

# Under the Big Sky

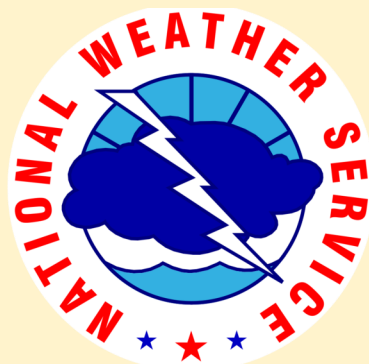
## e-Letter

May, June, & July 2023

National Weather Service

Glasgow, MT

Photo Credit: Julianna Glinskas Meteorologist at NWS Glasgow.



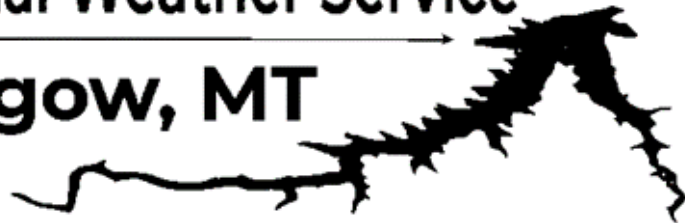
## **A Peak Inside:**

- **CoCoRaHS/30 Day Temp & Precip...Page 1**
- **Hydro Summary...Pages 2-5**
- **3 Month Outlooks...Page 6**
- **Drought Monitor...Page 7**
- **Climate Highlights...Page 8**
- **Wildfire Safety/WFO Glasgow Staff Changes...Page 9**
- **Monthly COOP Numbers...Pages 10-12**
- **Trivia...Page 13**

**National Weather Service**



**Glasgow, MT**



## Join CoCoRaHS Today!

CoCoRaHS is a grassroots organization with a network of highly committed observers who report daily precipitation such as rain, hail, or snow from all across the country. The data are used by meteorologists, insurance adjusters, mosquito control, those in academia, etc.

Participating in the CoCoRaHS program is a great way to make a difference in your community. Check out the [CoCoRaHS main page](#) to learn more! We are still accepting new observers so feel free to join through the main CoCoRaHS website today. All you'll need is a ruler and a rain gauge to get started!

**Need a refresher?:** Are you new to CoCoRaHS and need help getting started? Or, maybe you need help remembering how to take certain kinds of observations. The

[CoCoRaHS webpage](#)

has a number of available slide presentations that you can check out to learn more about these topics and more!



Are you looking to become a new CoCoRaHS observer? Then sign up to [join](#) today to get started! Just fill out the electronic form and the CoCoRaHS Coordinator from NWS Glasgow will follow up with you to help you get underway.

Fall Training: Keep an eye out for future announcements but we will be doing a virtual CoCoRaHS training this fall for anyone interested in becoming a new observer. We'll have more to share soon in this space.

## Percent of Normal Precipitation (Montana)

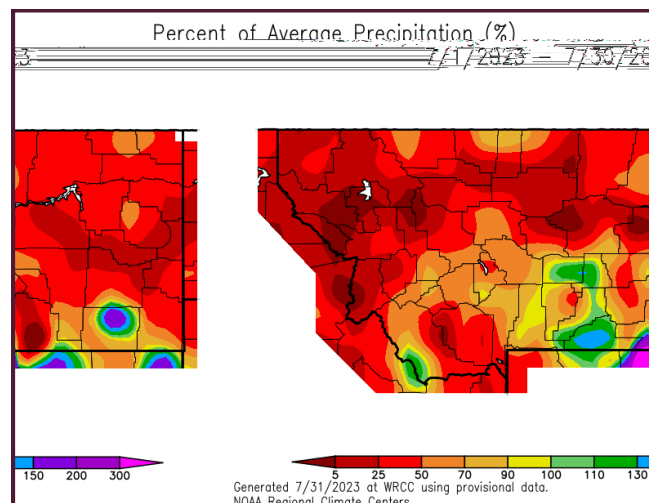


Figure 1: 30-day percent of normal precipitation across Montana.

## Avg. Temp Departure from Normal (Montana)

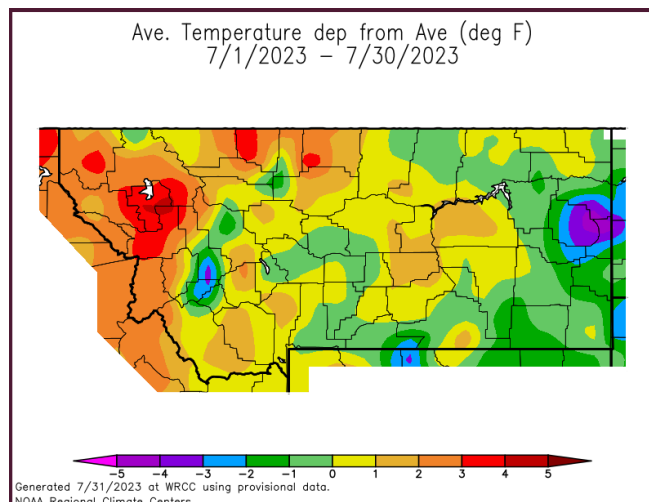


Figure 2: 30-day temperature anomalies across Montana.

**Summary:** Over the past 30 days, much of Montana has experienced drier than normal conditions. Meanwhile, temperatures were more variable depending on location compared with averages. Much of the eastern and southern portions of the state experienced temperatures near to below normal. Meanwhile, western Montana saw temperatures trending above normal.

## Preliminary Hydrologic Summary for April 2023, By Greg Forrester, Lead Forecaster at NWS

### Glasgow:

April was a colder than normal month in most areas with a couple of warm periods. The first warm period between April 8 and 11 brought rapid snow melt across the region. Prior to the warm up, most of the region had 2 to 4 inches of snow water equivalent while Northern Phillips and Northwest Valley Counties had 4 to 6 inches of snow water equivalent in the snow cover. Most of Garfield County and all of Petroleum County had bare ground. The rapid snowmelt with high temperatures in the 40s and 50s on April 8 and 9, in the 50s and 60s on April 10, and 70s to lower 80s on April 11 produced widespread flooding on the Milk and Poplar Rivers and several creeks that fed into the Milk River. There was also flooding on the Big Muddy Creek in far north-east Montana. The flooding on the Poplar River and Big Muddy Creek occurred between April 11 and April 14. The flooding on the Milk River started on April 11 with an ice jam in Nashua and spread to the most areas on the Milk River on April 12 due to a mixture of snow melt run off and ice jams. Beaver Creek which runs into the Milk River west of Hinsdale had flooding between April 10 and 13. The Frenchman Creek which runs into the Milk River northeast of Saco had flooding between April 12 and 16. The Milk River had major flooding between Saco, Hinsdale, Tampico, and Glasgow at its peak while Dodson to the west and Nashua to the east had minor flooding. The Milk River remained below flood stage in the Malta area during this event.

Temperatures were near normal over Petroleum and Garfield Counties and 3 to 7 degrees below normal over the remainder of northeast Montana during the month. Glasgow averaged 39.9 degrees which was 4.9 degrees below normal.

Most of northeast Montana had below normal precipitation during April. The wet spots were Zortman with 1.83 inches, Hinsdale 21SW with 1.30 inches, and Malta with 1.11 inches. The dry spots were Cohagen with 0.19 inch, Port of Morgan with 0.27 inch, and Glendive with 0.31 inch. Glasgow received 0.81 inch which was 80 percent of normal.

**Preliminary Hydrologic Summary for April 2023, By Greg Forrester, Lead Forecaster at NWS**

**Glasgow:**

There was some improvement in the drought across northeast Montana. At the end of April, severe drought had improved to moderate drought across most of northeast Montana.

Ice broke up on the Yellowstone River on April 9 around Glendive and April 10 and 11 around Sidney. The ice broke up on the Missouri River around Wolf Point on April 2 and 3 and near Culbertson around April 13. Ice broke up between April 9 and 13 on the Milk River and between April 12 and 14 on the Poplar River. Streamflow for April was well above normal for the Milk, Missouri, Yellowstone, and Poplar Rivers after the ice broke up.

The Fort Peck Reservoir elevation rose to 2221.9 feet during the month. The reservoir was at 66 percent of capacity and 84 percent of the mean pool.

Background Photo Credit: Ryan Bernhart  
Meteorologist at NWS Glasgow.

## Preliminary Hydrologic Summary for May 2023, By Greg Forrester ,Lead Forecaster at NWS

### Glasgow:

May was a much warmer than normal month with above normal precipitation. Temperatures were 6 to 10 degrees above normal. Glasgow averaged 63.0 degrees which was 7.5 degrees above normal. It was Glasgow's third warmest May on record with 1934 and 1936 being warmer.

Most of northeast Montana had above normal precipitation during May. The wet spots were Savage with 5.84 inches, Hinsdale 21SW with 5.44 inches, and Glendive with 5.37 inches. The dry spots were Glasgow 14NW with 1.60 inches, Scobey 4NW with 1.70 inches, and Homestead 5E with 1.90 inches. Glasgow received 3.89 inches which was 175 percent of normal.

The above normal precipitation eliminated the drought across northeast Montana by the end of May. Heavy rain on the night of May 25 flooded the 6th street railroad underpass in Glasgow. Heavy rain on May 27 produced flash flooding in southern Richland County near Crane.

Streamflow for May was well above normal on the Milk, Missouri, Yellowstone, and Poplar Rivers.

The Fort Peck Reservoir elevation rose to 2227.8 feet during the month. The reservoir was at 71 percent of capacity and 89 percent of the mean pool.

## Preliminary Hydrologic Summary for June 2023, By Greg Forrester, Lead Forecaster at NWS

### Glasgow:

June was a warmer than normal month with variable amounts of precipitation. Temperatures were 3 to 6 degrees above normal. Glasgow averaged 68.9 degrees which was 4.4 degrees above normal.

Precipitation amounts during June were highly variable due to thunderstorms being the main source of precipitation. In general, most areas south of US Highway 2 had well above normal precipitation. The wet spots were Hinsdale 4SW with 8.72 inches, Cohagen with 6.92 inches, Cohagen 22SE with 6.67 inches, and Winnett 12SW with 5.24 inches. Areas near North Dakota had well below normal precipitation. The dry spots were Medicine Lake with 0.35 inch, Sidney with 1.03 inches, and Brockton with 1.26 inches. Glasgow received 2.37 inches which was 84 percent of normal.

Heavy rain on the afternoon and evening of June 2nd produced flash flooding in the Hinsdale area along with the Larb Hills to the south of town. Flooding also occurred on the Milk River, Willow Creek, and Antelope Creek in the Glasgow area and Beaver and Larb Creeks in the Hinsdale area from the June 2nd heavy rain. There was also flash flooding from heavy rain in western Garfield County and western Daniels County on the afternoon and evening of June 2nd. Runoff from rain produced flooding on the Musselshell River on June 9 and 10 along the Garfield and Petroleum County line. Heavy rain in southwest Petroleum County produced flash flooding on the evening of June 23. On the afternoon of June 26th, heavy rain produced flash flooding on Interstate 94 near Fallon in eastern Prairie County.

Streamflow for June started well above normal on the Milk, Missouri, and Poplar Rivers. Flow on the Milk River remained above normal the entire month. Flow on the Missouri and Poplar Rivers fell to near normal by the end of the month. On the Yellowstone River, the flow started the month above normal and fell to near normal during the month. It then rose to above normal by the end of the month.

The Fort Peck Reservoir elevation rose to 2230.6 feet during the month. The reservoir was at 76 percent of capacity and 95 percent of the mean pool.

Background Photo Credit: Ryan Bernhart  
Meteorologist at NWS Glasgow.

## CPC Outlook:

The Climate Prediction Center released its latest three month outlook for temperature and precipitation for August through October 2023 on July 20, 2023. Western Montana is favored to see above normal temperatures. Meanwhile, look for equal chances for above normal, normal, or below normal temperatures across much of central and eastern Montana. Meanwhile, far northwest Montana expects drier than normal conditions favored during the three month period. The remainder of the state has equal chances for below normal, normal, or above normal precipitation.

The latest outlook is always available [here](#). In addition, you can check out the Climate Prediction Center [Interactive site](#)! You can zoom in on our area, and navigate to see the climate outlook for your specific location.

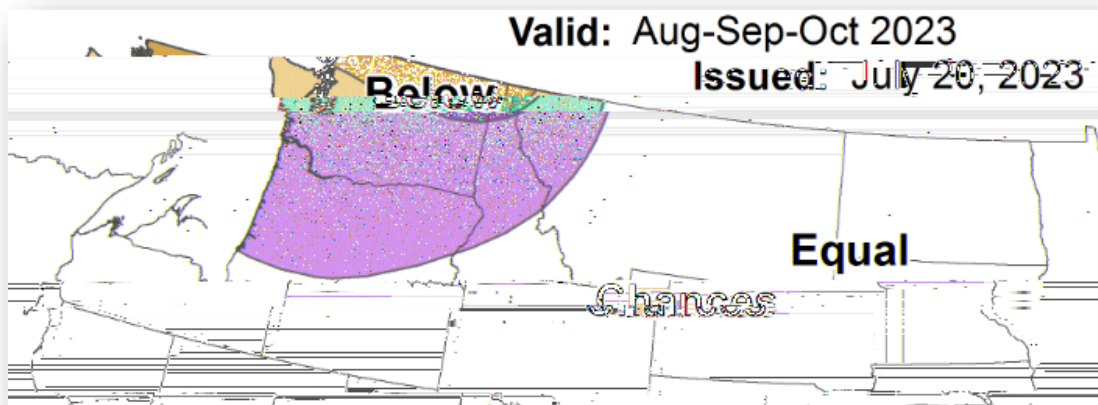
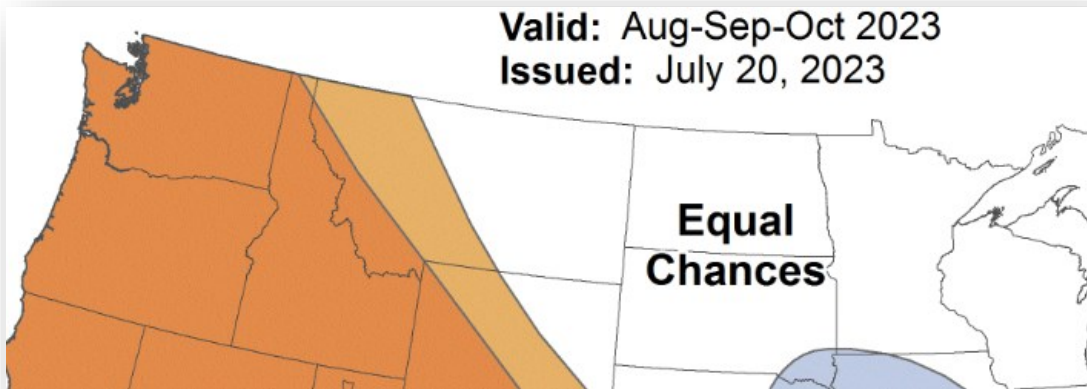


Figure 3: Climate Prediction Center three month outlook (August through October 2023) for temperature (top) and precipitation (bottom).



## U.S. Drought Monitor:

The latest U.S. Drought Monitor was released on Thursday July 27, 2023. Much of NE Montana has been labeled with abnormally dry conditions, particularly north of the Missouri River. Eastern Sheridan County is currently in moderate drought conditions. Portions of northwest Montana are currently experiencing moderate to severe drought. Southern Montana currently sits void of any drought concerns. However, if the dry trend over the last 30 day continues prolongs into the remaining summer and fall months, drought conditions could worsen, and this will be something we'll be monitoring closely.

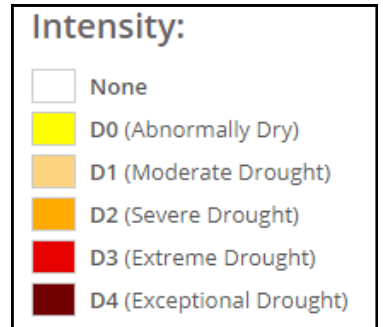
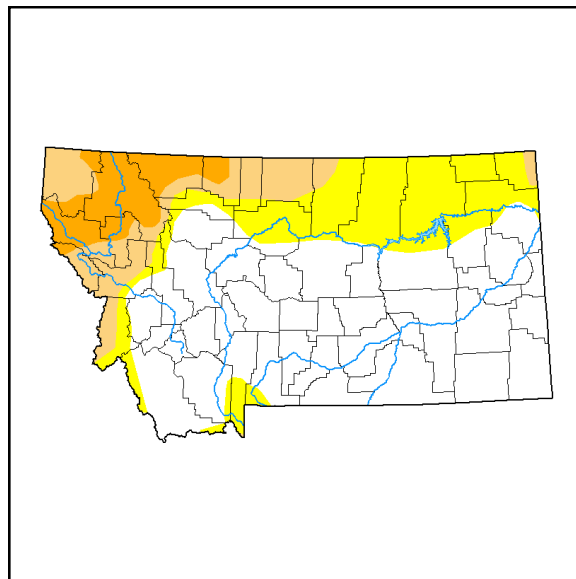
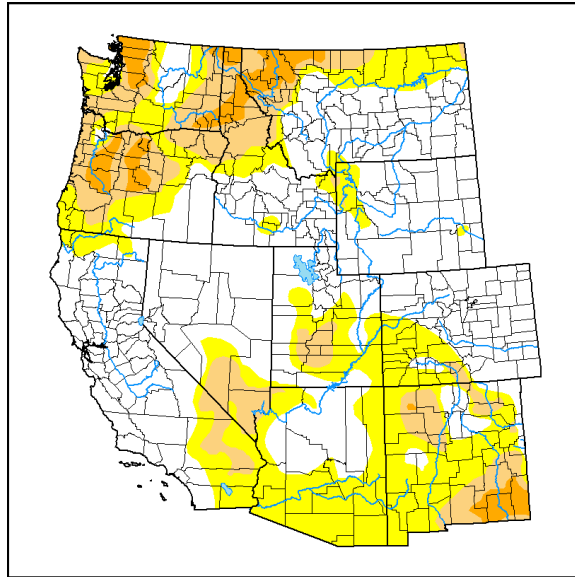


Figure 4: U.S. Drought Monitor updated July 27, 2023.



## Wildfire Safety

- ◆ As drier than normal conditions persist across portions of NE Montana, it's important to keep wildfire safety in mind. NWS Glasgow will issue a Fire Weather Watch or a Red Flag Warning when fire weather conditions necessitate doing so, often during very warm, dry, and windy days or when dry thunderstorms are in the forecast. Here is the difference between what each of these mean.



Figure 6: NOAA Infographic depicting the difference between a Fire Weather Watch and a Red Flag Warning.

---

### Links You May Like:

[July ENSO Update](#)

[ENSO Climate Connection](#)

[When is the hottest day of the year?](#)

[Antarctic Sea Ice: Record Low in June 2023](#)

---

### NWS Glasgow Staffing Changes:

**Brandon Bigelbach** has been a meteorologist at our local office and was promoted to the Science and Operations Officer (SOO). He has been in the role since 6/19/23. He'll be helping our staff with training as well as trying to infuse research, science, and new tools into operations!

**Scott Rozanski** is our new Warning Coordination Meteorologist (WCM). He began his new journey with us in Glasgow in June following his experience at WFO Honolulu. Scott will be helping our office with outreach, building relationships with our core partners, and helping to coordinate the warning function in our office with new innovation!

## COOP Precipitation Totals for April 2023 (Preliminary)

Station	Precipitation	Location
BAYM8	0.68	Baylor
BRDM8	0.53	Bredette
BTNM8	M	Brockton 17 N
BKNM8	0.81	Brockton 20 S
BKYM8	0.42	Brockway 3 WSW
BRSM8	M	Brusette
CLLM8	0.73	Carlyle 13 NW
CIRM8	0.58	Circle
CHNM8	0.19	Cohagen
COM8	0.36	Cohagen 22 SE
CNTM8	0.93	Content 3 SSE
CULM8	0.61	Culbertson
DSNM8	0.73	Dodson 11 N
FLTM8	1.05	Flatwillow 4 ENE
FPKM8	0.80	Fort Peck PP
GLAM8	0.58	Glasgow 14 NW
GGWM8	0.81	Glasgow WFO
GGSM8	0.71	Glasgow 46 SW
GNDM8	0.31	Glendive WTP
HRBM8	M	Harb
HINM8	0.63	Hinsdale 4 SW
HNSM8	1.30	Hinsdale 21 SW
HOMM8	0.64	Homestead 5 SE
HOYM8	0.55	Hoyt
JORM8	M	Jordan
LNDM8	0.81	Lindsay
MLAM8	1.11	Malta
MLTM8	0.46	Malta 7 E
MTAM8	0.40	Malta 35 S

Station	Precipitation	Location
MDCM8	0.45	Medicine Lake 3 SE
MLDM8	0.85	Mildred 5 N
MSBM8	0.61	Mosby 4 ENE
OPNM8	0.69	Opheim 10 N
OPMM8	0.70	Opheim 12 SSE
PTYM8	2.17	Plentywood
PTWM8	0.28	Plentywood 1 NE
POGM8	0.27	Port of Morgan
RAYM8	M	Raymond Border Station
SAOM8	0.74	Saco 1 NNW
SMIM8	0.46	St. Marie
SAVM8	M	Savage
SCOM8	0.63	Scobey 4 NW
SDYM8	0.41	Sidney
SIDM8	0.33	Sidney 2S
TERM8	0.88	Terry
TYNM8	M	Terry 21 NNW
VIDM8	M	Vida 6 NE
WSBM8	M	Westby
WTRM8	0.75	Whitewater
WHIM8	M	Whitewater 18 NE
WBXM8	M	Wibaux 2 E
WTTM8	0.99	Winnett
WNEM8	0.79	Winnett 6 NNE
WNTM8	1.32	Winnett 8 ESE
WITM8	1.81	Winnett 12 SW
WLFM8	0.90	Wolf Point
ZRTM8	1.83	Zortman

## COOP Precipitation Totals for May 2023 (Preliminary)

Station	Precipitation	Location
BAYM8	1.86	Baylor
BRDM8	2.31	Bredette
BTNM8	M	Brockton 17 N
BKNM8	3.65	Brockton 20 S
BKYM8	2.74	Brockway 3 WSW
BRSM8	M	Brusette
CLLM8	3.92	Carlyle 13 NW
CIRM8	3.68	Circle
CHNM8	3.57	Cohagen
COM8	3.36	Cohagen 22 SE
CNTM8	2.65	Content 3 SSE
CULM8	1.91	Culbertson
DSNM8	1.38	Dodson 11 N
FLTM8	2.57	Flatwillow 4 ENE
FPKM8	3.48	Fort Peck PP
GLAM8	1.60	Glasgow 14 NW
GGWM8	3.89	Glasgow WFO
GGSM8	3.77	Glasgow 46 SW
GNDM8	5.37	Glendive WTP
HRBM8	M	Harb
HINM8	M	Hinsdale 4 SW
HNSM8	5.44	Hinsdale 21 SW
HOMM8	1.92	Homestead 5 SE
HOYM8	2.02	Hoyt
JORM8	M	Jordan
LNDM8	4.35	Lindsay
MLAM8	3.25	Malta
MLTM8	3.26	Malta 7 E
MTAM8	3.52	Malta 35 S

Station	Precipitation	Location
MDCM8	2.04	Medicine Lake 3 SE
MLDM8	3.43	Mildred 5 N
MSBM8	M	Mosby 4 ENE
OPNM8	1.57	Opheim 10 N
OPMM8	M	Opheim 12 SSE
PTYM8	2.37	Plentywood
PTWM8	1.62	Plentywood 1 NE
POGM8	3.63	Port of Morgan
RAYM8	M	Raymond Border Station
SAOM8	2.47	Saco 1 NNW
SMIM8	M	St. Marie
SAVM8	M	Savage
SCOM8	1.70	Scobey 4 NW
SDYM8	3.64	Sidney
SIDM8	0.84	Sidney 2S
TERM8	0.89	Terry
TYNM8	0.64	Terry 21 NNW
VIDM8	M	Vida 6 NE
WSBM8	M	Westby
WTRM8	3.50	Whitewater
WHIM8	M	Whitewater 18 NE
WBXM8	M	Wibaux 2 E
WTTM8	2.27	Winnett
WNEM8	2.30	Winnett 6 NNE
WNTM8	3.48	Winnett 8 ESE
WITM8	2.09	Winnett 12 SW
WLFM8	3.89	Wolf Point
ZRTM8	4.18	Zortman

## COOP Precipitation Totals for June 2023 (Preliminary)

Station	Precipitation	Location
BAYM8	M	Baylor
BRDM8	2.00	Bredette
BTNM8	M	Brockton 17 N
BKNM8	4.46	Brockton 20 S
BKYM8	4.50	Brockway 3 WSW
BRSM8	M	Brusette
CLLM8	4.57	Carlyle 13 NW
CIRM8	5.19	Circle
CHNM8	6.92	Cohagen
COM8	6.67	Cohagen 22 SE
CNTM8	3.35	Content 3 SSE
CULM8	3.58	Culbertson
DSNM8	4.03	Dodson 11 N
FLTM8	3.71	Flatwillow 4 ENE
FPKM8	1.49	Fort Peck PP
GLAM8	3.74	Glasgow 14 NW
GGWM8	2.37	Glasgow WFO
GGSM8	4.89	Glasgow 46 SW
GNDM8	4.45	Glendive WTP
HRBM8	M	Harb
HINM8	5.07	Hinsdale 4 SW
HNSM8	3.14	Hinsdale 21 SW
HOMM8	1.69	Homestead 5 SE
HOYM8	2.83	Hoyt
JORM8	M	Jordan
LNDM8	2.65	Lindsay
MLAM8	3.03	Malta
MLTM8	2.25	Malta 7 E
MTAM8	4.22	Malta 35 S

Station	Precipitation	Location
MDCM8	1.33	Medicine Lake 3 SE
MLDM8	4.64	Mildred 5 N
MSBM8	M	Mosby 4 ENE
OPNM8	M	Opheim 10 N
OPMM8	1.70	Opheim 12 SSE
PTYM8	2.31	Plentywood
PTWM8	1.50	Plentywood 1 NE
POGM8	1.92	Port of Morgan
RAYM8	M	Raymond Border Station
SAOM8	3.35	Saco 1 NNW
SMIM8	3.53	St. Marie
SAVM8	M	Savage
SCOM8	2.21	Scobey 4 NW
SDYM8	1.77	Sidney
SIDM8	1.20	Sidney 2S
TERM8	5.60	Terry
TYNM8	0.64	Terry 21 NNW
VIDM8	M	Vida 6 NE
WSBM8	M	Westby
WTRM8	1.83	Whitewater
WHIM8	M	Whitewater 18 NE
WBXM8	M	Wibaux 2 E
WTTM8	5.44	Winnett
WNEM8	4.14	Winnett 6 NNE
WNTM8	4.73	Winnett 8 ESE
WITM8	5.24	Winnett 12 SW
WLFM8	2.19	Wolf Point
ZRTM8	3.76	Zortman

## Monthly Trivia:

Last time we asked...


We have had an increase in interest in the aurora as of late, leading to our next trivia question—How do forecasts for the aurora vary depending on the time scale?

**Answer: Pro-Tip—You can always find a short term 30 minute Aurora Forecast on the NOAA/NWS Space Weather Prediction Center [website](#).** A brief scientific description and some of the science behind the northern lights can be found [here](#).

What you would examine to forecast the aurora can vary depending on the time scale you are looking at. For example, over the span of hours to days you would look at coronal holes on the sun and Coronal Mass Ejections (CME) near the sun. On the span of years, you could factor in the solar activity which varies over an 11 year cycle and can lead to differences in aurora activity. Of course, on larger time horizons you can only surmise that an aurora may be more likely over a given period, it would be a challenge to pinpoint a specific day. To learn more about the science of auroras and how they are forecast, [check this out!](#)



Figure 7: Aurora Photo taken outside of NWS Glasgow by Ryan Bernhart, Meteorologist.

 **New Question:** What is a National Weather Service Spot Forecast? Learn more about this important fire weather product in our next newsletter!

**Find us on Facebook, Twitter and YouTube! No account needed:**

[Facebook.com/NWSGlasgow](https://www.facebook.com/NWSGlasgow)

[Twitter.com/NWSGlasgow](https://twitter.com/NWSGlasgow)

[YouTube.com/NWSGlasgow](https://www.youtube.com/NWSGlasgow)