

Water Information System, Lidar, and Drought



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A Daunting Task...

Precipitation

Reservoir storage

Temperature

Water rights

Flood risk



Watershed health



Forecasts



Streamflow measurement

Snow



Technical reports

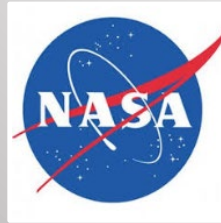


Drought



Water quality

Water Supply



Remotely sensed data



Source water

Fish/Aquatic life



Groundwater

Agricultural water use

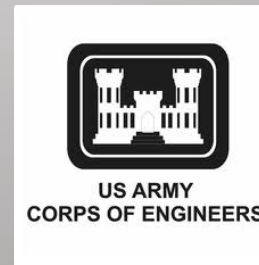


Irrigation Infrastructure

Streamflow measurement



Water quality



Reservoir storage

Someone
needs to do it . . .

Montana Water Information System

- Facilitate water data discovery and access
- Coordinate with water data providers
- Update and maintain the Montana Hydrography Dataset

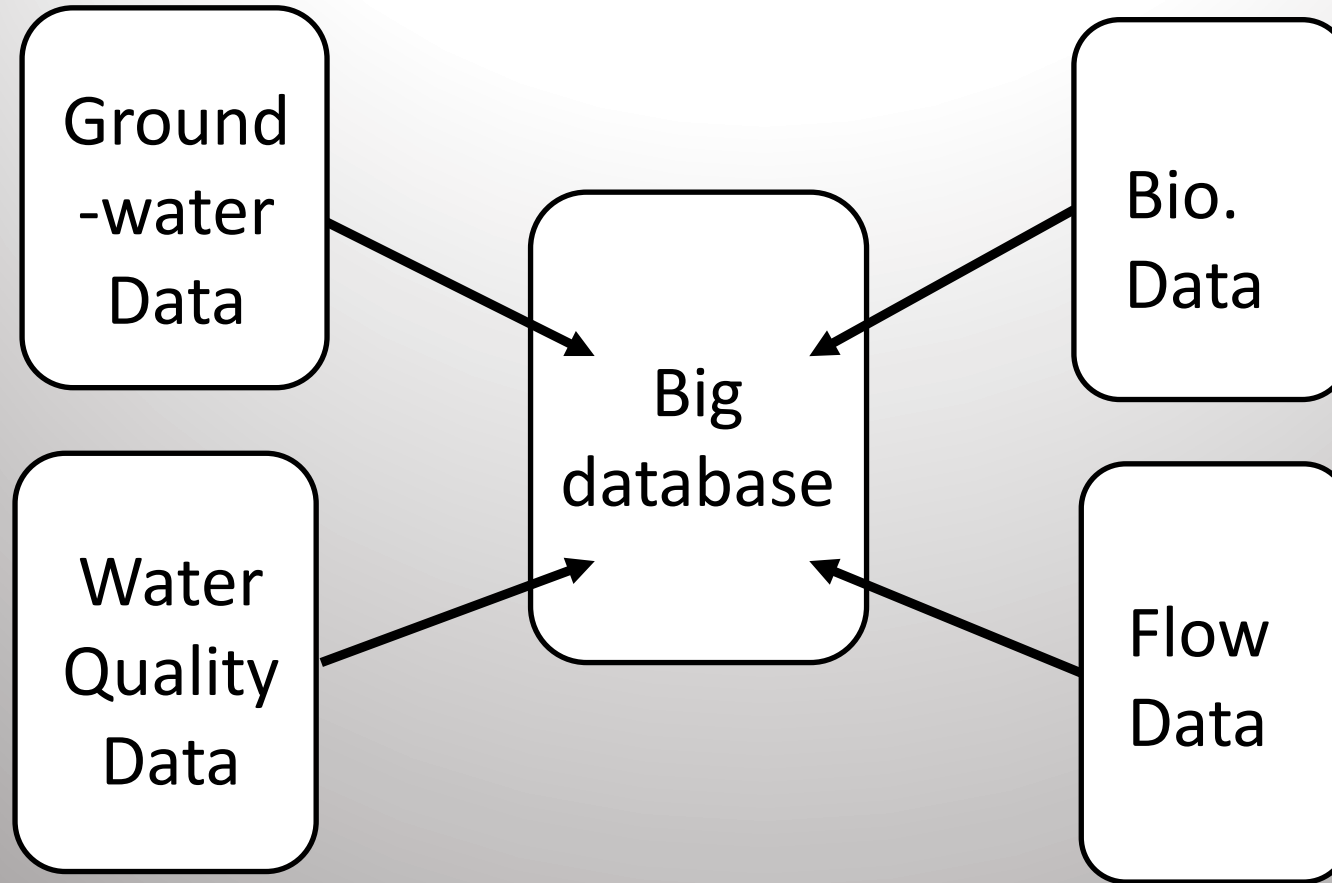
TITLE 90. PLANNING, RESEARCH, AND DEVELOPMENT
CHAPTER 15. NATURAL RESOURCE INFORMATION SYSTEM
Part 3. Information System

Water Information System

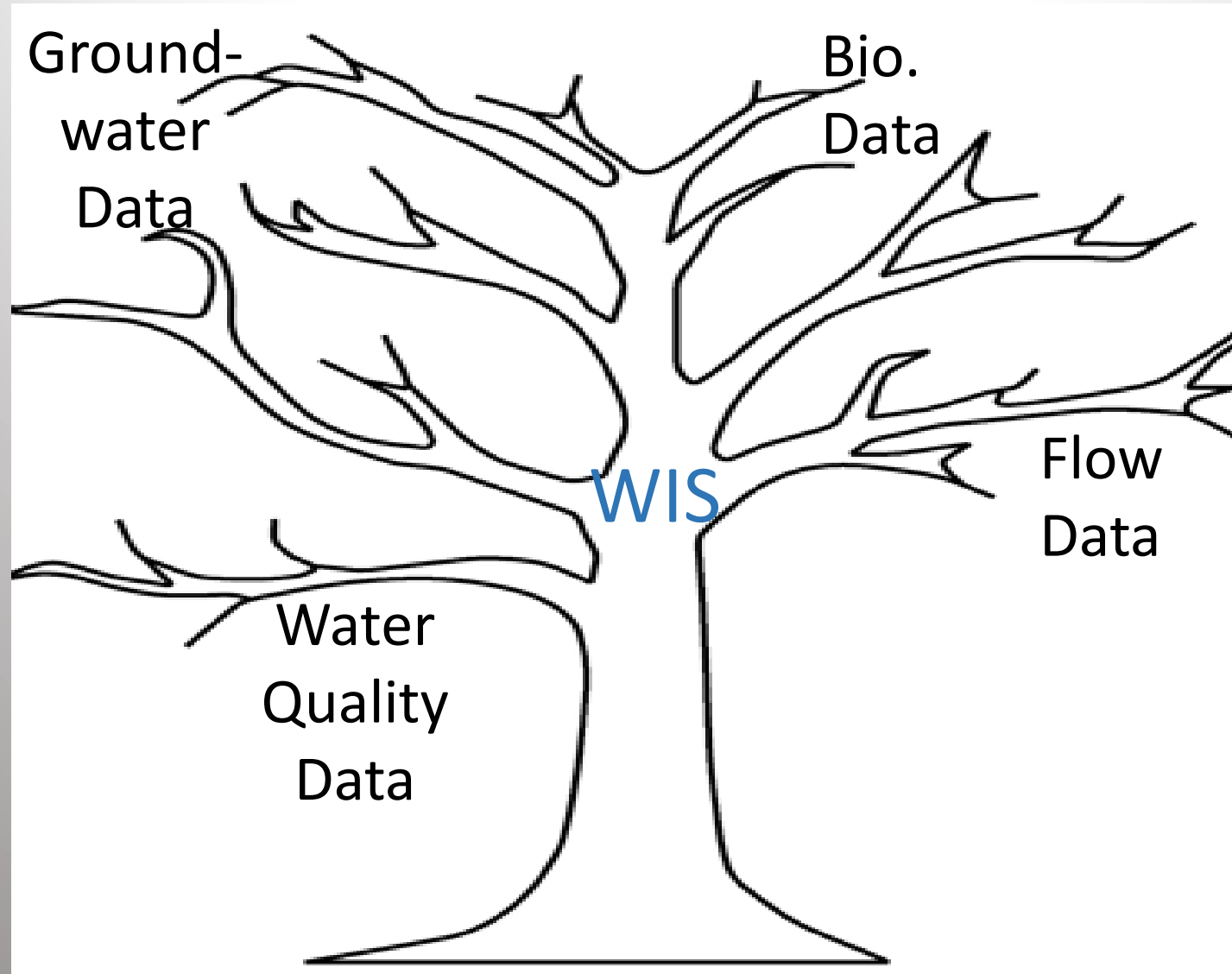
90-15-305. Water information system. (1) There is a Montana water information system, to be operated within the natural resource information system referred to in **90-15-301** and that is to be considered a part of the system.

(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.

NOT a single, central repository



Yes, separate databases linked to a common spatial framework





Montana Spatial Data Infrastructure: Hydrography

What is it?

Networked geometry and attributes representing surface water (lakes, ponds, streams, rivers, canals, ditches, etc.). Provides a system for indexing (addressing) water-relevant data.

Status

Maintenance, continuous improvement/alignment

Used for:

State water planning, water quality reporting, water quality monitoring locations, permitting, floodplain mapping, fisheries/wildlife, navigable waters, water rights, dam safety, streamside management.

Data Access:

Web services, downloadable data, online viewer, printed maps (PDF), Digital Atlas, Digital Bundler

MSDI Elevation

(lidar-derived)

What is it?

Statewide high-resolution (1-meter), high accuracy (<1 foot) elevation model derived from lidar

Status

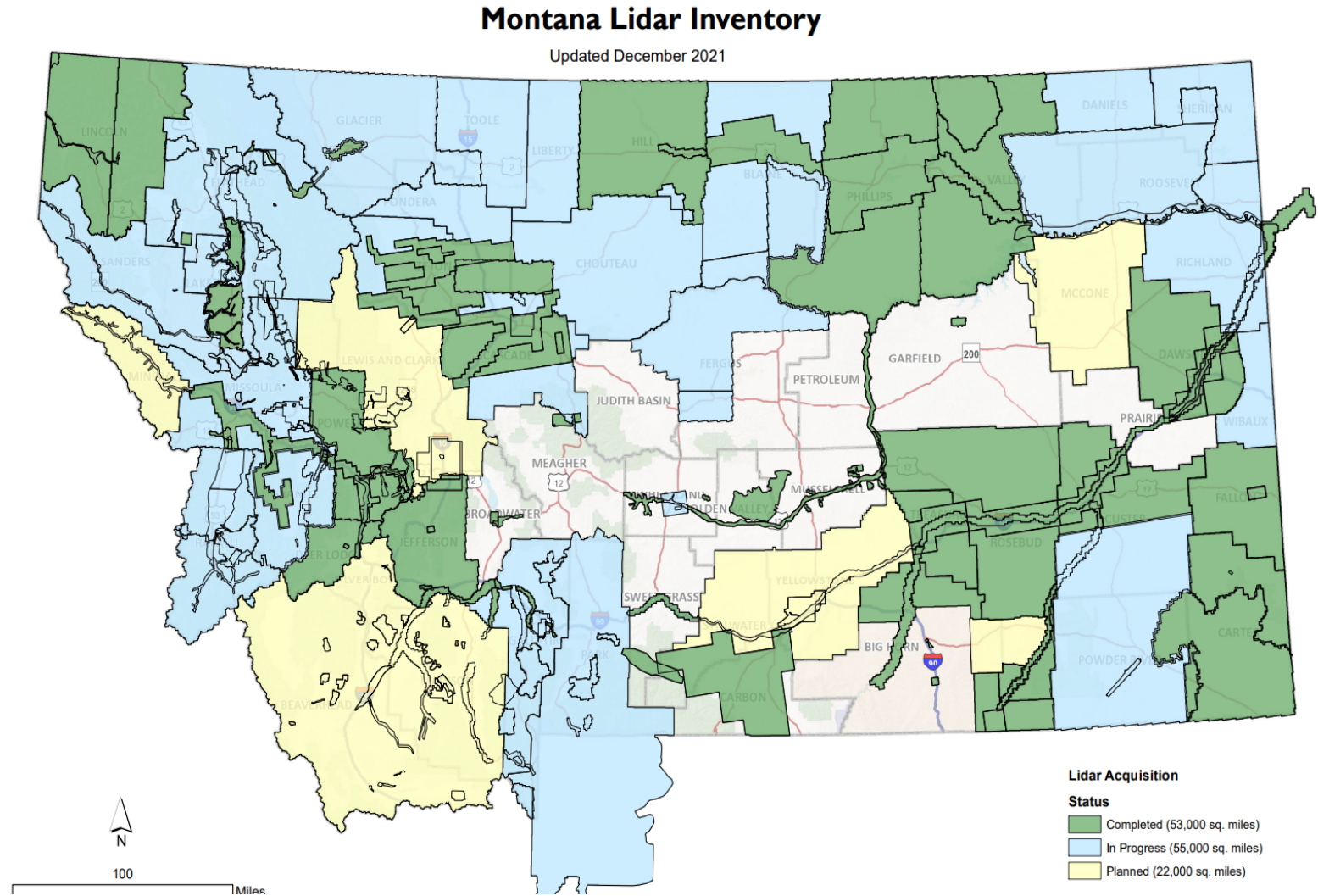
In development, acquiring data (5-year plan began 2019)

Data Access:

Montana Lidar Inventory
<https://msl.mt.gov/gis/lidarinventory>

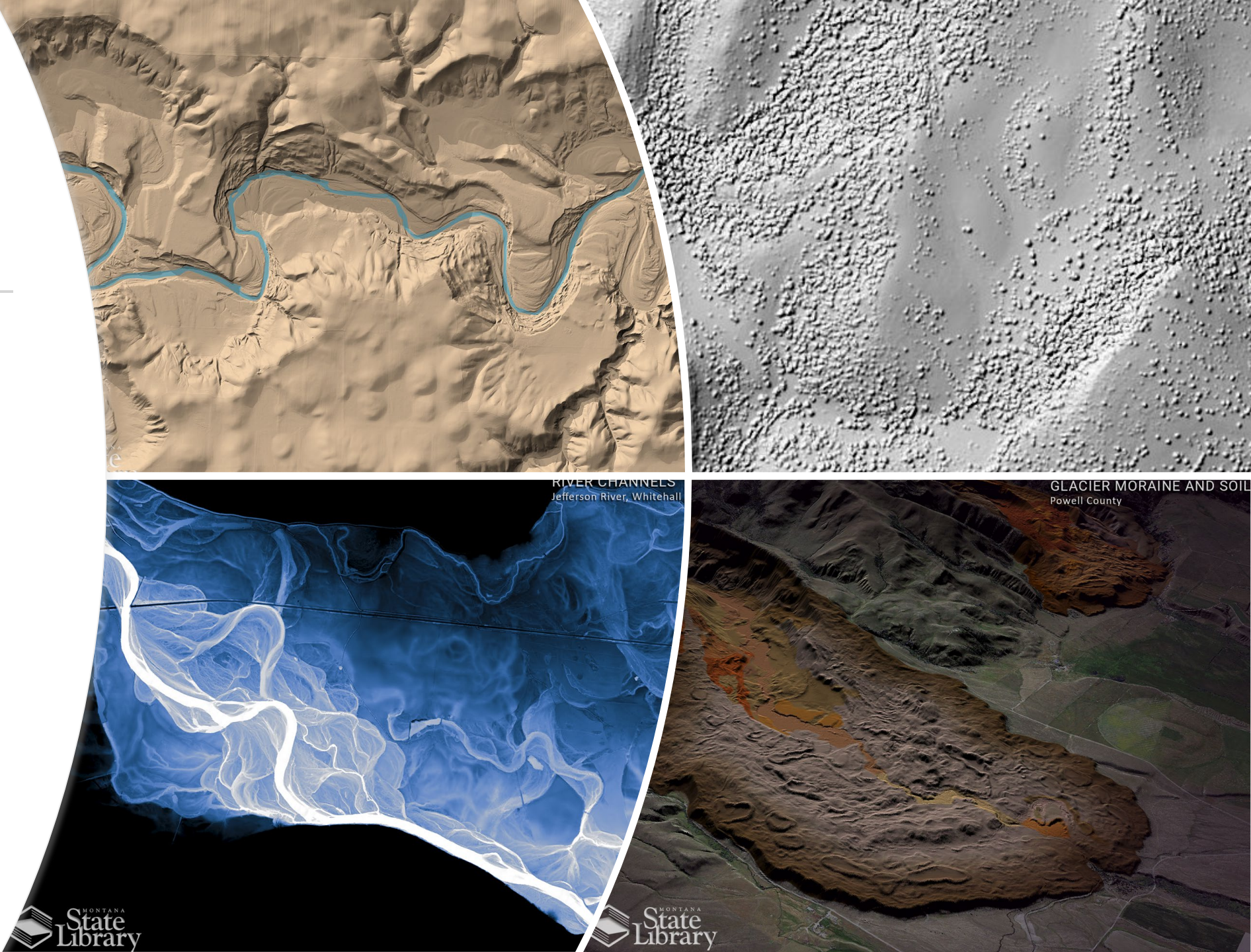
Montana Lidar Inventory – Acquisition Status

- **More lidar coming!** MT project recommended for funding FY2022 through the USGS 3D Elevation Program.
 - Yellow areas on map
 - 22,548 square miles will be flown with lidar
- Thank you to this year's lidar funding partners! Natural Resources Conservation Service (**NRCS**), Bureau of Land Management (**BLM**), United States Forest Service (**USFS**), United States Fish and Wildlife Service (**USFWS**).



MSDI Elevation

- **Core lidar-derived products available:**
 - Bare-earth Digital Elevation Model
 - Hillshade
 - Digital Surface Model
 - Intensity
 - Canopy Height Model
- LAS point cloud readily available by request
- 1-foot contours and building footprints available for some projects



Join the Montana Elevation Working Group

Federal, State, County, local, and private participants...all interested are welcome to join.

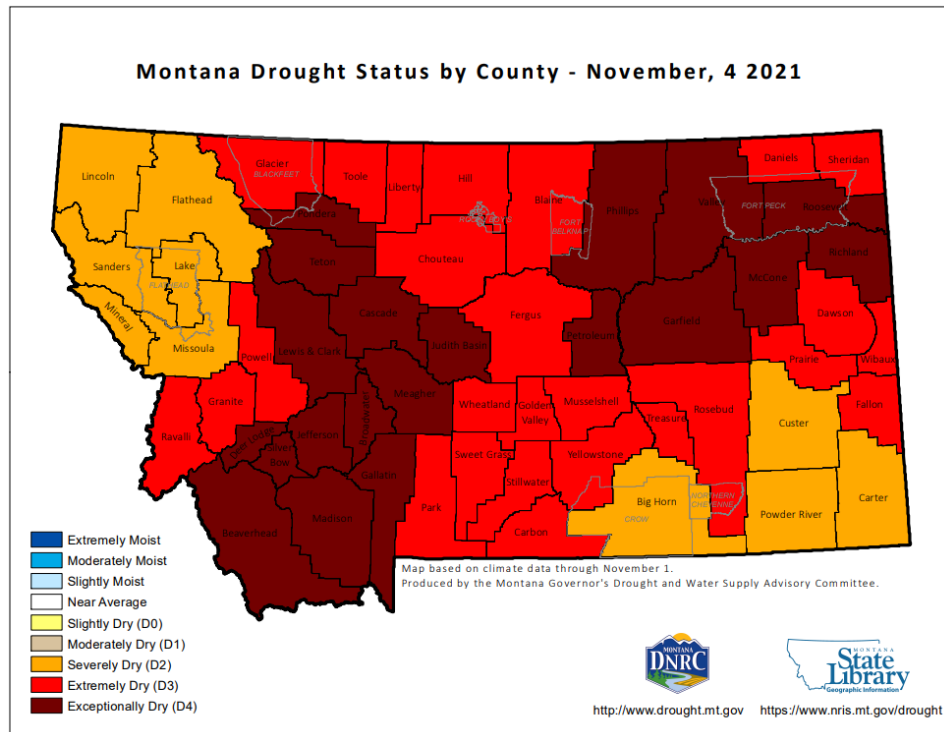
Annual Lidar Planning

- **April-May** – Acquisition Planning Meeting, set priority areas of interest for Fall proposal
- **May-July** – Funding partner identification
- **Mid-August** – USGS 3DEP Public Webinar for Broad Area Announcement
- **September** – Proposal development
- **October** – Proposals Due

Lidar collection generally occurs in spring and fall (leaf-off) when there is no snow. Turnaround time can be 18-24 months.

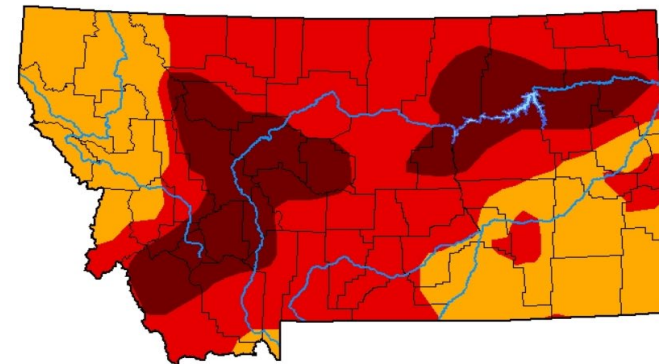
Montana drought monitoring

- Monthly, county-based drought map
- U.S Drought Monitor weekly map



U.S. Drought Monitor Montana

November 2, 2021
(Released Thursday, Nov. 4, 2021)
Valid 8 a.m. EDT



Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

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NOAA/NWS/NCEP/CPC



droughtmonitor.unl.edu

Montana drought monitoring

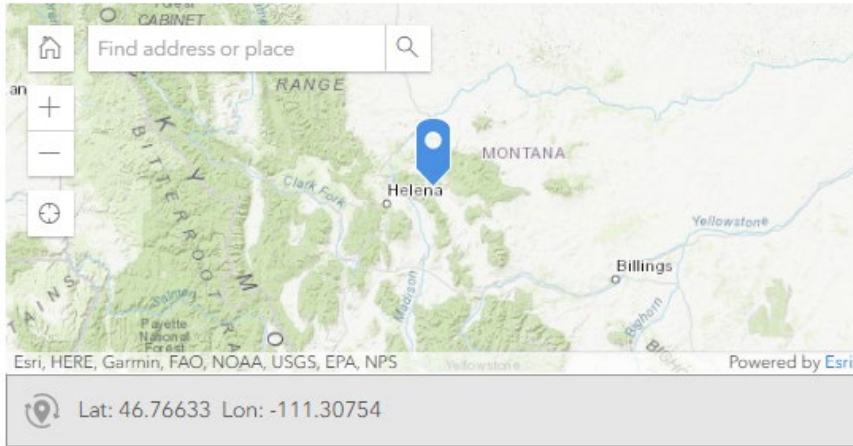
- **Governor's Drought and Water Supply Advisory Committee led by Dept. of Natural Resources and Conservation (DNRC)**
- **Weekly coordination** with the U.S Drought Monitor
 - MT Drought Liaisons
 - DNRC, Michael Downey
 - State Library, Troy Blandford
 - Montana Climate Office, Zach Hoylman
 - Montana Climate Office, Kelsey Jensco
 - NOAA NWS, Arin Peters
 - MT recommendation for changes to the drought map are drafted Monday morning > general agreement is reached > recommendation is sent to USDM Author by Tuesday afternoon > new USDM map is published Thursday morning.
 - 40-50 people on listserv. Would like to have more eyes! Email one of the contacts above to be added to the listserv.
- **Monthly meetings** (Apr – Sept) to gather local input on drought impacts
- **Montana Drought Impact Reporter** – live, ongoing survey for reporting moisture conditions. Producers, field staff, Extension, Farms Service Agency, ...open to anyone.

Introduction

Drought can affect wildfire, agriculture production, tourism, wildlife and many other areas important to Montana. The Governor's Drought and Water Supply Advisory Committee has put together a very short questionnaire for reporting local drought impacts. The information gathered will be used to investigate trends and impacts and will help inform potential responses in times of drought. This questionnaire may be completed more than once to report impacts in another location or to report changing conditions. Information on wet conditions is helpful too, so please submit reports anytime of year, wet or dry.

Where are you?*

Please click and drag the map to place the marker at the location of your observation. Click on the compass icon to select your current location.



Select your county: ▼

County:*

What is the date?*

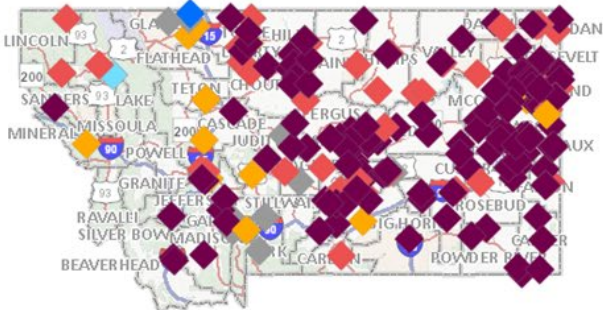
Please use the calendar to select the date of your observation.

MT Drought Impact Reporter

- Report on moisture conditions in your area with a simple questionnaire
 - Anyone can submit a report
- Released July 2017
 - Live/ongoing, retake as conditions change, good or bad
- 200+ reports received in Water Year 2021
- **Submit reports:**
<https://nris.mt.gov/droughtsurvey>

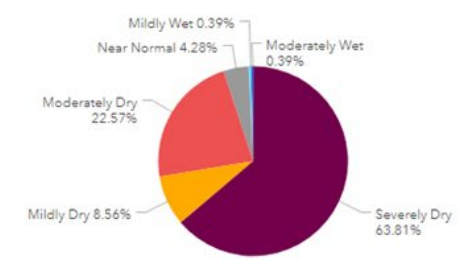
View Drought Impact Reports:

<https://nris.mt.gov/droughtimpacts>



Lincoln, Glacier, Hill, Daniels, Judith, Cascade, Mineral, Missoula, Powell, Granite, Jefferson, Ravalli, Silver Bow, Madison, Beaverhead, Lake, Teton, Chouteau, Park, Daniels, Hill, Judith, Cascade, Mineral, Missoula, Powell, Granite, Jefferson, Ravalli, Silver Bow, Madison, Beaverhead, Lincoln, Glacier, Hill, Daniels, Judith, Cascade, Mineral, Missoula, Powell, Granite, Jefferson, Ravalli, Silver Bow, Madison, Beaverhead, Lake, Teton, Chouteau, Park, Daniels, Hill, Judith, Cascade, Mineral, Missoula, Powell, Granite, Jefferson, Ravalli, Silver Bow, Madison, Beaverhead

How Wet or Dry is it?




Category	Percentage
Severely Dry	63.81%
Mildly Dry	8.56%
Moderately Dry	22.57%
Near Normal	4.28%
Mildly Wet	0.39%
Moderately Wet	0.39%

How Wet or Dry is it? Crop Conditions Range Conditions

1 of 37

10/20/2021, 12:00 PM - Liberty County



This is a pic of Winter Wheat that was seeded the first week in Sept. The wheat is attempting to sprout and will most likely die in a few day. This wheat should be 6"-8" tall by now and into the 3rd-4th leaf stage. Conditions are near critical and the forecast doesn't give us much hope. We have not received and substantial moisture in 60+ days.

Montana State Library

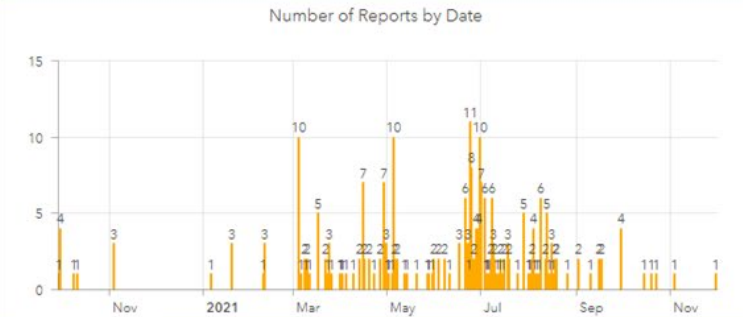
Overview Photos

Number of Reports Since 10/1/2020

257

Total Reports

Number of Reports by Date



Month	Number of Reports
Nov 2020	4
Dec 2020	11
Jan 2021	3
Feb 2021	1
Mar 2021	3
Apr 2021	3
May 2021	10
Jun 2021	7
Jul 2021	11
Aug 2021	10
Sep 2021	6
Oct 2021	4
Nov 2021	1

Reports by Date Reports by Primary Sector Reports by County Photos by Date

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Thanks!

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