

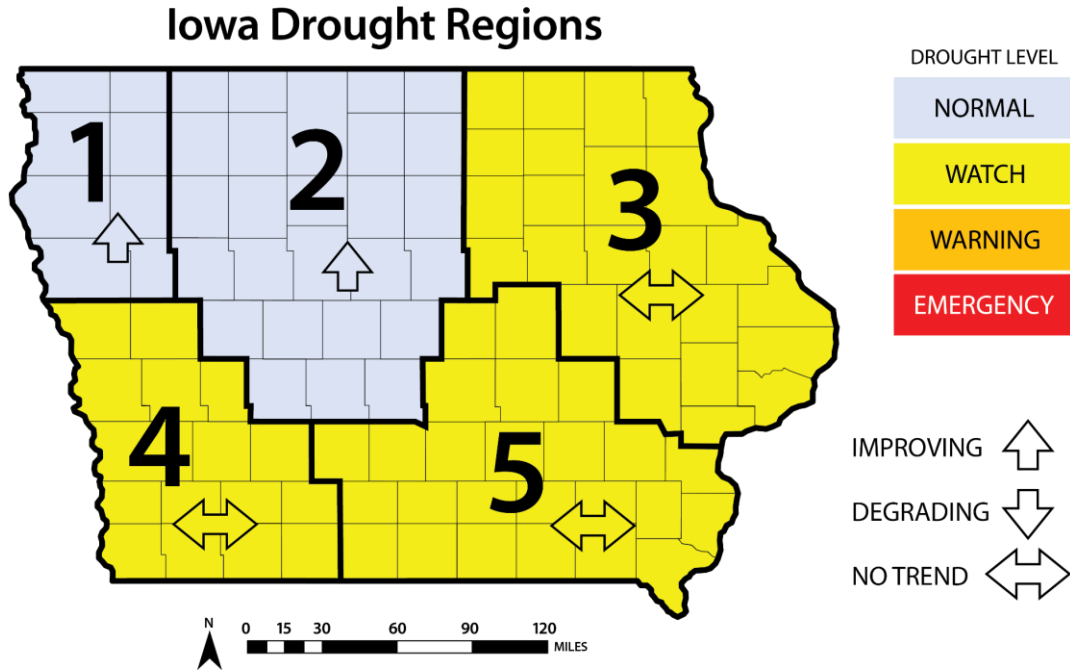


WATER SUMMARY UPDATE

Published Date March 7, 2024 | Issue 153

A snapshot of water resource trends for February 2024

IOWA DROUGHT CONDITIONS



CONDITION SUMMARY

February 2024 was a remarkable month that will rank as the warmest, 2nd driest and 5th least snowy. Meteorological winter will also be ranked as the 2nd warmest.

The US Geological Survey reports that streamflow remains generally normal across the state. The US Drought Monitor, one measure reflected in the Iowa Drought Plan (IDP), still shows nearly all of the state in some form of dryness or drought, with a slight deterioration of conditions in northwest and southeast Iowa.

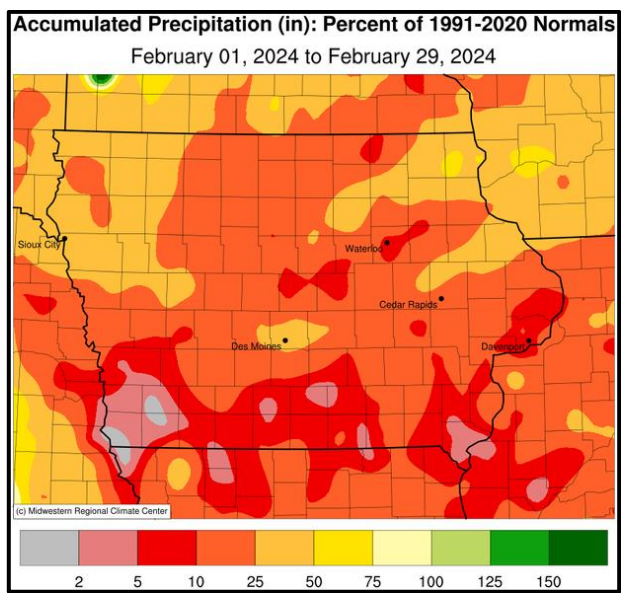
Drought Conditions overall are stable – but Drought Regions 3, 4 and 5 (northeastern and southern Iowa) remain in Drought Watch. With no snow cover to contribute to moisture, any improvement to conditions will depend on future rainfall; above normal precipitation is certainly needed.

February Precipitation and Temperature

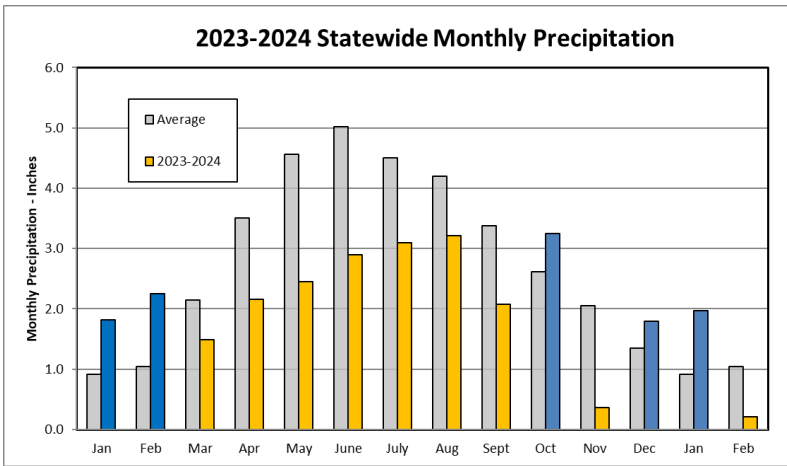
February’s statewide average precipitation was 0.19 inches, 0.98 inches below normal. Many National Weather Service co-op stations reported less than 25% of normal precipitation through February. Overall, a vast majority of Iowa’s reporting stations observed 50% of normal with the driest conditions across the southern three tiers of counties. Monthly precipitation totals ranged from 0.01 inches at several stations to 0.83 inches in Dubuque. Statewide snowfall was well below normal with an average of 1.1 inches, 5.7 inches below normal.

Anomalously warm temperatures blanketed Iowa in February with the highest departures found north and north-central; average temperature departures were up to 11 to 15 degrees above normal. In fact, February's statewide average was 1.2 degrees warmer than March's climatological average. Multiple stations in western Iowa had a daytime high of 81 degrees on the 26th, just one degree off the record high set on February 28, 1972, in Sidney (Fremont County).

Temperatures for the three winter months of December, January and February (DJF) averaged 30.7 degrees or 7.8 degrees above normal while precipitation totaled 3.83 inches, 0.32 inch above normal. Winter 2023-2024 ranks as the 2nd warmest and ties 1997 as the 47th wettest; 1877 was warmer while 2022 was wetter (3rd wettest). The statewide average snowfall was 20.1 inches, 2.00 inches below normal, making it the 71st least snowy winter in 137 years of records with 2020-2021 experiencing less snow.



The graph below shows monthly precipitation in Iowa compared to normal (gray bars), and indicates that Iowa received above normal precipitation October, December, and January, but much below normal precipitation in November and February. Over this five-month period the State has received 7.5 inches of precipitation, which is just behind the normal of 7.8 inches. This means that the surplus moisture from October, December, and January has been offset by the deficits from November and February. Over the past year, statewide average precipitation has been only 75 percent of normal, or 8.6 inches below what is expected.



Standardized Precipitation Index (SPI)

The SPI is an index based on accumulated precipitation for various time scales. SPI is the most commonly used indicator worldwide for detecting and characterizing meteorological droughts. The SPI indicator measures precipitation differences based on a comparison of observed total precipitation amounts over the period of interest with the long-

term historical precipitation record for that period. Droughts are characterized by negative SPI values, while positive SPI values indicate wet periods. The range of SPI values is between -2 and +2.

90-day SPI values for the Drought Regions for the month of February (comparing December, January, and February precipitation) range from +0.8 to -0.1, with all values close to or above zero. 180-day SPI values are mostly negative, but all are improving and all are in the IDP Normal range.

| Drought Region | 3-month SPI | 6-month SPI | IDP Classification ↑ = improving ↓ = degrading ↔ = no trend |
|----------------|-------------|-------------|--|
| 1 | +0.6 | +0.5 | Normal ↑ |
| 2 | -0.1 | -0.3 | Normal ↑ |
| 3 | +0.1 | -0.3 | Normal ↑ |
| 4 | +0.3 | -0.6 | Normal ↑ |
| 5 | +0.8 | -0.5 | Normal ↑ |

Standardized Streamflow Index (SSI) and Streamflow

SSI is a metric that compares current streamflow against the historical record to determine how far away the current streamflow value is from the river's historical mean observed on the same date. Drought index values typically range from 0 (streamflow is the same as the mean) to -3, which indicates the current streamflow is three standard deviations less than the historical mean for the period. Positive SSI values indicate wetter than normal or flood-level flows. For February, the SSI for each drought region is:

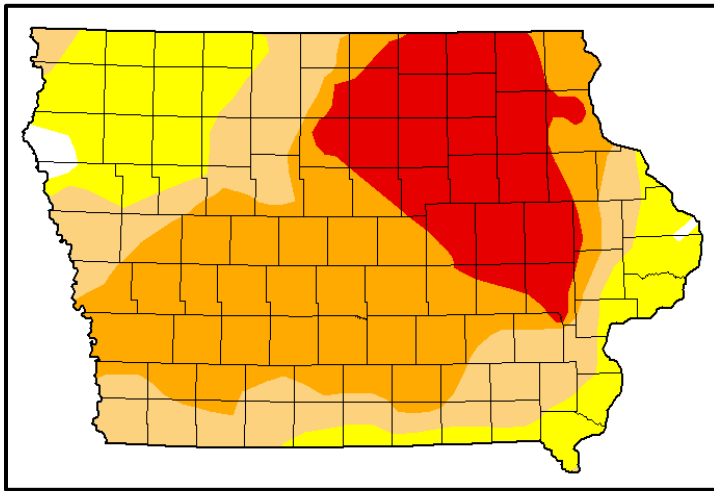
| Drought Region | 30-Day SSI | 365-Day SSI | IDP Classification ↑ = improving ↓ = degrading ↔ = no trend |
|----------------|------------|-------------|--|
| 1 | -0.04 | -0.54 | Normal ↑ |
| 2 | -0.07 | -0.87 | Normal ↑ |
| 3 | -1.17 | -0.56 | Drought Watch ↓ |
| 4 | -0.86 | -1.44 | Drought Watch ↔ |
| 5 | -1.26 | -1.42 | Drought Warning ↑ |

According to the US Geological Survey, streamflow conditions in February remain near normal for most of the state. This is similar to the conditions seen in January. Since January, portions of the Raccoon and Nishnabotna Rivers have moved into below-normal conditions, while the Iowa, Cedar, and Chariton Rivers remain in below-normal conditions. The Little Sioux River has moved into above-normal condition since last month. During the winter season, USGS streamflow data may be impacted by ice formation and backwater, so this data should be used as preliminary information only.

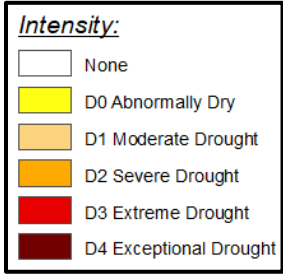
US DROUGHT MONITOR AND DROUGHT CONDITIONS

The US Drought Monitor shows little change in drought conditions in Iowa over the past month. The area of the state classified in D3-Extreme Drought expanded to 20 percent, while the areas of D2 – Severe Drought, and D1 – Moderate Drought remained largely unchanged at 36 percent, and 23 percent respectively. At the end of February less than one percent of the state was rated as free from drought and dryness. Degradation of conditions occurred in northwest, north central, and southeast Iowa. This week marks 200 weeks with some classification of drought or dryness in Iowa, dating back to May 5, 2020. This is the longest period of time since the start of the US Drought Monitor in 2000.

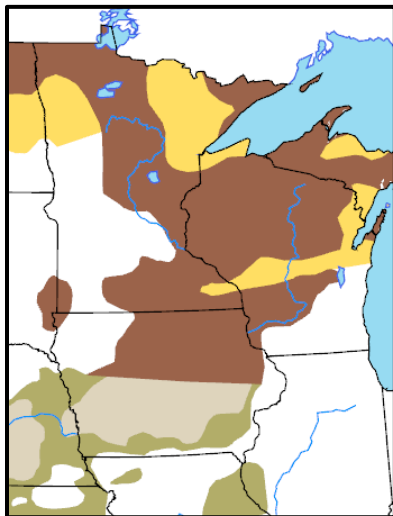
On a national scale, over half of the United States is free from drought or dryness, with less than 8 percent of the country rated in D2, D3, or D4 drought conditions. The driest areas are currently located in western Montana and most of New Mexico, along with eastern Iowa.



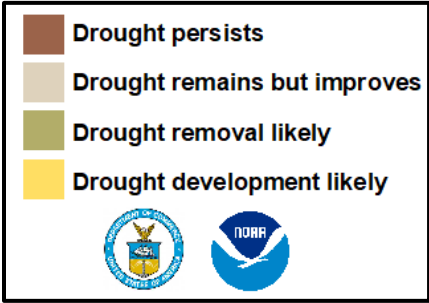
March 5, 2024
 (Released Thursday, Mar. 7, 2024)



The Seasonal Drought Outlook issued by the Climate Prediction Center (CPC), valid for March 1 through May 31, shows a tendency for drought to persist in the northern half of the state, with some drought improvement or removal of drought conditions possible in the southern half of the state.



U.S. Seasonal Drought Outlook
Drought Tendency During the Valid Period

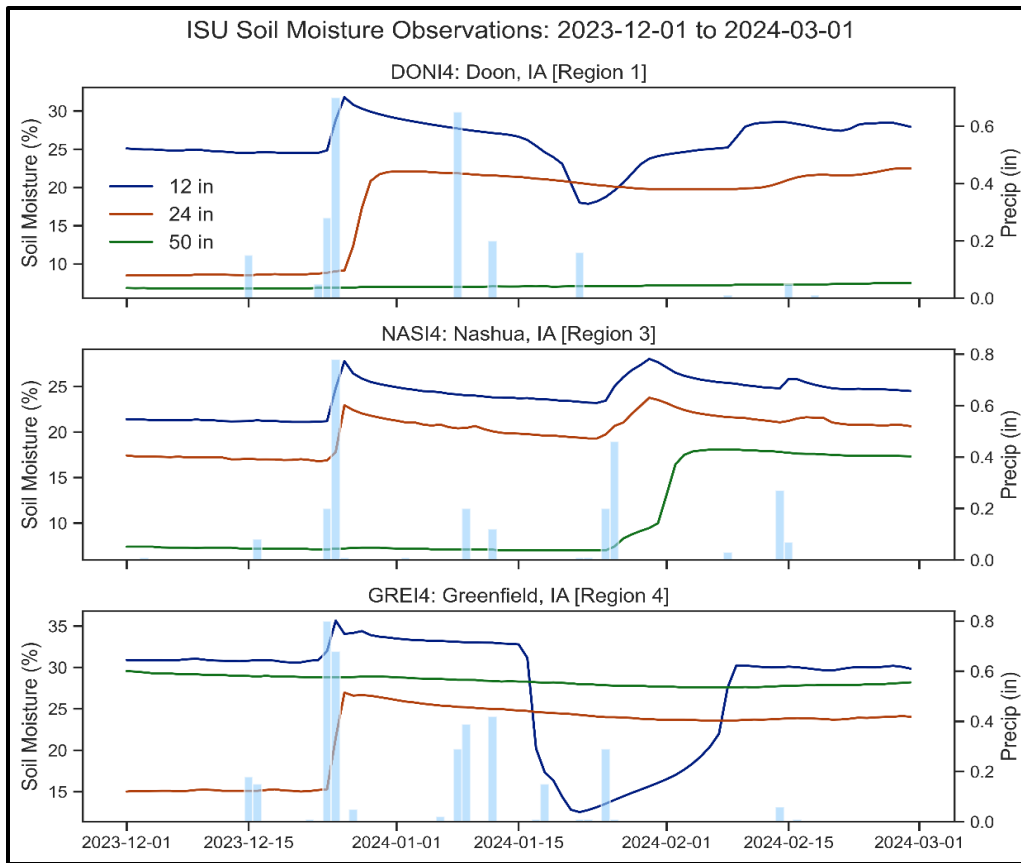


Valid for March 1 - May 31, 2024
Released February 29, 2024

OTHER WATER RESOURCE INFORMATION

February Soil Moisture

The graphs below show soil moisture at three depths and at three locations in Iowa over the past 90 days. Precipitation is also shown on these graphs (the light blue bars). In each of these graphs the soil moisture at the 12-inch depth (the dark blue line) shows rapid response to rainfall or snowmelt events. The 50-inch soil moisture (the green line) shows less change over these 90 days. Without rain, the start of the active growing season, along with warmer temperatures, will result in decreased soil moisture across the state.



BORDER RIVER CONDITIONS

In their weekly update of Missouri River conditions dated March 5, 2024, the Army Corps of Engineers (USACE) indicate that the volume of water stored in the system of reservoirs is 53.9 Million Acre-Foot (MAF), slightly below normal for this time of year. The annual runoff forecast for the Basin above Sioux City is 17.0 MAF, or just 66% of average. This forecast runoff results in the Corps projecting reservoir levels to be significantly below normal by the end of 2024. Mountain snowpack is currently below average in the basin. On March 3, the reach above Fort Peck had 9.4 inches of snow water equivalent (SWE), 73% of average, and the reach between Fort Peck and Garrison had 9.1 inches of SWE, 78% of average.

USACE data also shows that the lack of snowpack in Minnesota and Wisconsin, combined with dry conditions in the Upper Mississippi River basin and potentially lower Missouri River flow levels, could lead to a repeat of 2023’s low water conditions later this year on parts of the Mississippi River.

ADDITIONAL INFORMATION

This edition of the Water Summary Update continues to reflect use of the 2023 Iowa Drought Plan (IDP), which was developed as a collaborative effort between the Department of Natural Resources, the Department of Agriculture and Land Stewardship, and the Department of Homeland Security and Emergency Management. The IDP can be seen in its entirety on the DNR’s website: [The Iowa Drought Plan](#).

For additional information on the information in this Water Summary Update please contact any of the following:

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- Stream Flow, Dan Christiansen, USGS dechrist@usgs.gov, 319-358-3639
- Stream Flow, Mike Anderson, Iowa DNR..... Michael.Anderson@dnr.iowa.gov, 515-725-0336
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