

Decorah Weather - August 2024 Summary

by Richard Bernatz

Weather data available online at <http://faculty.luther.edu/~bernatzr/DecWx/>

1. TEMPERATURE

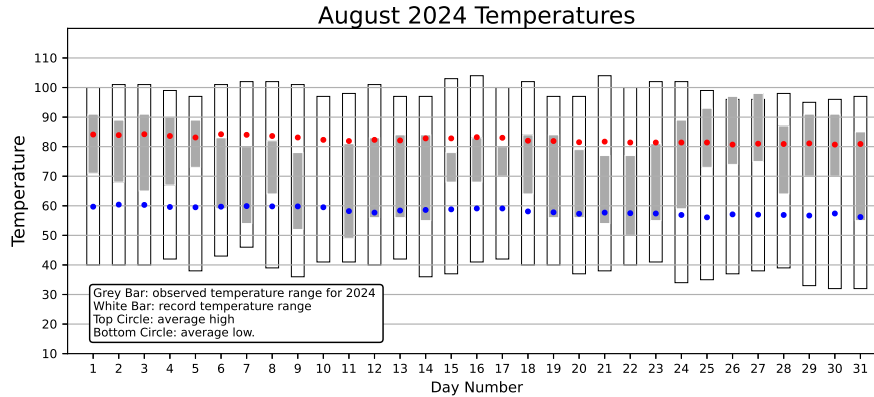


Figure 1: **Grey Bar:** Observed temperature range for 2024, **White Bar:** Record temperature range, **Average temperature range:** Red circle for average high, blue circle for average low.

Item	August 2024 Average	Historical Average	Deviation
High temperature (°F):	85.3	82.4	+2.9
Low temperature (°F):	62.3	58.4	+3.9
Daily temperature (°F):	73.8	70.4	+3.4

Table 1: August 2024 Temperatures compared with August History.

- AUGUST 2024
 - Record temperatures : Record maximum temperatures on the 26th and 27th of 97° F and 98° F, respectively. Previous records are 96° F in 1948 and 96° F in 2020.
Record maximum minimum temperatures (overnight lows) were set on the 5th, 25th, and 26th of 73° F, 73° F, and 74° F, respectively. Previous records are 72° F in 1947, 72° F in 2023, and 73° F 1948.
 - Average temperature : 73.8° F (3.4° F warmer than average)
 - Warmest temperature : 98° F on the 27th
 - Coldest temperature : 49° F on the 11th
 - Cooling degree days : 266, 75.5 more than average of 190.5
- ALL AUGUSTS: 1893 TO PRESENT (132 years)
 - Compared with August 2024, 17 Augusts were warmer and 114 Augusts were cooler
 - Warmest average : 77.5° F in 1900
 - Coldest average : 63.9° F in 1915
 - Warmest temperature : 105° F on the 23rd and 24th of 2024
 - Coldest temperature : 32° F on the 30th and 31st of 1915

2. PRECIPITATION

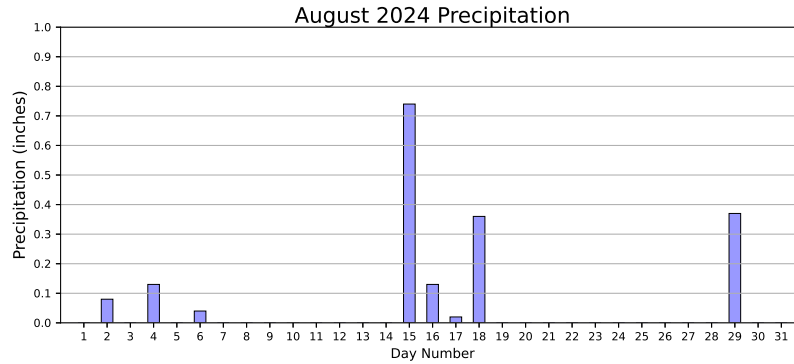


Figure 2: Precipitation for Decorah.

- AUGUST 2024
 - Total precipitation for August 2024 : 1.87 inches
 - 2.16 inches less than the average of 4.03 inches
 - Eight days with measurable precipitation, the average is nine days
 - Greatest one-day total of 0.74 inches on the 15th
- ALL AUGUSTS: 1893 TO PRESENT (132 years - no missing data)
 - Compared with August 2024, 107 Augusts were wetter and 24 Augusts were drier
 - Wettest August: 15.11 inches in 2007 (the wettest of any month on record)
 - Driest August: 0.33 inches in 1969

3. TWELVE-MONTH SUMMARY

Month	Year	Ave Temp (°F)	Deviation (°F)	Rank† (#/Total)	Precip (inches)	Deviation (inches)	Rank‡ (#/Total)
September	2023	69.3	+7.0	1/130	5.54	+1.84	26/130
October	2023	54.3	+4.0	19/130	2.78	+0.45	46/130
November	2023	40.0	+4.7	19/131	0.18	-1.65	128/131
December	2023	36.0	+14.1	1/131	1.07	-0.14	71/131
January	2024	24.0	+7.6	14/131	1.56	+0.51	24/131
February	2024	38.1	+17.9	1/131	0.37	-0.59	107/130
March	2024	42.4	+9.5	3/132	2.18	+0.28	49/132
April	2024	50.5	+3.1	26/131	3.97	+0.85	31/131
May	2024	62.7	+3.8	20/129	9.11	+4.85	6/129
June	2024	71.9	+3.6	18/130	7.38	+2.60	22/130
July	2024	73.8	+1.2	45/130	3.13	-0.94	79/131
August	2024	73.8	+3.4	108/132	1.87	-2.16	108/132

Table 2: A summary of the last twelve months. †- The smaller the number (#), the warmer the month. ‡- The smaller the number (#), the wetter the month. Boxed entries are within the historical top or bottom ten.

- Twelve of the last twelve months were warmer than average.
- Seven of the last twelve months were wetter than average, but the last two months were drier than average.
- Precipitation deviations from average (in inches). last three months: -0.50, last six months: 5.48, last nine months: 5.28, last twelve months: 5.90

4. METEOROLOGICAL SUMMER SUMMARY: JUNE - AUGUST

The meteorological summer (June - August) of 2024 ranks 27th out of 129 years on a summer severity scale calculated using temperature averages and distributions in addition to precipitation amounts and frequency.

Warmer than average temperatures and lesser than average precipitation contribute to a positive severity index. Cooler and wetter summers will have a negative index. The three general categories for determining the summer index are 24-hour maximum temperature, 24-hour minimum temperature, and 24-hour precipitation totals.

	Maximum Temperature					Minimum Temperature				Precipitation			Index
	Ave	85+	90+	95+	100+	Ave	65+	70+	75+	Total	Days	DB	
1901	89.7	67	48	30	10	59.3	30	13	3	7.31	18	5	18.93
2024	84.5	39	16	2	0	62.0	35	12	2	12.38	31	4	4.96
Ave	82.3	36	15	4	1	58.5	21	6	1	12.93	29	4.6	0.00
1993	78.4	15	0	0	0	58.4	19	2	0	29.30	57	2	-16.73

Table 3: Summer severity indicator values for the most severe summer (1901), the summer of 2024, the average value for each of the measures, and the least severe summer (1993).

Table 3 details the measures in each of the three general categories. The first column in each temperature category gives the average value for the summer. The other columns in the temperature categories provide glimpse at how the temperatures within that category were distributed. For example, the “Maximum Temperature” column with the “85+” header gives the number of summer days with a recorded daily maximum temperature of at least that value. The three rainfall measures include the total measured precipitation (in inches), the number of days of measurable precipitation, and the average number of days between measurable precipitation events.

The index for summer 2024 is 4.96, indicating it was a slightly more “severe” summer than average. This summer’s average maximum daily temperature is 84.5° F, 2.2 ° F warmer than average. A maximum temperature of 85° F or higher was recorded on 39 days, three more than average. Temperatures of at least 90° F were recorded on 16 days, one more than average. There were 2 daily maximums of at least 95° F, two days less than average, and no days with temperatures topping out at 100° F or greater.

This summer’s minimum temperature average of 62.0° F registers above average by 3.5° F. There were 35 days with a recorded minimum of at least 65° F, 12 days with a minimum of at least 70° F, and 2 days with a low reading of at least 75° F. The greater departure from averages for 24-hour minimum temperatures than 24-hour maximum temperatures is indicative of moist air. Moist air has more heat capacity than dry air, so it warms less during the day, but cools less overnight compared to drier air. A useful analogy to understand the concept of heat capacity is to think of an atmospheric parcel as a cylindrical vessel with heat represented by the volume of liquid in the vessel. Moist air is like a fat vessel having a wide circular cross-section. Dry air is a skinny vessel with a narrower circular cross-section. In this analogy, temperature is the depth of fluid in the vessel. The same volume of liquid (the same heat input) results in a greater depth (temperature) in the skinny vessel (dry air) compared to the depth of liquid in the fat vessel.

This summer precipitation total of 12.38 inches is slightly less than the average amount of 12.93. The “Precipitation Column” labeled “DB” gives the average number of *Days Between* measurable rainfall events. This year’s average of 4 days is slightly less than the average 4.6 days. Note that the summer of 1993 had a 2-day average length between rainfall events.

The most severe (hot and dry) summer is that of 1901 with an index of 18.94. That year there were 48 days with 90+ temperature readings, 30 days with 95+ readings, and 10 days with temperatures topping out at 100 degrees or greater. Only 7.31 inches of precipitation were recorded that summer.

On the opposite end of the scale is the summer of 1993 with an index of -16.59. That year, the maximum temperature reached 85 or higher on just 15 days, and there were no days with a temperature reading of 90 or greater. Precipitation totaled 29.30 inches, the wettest Decorah summer in recorded history.