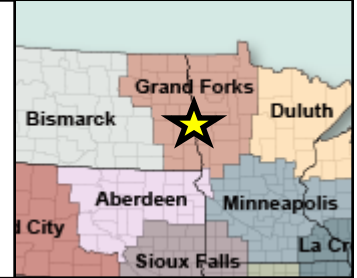


# National Weather Service Grand Forks



## Weather & Climate Review

July-August 2021



### July

	AveT	TDept	THigh	TLow	Pcpn	PDept	Snow	PWnd
DVL	73.5	5.5	93	51	0.98	-1.45	0.0	48
NWS GF	74.5	5.0	97	55	0.56	-2.99	0.0	M
GFK	73.0	4.1	96	52	0.42	-3.10	0.0	41
RDR	73.0	4.1	98	47	0.94	-2.58	0.0	35
FAR	74.8	4.1	96	55	0.66	-2.41	0.0	61
BDE	69.7	3.0	94	44	0.80	-3.23	0.0	46
PKD	72.1	3.4	94	50	2.19	-1.74	0.0	58
BJI	69.9	3.0	95	43	1.11	-2.42	0.0	38
TVF	71.9	3.2	95	50	0.38	-3.20	0.0	33
Y63	72.5	1.7	91	55	M	M	M	M

Table 1 July 2021 Temperature and Precipitation Statistics

In Table 1, (ND) **DVL** = Devils Lake, **NWS GF** = NWS Grand Forks, **GFK** = GF Airport, **RDR** = GF Air Force Base, **FAR** = Fargo, (MN) **BDE** = Baudette, **PKD** = Park Rapids, **BJI** = Bemidji, **TVF** = Thief River Falls, **Y63** = Elbow Lake.

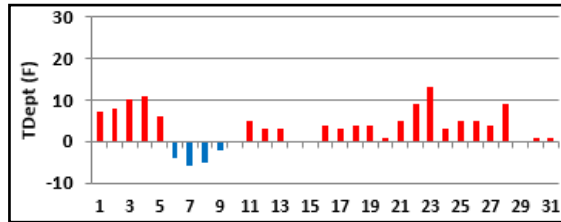


Figure 1  
July Daily  
Departure from  
Normal  
Temperatures at  
Thief River Falls,  
MN

Blue Bars = Colder than Normal Days & Red Bars = Warmer than Normal Days

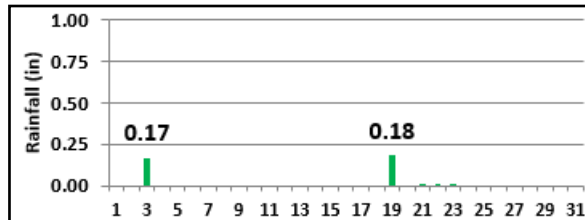


Figure 2  
July Daily  
Precipitation  
Totals at Thief  
River Falls, MN

Table 1 shows the July average temperature (AveT), departure from normal temperature (TDept), highest temperature (THigh), lowest temperature (TLow), precipitation (Pcpn), departure from normal precipitation (PDept), snowfall (Snow), and peak wind speed (PWnd in mph) for 10 climate stations. The July average temperature was well above normal at all sites. Precipitation amounts were below normal at all sites. Figure 1 plots the daily departure from normal temperatures in July 2021 at Thief River Falls, MN. Other than a few cooler days from July 6th to 9th, the rest of the month was quite warm. Figure 2 shows the July daily precipitation totals at Thief River Falls. The highest daily total was 0.18 inches on July 19th. Measurable precipitation fell on only 5 days during the month (although hard to see, 0.01 inches fell on July 21st, 22nd, and 23rd).

### Records

At Fargo-Moorhead (our longest running climate site), daily record high minimums were set on July 21st (72°), 22nd (73°), and 23rd (75°). The monthly average temperature of 74.8 degrees was the 9th warmest on record (July 1936 was the highest at 80.2 degrees).

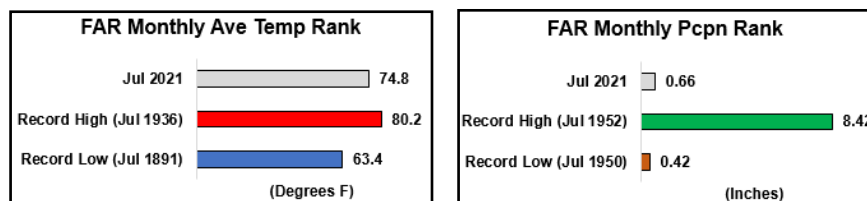


Figure 3 July 2021 Fargo Temperature and Precipitation Statistics Compared to Records

Figure 3 compares the July 2021 average temperature (AveT) and precipitation (Pcpn) at Fargo to the established records.

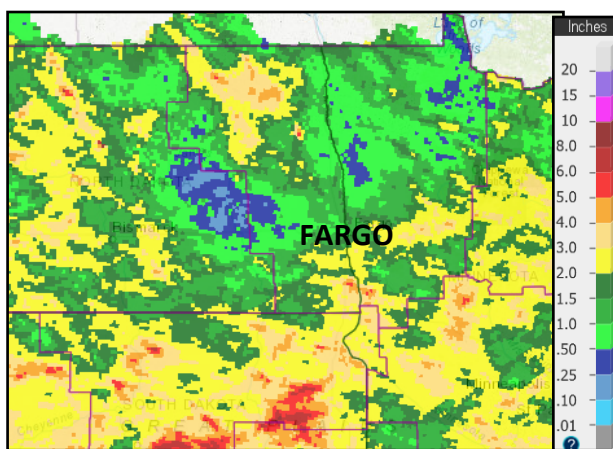


Figure 4 July Observed Precipitation

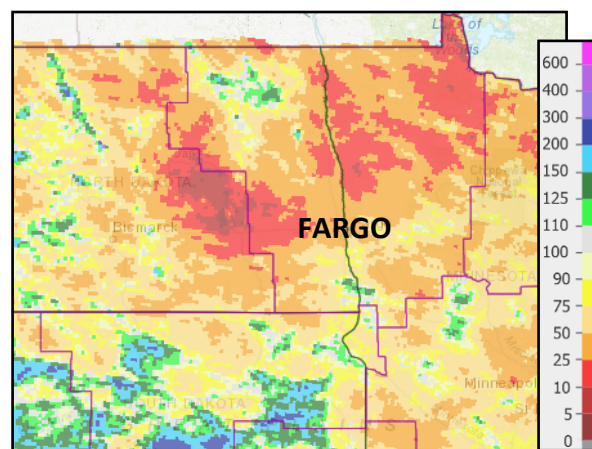
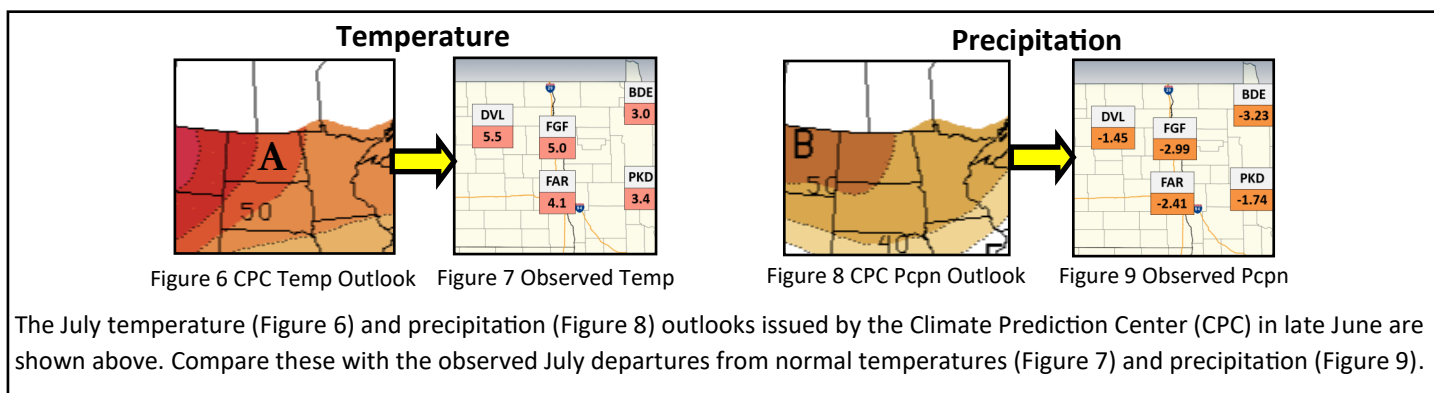


Figure 5 July Percent of Normal

Figure 4 gives a July precipitation estimate for all of eastern North Dakota and the northwest quarter of Minnesota. The most precipitation (2.00 to 5.00 inches) fell across portions of the Devils Lake region, southern Red River Valley, and adjacent areas of west central Minnesota (yellow to orange colors). Figure 5 shows the July precipitation as a percent of normal. For the areas with the least amount of precipitation from Jamestown to Grand Forks to Baudette, this was less than 25 percent of normal (red colors).



### Longer Term Trends

Looking at just the Fargo climate site (FAR), Figures 10 and 11 show how July 2021 fits into the previous 5 months. Figure 10 plots the monthly departures from normal temperatures at Fargo. The blue bars represent months that were colder than normal, while the red bars represent months that were warmer than normal. Figure 11 plots the monthly departures from normal precipitation at Fargo. The green bars represent months that were wetter than normal, while the brown bars represent months that were drier than normal.

April and May average temperatures were pretty close to normal (Figure 10), but June and July trended quite a bit warmer. All but the month of April ended with a below normal precipitation total (Figure 11).

Figure 12 tracks how much precipitation has fallen since January 1, 2021, and how it compares to normal and last year. Snowfall is also tracked for the snow season, which began on July 1, 2020.

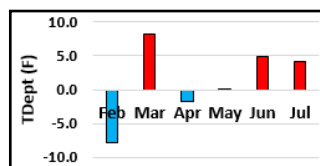


Figure 10 Monthly Departures from Normal Temps at Fargo, ND

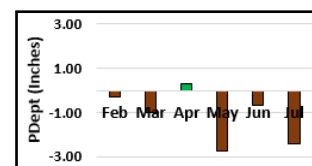


Figure 11 Monthly Departures from Normal Pcpn at Fargo, ND

	Observed Value	Normal	Departure from Normal	Last Year
Pcpn Since Jan 1	7.20	14.64	-7.44	12.08
Snow Since Jul 1	0.0	0.0	0	0.0

Figure 12 Yearly Precipitation & Seasonal Snowfall Trends at Fargo

## U. S. Drought Monitor

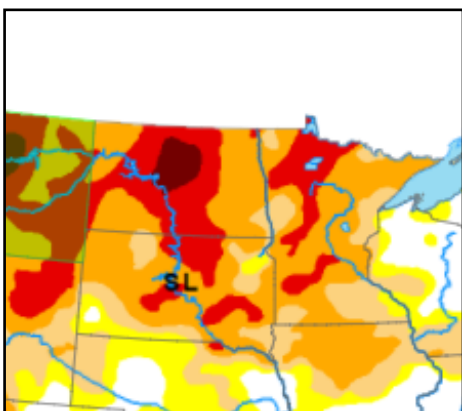


Figure 13 U. S. Drought Monitor, July 29

With the lack of rainfall in July, portions of northwest MN were upgraded to D3 (Extreme Drought) conditions. The latest U. S. Drought Monitor still has some D4 (Exceptional Drought) conditions across central ND (Figure 13). The key for Figure 13 is shown below.

### Intensity and Impacts

None	D3 (Extreme Drought)
D0 (Abnormally Dry)	D4 (Exceptional Drought)
D1 (Moderate Drought)	No Data
D2 (Severe Drought)	

## Summer Warnings

a map of the current air quality. Check out the MPCA website at:

[www.pca.state.mn.us/air/current-air-quality](http://www.pca.state.mn.us/air/current-air-quality)

Thirty-three Severe Thunderstorm, 2 Tornado, and 1 Flash Flood Warning were issued in July 2021 (Figure 16).

The Flash Flood Warning was issued for portions of northwest Grand Forks County on July 15th, when a thunderstorm sat near McCanna for several hours. The radar estimated precipitation is shown in Figure 17, where there is a small bullseye of 5 to 10 inches.

Smoke from wildfires covered the area during much of July, resulting in poor air quality. The Minnesota Pollution Control Agency (MPCA) produces graphics which show the current air quality. Figure 14 shows what an Air Quality Alert looks like, and Figure 15 shows

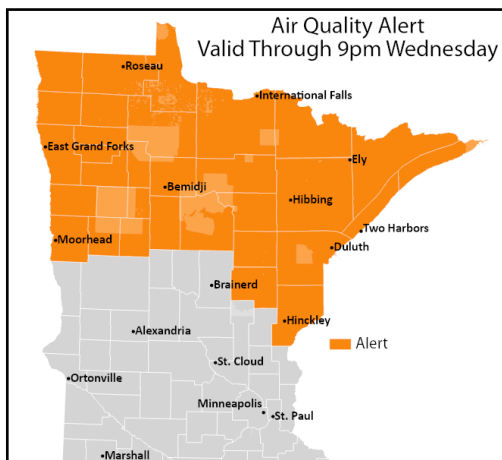


Figure 14 Air Quality Alert from the MPCA

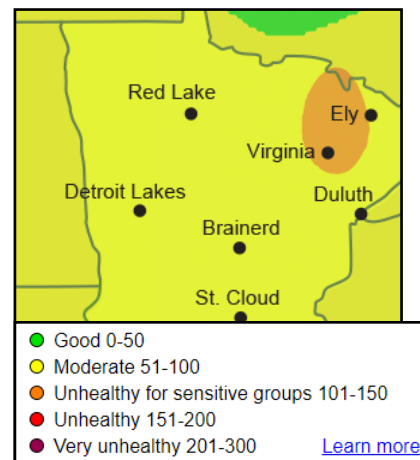


Figure 15 Current Air Quality Map MPCA

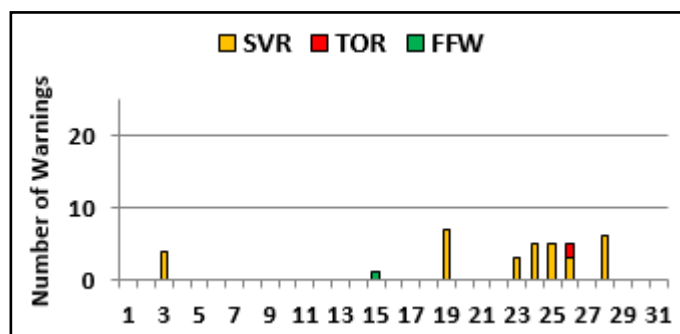


Figure 16 Number of July 2021 Convective Warnings

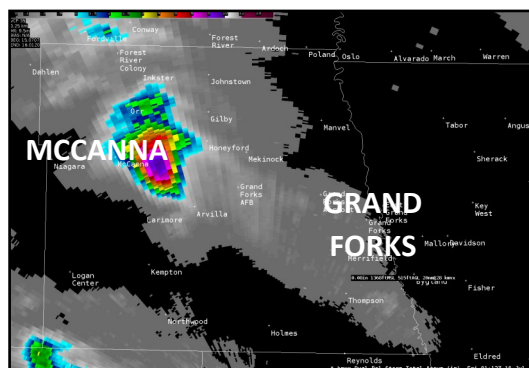


Figure 17 July 15th Rainfall from the Mayville WSR88D

## August

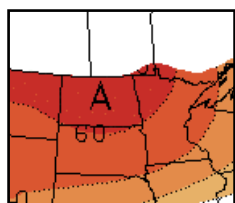


Figure 18 Temperature

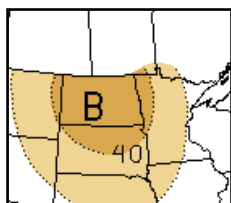


Figure 19 Precipitation

The latest Climate Prediction Center (CPC) temperature (Figure 18) and precipitation (Figure 19) outlooks for August 2021 are shown to the left. For eastern North Dakota and the northwest quarter of Minnesota, the CPC is forecasting higher probabilities of above normal temperatures and below normal precipitation.

## Sunrise/Sunset

Fargo, ND

Aug 1 Sunrise: 6:07 am

Sunset: 9:00 pm

Aug 31 Sunrise: 6:45 am

Sunset: 8:10 pm



## Last Year & Normals

Per Table 2, in August 2020, the average temperature was pretty close to normal at all sites. Precipitation amounts were variable, from 0.79 inches at Devils Lake to 5.07 inches at Bemidji.

	AveT	TDept	Pcpn	PDept	Snow
DVL	68.0	-0.6	0.79	-1.68	0.0
NWS GF	69.4	1.1	3.27	0.13	T
GFK	68.3	1.2	2.41	-0.47	0.0
RDR	67.4	0.3	1.18	-1.70	0.0
FAR	69.2	-0.1	4.16	1.60	0.0
BDE	66.4	2.1	2.93	-0.27	0.0
PKD	67.6	1.9	3.67	0.12	0.0
BJI	65.3	0.6	5.07	1.86	0.0
TVF	67.0	0.1	3.32	-0.50	0.0
Y63	68.8	-1.6	M	M	0.0

Table 2 August 2020 Temperature and Precipitation Statistics

Figure 20 shows normal highs and lows on August 1st for selected cities across eastern North Dakota and northwest Minnesota. Figure 21 shows how normal highs and lows change by August 31st. As an example, at NWS Grand Forks on August 1st, the normal high is 81 and the normal low is 59. By August 31st at NWS Grand Forks, the normal high falls to 76 and the normal low falls to 53. Figure 22 shows the normal precipitation amounts at the same sites as Figures 20 and 21. As an example, the normal precipitation at NWS Grand Forks in August is 3.03 inches.

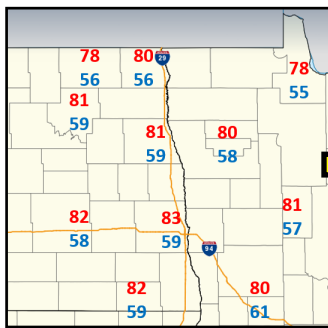


Figure 20 Normal Temps Aug 1

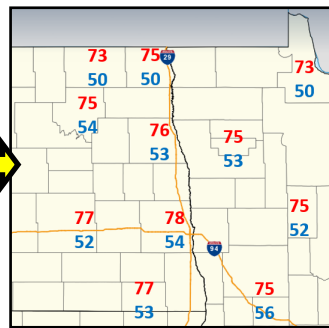


Figure 21 Normal Temps Aug 31

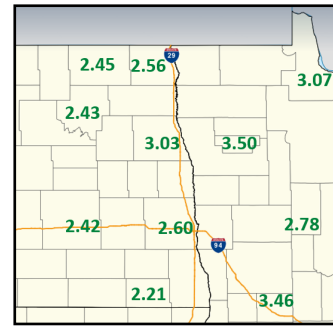


Figure 22 Normal Aug Pcpn

## Convective Warnings

In August 2020, 83 Severe Thunderstorm, 18 Tornado, and 8 Flash Flood Warnings were issued by the NWS in Grand Forks (Figure 23). On August 14th, five distinct tornadoes occurred over Grant County, Minnesota. Of the five tornadoes, there were three EF-0 tornadoes, 1 EF-1 tornado, and 1 EF-2 tornado. The EF-2 tornado tracked about 14 miles, from 9 miles west of Barrett to 6 miles east-northeast of Elbow Lake. The tornado snapped or uprooted numerous trees, snapped several power poles at 4 different locations, and chewed up corn fields.

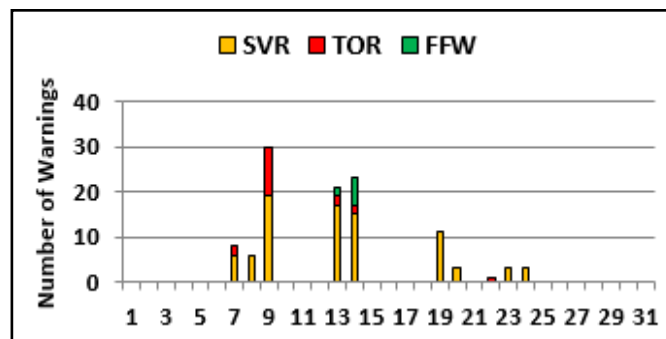


Figure 23 Number of August 2020 Convective Warnings