



North Dakota Monthly Climate Summary

August 2017

Volume: 11, No: 8

Precipitation

North Dakota State Climate Office

NDSU NORTH DAKOTA STATE UNIVERSITY

North Dakota State University

College of Agriculture, Food Systems, and Natural Resources

304 Morrill Hall, Fargo, ND 58108

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

Adnan.Akyuz@ndsu.edu

701-231-6577

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Based on the National Centers for Environmental Information (NCEI), the statewide total August precipitation was 2.85", 1.57" wetter than last month, 0.44" more than the last year, and 0.76" more than the 1981-2010 average, making it the 21st wettest August in the 123-year period of record. It was the wettest August since 2006, and the first wetter than normal month since February 2017. Below-average precipitation was common in the northern valley, northwest ND, and southwest ND. Above-to-near-normal conditions were observed elsewhere (Figure 1). The greatest monthly precipitation accumulation was 6.04" recorded in New Salem, Morton County. The greatest 24-hr precipitation was 3.62" recorded in Ellendale, Dickey County on August 12. Based on historical records, statewide August precipitation showed a slight positive long-term trend of 0.08" per century since 1895. The highest and the lowest August precipitation for the state ranged from 4.54" in 1900 to 0.73" in 1929 (Figure 2).

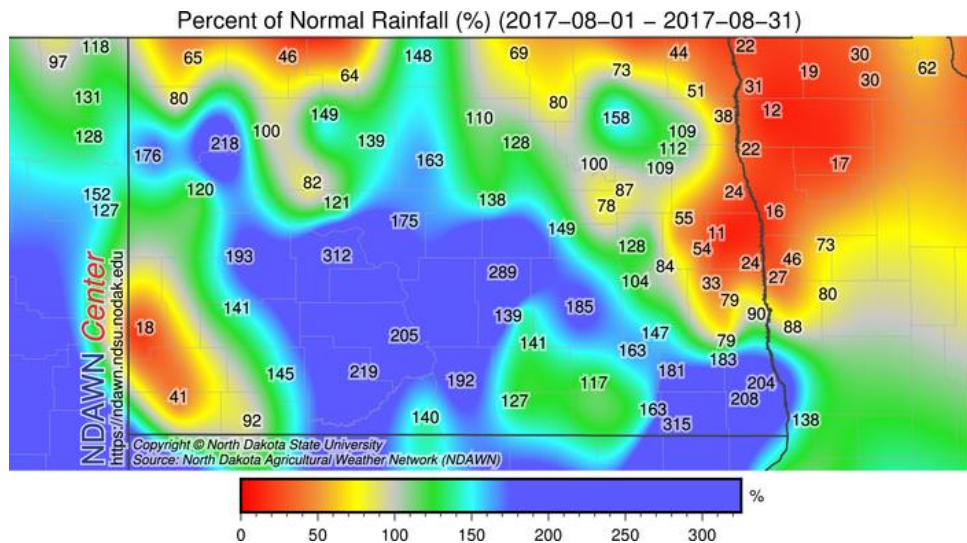


Figure 1. Precipitation Percent of Normal in August 2017 for North Dakota (North Dakota Agricultural Weather Network)



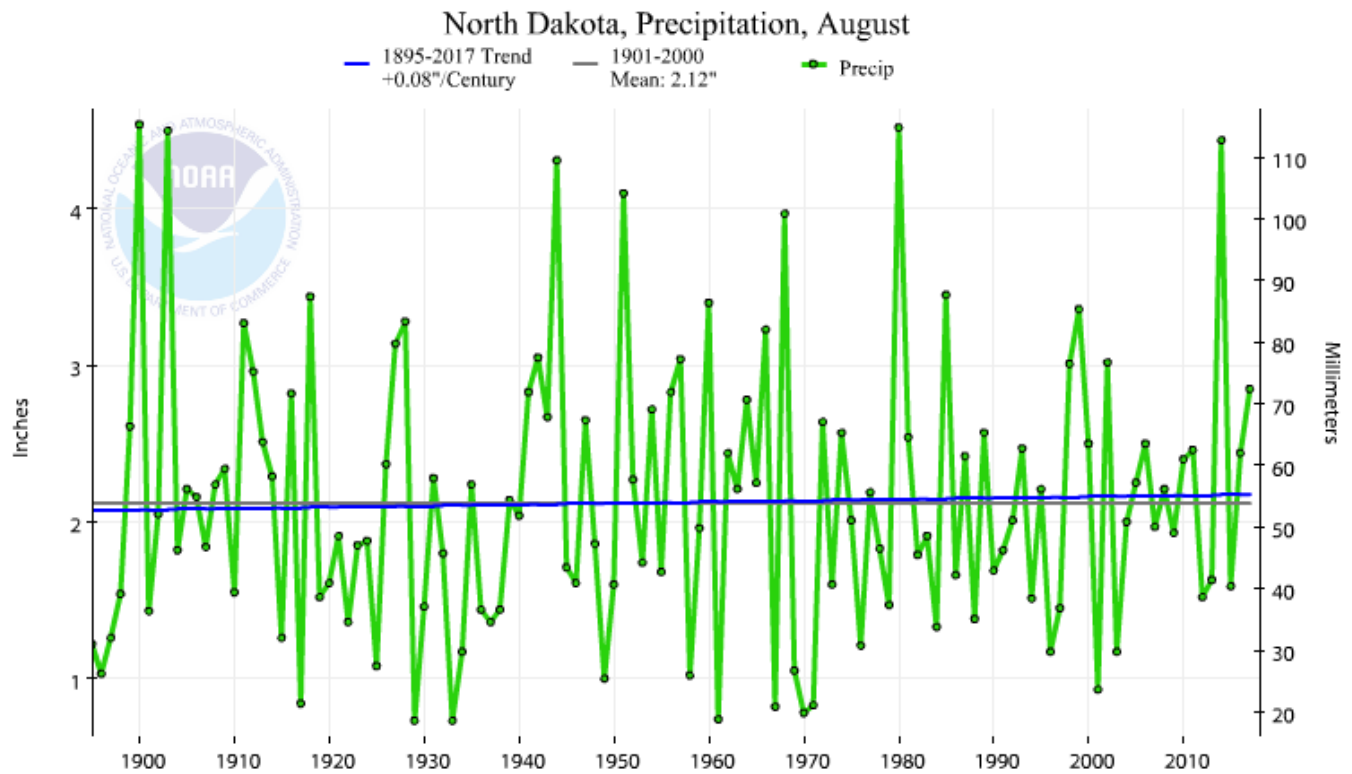
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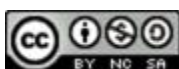


August Precipitation Statistics

Record High Value: 4.54 inches in 1900
 Record Low Value: 0.73 inches in 1929
 Trend: 0.08" per Century

August 2017 Value: 2.85 inches
 1981-2010 Average: 2.09"
 Monthly Ranking: 21st Wettest
 Record Length: 123 Years

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



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Temperature

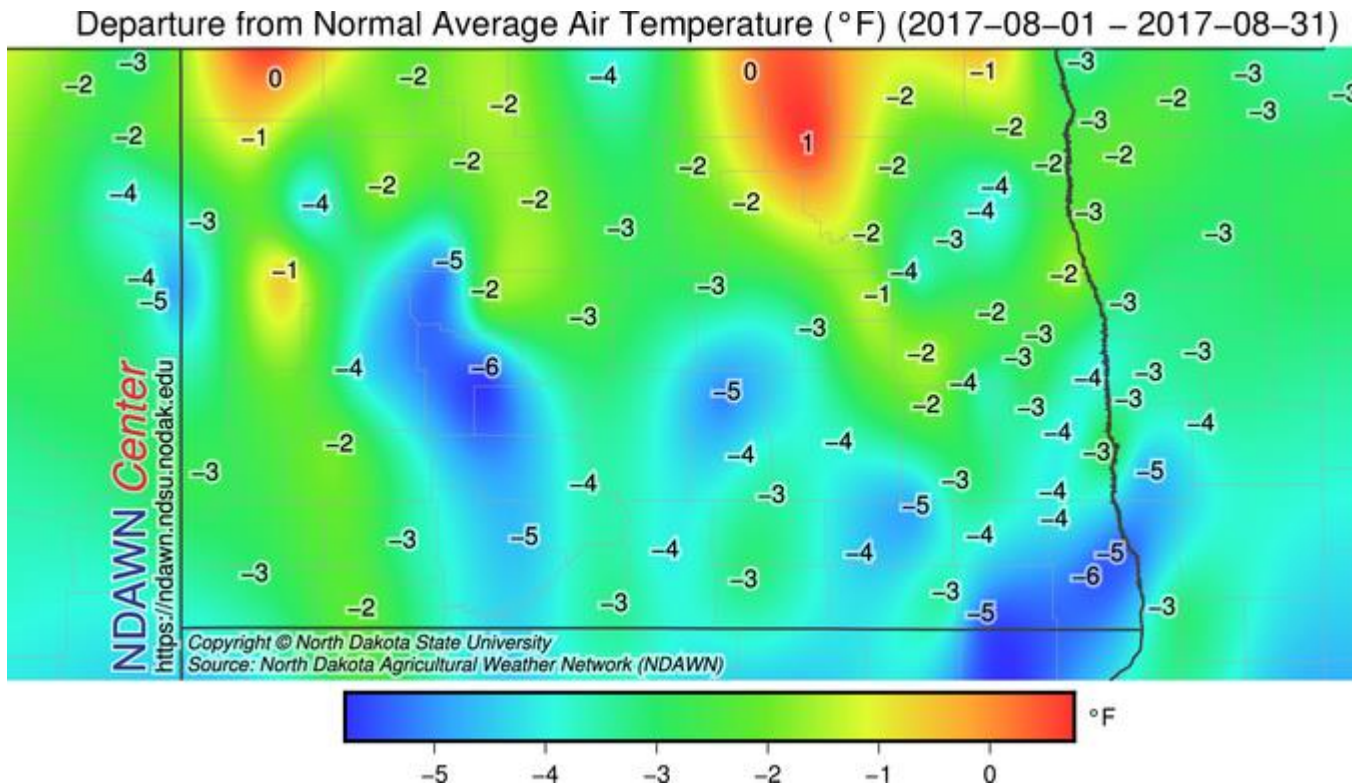


Figure 3. Temperature Departure from Normal in August 2017 for North Dakota (NDAWN).

The official state average August temperature was 65.4°F, 6.7° colder than last month, 2.6° colder than the last year, and 2.2° colder than the 1981-2010 average, making it the 40th coldest August in the 123-year period of record. It was the coldest August since 2009. Below-average temperatures were observed commonly in all parts of the state with the greatest departure from average conditions being observed in the central and southeastern parts of the state (Fig. 3). The state’s highest and lowest daily temperatures ranged from 98° on August 1 in Hettinger, Adams County to 38° on August 22 in Hettinger, Adams County giving a 60° temperature range in 22 days. Based on the historical records, the state average August temperature showed a positive trend of 0.2°F per decade since 1895. The highest and the lowest monthly state August average temperatures ranged from 73.8° in 1983 to 61.2° in 1977 (Figure 4).

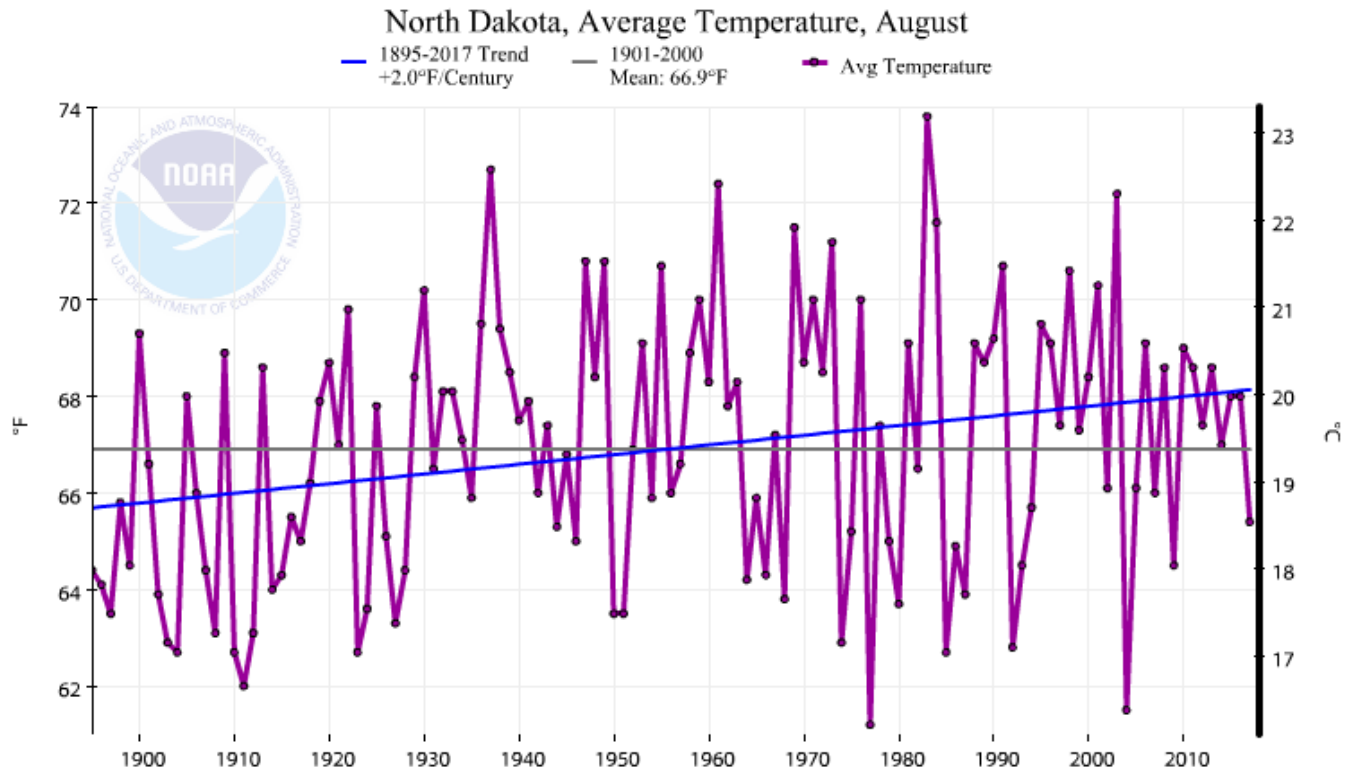




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August Temperature Statistics
 Record High Value: 73.8°F in 1983
 Record Low Value: 61.2°F in 1977
 Trend: 0.2°F per Decade

August 2017 Value: 65.4°F
 1981-2010 Average: 67.6°F
 Monthly Ranking: 40th Coldest
 Record Length: 123 Years

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



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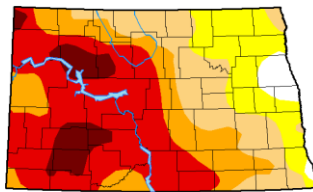
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Notable Impacts

U.S. Drought Monitor North Dakota



August 1, 2017
(Released Thursday, Aug. 3, 2017)
Valid 8 a.m. EDT

	None	D0	D1	D2	D3	D4
Current	3.38	96.91	91.74	62.45	44.09	7.52
Last Week (8/23/17)	6.81	93.39	79.21	61.16	45.56	7.62
3 Months Ago (5/23/17)	91.22	6.78	0.00	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 (8/1/16)	90.95	9.95	2.98	1.20	0.00	0.00

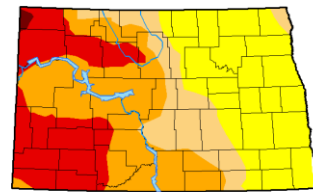
Intensity:
 D0 Abnormally Dry D3 Extreme Drought
 D1 Moderate Drought D4 Exceptional Drought
 D2 Severe Drought

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



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

U.S. Drought Monitor North Dakota



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

	None	D0	D1	D2	D3	D4
Current	0.41	96.59	65.84	51.53	22.08	0.39
Last Week (8/23/17)	0.41	90.59	62.79	53.42	22.08	0.39
3 Months Ago (5/23/17)	91.10	96.90	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 (8/1/16)	90.28	10.74	1.79	0.28	0.00	0.00

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

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



<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 August 2017.

Drought Monitor: Changing precipitation patterns in most drought stricken areas improved conditions. Even nearly 100% of the state still experienced some kind of dryness, the exceptional drought conditions were reduced significantly by the end of the month. Although the rains greened pastures and row crops, limited growth and volume prevented further improvement of the drought conditions. Cooler and wetter than normal conditions also eased the fire danger across the region. However, expanding exceptional drought coverage and much-warmer than normal conditions in western Montana caused a continuation of forest fires, reducing air quality in the western and central parts of North Dakota. Based on the DM map on August 29, only a less than 1% of the state was in Exceptional Drought (D4), 21% of the state was in Extreme Drought (D3), 29% of the state was in Severe Drought (D2), 15% of the state was in Moderate Drought (D1), and the rest of the state was in abnormally dry conditions (D0). Figure 5 shows a comparison of the drought conditions across the state

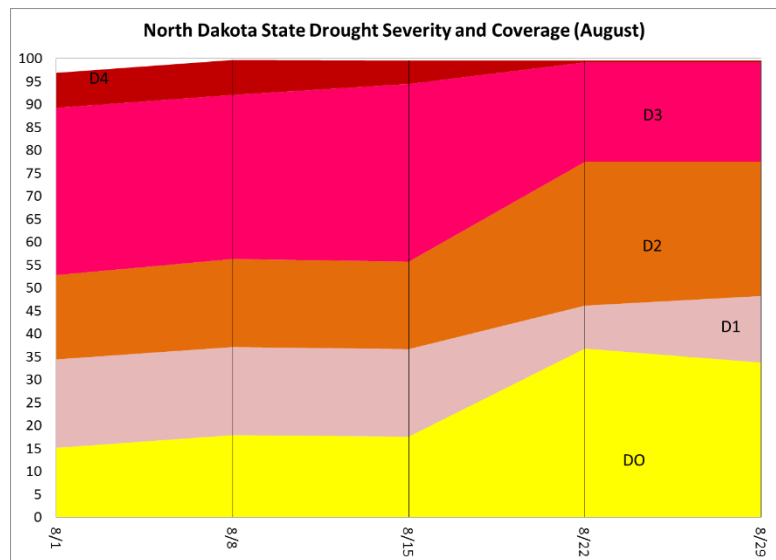


Figure 6. North Dakota State Drought Severity and Coverage Graph for August 2017.

Based on the DM map on August 29, only a less than 1% of the state was in Exceptional Drought (D4), 21% of the state was in Extreme Drought (D3), 29% of the state was in Severe Drought (D2), 15% of the state was in Moderate Drought (D1), and the rest of the state was in abnormally dry conditions (D0). Figure 5 shows a comparison of the drought conditions across the state



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between the beginning and the end of the month. Figure 6 on the right shows the statewide drought 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 exceptional drought areas as of August 29: Divide, Williams.

Agricultural Impact: Even though the majority of the state received an above-average rainfall throughout August, the southwest and northwestern parts of the state missed most August precipitation exacerbating the drought conditions in these areas. Even though the moisture was limited, it was welcomed by the area producers. However, the precipitation only helped the topsoil leaving the subsoil parched. Since the soil was dry, any additional precipitation immediately soaked into the soil with no surface drainage into dugouts. Water quality in most dugouts is poor, containing nitrate levels too high to feed the cattle. A producer in Hettinger County reported losing 2 cows due to the poor water quality. High nitrate problems with canola are reported. Based on local accounts in southwestern parts of the state, rains only helped volunteer weeds, primarily Kochia.



The picture to the left is a perfect example of how a corn field may look green from a distance. However, the field on the left is showing a poor stand, with underdeveloped or no ears.

Poor stand in Extreme Drought (D3) Area. Hettinger County on September 1. By Duaine Marxen, NDSU Extension.



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Storm Reports: NDAWN's highest peak gust in August was 45 mph, recorded at the Williston weather station in Williams County on August 31, 2017. The NOAA Storm Report reported 14 storm events including zero tornadoes, 13 hail events, and one wind damage report. August 2017 was very uneventful, storm-wise. Table 1 summarizes the number of tornadoes, hail and damaging wind reports in August, while Figure 7 geographically displays the locations of these storm reports.

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

Category	Number of Reports
Tornado Reports	0
Hail Reports	13
Wind Reports	1
Total	14

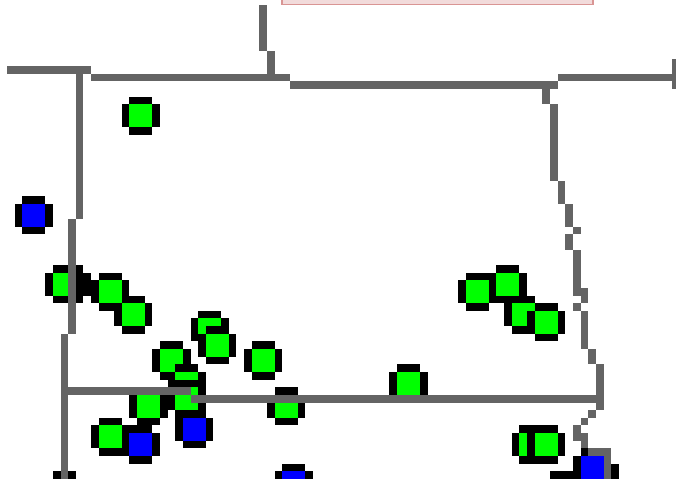
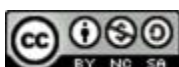


Figure 7. August 2017 North Dakota Storm Events (Red: Tornado; Blue: Wind; Green: Hail).





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Daily Record Event in August: 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 August records broken or set in North Dakota in August (NCEI Daily Weather Records)

<i>Category</i>	Number of Records
<i>Highest Daily Max Temp.</i>	0
<i>Highest Daily Min Temp.</i>	0
<i>Lowest Daily Max Temp.</i>	13
<i>Lowest Daily Min Temp.</i>	4
<i>Highest Daily Precipitation</i>	23
<i>Highest Daily Snowfall</i>	0
Total	26

Highlight of the Month

*A daily highest precipitation record of 3.51 inches set in **Forman** on **August 13**, breaking the previous record by 1.34" that was broken in 1957 (Years on record: 124).*

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



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