



North Dakota Monthly Climate Summary

July 2023

Volume 17, No. 7

North Dakota State Climate Office: Your Resource for Climate Information

North Dakota State University
School of Natural Resource Sciences

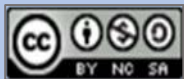
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Precipitation

Based on data from 138 stations* across the North Dakota Agricultural Weather Network (NDAWN) the statewide average precipitation in July 2023 was 1.28 inches. That is a 1.74 inch decrease from normal precipitation in July. The greatest measured precipitation was recorded at the Pioneer NDAWN station in Williams County with just 3.02 inches, which is only 0.6 inches more than the average normal for July. The least precipitation fell in Burke County, where the Bowbells (1N) NDAWN station measured just 0.18 inches (Figure 1).

Maximum average July precipitation occurred in 1993 with 7.97 inches, and minimum precipitation in 1936 with 0.64 inches. Historical climate data indicates a 0.25 inch increase over a century long trend (NCEI) for the month of July (Figure 2).

Average July precipitation was 1.59 inches greater than the previous month and ranks as the 14th driest July over 129 years of precipitation data (NCEI).

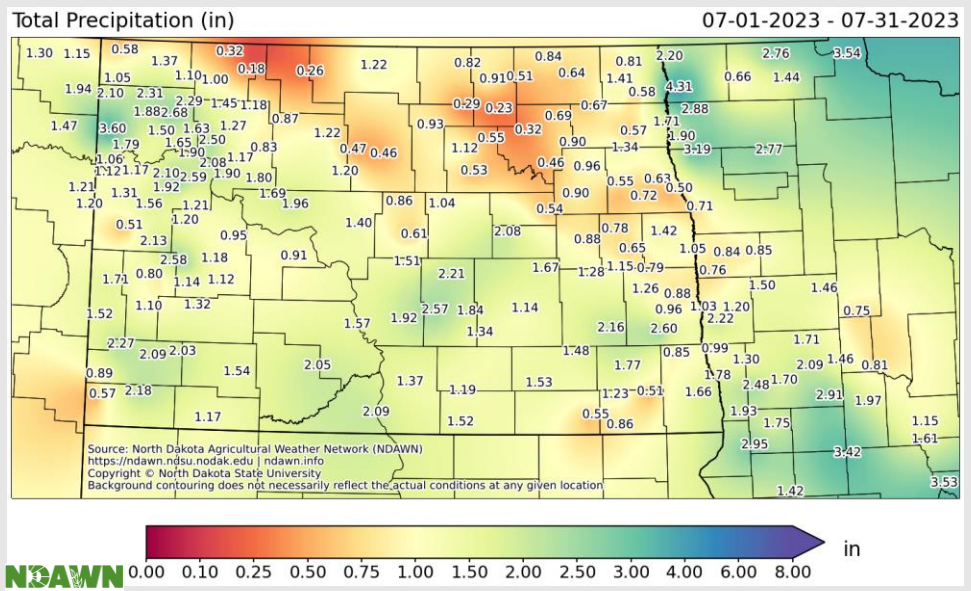


Figure 1: Total precipitation 7/1/2023 - 7/31/2023 at all NDAWN stations (NDAWN)

*Only North Dakota stations used for NDAWN data. All MN and MT stations omitted.



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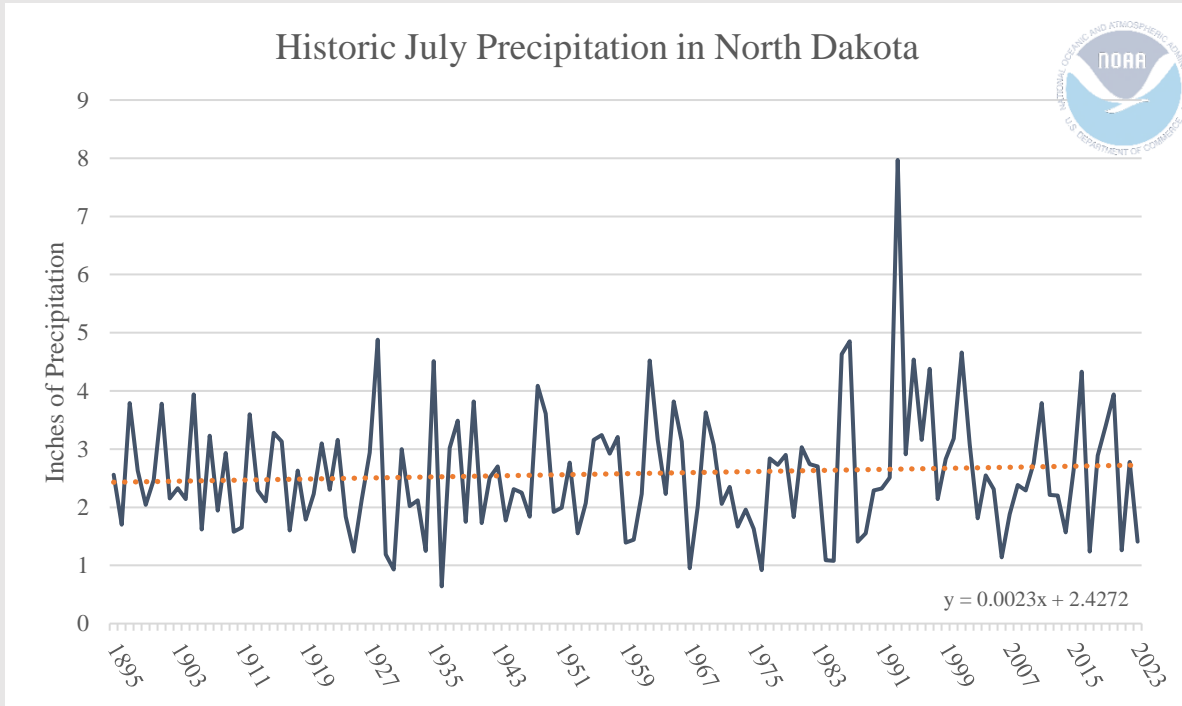


Figure 2: Historic average July precipitation 1895-2023 (NCEI, NOAA) with trendline representing average change per century.

North Dakota July Precipitation Summary

	Precipitation	Normal	Anomaly	Rank	Wettest/Driest Since	Record Year
July 2023	1.28"	3.02"	-1.74"	116 th Wettest	Wettest since 2022	1993
				14 th Driest	Driest since 2021	1936

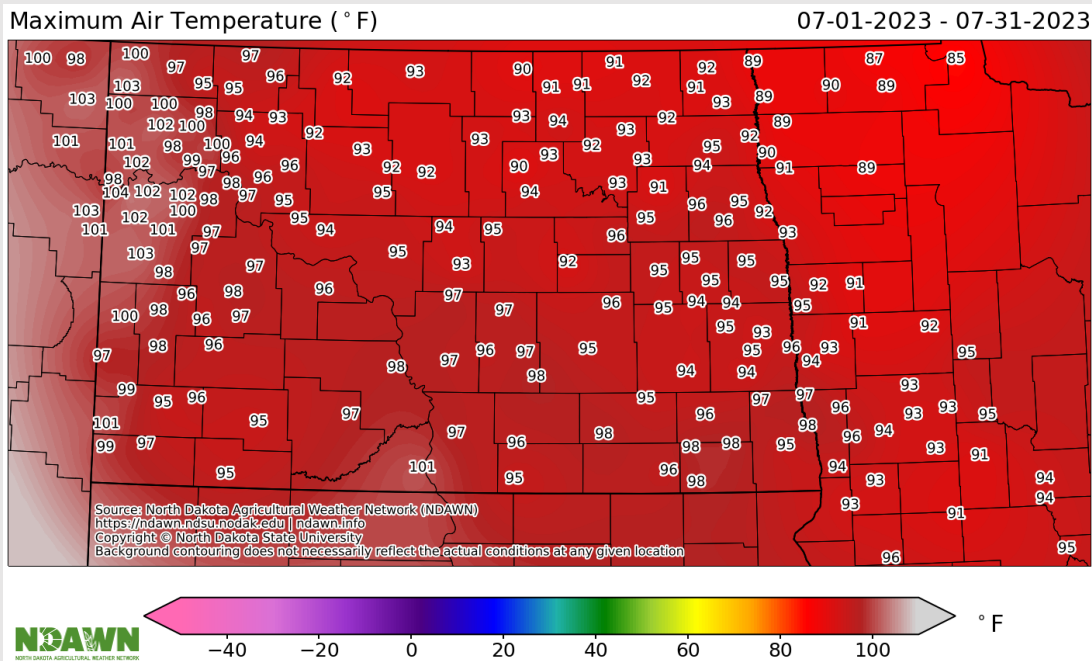
Table 1: Ranking from NCEI NOAA based on data from July 1885-2023. Precipitation amounts averaged from records at NDAWN stations in North Dakota.

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Temperature

The North Dakota July 2023 average temperature was 66.7°F making it the 32nd coolest July within the period of record (129 years) (NCEI). Normal July temperatures average 69.1°F; making July 2023 a -2.4°F departure from normal (NDAWN, Figure 5). Despite the cooler than average July, the maximum temperature recorded by NDAWN was 104°F at the Buford (3SE) station in Williams County. The minimum temperature recorded in North Dakota in July was 33°F at the Poker Jim NDAWN station in McKenzie County (Figure 3), which was also the station with the lowest minimum temperature in June, measuring 37°F. The Buford and Poker Jim station locations are less than 40 miles apart.

Statewide Maximum and Minimum Air Temperature



*Only North Dakota stations used for NDAWN data. All MN and MT stations omitted.

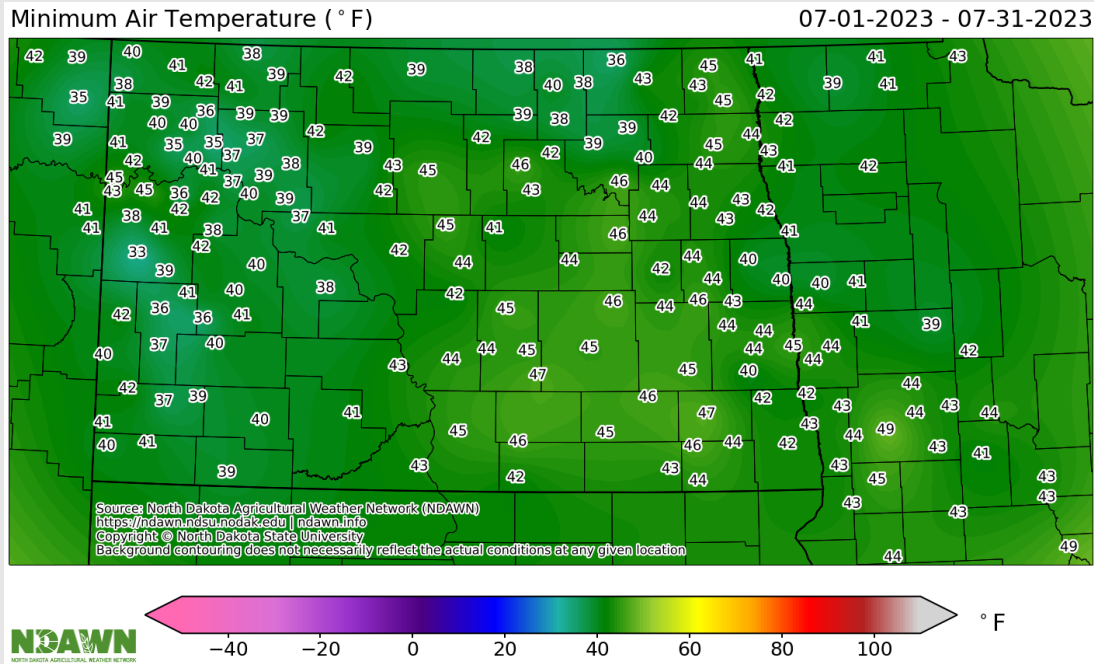


Figure 3: Maximum (Top) and Minimum (Bottom) air temperatures (°F) for July 2023 at all NDAWN Stations

July 2023 temperatures were relatively mild. June 2023 had an average temperature of 68.9°F, so June was, on average, warmer than July by 2.2°F. Even maximum temperatures in July stayed cooler than average, with maximum temperatures averaging 81.4°; 1.9°F cooler than normal July temperatures. Daily minimum temperatures for July averaged 53.8°F; 2.9°F cooler than normal (NDAWN). Overall, July average maximum and minimum temperatures were much cooler than June 2023 despite being the peak of summer.

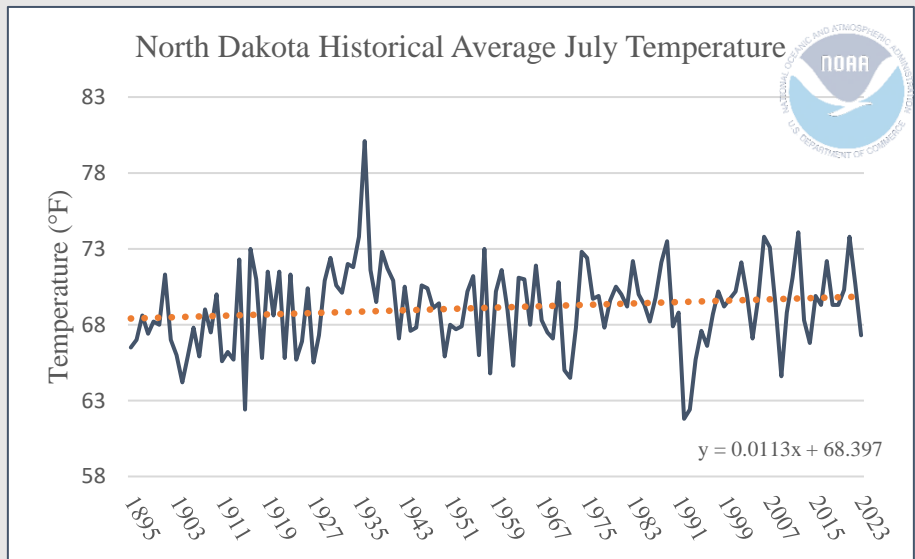


Figure 4: July historic average temperatures in North Dakota with trendline representing change per century increasing by 1.1°F. (NCEI)

*Only North Dakota stations used for NDAWN data. All MN and MT stations omitted.

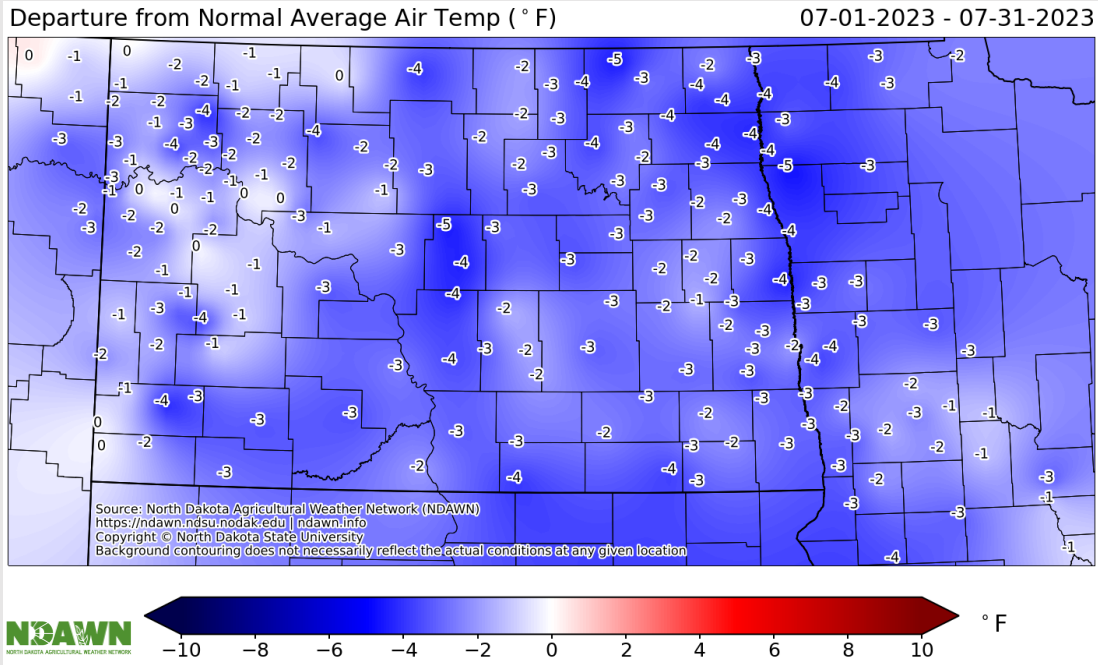


Figure 5: Departure from normal average air temperature for July 2023 at all NDAWN stations.

North Dakota July Temperature Summary

July 2023 Temperature Summary	Average T	Avg max T	Avg min T	Maximum	Minimum
	66.7°F	79.6°F	53.8°F	104°F	33°F
Anomaly	-2.4°F	-1.9°F	-2.9°F		
Rank					
Warmest	98 th Warmest	7 th warmest	3 rd warmest		
Coolest	32 nd Coolest	123 th coolest	127 th coolest		
Record					
Warmest	80.1°F (1936)	96.6°F (1936)	63.7°F (1936)	121°F (Steele, 1936)	
Coolest	61.8°F (1992)	72.2°F (1993)	50.3°F (1992)		20°F (Dunn Center, 1919)

Table 2: July temperature summary for North Dakota. 2023 statistics from NDAWN station data. Ranking and records based on NCEI climate data (1885-2023) (NOAA).

*Only North Dakota stations used for NDAWN data. All MN and MT stations omitted.

Storm Reports

July 2023 reported just 11 days with severe weather reports, with a total of 45 storm reports. The National Weather Service (NWS) preliminary report noted 13 severe wind, 30 severe hail, and 1 tornado report. The tornado report originated in the LaMoure County area near Verona on July 7th; this report was rated EFU (severity unknown) due to lack of damage evidence (SPC, NOAA). Only one of the 13 severe wind reports were confirmed gusts above 75 MPH. Of the 30 severe hail reports, 19 were between 1”-1.24” across North Dakota. There were 10 reports of large hail between 1.25”-1.99”, and only one report of hail greater than 2” which occurred in Cass County. (Figure 6)

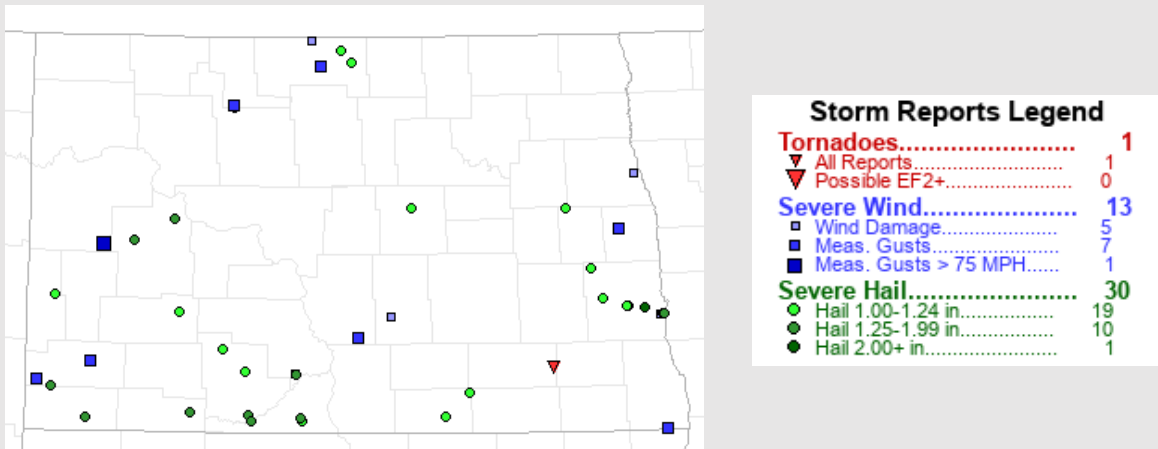


Figure 6: NOAA Storm Prediction Center summary of preliminary storm reports that occurred in July 2023 (NOAA SPC)

In terms of severe weather, July 2023 seemed more like the month of June with only 45 storm reports. Comparatively July 2022 had 236 total storm reports, 2021 had 86, and 2020 with 229 (final). Cool and dry conditions failed to foster an environment preferred by severe storms, sparing much of North Dakota from storm damages typically seen in July.

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Image/Data Sources

Climate at a Glance | National Centers for Environmental Information (NCEI).

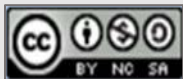
NDAWN current conditions

NDAWN Weather

SPC Storm Reports

NCEI Storm Events Database

XMACIS2



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