



North Dakota Monthly Climate Summary

February 2024

Volume 18, No. 2

North Dakota State Climate Office: Your Resource for Climate Information

North Dakota State University
School of Natural Resource Sciences

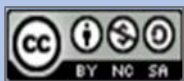
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Precipitation

Based on data from 149 stations* across the North Dakota Agricultural Weather Network (NDAWN) the statewide average precipitation in February 2024 was 0.27 inches. Normal precipitation in February is around 0.52 inches, leaving a 0.25 inch deficit. Precipitation totals were spread fairly equal around the state, with the highest amounting to 0.79 inches at the Davis Dam (2NW) NDAWN station. The least precipitation for the month of January occurred in McIntosh County at the Zeeland (7NE) NDAWN station with just 0.17 inches (Figure 1).

Maximum average February precipitation occurred in 1998 with 1.59 inches, and minimum precipitation in 1934 with 0.07 inches. Historical climate data indicates a 0.01 inch decrease over a century long trend (NCEI, Figure 2). Historic February precipitation is variable as oftentimes it is cold and dry, or packed with snowstorms. In 2024 specifically, it was notably warm with very few systems bringing in precipitation.

Average February precipitation was twice as much as the previous month and ranks as the 41st driest February over 130 years of precipitation data (NCEI).

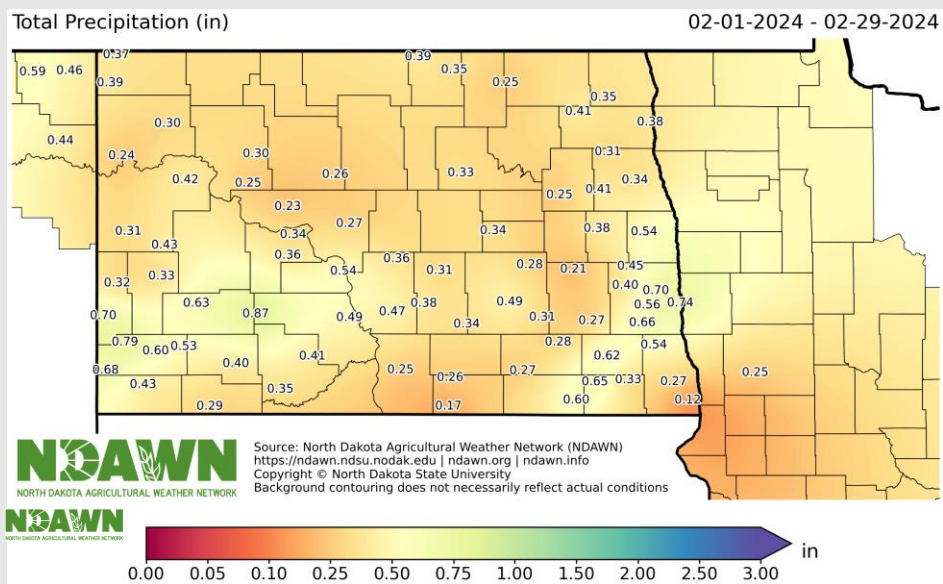


Figure 1: Total precipitation 2/1/2024 – 2/29/2024 at all NDAWN stations (NDAWN)

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

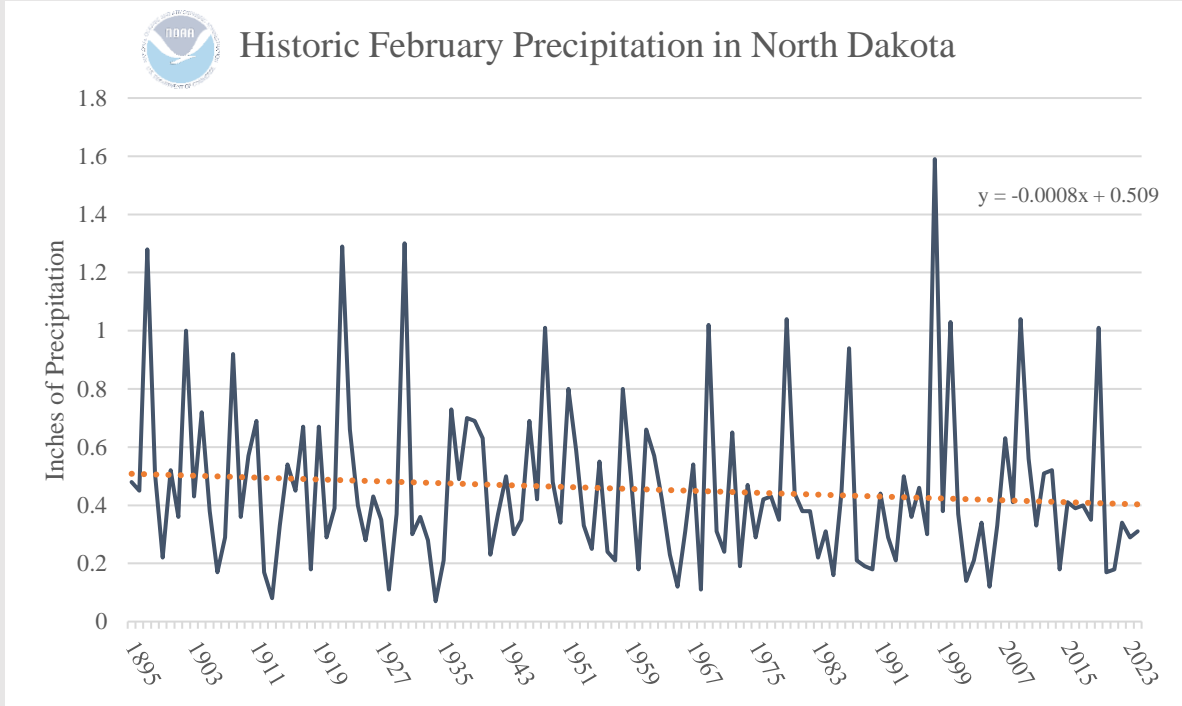


Figure 2: Historic average February precipitation 1895-2024 (NCEI, NOAA) with trendline representing average change per century.

North Dakota February Precipitation Summary

	Precipitation	Normal	Anomaly	Rank	Wettest/Driest Since	Record Year
February 2024	0.27"	0.52"	-0.25"	90 th Wettest	Wettest since 2022	1998
				41 st Driest	Driest since 2023	1934

Table 1: Ranking from NCEI NOAA based on data from February 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 February was 26.3°F making it the 2nd warmest February within the period of record (130 years) (NCEI). Normal temperatures average 14.3°F; making February 2024 a +12°F departure from normal (NDAWN, Figure 3). February was exceptionally warm, with much of North Dakota lacking a snowpack for the duration of the month. The maximum temperature recorded by NDAWN was 66°F at the Fort Yates (2W) station in Sioux County, 40°F warmer than the statewide average. Southern North Dakota led the way in high temperatures, with many locations reaching into the 60s. The minimum temperature recorded in North Dakota in February was -17°F at the Hillsboro (7SE) NDAWN station in Traill County (Figure 4). An impressive temperature difference for February, a month that typically does not frequent temperatures above 32°F. This was the case for a large portion of the U.S, four states had its warmest February on record, and 20 states, including North Dakota, had a top ten warmest February.

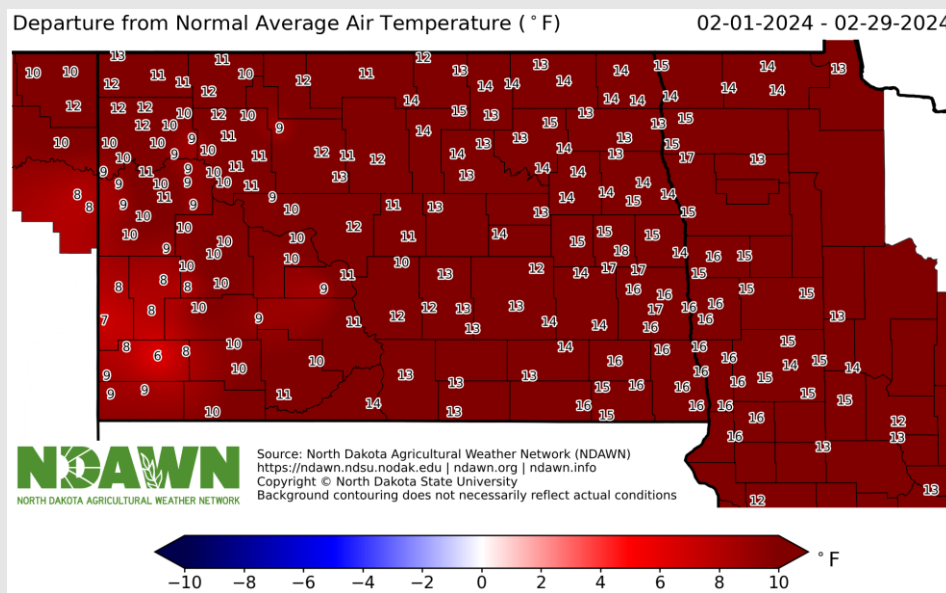


Figure 3: February 2024 departure from normal average temperature. Clearly all of North Dakota was well above average for the month (NDAWN)

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

Statewide Maximum and Minimum Air Temperature

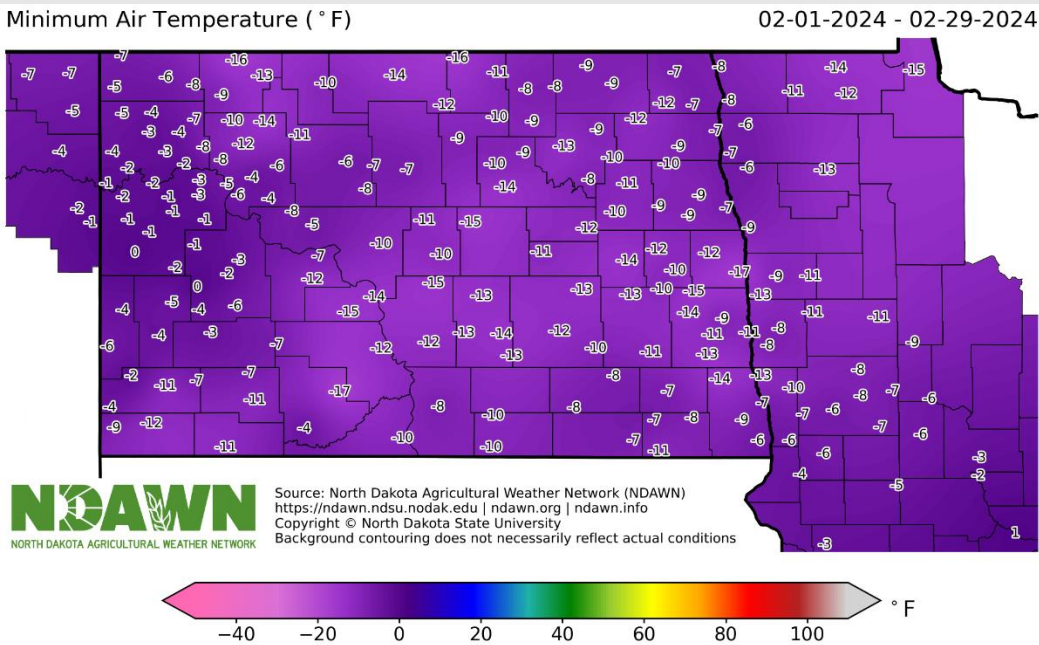
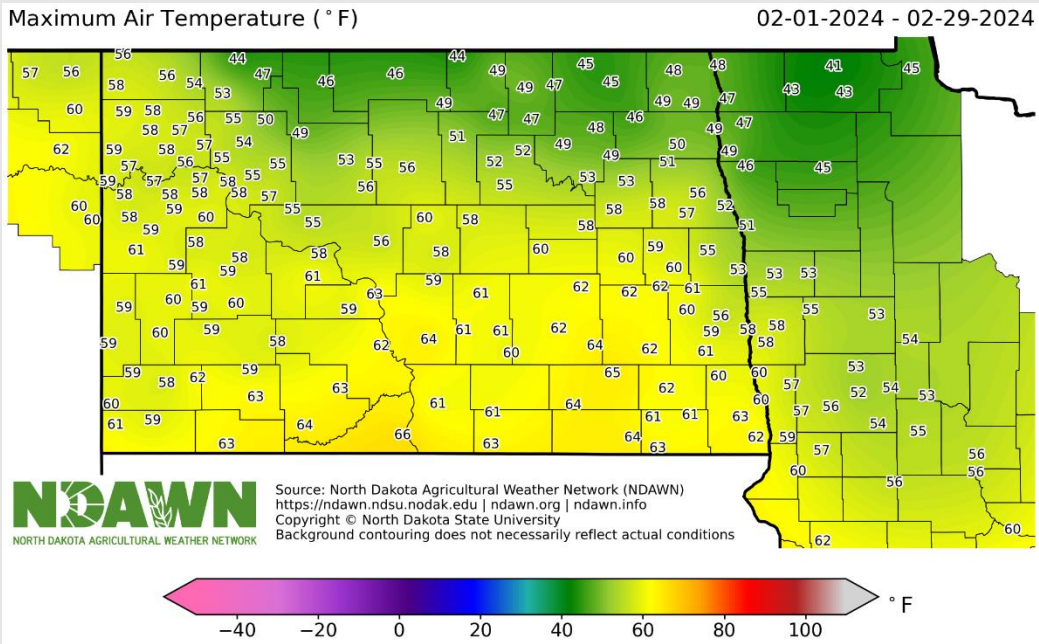
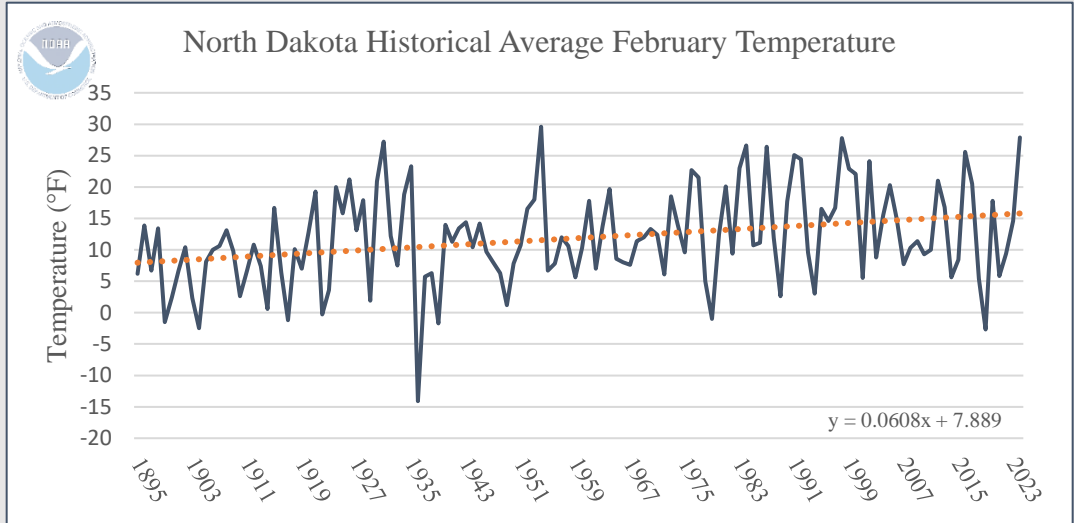


Figure 4: Maximum (Top) and Minimum (Bottom) air temperatures (°F) for February 2024 at all NDAWN Stations

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

Average maximum temperatures in February were high all around, with almost every North Dakota NDAWN station averaging a max temperature above 30°F. The statewide



average maximum temperature was

Figure 5: February historic average temperatures in North Dakota with trendline representing change per century increasing by 0.6°F (NCEI)

35.4°F, making this month 11°F above normal. Minimum temperatures were also well above normal, with February averaging 17.1°F, normal minimum temperatures are typically in the single digits. According to historical temperature records maintained by NCEI, the average temperature change per century is increasing by 0.6°F (NCEI) (Figure 5).

While February 2024 was dominated by mild temperatures, at the end of the month a strong cold front advanced across the nation, not only affecting temperatures in North Dakota, but the entire Midwest and down into Texas. In North Dakota, high temperatures began in the 50-60s on February 26th, rapidly dropping to below 0°F statewide (Figure 6,7). Temperatures soon recovered by February 29th, consequently melting any snow from the passing system.

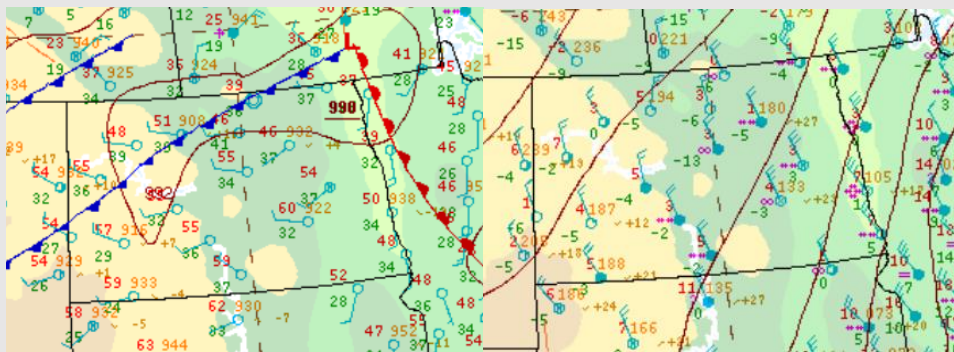


Figure 6: Surface analysis from 2/26/2024 at 18Z showing warm temperatures across North Dakota (Left) compared to exactly one day later, 2/27/2024 18Z, when a cold front dropped temperatures by over 50°F (Right) (WPC)

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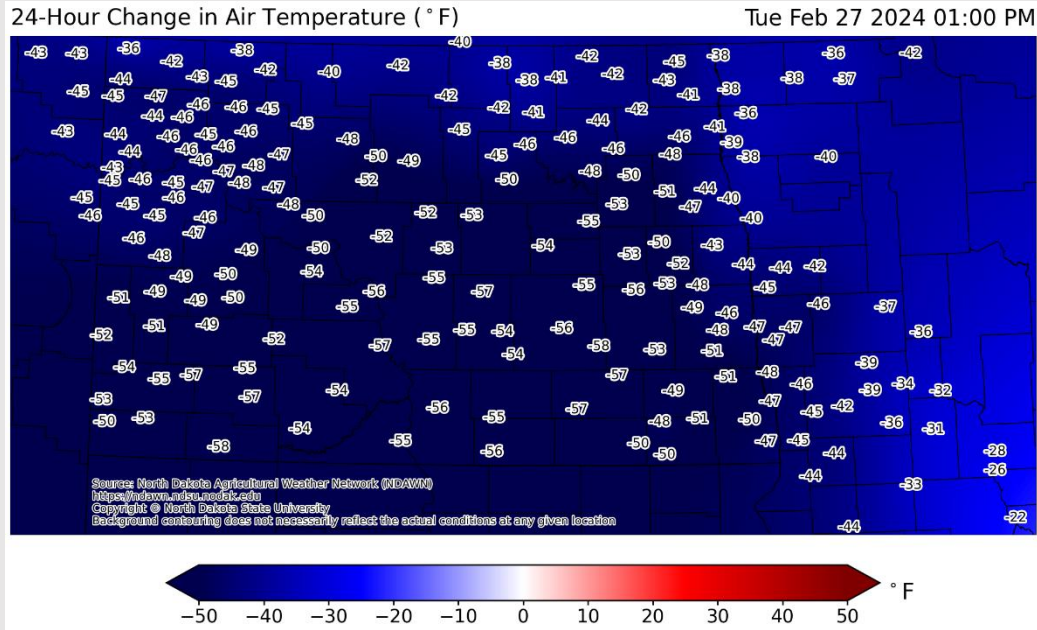


Figure 7: 24 hour temperature change between 2/26-2/27 at 19Z at all NDAWN stations. The biggest recorded temperature difference occurred at the Marion station at 21Z with -59°F temperature change

North Dakota February Temperature Summary

February 2024 Temperature Summary	Average T	Avg max T	Avg min T	Maximum	Minimum
	26.3°F	35.4°F	17.1°F	66°F	-17°F
Anomaly	+12.0°F	+11.0°F	+13.0°F		
Rank					
Warmest	2 nd warmest	2 nd warmest	3 rd warmest		
Coolest	129 th coolest	129 th coolest	128 th coolest		
Record					
Warmest	29.6°F (1954)	38.7°F (1954)	21.2°F (1998)	73°F (Bismarck, 2016)	
Coolest	-14.1°F (1936)	-4.7°F (1936)	--23.4°F (1936)		-55°F (Minnewaukan, 1899)

Table 2: February 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

There was very little snow during the month of February. The biggest event occurred at the tail end of February, associated with a brutal cold front that dropped temperatures significantly. Strong winds persisted as well, the Fargo Airport measured a wind gust of 60 mph on the 27th. The criteria were met for NWS Grand Forks to issue a blizzard warning, with low visibility from the fresh snow falling across the Red River Valley. The highest snow totals of the event were measured in Griggs and Traill County, with 10-11 inches measured in the May-Port area.

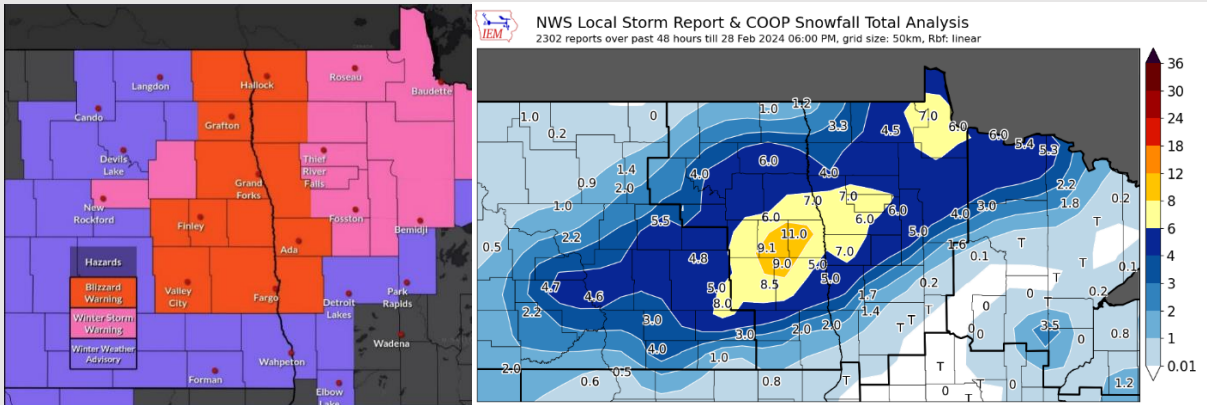


Figure 7: NWS Grand Forks issued a Blizzard warning for the Red River Valley (Left) Snow totals after the event (right) All of North Dakota was affected by this system (NWS)

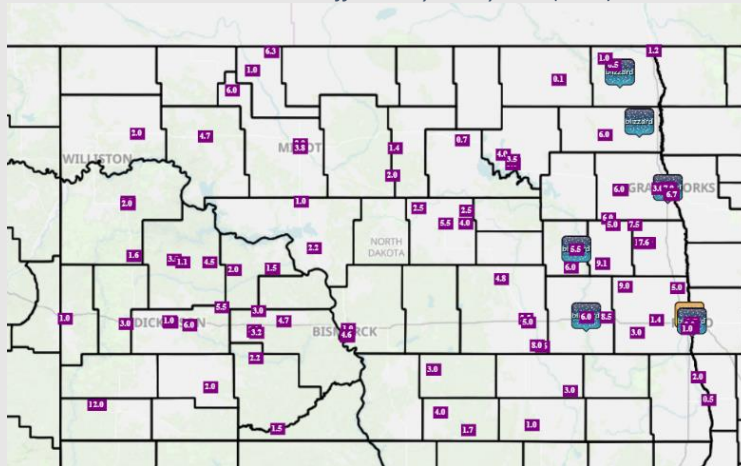


Figure 8: Local Storm reports for February 2024 indicate snow across the state, with blizzard conditions reported in the eastern portion of the state (IEM, NWS)

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In Late February Western North Dakota experienced extreme temperature swings that affected the Missouri River. Warm weather had melted and broken up ice throughout the river, and a rapid freeze associated with the temperature drop caused more ice buildup. This created an event known as an “ice jam” where river ice collects at a certain point, causing the river to back up. This can quickly create flood conditions, which was the case in the Bismarck/Mandan area. The Bismarck National Weather Service issued a Flood Warning for the area due to rising water in low-lying areas (Figure 9). The Missouri River gauge at Bismarck, which typically resides at around 10 feet, had reached up to 15.43 feet on February 29th (Figure 10). The flood warning expired on the first of March as the temperatures again rose into the 50s.

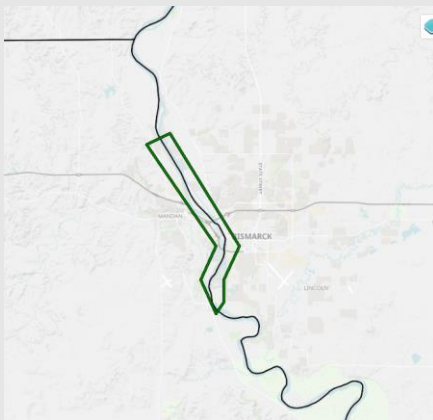


Figure 9: NWS Bismarck issued a Flood Warning, valid 2/29-3/1, as an ice jam caused river levels to rise rapidly, flooding low lying areas in the Bismarck/Mandan Area

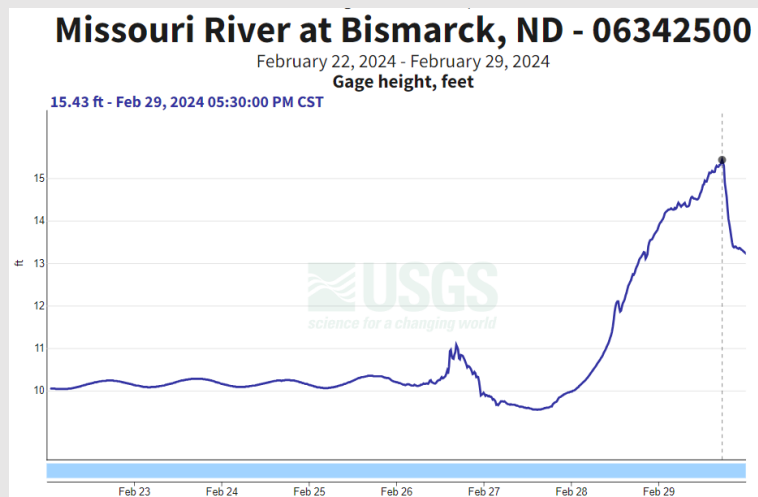


Figure 9: Missouri River Gauge Height at Bismarck, ND peaked at 15.43 feet on February 29th due to an ice jam caused by rapid heating and cooling of the river (USGS)



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Image/Data Sources

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

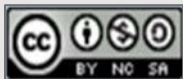
NDAWN current conditions

NDAWN Weather

SPC Storm Reports

NCEI Storm Events Database

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