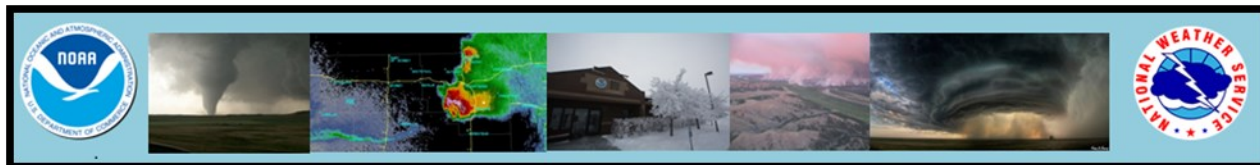


# Under the Big Sky e-Letter

## January 2020



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### CoCoRaHS Opportunity:



**NWS Glasgow** would like to thank all those who attended the CoCoRaHS training on **January 3**. If you would like to become a new observer, you can start reporting your very

own daily precipitation reports! It's a great way to make a difference in your community and it can be a lot of fun to help fill in the data gaps that we otherwise couldn't see, as well as compare your precipitation amounts to those around you. Just check out the CoCoRaHS [webpage](#) and tap the join button on the upper right. A station will be created at your location and you'll soon be on your way toward sending in your reports. All you need to get started is a ruler or yard stick, as well as an official CoCoRaHS 4 inch rain gauge. Your data is used by NWS meteorologists, as well as by those in agriculture, education, those working with mosquito control, insurance adjusters, and numerous others. Get started today!

### 30 Day Percent of Normal Precipitation (Montana)

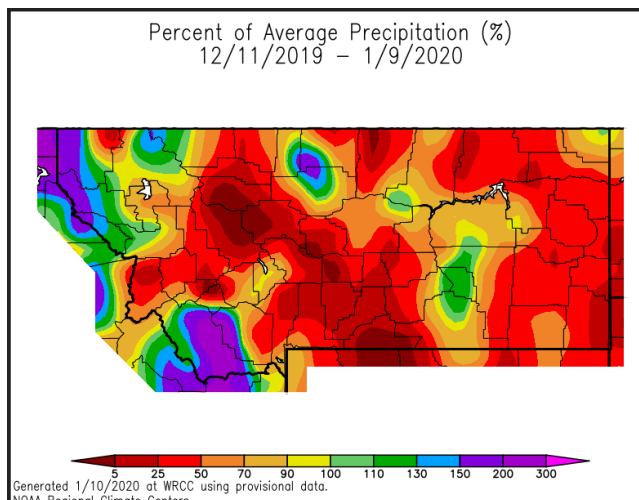


Figure 1: 30-day percent of normal precipitation across Montana.

### 30 Day Temperature Anomalies (Montana)

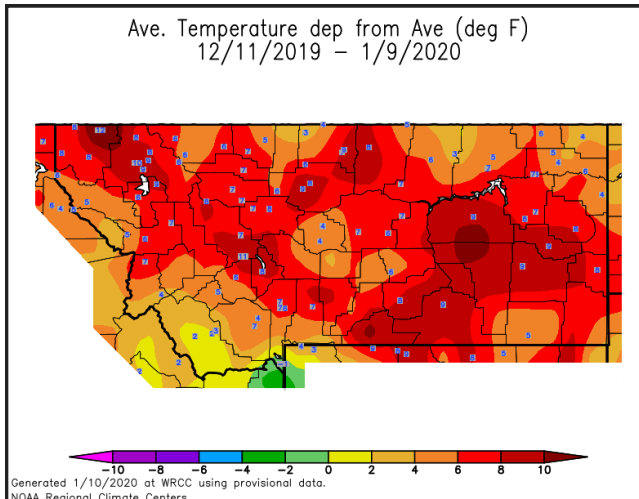


Figure 2: 30-day temperature anomalies across Montana.

**Summary:** Over the recent 30 day period prior to the mid January Arctic invasion, temperatures generally averaged above average by several degrees across much of the state of Montana. On the other hand, precipitation ranged below normal over the same period. In short, much of December and the first part of January came with mild and dry weather conditions across much of Big Sky Country!

## 2019 In Review:

Each year, NE Montana experiences unique weather challenges which can range from extreme drought to excessive spring flooding, large hail during convective summertime thunderstorms to damaging winds, as well as snow, freezing rain, and extreme cold. What are some of the highlights from 2019 worth remembering? While we couldn't possibly cover everything, here are a few that may come to mind.

### 1) February 2019 Arctic Blast

A February storm system brought widespread 6 to 10 inches of snow accumulation to NE Montana, setting the stage for a week long stretch of Arctic temperatures. As the Arctic air mass moved in, fresh snow pack under clear skies and with the presence of light winds helped create favorable conditions for strong radiational cooling. Look below for a plot of 24 hour actual low temperatures that occurred ending February 8th across the area.

24 Hour Min Temps (°F)			
Four Buttes 13nnw	-50	Antelope 2sw	-50
Culbertson	-48	Wolf Point 29ENE	-47
Medicine Lake 1ESE	-47	Scobey 1nw	-45
Poplar 4nne	-44	Circle	-44
Vida 9S/Cow Creek	-43	Glasgow 4n	-40
2 ENE Poplar	-40	Wolf Point Airport	-40
Poplar 2 ENE	-40	Saco	-40
Poplar Raws	-40	Saco 1E	-39
Froid	-39	Thoeny 1WSW/Bluff	-39
Whatley 4ESE	-39	Bredette 4W	-39
Culbertson	-39	Saco 1 NNW	-39
Sidney Airport	-38	Circle	-37
Nashua	-37	2 W Malta	-35
Frazer	-35	Fort Peck Power Plant	-35
Wibaux (school)	-34	Glasgow	-34
Glasgow Airport (ASOS)	-32	Comertown	-32
Glasgow 3sse	-32	6 WNW Jordan	-31
Baylor	-31	Comertown 6S	-31
Scobey	-31	Jordan Airport	-31
Navajo Mt5	-31	Navajo 1N	-30
Bredette 8WSW	-30	Glendive	-29
Malta 4.7ENE	-28	Malta 4e	-28
Culbertson	-28	Glendive Airport	-27
Terry	-27	Weldon 4W	-27
Mosby	-26	Port Of Morgan	-26

data valid as of Fri 5:32 pm - NWS Glasgow

Figure 3: Actual 24 hour min temperatures ending February 8, 2019 across the area.

### 2) NE Montana Spring Flooding

Following a colder than usual February, things warmed up all at once as the second part of March came around. This began ice breakup and thus ice jam flooding season. Snow melt led to flooding of poor drainage areas as well. Check out the image on the next page for Yellowstone River flooding near Fairview, MT.

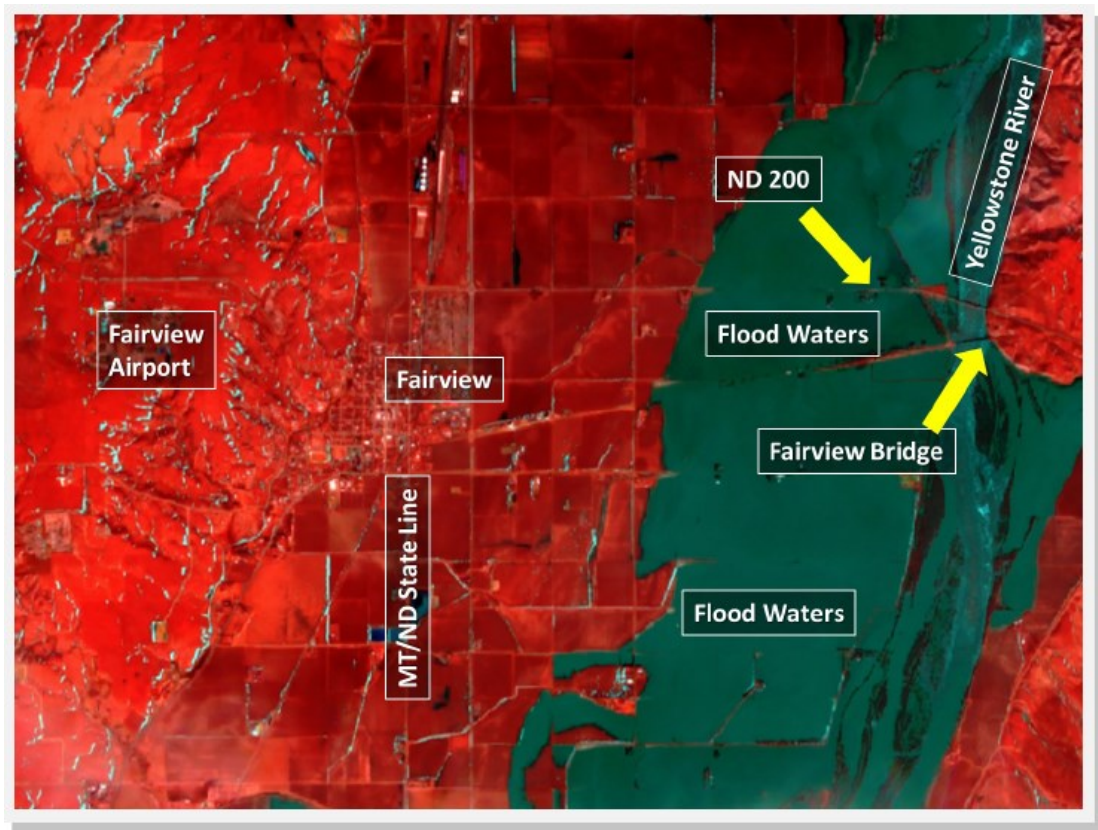


Figure 4: Satellite imagery taken on March 26, 2019, annotated, depicting Yellowstone River Flooding.

### 3) July 30 Severe Weather

Thunderstorms developed in the afternoon and persisted in the evening hours across NE Montana on July 30, 2019, perhaps one of the more eventful severe weather days of the season. One storm produced significant damage in Terry, MT, leading to a storm survey by the NWS office. Wind estimates ranged in excess of 75 mph, enough to cause major damage to the awning of a gas station. Two spruce trees were uprooted on the west side of town as well. This is an example of how straight line winds, and not just tornadoes,

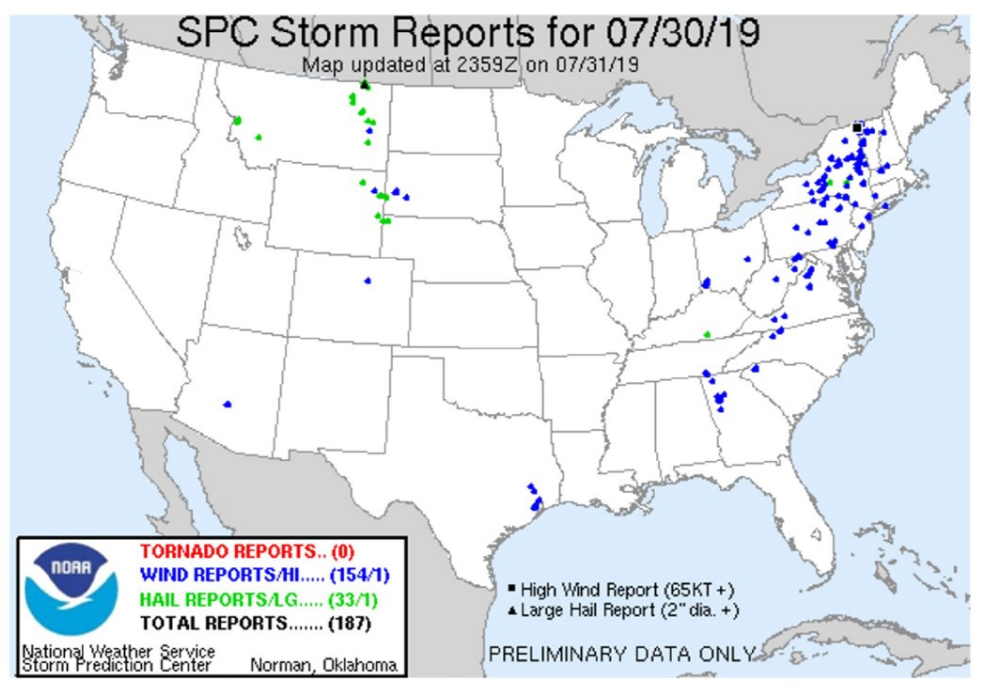


Figure 5: SPC Storm Reports map on 7/30/2019.

can lead to significant structural damage and numerous impacts. Several hail reports were also present on that day, including a 2 inch report in Daniels County. Check out the map with the storm reports via the Storm Prediction Center. You can find the specific reports [here](#).



## 4) A Wet September

NE Montana saw one of its wettest September months on record. Several weather systems produced heavy rainfall, notably one on September 6-7, 2019 and another on September 28-30. Check out the rankings across just a few of the locations in the area.

September Total Precipitation Ranking

<u>Location</u>	Total Precip (inches)	Departure from Normal	<u>Ranking</u>
Glasgow	4.57	+3.63	2nd Wettest
Sidney	10.27	+9.02	1st Wettest
Glendive	8.46	+7.19	1 <sup>st</sup> Wettest
Plentywood	6.84	+5.80	1 <sup>st</sup> Wettest
Wolf Point	6.32	+5.08	1 <sup>st</sup> Wettest

Figure 6: Chart showing total precipitation in September for 2019, departure from normal, and historical ranking.

## 5) October Snow

An early winter storm brought snow to NE Montana from October 8th and 9th, producing generally 2 to 4 inches of accumulations.

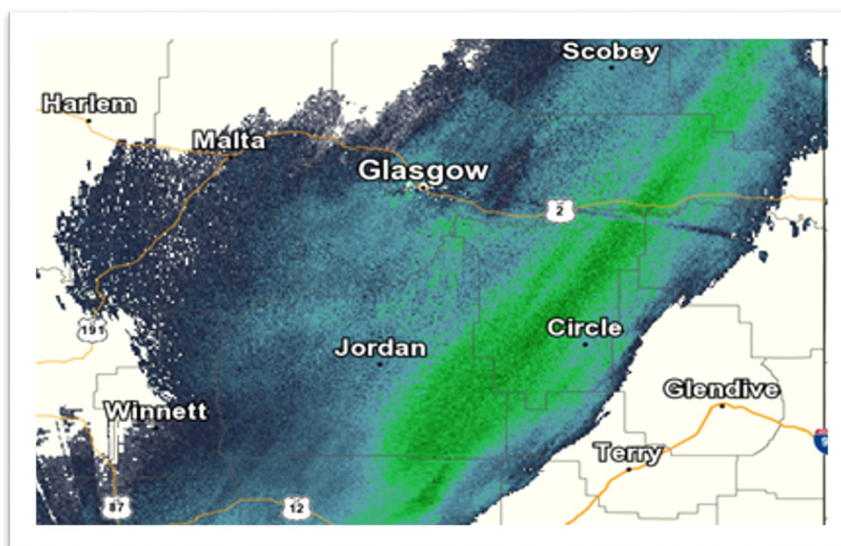


Figure 7: Radar image morning of 10/09/2019 depicting area of snow over portions of NE Montana.

That's a look back at 2019—at least a small sample of what took place. Let's see what 2020 brings!

## Hydrologic Summary for December by Greg Forrester, Lead Forecaster at NWS Glasgow:

It was a warmer than normal month over northeast Montana. Temperatures averaged between 1 and 6 degrees above normal. Glasgow averaged 20.4 degrees which was 4.1 degrees above normal.

Precipitation varied from well below normal to near normal for the month. The dry spots were Mosby with 0.03 inch, Cohagen 22SE with 0.04 inch, and Brockway with 0.07 inch. The wet spots were Malta with 0.55 inch, Plentywood with 0.52 inch, and Glasgow 46SW with 0.51 inch.

Glasgow had 0.37 inch of precipitation which was 93 percent of normal.

The Milk, Yellowstone, Missouri, and Poplar Rivers were either frozen or partially frozen during December. Stream flow information was not available for the month.

The Fort Peck Reservoir elevation fell to 2237.4 feet during the month. The reservoir was at 84 percent of capacity and 104 percent of the mean pool.

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### Winter Safety Reminders

January and February are known for their ability to produce harsh winter weather conditions that can threaten your travel plans with low visibility, snow covered or icy roads, as well as other impacts. If you get stuck along your way, dangerous wind chills and prolonged exposure to the cold can leave you and those you care about at risk to things like frostbite and hypothermia. **One of the most proactive things that you can do** ahead of time is to pack a winter safety kit in your vehicle. It is also a good idea to let someone know before you travel, and be sure to provide them with details such as when you expect to leave, where you are going, and when you are expected to arrive at your destination. We will continue to provide you with [additional winter safety information](#) all season long to help you be weather ready before the storm hits.



Figure 8: Graphical depiction of a vehicle safety kit ahead of winter travel.

**CPC Three Month Outlook:** The Climate Prediction Center released its three month outlook for temperature and precipitation for February 2020 through April 2020 on January 16, 2020. The outlook calls for increased odds for below normal temperatures across much of central and eastern Montana. Western parts of the state carry equal chances for above normal, below normal, or normal temperatures over the three month period. Across the state, the probabilities favor above normal precipitation for the same time frame. This suggests that while mild and dry conditions are certainly possible at times, as a whole, the next few months may stack up to be colder and wetter (perhaps snowier) than average. The latest outlook in full detail 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. The pie charts on the left hand side can be particularly useful for assessing the outlook at your specific location.

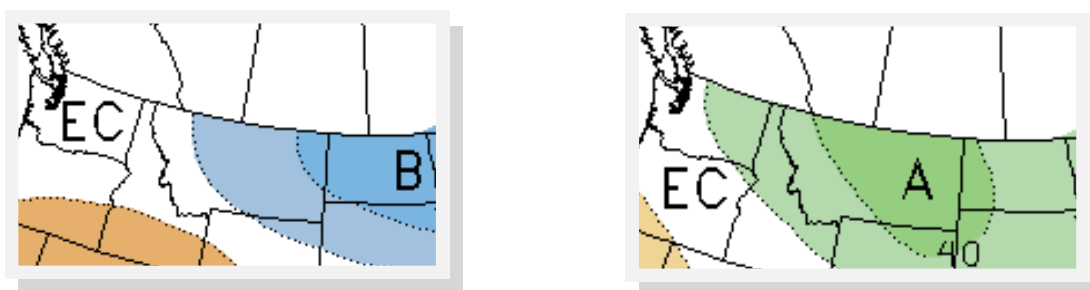


Figure 9: Climate Prediction Center three month temperature (left) and precipitation (right) outlook for February 2020 through April 2020.

**Updated U.S. Drought Monitor:** The [latest U.S. Drought Monitor](#) was released on Thursday January 23, 2020. At this point in time, Montana was void of any drought indications. However, spotty abnormally dry conditions were present across western portions of the state. Looking ahead, if the above normal precipitation outlook verifies, Montana should continue to benefit with a lack of drought conditions over the short and medium term.

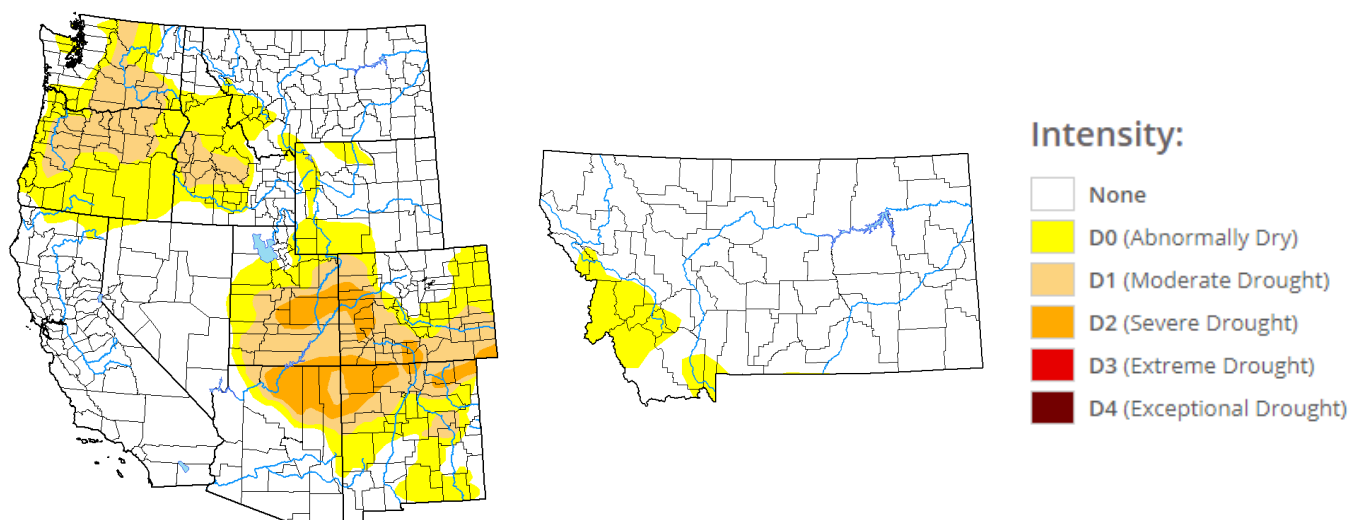


Figure 10: Latest Drought Monitor for the western U.S. (left) and Montana (right) released Thursday January 23, 2020.

**U.S. Climate Highlights (December):** The [U.S.](#) & [Global](#) climate highlights for December 2019 have been released. A few points for you to take home are provided below.

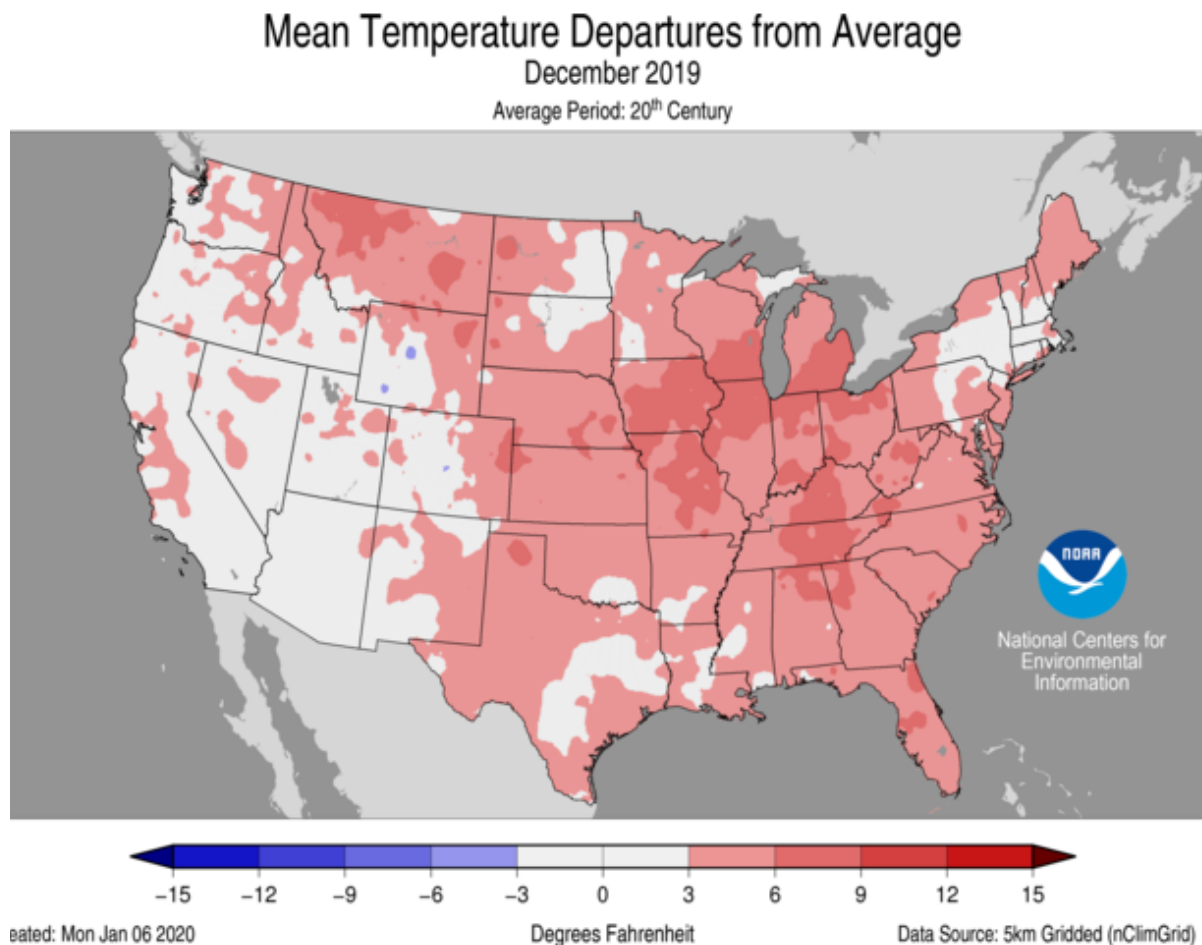


Figure 11: Temperature departure from average for December 2019, across the U.S.

#### U.S. Highlights for December 2019

- 1) The contiguous U.S. average temperature for December 2019 was 36.5 °F.
- 2) The average December precipitation total for the contiguous U.S. came in at 2.53 inches. This ranks within the middle third of the existing period of record (spanning 125 years).
- 3) According to the U.S. Drought Monitor, 11% of the contiguous U.S. was in drought.

#### Global Highlights for December 2019

- 1) The December 2019 global land and ocean surface temperature departure from average was the second warmest on record.
- 2) The global land only surface temperature for December 2019 was also the 2nd highest on record.
- 3) The globally averaged sea surface temperature was the second highest for December in the record books.
- 4) ENSO neutral conditions continued in December 2019 and are favored to continue during the Northern Hemispheric Winter.

## Precipitation Data (December 2019):

Station	Precipitation	Location
BAYM8	0.26	Baylor
BRDM8	0.43	Bredette
BTNM8	M	Brockton 17 N
BKNM8	0.41	Brockton 20 S
BKYM8	0.07	Brockway 3 WSW
BRSM8	M	Brusette
CLLM8	0.41	Carlyle 13 NW
CIRM8	0.21	Circle
CHNM8	0.09	Cohagen
COM8	0.04	Cohagen 22 SE
CNTM8	0.30	Content 3 SSE
CULM8	0.33	Culbertson
DSNM8	0.34	Dodson 11 N
FLTM8	0.31	Flatwillow 4 ENE
FPKM8	0.22	Fort Peck PP
GLAM8	0.31	Glasgow 14 NW
GGWM8	0.37	Glasgow WFO
GGSM8	0.51	Glasgow 46 SW
GNDM8	0.34	Glendive WTP
HRBM8	M	Harb
HINM8	0.31	Hinsdale 4 SW
HNSM8	0.65	Hinsdale 21 SW
HOMM8	0.25	Homestead 5 SE
HOYM8	M	Hoyt
JORM8	M	Jordan
LNDM8	0.27	Lindsay
MLAM8	0.55	Malta
MLTM8	0.19	Malta 7 E
MTAM8	0.14	Malta 35 S

Station	Precipitation	Location
MDCM8	0.25	Medicine Lake 3 SE
MLDM8	M	Mildred 5 N
MSBM8	0.03	Mosby 4 ENE
OPNM8	0.23	Opheim 10 N
OPMM8	0.22	Opheim 12 SSE
PTYM8	0.52	Plentywood
PTWM8	0.13	Plentywood 1 NE
POGM8	0.25	Port of Morgan
RAYM8	M	Raymond Border Station
SAOM8	0.46	Saco 1 NNW
SMIM8	0.27	St. Marie
SAVM8	0.18	Savage
SCOM8	0.14	Scobey 4 NW
SDYM8	0.33	Sidney
SIDM8	0.38	Sidney 2S
TERM8	0.20	Terry
TYNM8	M	Terry 21 NNW
VIDM8	0.17	Vida 6 NE
WSBM8	M	Westby
WTRM8	M	Whitewater
WHIM8	M	Whitewater 18 NE
WBXM8	0.26	Wibaux 2 E
WTTM8	M	Winnett
WNEM8	0.20	Winnett 6 NNE
WNTM8	0.17	Winnett 8 ESE
WITM8	M	Winnett 12 SW
WLFM8	0.35	Wolf Point
ZRTM8	0.40	Zortman

## Links You May Like:

[2019 Second Wettest Year for U.S.](#)

[Billion Dollar Weather & Climate Events](#)

[Australian Wildfires](#)

[ENSO Update](#)



## Monthly Trivia: Last time we asked...

What does it take, for a snow storm to be considered a true blizzard? Imagine that following an unusual ten inch snowstorm, you overhear someone at the dinner table mention that she or he is exhausted after driving home in that “blizzard.” Is this person necessarily correct in the characterization of the weather conditions that she or he went through on the commute home? Maybe. More information would be needed such as the wind conditions, visibility, etc. The take home is that it takes more than “a whole lot of snow” to produce a true blizzard. Whether or not something amounts to a true blizzard doesn’t mean that travel conditions are not dangerous, but a blizzard is a very specific weather phenomenon. We’ll have the complete answer next month, as well as a few fun winter weather facts!

**Answer:** By itself, a foot of snow may cause enormous impacts with snow covered roads, blowing and drifting conditions, etc. However, in order for a winter storm to be classified as a true blizzard, certain criteria have to be met. In fact, blizzard conditions can arise from pre-existing loose snow that is already on the ground. That’s because it’s the wind and visibility that matter here. A blizzard means that for a period of three hours or longer that there will be sustained or frequent wind gusts to 35 mph or greater, considerable falling and/or blowing snow, and a resultant reduction in visibility frequently to less than one quarter mile. A winter storm that is associated with less wind, and somewhat greater visibility can still lead to dangerous travel conditions, but just the same this is what it takes for an event to be truly classified as a blizzard.



**New Question:** The National Weather Service issues a number of products to help keep people safe and informed when cold temperatures and wind speeds combine to create dangerous wind chills. These include wind chill warnings and advisories. We all know that it feels colder when the wind is stronger (if the temperature is constant), but what is the science behind this concept? We’ll go over it in the next newsletter.

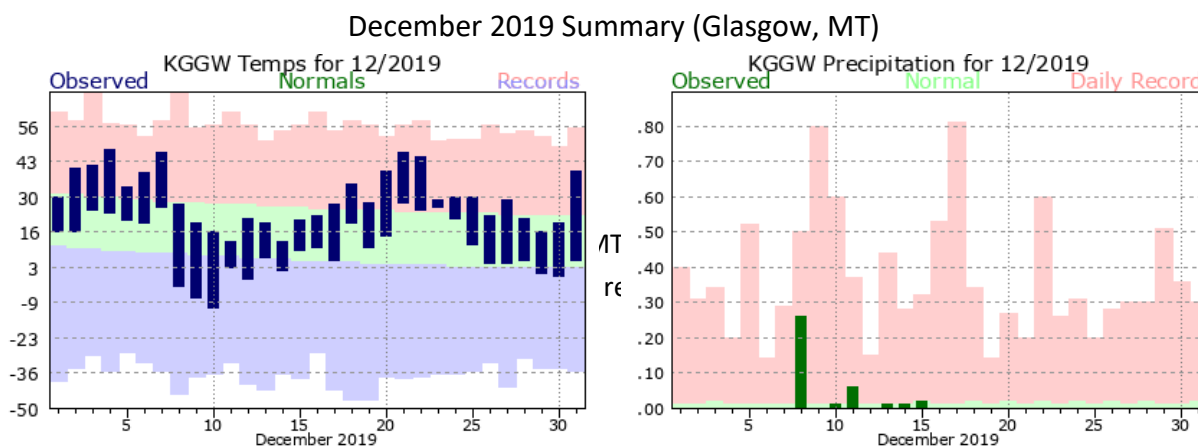


Figure 12: Observed temperature (left) for Glasgow, MT compared with normal and extremes as well as observed precipitation (right) for Glasgow, MT compared with normal and extremes in December 2019.

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