



# North Dakota Monthly Climate Summary

March 2024

Volume 18, No. 3

North Dakota State Climate Office: Your Resource for Climate Information

North Dakota State University  
School of Natural Resource Sciences

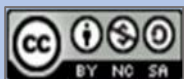
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## Precipitation

Based on data from 149 stations\* across the North Dakota Agricultural Weather Network (NDAWN) the statewide average precipitation in March 2024 was 0.45 inches. Normal precipitation in March is around 0.77 inches, leaving a 0.32 inch deficit. Western North Dakota received above average precipitation, while the Eastern Portion of the state dealt with low dewpoints that inhibit moisture reaching the ground. The maximum rainfall in March fell at the Hawkeye (3NW) NDAWN station in McKenzie County with 1.27 inches of precipitation. The least precipitation fell at the Mayville (2E) NDAWN station in Traill County, with 0.14 inches (Figure 1).

The maximum statewide averaged precipitation occurred March of 1902 with 2.31 inches, and minimum precipitation in 1930 with 0.11 inches. Climatologically, precipitation in March is variable and dependent on spring snowstorms. Historically, higher precipitation is observed every other year, with the exception of a dry spell around 2019-2022.

Average March precipitation was only 0.20 inches more than the previous month and ranks as the 61<sup>st</sup> driest March over 130 years of precipitation data (NCEI).

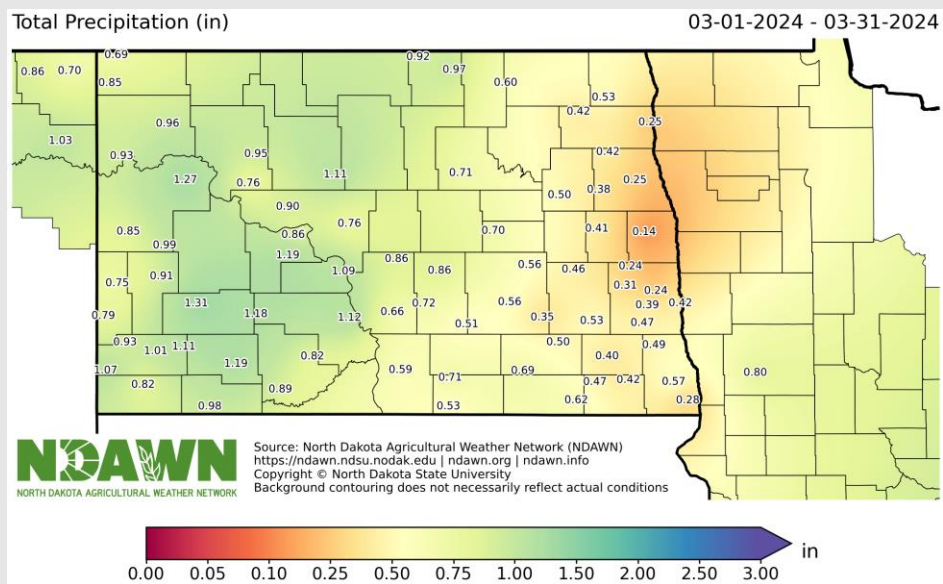


Figure 1: Total precipitation 3/1/2024 – 3/31/2024 at all NDAWN stations (NDAWN)

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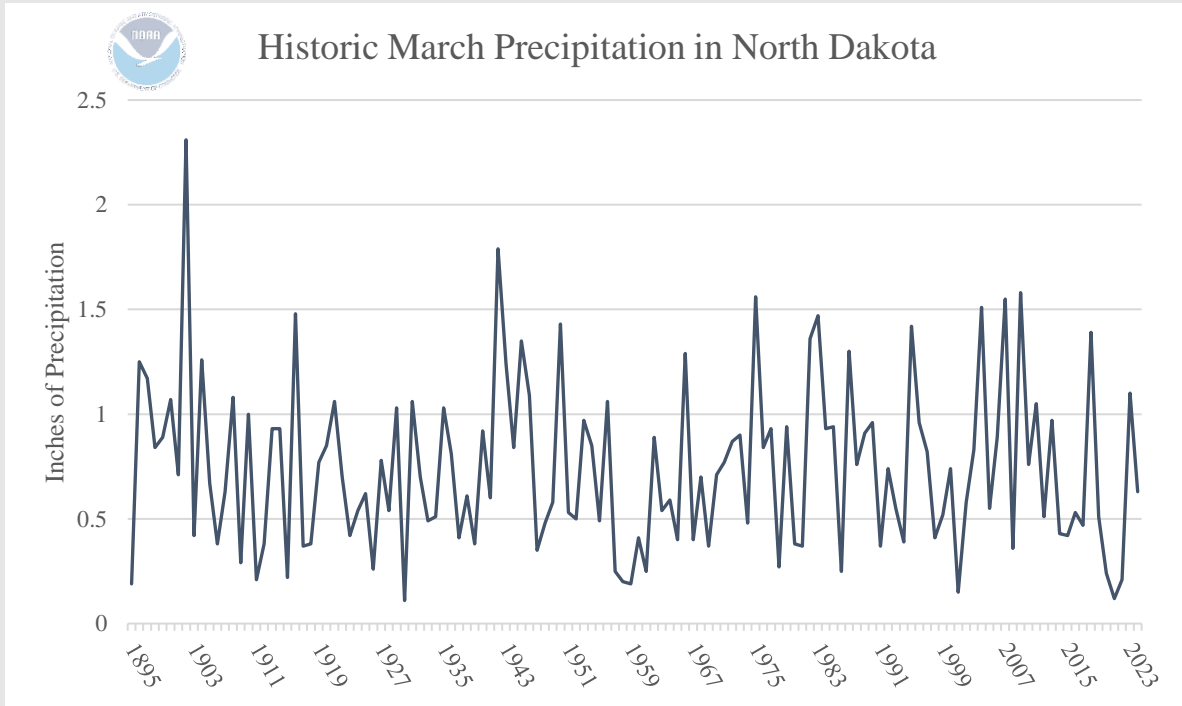


Figure 2: Historical statewide average precipitation in March 1895-2024 (NCEI, NOAA)

## North Dakota March Precipitation Summary

	Precipitation	Normal	Anomaly	Rank	Wettest/Driest Since	Record Year
<b>March 2024</b>	0.45"	0.77"	-0.32"	70 <sup>th</sup> Wettest	Wettest since 2023	1902
				61 <sup>st</sup> Driest	Driest since 2022	1930

Table 1: Ranking from NCEI NOAA based on data from March 1885-2024. Precipitation amounts averaged from records at NDAWN stations in North Dakota.

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

## Temperature

The average temperature in North Dakota for the month of March was 24.7°F making it the 51<sup>st</sup> warmest March within the period of record (130 years) (NCEI). Normal temperatures average 26.6°F; making 2024 1.8°F cooler than normal. (NDAWN, Figure 3). February was on average warmer than March by a couple degrees even though both months lacked significant snowpack, but as the El Nino pattern is taken over by El Nina, the region returns to seasonal temperatures and precipitation. The maximum temperature recorded by NDAWN was 72°F at the Milnor (1S) station in Sargent County, 46°F warmer than the statewide average. The light but persistent snowpack kept East and North Central North Dakota cooler, with maximum temperatures reaching only into the upper 50s. The minimum temperature recorded in North Dakota in March was -23°F at the Buford (7SE) NDAWN station in Williams County (Figure 4). This minimum temperature is 6°F colder than the minimum temperature recorded in February 2024. This 95°F temperature difference is a reminder that North Dakota spring weather can vary greatly.

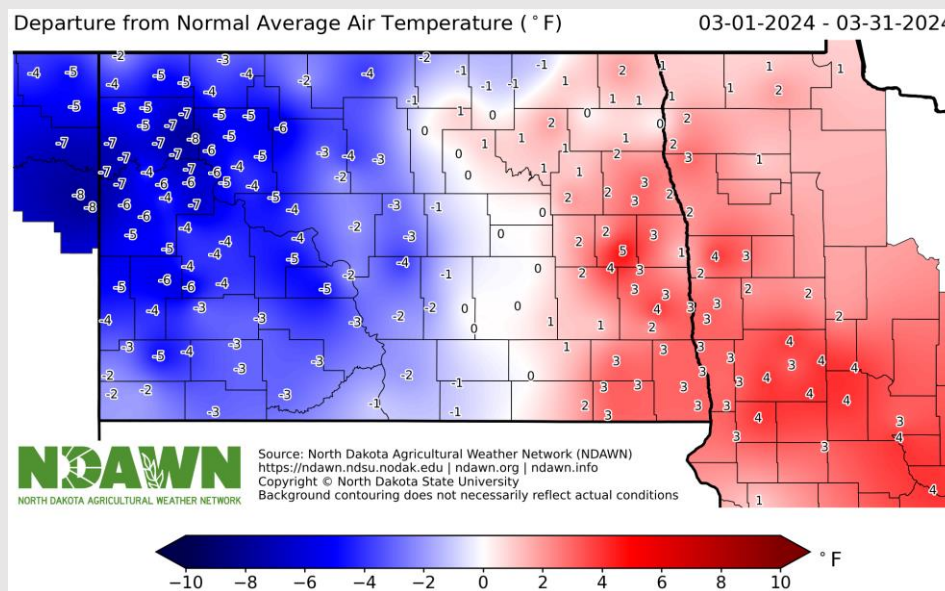


Figure 3: March 2024 departure from normal average temperature. (NDAWN)

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## Statewide Maximum and Minimum Air Temperature

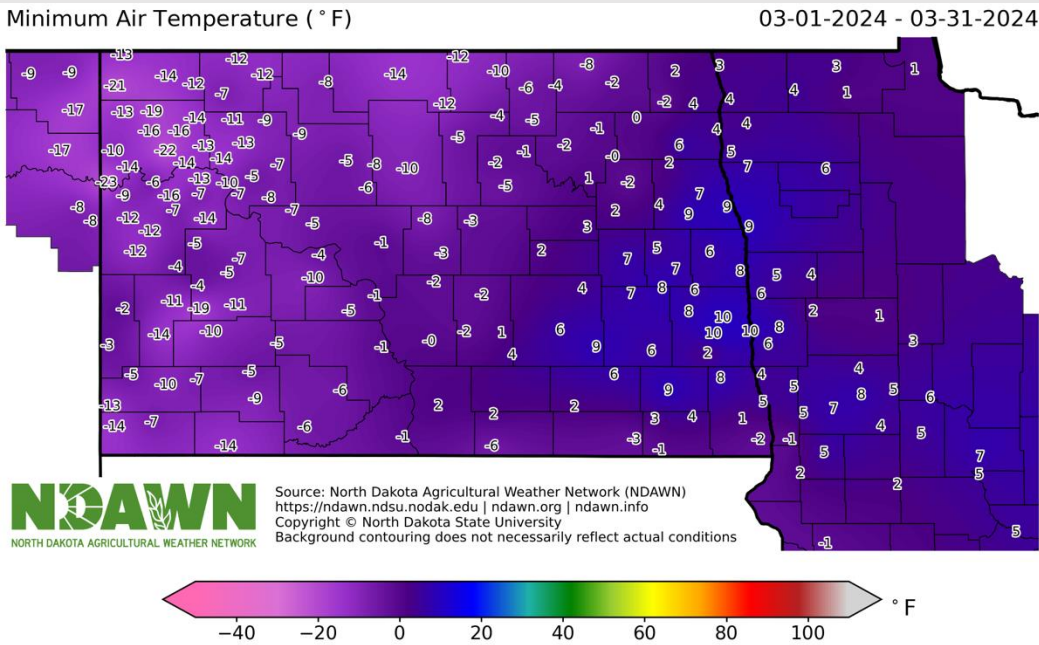
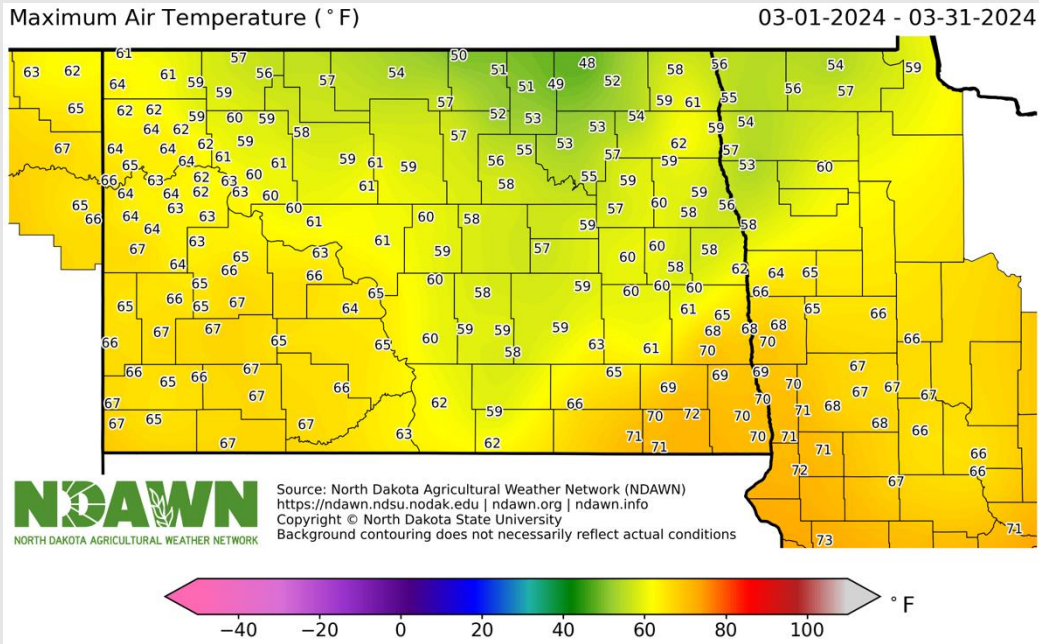


Figure 4: Maximum (Top) and Minimum (Bottom) air temperatures (°F) for March 2024 at all NDAWN Stations

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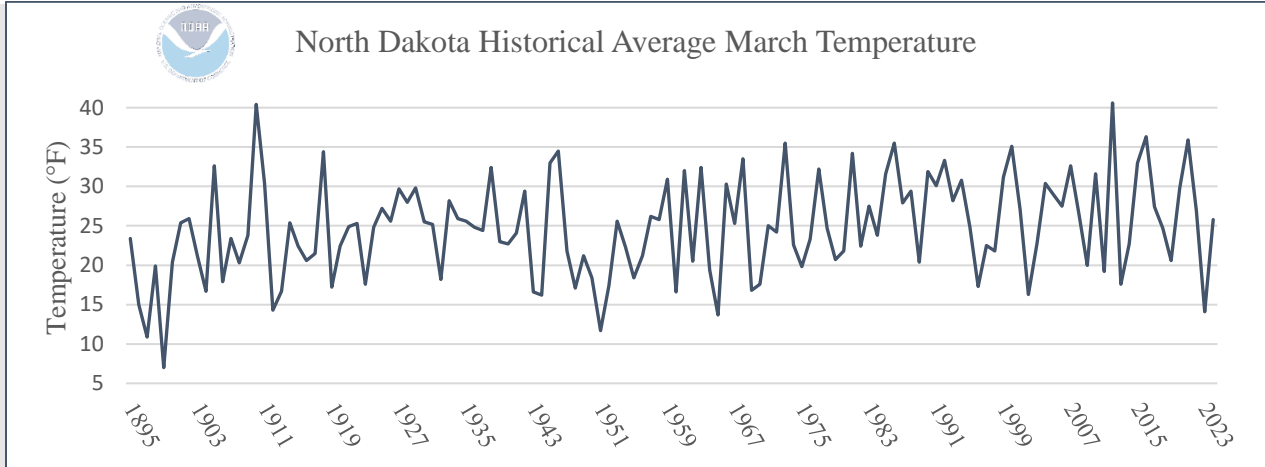


Figure 5: March historic average temperatures by year in North Dakota (NCEI)

Maximum temperatures in March remained mild, similar to the 2023-2024 winter season despite being slightly cooler than February on average. The statewide average maximum temperature was 34.7°F, only 2.3°F cooler than normal; compared to February 2024 which measured 11°F above normal. Minimum temperatures were also slightly below normal, with March averaging 14.7°F, normal minimum temperature in March averages to 16.2°F. Even minimum temperatures averaged cooler than the previous month of February. Historically, March temperatures swing between well above average and well below average (Figure 5). Many factors are involved in this, the most important being the depth of the snowpack. Simply, there is an inverse relationship between temperature and precipitation measured in March. Greater precipitation implies a deeper snowpack. More snowpack equates to a higher albedo, reflecting solar radiation away from the ground, keeping temperatures cooler. This is not always the case, as precipitation is able to fall as rain in March; this can often mean there is little snow on the ground thus warmer temperatures.

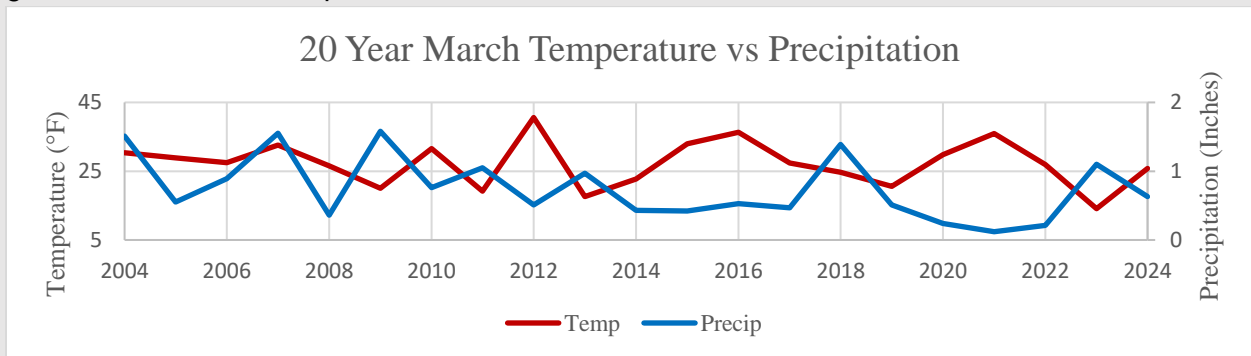


Figure 6: 20 year average temperature and precipitation during March. An inverse relationship pattern is noticeable for many of the given years (NCEI)

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## North Dakota March Temperature Summary

<i>March 2024 Temperature Summary</i>	Average T	Avg max T	Avg min T	Maximum	Minimum
	24.7°F	34.7°F	14.7°F	72°F	-23°F
Anomaly	-1.8°F	-2.6°F	-1.5°F		
Rank					
Warmest	51 <sup>st</sup> warmest	49 <sup>th</sup> warmest	64 <sup>th</sup> warmest		
Coolest	80 <sup>th</sup> coolest	82 <sup>nd</sup> coolest	67 <sup>th</sup> coolest		
Record					
Warmest	40.6°F (2012)	53.5°F (2012)	27.8°F (1910)	93°F (Richardton, 1918)	
Coolest	7.0°F (1899)	18.4°F (1899)	--4.4°F (1899)		-48°F (Mohall, 1897)

Table 2: March temperature summary for North Dakota. 2024 statistics from NDAWN station data. Ranking and records based on NCEI climate data (1885-2024) (NOAA).

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

## Storm Reports

In March 2024 there were two notable snow events, not much different from the previous month. On March 3 and 4 a system swept through the state and brought snow totals of over 8 inches to West Central North Dakota along with winds reported sustained at 40+ mph and gusts up to 60 mph. No severe warnings were issued during this event. Very cold air temperatures followed this system, affecting mostly the Northwest portion of North Dakota. Some temperatures dipped into the minus 20s but quickly recovered into the 40s and 50s after the event.

The second snowstorm to happen in March 2024 happened late in the month. Snow totals were forecast to be in the double digits around Southeastern North Dakota. On March 24-27, however persistent dry air from the north overtook the moisture and the highest totals seen in North Dakota were only up to six inches. Blowing snow was an issue during this storm, with many places reporting wind speeds of over 35 mph. Criteria was not met for a Blizzard Warning, however winter weather advisories and Winter Storm Warnings were issued for parts of the Red River Valley and South Central North Dakota (Figure 7). This storm was much more impactful to our neighbors Minnesota and South Dakota, that saw 10-12 inches of snow.

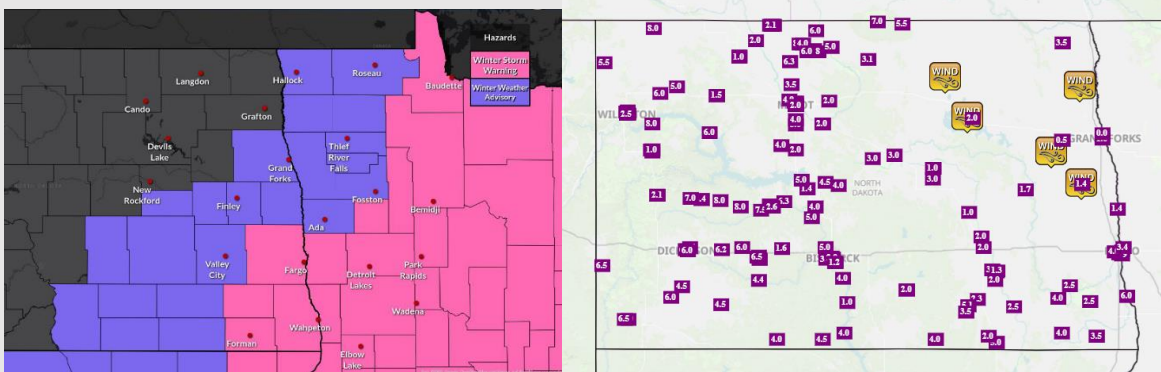


Figure 7: Winter Storm Warning and Winter Weather Advisory issued for the March 24-27 snowstorm (left). Local Storm reports for March 2024 indicate snow across the state, with a few strong wind reports in the Northeast (right) (IEM, NWS) (NWS)

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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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