North Dakota Climate Bulletin

Spring 2024 **Volume 18, No. 1**

In this Issue:

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From the office of the State Climatologist

The North Dakota Climate Bulletin is a quarterly publication of North Dakota's weather and climate from the North Dakota State Climate Office in the College of Natural Resource Sciences, North Dakota State University in Fargo, North Dakota.

Spring (March-May) 2024 average temperature ranks as the 45th warmest out of 130 years of North Dakota climate data with a value of 40.9°F. Spring 2024 was bountiful in precipitation, with the 3-month average of 5.94 inches ranking as the 23rd wettest of 130 years. The majority of the state received at or above normal precipitation, East and Northeast North Dakota had the highest totals up to 150-200% of normal. Excessive rainfall towards the end of the season prevented or troubled some planting operations.

This year was not short of peculiar spring weather. There was a total of 633 Local Storm Reports during the three months that included rain, snow, hail, and even a tornado in Northern Richland County. Windy days reigned in spring with major North Dakota cities averaging around 50 days of average wind gusts greater than 30 mph. This consistently ranks as one of the top 10 windiest springs within the last 30 years.

Figure 1: The Northern Lights seen from the camera on the NDAWN Clyde station on May 10, 2024

Detailed monthly summaries can be found at www.ndsu.edu/ndsco

Cassidy Holth, Assistant to the North Dakota State Climatologist.

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

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Seasonal Summary

Precipitation

Statewide spring (March 1-May 31) precipitation averaged 2.04 inches, above normal average precipitation of 1.59 inches for the season. Areas along the Red River Valley received well over 8 inches while Western North Dakota received normal or just under normal precipitation. The Peace Garden NDAWN station in Rolette County received the most rain with 9.65 inches, a remarkable 5.05 inches above normal. The Ekre station followed with 9.04 inches, 3.34 inches above normal. The least precipitation was collected at the Marmarth (2N) NDAWN station in Slope County with 3.45 inches which is 1.5 inches less than normal (NDAWN, Figure 2).

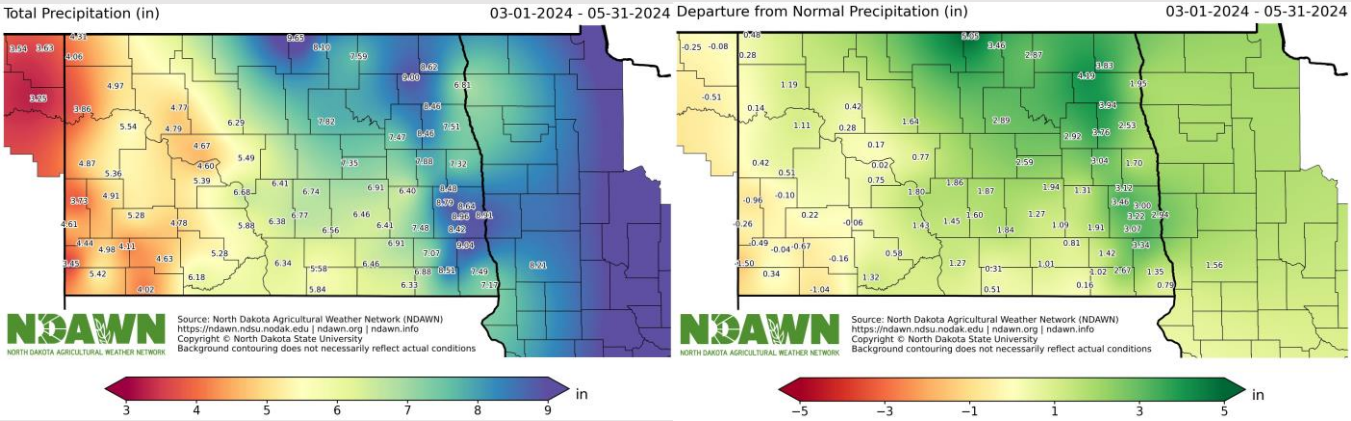

Figure 2: Total precipitation (left) and departure from normal (right) recorded by NDAWN stations between 3/1/2024-5/31/2024

Rainfall was persistent across North Dakota from a very active springtime weather pattern. While the Central and Southern Plains endured severe weather seemingly on end, the Northern Plains saw stratiform rain leading to high precipitation totals. Thanks to the mild winter, the few inches of snow that fell in March did not stick around. However, the final snowfall of the season happened on May 24 and dropped approximately 8 inches at the Peace Garden NDAWN station, and other public reports in the area concur about 2-4+ inches as well. The high solar angle and warm ground quickly helped to rid of the late-season snow.

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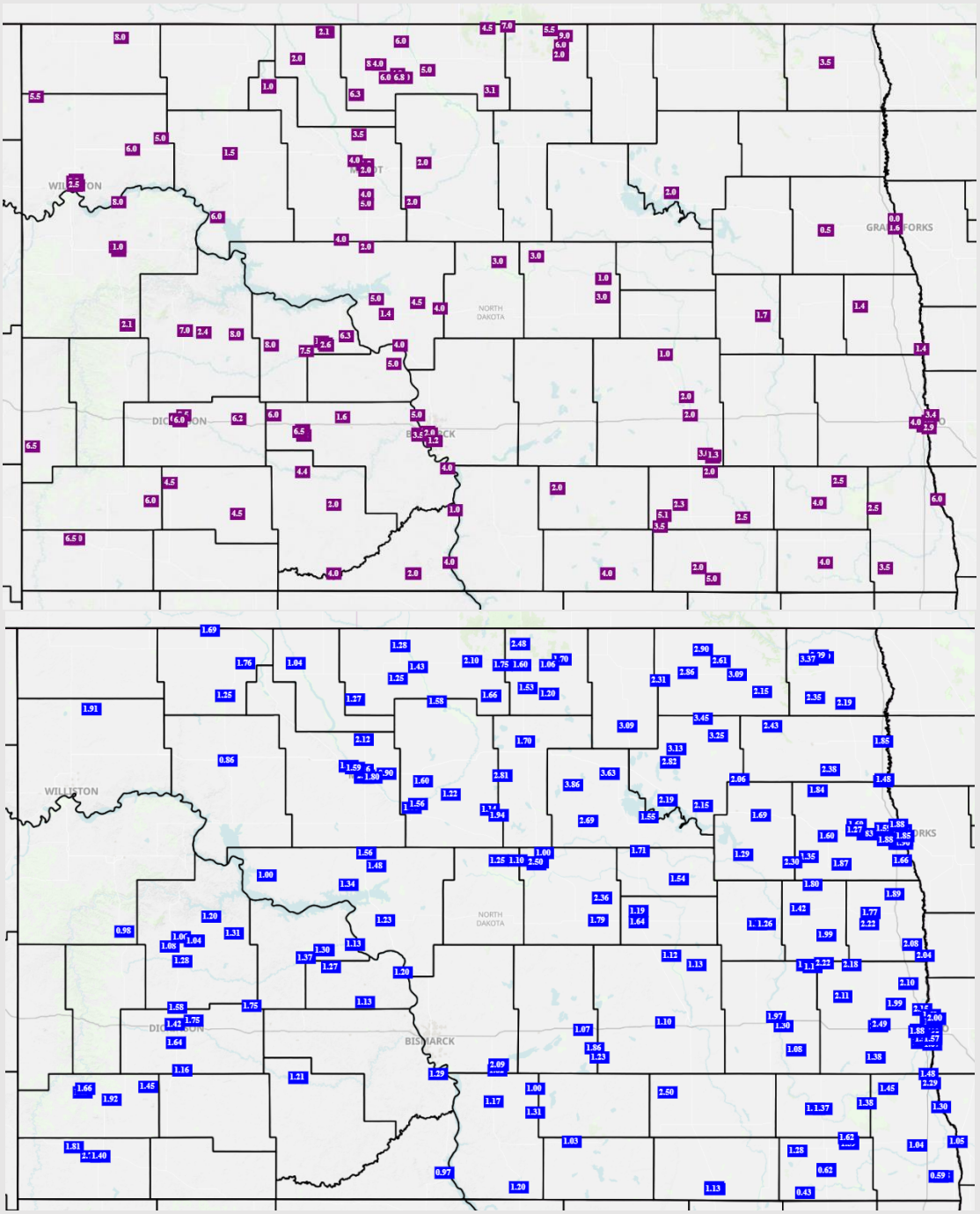

Figure 3: Local snow reports (Top) and rain reports (Bottom) between 3/1/2024 - 5/31/2024

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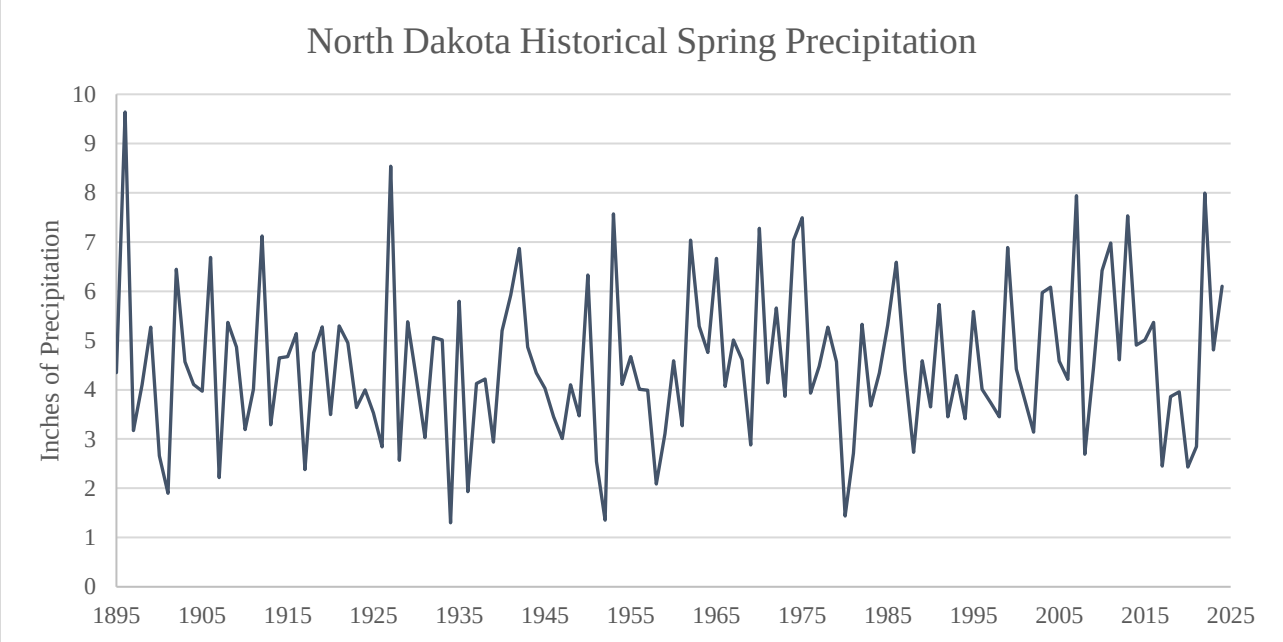
Historically, spring precipitation is variable across the Northern Plains due to a number of factors. Perhaps the biggest factor is how late the snowpack sticks around, keeping air temperatures cool enough that precipitation falls as snow and drier air inhibits moisture in the lower atmosphere. Recently in North Dakota a dry period was observed between 2017-2021. 2022-present spring season has seen above average precipitation.



North Dakota Spring Precipitation Summary

	Precipitation	Normal	Anomaly	Rank	Wettest/Driest Since	Record Year
Spring 2024 ***March-May***	6.12”	4.76”	+1.36”	21st Wettest	Wettest since 2022	1896
				110th Driest	Driest since 2023	1934

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

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Temperature

The warmest average spring temperature occurred in 1977 with a value of 48.1°F and the coldest in 1899 with 31.5°F.

The average temperature across North Dakota for the three-month period was 41°F, around the normal average temperature (NDAWN) (Figure 5). In 2024 February was quite warm, followed up by a below average March, almost 2°F cooler than normal in North Dakota. April showed up quickly and returned to more spring like temperatures, over 2.5°F above normal, which evened out the springtime average. May was a normal month, much different than May 2023 which was ranked as the 6th warmest on record.

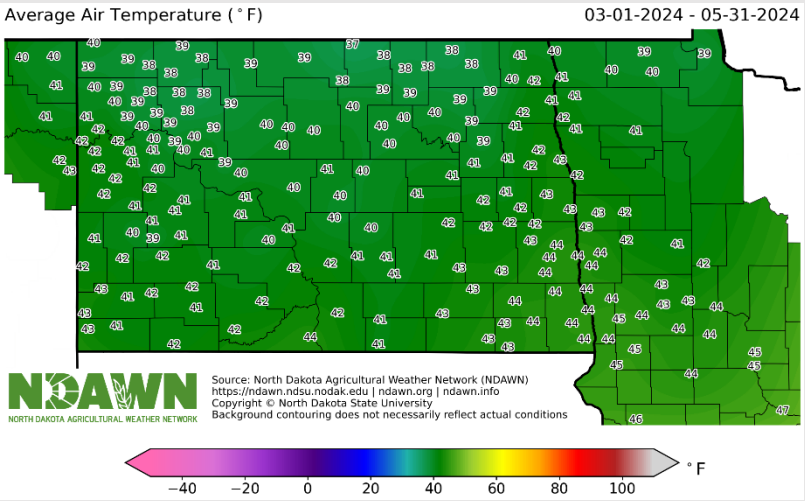

Figure 5: Average temperature across North Dakota NDAWN stations from 3/1/2024-5/31/2024

The statewide average maximum temperature was 52.3°F, equal to the normal max temperature. Similarly, average minimum temperature was only 0.5°F warmer than normal. Overall in North Dakota, the Eastern portion of the state was a few degrees above normal, while Western North Dakota was at or slightly below normal.

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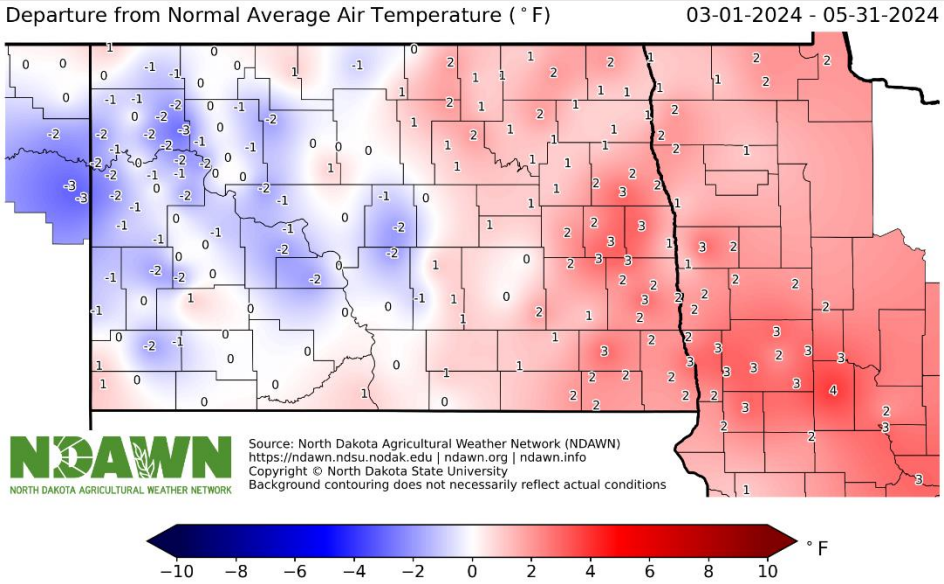

Figure 6: NDAWN Departure from normal temperatures for each station from 3/1/2024 - 5/31/2024

North Dakota Spring Temperature Summary

Spring 2024 March-May	**Average T**	**Avg max T**	**Avg min T**	**Maximum**	**Minimum**
	40.98°F	52.35°F	29.62°F	89°F	-23°F
Anomaly	+0.33°F	+0.04°F	+0.61°F		
Rank					
Warmest	45th Warmest	51st Warmest	43rd Warmest		
Coolest	86th Coolest	80th Coolest	88th Coolest		
Record					
Warmest	48.1°F (1977)	61.3°F (1977)	34.8°F (1977)	111°F (Langdon, May 30, 1934)	
Coolest	31.5°F (1899)	42.6°F (1950)	20.3°F (1899)		-48°F (Mohall, March 14, 1897)

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

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Storm Reports & Record Events

NWS Issued Warnings

Throughout March-May 2024, North Dakota received 633 Local Storm Reports consisting of rain, snow, wind, hail, and even tornado reports. Two tornadoes were reported in North Dakota during the spring, both happening in late May. The first in Southwestern North Dakota in Adams County on 5/23 and second in Cass County on 5/24. The maximum hail size reported was 2 inches (golf ball, hen egg size) in Beach ND; this occurred on May 29. Strong thunderstorm gusts were reported in multiple areas of the state on May 17, the highest of which was measured by the DOT north of Grand Forks with 76 mph winds (Figure 4). The number of Local Storm Reports in the state was above average by 183, a breakdown by county shows that Cass County was the most above average, and Morton County was the lowest below average (Figure 5).

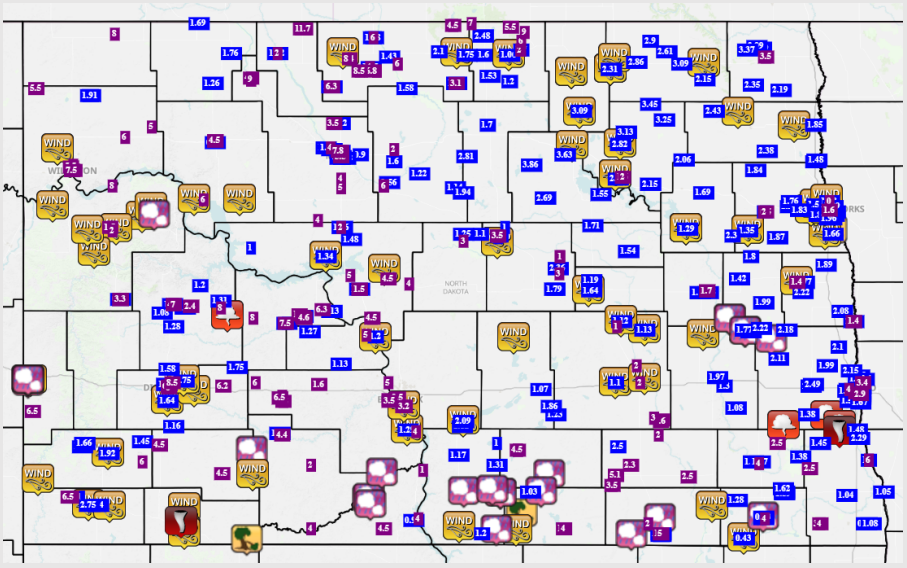

Figure 4: Total Local Storm Reports across North Dakota between 3/1/2024 – 5/31/2024

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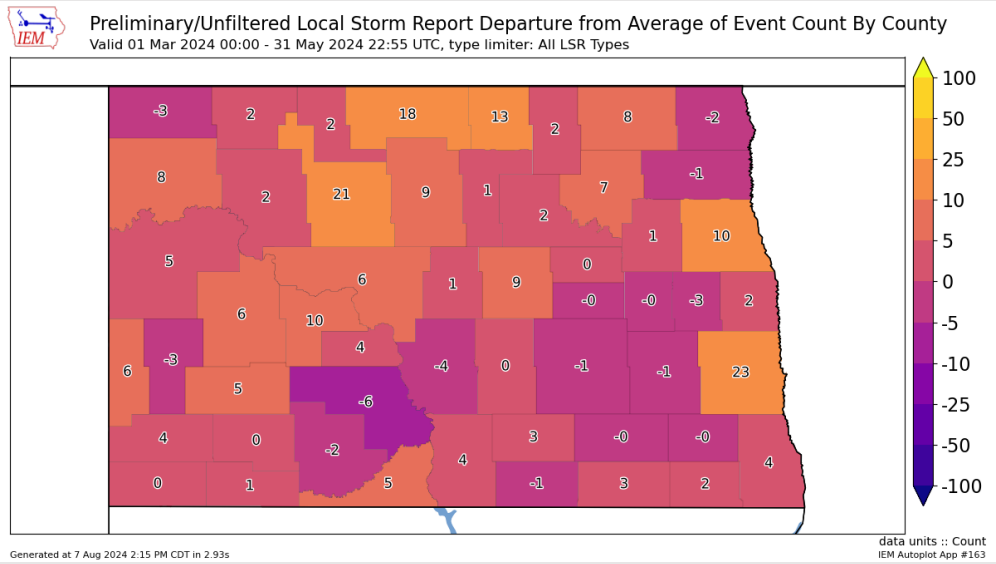

Figure 5: Departure from the average number of Local Storm Reports between 3/1/2024 - 5/31/2024 in North Dakota broken down by county

There were in total 41 Severe warnings during Spring 2024. Of which, 9 warnings were flood related, 1 was a tornado warning, and 31 severe thunderstorm warnings (Figure 6). Emmons County had the highest number of severe thunderstorm warnings during the season (Figure 7). The average number of severe thunderstorm warnings during the spring in North Dakota over the last 38 years is 27.5, 2024 was just slightly above average with 31 severe thunderstorm warnings (Figure 8).

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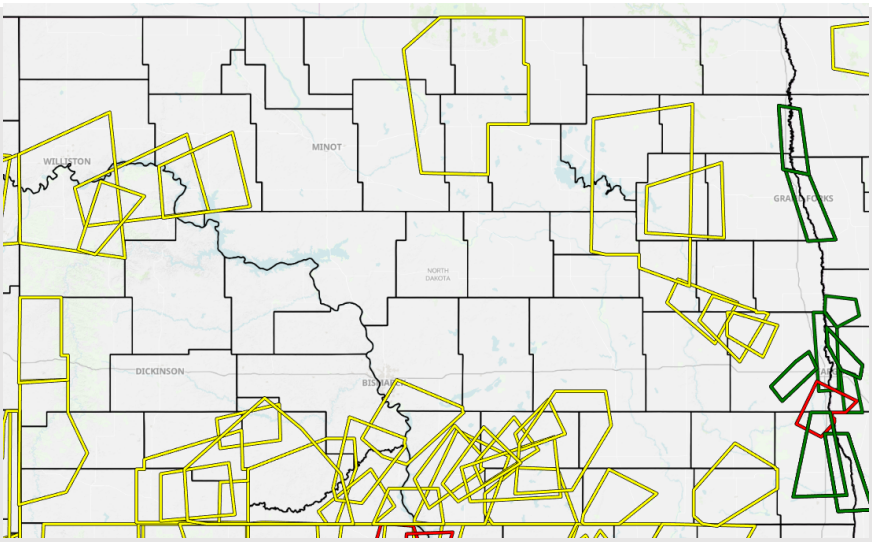

Figure 6: Visual of warning polygons issued by NWS between 3/1/2024 - 5/31/2024 Yellow = Severe thunderstorm, Red = Tornado, Green = Flash Flood (NWS, IEM)

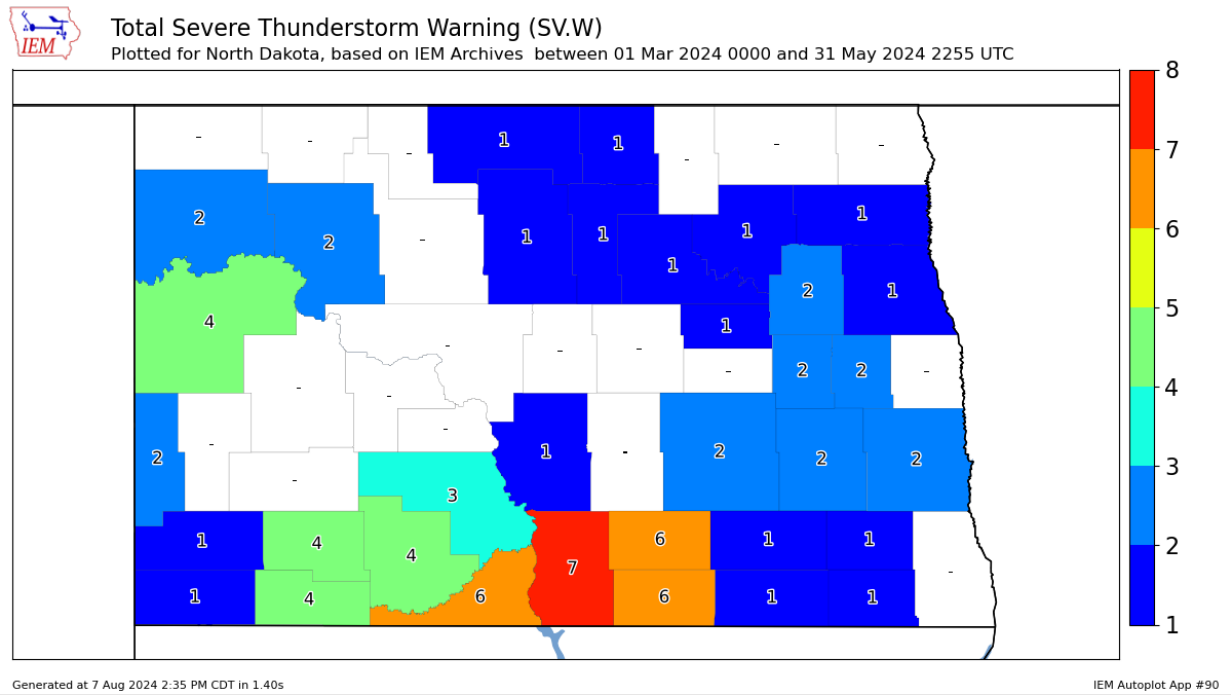

Figure 7: Severe Thunderstorm Warnings in North Dakota by County between 3/1/2024-5/31/2024 (Note this map only includes Severe Thunderstorm Warnings) (NWS, IEM)

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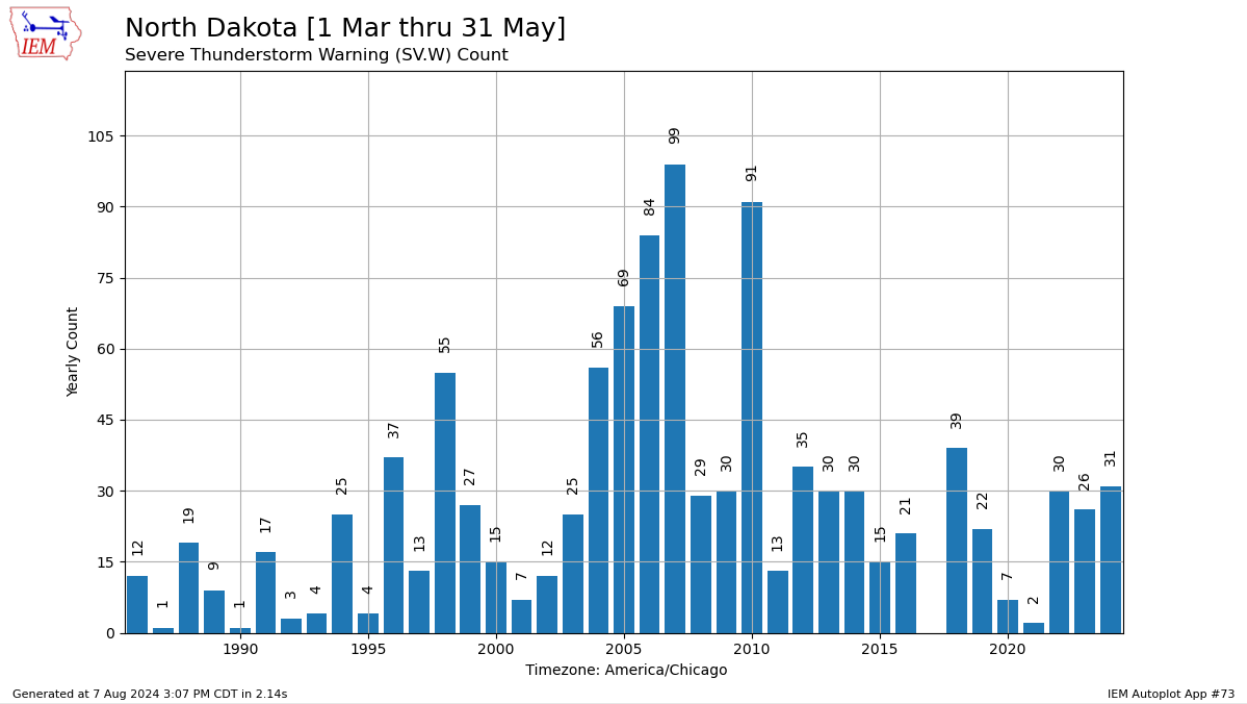

Figure 8: Number of Severe Thunderstorm Warnings from 3/1 - 5/31 from 1986-2024 (Note this graph only includes Severe Thunderstorm Warnings) (NWS, IEM)

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Image/Data Sources

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

NDAWN Weather

SPC Storm Reports

NCEI Storm Events Database

NWS Grand Forks and Bismarck

GOES Satellite

XMACIS2

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