North Dakota Monthly Climate Summary

May 2023 **Volume 17, No. 5**

North Dakota State Climate Office: Your Resource for Climate Information

North Dakota State University

School of Natural Resource Sciences

174 Van Es Hall

Fargo, ND 58108

www.ndsu.edu/ndsco

cassidy.holth@ndsu.edu

This publication can be made available in alternative formats upon request.

Precipitation

Based on data from 133 stations* across the North Dakota Agricultural Weather Network (NDAWN) the statewide average precipitation in May 2023 was 2.71 inches. The statewide average departure from normal precipitation was insignificant, however May 2022 notably averaged 1.61 more inches of precipitation than this year. The greatest precipitation was recorded at the Sawyer (7S) NDAWN station in Ward County with 6.01 inches, which is 3.25 inches more than normal. The least precipitation fell in Towner County, where the Cando (1W) NDAWN station measured just 0.11 inches. (Figure 1)

Maximum May average precipitation occurred in 1927 with 5.96 inches, and minimum average precipitation in 1901 with 0.23 inches. Historical climate data indicates a 0.33 inch increase over a century long trend (NCEI) for the month of May (Figure 2).

Average May precipitation was 1.9 inches greater than the previous month and ranks as the 43rd wettest May over 129 years of precipitation data (NCEI).

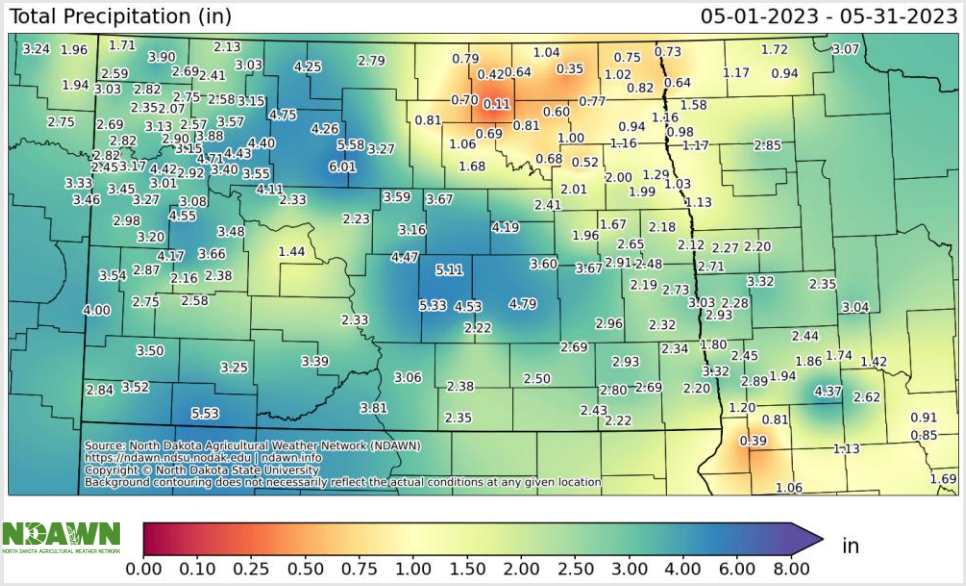


Figure 1: Total precipitation 5/1/2023 - 5/31/2023 at all NDAWN stations (NDAWN)

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

North Dakota Monthly Climate Summary

May 2023 **Volume 17, No. 5**

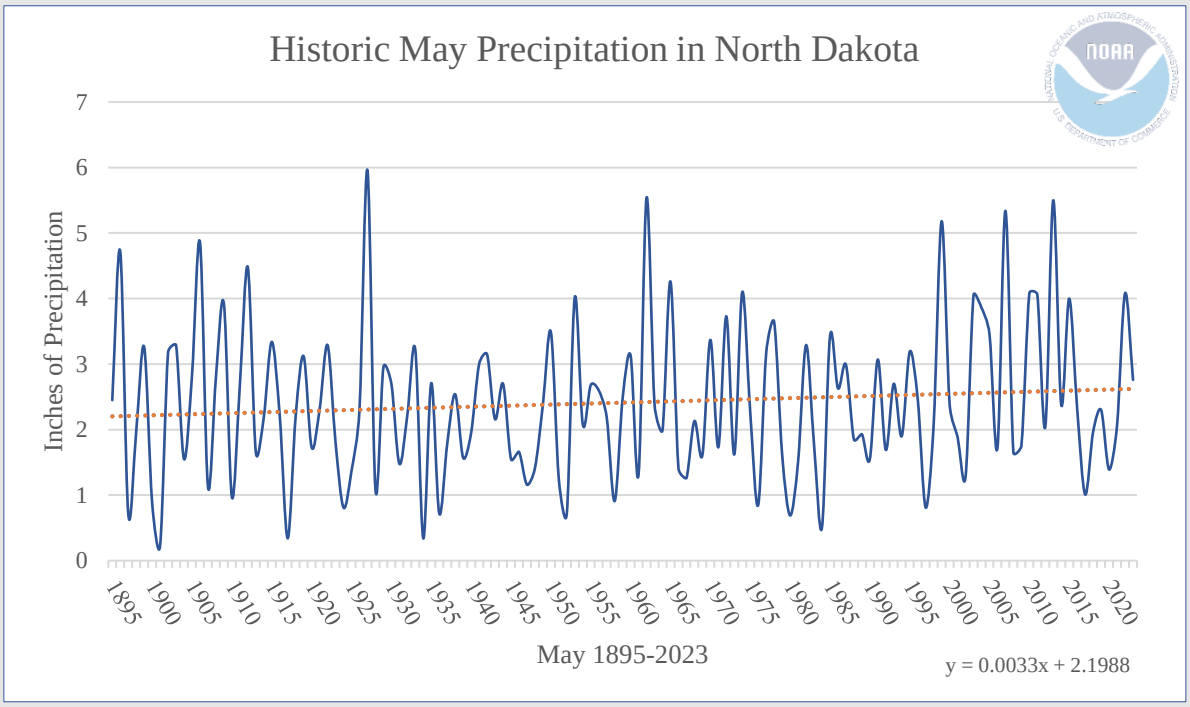


Figure 2: Historic average May precipitation 1895-2023 (NCEI, NOAA) with trendline representing average change per century.

North Dakota May Precipitation Summary

	Precipitation	Normal	Anomaly	Rank	Wettest/Driest Since	Record Year
May 2023	2.71”	2.70”	+0.01”	43rd Wettest	Wettest since 2022	1927
				87th Driest	Driest since 2023	1901

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

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

NORTH DAKOTA STATE CLIMATE OFFICE ndsco

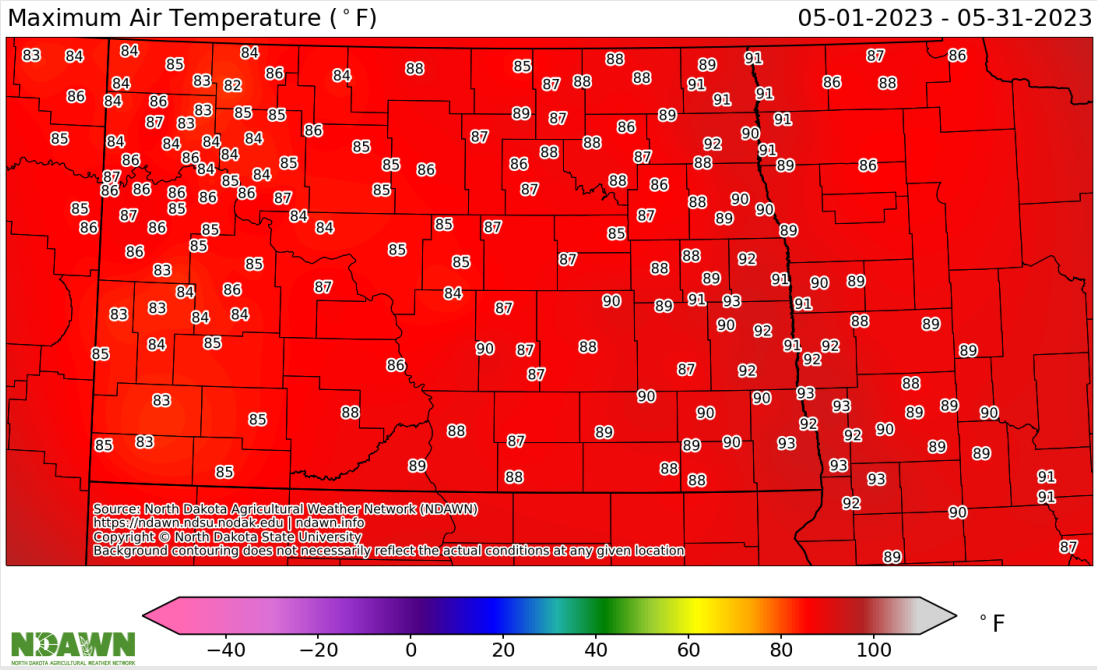
North Dakota Monthly Climate Summary

May 2023 **Volume 17, No. 5**

Temperature

The North Dakota May 2023 average temperature was 60.1°F making it the 6th warmest May within the period of record (129 years) (NCEI). Normal May temperatures average 53.8°F; making 2023 a +6.3°F departure from normal. (NDAWN, Figure 5) The maximum temperature recorded by NDAWN was 93°F at the Mooreton (3SW) station in Richland County and Galesburg (4SSW) in Cass County. All NDAWN stations recorded a maximum temperature greater than 80°F in the month of May. The minimum temperature recorded in North Dakota in May was 21° at the Alexander (7SW), Hettinger (NW), and Carson (9ENE) NDAWN stations (Figure 3). With a range of 72°F, it is clear there was a substantial difference between the maximum and minimum temperatures for May.

Statewide Maximum and Minimum Air Temperature



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

NORTH DAKOTA STATE CLIMATE OFFICE ndsco

North Dakota Monthly Climate Summary

May 2023 **Volume 17, No. 5**

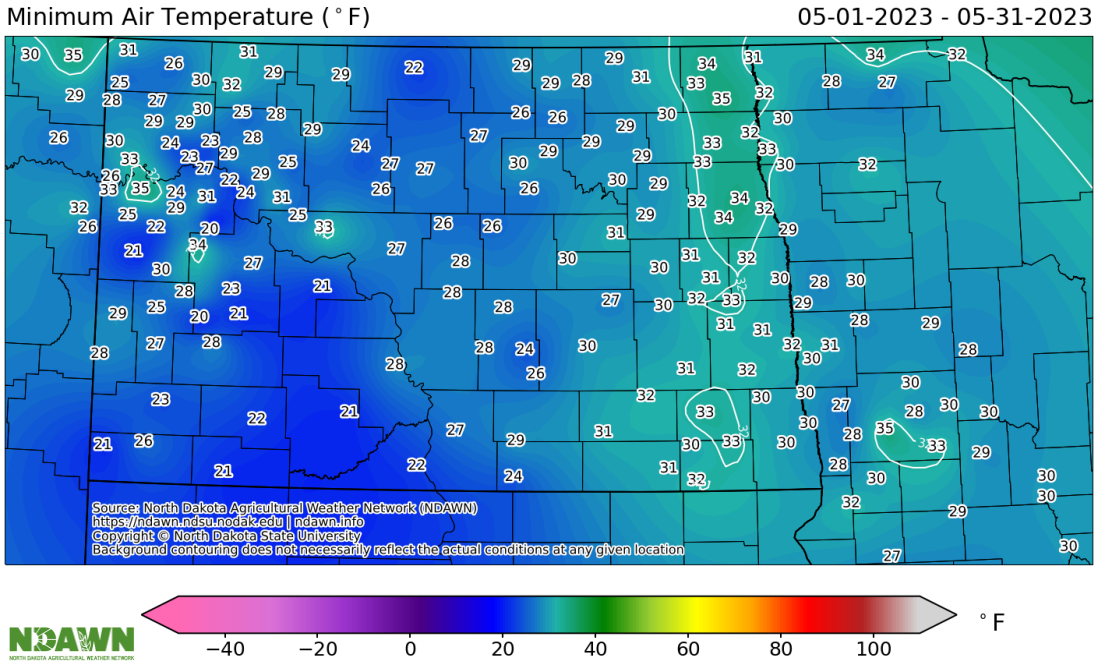


Figure 3: Maximum (Top) and Minimum (Bottom) air temperatures (°F) for May 2023 at all NDAWN Stations

May 2023 temperatures differed greatly from the month prior. April 2023 had an average temperature of 34.3°F; nearly a 20°F difference between the months. Though maximum temperatures in May reached well into the 90s, the average daily high temperature statewide was 73.1°F. This is still an average of 6.8°F warmer than normal May temperatures. Daily minimum temperatures for May averaged 47°F; 5.6°F warmer than normal (NDAWN). NCEI historical temperature for May in North Dakota indicates an increase of 0.9°F per century (Figure 4, NCEI).

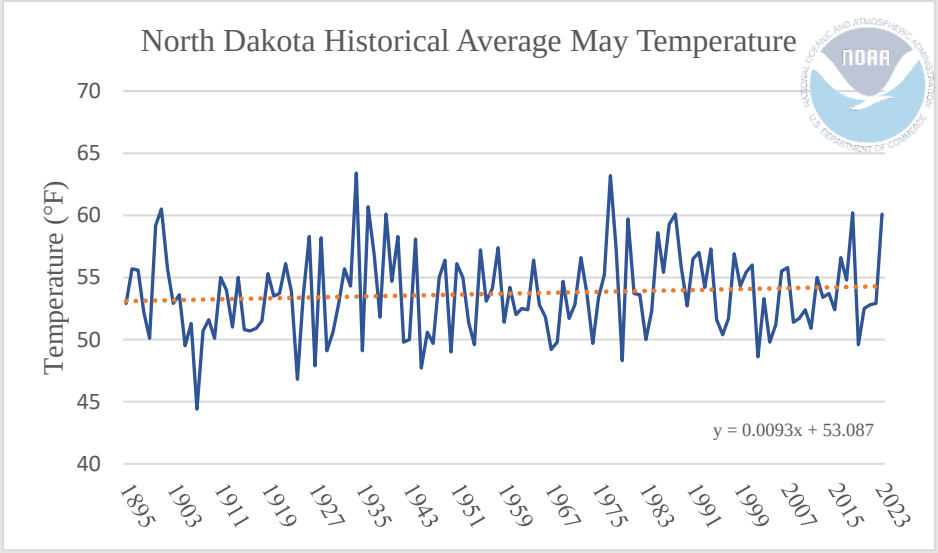


Figure 4: May historic average temperatures in North Dakota with trendline representing change per century. (NCEI)

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

NORTH DAKOTA STATE CLIMATE OFFICE ndsco

North Dakota Monthly Climate Summary

May 2023 **Volume 17, No. 5**

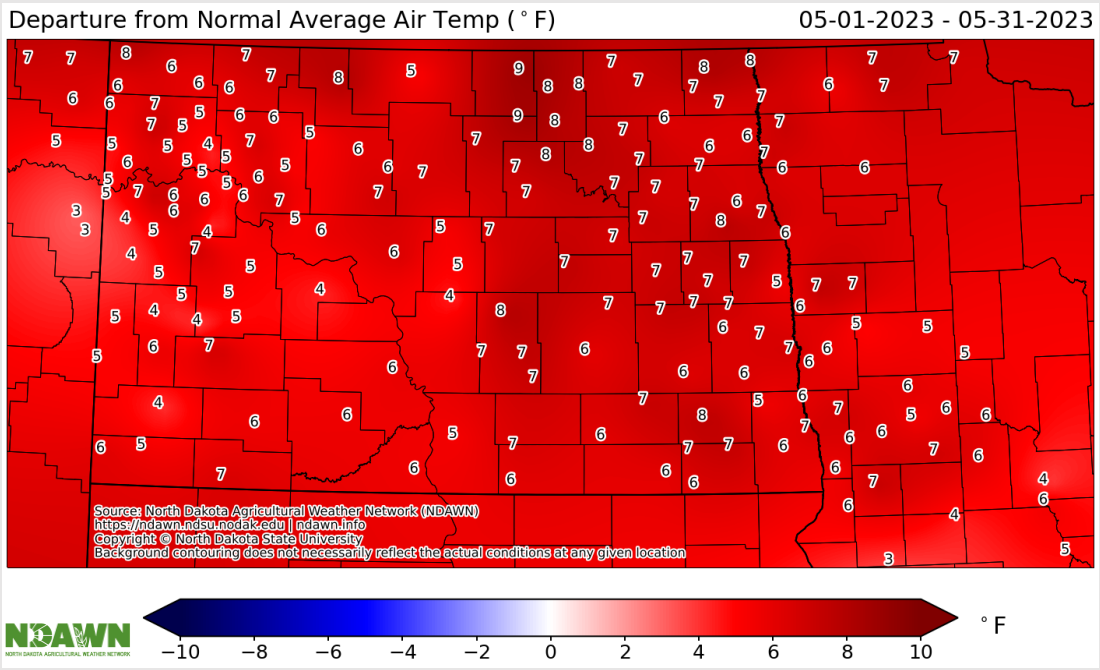


Figure 5: Departure from normal average air temperature for May 2023 at all NDAWN stations.

North Dakota May Temperature Summary

May 2023 Temperature Summary	Average T	Avg max T	Avg min T	Maximum	Minimum
	60.1°F	73.1°F	47.0°F	93°F	21°F
Anomaly	+6.3°F	+6.8°F	+5.6°F		
Rank					
Warmest	6th Warmest	10th warmest	3rd warmest		
Coolest	124th Coolest	120th coolest	127th coolest		
Record					
Warmest	63.4°F (1934)	76.2°F (1901)	49.3°F (1977)	111°F (Langdon, 1934)	
Coolest	44.4°F (1907)	56.9°F (1927)	31.2°F (1907)		-3°F (Larimore, 1967)

Table 2: May 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.*

North Dakota Monthly Climate Summary

May 2023 Volume 17, No. 5

Storm Reports

May 2023 had the chance to produce few storms severe enough to warrant storm reports of hail and damaging winds. In total, the National Weather Service (NWS) reported 20 severe hail reports; 10 of which were 1.00”-1.24”, and the remaining 10 reported 1.25”-1.99” (Figure 6). There were three reports of wind damage, however no measurements of severe wind gusts. Severe weather was mostly isolated to the western half of North Dakota, with only one severe wind report and two severe hail reports within the NWS Grand Forks Weather Forecasting Office (WFO). No tornado reports were made in May in North Dakota.

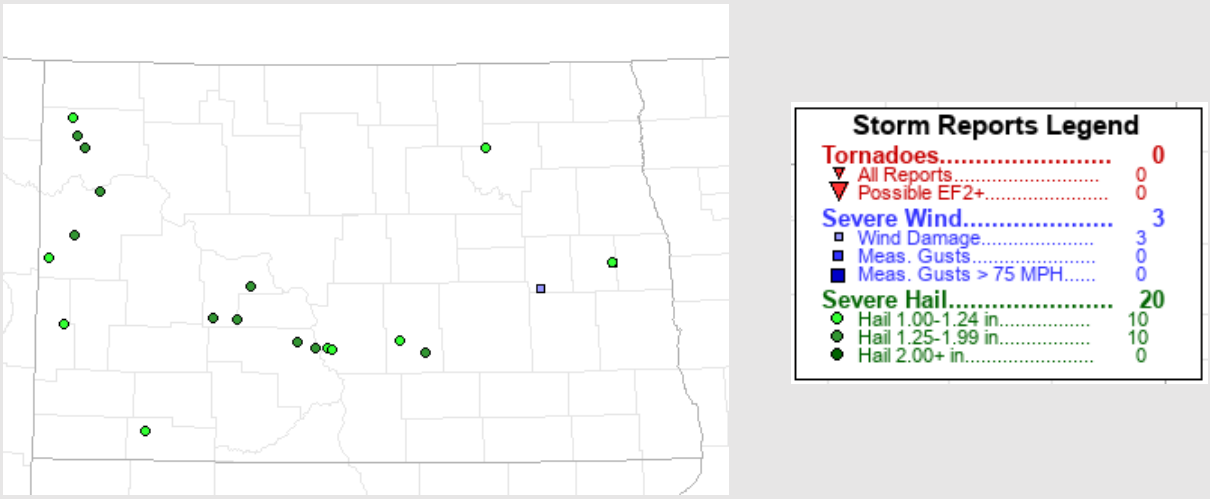


Figure 6: NOAA Storm Prediction Center summary of storm reports that occured in May 2023 (NOAA SPC)

According to the NWS and the North Dakota Department of Air Quality, May 17th 2023 was one of the worst air quality days ever recorded in North Dakota due to smoke from Canadian wildfires. Air Quality Index was well into the Hazardous category statewide, with most sensors measuring up to and over 700 µg/m^3. The highest air quality measured on that day was 1,041 µg/m^3 in Oliver County (WESTAR). Wildfire smoke persisted throughout much of the month, seen in Figures 7 and 8.

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

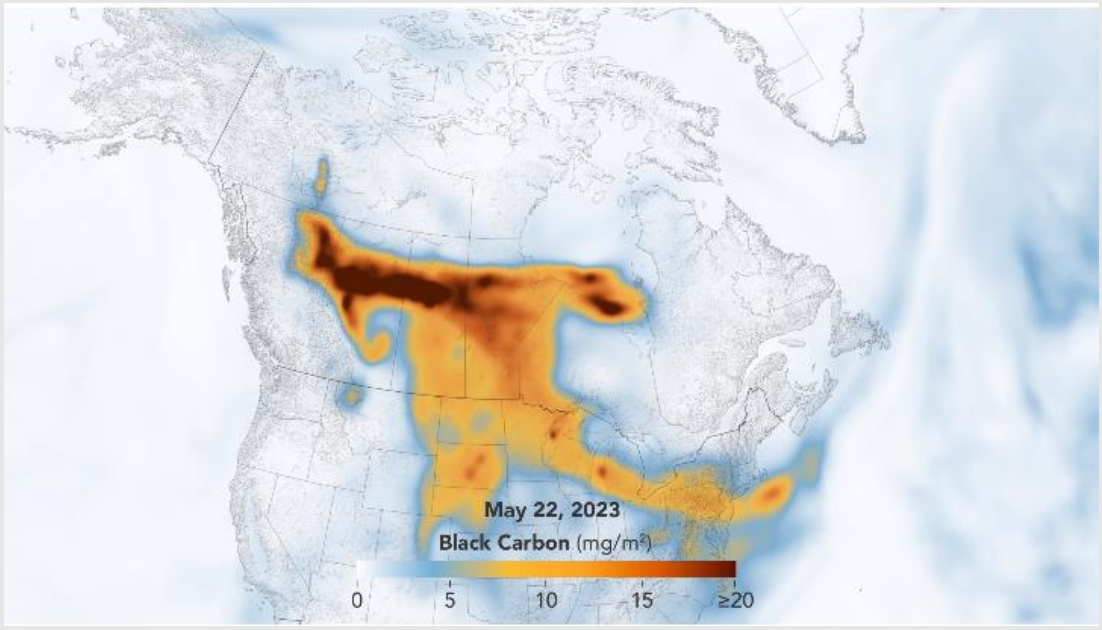


Figure 7: Map of particulate matter (wildfire smoke) encroaching into North Dakota and other parts of the U.S. on May 22 2023 (NASA)

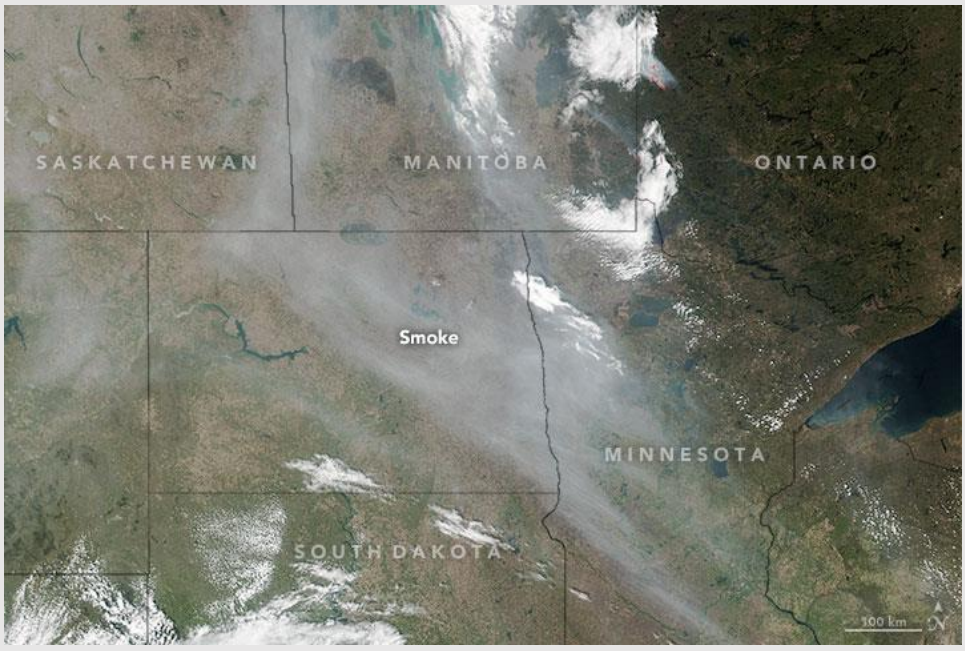


Figure 8: Satellite imagery of wildfire smoke filtering into North Dakota on May 8 2023. Wildfire smoke often causes issues with visibility and respiratory health. (NASA)

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

Image/Data Sources

NCEI.Monitoring.Info@noaa.gov. *Statewide mapping: Climate at a glance*. Statewide Mapping | Climate at a Glance | National Centers for Environmental Information (NCEI).

NDAWN Weather.

Voiland, A. (2023a). *A Smoky May for North America*. NASA.

Voiland, A. (2023b). *Smoke from Alberta streams into the United States*. NASA.

Westar (2023). *Worst Air Quality Day in North Dakota's History*

XMACIS

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