



North Dakota Monthly Climate Summary

December 2017

Volume: 11, No: 12

Precipitation

North Dakota State Climate Office: Your Resource for Climate Information

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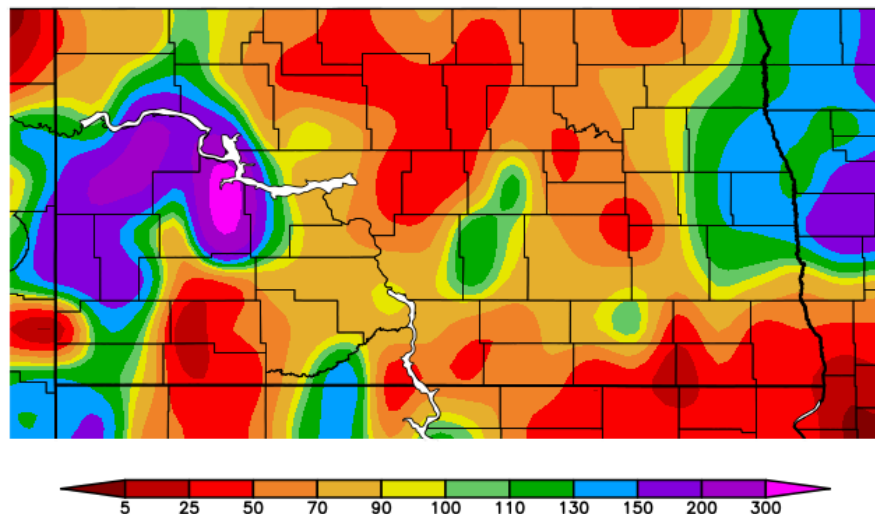
<http://www.ndsu.edu/ndSCO>

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Based on the National Centers for Environmental Information (NCEI), the statewide total December precipitation was 0.44 inch, which was 0.15 inch greater than last month, 0.86 inch less than in December 2016 and 0.08 inch less than the 1981-2010 average, making it the 59th driest December in the 123-year period of record. It was the driest December since 2014. Below-average precipitation was observed commonly in central parts of the state, while above-normal precipitation was common in eastern and western parts of the state (Figure 1). The greatest monthly precipitation accumulation was 1.69 inches, recorded in Grand Forks, Grand Forks County. The greatest 24-hour precipitation was 1.15 inches, also recorded in Grand Forks, on Dec. 5. The greatest monthly snowfall accumulation was 15 inches, recorded in Grand Forks. The greatest 24-hour snowfall was 8 inches, also recorded in Grand Forks, on Dec. 5. Based on historical records, statewide December precipitation showed a slight positive long-term trend of 0.05 inch per century since 1895. The highest and the lowest December precipitation for the state ranged from 1.27 inches in 2008 to 0.05 inch in 1944 (Figure 2).



Generated 1/6/2018 at HPRCC using provisional data.

NOAA Regional Climate Centers

Figure 1. December 2017 precipitation percent of normal for North Dakota (High Plains Regional Climate Center, NOAA)



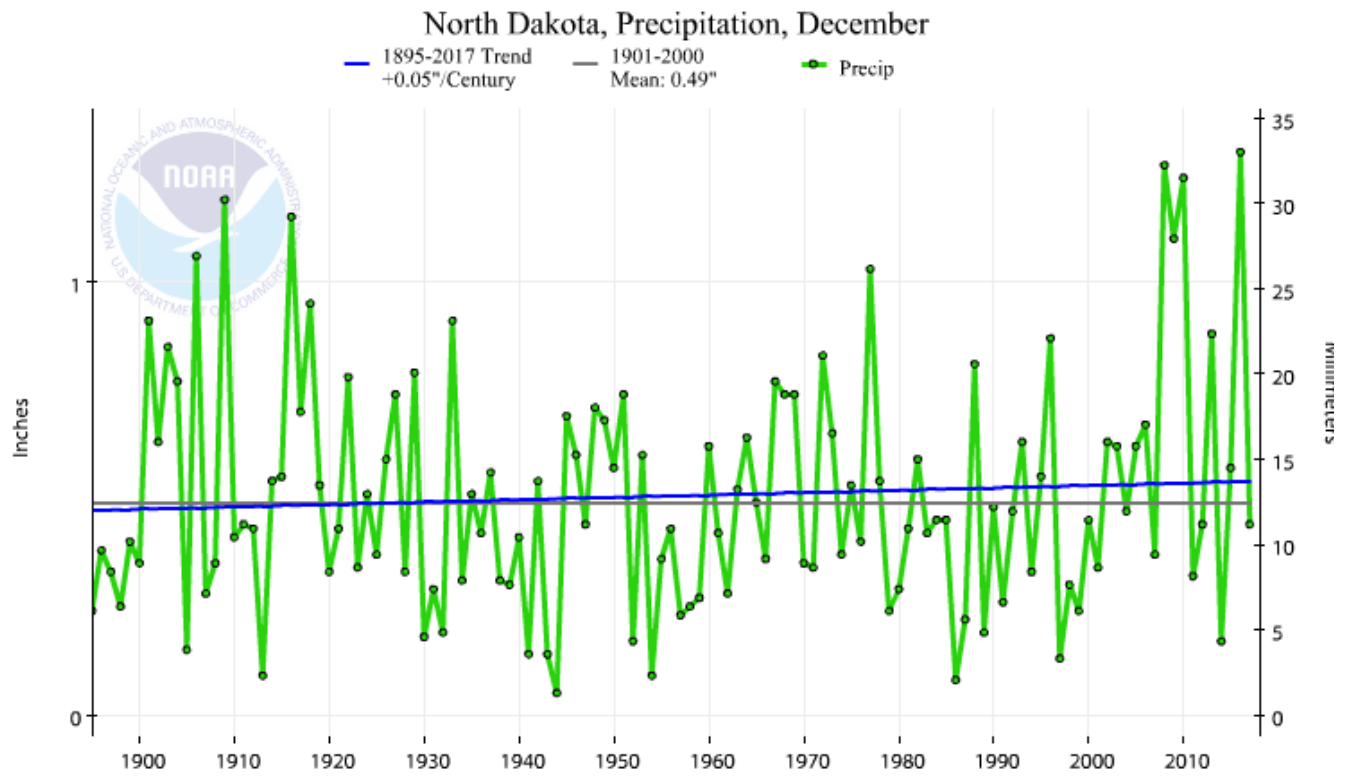
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December Precipitation Statistics

Record high value: 1.27 inches in 2008
 Record low value: 0.05 inch in 1944
 Trend: 0.05 inch per century

December 2017 value: 0.44 inch
 1981-2010 average: 0.52 inch
 Monthly ranking: 59th driest
 Record length: 123 years

Figure 2. Historical December precipitation time series for North Dakota



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Temperature

Departure from Normal Average Air Temperature (°F) (2017-12-01 – 2017-12-31)

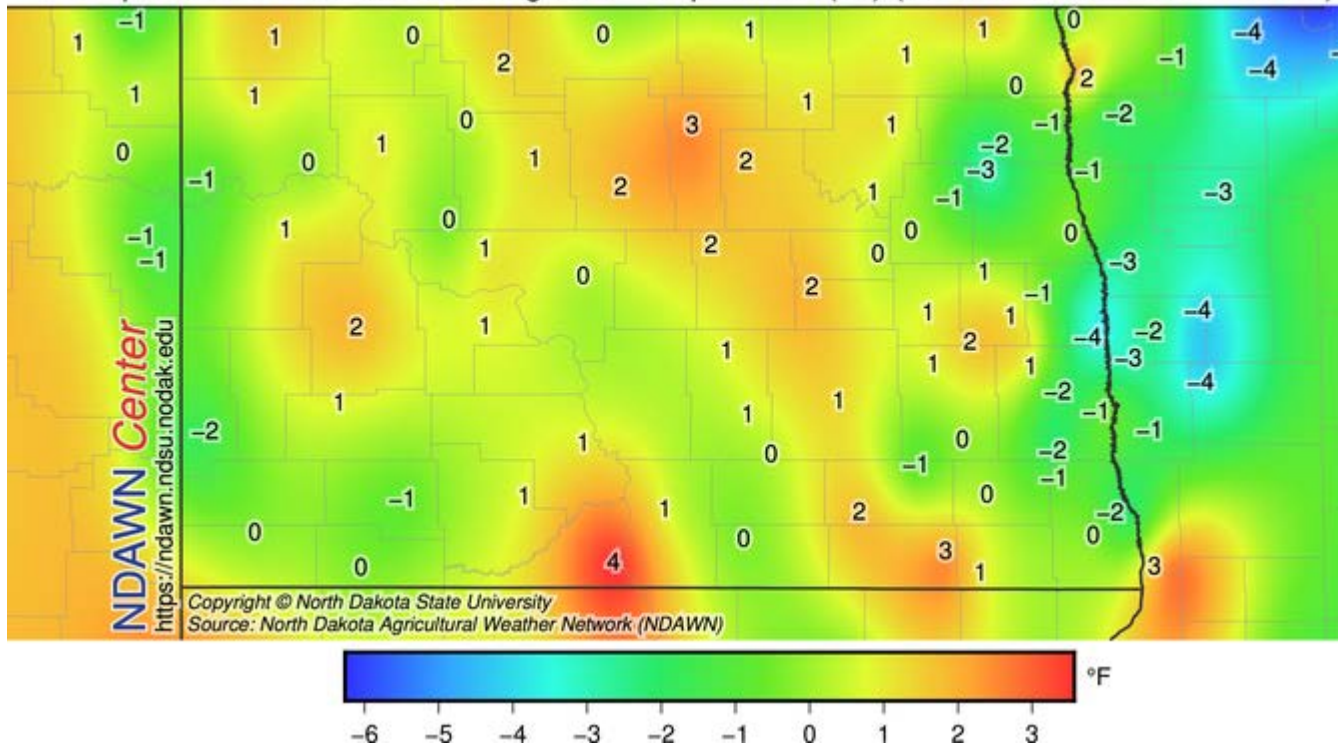


Figure 3. December 2017 temperature departure from normal for North Dakota (NDAWN)

The official state average December temperature was 16.8 F, 9.7 F colder than last month, but 6.6 F warmer than December 2016, and 2.8 F warmer than the 1981-2010 average, making it the 42nd warmest December in the 123-year period of record. It was the warmest December since 2015. Below-average temperatures were observed commonly in eastern parts of the state. Elsewhere, warmer-than-average or near-average conditions were observed (Figure 3). The state's highest and lowest daily temperatures ranged from 59 F on Dec. 13 in Hettinger, Adams County, to minus 42 F on Dec. 31, also in Hettinger, yielding a staggering 101 F temperature gradient in less than 18 days. Based on the historical records, the state average December temperature showed a positive trend of 0.24 F per decade since 1895. The highest and the lowest monthly state December average temperatures ranged from 25.4 F in 1939 to minus 3.2 F in 1927 (Figure 4).



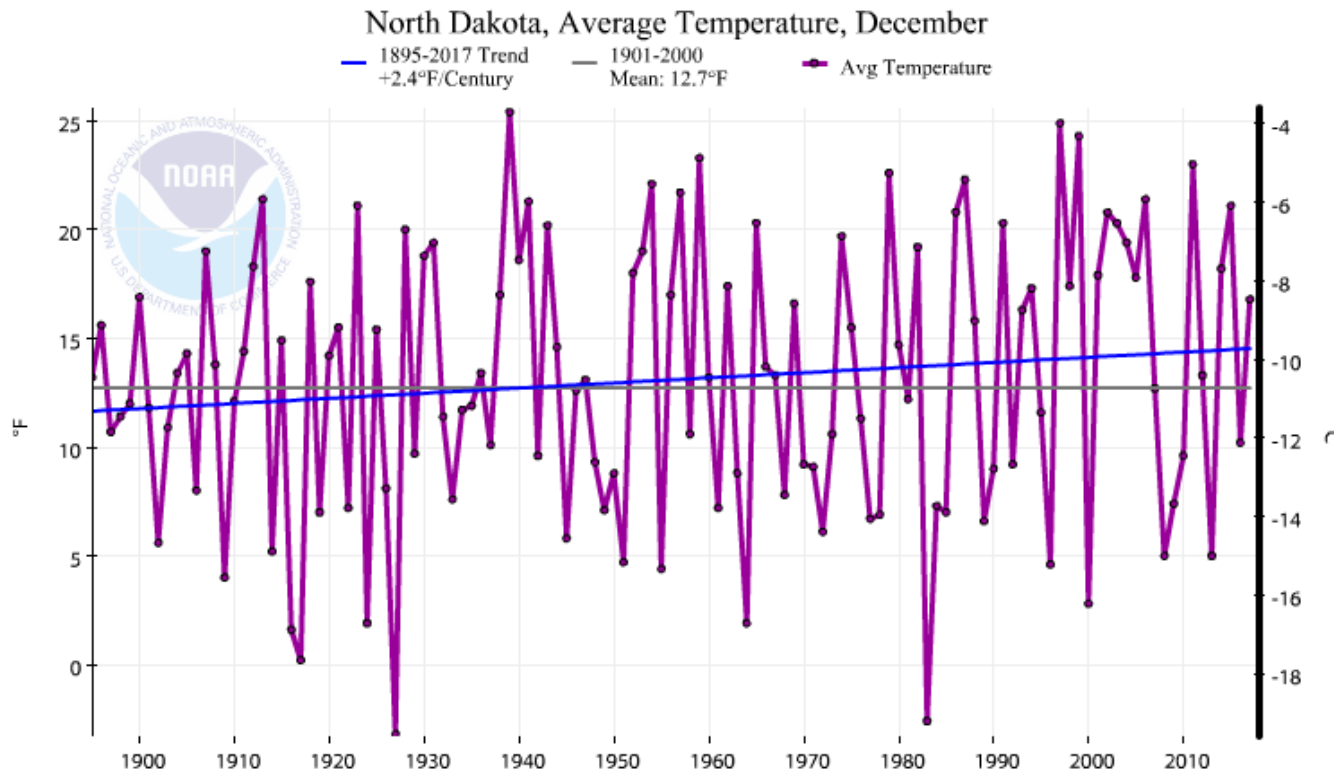
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December Temperature Statistics

Record high value: 25.4 F in 1939
 Record low value: minus 3.2 F in 1927
 Trend: 0.24 F per decade

December 2017 value: 16.8 F
 1981-2010 average: 14 F
 Monthly ranking: 42nd warmest
 Record length: 123 years

Figure 4. Historical December temperature time series for North Dakota



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Notable Impacts

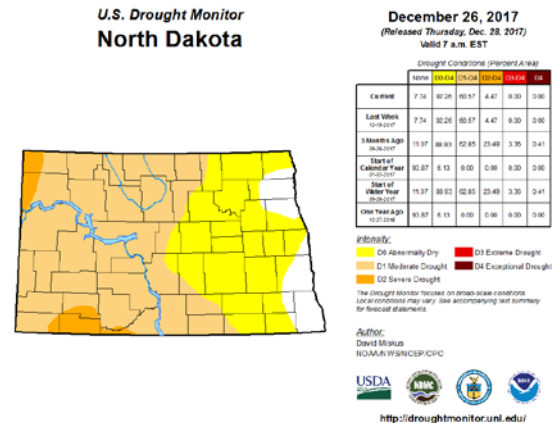
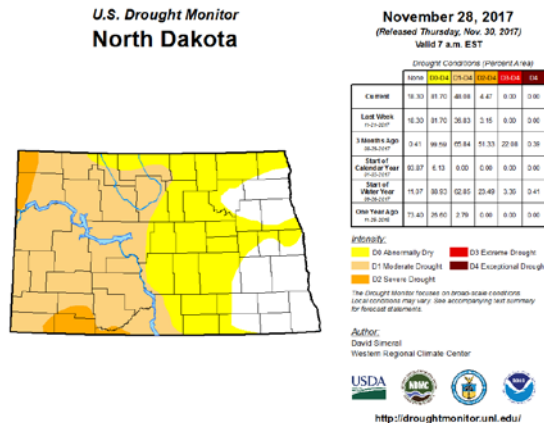


Figure 5. Drought Monitor map comparison for North Dakota in the beginning (on the left) and at the end (on the right) of December 2017

Drought Monitor (DM): Dry conditions continued from the previous month. By the end of the month, the percent of the state experiencing drought was nearly 61, a 13 percent increase, compared with the previous month. Based on the DM map on Dec. 26, only 5 percent of the state was in severe drought (D2). Figure 5 shows a comparison of the drought conditions across the state from the beginning to the end of the month. Figure 6 on the right shows the statewide drought coverage in percentage and intensity (D0, and D1) in a time scale representing the state from the beginning to the end of the month, with a one-week resolution.

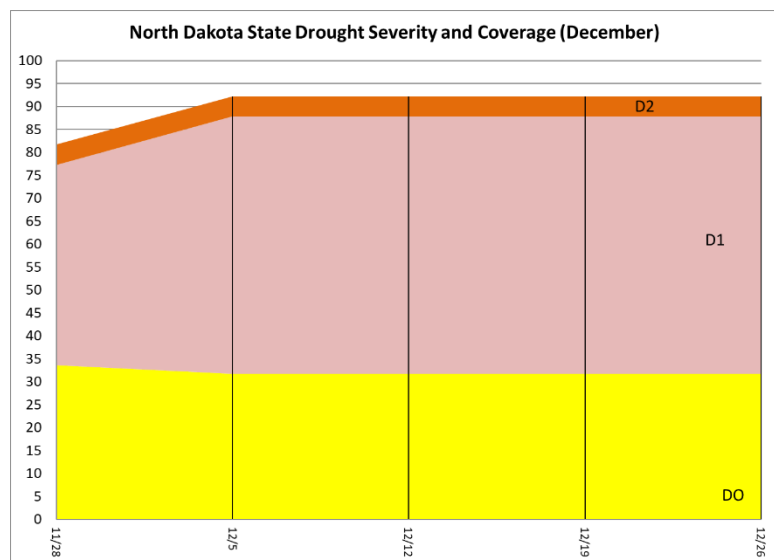


Figure 6. North Dakota drought severity and coverage for December 2017

Storm Reports: NDAWN's highest peak gust in December was 49 mph, recorded at the Dazey weather station in Barnes County on Dec. 4, 2017.



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The NOAA Storm Report reported no significant storm events in December.

Daily Record Event in December: Across the observation network of weather stations with at least 30 years of history, a total of 25 daily high-temperature-related and 41 daily low-temperature-related records were set or tied. A total of 16 highest daily precipitation-related records were set or tied. Details of the records are in Table 1 below.

Table 1. Summary of daily December records broken or set in North Dakota in December (NCEI Daily Weather Records)

<i>Category</i>	Number of Records
<i>Highest daily max. temp.</i>	10
<i>Highest daily min. temp.</i>	25
<i>Lowest daily max. temp.</i>	25
<i>Lowest daily min. temp.</i>	16
<i>Highest daily precipitation</i>	12
<i>Highest daily snowfall</i>	4
Total	92

Highlight of the Month

*A daily lowest temperature record of minus 39 F was set in **Medora** on **Dec. 31**, breaking the previous record by 3 F that was set in 1978 (years on record: 69).*

