Under the Big Sky e-Letter
October 2019

A Peak Inside:

Join CoCoRaHS: Storm systems can deliver a wide variety of precipitation amounts over just short distances across northeast Montana. That is why we need CoCoRaHS weather observers to help provide some ground truth. We can get estimations from radar imagery and other sources, but our weather observers help us to validate the data. CoCoRaHS stands for The Community, Collaborative, Rain, Hail, & Snow Network. If you are interested in reporting daily precipitation, becoming a CoCoRaHS observer is easy! It is also a great way to make a difference in your community! Check out the national CoCoRaHS webpage to learn more.

September Total Precipitation Ranking

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

Figure 1: The chart above was produced and shared on social media by NWS Glasgow and displays total September precipitation for 2019, departure from normal, and historical ranking.

Summary: Much of NE MT saw one of the wettest September months on record. Several weather systems were responsible for the wet weather, notably the wettest day occurring on the 11th, and additional weather systems occurring on the 6-7th and the 28-30th. Each storm system delivered widespread precipitation amounts in excess of one inch, and the latter storm even delivering snow to some areas.

The wet conditions brought significant impacts to harvesting season, area activities, and to hunting season as well.

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

It was a very wet month over Northeast Montana. Several locations have their wettest month on record like Savage with 10.30 inches, Sidney with 10.27 inches, and Glendive with 8.46 inches. Other locations that had their wettest September included Bredette with 5.15 inches, Brockton 20S with 8.96 inches, Brusette with 8.56 inches, Carlyle with 5.42 inches, Culbertson with 6.27 inches, Lindsay with 5.94 inches, Nashua with 7.93 inches, Plentywood with 6.84 inches, Port of Morgan with 6.23 inches, and Wolf Point with 6.32 inches.

Glasgow had their second wettest September with 4.57 inches which was 486% of normal.

Temperatures varied between 1 to 3 degrees above normal. Glasgow averaged 58.2 degrees which was 1.2 degrees above normal.

Heavy rain on September 17 produced flooding in the Sidney area.

Stream flow was either well above normal or at record high for the time of year during the month for the Milk, Missouri, and Poplar Rivers. Stream flow on the Yellowstone River was near normal for the month.

Winter Weather Safety: Winter is right around the corner, and NWS Glasgow is here to help keep you and loved ones safe all season long. Now is a good time to prepare your emergency supply kit for your car so that you can be ready. For more, check out the [NWS Winter Safety Page](#).

Figure 2: Graphic depicting common supplies for a "Winter Survival Kit" to help be prepared ahead of adverse conditions.

Winter Season 2019-2020 Outlook: NOAA issued its outlook for temperature and precipitation for December 2019 through February 2020 on October 17, 2019. Look for equal chances for above normal, below normal, or near normal temperatures for eastern Montana, with odds favoring milder than usual temperatures further west. The odds are in favor of a wetter than average winter season across most of and including those of us in NE Montana. Depending on how temperatures shape up, that could mean more snow. You can read the full details of the outlook here. The latest Climate Prediction Center (CPC) 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 3: NOAA's winter 2019-2020 outlook including a three month temperature (left) and precipitation (right) outlook for December 2019 through February 2020.

Updated U.S. Drought Monitor: The latest U.S. Drought Monitor was released on Thursday October 17, 2019. Much of Montana remains void of drought conditions, and the wet September has brought about improvements to even northwest portions of the state. Abnormally dry conditions still exist there across small areas, but the overall trend has been toward lesser concern for drought.

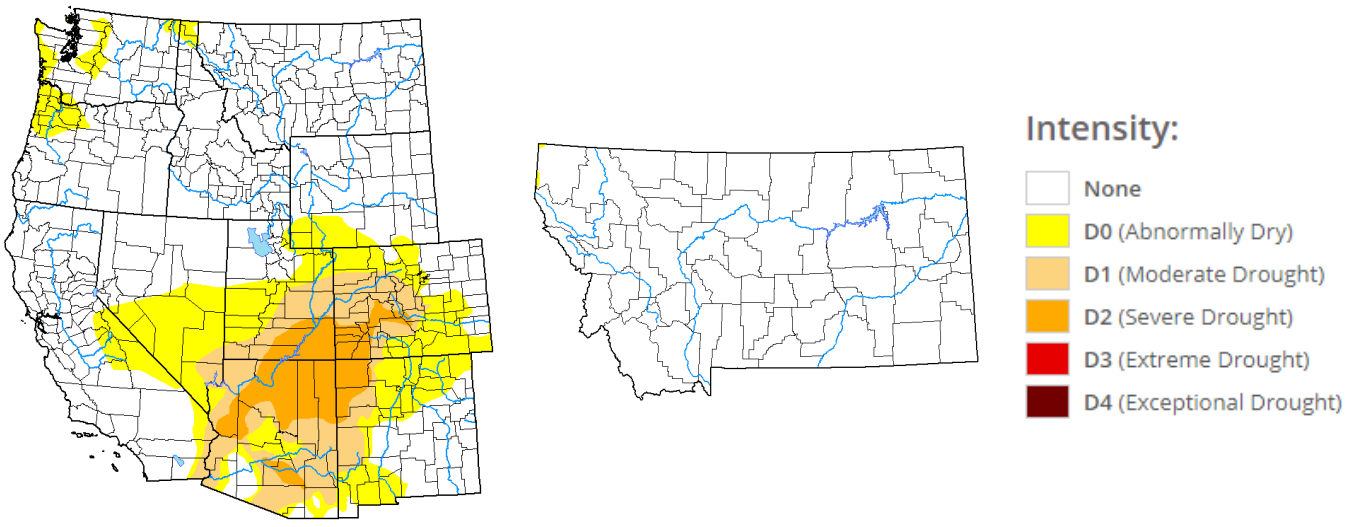

Figure 4: Latest Drought Monitor for the western U.S. (left) and Montana (right) released Thursday October 17, 2019.

U.S. Climate Highlights (August): The latest U.S. & Global climate highlights for August 2019 are now available. A few points for you to take home are provided below.

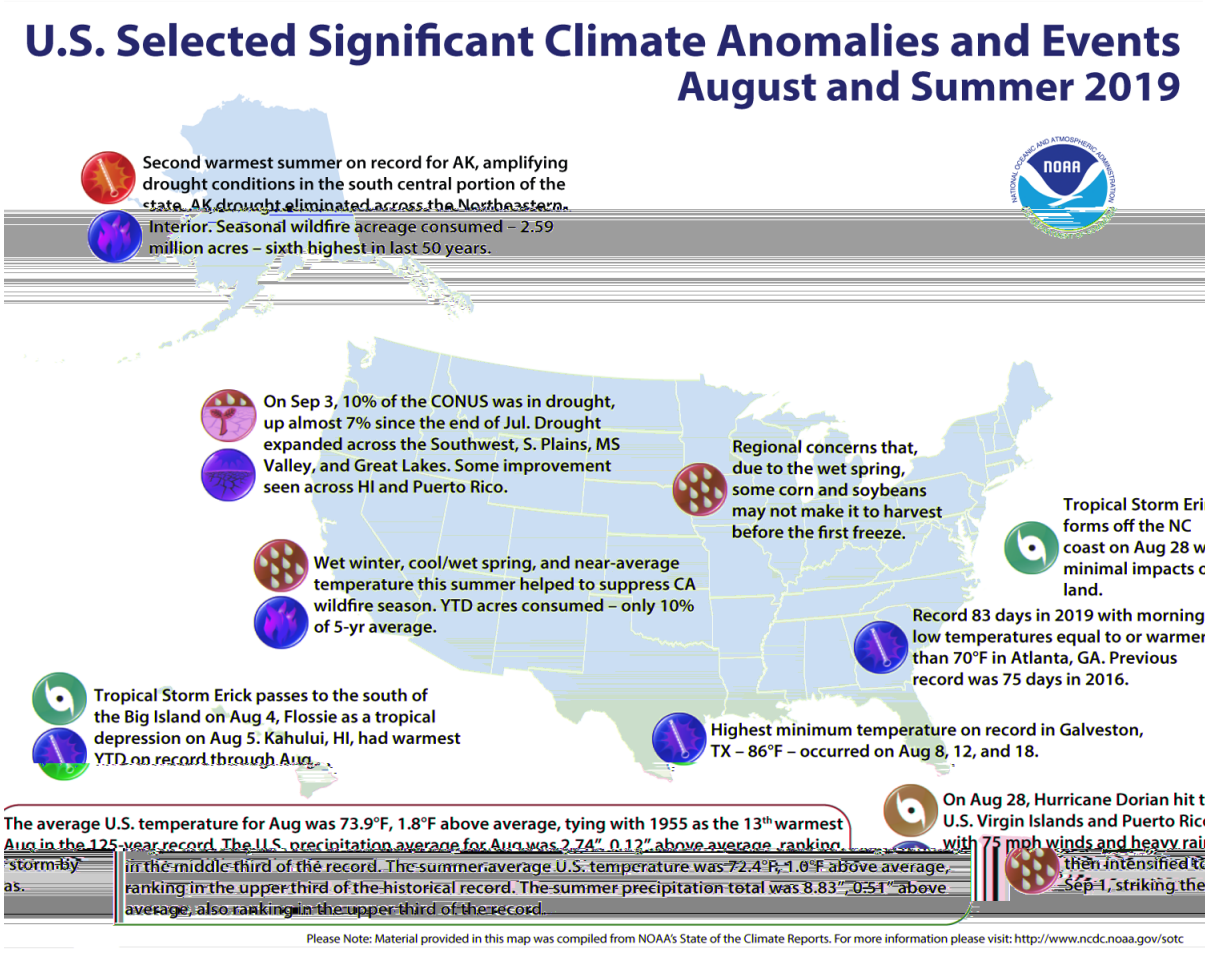

Figure 5: Climate Highlights for August 2019.

U.S. Highlights for August 2019

1) The contiguous U.S. average temperature for August 2019 was 73.9 °F.
2) The average August precipitation total for the contiguous U.S. came in at 2.74 inches. This ranks within the middle third wettest throughout the 125 year period of record.
3) According to the U.S. Drought Monitor, 10% of the contiguous U.S. was in drought, a notable uptick from July.

Global Highlights for August 2019

1) The August 2019 global land and ocean surface temperature departure from average tied with the warmest on record (2015, 2017).
2) The global land only surface temperature for July 2019 was the fourth highest on record for August, coming in at 2.05 °F above average, trailing only 2015, 2016, and 2017.
3) ENSO neutral conditions were present during August 2019. This will likely continue to be the case through the Northern Hemisphere Winter.

U.S. Climate Highlights (September): The latest U.S. climate highlights for September 2019 are now available. A few points for you to take home are provided below.

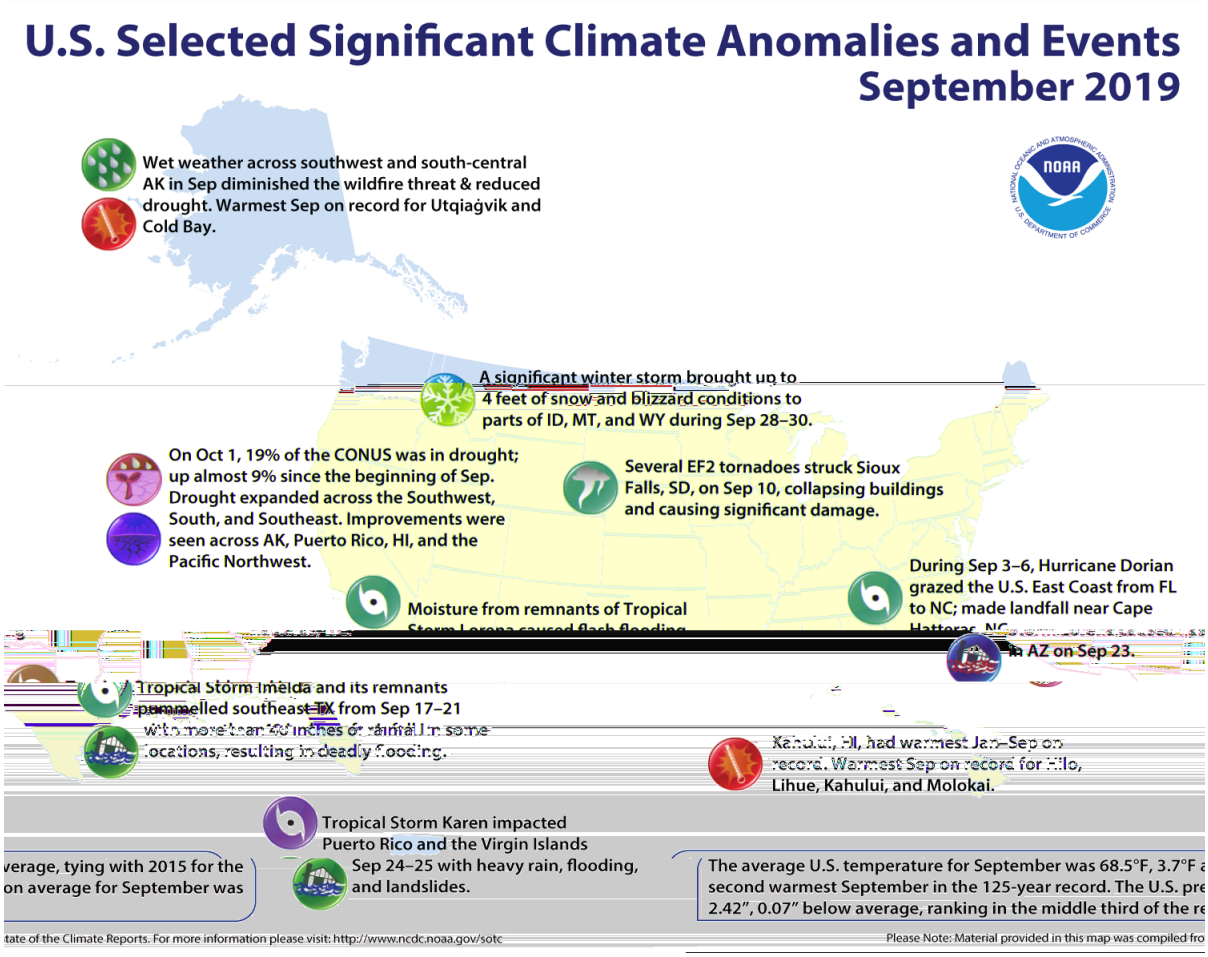

Figure 6: Climate Highlights for September 2019.

U.S. Highlights for September 2019

1) The contiguous U.S. average temperature for August 2019 was 68.5 °F.
2) The nationally averaged max temperature was warmer than average, 8th highest in a record spanning 125 years.
3) The nationally averaged min temperature was warmer than average, ranking the warmest in a 125 year record. Not even a single state ranked below average for overnight lows during September.
4) The average August precipitation total for the contiguous U.S. came in at 2.42 inches. This ranks within the middle third wettest throughout the 125 year period of record.
5) According to the U.S. Drought Monitor, 19% of the contiguous U.S. was in drought, a continuing uptick from recent months.

Precipitation Data (August 2019):

Station	Precipitation	Location
BAYM8	2.32	Baylor
BRDM8	1.74	Bredette
BTNM8	M	Brockton 17 N
BKNM8	2.88	Brockton 20 S
BKYM8	2.41	Brockway 3 WSW
BRSM8	3.07	Brusette
CLLM8	2.69	Carlyle 13 NW
CIRM8	1.43	Circle
CHNM8	1.99	Cohagen
COM8	2.17	Cohagen 22 SE
CNTM8	3.00	Content 3 SSE
CULM8	2.73	Culbertson
DSNM8	1.06	Dodson 11 N
FLTM8	1.04	Flatwillow 4 ENE
FPKM8	3.09	Fort Peck PP
GLAM8	5.38	Glasgow 14 NW
GGWM8	2.74	Glasgow WFO
GGSM8	1.82	Glasgow 46 SW
GNDM8	4.08	Glendive WTP
HRBM8	M	Harb
HINM8	2.39	Hinsdale 4 SW
HNSM8	2.11	Hinsdale 21 SW
HOMM8	3.54	Homestead 5 SE
HOYM8	3.07	Hoyt
JORM8	M	Jordan
LNDM8	2.16	Lindsay
MLAM8	3.03	Malta
MLTM8	1.96	Malta 7 E
MTAM8	1.99	Malta 35 S

Station	Precipitation	Location
MDCM8	3.43	Medicine Lake 3 SE
MLDM8	M	Mildred 5 N
MSBM8	1.39	Mosby 4 ENE
OPNM8	2.46	Opheim 10 N
OPMM8	1.64	Opheim 12 SSE
PTYM8	1.69	Plentywood
PTWM8	1.50	Plentywood 1 NE
POGM8	2.83	Port of Morgan
RAYM8	2.25	Raymond Border Station
SAOM8	2.86	Saco 1 NNW
SMIM8	2.08	St. Marie
SAVM8	2.41	Savage
SCOM8	2.62	Scobey 4 NW
SDYM8	1.61	Sidney
SIDM8	2.74	Sidney 2S
TERM8	1.85	Terry
TYNM8	M	Terry 21 NNW
VIDM8	0.26	Vida 6 NE
WSBM8	1.74	Westby
WTRM8	3.27	Whitewater
WHIM8	M	Whitewater 18 NE
WBXM8	2.47	Wibaux 2 E
WTTM8	M	Winnett
WNEM8	2.04	Winnett 6 NNE
WNTM8	1.65	Winnett 8 ESE
WITM8	M	Winnett 12 SW
WLFM8	1.59	Wolf Point
ZRTM8	1.96	Zortman

Links You May Like:

[New Flash Flood Warning Format]

[Sea Ice Extent Ties for Second Lowest Summer Minimum]

[Huge Heat Waves by Mid-century]

[Spring Snow Cover]

[Correlation?: Extreme Temperatures and Pre-term Delivery]

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SCOM8	M	Scobey 4 NW
SDYM8	10.27	Sidney
SIDM8	10.92	Sidney 2S
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TYNM8	M	Terry 21 NNW
VIDM8	7.91	Vida 6 NE
WSBM8	5.95	Westby
WTRM8	M	Whitewater
WHIM8	M	Whitewater 18 NE
WBXM8	M	Wibaux 2 E
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Staffing Updates:

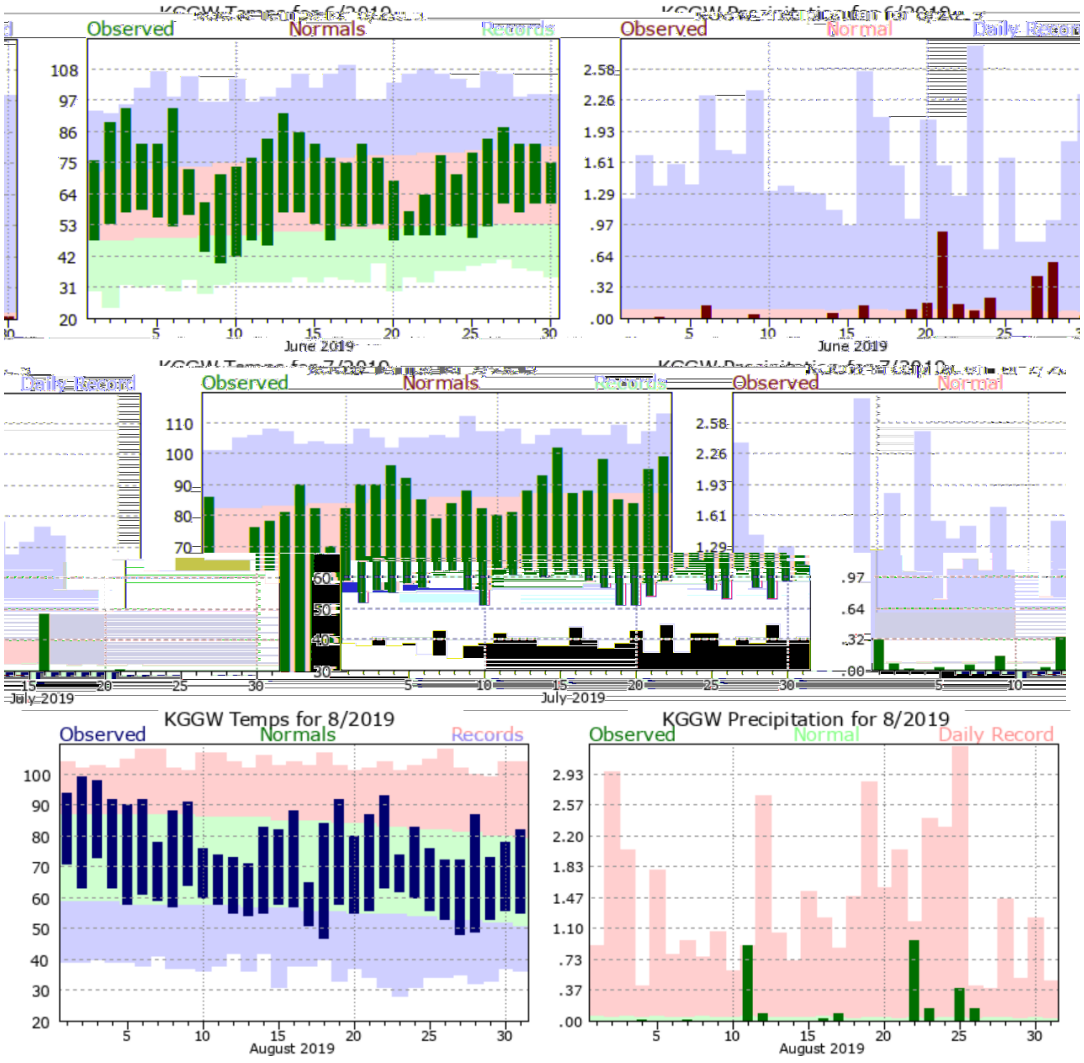
Mark Siverly rejoined the team at NWS Glasgow to serve once again as one of our Electronics Technicians. His official first day back was Monday September 16, 2019. He was in this role previously here at Glasgow for 18 years before retiring in December of 2017, and he served as a Hydrometeorological Technician prior. We definitely welcome him back to the office and are glad to have his service.

Monthly Trivia: Last month we asked…

How did the Summer Season of 2019 stack up across northeast Montana compared with normal? Next month we'll share some key highlights!

Answer: With a string of fall to winter-like weather conditions as of late, we thought we would end the newsletter this month by reflecting back on summer for a little bit for Glasgow, MT.

For Glasgow, MT, Here is how temperatures and precipitation stacked up compared with normal and extremes:



Whether the hot temperatures or large hail and damaging winds from severe season, this summer offered a variety across NE MT. Perhaps the storms that will be remembered going forward will be the ones that produced the microburst on June 30 in Terry. Wind estimates exceeded 75 MPH with that storm, causing major damage to a gas station awning. Two spruce trees were also uprooted on the west end of town. Now that summer, and associated convective season are in the rear view mirror, we'll see what the winter brings!

New Question: What is the difference between snowfall and snow depth? These are terms that are often thrown around during the fall and winter, or cold season months. Do you know the difference? Find out next month!

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