

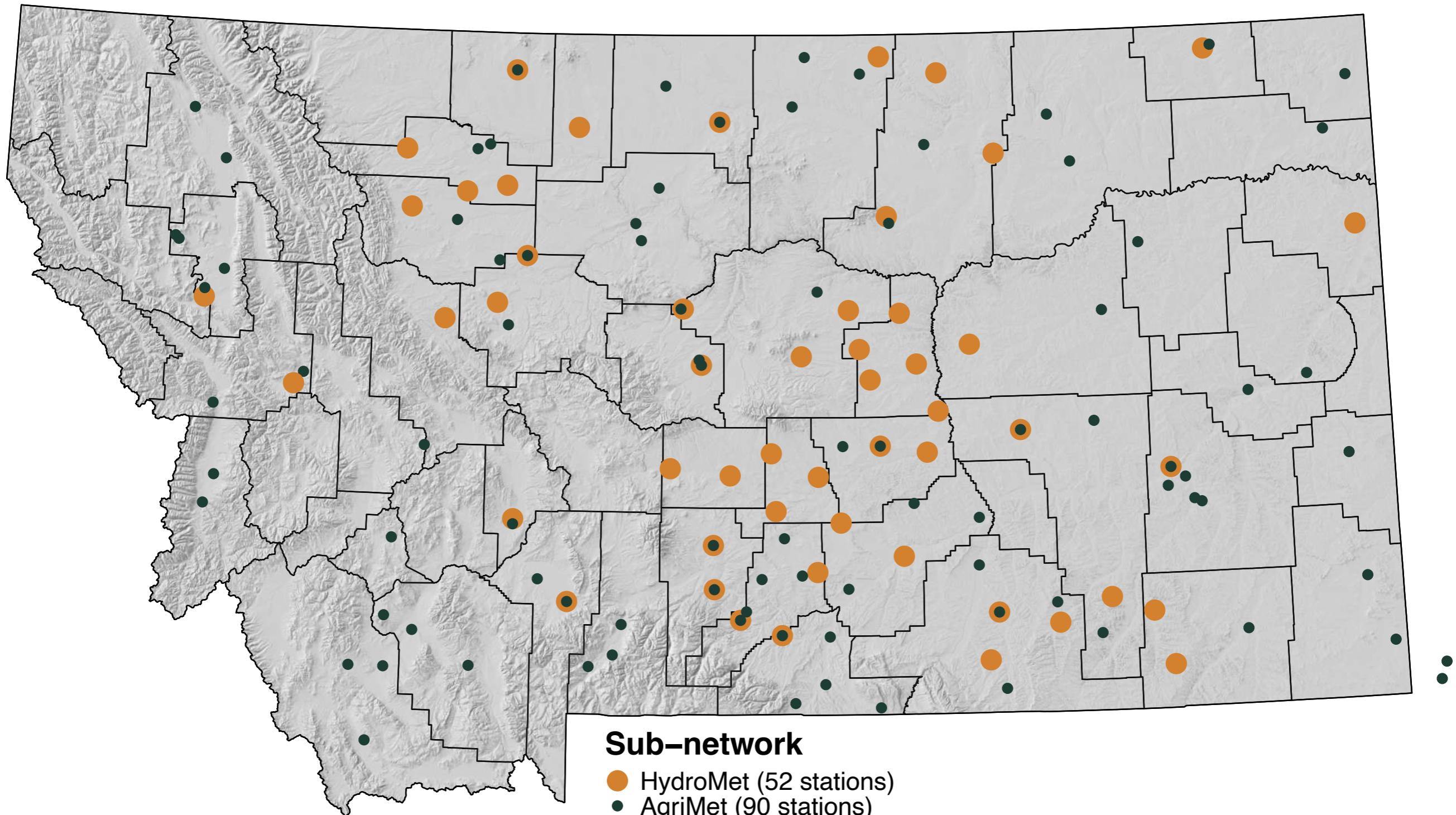
The Montana Mesonet and UMRB Soil Moisture and Snowpack Monitoring

Kyle Bocinsky
Director of Climate Extension
Montana Climate Office
University of Montana



- Montana's **official climate data stewards**.
- Provides **high quality, timely, relevant, and scientifically-based climate information** and services to Montanans.
- Operates the **Montana Mesonet** — an extensive and growing network of weather, soil moisture, and snowpack monitoring stations.

Montana Mesonet: A collaborative model



142 stations across the state (and growing!)

Montana Mesonet: A collaborative model

Federal, State, and Private Partnerships

- US Army Corps of Engineers
- National Oceanographic and Atmospheric Administration (NOAA)
- DOI Bureau of Land Management
- USDA Forest Service
- MT Department of Agriculture
- MSU Agricultural Research Centers
- Stillwater County (Maureen Davey)
- Montana Bureau of Mines and Geology
- Bureau of Indian Affairs: Little Big Horn College, Crow Agency
- Fort Peck Tribes
- Blackfeet Nation
- Montana Department of Natural Resources and Conservation
- Lolo Watershed Group
- Musselshell Watershed Coalition
- Blackfoot Challenge
- Trout Unlimited
- National Drought Resiliency Partnership
- Community Collaborative Rain, Hail and Snow Network (CoCoRahs)
- Roberts L7 Ranch
- **Private landowners**

Sub-network

- HydroMet (32 stations)
- AgriMet (90 stations)

142 stations across the state (and growing!)

Montana Mesonet: Building the HydroMet



Carly Andlauer, a University of Montana senior finishing up a bachelor's degree in ecology restoration, processes soil samples Thursday from across the state for a climate monitoring project. UM researchers recently received a \$21 million government contract for the project to better monitor soil moisture, snowpack, weather hazards and climate conditions.

UM awarded \$21M contract

Researchers given Army Corps contract to expand climate monitoring network

Laura Scheer
laura.scheer@missoulian.com

University of Montana researchers recently received a

\$21 million government contract, bringing more support and longevity to what has been a grassroots effort to build a better climate monitoring network across the state.

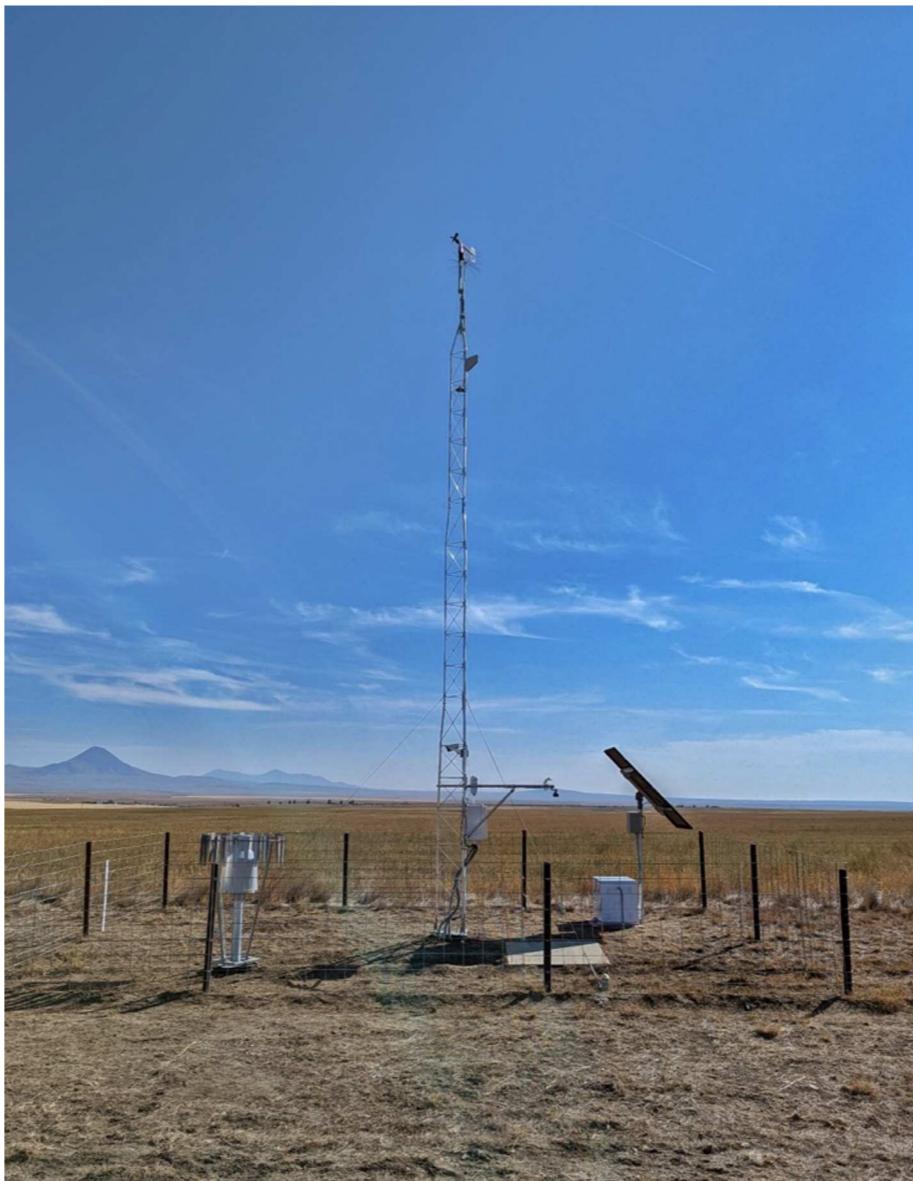
The funding from the U.S. Army Corps of Engineers will pay to expand and enhance a collaborative project spearheaded by UM's Montana Climate Office

in weather and soil moisture data throughout the state.

"This project is very unique," said Kelsey Jencso, a lead researcher and associate professor of watershed hydrology at UM. "This is a very applied project. It has a particular goal, which is to better monitor soil moisture, snowpack, weather hazards and climate conditions."

Through partnerships with

Please see CONTRACT, Page A3



Mesonet
SDSTATE



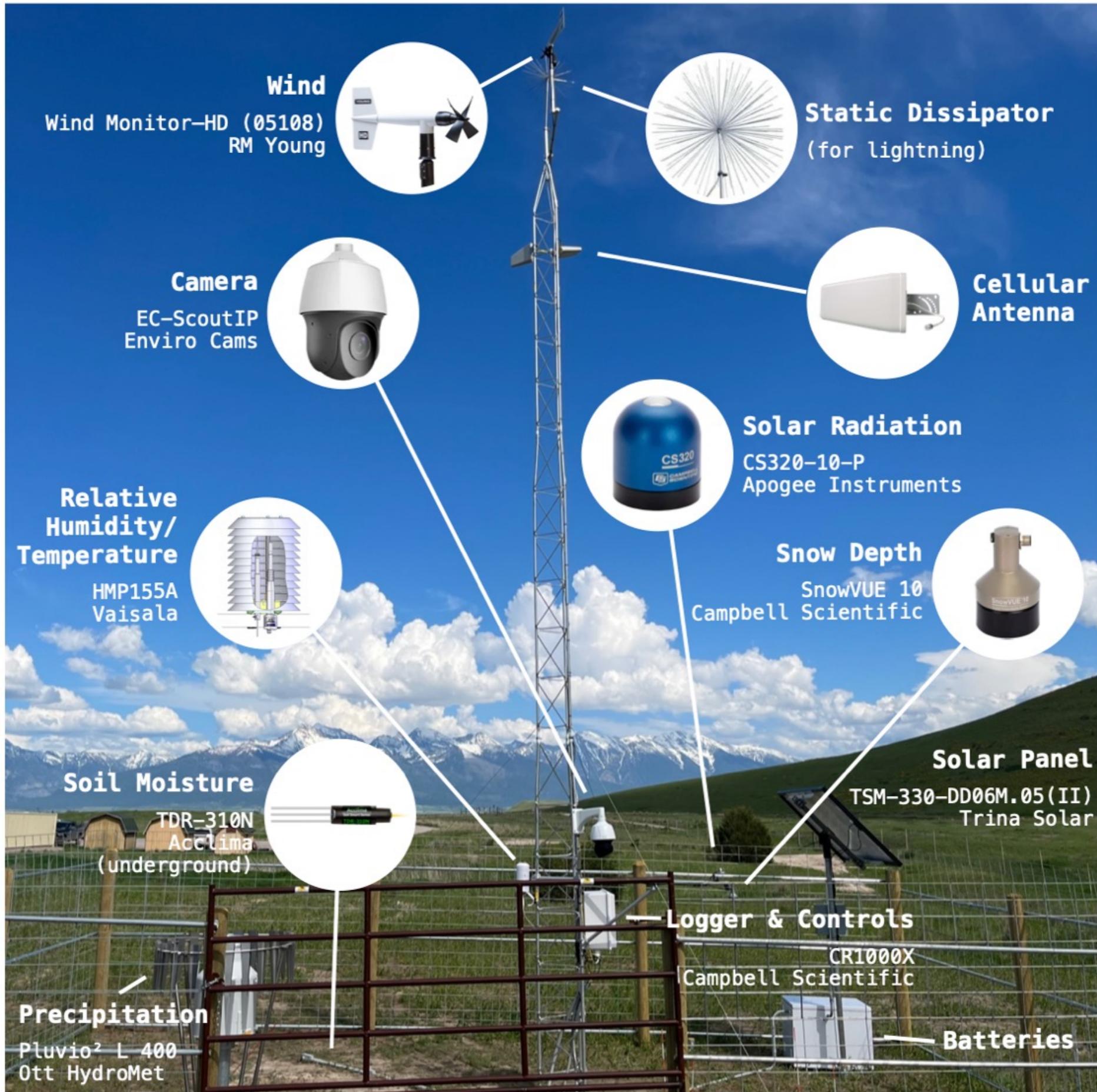
NDAWN
NORTH DAKOTA AGRICULTURAL WEATHER NETWORK

 **Montana Climate Office**

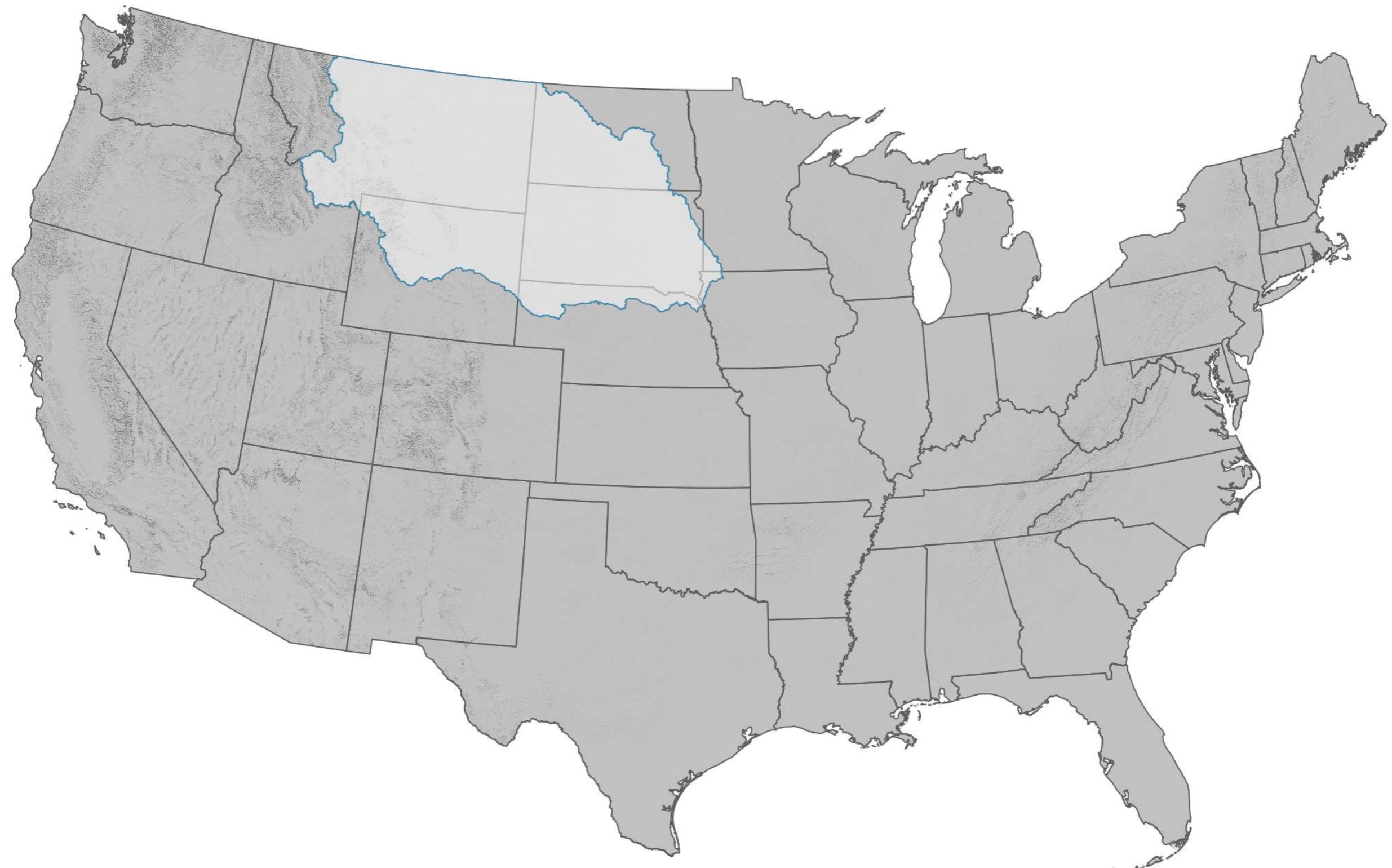
 **nebraska mesonet**



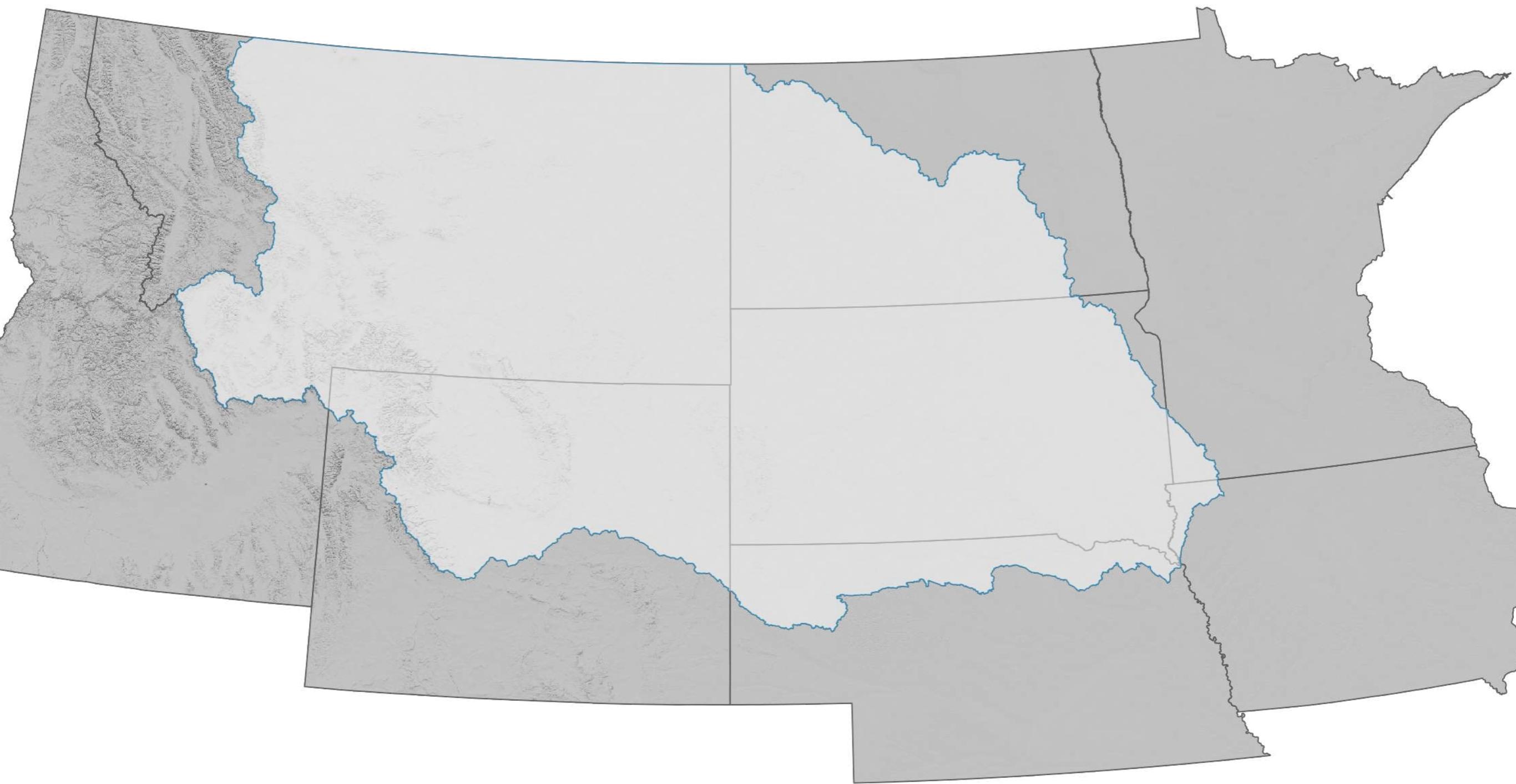
Corps of Engineers photo of June 16, 2011, showing the Fort Calhoun nuclear power plant surrounded by flood water



The Upper Missouri River Basin

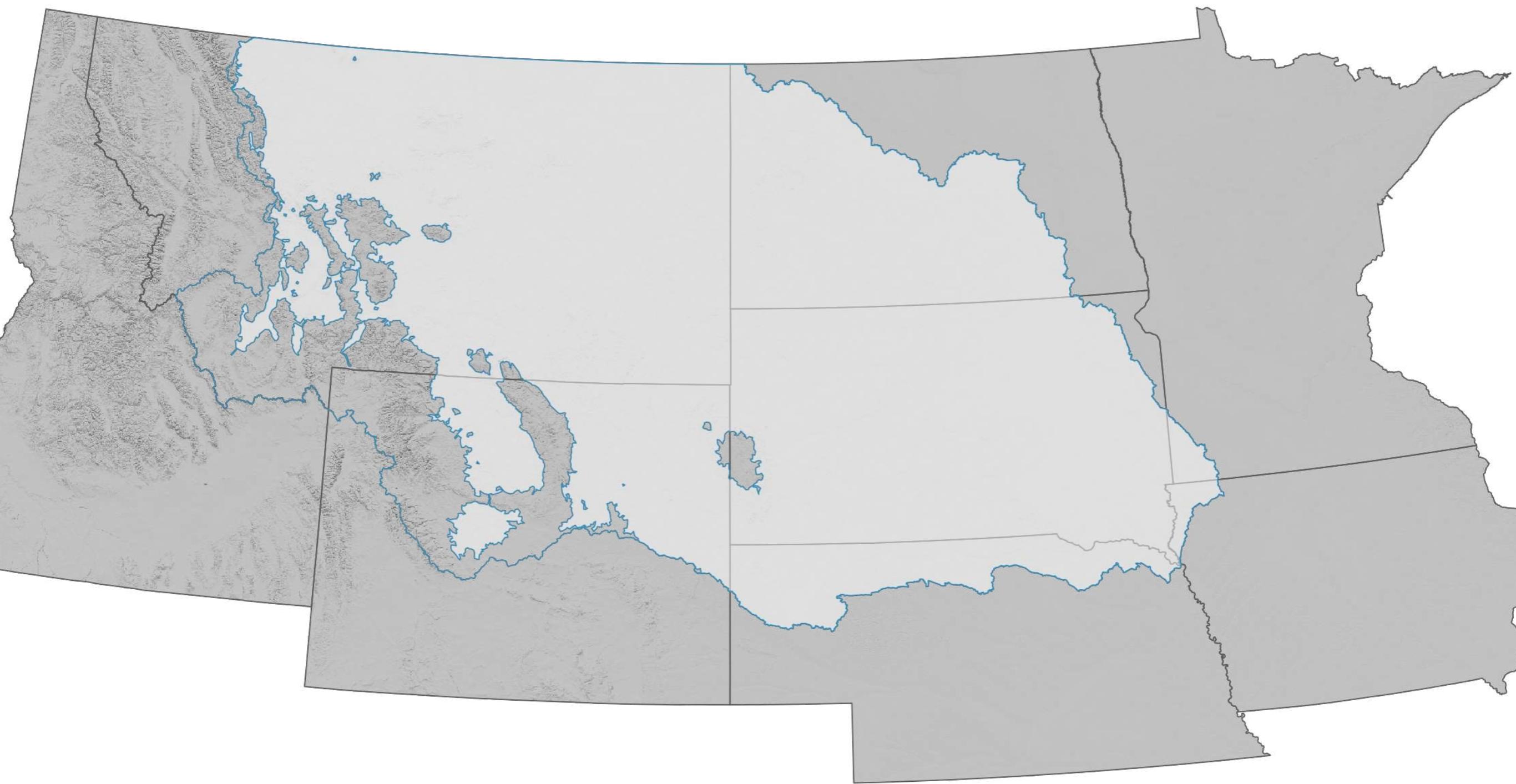


The Upper Missouri River Basin



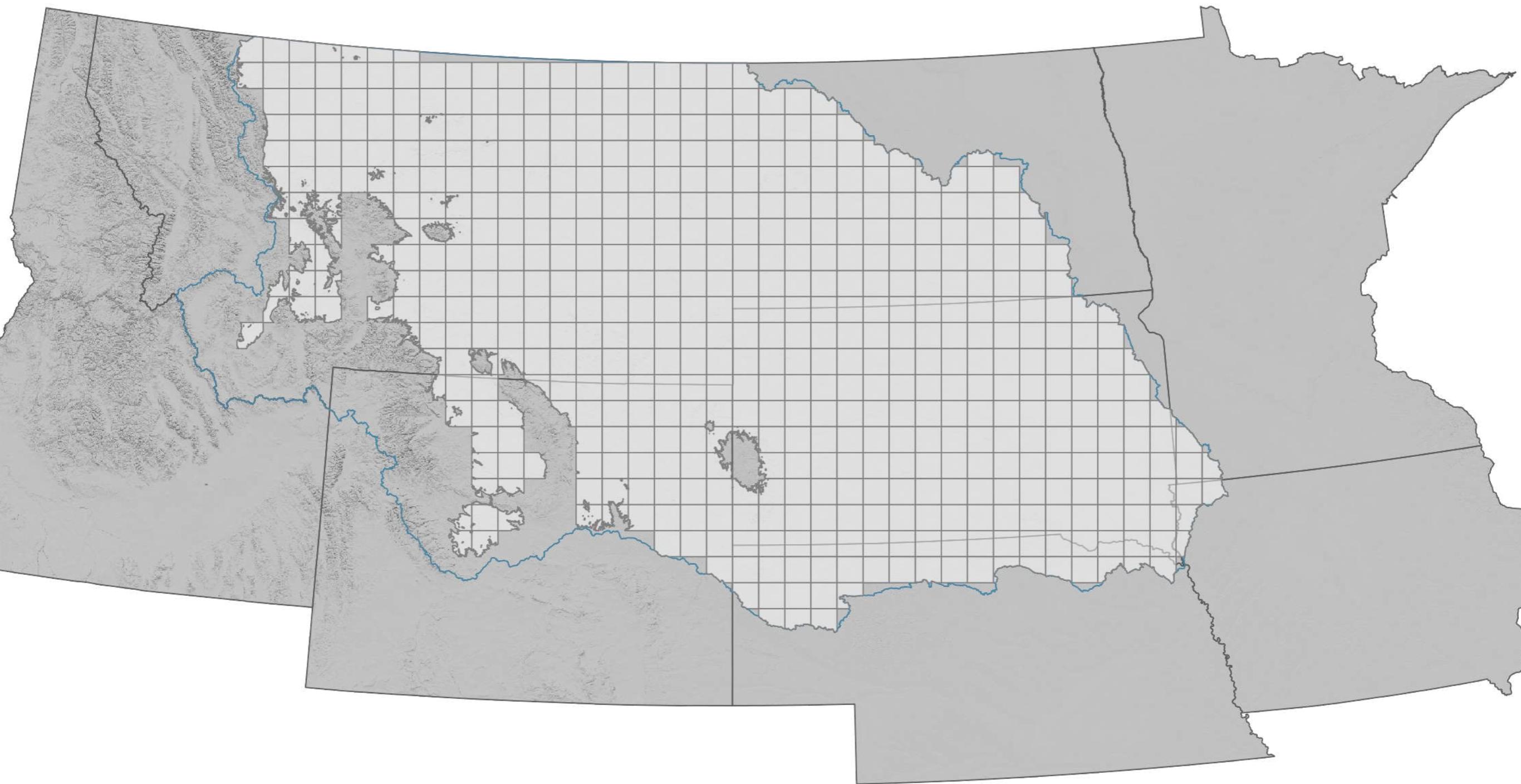
The Upper Missouri River Basin

Plains Below 5,500 ft.



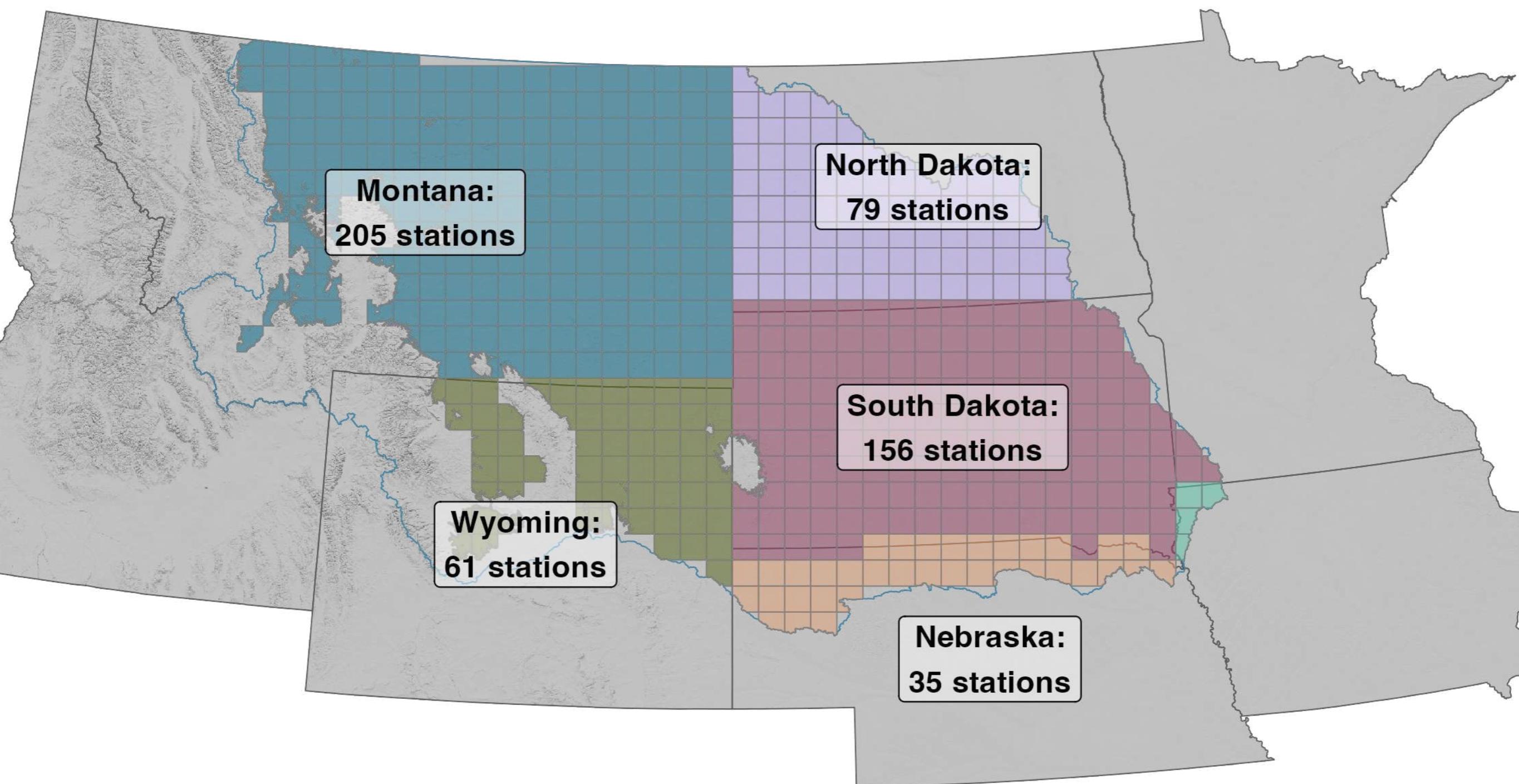
The UMRB Monitoring Network

500 mi² Grid



The UMRB Monitoring Network

Participating State Mesonets



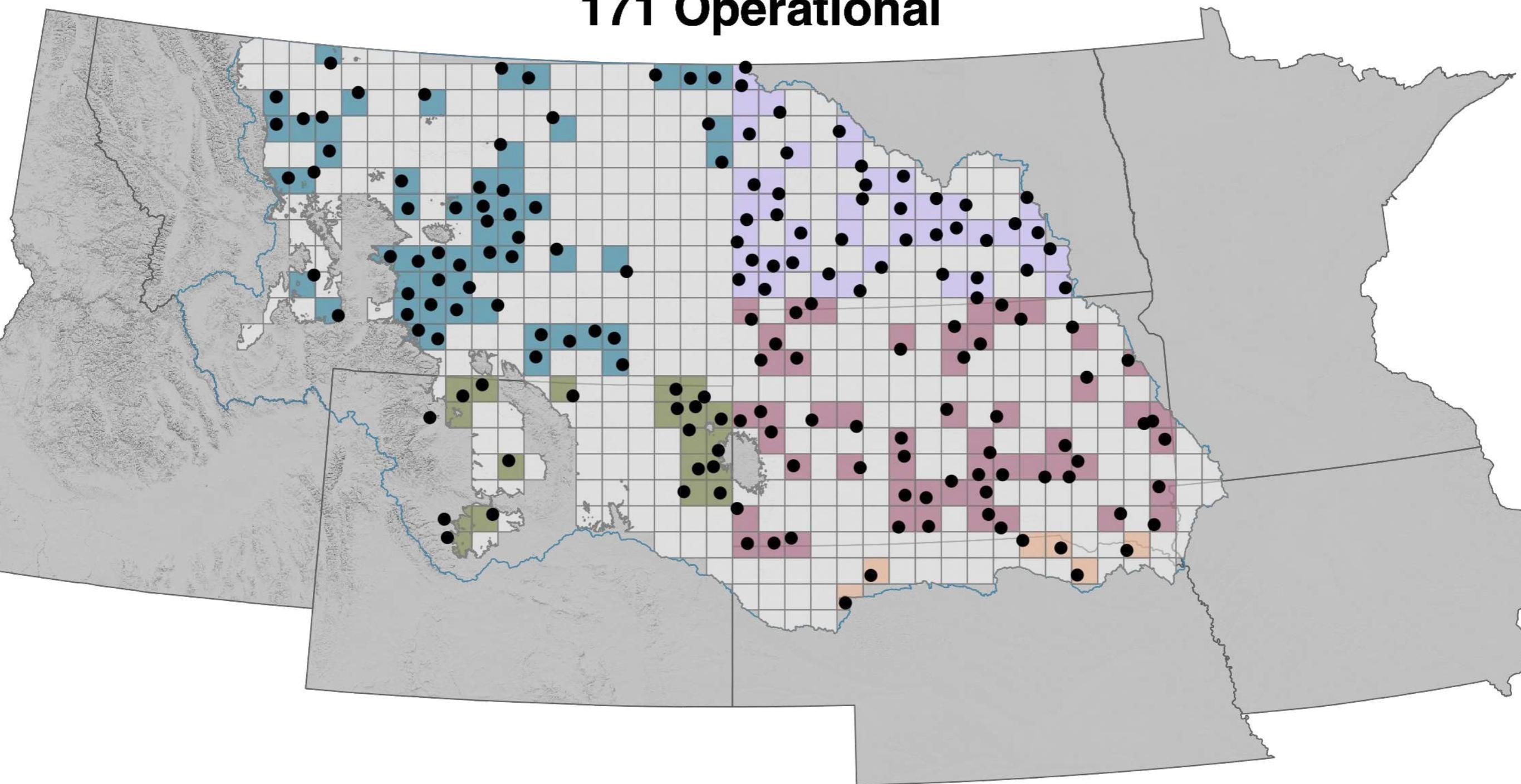
The UMRB Monitoring Network

- Operational

Summer 2024

Candidate 2025

171 Operational



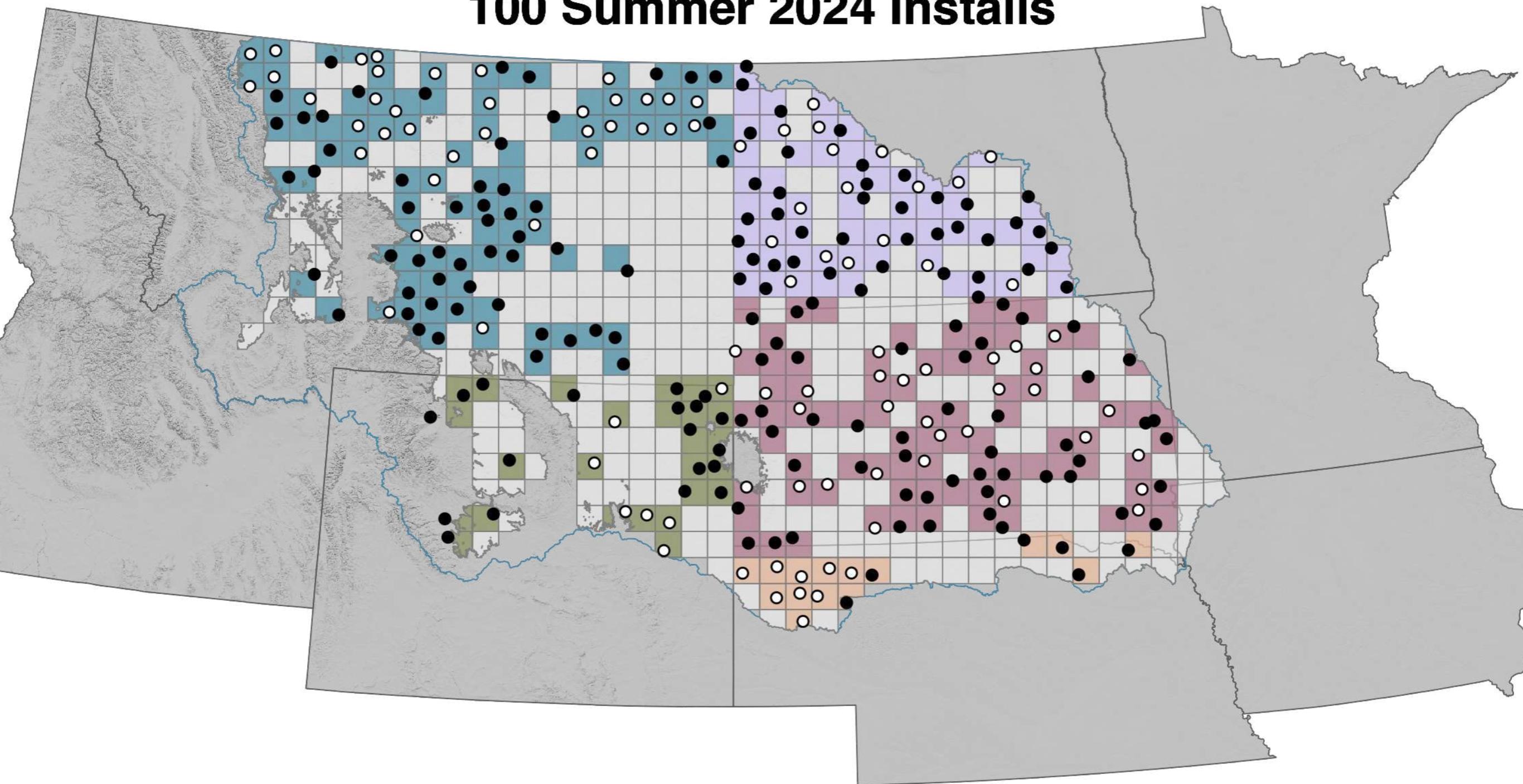
The UMRB Monitoring Network

- Operational

- Summer 2024

- Candidate 2025

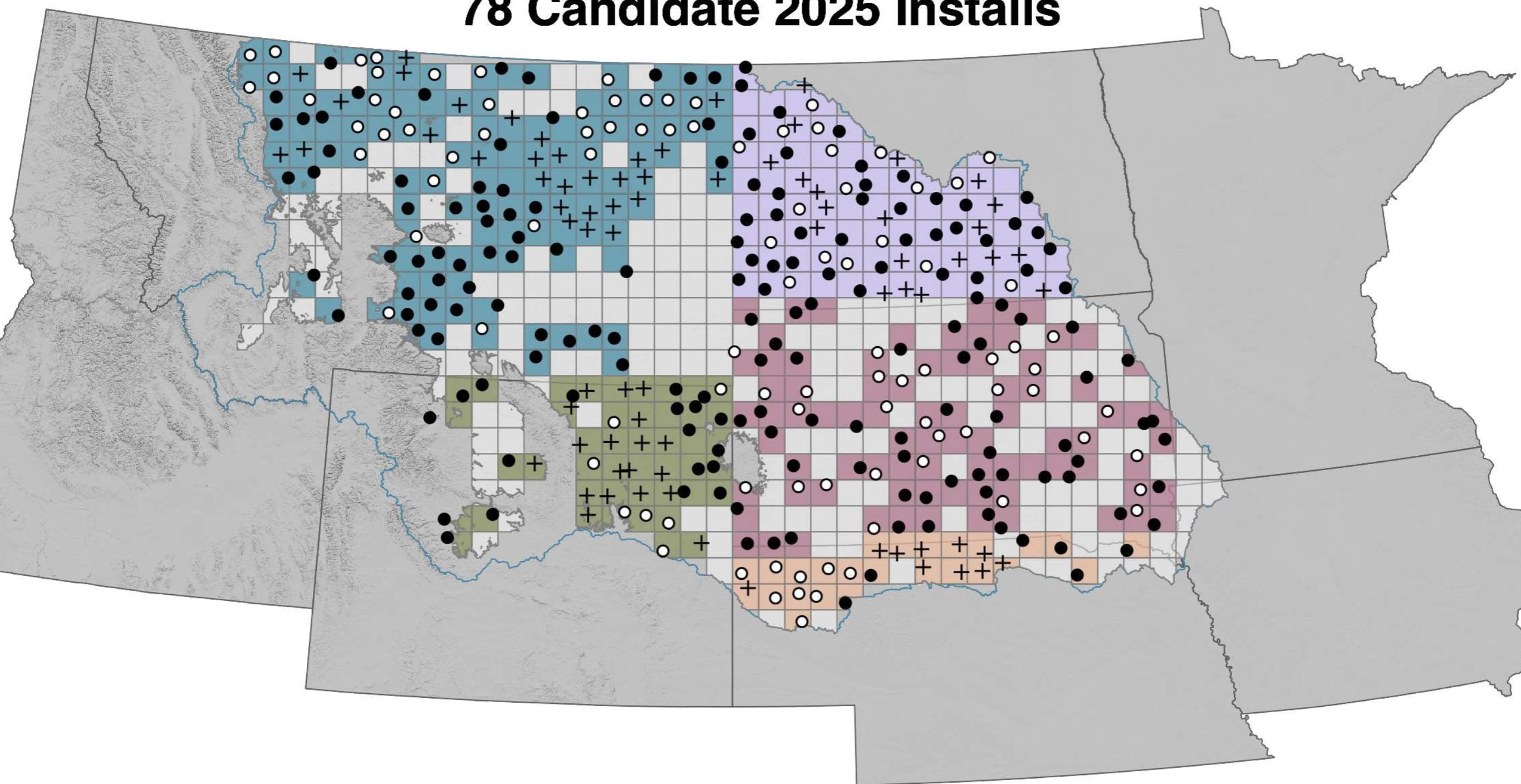
100 Summer 2024 Installs



The UMRB Monitoring Network

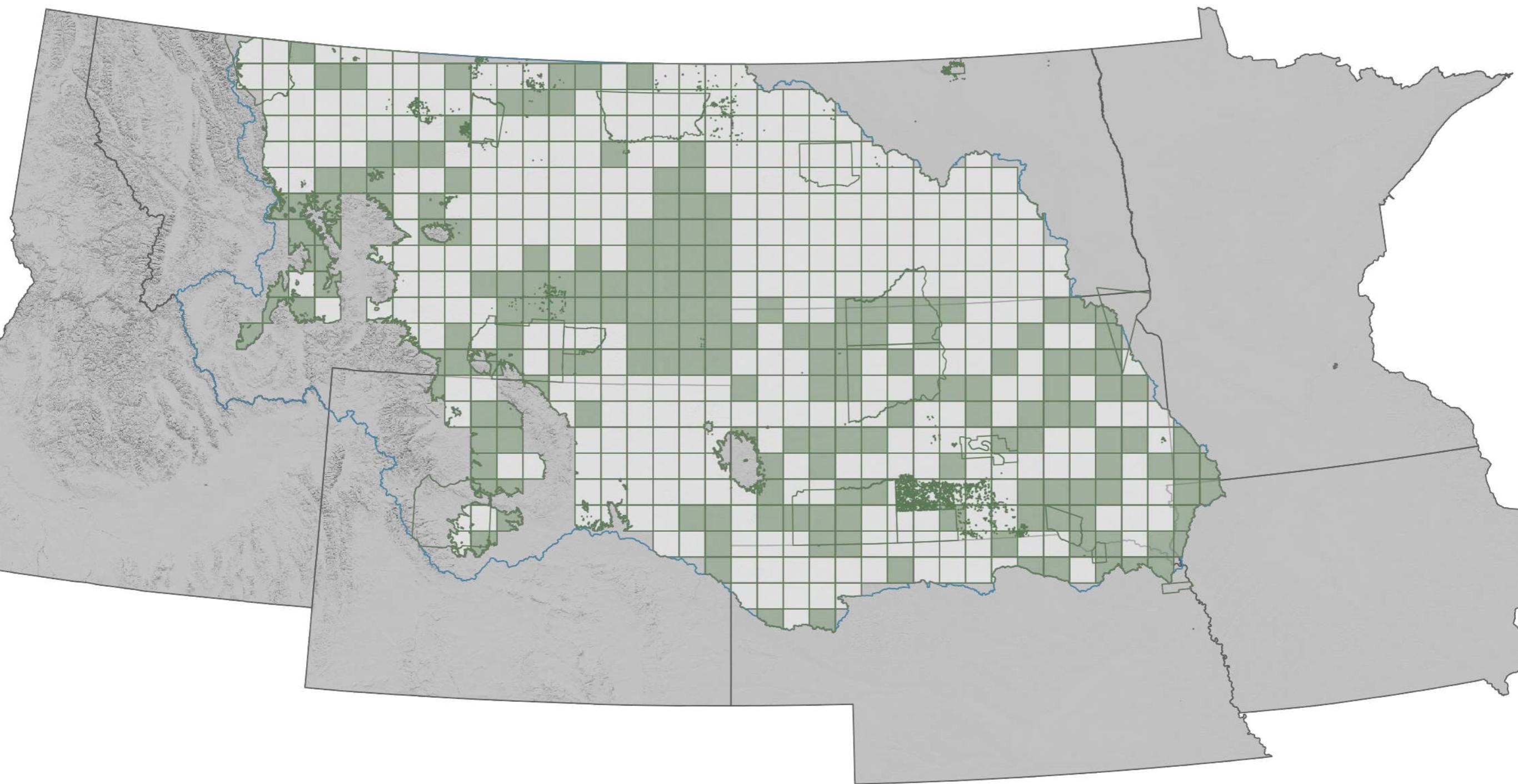
- Operational
- Summer 2024
- + Candidate 2025

78 Candidate 2025 Installs



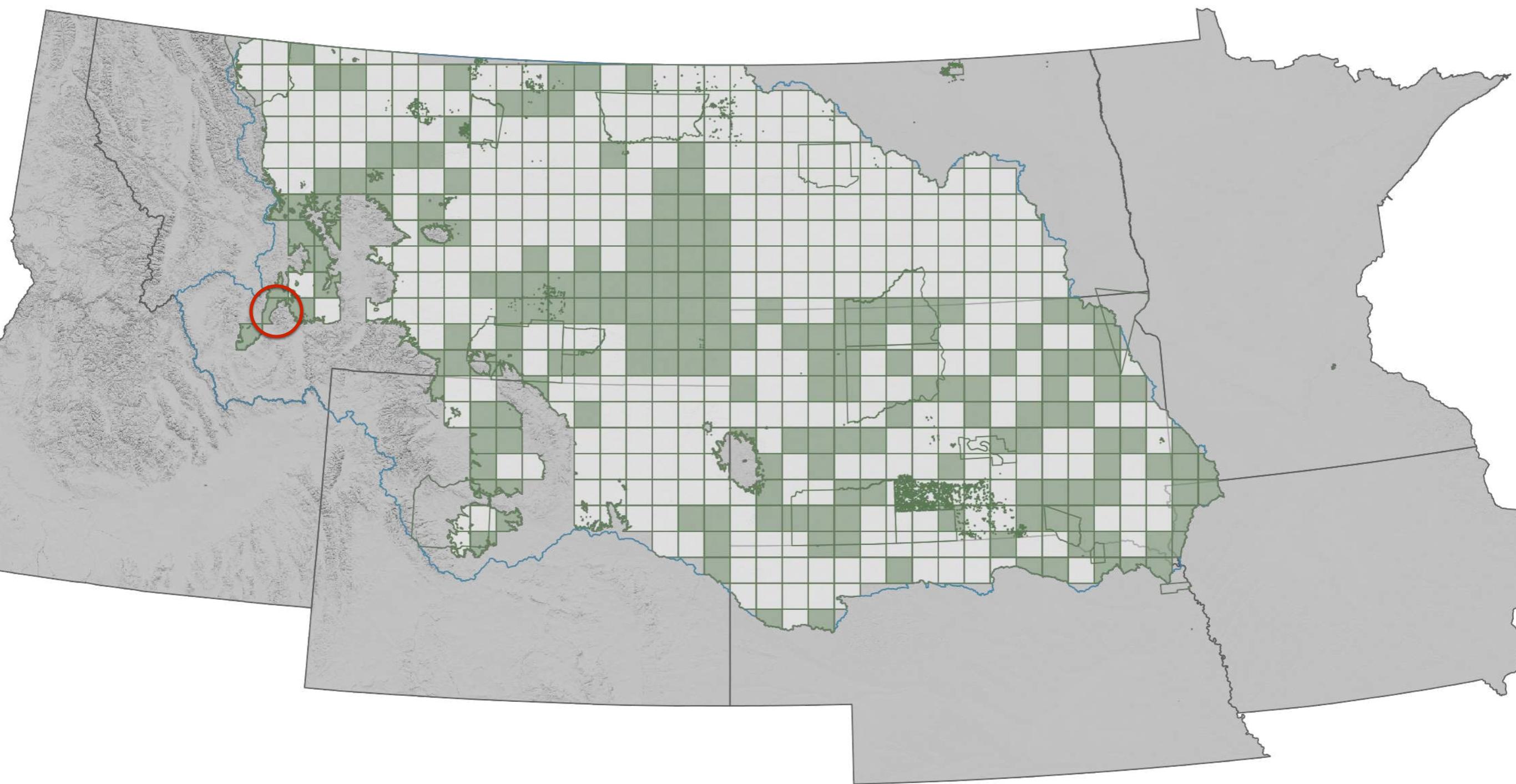
The UMRB Monitoring Network

190 Grid Cells Remaining



The UMRB Monitoring Network

190 Grid Cells Remaining



The UMRB Monitoring Network

190 Grid Cells Remaining

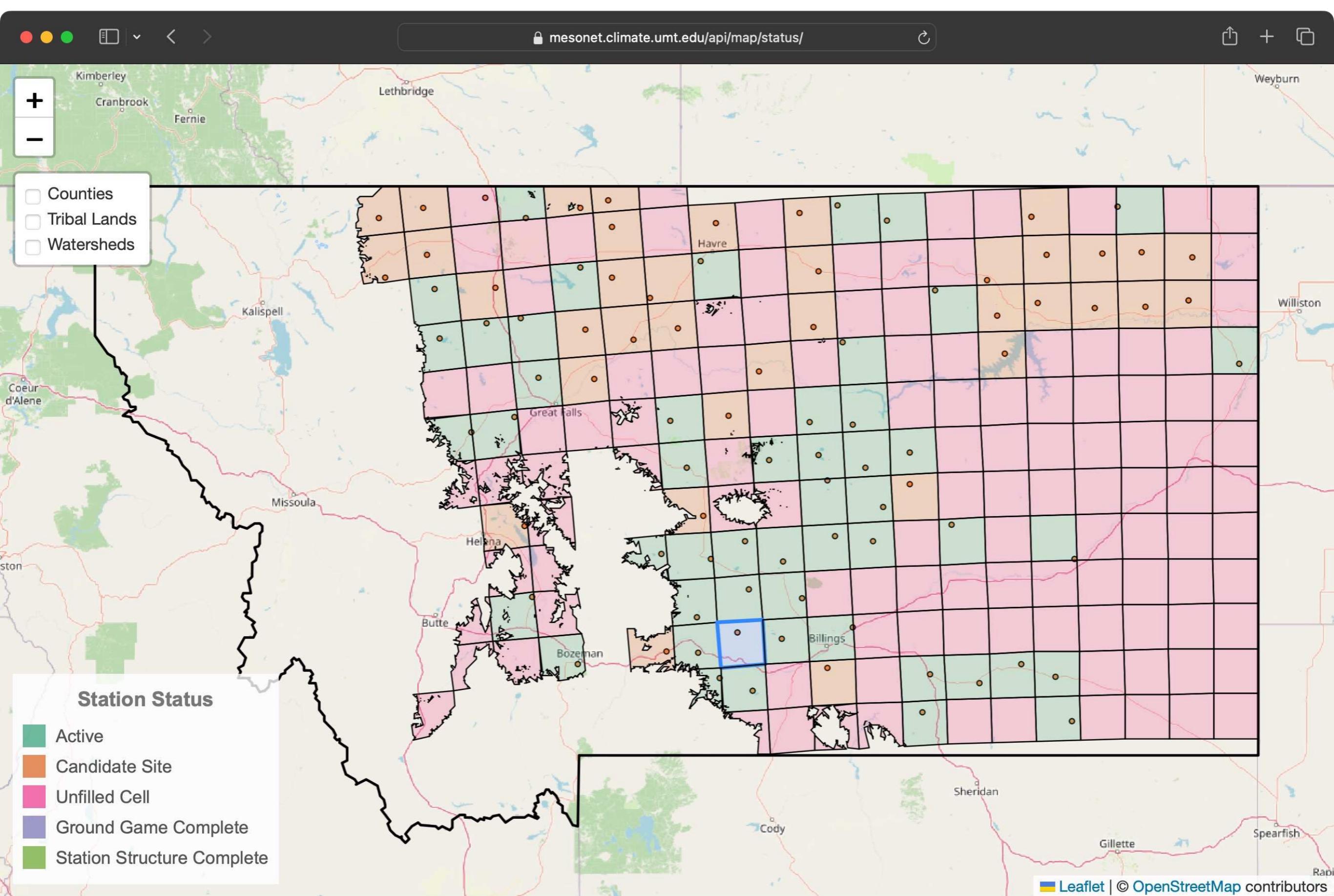
Partners Needed!

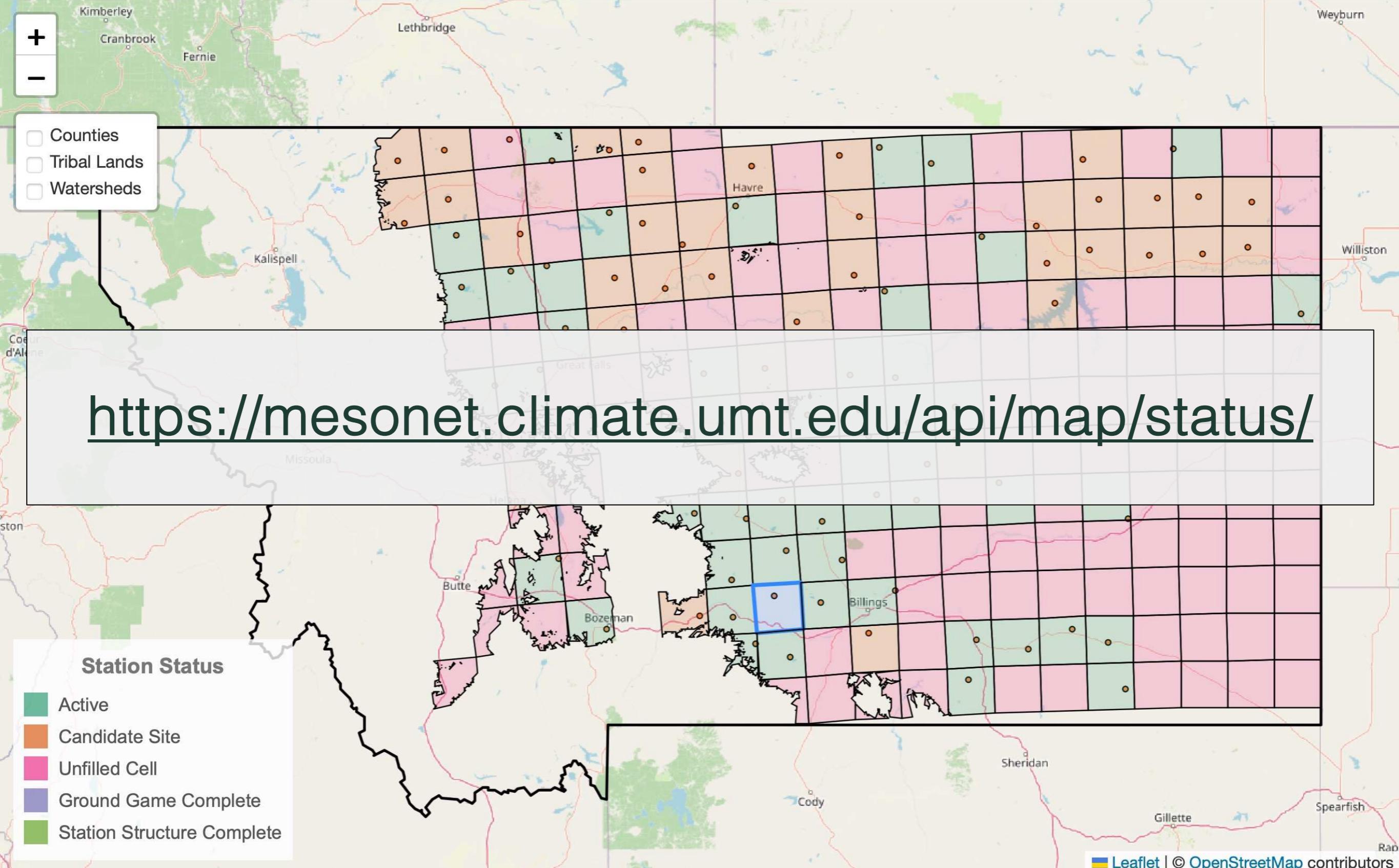
Email interest to Kevin Hyde

MT Mesonet Development Manager

kevin.hyde@umontana.edu









The Montana Mesonet Dashboard: CSKT Bison Range

[GIVE FEEDBACK](#)[LEARN MORE](#)[SHARE PLOT](#)

Latest Data

Ag Tools

Data Downloader

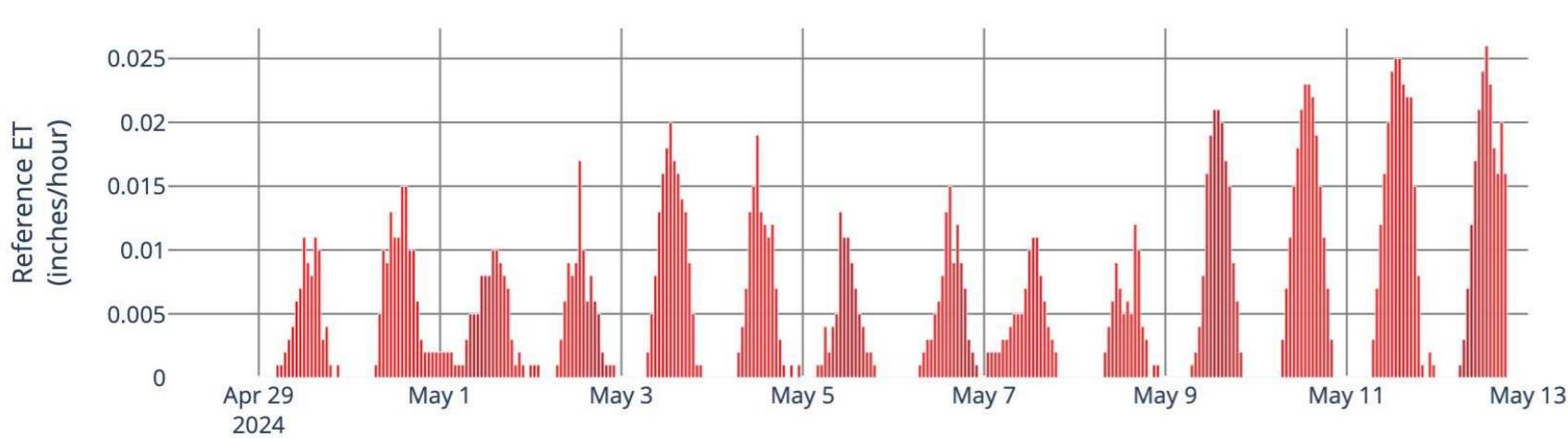
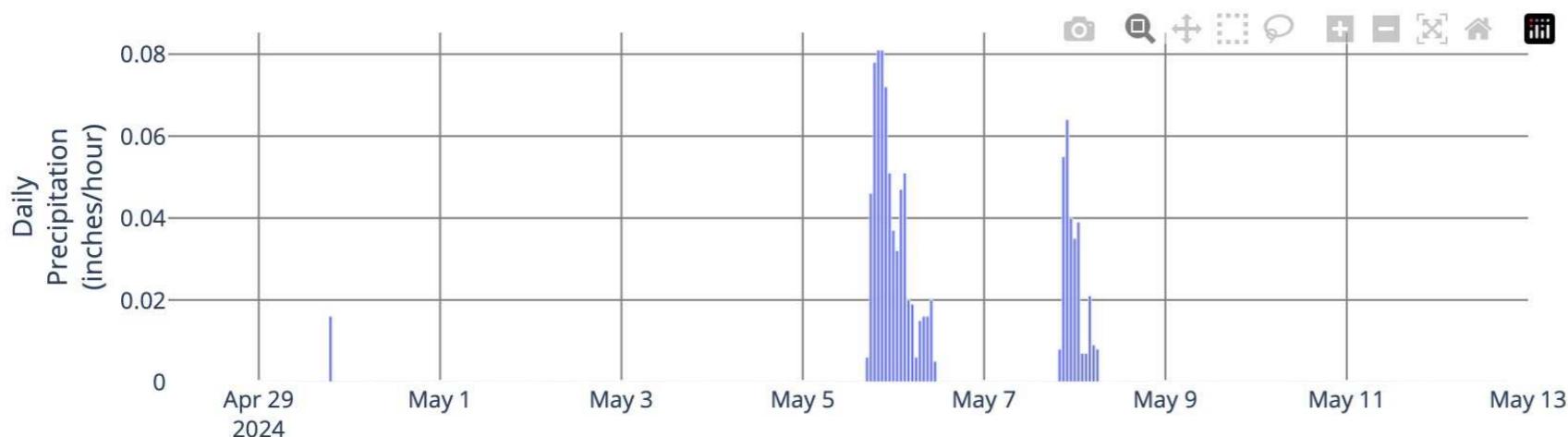
Satellite Indicators

CSKT Bison Range (HydroMet) ▾

04/29/2024 → 05/13/2024

 Hourly Daily Raw

 gridMET Normals

 HydroMet AgriMet
[ABOUT THESE VARIABLES](#)
 Air Temperature Atmospheric Pressure Bulk EC Gust Speed Max Precip Rate Precipitation Reference ET
[Wind Rose](#)[Weather Forecast](#)[Photos](#)
 North South East

 West Snow

2024-05-12 Afternoon

[Locator Map](#) [Station Metadata](#)[Current Conditions](#)

Latest Data Summary

Timestamp	2024-05-12 20:05:00-06:00
Air Temperature [°F]	76.964
Precipitation [in]	0
Max Precip Rate [in/hr]	0
Atmospheric Pressure [mbar]	915.24
Relative Humidity [%]	28.83
Soil Temperature @ 2 in [°F]	69.08
Soil Temperature @ 4 in [°F]	71.86



The Montana Mesonet Dashboard: CSKT Bison Range

[GIVE FEEDBACK](#)[LEARN MORE](#)[SHARE PLOT](#)

Latest Data

Ag Tools

Data Downloader

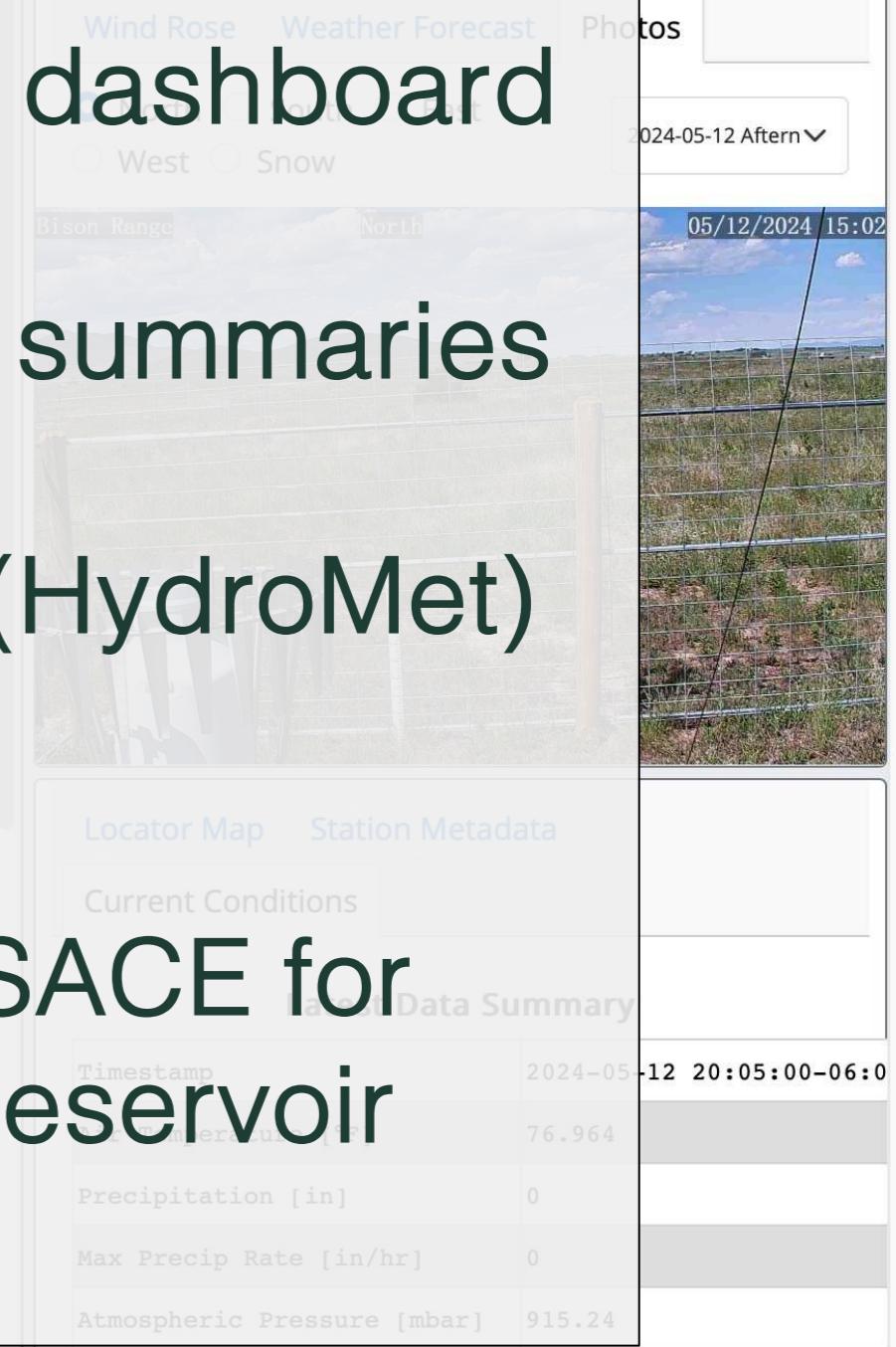
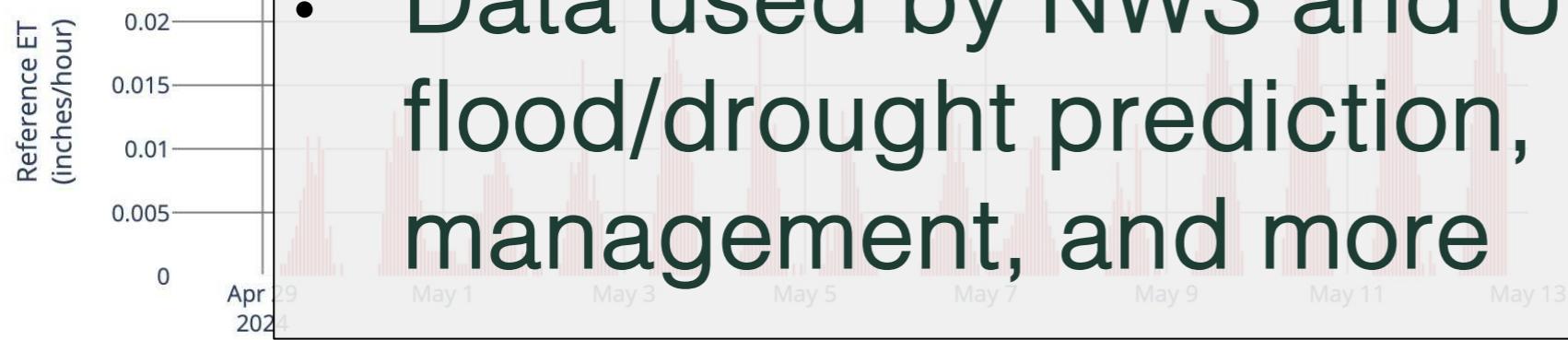
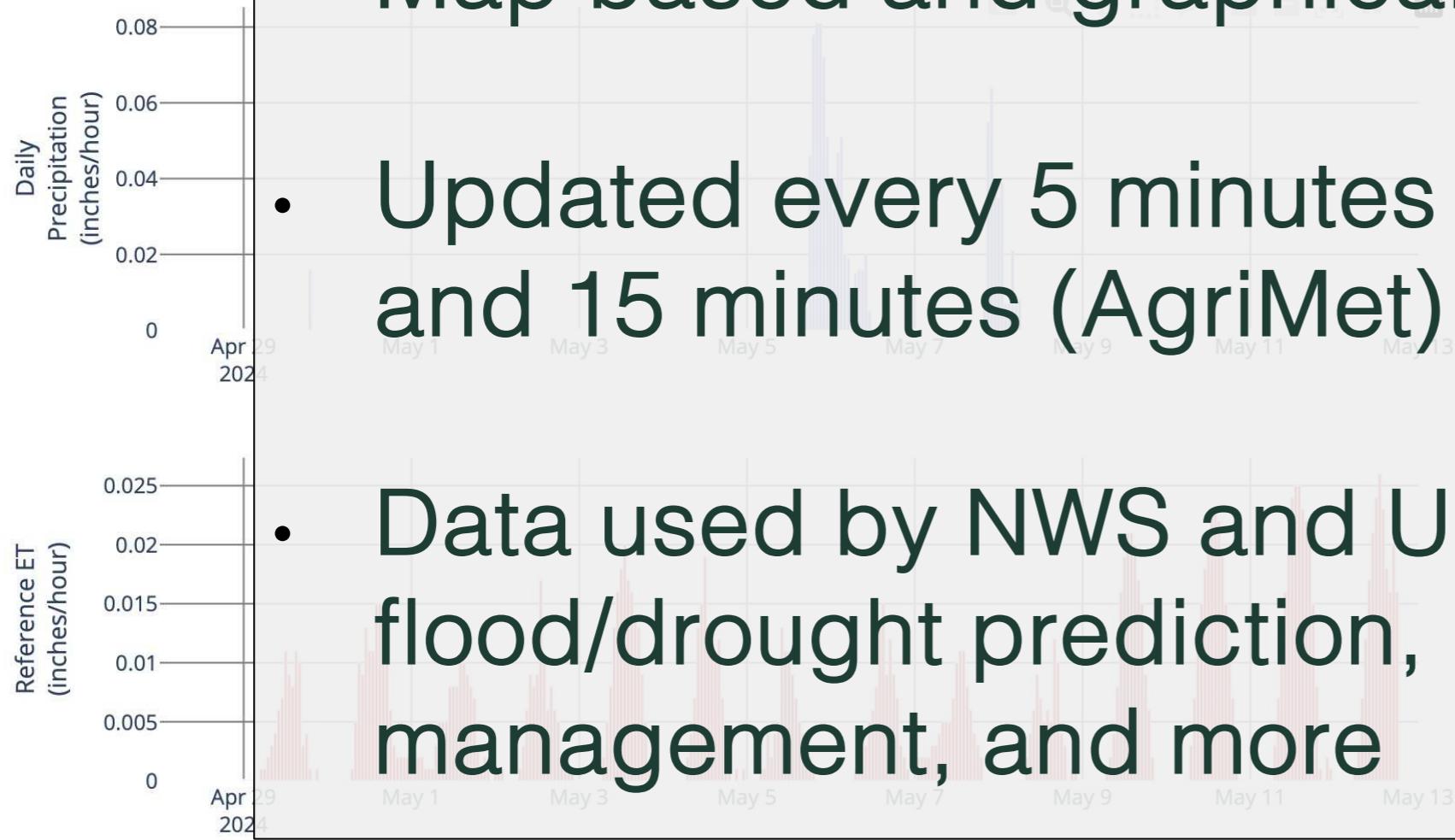
Satellite Indicators

CSKT Bison Range (HydroMet)

 Hourly Daily Air Temperature

Publicly available API and dashboard

- Map based and graphical summaries
- Updated every 5 minutes (HydroMet) and 15 minutes (AgriMet)
- Data used by NWS and USACE for flood/drought prediction, reservoir management, and more





The Montana Mesonet Dashboard: CSKT Bison Range

[GIVE FEEDBACK](#)[LEARN MORE](#)[SHARE PLOT](#)

Latest Data

Ag Tools

Data Downloader

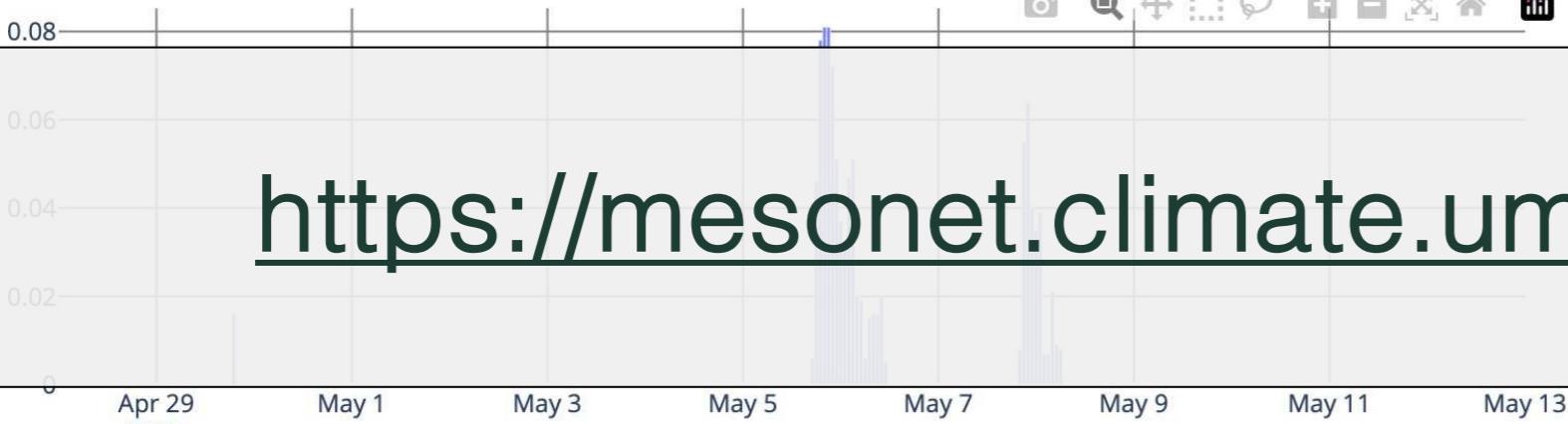
Satellite Indicators

CSKT Bison Range (HydroMet) ▾

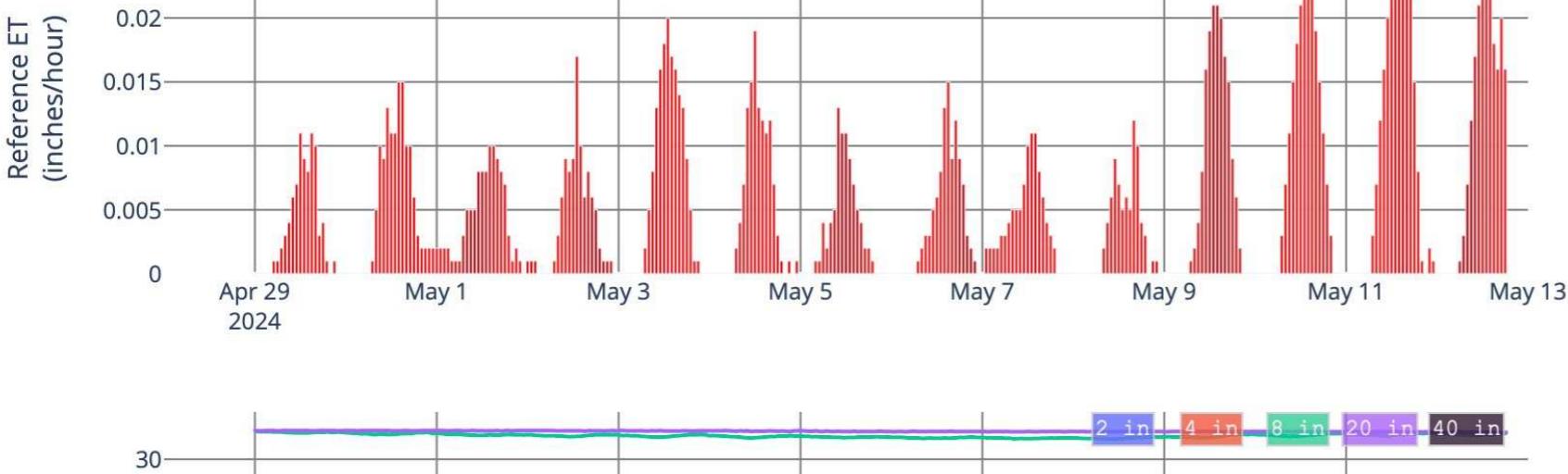
04/29/2024 → 05/13/2024

 Hourly Daily Raw

 gridMET Normals

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<https://mesonet.climate.umt.edu/dash/>


**Montana
Climate
Office**
[Wind Rose](#) [Weather Forecast](#) [Photos](#)
 North South East
 West Snow

2024-05-12 Afternoon

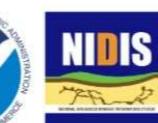
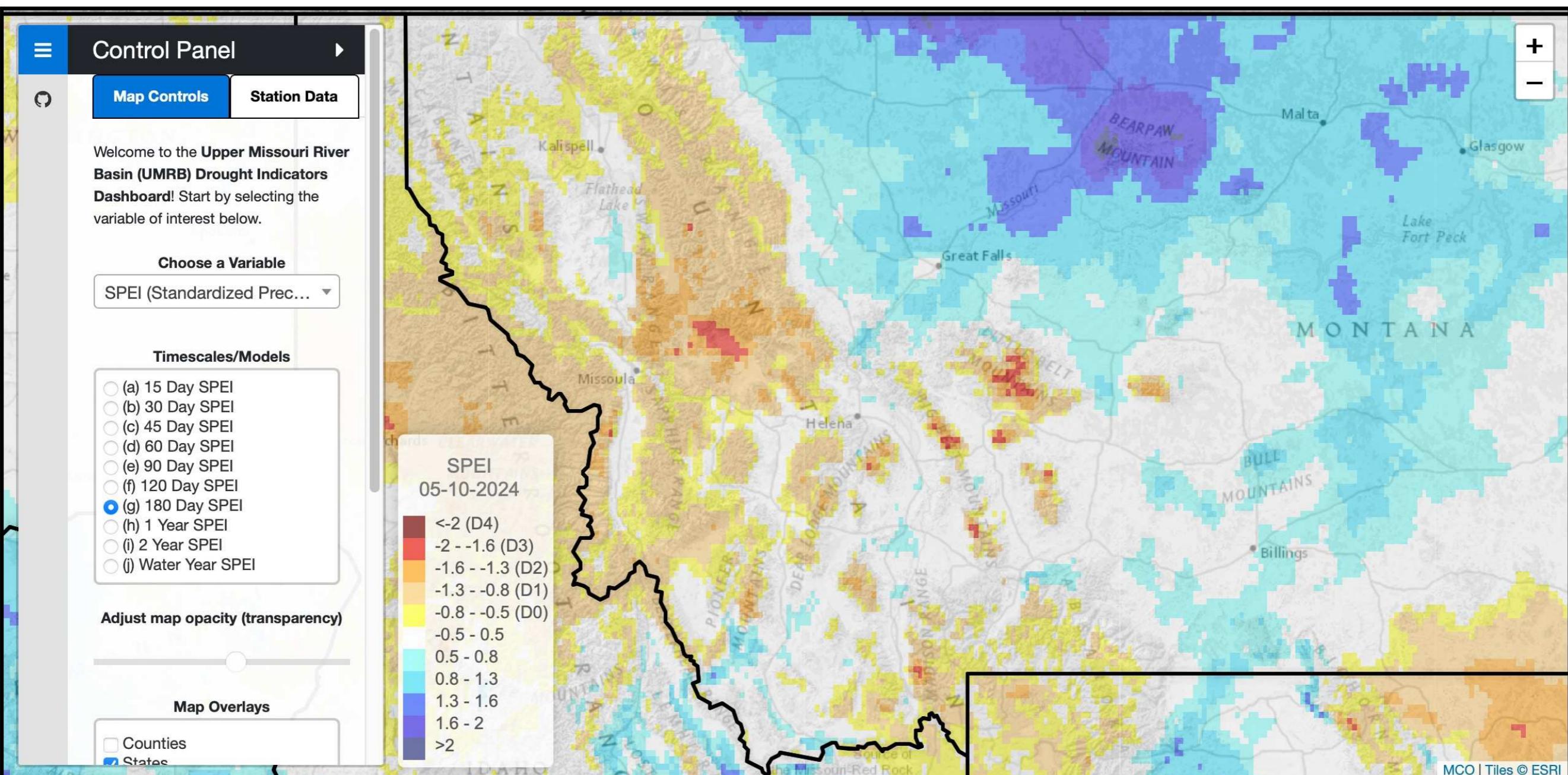

[Locator Map](#) [Station Metadata](#)

Current Conditions

Latest Data Summary

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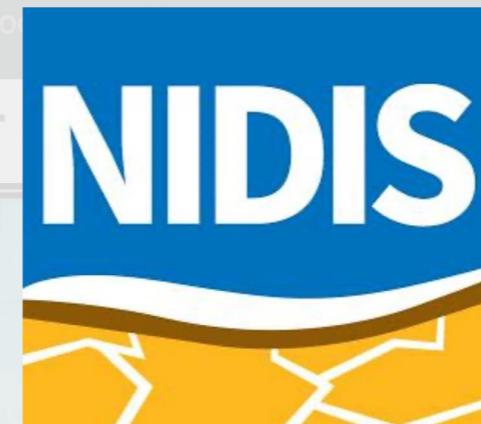
180 Day SPEI for 05-10-2024



Drought Indicators Dashboard

MT Mesonet Impacts

Do



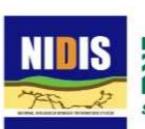
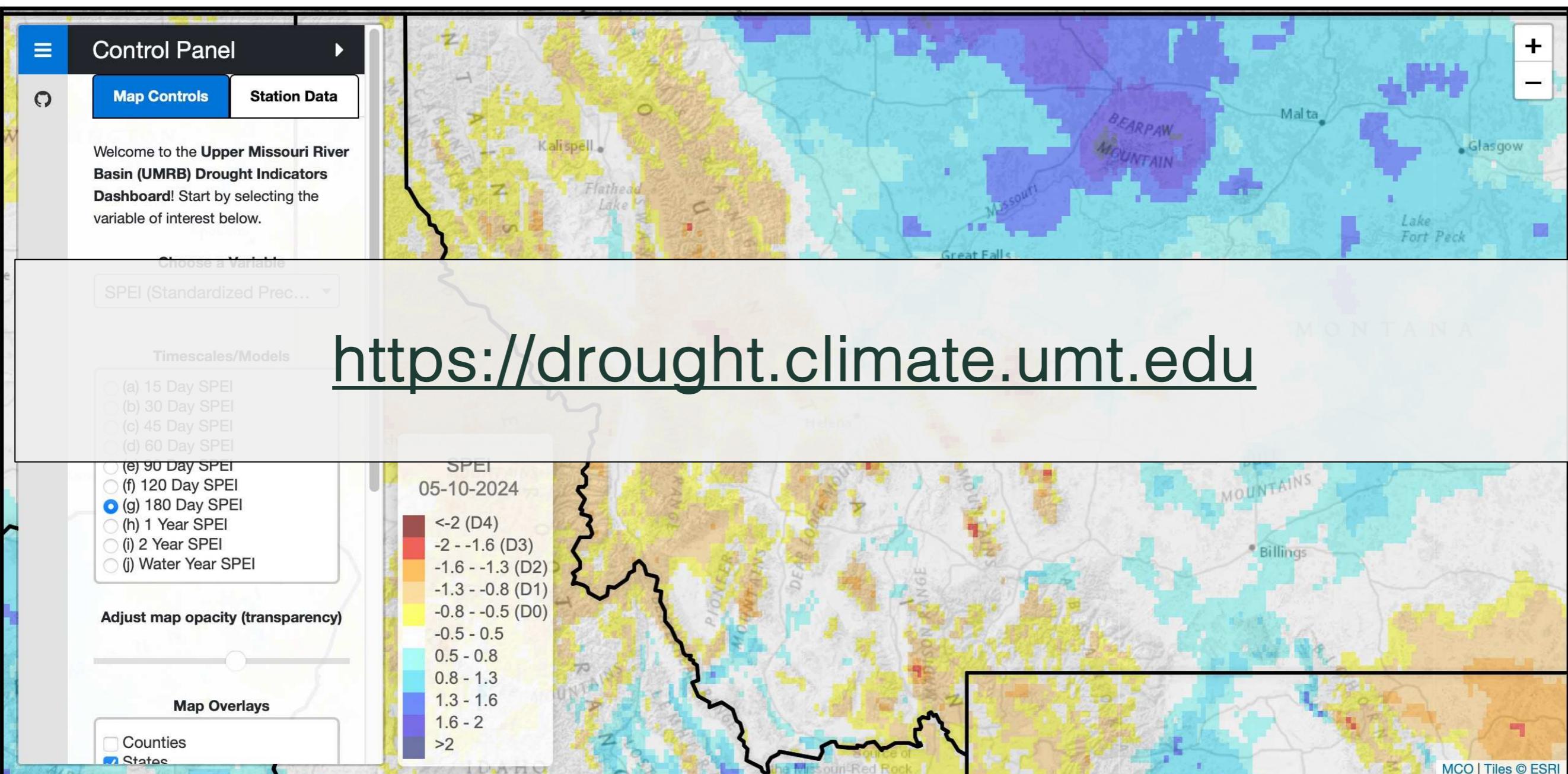
Operational drought models

- Interactive
- Daily to weekly
- 30m – 1km resolution
- Local validation via MT Mesonet

These data form the basis for objective assessment by the monitoring committee and making our case to the USDM



180 Day SPEI for 05-10-2024





Thank You!

Questions?

kyle.bocinsky@umontana.edu

Montana Mesonet Station, Matador Ranch, Phillips County

