



North Dakota Monthly Climate Summary

September 2017

Volume: 11, No: 9

Precipitation

North Dakota State Climate Office

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Based on the National Centers for Environmental Information (NCEI), the statewide total September precipitation was 2.42", 0.43" less than last month, 0.63" less than the last September, but 0.72" more than the 1981-2010 average, making it the 28th wettest September in the 123-year period of record. It was the wettest September since 2016. Above-average precipitation was observed commonly in all parts of the state, except for a few pockets in central ND where drier than normal conditions were observed (Figure 1). The greatest monthly precipitation accumulation was 8" recorded in Litchville, Barnes County. The greatest 24-hr precipitation was 5.07" recorded also in Litchville, Barnes County on September 20. Based on historical records, statewide September precipitation showed a slight positive long-term trend of 0.08" per century since 1895. The highest and the lowest September precipitation for the state ranged from 4.54" in 1900 to 0.73" in 1929 (Figure 2).

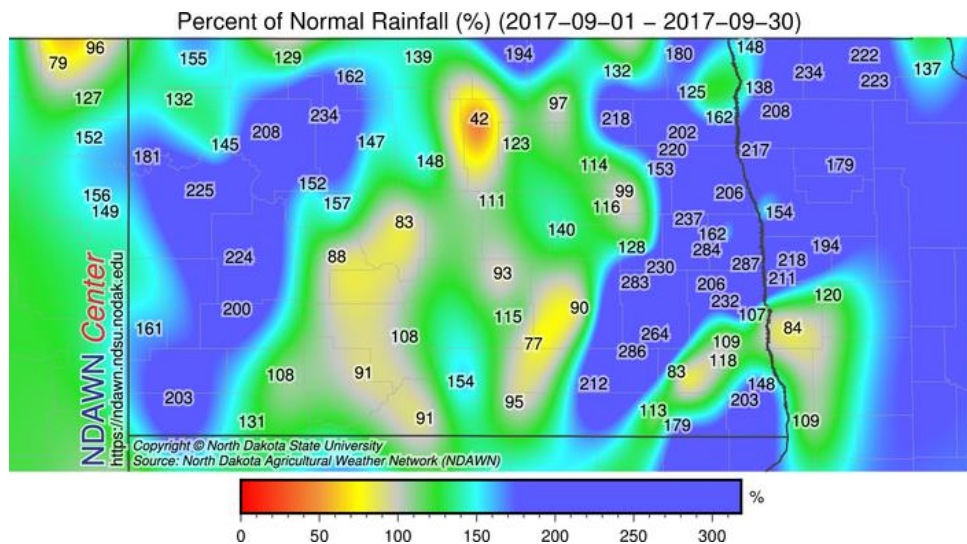


Figure 1. Precipitation Percent of Normal in September 2017 for North Dakota (North Dakota Agricultural Weather Network)



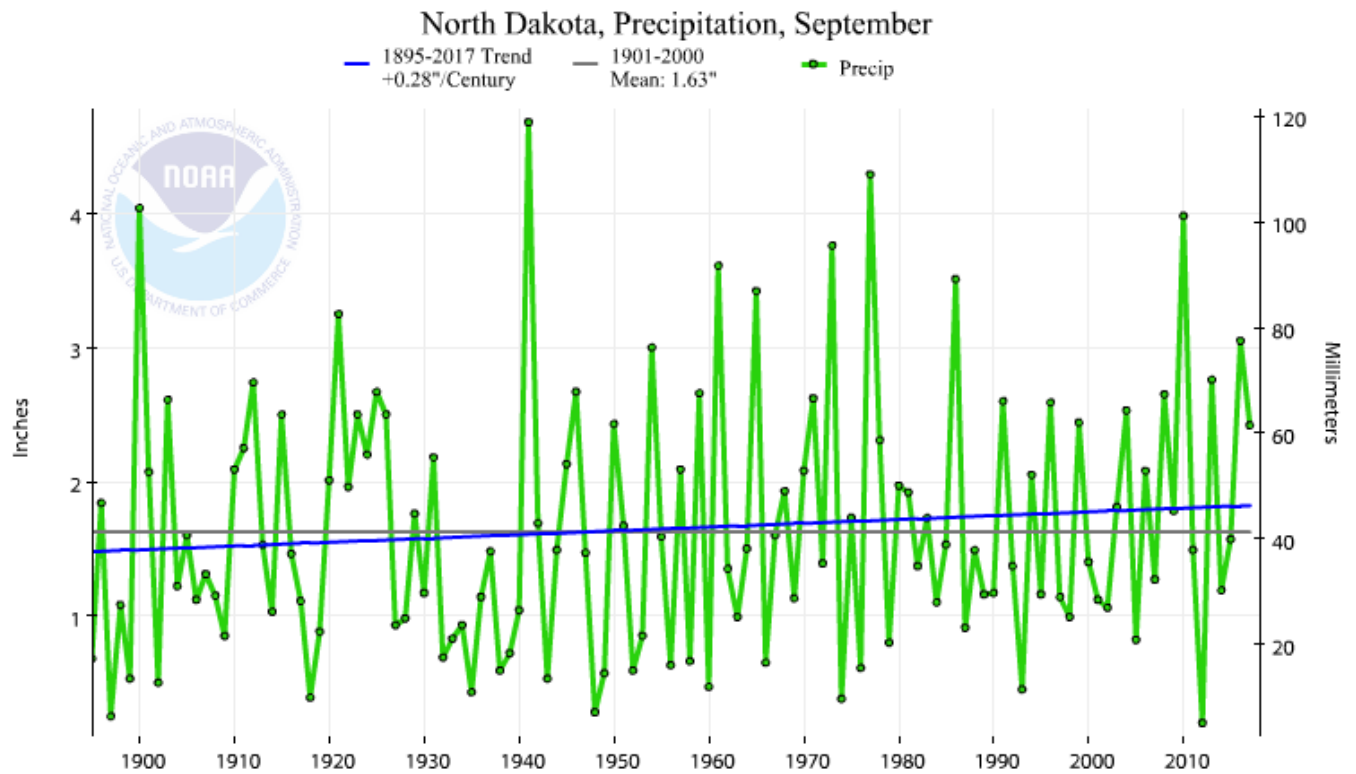
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September Precipitation Statistics

Record High Value: 4.68 inches in 1941
 Record Low Value: 0.20 inches in 2012
 Trend: 0.28" per Century

September 2017 Value: 2.42 inches
 1981-2010 Average: 1.71"
 Monthly Ranking: 28th Wettest
 Record Length: 123 Years

Figure 2. Historical September Precipitation Time Series for North Dakota.



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Temperature

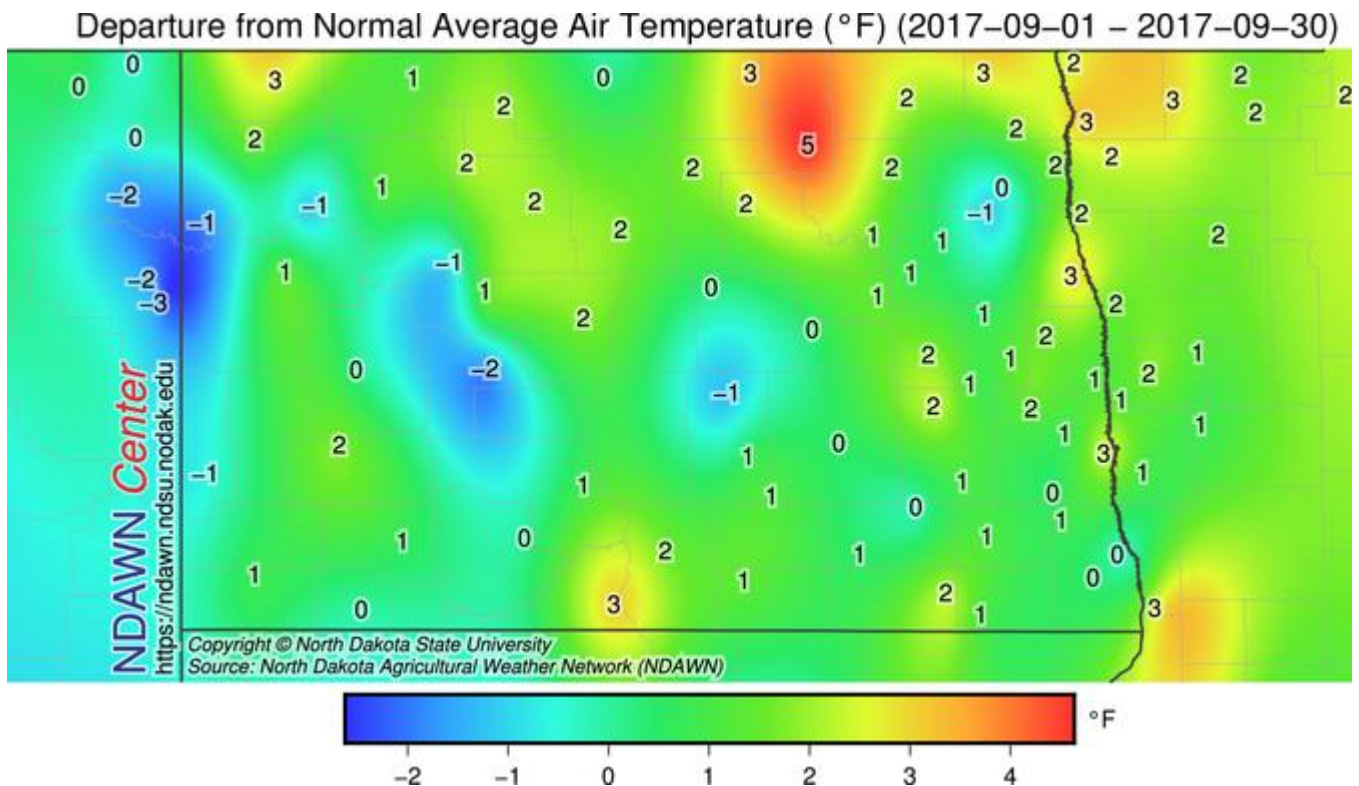


Figure 3. Temperature Departure from Normal in September 2017 for North Dakota (NDAWN).

The official state average September temperature was 58.2°F, 7.2° colder than last month, 0.5° colder than the last September, but 1.3° warmer than the 1981-2010 average, making it the 40th warmest September in the 123-year period of record. It was the warmest September since 2016. Above-average temperatures were observed commonly in all parts of the state except for a few pockets where cooler than normal conditions were observed (Fig. 3). The state's highest and lowest daily temperatures ranged from 98° on September 12 in Minot¹, Ward County to 23° on September 23 in Medora, Billings County. Based on the historical records, the state average September temperature showed a positive trend of 0.2°F per decade since 1895. The highest and the lowest monthly state September average temperatures ranged from 63.5° in 1897 to 45.5° in 1965 (Figure 4).

¹ More than one location share this record.



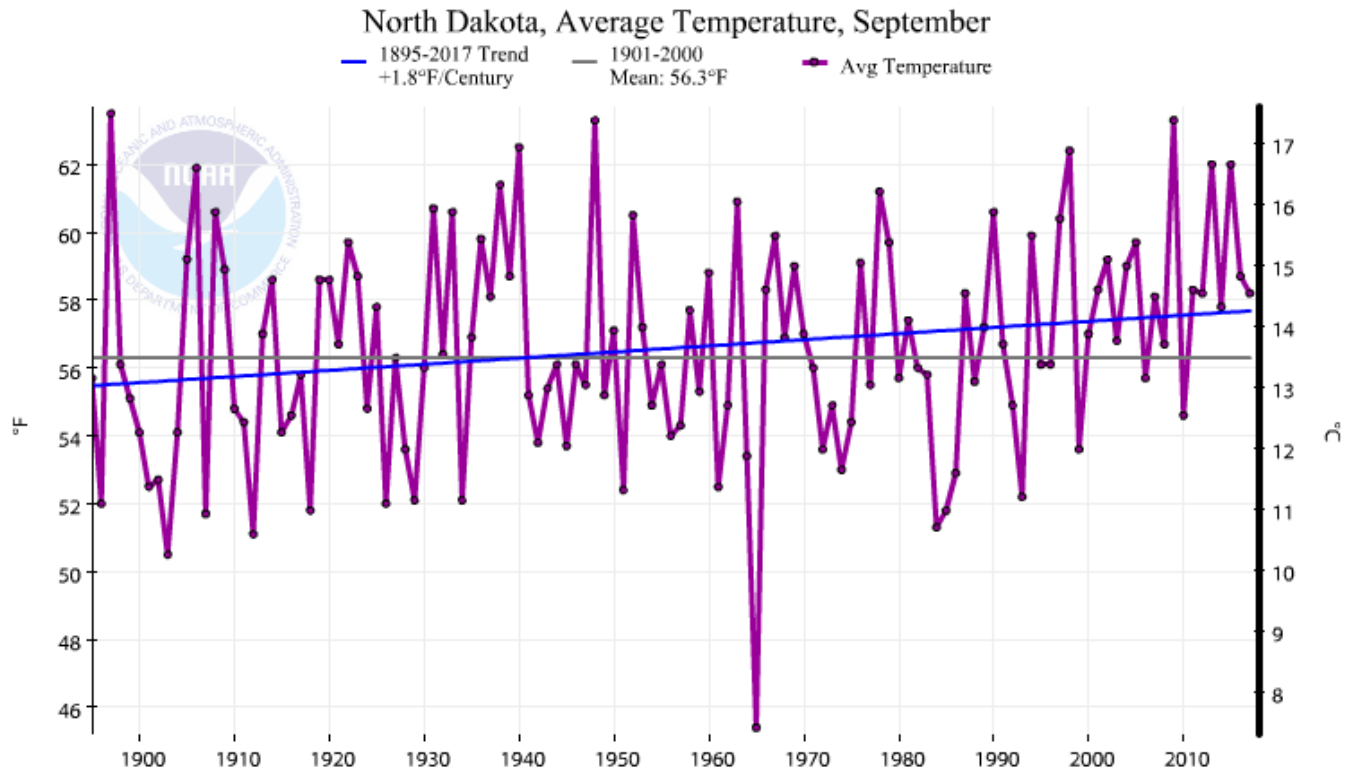
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September Temperature Statistics
 Record High Value: 63.5°F in 1897
 Record Low Value: 45.5°F in 1965
 Trend: 0.2°F per Decade

September 2017 Value: 58.2°F
 1981-2010 Average: 56.9°F
 Monthly Ranking: 40th Warmest
 Record Length: 123 Years

Figure 4. Historical September Temperature Time Series for North Dakota.



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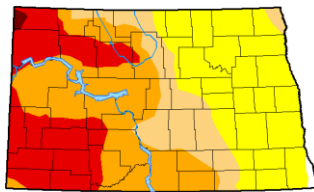
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Notable Impacts

U.S. Drought Monitor
North Dakota



August 29, 2017
(Released Thursday, Aug. 31, 2017)
Valid 8 a.m. EDT

	Drought Conditions (Percent Area)					
	None	D0	D1	D2	D3	D4
Current	0.41	96.58	65.84	51.33	22.08	0.39
Last Week (8/22/17)	0.41	96.59	62.79	53.42	22.08	0.39
3 Months Ago (7/30/17)	0.10	99.90	24.11	0.00	0.00	0.00
Start of Calendar Year (1/1/17)	93.87	6.13	0.00	0.00	0.00	0.00
Start of Water Year (8/1/16)	96.70	3.30	0.41	0.00	0.00	0.00
One Year Ago (8/29/16)	89.29	10.74	1.79	0.29	0.00	0.00

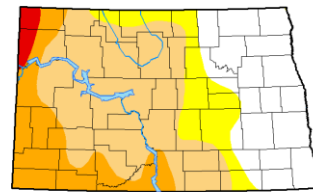
Intensity:
 D0 Abnormally Dry D1 Moderate Drought
 D2 Severe Drought D3 Extreme Drought
 D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
Chris Fenimore
NCEI/NESS/NOAA

<http://droughtmonitor.unl.edu/>

U.S. Drought Monitor
North Dakota



October 3, 2017
(Released Thursday, Oct. 5, 2017)
Valid 8 a.m. EDT

	Drought Conditions (Percent Area)					
	None	D0	D1	D2	D3	D4
Current	28.02	71.98	50.79	16.90	1.81	0.00
Last Week (9/26/17)	11.07	88.93	62.85	23.49	3.36	0.41
3 Months Ago (7/30/17)	0.10	99.90	24.11	0.00	0.00	0.00
Start of Calendar Year (1/1/17)	93.87	6.13	0.00	0.00	0.00	0.00
Start of Water Year (8/1/16)	91.07	88.93	62.85	23.49	3.36	0.41
One Year Ago (10/3/16)	86.94	1.06	0.00	0.00	0.00	0.00

Intensity:
 D0 Abnormally Dry D1 Moderate Drought
 D2 Severe Drought D3 Extreme Drought
 D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
Anthony Arfano
NOAA/NWS/NCEP/CFPC

<http://droughtmonitor.unl.edu/>

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

Drought Monitor: Changing precipitation patterns in August continued into September, making it the 18th wettest August through September period on record. Drought conditions improved mostly in the central and eastern parts of the state where 2-category improvements were implemented. By the end of the month, the percent of the state experiencing drought was reduced to 60%. Exceptional Drought conditions (D4) that first impacted the state on July 18, 2017, was removed by the end of the month. However, there are still parts of the state in the northwest feeling the lingering effects of Extreme Drought. Based on the DM map on October 3, only less than 2% of the state was in Extreme Drought (D3), 17% of the state was in Severe Drought (D2), and 40% of the state was in Moderate Drought (D1). Figure 5 shows a comparison of the drought conditions across the state between the beginning and the end of the month. Figure 6 on the right shows the statewide drought

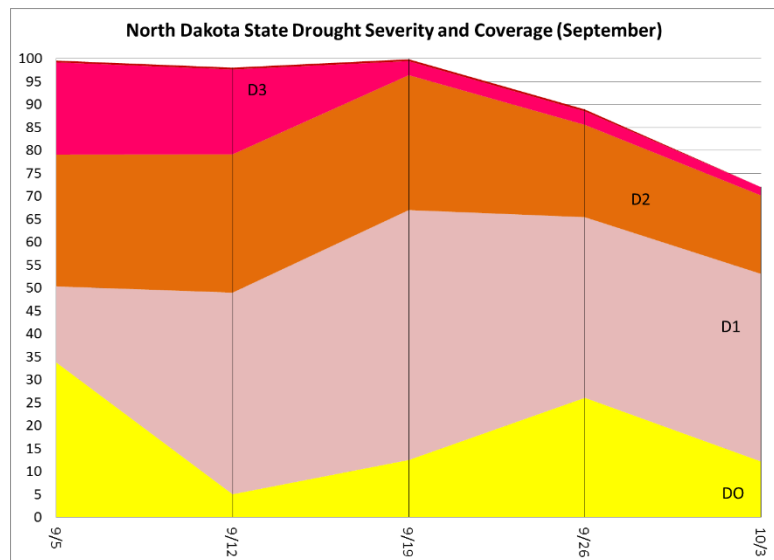
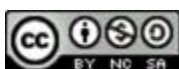


Figure 6. North Dakota State Drought Severity and Coverage Graph for September 2017.



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coverage in % and intensity (i.e. DO, and D1) in time scale representing the state from the beginning to the end of the month with one-week resolution.

Counties in extreme drought areas as of October 3: Divide, Williams, and McKenzie.

Agricultural Impact: Significant rain all across the state was beneficial for livestock water supplies. However, it halted agricultural activities in areas with heavy precipitation. Livestock producers moved livestock to fall pastures. Producers in some counties such as Hettinger claimed the precipitation was not enough or not timely to change the conditions the county was under since March. Precipitation in other counties such as Pierce and LaMoure was beneficial but not enough to fill the sloughs. Drought in Pierce County impacted fishing due to the algae growth. Pastures in the far western counties are still showing stress due to overgrazing.

Storm Reports: NDAWN's highest peak gust in September was 44 mph, recorded at the Rugby weather station in Pierce County on September 4, 2017. The NOAA Storm Report reported 22 storm events including six tornadoes, 8 hail events, and 8 wind damage reports. Based on the preliminary Storm Prediction Center report, the number of tornadoes reported in ND reached 40², which is almost twice as much as the annual average number of tornadoes to occur in ND. Table 1 summarizes the number of tornadoes, hail and damaging wind reports in September, while Figure 7 geographically displays the locations of these storm reports.

Table 1. Summary of September Severe Storm Reports of North Dakota (SPC, NOAA)

Category	Number of Reports
Tornado Reports	6
Hail Reports	8
Wind Reports	8
Total	22

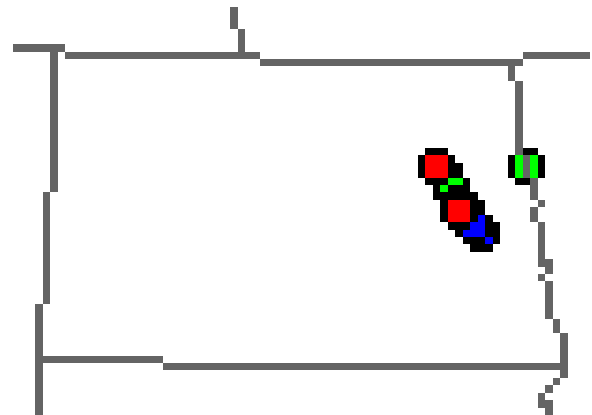


Figure 7. September 2017 North Dakota Storm Events (Red: Tornado; Blue: Wind; Green: Hail).

² The data is preliminary and subject to revision.



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Daily Record Event in September: Across the observation network of weather stations with at least 30 years of history, a total of zero daily high-temperature related and 17 daily low-temperature related records were set or tied. A total of 23 highest daily precipitation related records were set or tied. Details of the records are in Table 2 below.

Table 2. Summary of daily September records broken or set in North Dakota in September (NCEI Daily Weather Records)

<i>Category</i>	Number of Records
<i>Highest Daily Max Temp.</i>	26
<i>Highest Daily Min Temp.</i>	1
<i>Lowest Daily Max Temp.</i>	7
<i>Lowest Daily Min Temp.</i>	1
<i>Highest Daily Precipitation</i>	15
<i>Highest Daily Snowfall</i>	0
Total	50

Highlight of the Month

*A daily highest temperature record of 98°F was set in **Minot** on **September 12**, breaking the previous record by 5°F that was broken in 1969 (Years on record: 69).*

Acknowledgment: Many thanks to Loretta Herbel (NDAES) for her diligent editorial corrections.



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