

North Dakota Monthly Climate Summary

June 2025

Volume 19. No. 6

NORTH DAKOTA STATE CLIMATE OFFICE



June 2025



Photo: A swirl of dust can be seen associated with a tornado touchdown SW of Dickinson North Dakota on June 19, 2025

June is climatologically the wettest month of the year in North Dakota. A high percentage of North Dakota finished June 2025 with below average precipitation. Northern North Dakota was by far the driest area. State wide it was not only dry, but also on the cool side with most areas finishing a degree or two below average.

The month will likely always be remembered for the tornadoes, derecho, and mesoscale convective vortex that created hurricane force wind for over an hour during the evening and overnight hours of June 20-21, 2025, which will be presented in more detail later in this report.

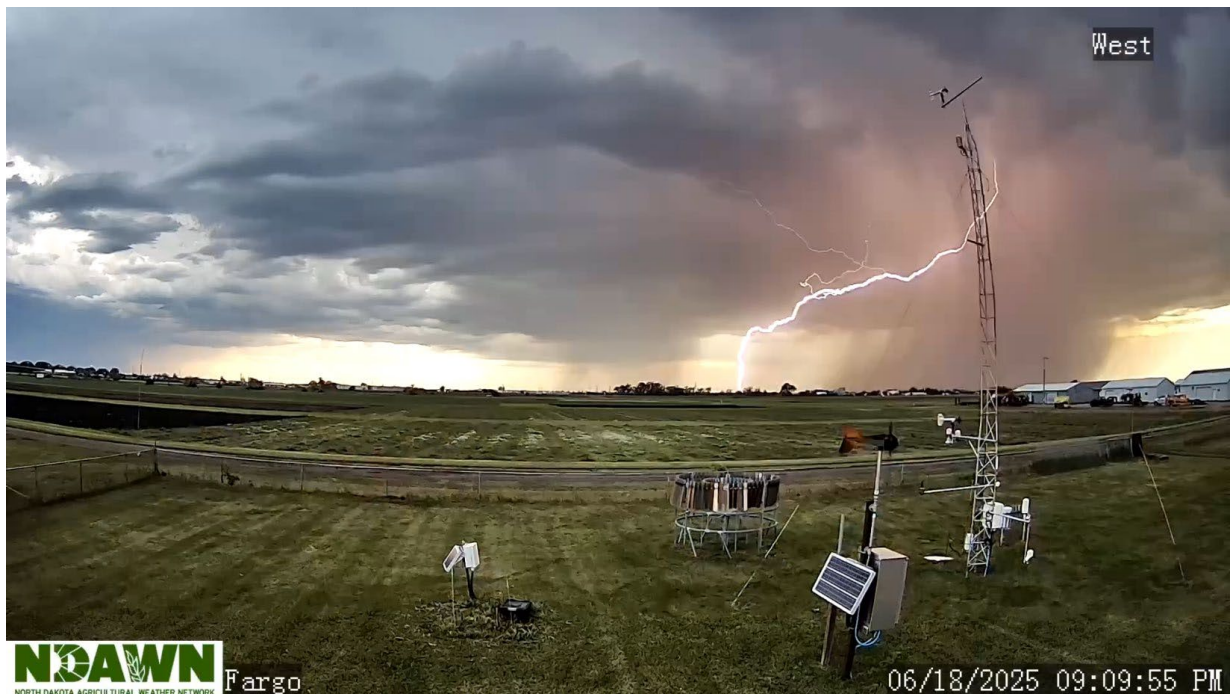
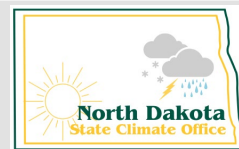


Figure 1: A lightning strike just west of the NDSU Fargo NDAWN location.

Daryl Ritchison, North Dakota State Climatologist

Precipitation

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June, being the wettest month of the year, is a critical month for the state. Often when June is dry, it is difficult to catch up as July and August usually have more evaporation potential than precipitation. The northern one-third of the state in particular was quite dry with only around or less than one-inch being recorded. By percent, that meant most of that part of North Dakota received less than 30% of normal precipitation, with some areas recording even less than 20% making it one of the driest Junes on record for some locations.

Total Precipitation (in)

06-01-2025 - 06-30-2025

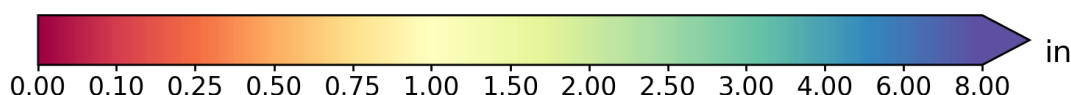
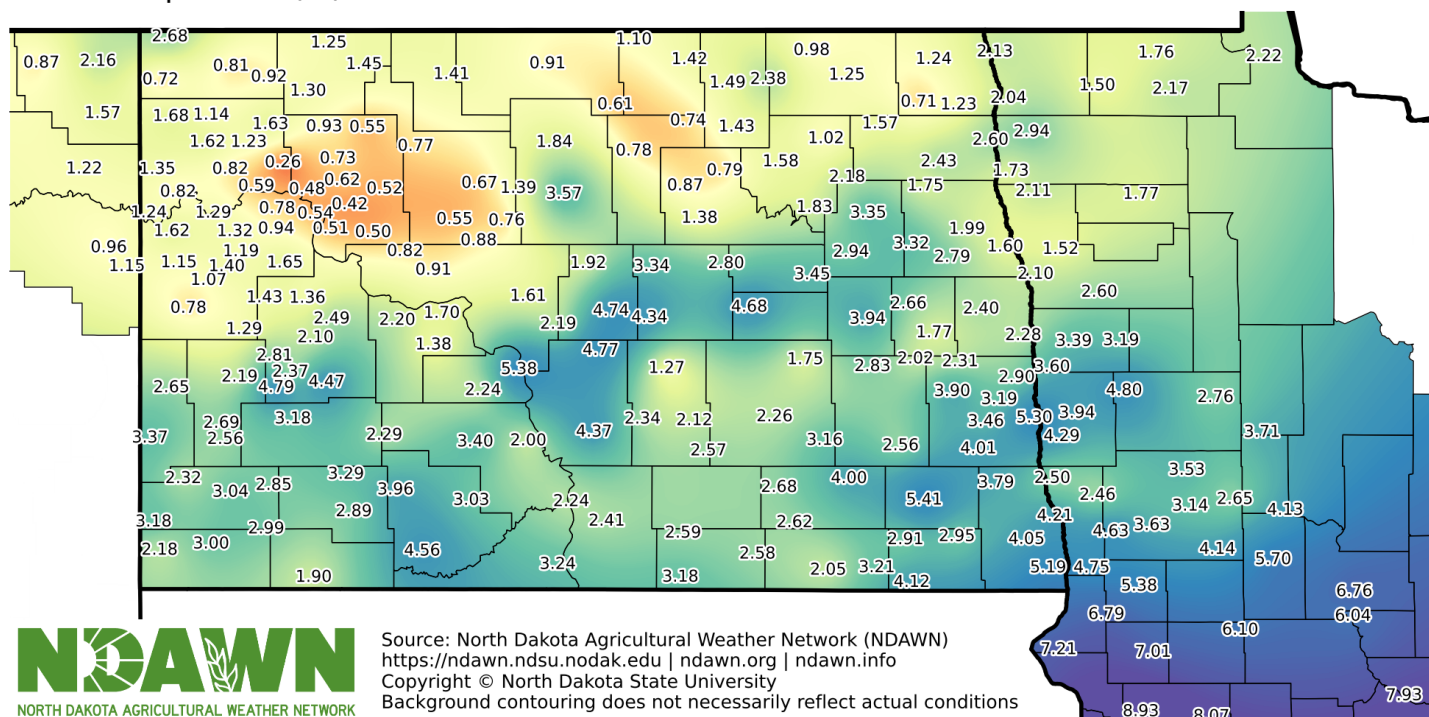
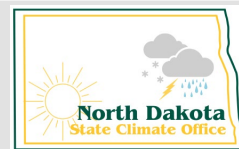


Figure 2: Total Precipitation measured at all NDAWN stations in June 2025

Precipitation

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The maximum monthly precipitation recorded by NDAWN (North Dakota Agricultural Weather Network) during the month of June was 5.38 inches at the Sanger station in eastern Oliver County. That was 164% of average. On the dry side of things, in northwestern North Dakota, the Dry Fork NDAWN station recorded just 0.26 inches of precipitation, less than 10% of normal (Figure 3).

Percent of Normal Precipitation (%)

06-01-2025 - 06-30-2025

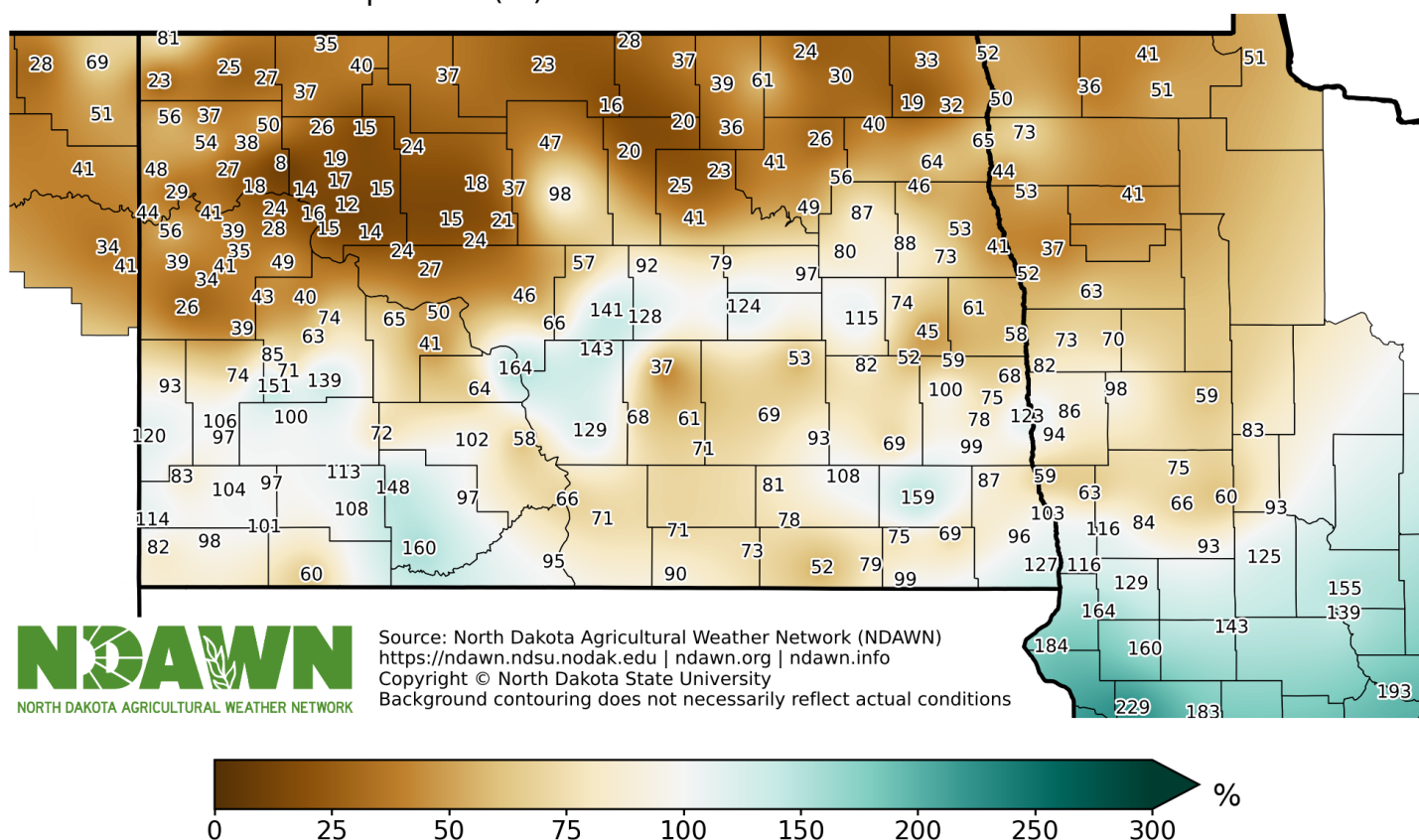
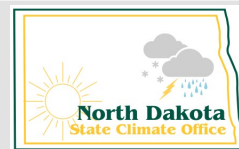


Figure 3: Percent of Normal Precipitation measured at each NDAWN station throughout the month of June 2025

Precipitation

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From a long-term perspective, although May precipitation did help in some areas, the dry conditions across northern North Dakota exasperated the dry conditions in that region (Figure 4). This was especially true for areas along and north of Highway 2. Northeastern North Dakota moved from D0, Abnormally Dry conditions, to D1, Moderate Drought over the course of the month because of the lack of rainfall in that part of the state.

Total Precipitation (in)

01-01-2025 - 06-30-2025

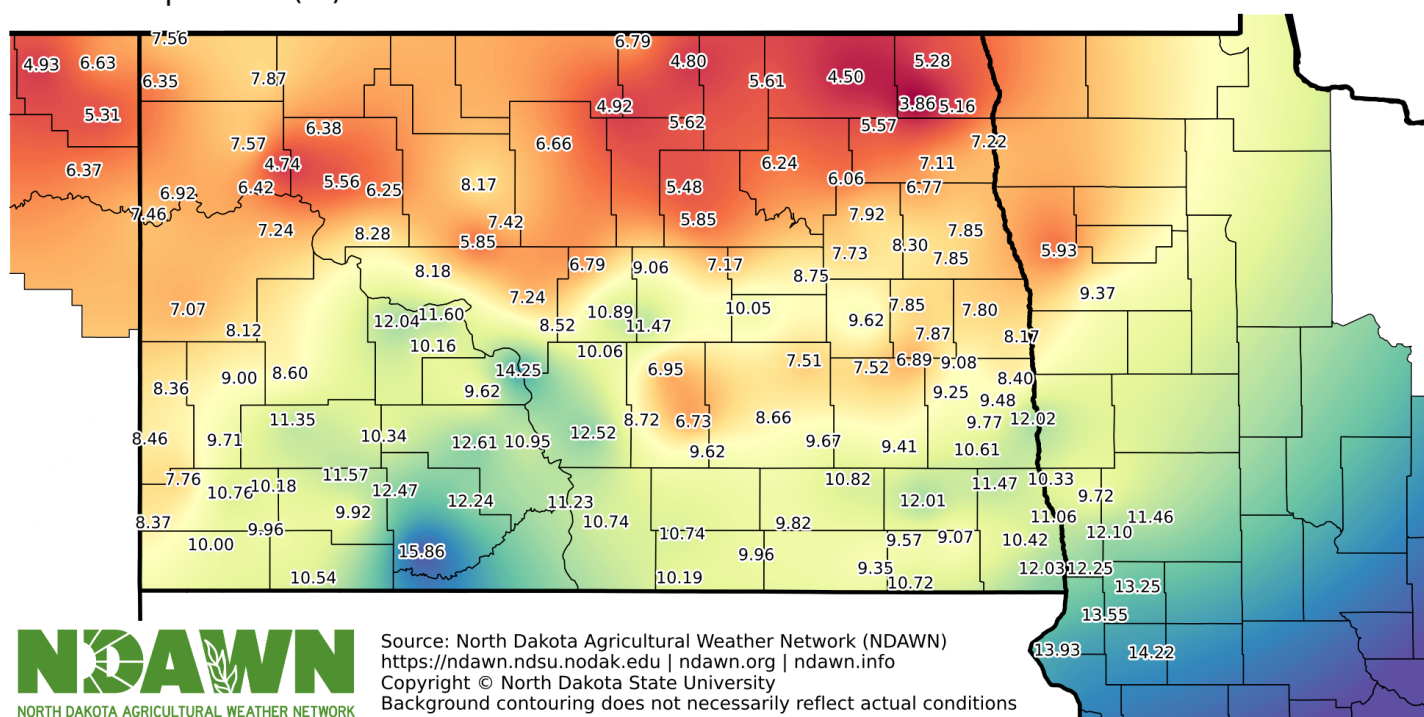
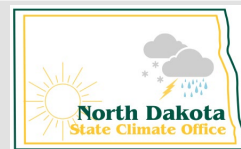


Figure 4: Total Precipitation from January through June at NDAWN with all-season gauges

Precipitation

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Improvements to the Drought Monitor that started in May, slowed down in June, with most of the improvement coming in the southwestern part of the state where the D2 drought was removed.

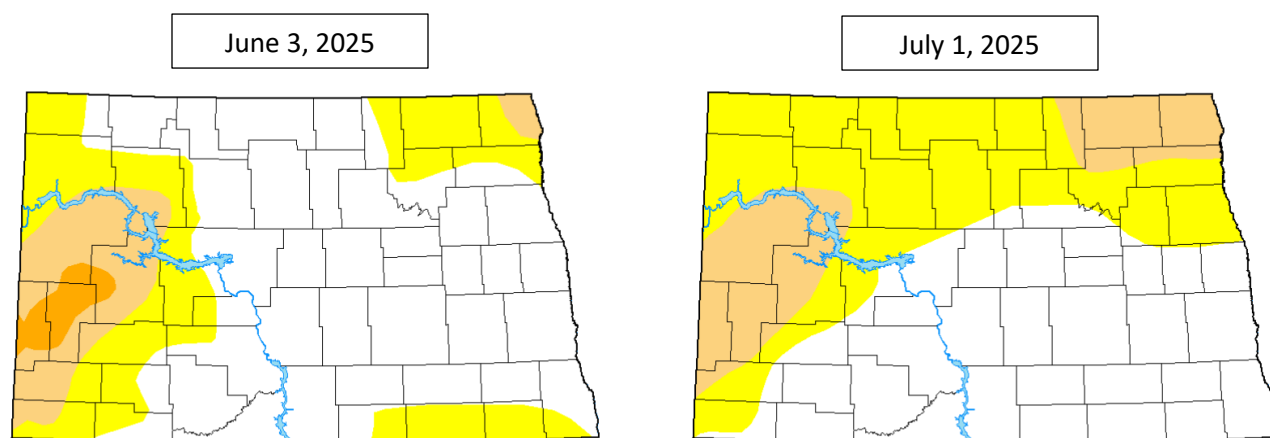


Figure 5: U.S. Drought Monitor conditions change between June 3, 2025 (left) to July 1, 2025 (right)

North Dakota Precipitation

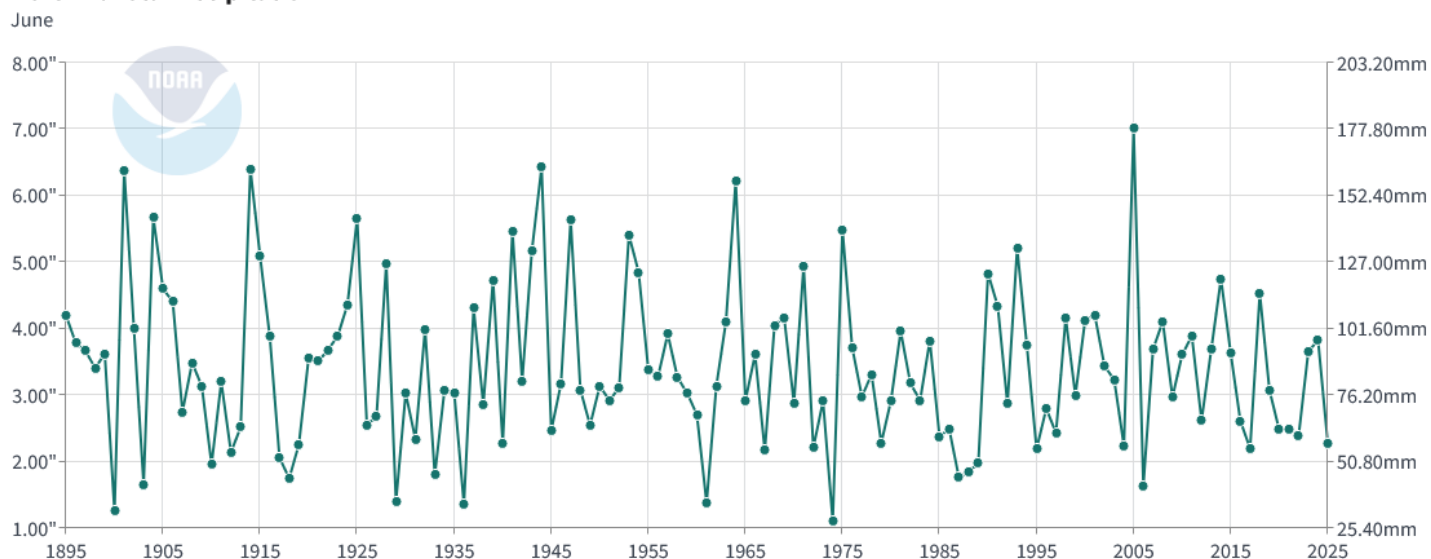


Figure 6: Average Precipitation in North Dakota for the month of June (via NCEI)

Precipitation

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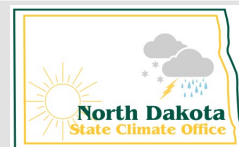


Figure 7: A rainbow after a thunderstorm with 1" hail fell over the NDAWN Belfield rain gauge only station.

North Dakota June Precipitation Summary

| | Precipitation | Normal | Anomaly | Rank | Record Year |
|-----------|---------------|--------|---------|---------------|-------------|
| June 2025 | 2.28" | 3.43" | -1.15" | 109th Wettest | 2005 |
| | | | | 23rd Driest | 1974 |

Table 1: June precipitation summary for North Dakota. 2025 statistics from NDAWN station data. Ranking and records based on NCEI climate data (1895-2025) (NOAA).

Temperature

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June overall was cooler than average with few days with extreme heat. (Figure 8). The National Center of Environmental Information (NCEI) had the month above average, but NDAWN data would say otherwise. NDAWN stations give a much better analysis than NCEI usually does and although their data is presented, overall, a vast majority of North Dakota recorded cooler than average temperatures which lessened crop development during the month.

Departure from Normal Average Air Temperature (° F)

06-01-2025 - 06-30-2025

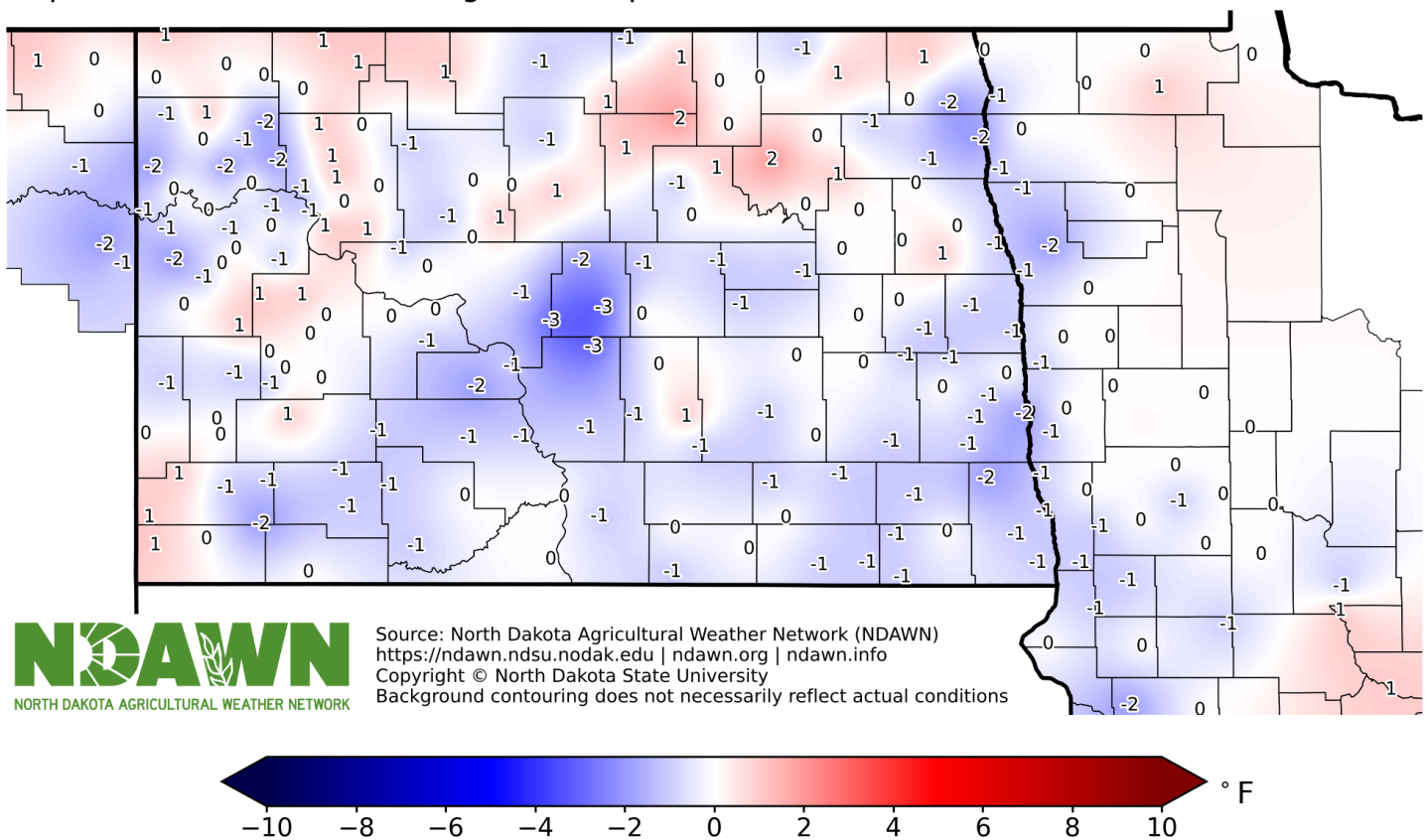


Figure 8: Average Air Temperature Departure from average for the month of June at all NDAWN Stations

Temperature

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As mentioned, there was little extreme heat during the month with much of the state not even recording a 90° maximum and the stations that did mostly only recorded a maximum for the month at 90° or slightly above (Figure 9). The highest temperature in North Dakota recorded at a NDAWN station was just 95° at the Mooreton station, in Richland County. Richland County is located in the far southeastern part of the state.

Maximum Temperature (° F)

06-01-2025 - 06-30-2025

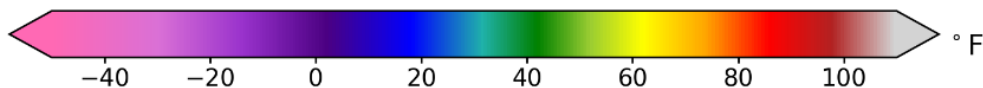
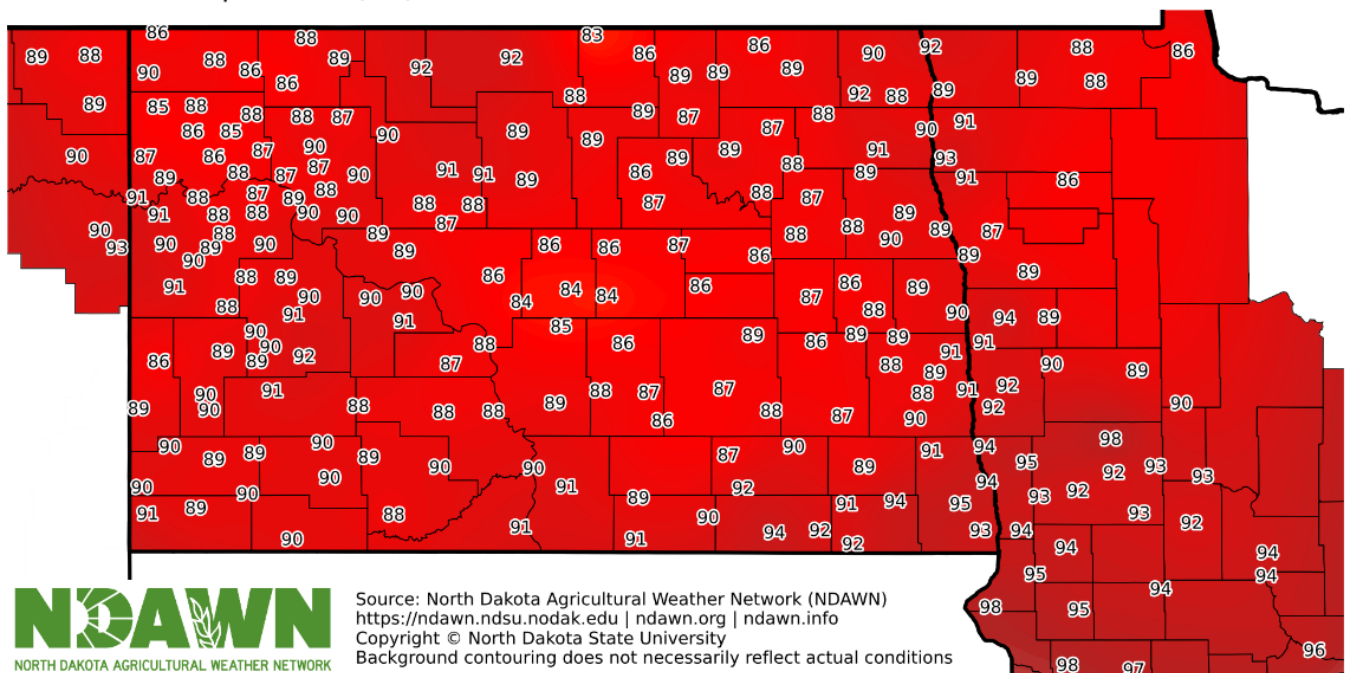


Figure 9: Maximum Temperature recorded at all NDAWN stations during the month of June

Temperature

The lowest temperature recorded during June at NDAWN stations was at the Willow City station with a minimum of 33° (Figure 10). Temperatures near freezing aren't necessarily unusual in June across, especially, northern North Dakota, but it was certainly unwelcomed as frost was observed in around that area. Fortunately, most station's minimums were much warmer.

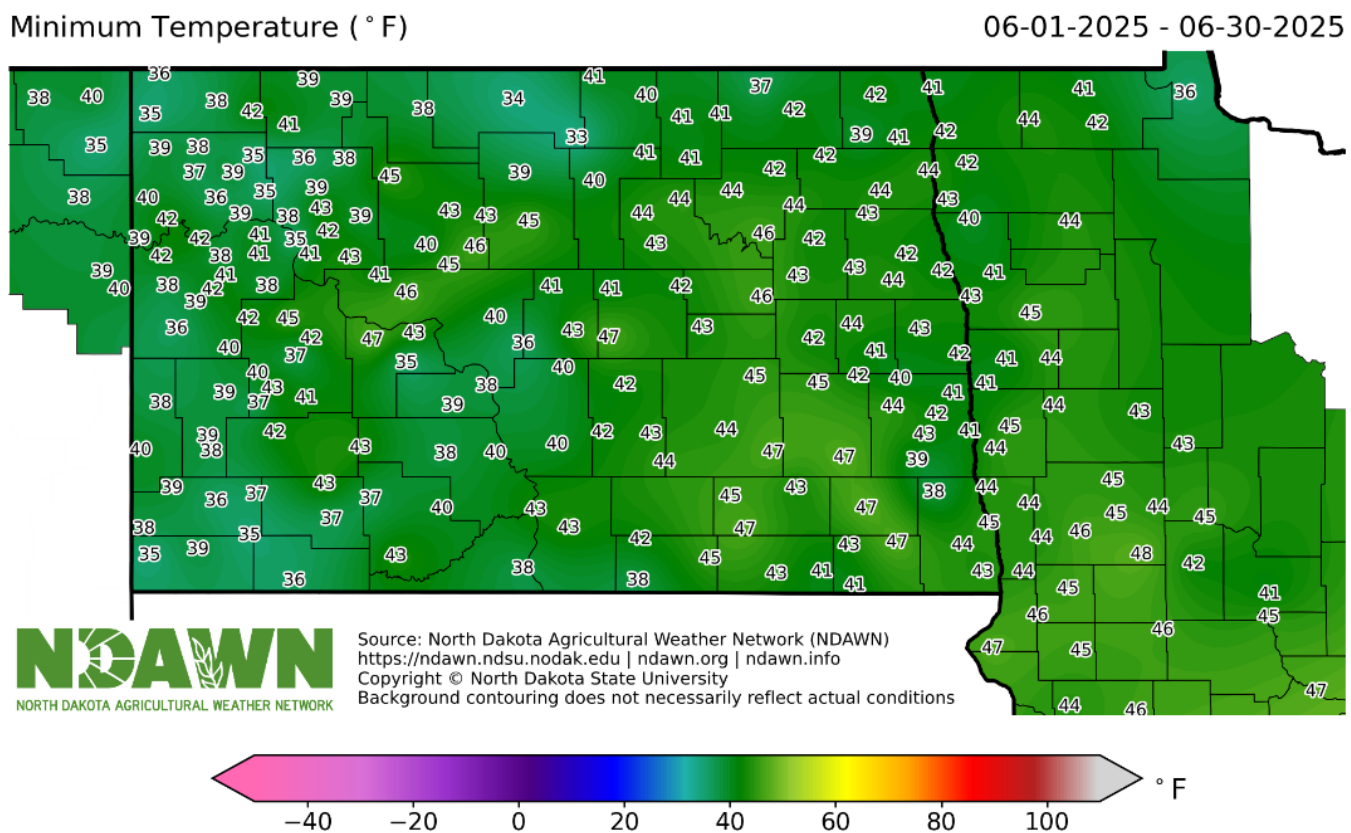


Figure 10: Minimum temperature recorded at each NDAWN Station during June

North Dakota June Temperature Summary

| June 2025 Temperature Summary | Average T | Avg max T | Avg min T | Maximum | Minimum |
|-------------------------------|---------------|--------------------------|--------------------------|---------|---------|
| | 64°F | 76°F | 52°F | 95°F | 33°F |
| Anomaly | +1.1°F | +0.8°F | +1.3°F | | |
| Rank | | | | | |
| Warmest | 49th warmest | 78 th Warmest | 44 th warmest | | |
| Coolest | 83rd Coldest | 54 th Coldest | 88th Coldest | | |
| Record | | | | | |
| Warmest | 74.1°F (1988) | 89.2°F (1988) | 68.2°F (1915) | | |
| Coolest | 56.8°F (1915) | 68.2°F (1915) | 44.8°F (1969) | | |

Table 2: June temperature summary for North Dakota. 2025 statistics from NDAWN station data. Ranking and records based on NCEI climate data (1895-2025) (NOAA).

North Dakota Average Temperature

June

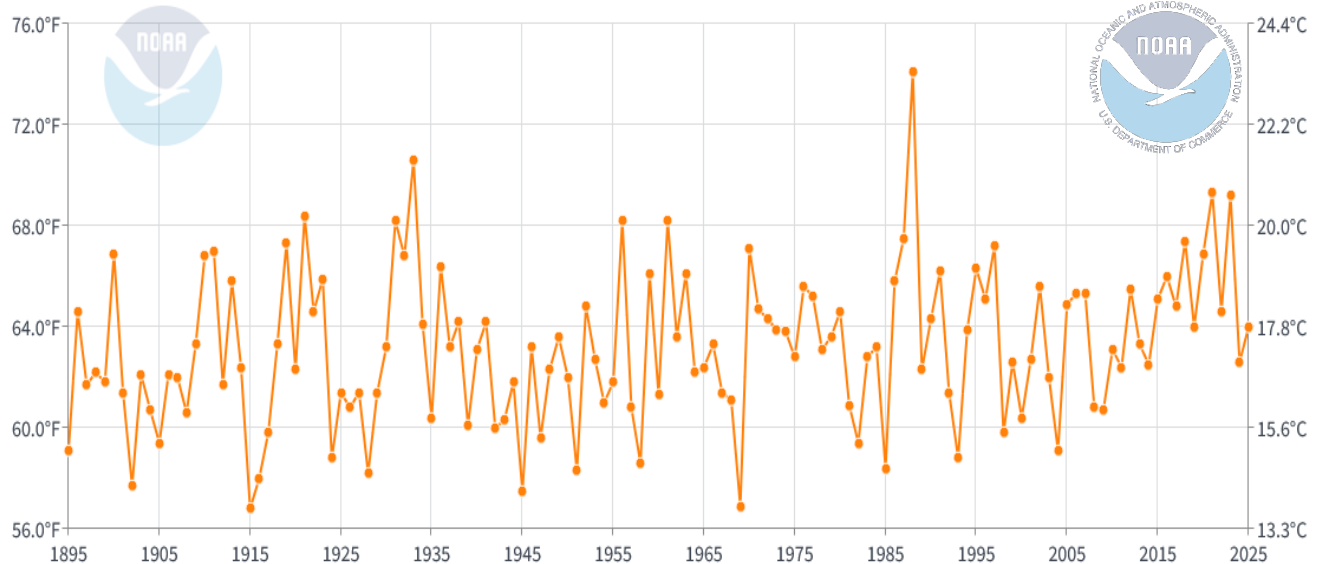


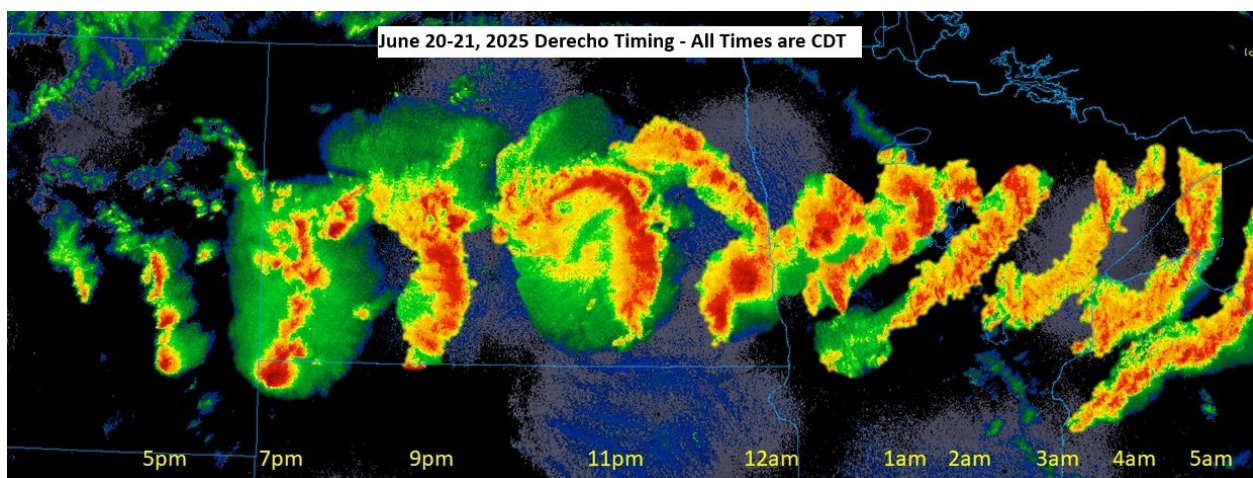
Figure 11: Average June Temperatures since 1895 based on NCEI analysis. NDAWN data suggested much colder readings.

Overview

On June 20-21, 2025, North Dakota experienced a severe weather outbreak characterized by a powerful derecho and multiple tornadoes, causing significant damage and loss of life. The event began in the late afternoon of June 20 and continued into the early morning of June 21, 2025, primarily affecting the southern and eastern parts of the state. Severe thunderstorms brought high wind, with gusts reaching up to 101 mph near Linton, North Dakota, alongside large hail, with sizes around 3 inches in diameter reported around Jamestown and Marion. Numerous tornadoes were reported, with notable impacts in Enderlin, where a preliminary EF-3+ tornado killed three people, and other areas like Spiritwood, New Salem, and Valley City, where tornados ranged from EF-2 to EF-3+ in intensity.

Meteorological Conditions

Two meteorological features impacted North Dakota on June 20-21, 2025. First was the long-lived straight-line wind event that was considered a derecho (Figure 1). A derecho, according to the National Oceanic and Atmospheric Administration (NOAA) definition has a wind damage swath extending for more than 400 miles, has wind gusts of at least 58 mph (50 knots) along most of its length and has several, well-separated 75 mph or greater gusts. As a reference, 58 mph is also considered to be the lower limit of a severe thunderstorm by the National Weather Service (NWS).

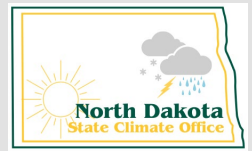


**Figure 1: Radar Composite during the late afternoon/night of June 20-21, 2025
(image from NWS Grand Forks)**

June 20-21, 2025

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Wind gusts began to exceed 58 mph in far southwestern North Dakota and continued to surpass severe limits across the entire state then into Minnesota (Figure 2). The highest recorded wind was 101 mph at the North Dakota Agricultural Weather Network (NDAWN) station near Linton, North Dakota. The 101-mph wind was the strongest wind recorded at any NDAWN station since the network started in 1989. Other wind gusts near 100 mph were recorded at the Robinson and Galesburg NDAWN stations that recorded gusts to 99 mph. NDAWN stations record wind at either 10 feet and/or 33 feet depending on the station. The Linton and Robinson station recorded their peak wind at 33 feet whereas the Galesburg station recorded the 99-mph gust at 10 feet.

Maximum Wind Gust (10ft or 33ft) (mph)

06-20-2025 - 06-21-2025

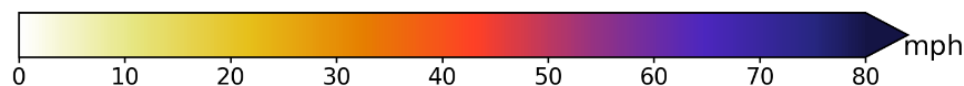
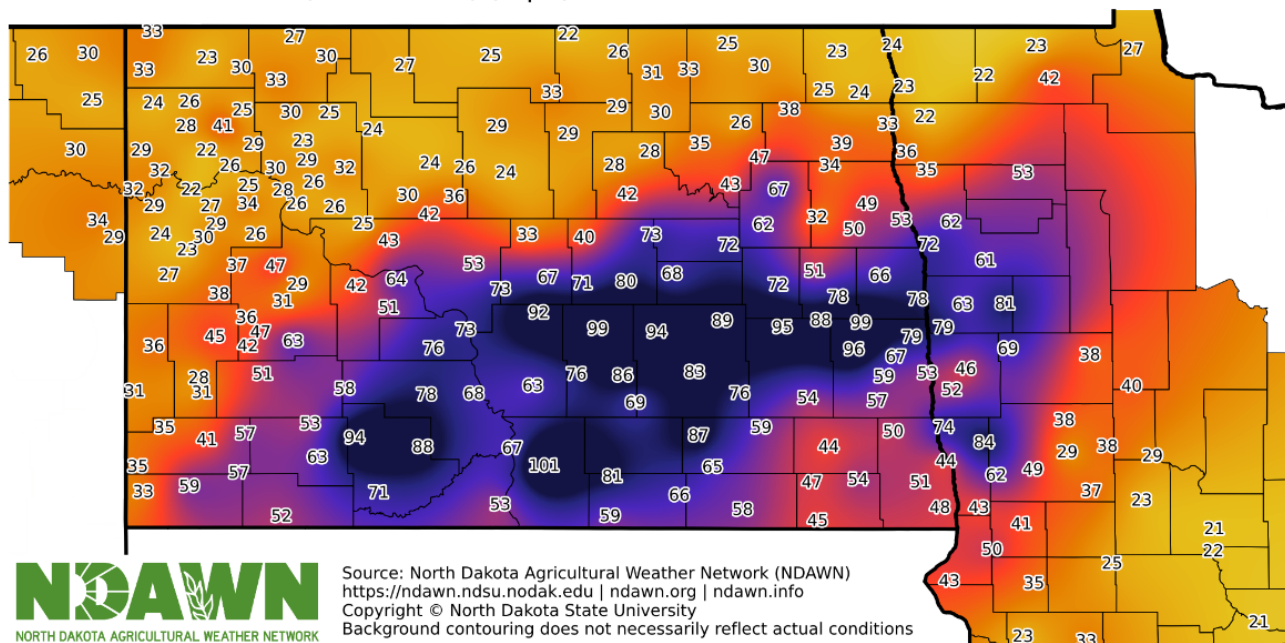


Figure 2: Maximum Wind Gust at 33 ft or 10 ft at NDAWN stations on June 20-21, 2025.
(image courtesy of North Dakota Agricultural Weather Network (NDAWN))

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The wind was strong enough to cause significant damage with the highest gusts measured at a given location, yet in addition, once the main line of storms moved into eastern North Dakota, a Mesoscale Convective Vortex (MCV) developed on the northern end of the bow echo that was moving across North Dakota. The MCV is essentially a low-pressure system that develops associated with the with bow echo. While MCVs are not uncommon in derecho events, this one was unusually intense and long-lasting.

Consequently, areas near and south of Highway 200 experienced 1 to 2 hours of winds between 60 and 90 mph or stronger. For example, Figure 3 illustrates the wind's duration and intensity at the Robinson, North Dakota NDAWN station in northern Kidder County, showing an initial gust over 70 mph, followed by over an hour of winds exceeding 60 mph with higher gusts, peaking at 99 mph during the MCV-enhanced winds. The combination of the wind's intensity and prolonged duration caused significant damage between Highway 200 and Interstate 94.

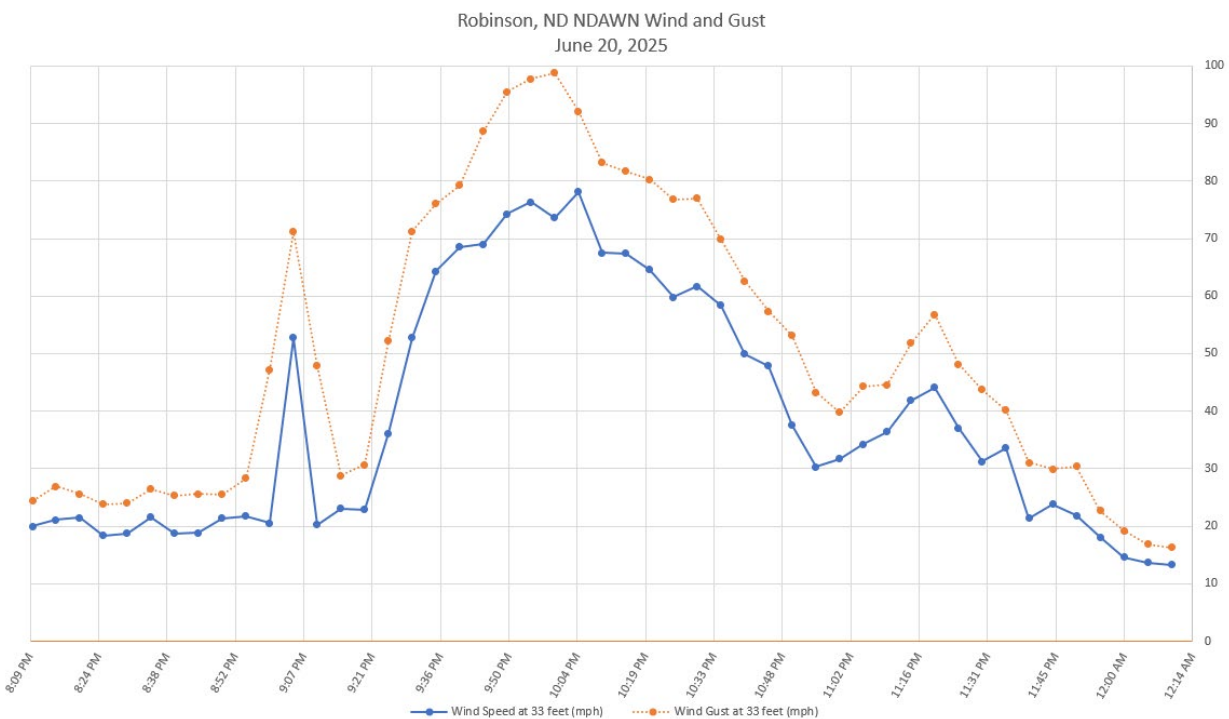


Figure 3: Sustained Wind (2-minute average) and Gusts at 33 ft at the Robinson NDAWN station during the evening of June 20, 2025

Damage Pictures



A “shelf cloud” associated with the Derecho as it approached the Elgin NDAWN station in Grant County, North Dakota. That station recorded a 94-mph wind gust shortly after this picture was taken. (photo courtesy of North Dakota Agricultural Weather Network (NDAWN))



Picture of train cars that were blown off the tracks near Page, North Dakota associated with the extreme long-lasting wind that moved through that area. (photo courtesy of Daryl Ritchison)

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Damage to grain bins to the east of Pillsbury, North Dakota associated with the with the extreme long-lasting wind that moved through that area. (photo courtesy of Daryl Ritchison)

Tornados

Before the MCV or derecho wind arrived in eastern North Dakota, two supercells developed near and south of Jamestown, North Dakota in Stutsman County. A supercell is a thunderstorm that contains a deep and persistent rotating updraft called a mesocyclone. Supercells can and occasionally produce not only tornados but large destructive tornados. During the evening of June 20, 2025, several tornados formed from these supercells. Tornados have a life cycle and it is common for a tornado to form, dissipate and then reform from the parent thunderstorm. That was the case during this event. Not all the tornados reported that day were from the supercells. Some were triggered by the bow echo/derecho wind event, but the notable impacts in Enderlin, where a tornado killed three people, and other areas like Spiritwood and Valley City, where tornadoes ranged from EF-2 to EF-3+ in intensity were triggered by the supercell thunderstorms that formed ahead of the derecho.

Most of the tornados formed in the southeastern quarter of North Dakota (Figure 4). The tornados were rated as high as EF-3+ on the Enhanced Fujita Scale based on damage the tornados caused. Figure 5 gives the representative wind estimate for each EF category.

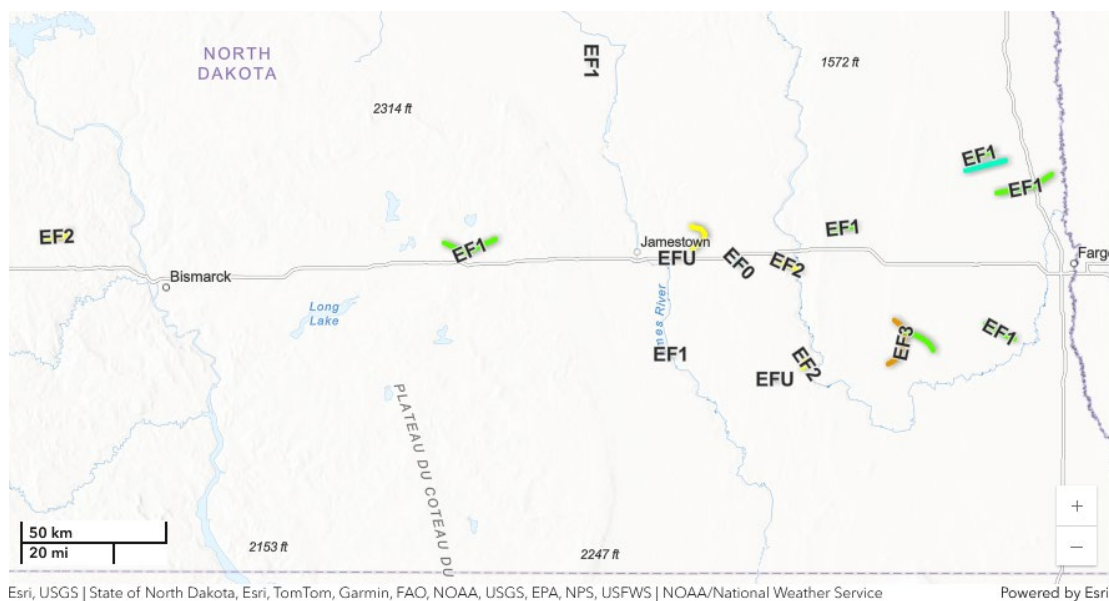


Figure 4: Locations and EF Scale of tornados from June 20, 2025. Image from NWS Grand Forks

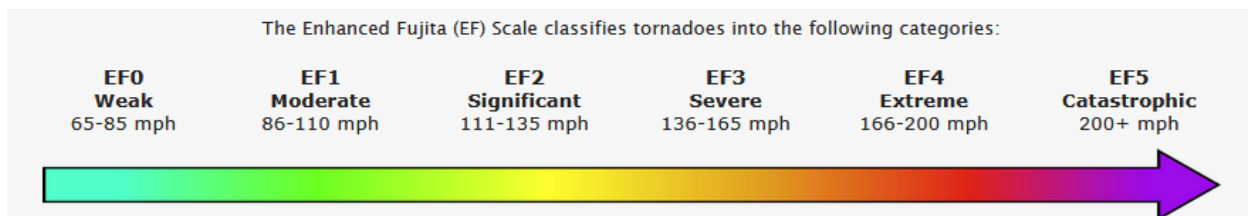


Figure 5: The EF Scale with the estimated wind speed associated with each category.

Tornado Damage Pictures



Picture of a developing tornado near Marion North Dakota via the Marion NDAWN station camera. (photo courtesy of NDAWN)



Stripped trees near Medina North Dakota caused by a tornado. Photo via NWS Bismarck.

Key Points and Conclusion

- **Derecho/MCV, Tornadoes and Hail:** A derecho and a Mesoscale Convective Vortex (MCV) produced wind gusts measured as strong as 101 mph (higher unmeasured wind was likely). The MCV was slow moving creating long-lasting 60 to 90+ mph wind for over an hour. Several tornadoes were reported, including the tornado near Enderlin, which claimed three lives (two men and one woman) at separate residences. Hail around 3 inches or larger caused damage in some areas.
- **Damage:** Extensive structural damage occurred, including destroyed homes, pole barns, and grain bins. Trees were uprooted, power lines downed, and over 75,000 households lost power across North Dakota (and Minnesota). Large hail (3 inches or greater) was reported and debris was scattered hundreds of yards.
- **Meteorological Context:** The most destructive tornados were spawned by supercell thunderstorms. The high wind was induced by the derecho and the long duration hurricane force wind was driven by a Mesoscale Convective Vortex, a low-pressure system that intensified the wind.