Under the Big Sky e-Letter
October/November 2018

A Peak Inside:

Join CoCoRaHS: Report your daily precipitation by becoming a CoCoRaHS weather observer today! It is a fantastic way to make a difference in your community, and getting involved can even help save lives! Check out the national CoCoRaHS webpage and click on **join** on the upper right to create your weather station today!

30 Day Percent of Normal Precipitation (Montana)

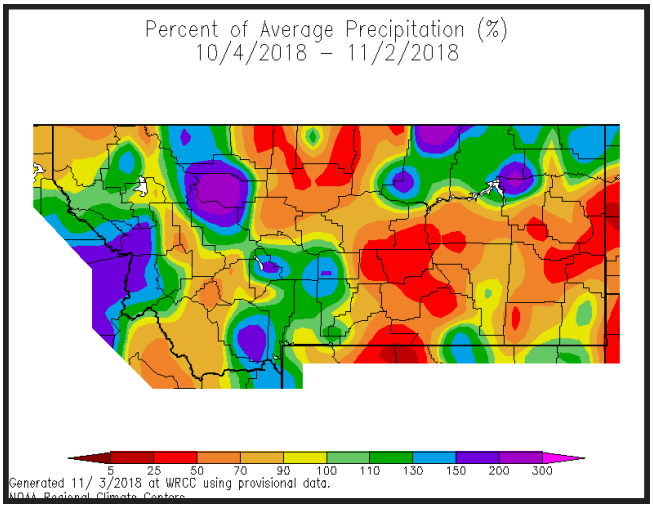

Figure 1: 30-day percent of normal precipitation across Montana.

30 Day Temperature Anomalies (Montana)

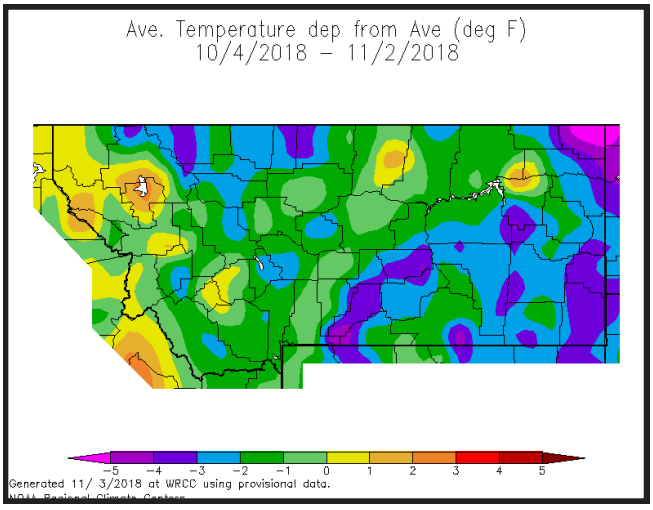

Figure 2: 30-day temperature anomalies across Montana.

Summary: Temperature and precipitation trends varied significantly across Montana over the past 30 days. For northeast Montana specifically, north of Highway 2 saw wetter than normal conditions while locations to the south were drier than average. In general, northeast Montana was near or a little cooler than average for the same period.

Meet the Staff:

This Month's Portrait: Felix Castro, Lead Forecaster, NWS Glasgow

1) What is your favorite part about working for the National Weather Service?

Figure 3: Felix Castro, Lead Forecaster at NWS Glasgow, shoveling the snow!

My favorite part is to help saving lives and property. Every time I have the chance to make people aware of any hazardous weather event, it makes me feel good. Everything we do at the National Weather Service is to accomplish the mission of the agency of saving lives and property. I like the commitment of every single employee in the agency.

2) How did you decide that you wanted to come to Glasgow?

I worked for almost 14 years at WFO San Juan, PR where I come from. Life is about challenging yourself and experiencing and innovating things. That's how you grow personally, meeting new people, integrating yourself with new ideas, and grow professionally as well. In my particular case, I have vast experience in tropical weather, but none in winter weather. Coming to Glasgow will give me a tremendous opportunity to expand my knowledge in winter, and learn and experience weather outside of the tropics.

3) Since moving to northeast Montana, what do you like the most about the area?

What I like most is the people. We are a big family.

4) When it comes to the weather, what are some of your likes and dislikes?

Before coming to northeast Montana, I did not have any winter weather experience. I definitely like winter weather! Although I come from a tropical environment, I dislike hot and humid weather, believe it or not! If I would ask for a perfect temperature, I would say mid 60s is my favorite. I like rainy days too!

5) Do you have any hobbies or interests that you would like to share?

I really like playing chess. I find it extremely challenging and exciting. After moving to northeast Montana, I also like bowling. Playing in a weekly league is so much fun. One of my best hobbies too is to travel around the world, visit new places, new cultures.

6) If you could name one thing that truly inspires you, what would it be?

Helping others. If I can add something positive to someone's life, I will do it.

CPC Three Month Outlook: The Climate Prediction Center released its three month outlook for temperature and precipitation for November 2018 through January 2019 on October 18, 2018. The three month outlook calls for increased chances for above normal temperatures for most all Montana. Meanwhile, expect below average precipitation through the period to be favored across the state. The latest outlook in full detail is always available here for anyone seeking additional details.

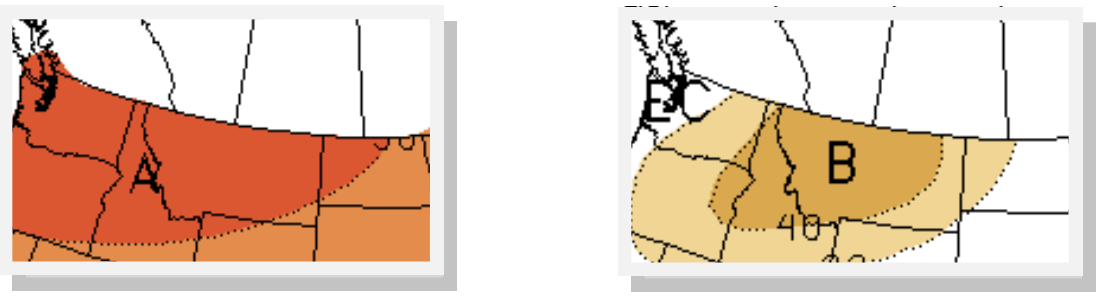

Figure 4: Climate Prediction Center three month temperature (left) and precipitation (right) outlook for November 2018 through January 2019.

Updated U.S. Drought Monitor: The latest U.S. Drought Monitor was released on Thursday November 6, 2018. The southern half is void of virtually any drought conditions. However, far northwest Montana has moderate to severe drought. Portions of north central and northeast Montana have abnormally dry and conditions as of this time. The Climate Prediction Center's three month outlook suggests that dry conditions are favored for the period. If true, worsening drought conditions may occur with time. It will be interesting to see how El Niño as a factor has an effect this year as well. Stay tuned!

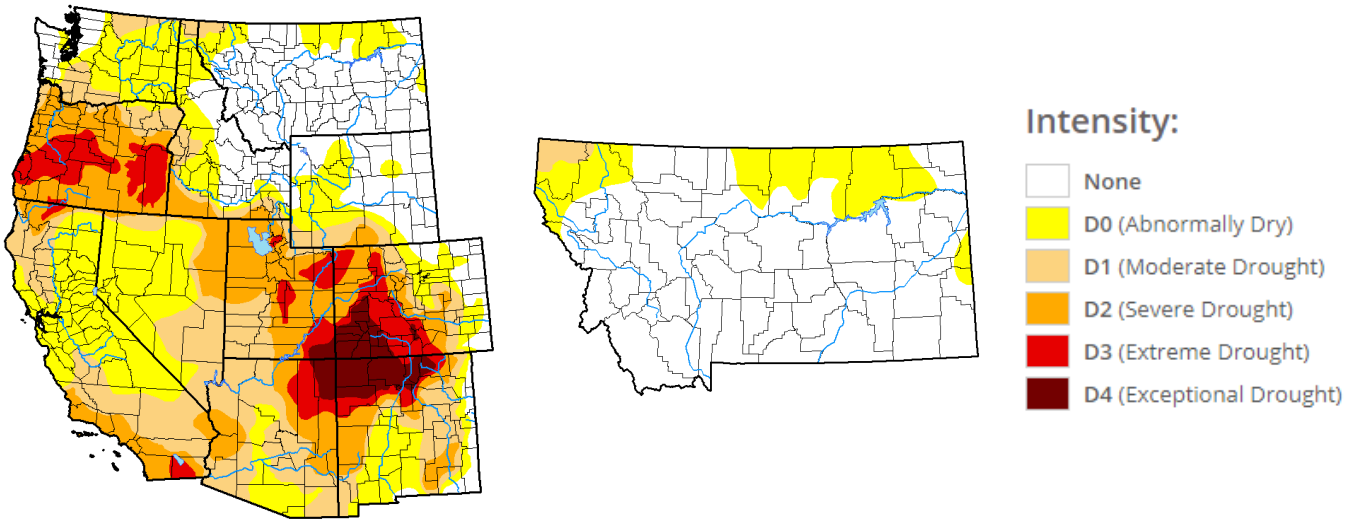

Figure 5: Latest Drought Monitor for the western U.S. (left) and Montana (right) released Thursday November 6, 2018.

U.S. & Global Climate Highlights (September): The latest U.S. and global climate highlights for September 2018 are now available. A few points for you to take home are provided below.

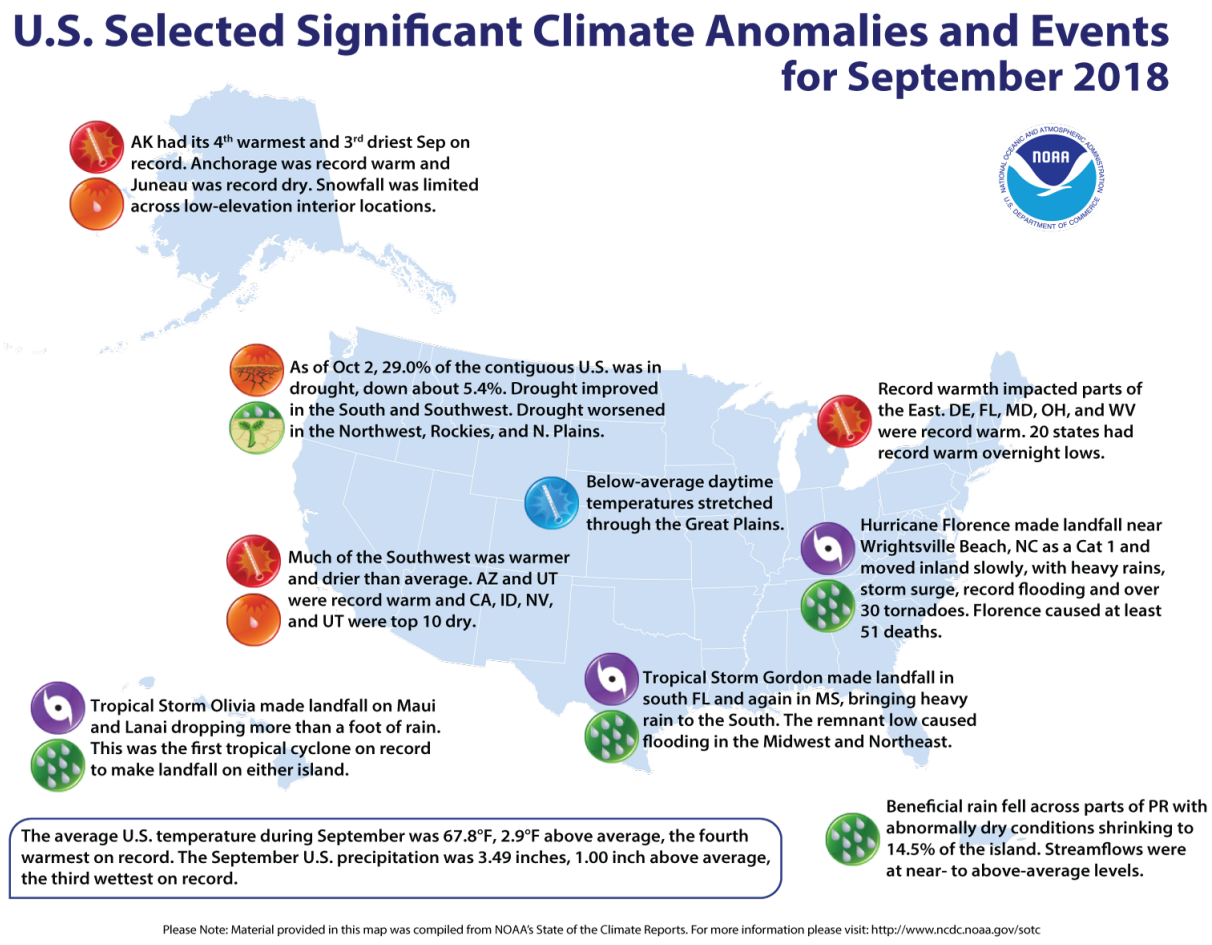

Figure 6: Climate Highlights for September of 2018.

U.S. Highlights for September 2018

1) The contiguous U.S. average temperature for September 2018 was 67.8 °F. This was the 4th warmest September on record.
2) The average September precipitation total for the contiguous U.S. came in at 3.49 inches, or 1.00 inch above the normal.
3) According to the U.S. Drought Monitor, 29.0% of the contiguous U.S. was in drought.

Global Highlights for September 2018

1) The average September temperature across global land and ocean surfaces tied with 2017 for the 4th warmest September since records have been kept.
2) The global oceans also had their 4th warmest September temperatures on record.
3) ENSO-Neutral conditions prevailed in September. El Niño is still expected to develop in the next few months.

September Report of Hydrologic Conditions by Greg Forrester, Lead Forecaster at NWS Glasgow:

September was a cooler and wetter than normal month across Northeast Montana. The wet spots were Malta with 2.74 inches, Saco with 2.53 inches, and Zortman with 2.51 inches. The dry spots were Mosby with 0.62 inch, Wibaux with 0.80 inch, and Carlyle 13NW with 0.82 inch. Glasgow had 1.28 inches which was 136 percent of normal. The wetter weather in September reduced the area with moderate drought to mainly along US 2 between Saco, Glasgow, and Wolf Point.

Temperatures were between 2 and 4 degrees below normal for the month. Glasgow averaged 55.7 degrees which was 2.5 degrees above normal.

Stream flow on the Milk, Poplar, and Yellowstone Rivers was near normal for the month. The flow on the Missouri River was above normal for the entire month.

The Fort Peck Reservoir elevation fell to 2241.44 feet at the end of the month. The reservoir was at 93 percent of capacity and 112 percent of the mean pool.

Winter Weather Safety: Winter weather is already upon us across portions of northeast Montana, and it is only November! As the calendar turns to December, January, and the months to follow, we'll surely see our fair share of bitter cold temperatures, snow, freezing rain, and the like. With this will come the need to bundle up, but also the need to remember to slow it down and to allow extra travel time to reach your destination. The National Weather Service will be here to help you be weather ready by issuing the latest forecast, as well as any advisories and warnings to help you stay safe all season long. In the meantime, feel free to hop on over to our Winter Weather Preparedness Page so you can learn more about various winter weather hazards, as well as some important safety reminders.

Cold Weather Safety Reminders:

1) Follow the latest NWS forecast, advisories, and warnings.
2) If possible, avoid being outdoors in the early morning during the coldest part of the day.
3) Make sure pets and livestock have ample water and food and are protected from the extreme cold.
4) Make sure your vehicle has at least a half a tank of gas so you can remain warm should you become stranded.
5) Dress in layers.
6) Remember your winter survival kit.

NWS Glasgow Staff Changes:

Phillip Davis, new Electronics Technician, arrived at NWS Glasgow for his first day on Tuesday October 30, 2018! We welcome him to northeast Montana, and, as part of our team as well!

Precipitation Data (September):

Station	Precipitation	Location
BAYM8	2.02	Baylor
BRDM8	1.53	Bredette
BTNM8	1.20	Brockton 17 N
BKNM8	2.03	Brockton 20 S
BKYM8	1.12	Brockway 3 WSW
BRSM8	1.82	Brusette
CLLM8	0.82	Carlyle 13 NW
CIRM8	1.78	Circle
CHNM8	1.03	Cohagen
COM8	1.42	Cohagen 22 SE
CNTM8	1.73	Content 3 SSE
CULM8	1.80	Culbertson
DSNM8	2.26	Dodson 11 N
FLTM8	1.00	Flatwillow 4 ENE
FPKM8	1.45	Fort Peck PP
GLAM8	1.63	Glasgow 14 NW
GGWM8	1.28	Glasgow WFO
GGSM8	1.92	Glasgow 46 SW
GNDM8	0.97	Glendive WTP
HRBM8	M	Harb
HINM8	2.84	Hinsdale 4 SW
HNSM8	2.27	Hinsdale 21 SW
HOMM8	1.74	Homestead 5 SE
HOYM8	0.90	Hoyt
JORM8	M	Jordan
LNDM8	1.23	Lindsay
MLAM8	2.74	Malta
MLTM8	2.49	Malta 7 E
MTAM8	1.78	Malta 35 S

Station	Precipitation	Location
MDCM8	1.45	Medicine Lake 3 SE
MLDM8	0.91	Mildred 5 N
MSBM8	0.62	Mosby 4 ENE
OPNM8	2.45	Opheim 10 N
OPMM8	1.96	Opheim 12 SSE
PTYM8	1.57	Plentywood
PTWM8	1.31	Plentywood 1 NW
POGM8	1.90	Port of Morgan
RAYM8	2.03	Raymond Border Station
SAOM8	2.53	Saco 1 NNW
SMIM8	1.48	St. Marie
SAVM8	1.21	Savage
SCOM8	2.03	Scobey 4 NW
SDYM8	1.40	Sidney
SIDM8	1.37	Sidney 2S
TERM8	1.26	Terry
TYNM8	1.52	Terry 21 NNW
VIDM8	2.32	Vida 6 NE
WSBM8	1.14	Westby
WTRM8	2.54	Whitewater
WHIM8	M	Whitewater 18 NE
WBXM8	0.80	Wibaux 2 E
WTTM8	1.06	Winnett
WNEM8	1.33	Winnett 6 NNE
WNTM8	1.10	Winnett 8 ESE
WITM8	0.93	Winnett 12 SW
WLFM8	1.50	Wolf Point
ZRTM8	2.51	Zortman

Links You May Like:

NOAA'S WINTER 2018-2019 OUTLOOK

Climate Change & The Future of October

El Niño Update

Deep Southern Ocean Affected by Climate Change

GOES 17: New Operational Position

Monthly Trivia: Last month we asked…

With fall upon us, it is not uncommon for overnight temperatures to dip below freezing. Under the right circumstances, frost can form as well, which can be of impact to those with interests in agriculture, or even to someone who is doing a little late season gardening. This month we ask, what causes the formation of frost?

Answer: Frost, which can cause impacts during the late growing season, can occur when temperatures start to fall into the low and mid 30s. Clear skies, calm or light winds can lead to radiational cooling can allow temperatures to drop. If there's enough low level moisture (humid conditions), condensation occurs and results can be anything from fog or dew. If the temperature continues to drop or the ground is cold enough, these dew drops can freeze. Otherwise, if the surface gets cold enough water vapor can deposit directly onto the ground. This process that leads to frost is called deposition. Note, the air temperature can actually be a few degrees above freezing for frost to occur since ground temperatures can sometimes be colder.

New Question: How does an El Niño typically impact the winter in northeast Montana? Find out the answer in the very next newsletter!

September 2018 Summary (Glasgow, MT)

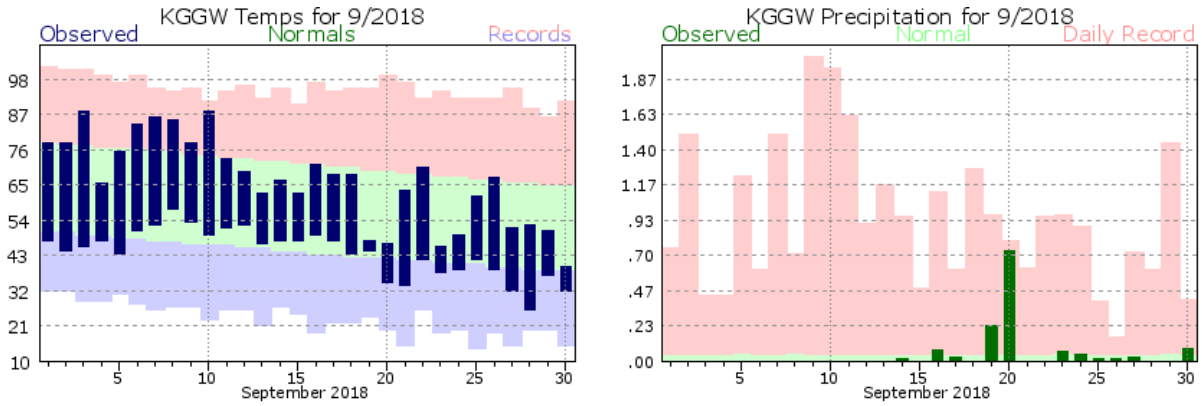

Figure 7: Observed temperatures for Glasgow relative to records and normal (left) and observed precipitation for Glasgow relative to records and normal (right) in September 2018.

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