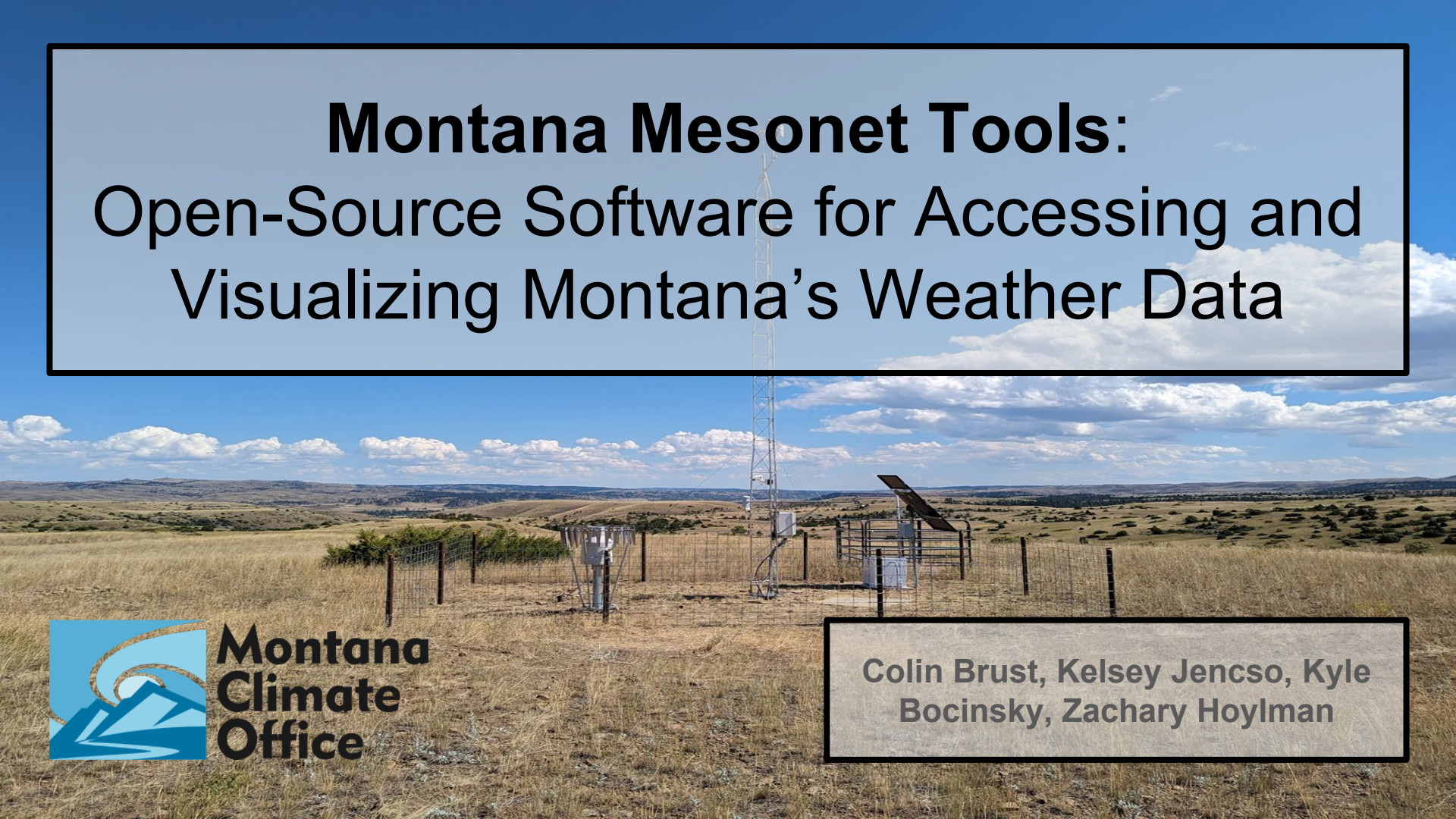
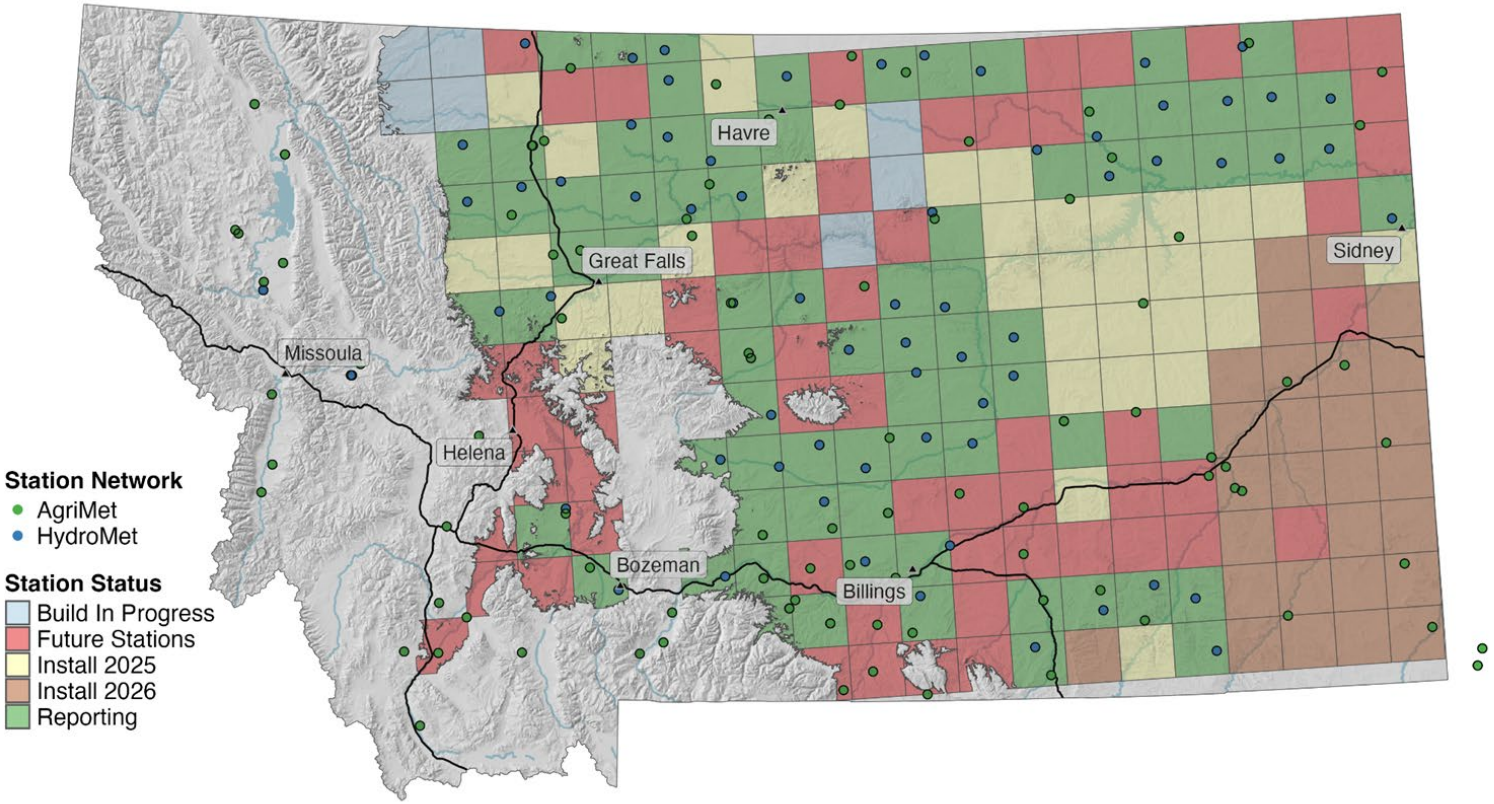
Montana Mesonet Tools: Open-Source Software for Accessing and Visualizing Montana's Weather Data



Montana Climate Office

Colin Brust, Kelsey Jencso, Kyle Bocinsky, Zachary Hoylman

What is the Montana Mesonet?



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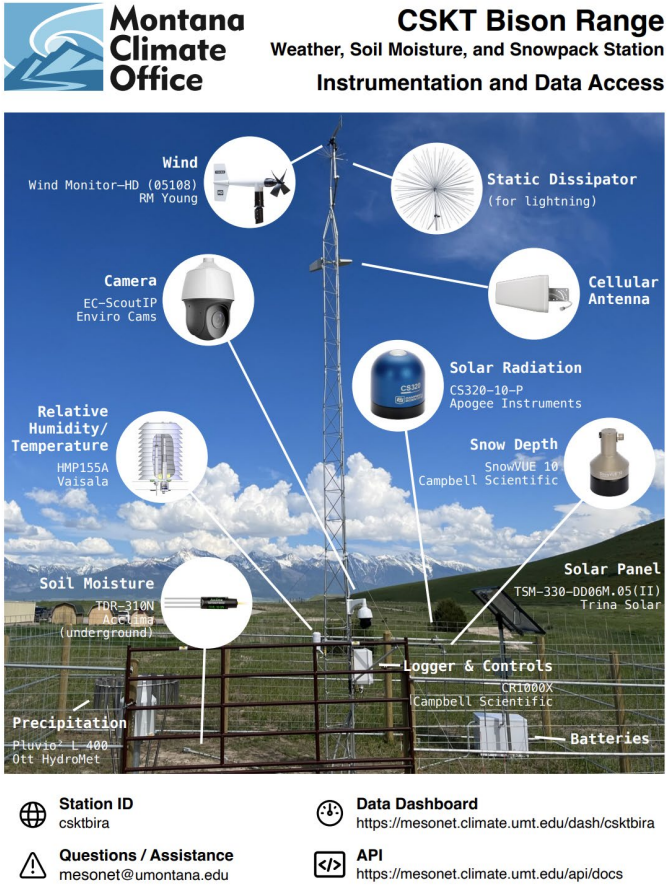

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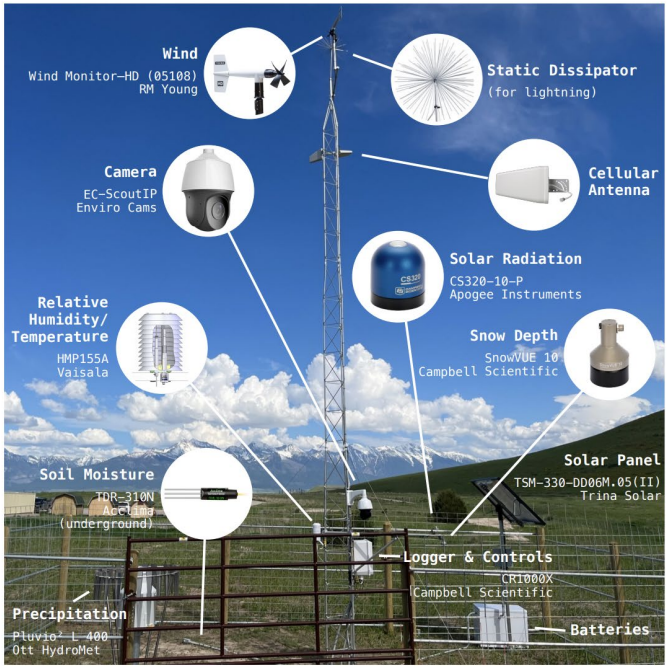
- All station data is freely available to the public

Montana Climate Office

CSKT Bison Range
Weather, Soil Moisture, and Snowpack Station
Instrumentation and Data Access



Station ID
csktbira

Data Dashboard
https://mesonet.climate.umt.edu/dash/csktbira

Questions / Assistance
mesonet@umontana.edu

API
https://mesonet.climate.umt.edu/api/docs

Importance of Mesonet Data

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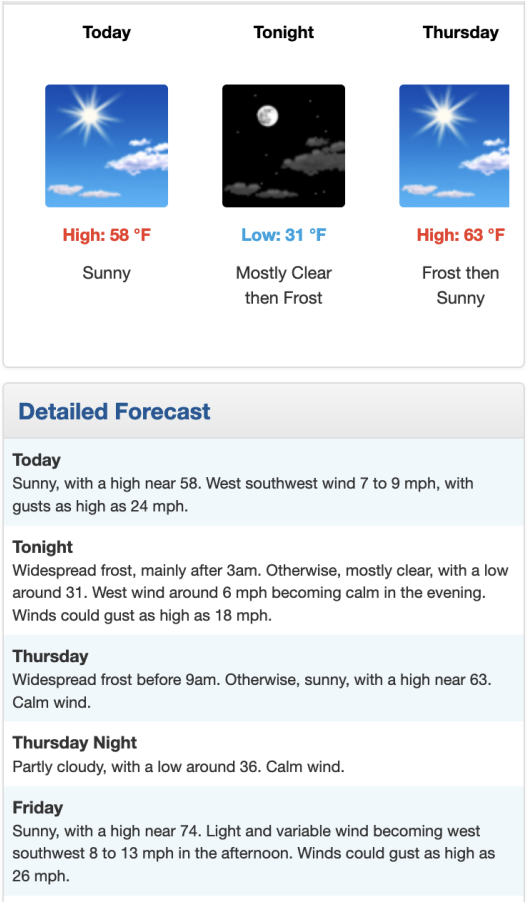
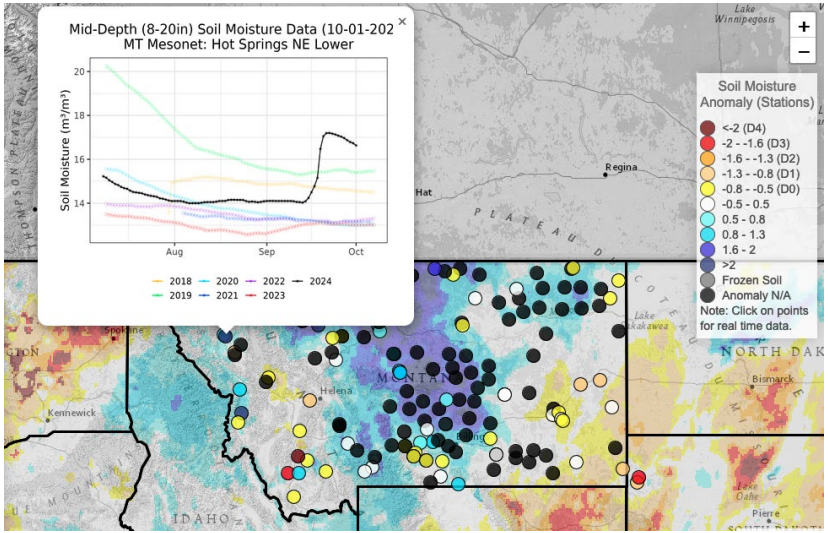


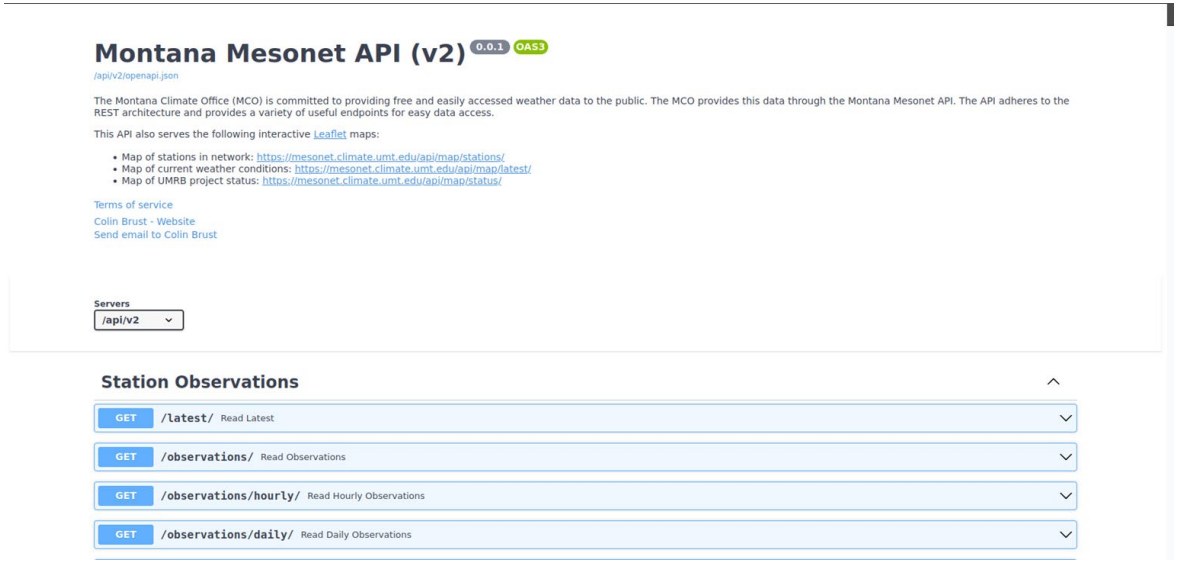
Importance of Mesonet Data

- Data used by farmers and ranchers to make informed decisions
- Data from HydroMet stations is used to inform weather models and forecasts
- Data used for drought monitoring and mapping



The Montana Mesonet API: Documentation

- API = Application Programming Interface: Interface that allows users to access and interact with data.
- https://mesonet.climate.umt.edu/api/



The Montana Mesonet API: Stations

https://mesonet.climate.umt.edu/api/stations

station	name	date_installed	sub_network	longitude	latitude	elevation
aceabsar	Absarokee	2021-06-02	HydroMet	-109.61	45.56	1400.40
aceashla	Ashland E	2023-08-27	HydroMet	-106.14	45.57	971.00
acebento	Benton Lake W	2022-10-21	HydroMet	-111.47	47.69	1129.00
acebigsa	Big Sandy NW	2024-07-17	HydroMet	-110.32	48.24	871.00
acebigti	Big Timber SE	2022-08-23	HydroMet	-109.83	45.74	1347.00
acebilli	Billings S	2024-07-11	HydroMet	-108.49	45.63	1231.00
acebowma	Bowmans Corner NW	2023-10-22	HydroMet	-112.17	47.31	1301.00
acebozem	Bozeman	2020-10-30	HydroMet	-111.07	45.66	1495.09
acebrady	Brady NE	2023-06-27	HydroMet	-111.66	48.10	1029.00
acebrede	Bredette NE	2024-09-20	HydroMet	-105.26	48.55	787.00
acebroad	Broadview	2021-08-14	HydroMet	-108.76	46.13	1239.41
acebsase	Big Sandy SE	2024-09-10	HydroMet	-110.04	48.03	945.00
acebusby	Busby S	2023-08-26	HydroMet	-106.93	45.52	1092.00
acebynum	Bynum W	2023-06-21	HydroMet	-112.49	47.96	1353.00
acecarte	Carter N	2024-07-15	HydroMet	-110.99	48.02	1064.00
acechest	Chester SW	2023-06-28	HydroMet	-111.04	48.45	946.00
acechris	Christina W	2024-07-11	HydroMet	-109.52	47.42	1099.00
acecoffe	Coffee Creek N	2022-09-19	HydroMet	-110.11	47.39	1136.00
aceconra	Conrad N	2024-08-07	HydroMet	-111.92	48.31	1132.03

The Montana Mesonet API: Observations

https://mesonet.climate.umt.edu/api/observations

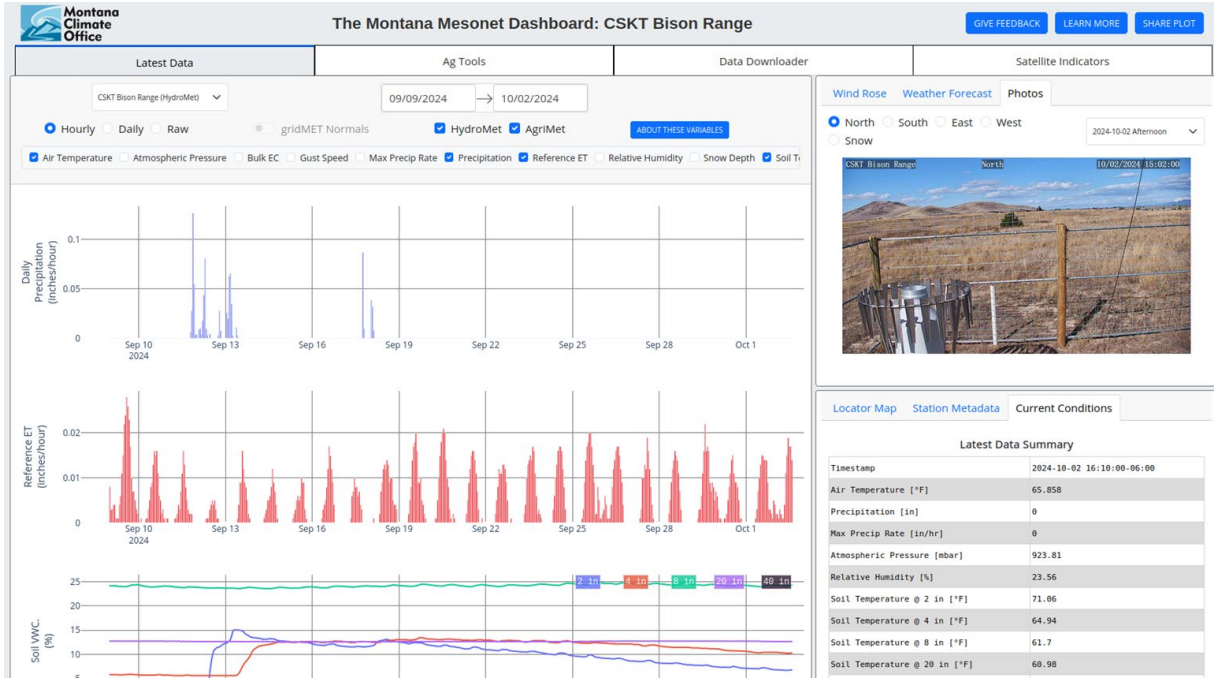
station	datetime	Air Temperature @ 2 m [°F]	Air Temperature @ 8 ft [°F]	Precipitation [in]	Max Precip Rate [in/hr]	Atmospheric Pressure [mbar]	Relative Humidity [%]
aceabsar	2024-10-02 15:25:00-06:00	76.388		0.0	0.0	852.61	15.06
aceashla	2024-10-02 15:25:00-06:00	74.120		0.0	0.0	898.50	22.48
acebento	2024-10-02 15:25:00-06:00	59.378		0.0	0.0	885.20	40.14
acebigsa	2024-10-02 15:25:00-06:00	57.578		0.0	0.0	915.06	37.90
acebigti	2024-10-02 15:25:00-06:00	75.398		0.0	0.0	860.52	14.18
acebilli	2024-10-02 15:25:00-06:00	70.322		0.0	0.0	872.50	27.51
acebowma	2024-10-02 15:25:00-06:00	61.034		0.0	0.0	867.59	35.56
acebozem	2024-10-02 15:25:00-06:00	72.230		0.0	0.0	846.35	15.74
acebrady	2024-10-02 15:25:00-06:00	57.614		0.0	0.0	893.91	42.66
acebrede	2024-10-02 15:25:00-06:00	58.892		0.0	0.0	920.39	37.60
acebroad	2024-10-02 15:25:00-06:00	67.424		0.0	0.0	871.80	34.24
acebsase	2024-10-02 15:25:00-06:00	56.804		0.0	0.0	905.80	43.02
acebusby	2024-10-02 15:25:00-06:00	74.516		0.0	0.0	885.46	21.35
acebynum	2024-10-02 15:25:00-06:00	55.490		0.0	0.0	861.66	40.66
acecarte	2024-10-02 15:25:00-06:00	56.678		0.0	0.0	893.22	43.86
acechest	2024-10-02 15:25:00-06:00	58.694		0.0	0.0	904.79	41.31
acechris	2024-10-02 15:25:00-06:00	59.738		0.0	0.0	887.81	38.02
acecoffe	2024-10-02 15:25:00-06:00	57.632		0.0	0.0	885.57	42.68

The Montana Mesonet API: Flexible Interface

https://mesonet.climate.umt.edu/api/observations/?stations=csktbira&start_time=2024-10-01&end_time=2024-10-02&elements=air_temp

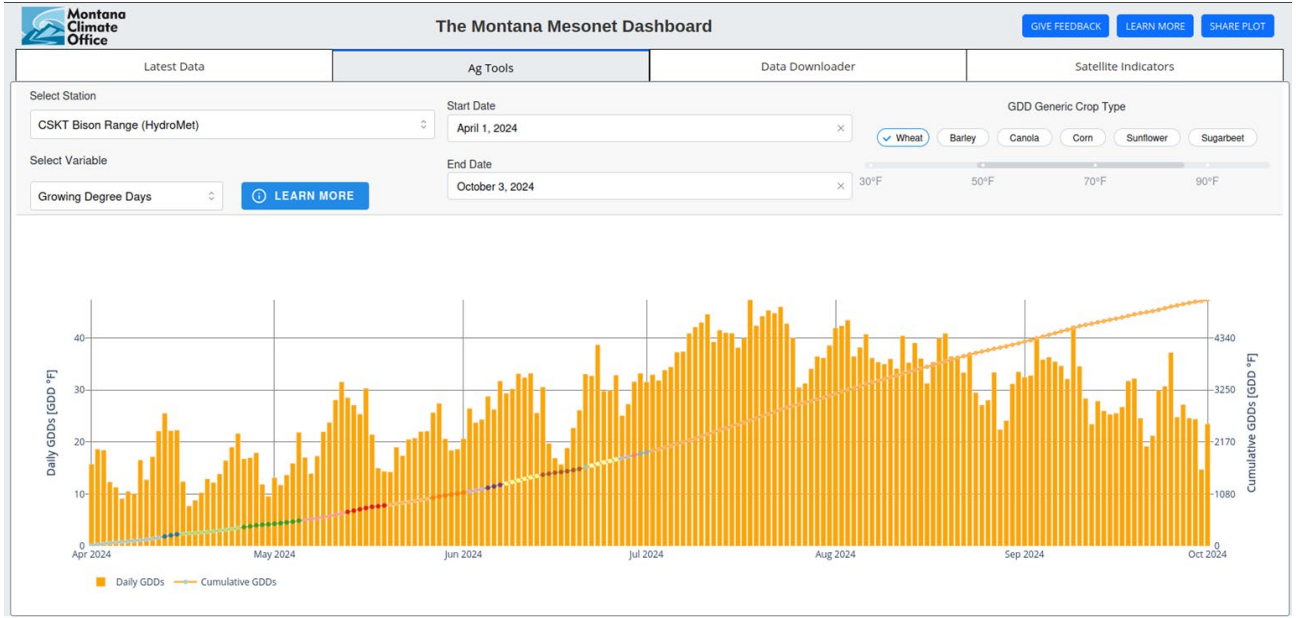
station	datetime	Air Temperature @ 2 m [°F]
csktbira	2024-10-01 00:00:00-06:00	35.029
csktbira	2024-10-01 00:05:00-06:00	35.958
csktbira	2024-10-01 00:10:00-06:00	36.214
csktbira	2024-10-01 00:15:00-06:00	35.929
csktbira	2024-10-01 00:20:00-06:00	35.065
csktbira	2024-10-01 00:25:00-06:00	36.149
csktbira	2024-10-01 00:30:00-06:00	36.633

The Montana Mesonet Dashboard



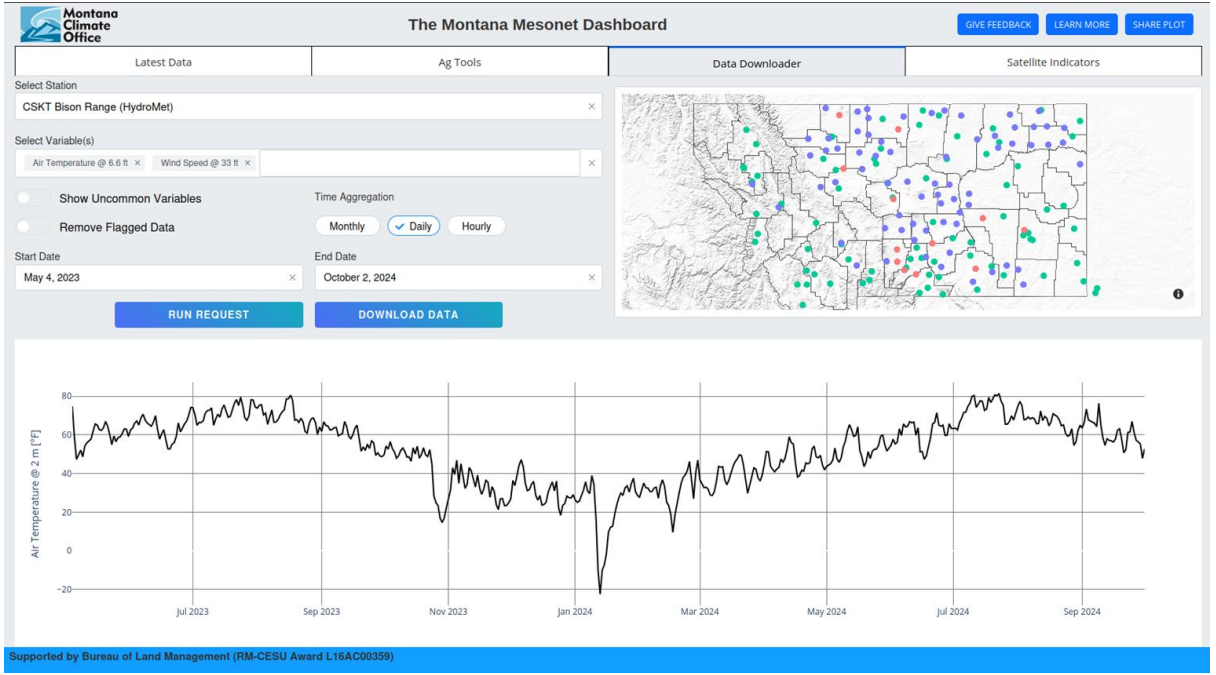
https://mesonet.climate.umt.edu/dash/csktbira

The Montana Mesonet Dashboard: Ag Tools



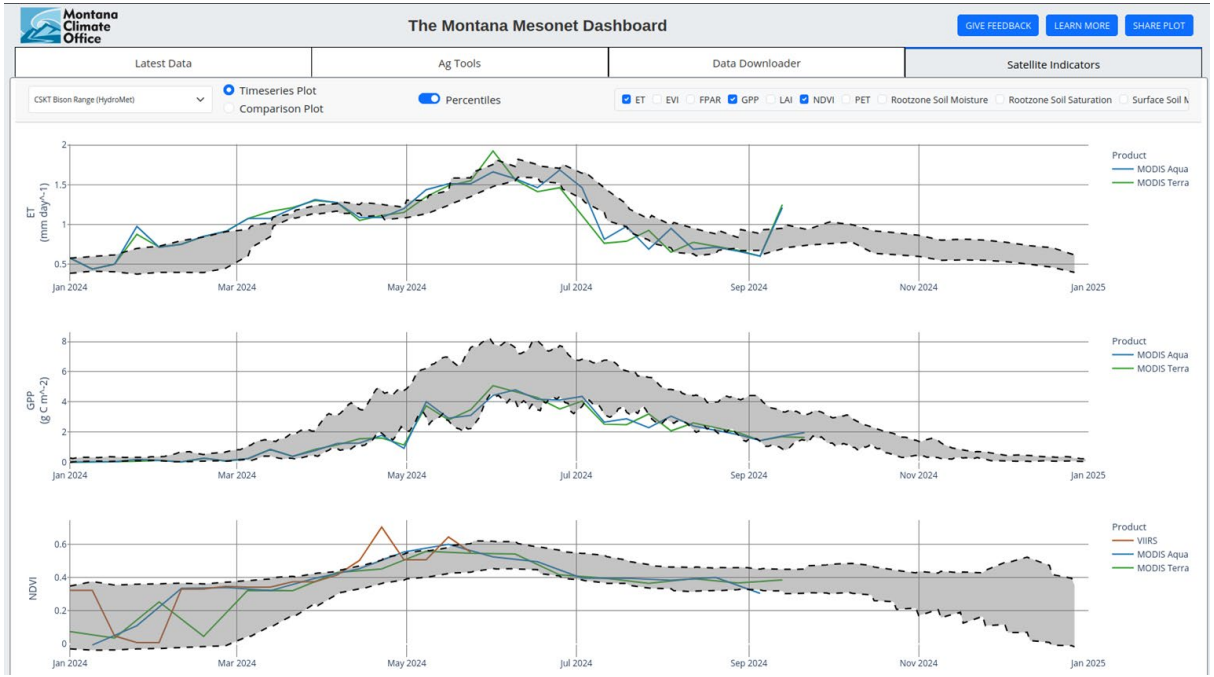
https://mesonet.climate.umt.edu/dash/#ag

The Montana Mesonet Dashboard: Data Downloader



https://mesonet.climate.umt.edu/dash/#downloader

The Montana Mesonet Dashboard: Satellite Indicators



https://mesonet.climate.umt.edu/dash/#satellite

Thank you!

Montana Mesonet Resources:

- MCO Website: https://climate.umt.edu
- Mesonet API: https://mesonet.climate.umt.edu/api/
- Mesonet Dashboard: https://mesonet.climate.umt.edu/dash/
- MCO GitHub: https://github.com/mt-climate-office