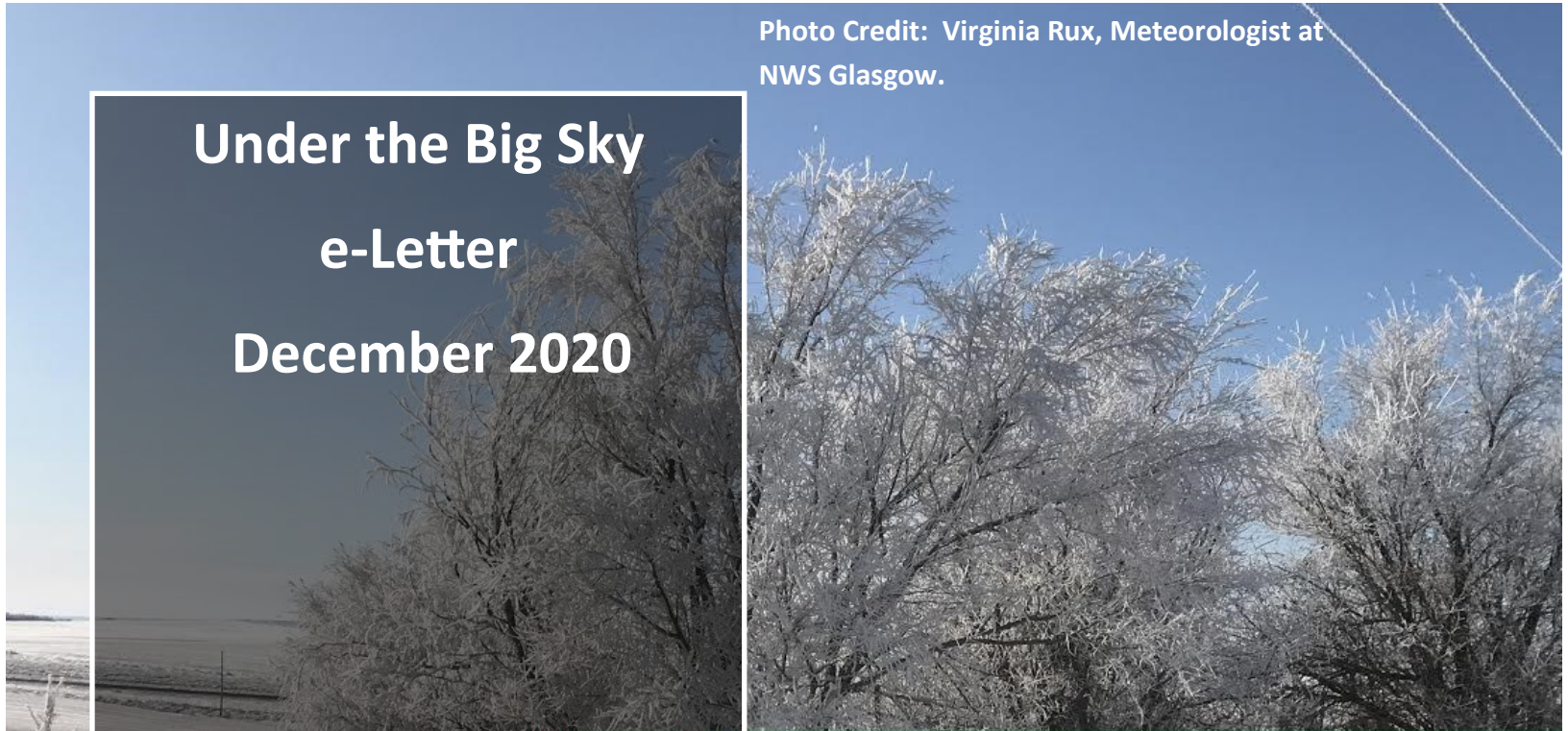


Photo Credit: Virginia Rux, Meteorologist at  
NWS Glasgow.

# Under the Big Sky

## e-Letter

### December 2020



**National Weather Service**  
**Glasgow, MT**



## Welcome to the December 2020 Edition of the NWS Glasgow Under the Big Sky E-Letter!

Each month we issue the latest Under the Big Sky newsletter in which we provide you with important weather, climate, and water information. Routinely included are the latest three month outlooks, the latest U.S. Drought Monitor, COOP precipitation reports, summaries of important weather events, trivia, and more. In addition, we also try to shed light on local office NWS Glasgow happenings from time to time such as keeping you up to date on any staffing changes.

We hope that you find these regularly issued newsletters both fun and informative and we thank you for allowing us the opportunity to serve!

As always, we continue to welcome any feedback that you may have so feel free to share with us what you think!

### **A Peak Inside:**

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## 2020 Highlights from NWS Glasgow

### By Tanja Fransen, Meteorologist in Charge

On March 17th, operations at NWS Glasgow drastically changed as we were told we had to go into mandatory, maximum telework and we all wondered, “How is this going to work?” We had a new employee who started April 1, and we couldn’t let him into the office for two weeks due to the statewide mandate to quarantine if you were coming from outside of the county. Not much of a Big Sky Welcome, although we did our best virtually, trying to convey that Montana is a state full of friends, you just haven’t met them all yet!

Our staffing on a routine day has 5-8 people during the day (technicians, admin, etc) and we are at just 2-3 operational forecasters in the building, with others as needed, for short trips in. In the case of hazardous weather we can staff up with a few extra bodies (everyone wearing masks and distancing) but for the most part, we have been remotely supporting operations.



Figure 1: NWS Glasgow holding a virtual morning briefing.

While it’s not our preference to telework, it’s generally going better than anticipated (depends on who you ask, and the day!). A few of us have moved our “offices” a few times, and we have the occasional video bomb of a toddler or a cat, but that helps keep things light in a time that is somewhat scary and uncertain. We do our daily briefings via video conferencing and that’s given those who were unfamiliar with the technologies a chance to gain comfort and skill with it. Our electronics staff can go to a site to do maintenance on equipment, and our IMETs were deployed to wildfires, but we are not allowed to attend the meetings we used to with partners, or have school tours come into the office. We really miss seeing your faces! ***Thank you to all those who continue to be “social” with us on social media, phone calls, emails etc!***

*This past year, I’m particularly proud of our staff for their adaptability, their ability to stay positive, support one another, and their professional skills and performance during the spring snowmelt runoff, the May 20th event, the Sept 2nd fire weather event, and the Nov 7-9 blizzard and winter storm. Not to mention our techs who keep the equipment in top shape, and the IT guy who had WAY more calls from us at home than he could handle at times (Mr. Popularity for a few weeks!)*

To all our partners, we can’t say thank you enough for all you do to keep your communities safe with the information we provide. And to all our weather spotters, thank you for feeding us the great information with your report, photos, videos etc. We can’t build a Weather Ready Nation without you all! Be safe, be well in 2021, we look forward to getting out one day and visiting with you all again!

~~Tanja~~

## Top 5 Weather Events in 2020 Across NE Montana

By Felix Castro, Lead Meteorologist, and Virginia Rux, Meteorologist at NWS Glasgow

### #5– Record Breaking Cold



Figure 2: Graphical summary of the record cold at the end of October 2020.

The cold that we had over the last week in October shattered records in many places. Here’s a breakdown of what the records were (red numbers are the ones broken).

### #4– Hill Fire on August 20, 2020

August 20, 2020 was drier than normal for many places over NE Montana and abnormally dry conditions over the summer continued to degrade. Approximately three days over the entire month had measureable precipitation with the first half of the month being completely dry. The Storm Prediction Center (SPC) had issued a Marginal Severe Thunderstorm Outlook and indicated Isolated Dry Thunderstorms may occur on August 20th. This led to a Red Flag Warning issuance for all of NE Montana. All of the storm reports were for high winds above 58 mph. With already dry fuels, a lightning strike west of the Pines Recreation Area smoldered overnight. Winds increased the following day and an initial spot forecast was requested around 5 PM for the Hill Fire. Another fire occurred near Oswego that day. Persistent smoke, primarily from the western United States along with some of the local fires, degraded air quality across the region. Support for the Hill Fire continued until early September.

## Top 5 Weather Events in 2020 Across NE Montana (Continued)



Figure 3: MODIS Imagery of Hill Fire.

### **#3– July 7 Severe Weather Event**

A very unstable atmosphere combined with warm moist air from the southeast and a cold front from the west, to easily form and support multiple severe thunderstorms which merged into a bowing squall line and resulted in a tornado and a gustnado. In total, 14 warnings were issued on this particular evening. There were 2 tornado warnings, with one confirmed by Law Enforcement in Petroleum County, and a total of 12 severe thunderstorm warnings.

### **#2– 2020 Jordan’s Huff Fire**

Fuels were very dry, temperatures were in the 90s, and the relative humidity was forecast to drop to the low to mid-teens. September started with high confidence of critical weather fire conditions bordering extreme conditions. A Red Flag Warning was issued throughout the region August 31st for the first two days in September. On the morning of September 2nd, a High Wind Warning was issued throughout northeastern Montana. Around noon, the first observed 60 mph wind gust occurred at Malta South and a hot spot north of Jordan, MT appeared on satellite imagery. Over the next couple hours, several fires started throughout eastern Montana with one near Hinsdale and another east of Lustre. Winds continued to intensify and the “Huff fire” rapidly spread uncontrollably south toward Jordan.

## Top 5 Weather Events in 2020 Across NE Montana (Continued)

An evacuation order was declared by Garfield County Disaster and Emergency Services. As the fire crossed Highway-200 and continued south threatening to cross Highway 59, Cohagen followed with an evacuation order as well. Near zero visibility from smoke created dangerous driving conditions along the roadways with one highway accident reported. Although some small structures were burned, no homes were lost. Livestock, farming equipment, and semi-trucks were lost. According to inciweb.nwcg.gov on September 10th, the Huff fire burned 46,892 acres and was 100% contained.

### #1– Severe Weather, May 20, 2020

Significant thunderstorm wind damage occurred on the evening of Wednesday, May 20, 2020 in McCone and eastern Garfield Counties. The storm system originated with large hail and severe winds in the Yellowstone River Valley. As it moved northward, it transitioned into an extreme high wind and heavy rain event as it approached Montana Highway 200. When it approached Fort Peck Lake and the Missouri River it continued with severe thunderstorm winds, heavy rainfall and had some weak tornado indicators. A weak EF-0 tornado occurred near the Whatley area between Glasgow and Nashua.



Figure 4: While May 20,2020 brought significant severe weather damage, heavy rain was also common. Here is a photo of Virginia Rux's rain gage the following morning (Meteorologist and CoCoRaHS observer).

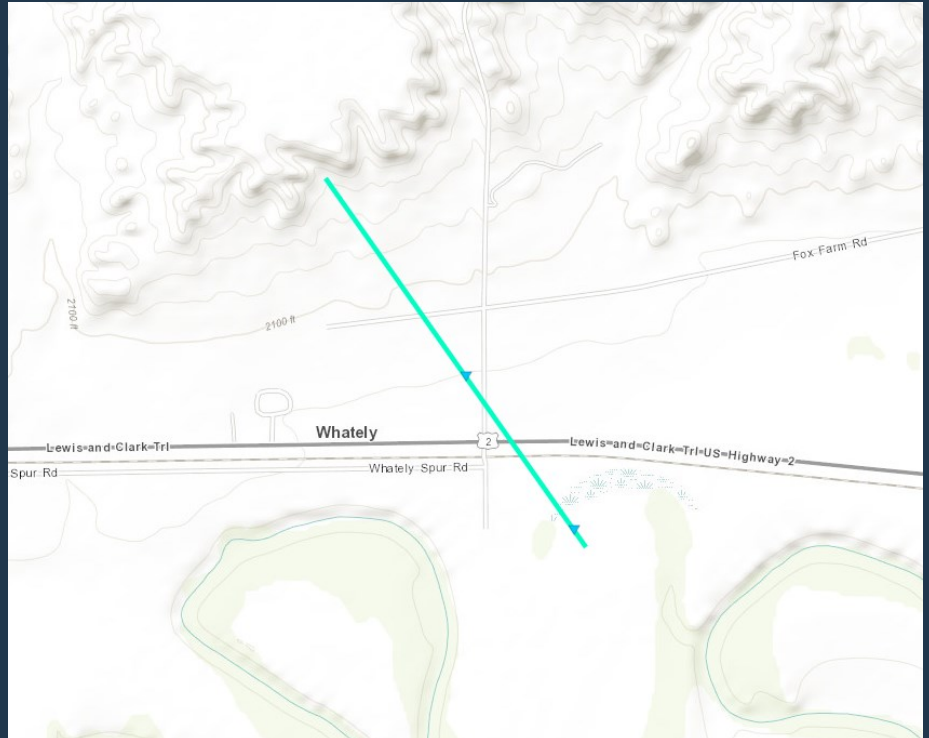


Figure 5: Track of Whatley Tornado (May 20,2020) created by Cory Mottice, Lead Forecaster.

## Become a Weather Observer for CoCoRaHS:

NWS Glasgow is looking for new CoCoRaHS volunteers to send in daily precipitation reports.

CoCoRaHS is a grass-roots organization with a network of dedicated 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, and even by those in academia.



Participating in the CoCoRaHS program is a great way to make a difference in your community. And the best part is that you only need a couple of things to get started such as a 4 inch rain gauge and a ruler or yardstick. Why not give it a try today? All you have to do is check out the [CoCoRaHS main page](#), hit the join button in the upper right, fill out the form, and take some initial training. Once you have your rain gauge and ruler you are ready to get started!

Did you miss our recent CoCoRaHS training session: Check it out [here](#).

## 30 Day Percent of Normal Precipitation (Montana)

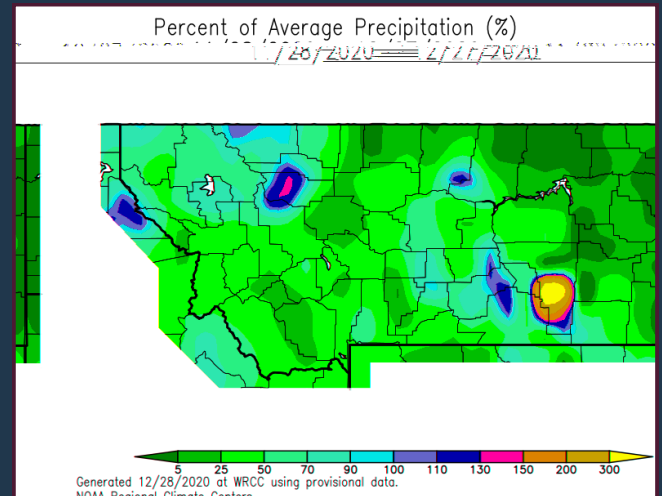


Figure 6: 30-day percent of normal precipitation across Montana.

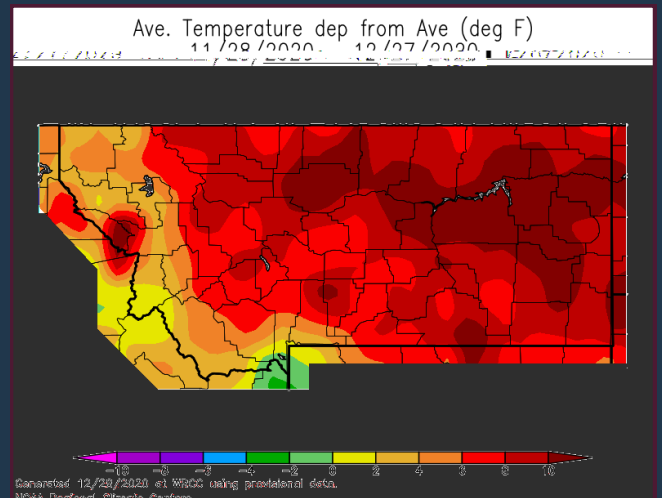


Figure 7: 30-day temperature anomalies across Montana.

**Summary:** Over the prior 30 days, as noted by all the oranges and reds on the maps above, precipitation trended below the average while temperatures trended above the average.

## **Hydrologic Summary for November 2020 by Greg Forester, Lead Forecaster at NWS Glasgow:**

It was a warmer than normal month for temperatures over most of Northeast Montana while areas near the Canadian border had near normal to slightly below normal temperatures. Temperatures averaged between 2 degrees below and 5 degrees above normal across the region. Glasgow averaged 31.6 degrees which was 2.3 degrees above normal.

Almost all of the precipitation fell in a winter storm that occurred on November 8<sup>th</sup> and 9<sup>th</sup>. Some areas like Phillips and Valley Counties had well above normal precipitation for the month with the wet spots of 1.13 inches in Malta, 1.04 inches at Glasgow 46SW and 0.99 inch at Zortman. Areas near the North Dakota border and most areas south of the Missouri River had below normal precipitation for the month. The dry spots were Winnett with 0.08 inch, Medicine Lake with 0.15 inch, and Sidney and Wibaux with 0.19 inch. Glasgow had 0.82 inches which was 204 percent of normal.

Stream flow on the Milk, Yellowstone, Missouri and Poplar Rivers was near normal for the entire month. The Fort Peck Reservoir elevation fell to 2237.2 feet during the month. The reservoir was at 86 percent of capacity and 105 percent of the mean pool.



## CPC Three Month Outlook:

The Climate Prediction Center released its three month outlook for temperature and precipitation for January 2021 through March 2021 on December 17, 2020. The outlook calls for below normal temperatures over much of the state. Meanwhile, above average precipitation is favored across Montana over the period aside from far southeast locations. 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.

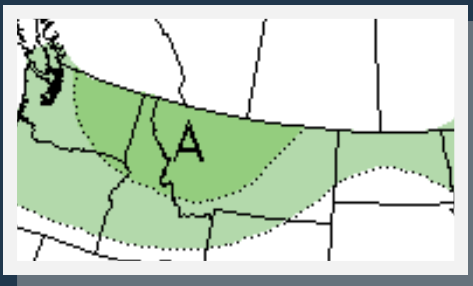
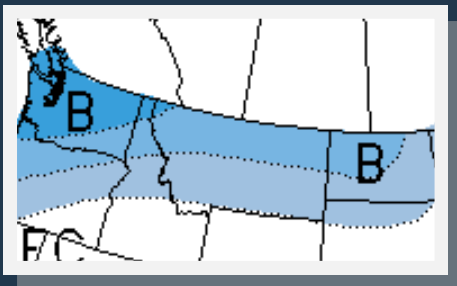
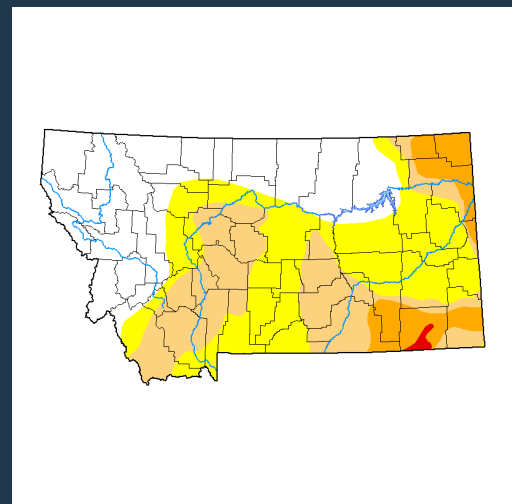
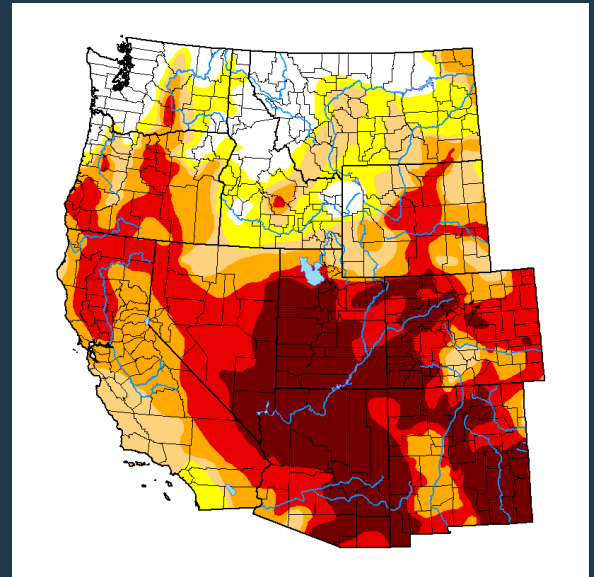


Figure 8: Climate Prediction Center three month temperature (top) and precipitation (bottom) outlook for January 2021 through March 2021.

## U.S. Drought Monitor:

The [latest U.S. Drought Monitor](#) was released on Thursday December 24 2020. Portions of eastern MT are experiencing severe drought conditions. Patchy extreme drought is present for southeast Montana as well. The rest of the state mostly fell between abnormally dry and moderate drought conditions. Only far western MT and north central locations had patches void of drought.



### Intensity:

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

Figure 9: U.S. Drought Monitor updated December 24, 2020.

## U.S. & Global Climate Highlights (November):

The [U.S.](#) & [Global](#) climate highlights for November 2020 have been released, the latest month for which data was available. A few points for you to take home are provided below.

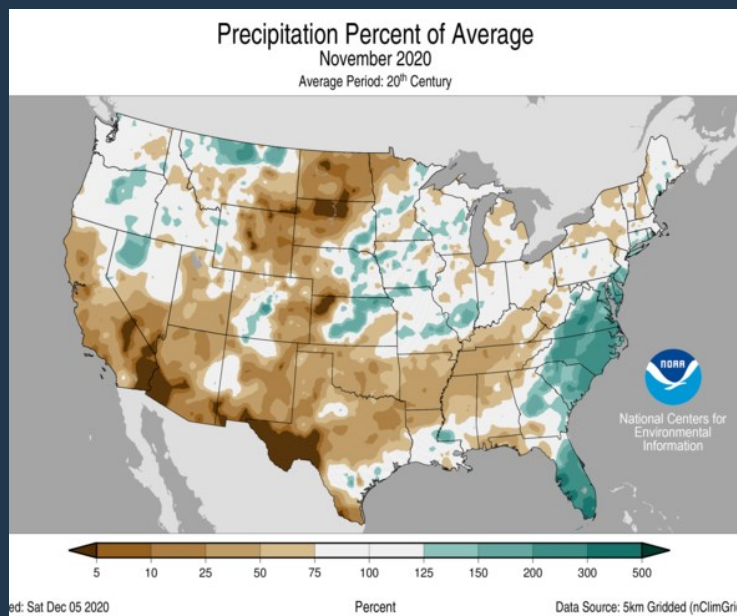


Figure 10: November 2020 Percent of Average Precipitation (U.S.).

### U.S. Highlights for November 2020

- 1) The contiguous U.S. average temperature for November 2020 was 46.4 °F, ranking as the fourth warmest on record.
- 2) The average November precipitation total for the contiguous U.S. came in at 1.90 inches. This ranks within the driest third of the existing period of record.

### Global Highlights for November 2020

- 1) The November 2020 global land and ocean surface temperature was the second highest for November in the 141 year record.
- 2) There were no land or ocean locations that experienced record cold November temperatures.

## Radar Page Refresh

The radar page that is linked to NWS forecast pages is getting a makeover. Old bookmarks and links will automatically direct to the new national mosaic view as well. Improvements include more frequent updates to radar images, four times higher resolution than before, radar can be layered with NWS watches and warnings on a map that allows interaction such as zooming and scrolling, and since it is GIS-based, many users will be able to integrate available data into their own platforms. Additionally, the format will be more mobile friendly. The changes have been in effect since December 16, 2020 officially. Here's [more](#).

## Links You May Like:

[ENSO Update...and Penguins](#)

[Sea Ice Loss & Extreme Wildfires](#)

[U.S. Methane Hot Spot](#)

[Atlantic Hurricane Season Breaks Records](#)

[Weather Ready Nation](#)

## COOP Precipitation Data (\*Preliminary\* November 2020)

Station	Precipitation	Location
BAYM8	0.98	Baylor
BRDM8	0.71	Bredette
BTNM8	M	Brockton 17 N
BKNM8	0.32	Brockton 20 S
BKYM8	0.28	Brockway 3 WSW
BRSM8	M	Brusette
CLLM8	0.39	Carlyle 13 NW
CIRM8	M	Circle
CHNM8	0.32	Cohagen
COM8	M	Cohagen 22 SE
CNTM8	0.49	Content 3 SSE
CULM8	0.39	Culbertson
DSNM8	0.65	Dodson 11 N
FLTM8	0.25	Flatwillow 4 ENE
FPKM8	0.53	Fort Peck PP
GLAM8	0.75	Glasgow 14 NW
GGWM8	0.82	Glasgow WFO
GGSM8	1.04	Glasgow 46 SW
GNDM8	0.26	Glendive WTP
HRBM8	M	Harb
HINM8	M	Hinsdale 4 SW
HNSM8	M	Hinsdale 21 SW
HOMM8	0.21	Homestead 5 SE
HOYM8	M	Hoyt
JORM8	M	Jordan
LNDM8	0.20	Lindsay
MLAM8	1.13	Malta
MLTM8	M	Malta 7 E
MTAM8	0.50	Malta 35 S

Station	Precipitation	Location
MDCM8	0.15	Medicine Lake 3 SE
MLDM8	M	Mildred 5 N
MSBM8	M	Mosby 4 ENE
OPNM8	0.77	Opheim 10 N
OPMM8	0.57	Opheim 12 SSE
PTYM8	0.36	Plentywood
PTWM8	0.21	Plentywood 1 NE
POGM8	0.26	Port of Morgan
RAYM8	0.16	Raymond Border Station
SAOM8	0.81	Saco 1 NNW
SMIM8	0.39	St. Marie
SAVM8	M	Savage
SCOM8	0.45	Scobey 4 NW
SDYM8	0.19	Sidney
SIDM8	0.18	Sidney 2S
TERM8	0.24	Terry
TYNM8	M	Terry 21 NNW
VIDM8	0.26	Vida 6 NE
WSBM8	0.15	Westby
WTRM8	0.85	Whitewater
WHIM8	M	Whitewater 18 NE
WBXM8	0.19	Wibaux 2 E
WTTM8	M	Winnett
WNEM8	0.08	Winnett 6 NNE
WNTM8	0.22	Winnett 8 ESE
WITM8	M	Winnett 12 SW
WLFM8	0.32	Wolf Point
ZRTM8	0.99	Zortman

## Monthly Trivia:

Last time we asked...

what is the difference between the air temperature and wind chill temperature? In other words, why does the wind make it “feel” colder?

Answer:

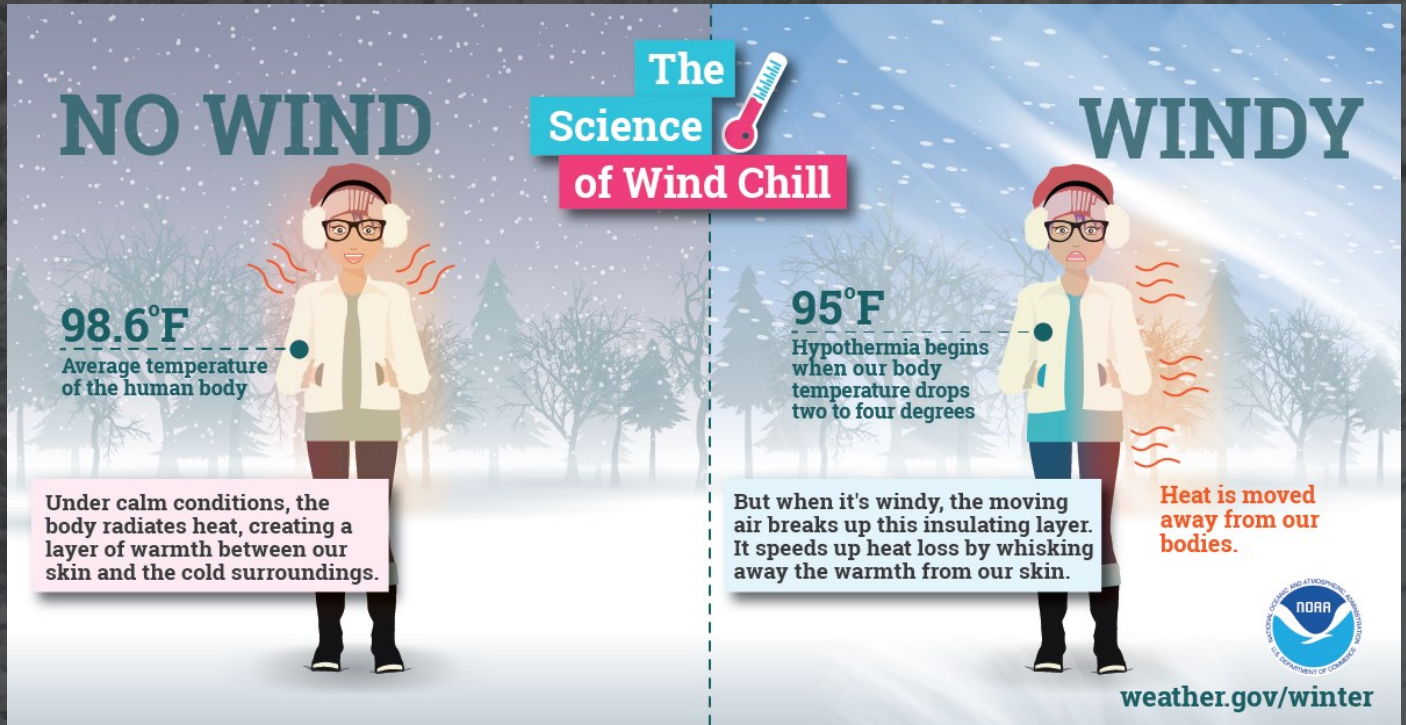


Figure 11: Depicting the science of wind chill.

It's no surprise that it “feels” colder when the wind is blowing, especially during the winter months. The graphic above does a good job showing why, but the simple explanation is that when it is windy, the moving air breaks up the insulating layer that usually exists between our skin and colder surroundings. Thus, heat loss from the skin becomes accelerated.

**?** **New Question:** During the cold season, why are bridges and overpasses more susceptible to icing/freezing?

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