

2023-24 Winter In Review

Now that March has arrived, it's time to take a look back at the record-breaking "meteorological winter" (December-February) of 2023-24. This winter will long be remembered for its persistent and remarkable warmth, as well as for the notable exception of a period of extreme cold and heavy snowfall in the middle of January.

Record-Breaking Warmth

With the exception of a 10-12 day period in mid-January, this winter was persistently and exceptionally warm. Many stations across Iowa achieved their warmest winter on record, including Des Moines (33.2°; previous record 32.5° in 1881-82), Waterloo (31.1°; previous record 29.6° in 2001-02), and Mason City (27.7°; previous record 26.9° in 1930-31). Ottumwa tied its 2nd-warmest winter on record (with 1930-31) at 32.7°, only behind the 33.7° measured in 1931-32.

At Des Moines, more than half the days this winter (46 out of 91) were 10 or more degrees above normal, which is a remarkable feat. In fact, in the streak of 23 days from January 23 through Valentine's Day, every day was 10 or more degrees above normal except February 11 (and that was 7 degrees above normal). Meanwhile, there were only nine days all winter that were 10 or more degrees below normal; eight of those occurred between January 12 and 20, and the other was on February 28th. Overall, 82% of days this winter were warmer than normal in Des Moines, while only 16% were cooler than normal (one day, December 5th, was right at normal). Another perspective on the persistence of warmth this winter is the number of days on which the temperature reached 50° or higher. There were 30 such days (out of 91) in Des Moines, shattering the old record of 23 (in 1953-54 and 2001-02). The average number (over the entire climate record) is only 9 days per winter. Similarly, there were only 20 days this winter on which the temperature fell below 20° at Des Moines, breaking the old record of 24 days (in 1997-98). The average number of such days in a winter is 50.

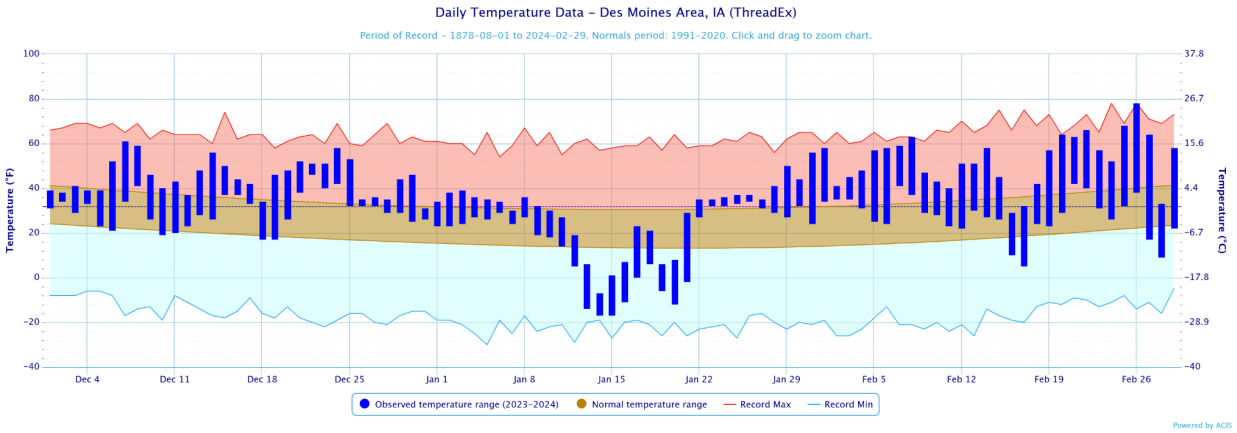
At Waterloo, an incredible 51 days this winter (out of 91) were 10 or more degrees above normal. This includes an astonishing streak of 19 consecutive days (from January 23 through February 10) that were 13 or more degrees above normal. Meanwhile, there were only nine days all winter that were 10 or more degrees below normal; eight of those occurred between January 13 and 21, and the other was on February 28th. Overall, 80% of days this winter were warmer than normal in Waterloo, while only 18% were cooler than normal (two days were right at normal). There were also 26 days (out of 91) on which the temperature reached 50° or higher at Waterloo, breaking the previous record of 16 days (in 2001-02). The average number (over the

entire climate record) is only 4 days per winter. Similarly, there were only 30 days this winter on which the temperature fell below 20° at Waterloo, breaking the old record of 31 days (in 1997-98). The average number of such days in a winter is 59.

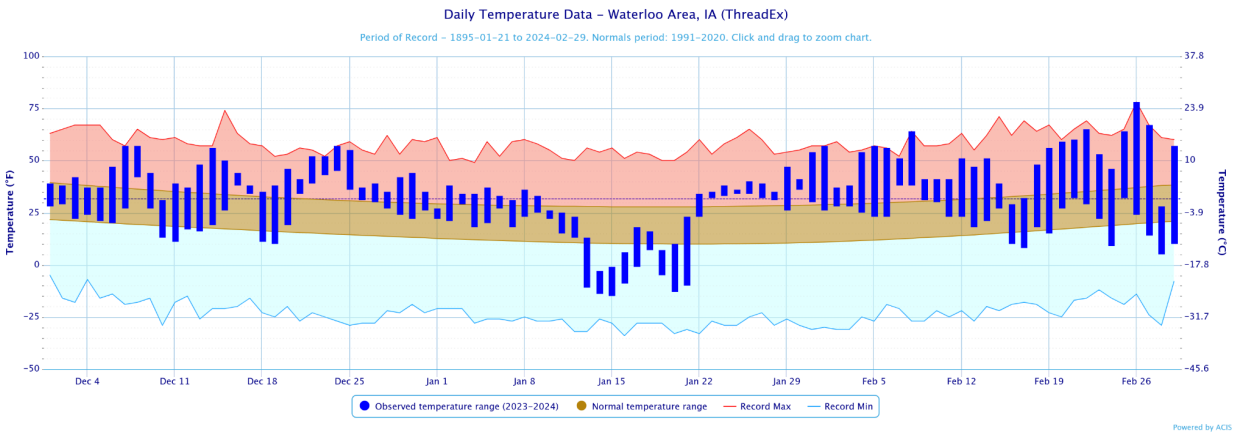
Two Weeks of Winter

While this winter goes into the record books for its pervasive warmth, it was interrupted by a period of heavy snow and intense cold. This period began with snow moving into Iowa on January 8th that continued into the 9th. This storm was followed quickly by a second heavy snow event, with stronger winds, from late on the 11th through the 12th and lingering into early on the 13th. Snowfall totals over the six days from January 8-13 were exceptional, and in fact the 22.9 inches measured at Des Moines makes it the snowiest six-day stretch on record (breaking the old record of 22.7 inches set over New Year's from 1941-42). The second storm was followed by extreme cold that persisted for several days. On January 14th the high at Des Moines was only -7° and the low was -17°, resulting in an average temperature of -12° which is fully 34 degrees below normal for the date. The average temperature over the four days from January 13-16 was only -6.5°, making it the coldest four-day stretch in Des Moines in nearly 28 years (since February 1-4, 1996). A third snow storm with more strong wind moved through on January 18th, bringing the 11-day snowfall total at Des Moines (from January 8-18) to a whopping 27.0 inches, which is higher than the totals for meteorological winter in seven of the last nine years. In other words, if you rank the last 10 winters (December through February), the amount that fell over just those 11 days in January is #3 on the list. The numbers are similar at Waterloo, where from January 8-18 a total of 24.9 inches of snow fell, which would rank #5 against the meteorological winter totals of the last 10 years.

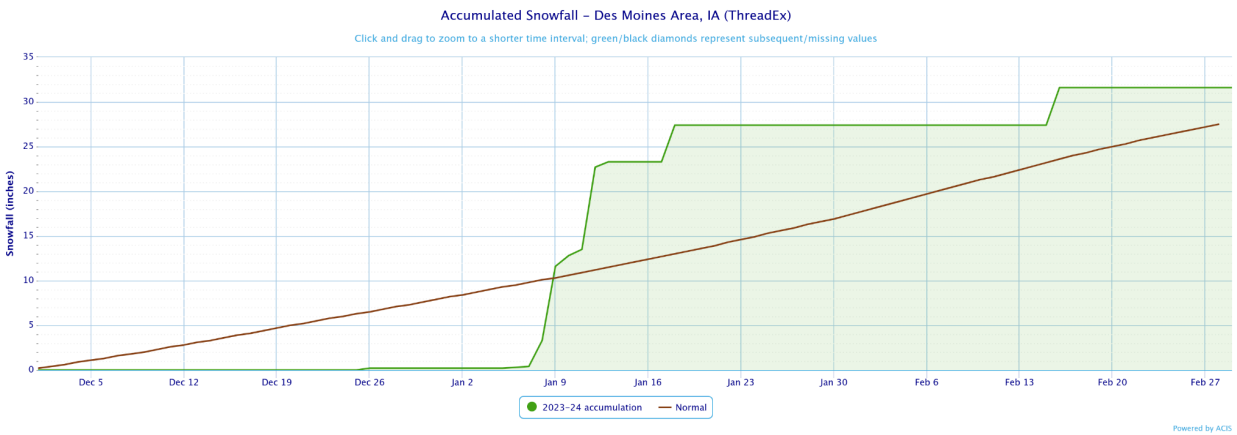
The plots below show the temperature for each day this winter, and the accumulation of snowfall, at both Des Moines and Waterloo. The “two weeks of winter” in the middle of January are readily apparent!



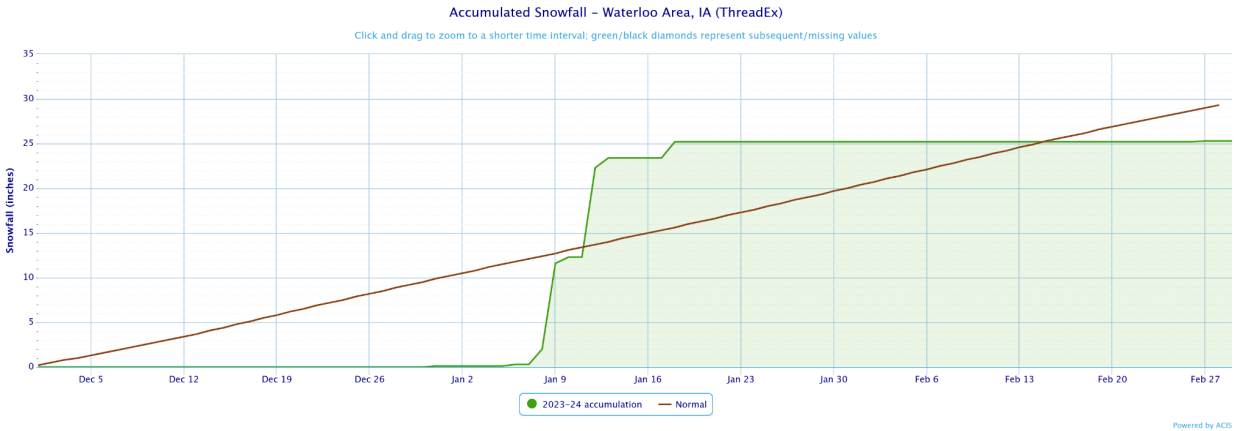
Daily temperatures at Des Moines (December 2023 - February 2024)



Daily temperatures at Waterloo (December 2023 - February 2024)

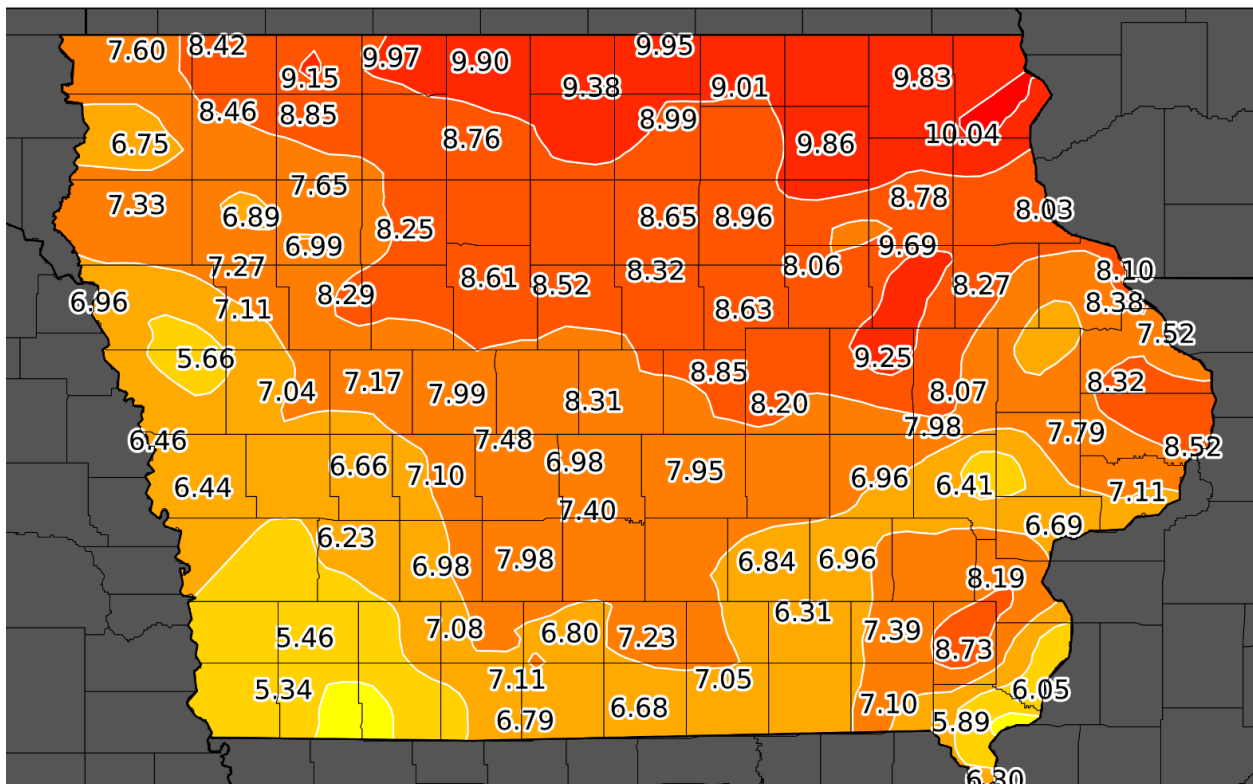


Snowfall accumulation at Des Moines (December 2023 - February 2024)

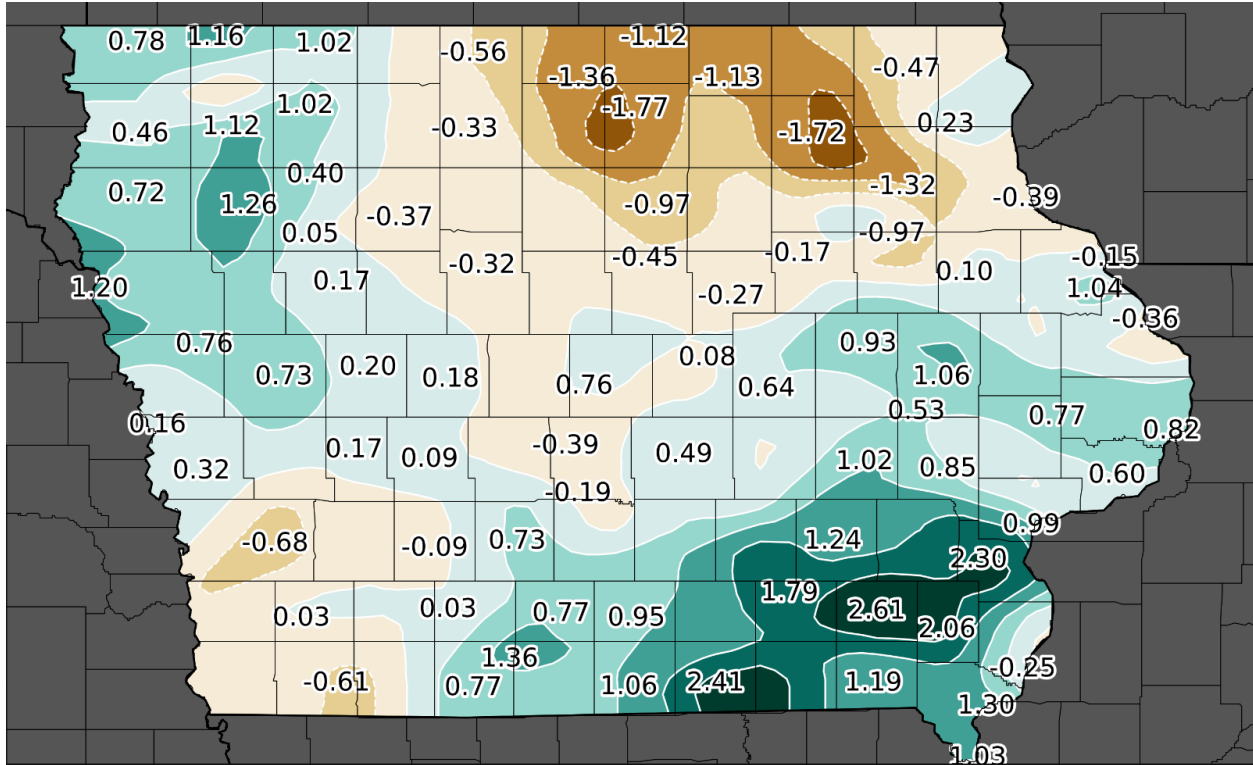


Snowfall accumulation at Waterloo (December 2023 - February 2024)

Finally, here is a look at the temperature and precipitation departures from normal across Iowa, for the 2023-24 meteorological winter (courtesy of the Iowa Environmental Mesonet):



Temperature departures from normal across Iowa (December 2023 - February 2024). Most of the state was 6-9 degrees above normal, averaged over those three months.



Precipitation departures from normal across Iowa (December 2023 - February 2024).
The winter was wetter than normal in the southeast, and to some extent in the northwest, but drier than normal in north central and northeastern sections.