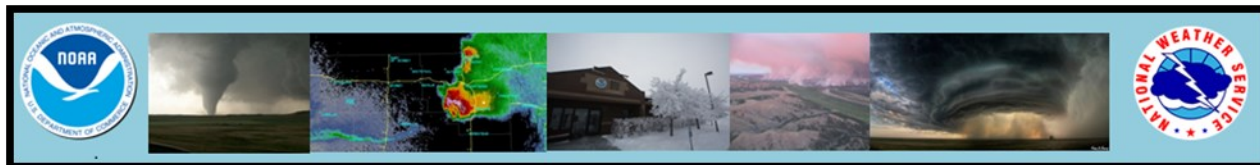


Under the Big Sky e-Letter

March 2019



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Join CoCoRaHS: Spring convective season is on the way across northeast Montana. This is a time of year when there can be a great spread in precipitation amounts over really short distances. You may get

a downpour while your neighbor sees very little (if any) precipitation. Help us get some ground truth this year by reporting your daily precipitation reports through CoCoRaHS! 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)

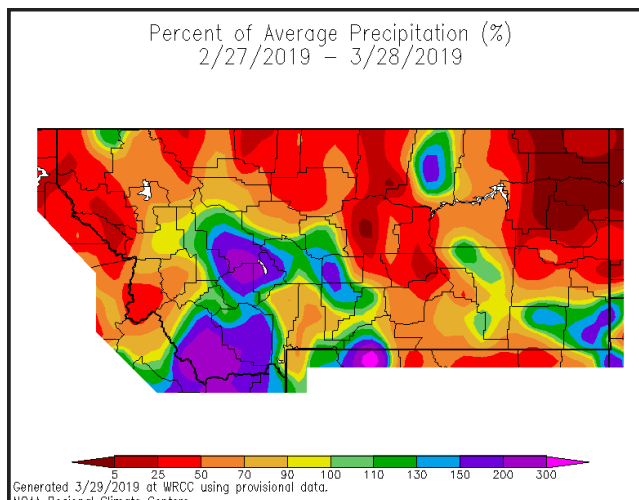


Figure 1: 30-day percent of normal precipitation across Montana.

30 Day Temperature Anomalies (Montana)

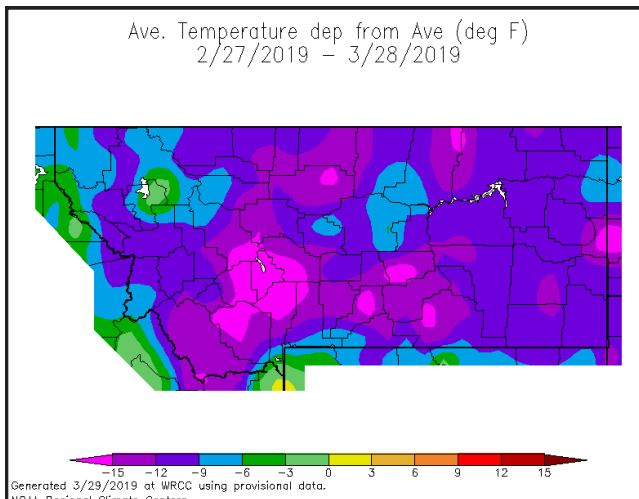


Figure 2: 30-day temperature anomalies across Montana.

Summary: Temperature has generally been several degrees below normal over the past 30 days. Precipitation also has trended below normal over the same period for much of the state, including large portions of northeast Montana. Some of the driest conditions have occurred over the Little Rockies as well as across locations near the Montana/North Dakota border.

Northeast Montana Spring 2019 Flood Season:

Typically, as winter becomes long in the tooth, Chinook warming will lead to snowmelt and ice break up/ice jams along rivers and streams over portions of Western, Central, and Southern Montana. As the spring season evolves, eventually the warmer temperatures and associated flooding risk spills gradually into northeast Montana. This year was a bit of an anomaly in that the warm up occurred across the region all at once. February temperatures were well below average, and that trend lingered into the first part of March. As the second half of March approached, much of the area then saw near normal temperatures. Thus, ice breakup and ice jam flooding, as well as snow melt leading to flooding of poor drainage areas, occurred across a much larger part of the region over roughly the same period. This year, the Beaver Creek near Hinsdale, the Milk River near Tampico, the Milk River near Glasgow, and the Poplar River near Poplar all reached major flood stage. As of the time of this writing, flooding is on the way down across these locations. Improvements have already occurred along the Yellowstone and all river sites are presently below flood stage. This is a good reminder to anyone traveling, if you encounter flooded roadways: turn around, don't drown! It doesn't take much water to lift a small vehicle, and especially at night it can be difficult to see how deep the water is.

One of the noteworthy flooding events from this season occurred as the Yellowstone River flooded near Fairview. The image below is taken from satellite imagery and shows the proximity and extent of the flooding in that area on March 26, 2019. You can check out the full image [here](#) for more details.

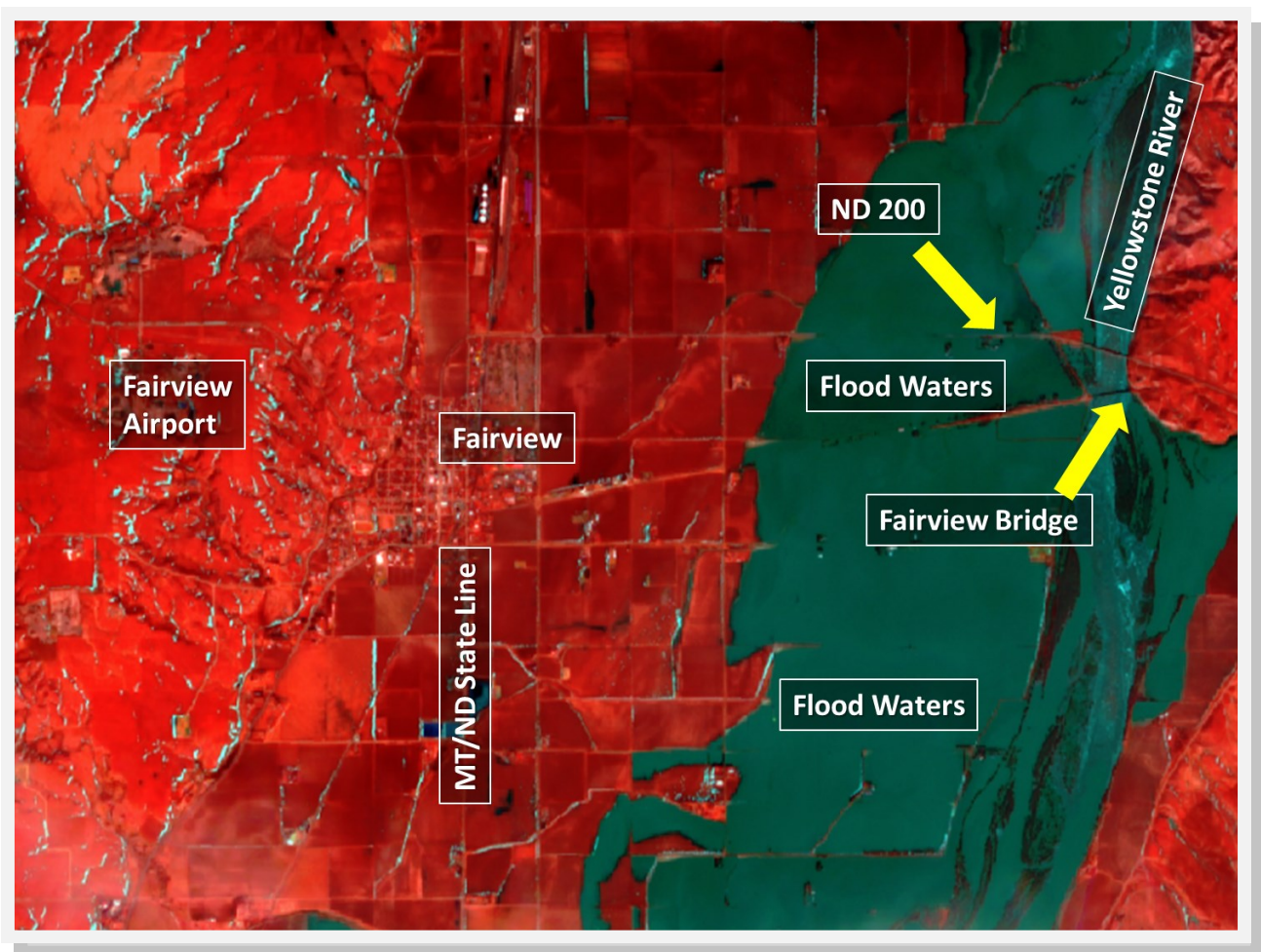


Figure 3: Satellite imagery taken on March 26, 2019, annotated, showing Yellowstone River flooding near Fairview, MT.

Meet the Staff:

This Month's Portrait: Ross Allen, Information Technology Officer, NWS Glasgow

1. How did you come to decide that you wanted to work for the National Weather Service?

I had spent the majority of my career working for the Department of Defense, and it was time for a change. It's also been a lifelong dream to move to Montana. When I saw the opportunity to work at the NWS in Montana, it was an easy decision.

2. What do you find most enjoyable about northeast Montana living??

The people! Glasgow is an amazing community and I feel fortunate to be living here.

3. Do you have any hobbies or interests that you'd like to share?

I love to hunt and fish. When I can't do either of those, I enjoy photography and fiddling with my 3D printers.

4. If you could name something that truly inspires you, what would that be?

Problems! Nothing inspires me like facing a new problem, and using my skills and knowledge to try to solve it. The best part is when I don't have the answers, and I get to learn something new.



Figure 4: Ross Allen, ITO at NWS Glasgow.

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

It was the second coldest February on record for Northeast Montana. Only 1936 was colder. Bitter cold temperatures moved into the region on the 3rd and remained over the area the remainder of the month. Temperatures averaged 20 to 25 degrees below normal. It was also the 8th coldest month on record and the coldest month since January 1982.

It was also a wet and snowy month. The wet spots were Glasgow 46SW with 2.10 inches, Plentywood with 1.76 inches, and Zortman with 1.48 inches. The dry spots were Wolf Point and Hoyt with 0.33 inch, Opheim 12SSE with 0.39 inch, and Malta 35S with 0.50 inch. Glasgow had 1.41 inches which was 542 percent of normal. It was the third wettest February with only 1916 and 1952 being wetter. Glasgow also had its snowiest February and 5th snowiest month on record with 28.2 inches. The previous February snowfall record was 21.4 inches set in 1952. At the end of the month, Northeast Montana had 2 to 4 inches of snow water equivalent across most of the region.

Stream Flow was not available on the Milk, Missouri, Poplar, and Yellowstone Rivers due to being frozen.

The Fort Peck Reservoir elevation remained steady at 2234.4 feet during the month. The reservoir was at 82 percent of capacity and 101 percent of the mean pool.

CPC Three Month Outlook: The Climate Prediction Center released its three month outlook for temperature and precipitation for April 2019 through June 2019 on March 21, 2019. The three month outlook indicates that there is a greater likelihood for above average temperatures across western MT, and equal chance for above, normal, or below normal temperatures over central portions of the state, and finally increased chances for below normal temperatures along the Montana/North Dakota border. Through this same period, equal chances exist for normal, above normal, or below normal precipitation for much of Montana. The exception is for locations along southern Montana where above normal precipitation chances are favored through the three month period. The latest outlook in full detail is always available [here](#) for anyone seeking additional details.

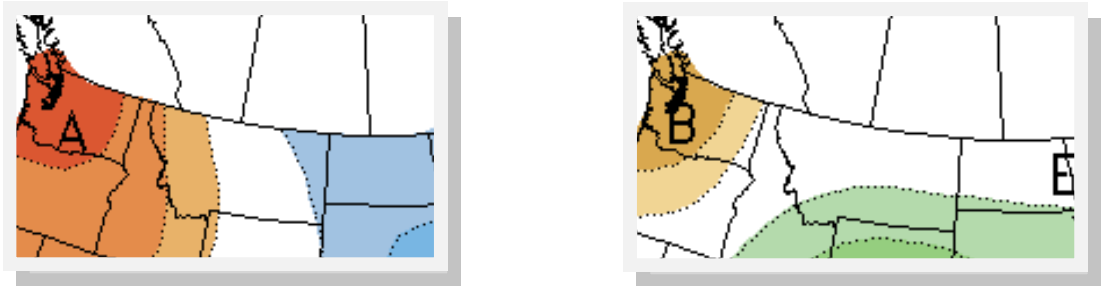


Figure 5: Climate Prediction Center three month temperature (left) and precipitation (right) outlook for April through June 2019.

Updated U.S. Drought Monitor: The [latest U.S. Drought Monitor](#) was released on Thursday March 28, 2019. Most of Montana is currently void of any drought conditions, however, portions of northwest Montana are currently experiencing abnormally dry conditions.

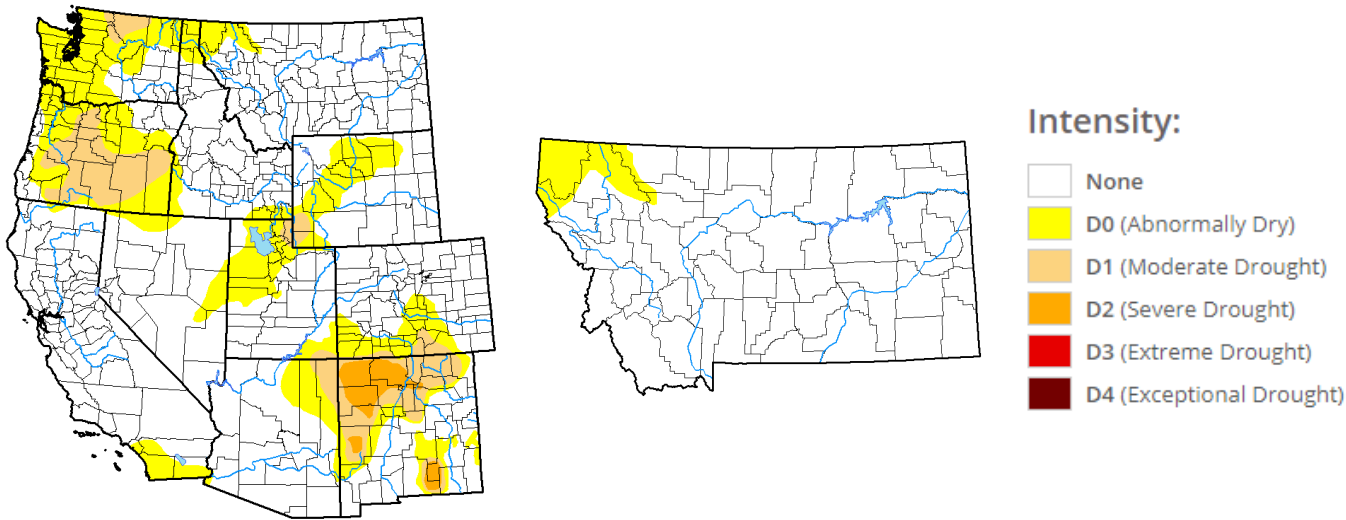


Figure 6: Latest Drought Monitor for the western U.S. (left) and Montana (right) released Thursday March 28, 2019.

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

U.S. Selected Significant Climate Anomalies and Events for February and Winter 2019

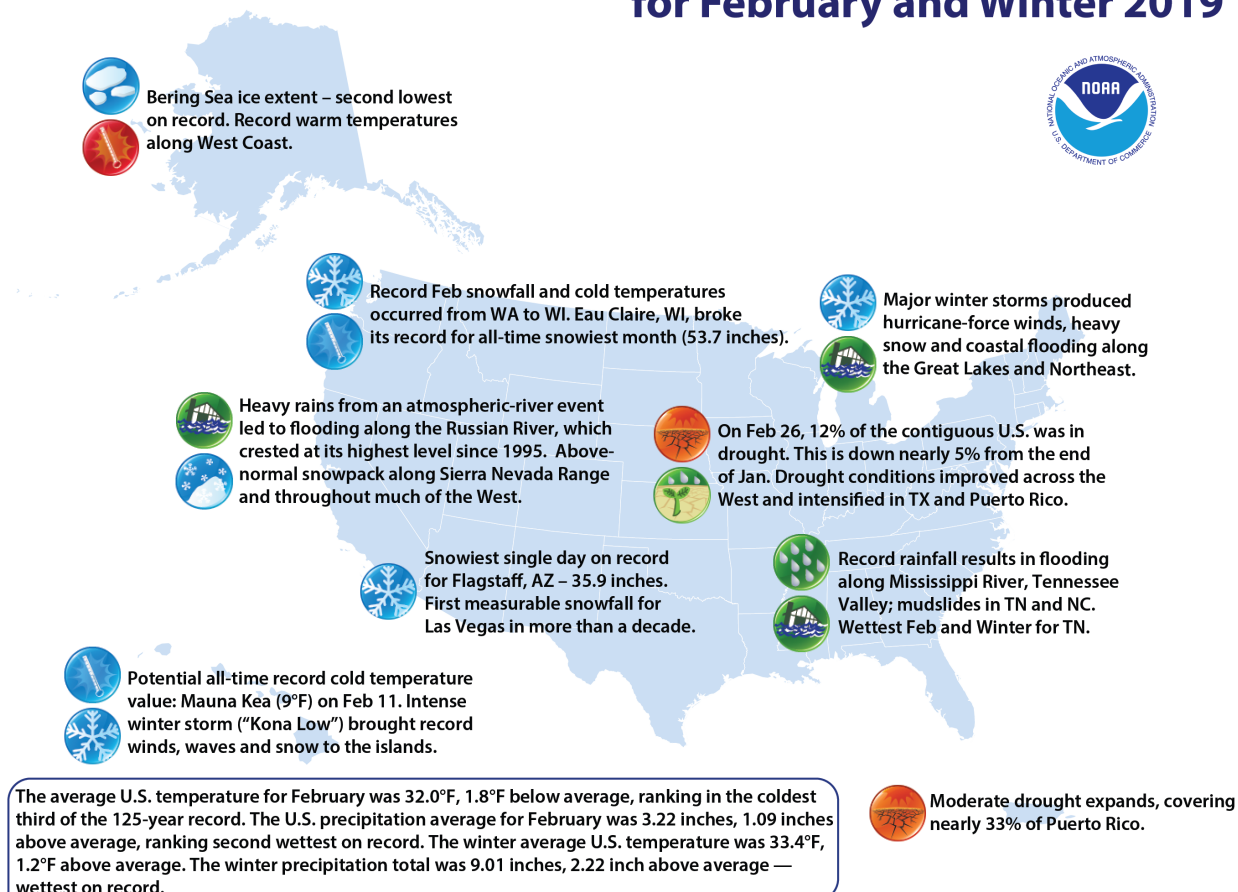


Figure 7: Climate Highlights for February of 2019.

U.S. Highlights for February 2019

- 1) The contiguous U.S. average temperature for February 2019 was 32.0 °F. This ranks within the coldest third of the period of record, spanning 125 years.
- 2) The average February precipitation total for the contiguous U.S. came in at 3.22 inches. This is the second highest February precipitation total on record.
- 3) According to the U.S. Drought Monitor, 11.9% of the contiguous U.S. was in drought.

Global Highlights for February 2019

- 1) The February 2019 global land and ocean surface temperature was 1.42 °F above average. This ranks as the 5th highest February on record.
- 2) The global ocean surface temperature specifically for February was the second warmest on record since 1880, coming in at 1.26 °F above average
- 3) El Niño conditions were present in February 2019 and are expected to continue into the spring months.

Precipitation Data (February 2019):

Station	Precipitation	Location
BAYM8	0.89	Baylor
BRDM8	1.02	Bredette
BTNM8	1.22	Brockton 17 N
BKNM8	1.27	Brockton 20 S
BKYM8	0.51	Brockway 3 WSW
BRSM8	0.64	Brusette
CLLM8	1.22	Carlyle 13 NW
CIRM8	0.84	Circle
CHNM8	0.63	Cohagen
COM8	0.82	Cohagen 22 SE
CNTM8	0.77	Content 3 SSE
CULM8	1.17	Culbertson
DSNM8	M	Dodson 11 N
FLTM8	1.17	Flatwillow 4 ENE
FPKM8	1.18	Fort Peck PP
GLAM8	M	Glasgow 14 NW
GGWM8	1.41	Glasgow WFO
GGSM8	2.10	Glasgow 46 SW
GNDM8	1.03	Glendive WTP
HRBM8	M	Harb
HINM8	0.87	Hinsdale 4 SW
HNSM8	1.11	Hinsdale 21 SW
HOMM8	M	Homestead 5 SE
HOYM8	0.33	Hoyt
JORM8	M	Jordan
LNDM8	0.67	Lindsay
MLAM8	1.06	Malta
MLTM8	0.99	Malta 7 E
MTAM8	0.50	Malta 35 S

Station	Precipitation	Location
MDCM8	0.74	Medicine Lake 3 SE
MLDM8	1.05	Mildred 5 N
MSBM8	1.05	Mosby 4 ENE
OPNM8	0.66	Opheim 10 N
OPMM8	0.39	Opheim 12 SSE
PTYM8	1.76	Plentywood
PTWM8	0.40	Plentywood 1 NE
POGM8	M	Port of Morgan
RAYM8	0.44	Raymond Border Station
SAOM8	1.49	Saco 1 NNW
SMIM8	0.79	St. Marie
SAVM8	1.09	Savage
SCOM8	0.90	Scobey 4 NW
SDYM8	1.08	Sidney
SIDM8	0.87	Sidney 2S
TERM8	0.78	Terry
TYNM8	M	Terry 21 NNW
VIDM8	1.34	Vida 6 NE
WSBM8	M	Westby
WTRM8	0.96	Whitewater
WHIM8	M	Whitewater 18 NE
WBXM8	0.88	Wibaux 2 E
WTTM8	0.67	Winnett
WNEM8	0.86	Winnett 6 NNE
WNTM8	1.08	Winnett 8 ESE
WITM8	1.25	Winnett 12 SW
WLFM8	0.33	Wolf Point
ZRTM8	1.48	Zortman

Links You May Like:

[NOAA's 2019-2022 Strategic Plan](#)

[Antarctica Ice Loss](#)

[Minimum Arctic Sea Ice Extent](#)

[ENSO Update](#)

Monthly Trivia: Last month we asked...

New Question: Although sub-zero temperatures can sometimes make it feel as though winter is never going to end, the Calendar suggests that spring is in fact, right around the corner! With the new season comes the threat of hazardous ice jam flooding along our rivers and streams. This month we ask, how do ice jams form and what are some of the ways that you can stay safe when they occur?

Answer: It turns out that Montana has the highest number of reported ice jams in the lower 48 states as well the highest number of ice jam related deaths. Two-thirds of Montana's ice jams occur in February and March. Ice jams can occur with little or any warning, and the abrupt flooding that results is what makes them so dangerous. When a period of freezing weather is followed by significant warming, the ice begins to break up along a river or stream and flow downstream. As ice accumulates at bends or on bridge supports, water can back up behind the jam, leading to localized flooding. When ice jams release, flash flooding can result as the water that accumulated behind the ice abruptly moves on downstream. More information on the types of ice jams that exist, how they form, and important safety information can be found [here](#). Importantly, when driving, if you encounter flooded roads along your way: Turn around, don't drown!



New Question: Convective season is coming! This month, we ask, what are the different types of thunderstorms, and how do they form?

NWS Glasgow Staffing Update:

Virginia Rux, our newest forecaster that was hired will be arriving on station to join us at NWS Glasgow as of Monday April 1, 2019. She graduated from the University of Washington. After starting out in astronomy, she eventually switched on over to meteorology. She has a background in a variety of research and ranked 45 out of 1500 forecasters in the 2018-19 National Wx Challenge. We definitely welcome her aboard and look forward to what we can accomplish together!

Brandon Bigelbach has been promoted to a General Forecaster here at NWS Glasgow. He has been very active as the recent Assistant Hydrology Program Focal Point, and just returned from the Hydro Program Managers Course in Kansas City (seated third from the left in the front row



Figure 8: WFO Hydrology Program Manager's Course attendees.

on the photo to the right). We look forward to what he can bring to the table with his new learning & experience over time. The future is definitely as bright and sunny as ever here at NWS Glasgow!

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