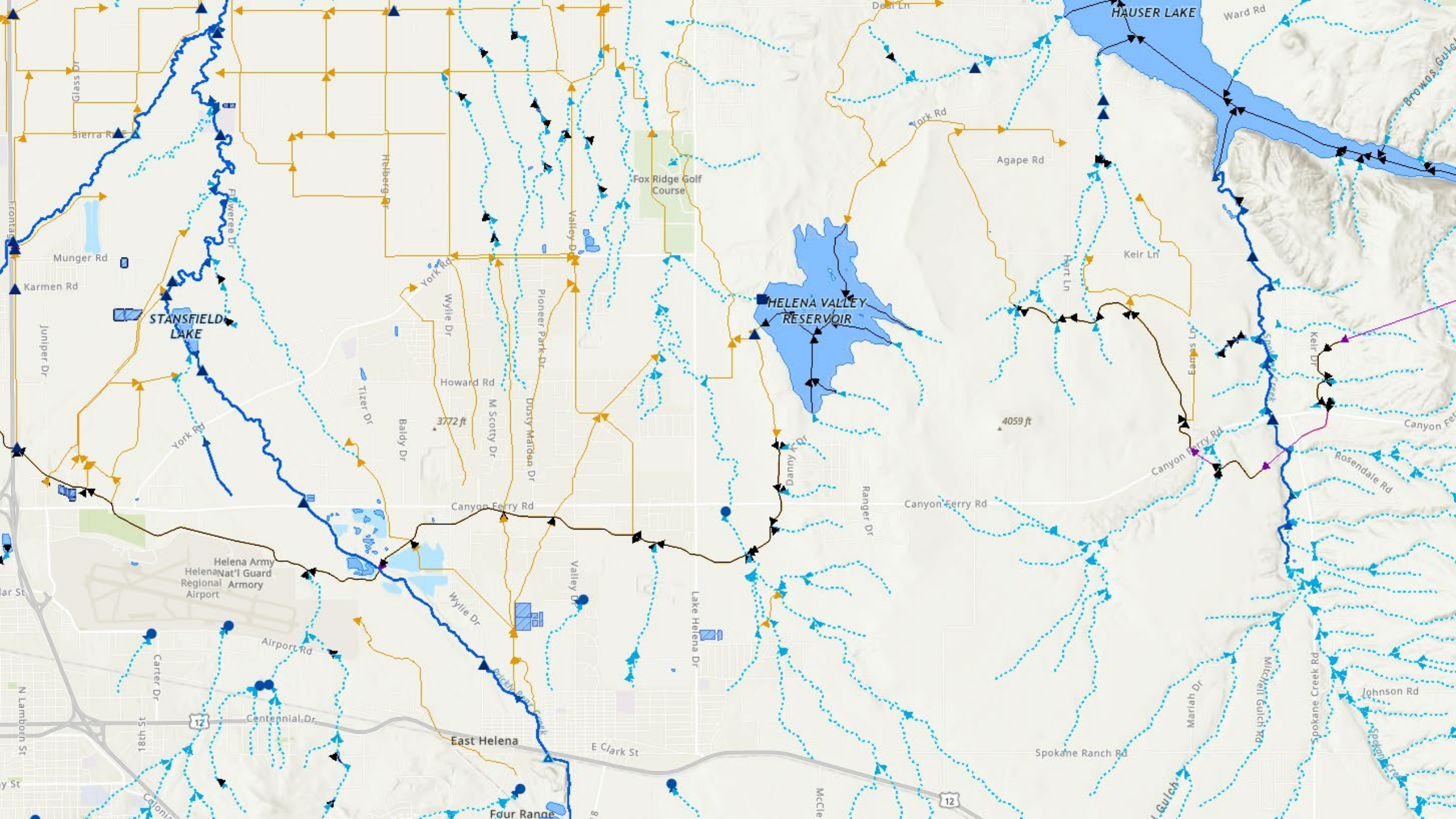
## Water Information System

**90-15-305. Water information system.** (1) There is a Montana water information system, to be operated within the natural resource information system referred to in **90-15-301** and that is to be considered a part of the system.

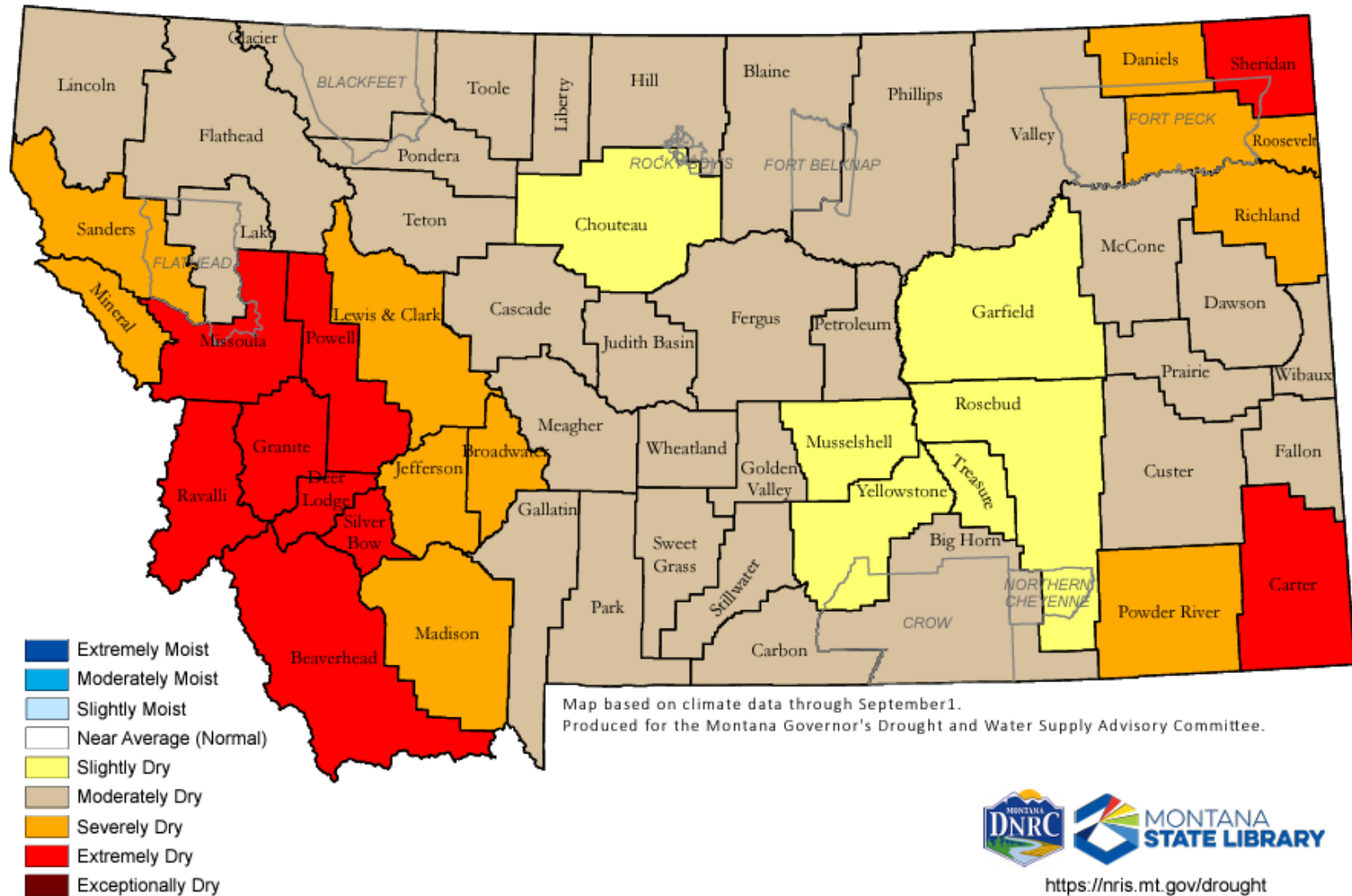
(2) The Montana water information system shall make available and readily accessible, in a usable format, to state agencies and other interested persons, information on the state's water resources, out-of-state water resources that affect the state, existing and potential uses, and the existing and potential demand.

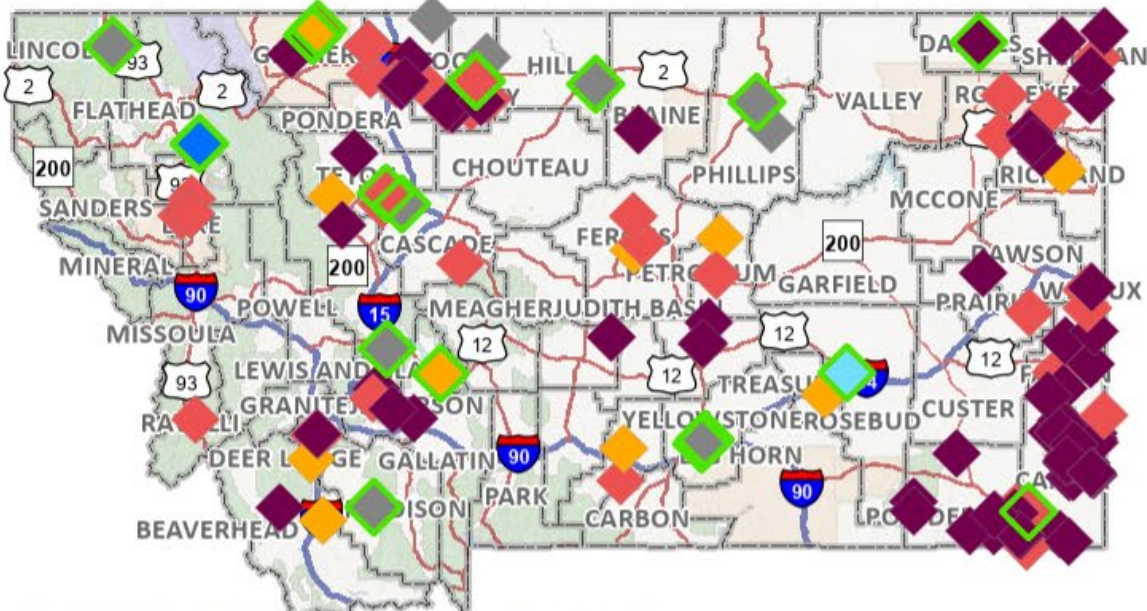
### Featured Products:

- Statewide Hydrography Dataset • GIS data, web services, and applications
- Digital Atlas • Yellowstone River Clearinghouse • Statewide Aerial Imagery
- Watershed Boundary Dataset • Elevation and Lidar Data • Cadastral Application
- Snowpack and Water Supply Maps in coord. with NRCS • Drought Monitoring in coord. with DNRC
- Digital Gallery of Water Maps . . . and more



## Montana Drought Status by County - September 7, 2024





Montana State Library | National Drought Mitigation Center, University of Nebraska

Powered by Esri

Overview Map

Photo Map

Impact Type Map

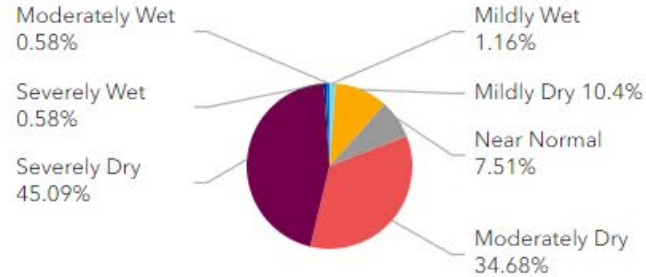
Number of Reports  
Since 10/1/2023

**173**

Number of Reports by Date



How Wet or Dry is it?



How Wet or Dry is it?

2 of 41

### 9/8/2024 - Carter County

Description: The drought has continued to cause problems for our operation. The reservoirs are extremely low or dry causing the cattle to travel long distances for water. We have also had to move cattle out of pastures with insufficient water.



Photos

Photo Viewer

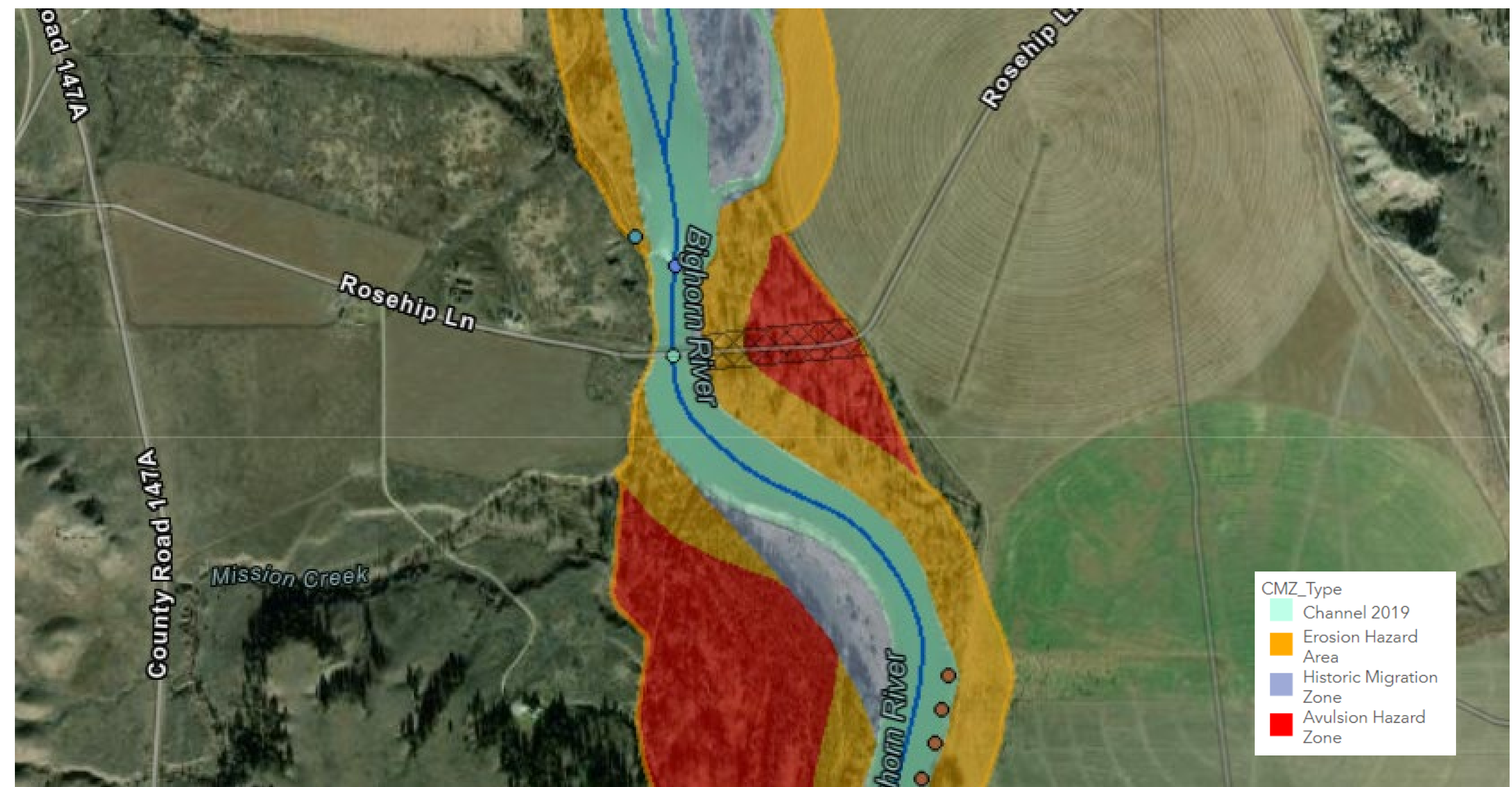
Total

Reports by Date

Reports By County

Photos by Date







# Montana State Library's 2022 Floods GIS Data Hub

Providing Montana Spatial Data Infrastructure and other GIS data for the  
2022 Flood Disaster Declaration Counties

Browse and download data:

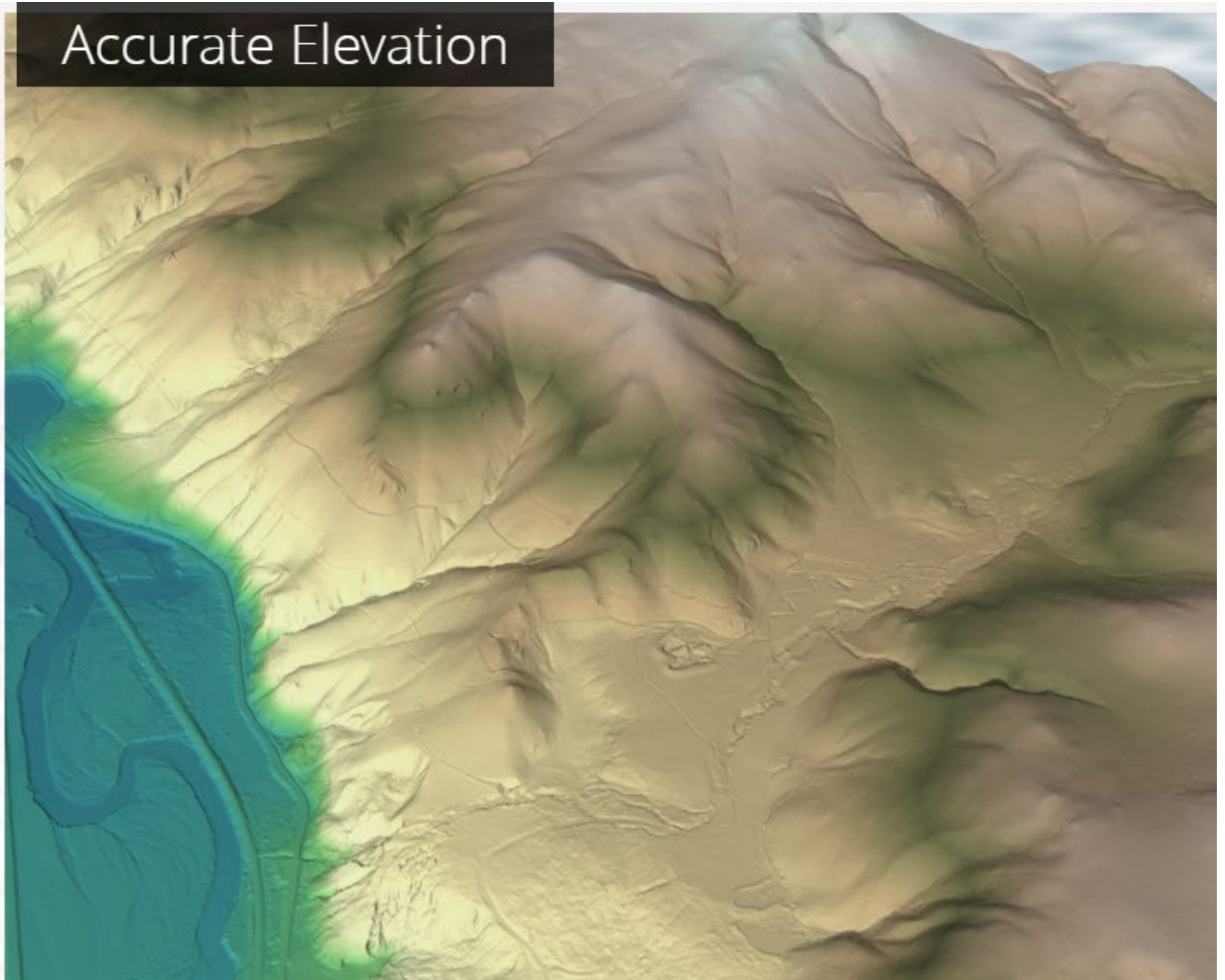


# LiDAR

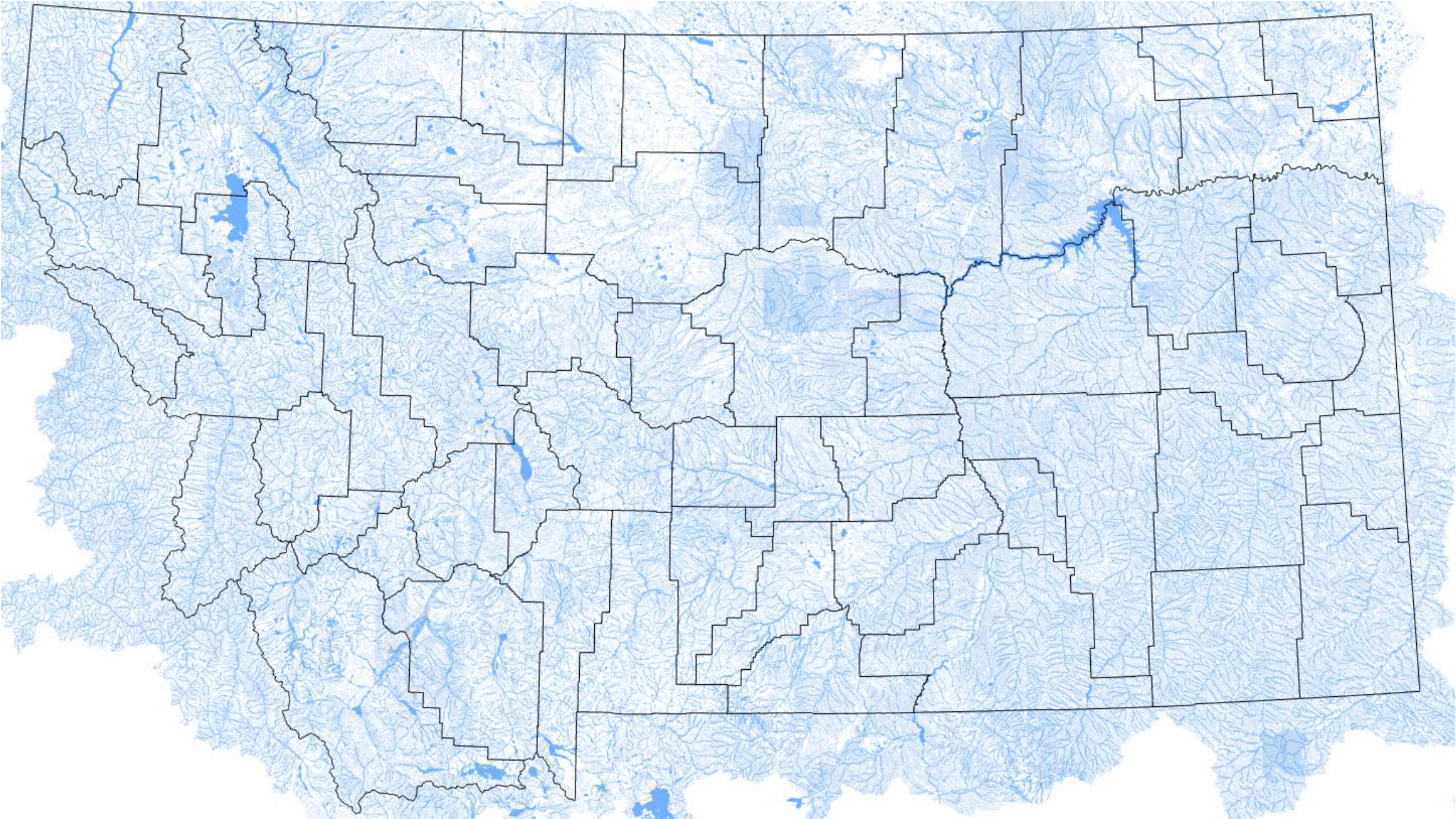
High-resolution, high-accuracy elevation data

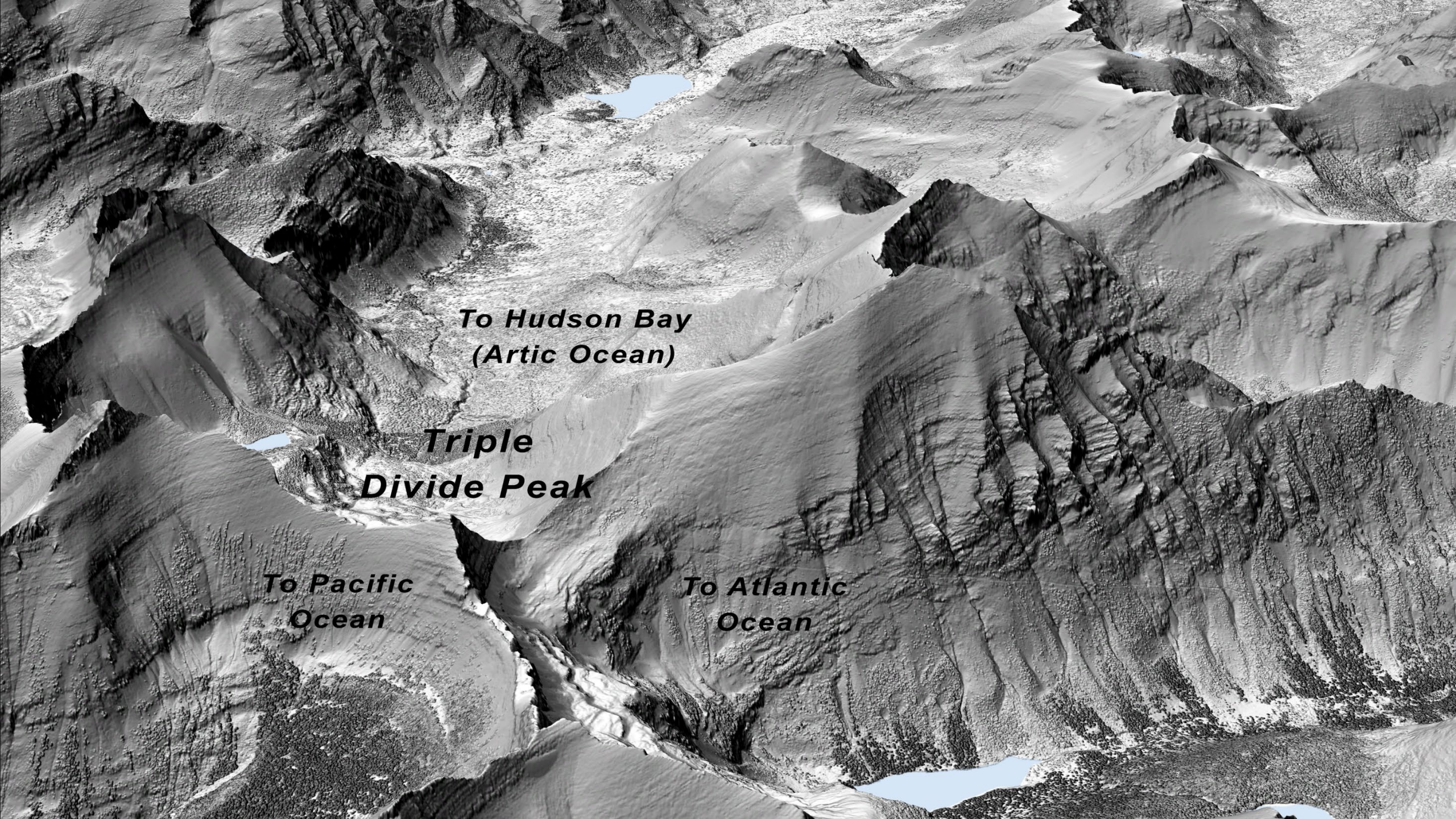


# Accurate Elevation



**Mapping the State's rivers, streams, lakes and other waterbodies**



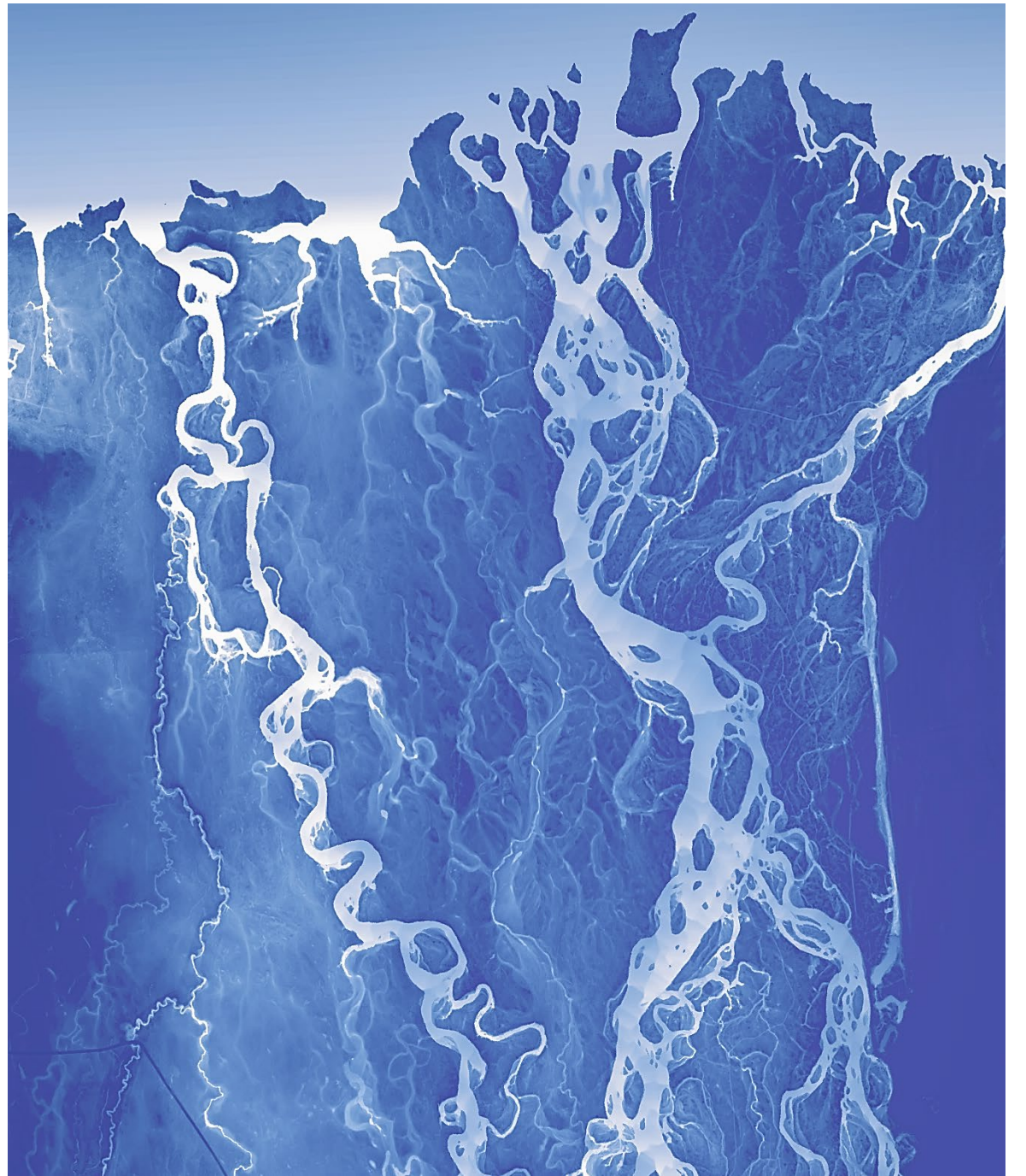


*To Hudson Bay  
(Arctic Ocean)*

*Triple  
Divide Peak*

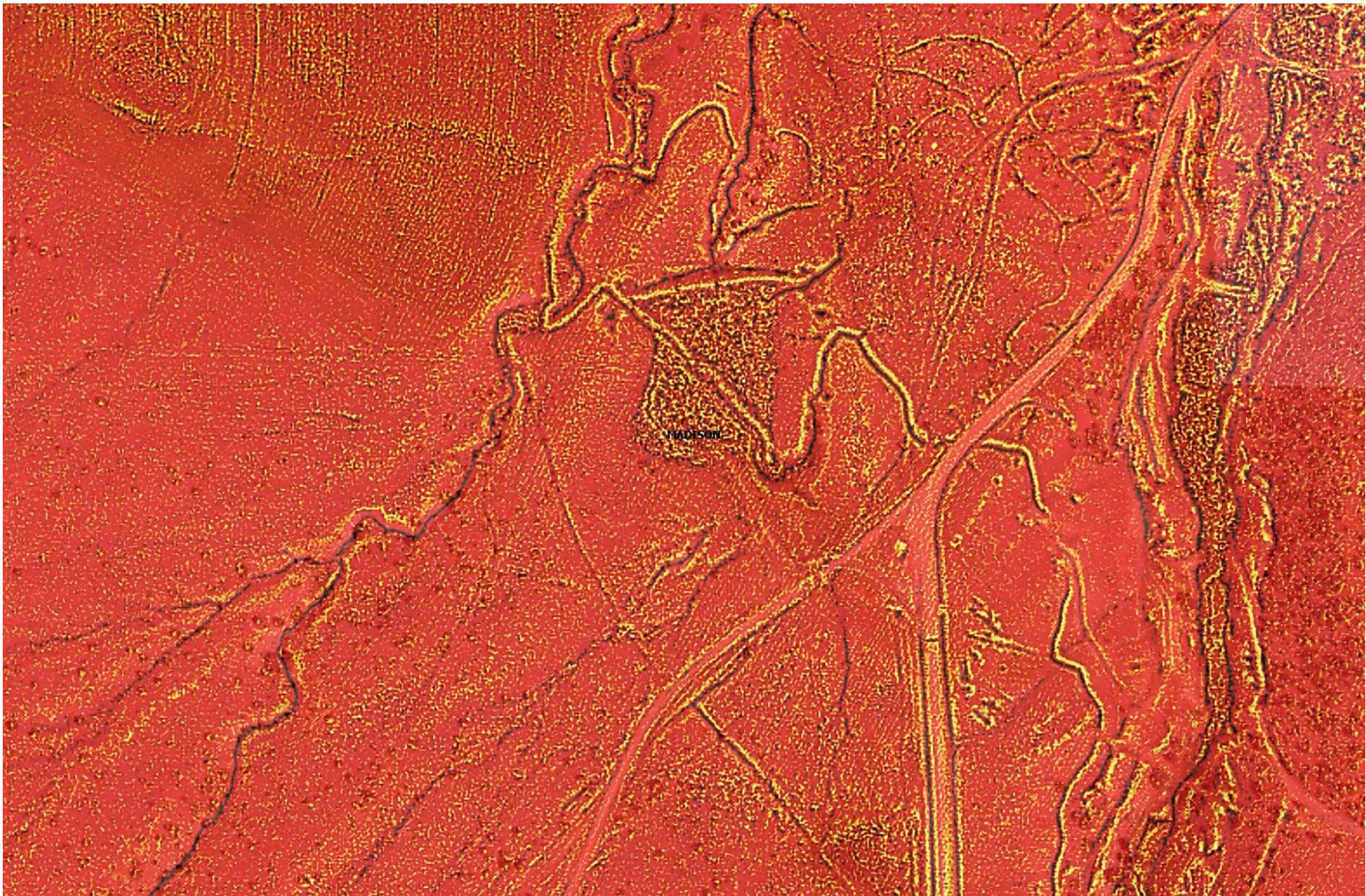
*To Pacific  
Ocean*

*To Atlantic  
Ocean*



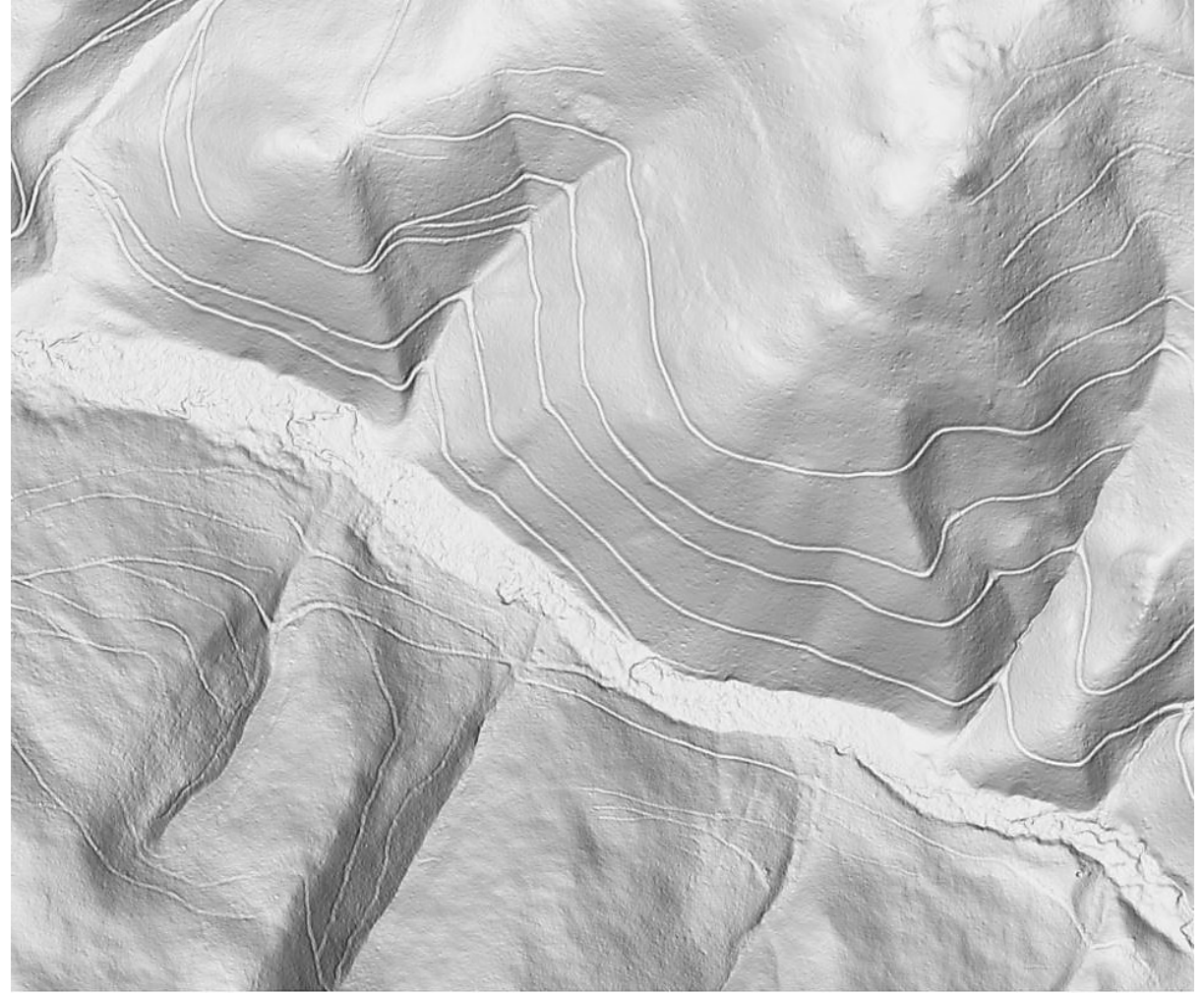




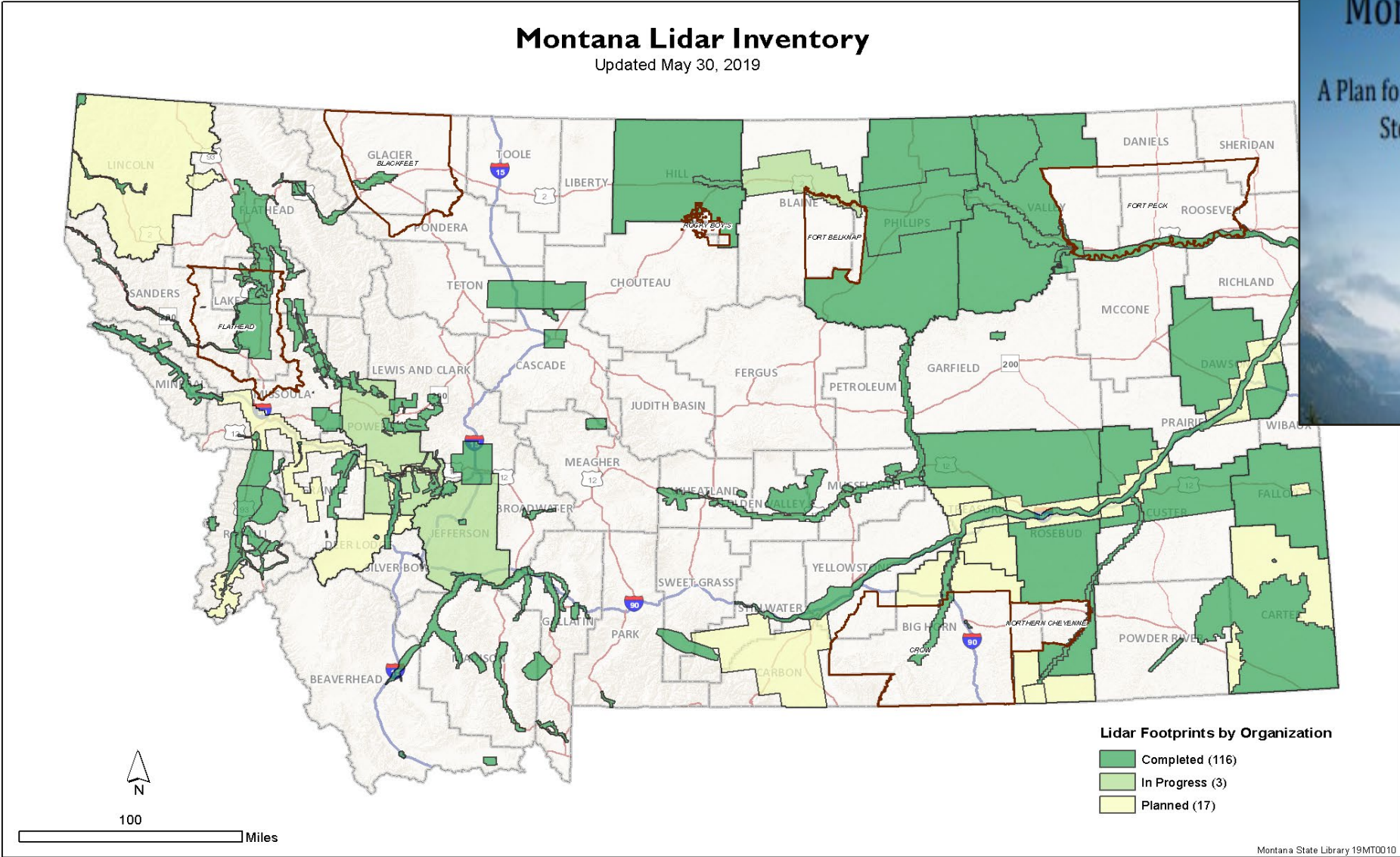
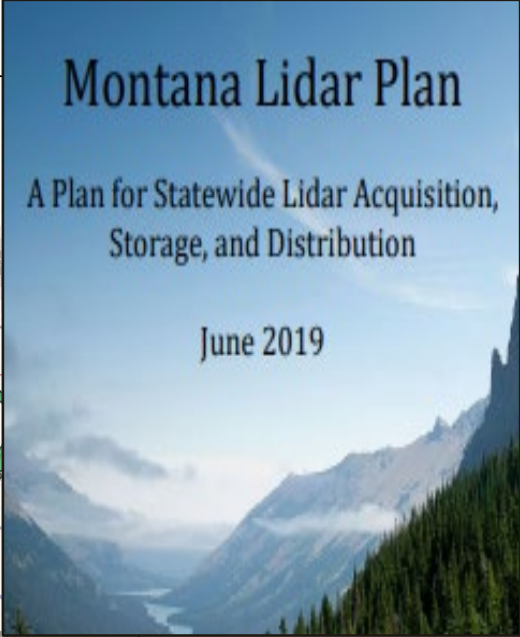


Hydrographic Position Index for mapping canals and ditches

## Aerial imagery (left) and LiDAR (right)

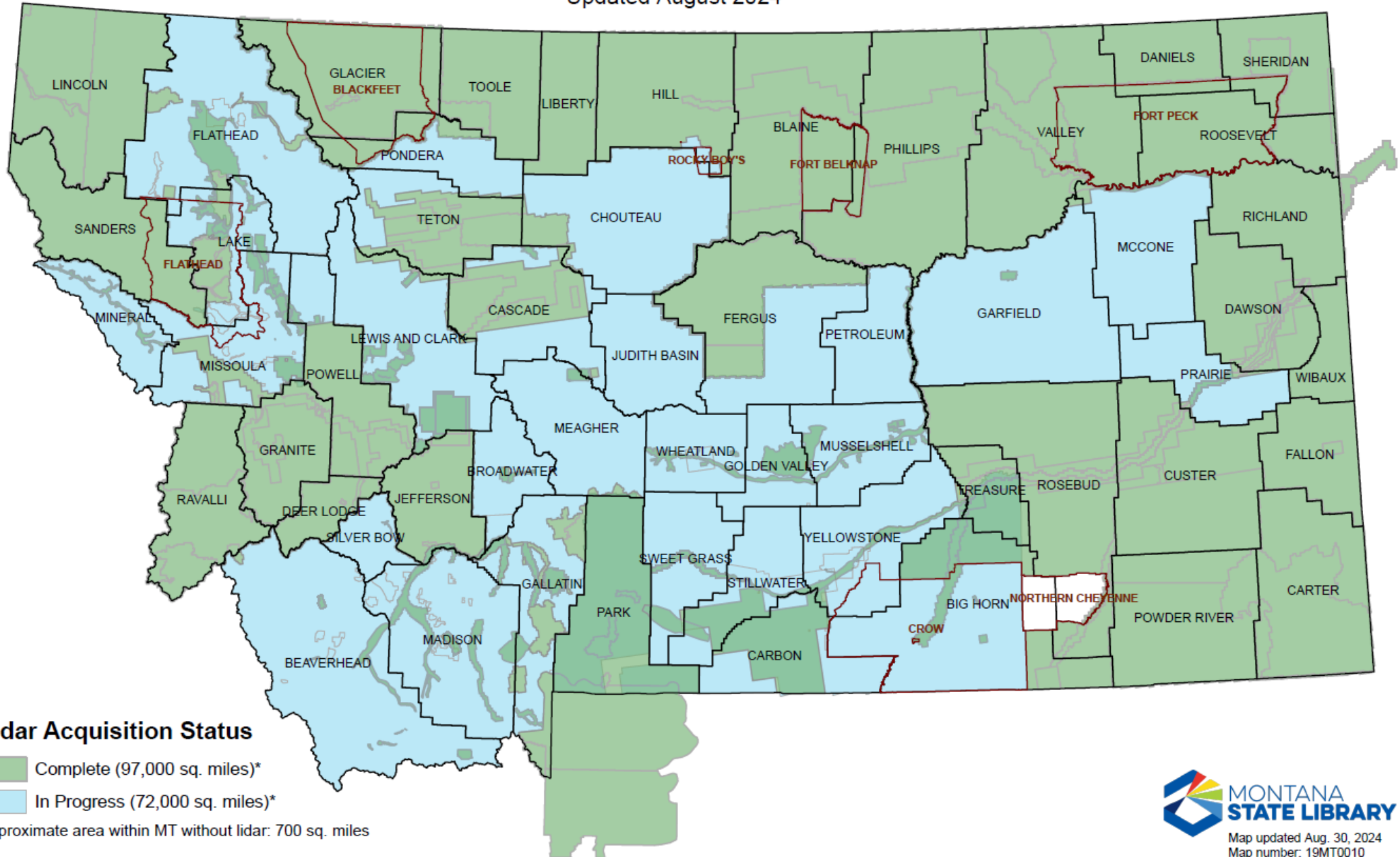


# Montana Lidar Plan, June 2019



# Montana Lidar Inventory

Updated August 2024



## Lidar Acquisition Status

- Complete (97,000 sq. miles)\*
- In Progress (72,000 sq. miles)\*

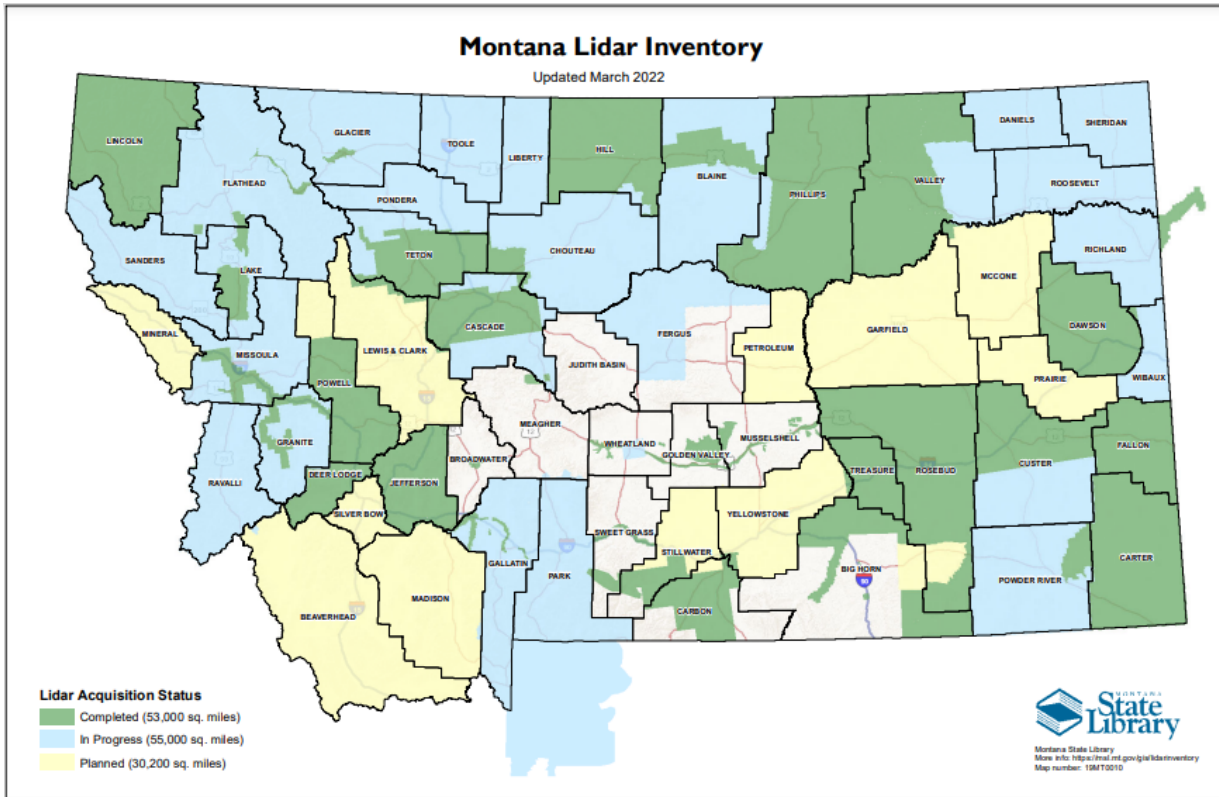
Approximate area within MT without lidar: 700 sq. miles

\*Includes overlapping projects and Yellowstone National Park, WY

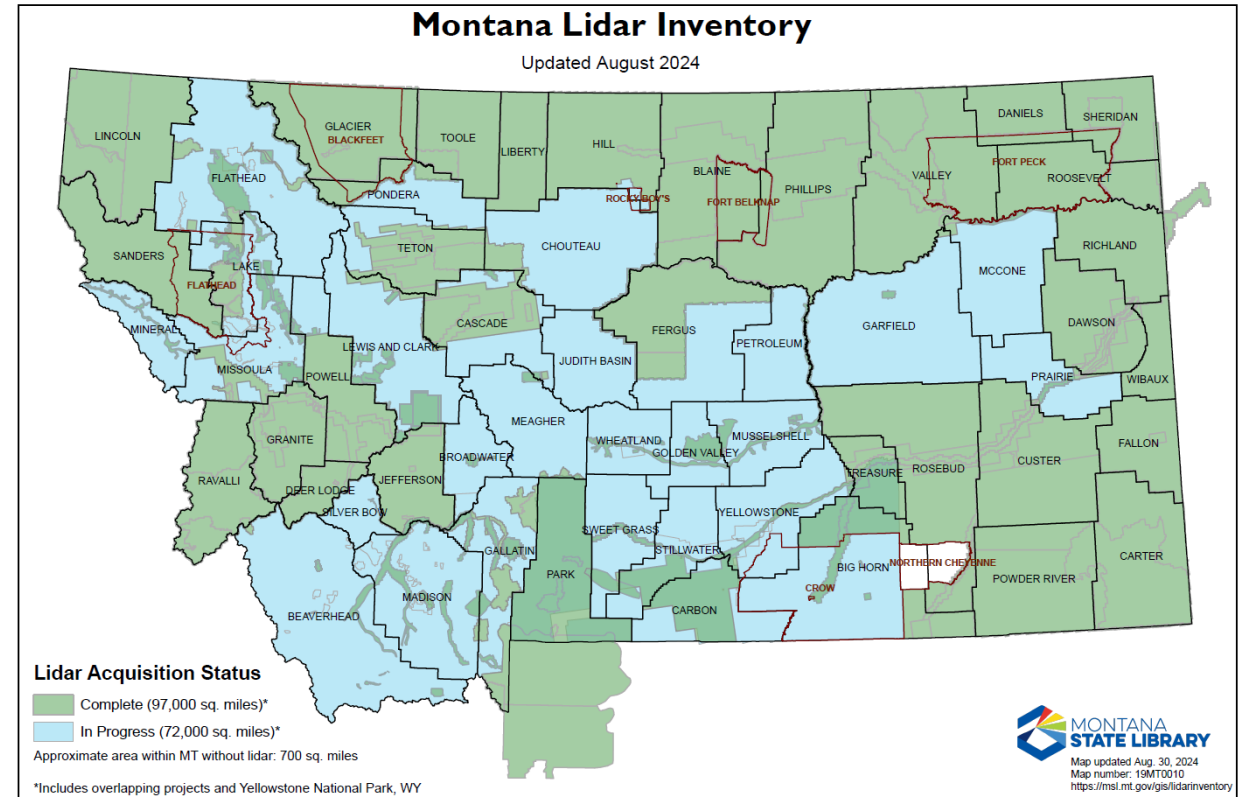


Map updated Aug. 30, 2024  
Map number: 19MT0010  
<https://msl.mt.gov/gis/lidarinventory>

# Lidar Status March 2022



# Lidar Status August 2024



# Thank You Lidar Funding Partners

- USGS 3D Elevation Program
- FEMA and MT DNRC Floodplain Program
- USDA Natural Resources Conservation Service
- United States Forest Service
- Bureau of Land Management
- United States Fish and Wildlife Service
- Confederated Salish and Kootenai
- Blackfeet Nation
- Fort Belknap Indian Community
- Fort Peck Tribes
- MT DNRC Trust Lands and Water Resources Divisions
- Glacier National Park
- USGS Northern Rocky Mountain Science Center
- Bureau of Indian Affairs

# Montana Lidar Inventory

The screenshot displays the Montana Lidar Inventory web application. At the top, the title "Montana Lidar Inventory" is on the left, and "Montana Spatial Data Infrastructure - Elevation" is on the right with a logo. Below the title is a navigation menu with four items: "Introduction", "1. Acquisition Status Map", "2. View, Download, and Request Data", "3. Collaborate - Submit Areas of Interest", and "4. Use Examples". The main interface is titled "Montana Lidar Viewer" and includes a search bar with the text "search places" and a search icon. Below the search bar is a list of filter options, each with a toggle switch:

- Viewable lidar projects
- Downloadable lidar projects
- Lidar projects available by request
- Lidar projects not yet at the State Library
- Completed lidar acquisitions
- In-progress lidar acquisitions
- Planned lidar acquisitions
- Completed lidar projects that are less than 5 years old
- Lidar projects that have contours
- Lidar projects that have building footprints
- Quality Level 1 lidar (~8 points per square meter)
- Quality Level 2 lidar (~2 points per square meter)

The main map area shows a topographic view of a mountainous region with a grid overlay. The grid cells are labeled with quad names: "Monitor Peak, 45110b6", "Quad: Mineral Mountain, 45110b5", "Quad: Mount Wallace, 45110b4", "to Peak, 45110a7", "Quad: Gardiner, 45110a6", "Quad: Ash Mountain, 45110a5", and "Quad: Specimen Creek, 45110a4". A search bar at the top of the map contains the text "search places". A toolbar on the left side of the map includes icons for home, search, print, and other functions. A pop-up window on the right side of the map displays the following information:

(1 of 3) ▶ □ ✕

Quads with downloadable lidar: Specimen Creek 45110a4

The link below will provide a .zip file containing the bare-earth DEM, Digital Surface Model, intensity and hillshade for all lidar projects available by download within the selected quad. Some quads only have partial coverage. Metadata and reports are not available by quad and can be found instead through the projects layer.

[Click here to Download](#)

Zoom to ⋮

<https://msl.mt.gov/gis/lidarinventory>

Thank you.

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