



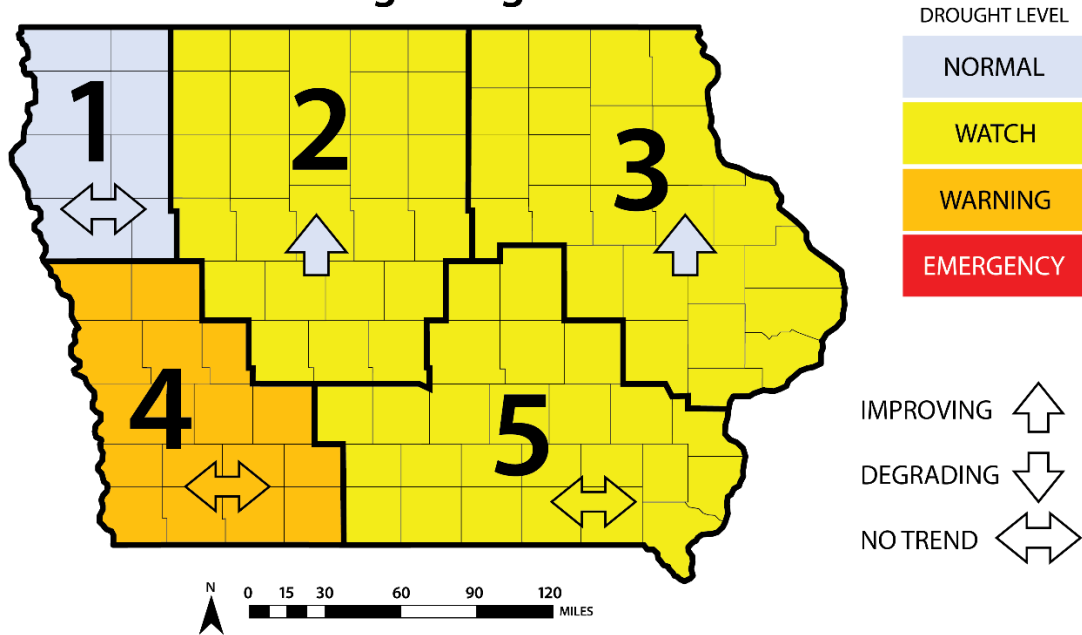
WATER SUMMARY UPDATE

Published Date November 9, 2023 | Issue 149

A snapshot of water resource trends for October 2023

IOWA DROUGHT CONDITIONS

Iowa Drought Regions



CONDITION SUMMARY:

October was the first month since February in which the statewide average precipitation was above normal.. Monthly rain and snow helped to improve drought conditions across Iowa, but many more months of above normal precipitation are needed before drought is eliminated from the state. October's statewide average rainfall was 3.12 inches, or 0.43 inches above normal. Despite a wetter than normal October, Iowa's year-to-date average precipitation is 24.64 inches, 7.72 inches below normal – or 76 percent of normal. Temperatures averaged 54.4 degrees, or about 2.4 degrees above normal for October. The wettest area of Iowa in October was the northwest part of the state, with many counties getting two or three times their normal monthly precipitation. Stream flow rebounded after October rains, but in many locations has dropped to very low levels once that moisture drained out of the systems. Soil moisture has improved in some locations, though profiles remain particularly dry. The US Drought Monitor shows nearly all of the state in some form of dryness or drought, with almost 25 percent rated as D3 – Extreme Drought the worst conditions in located in north-to-south swath in eastern Iowa.

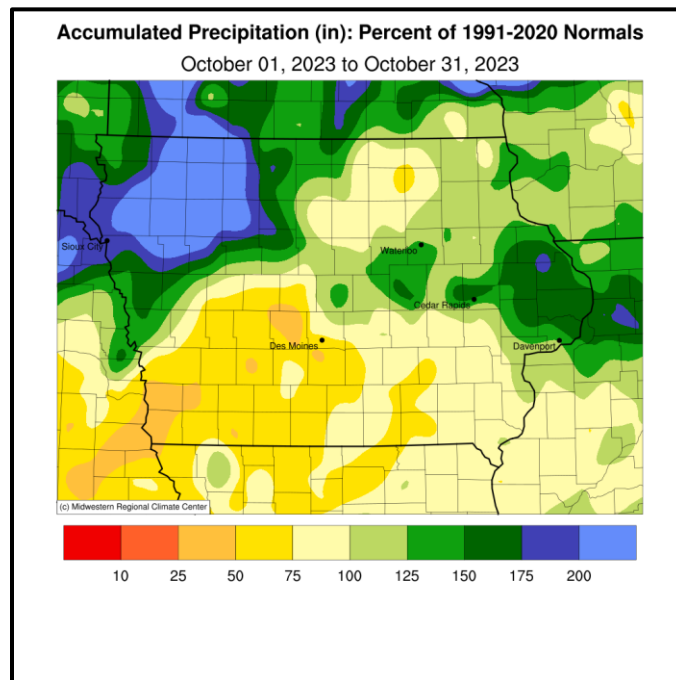
Conditions in Drought Region 4 (southwest Iowa) are rated as Drought Warning, with below-average precipitation and low streamflow values in October. The Iowa Drought Team continues to closely monitor

conditions as the state moves through fall and into winter. Typically, drought conditions do not change significantly over the winter months.

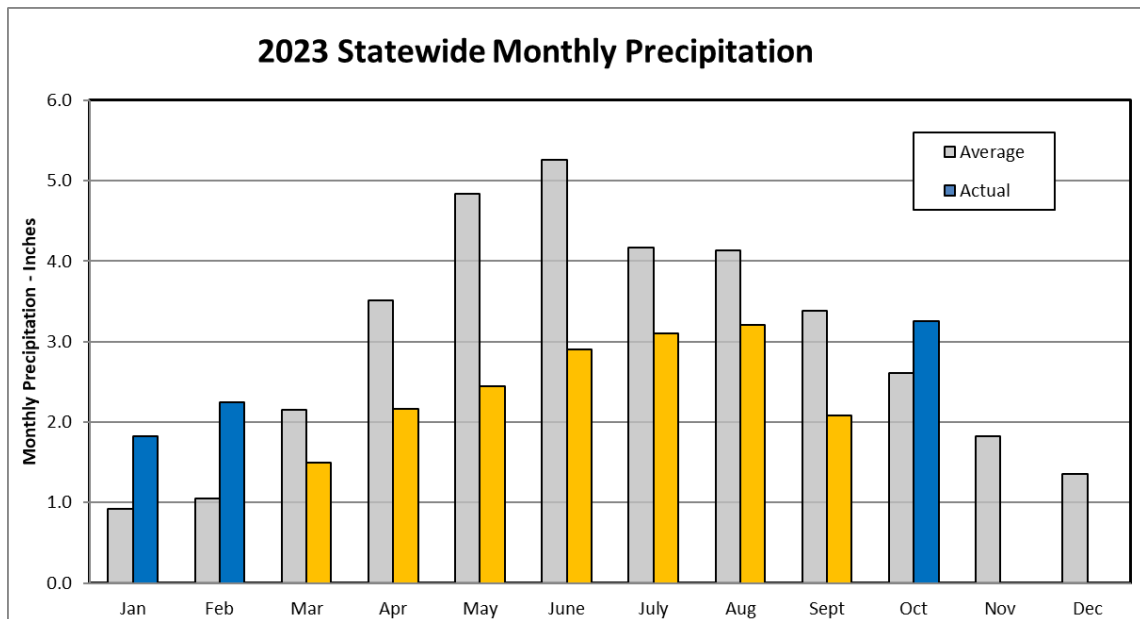
October Precipitation and Temperature

Iowa's statewide precipitation totaled 3.12 inches, or 0.43 inches above normal, tying 2012 as the 46th wettest October in 151 years of statewide records. October 2021 was wetter and the 7th wettest on record. October broke seven consecutive months of below-average precipitation for Iowa. National Weather Service (NWS) stations and Community Collaborative Rain, Hail and Snow (CoCoRaHS) gauges in northwest Iowa reported 150-300 percent of normal precipitation with sections of eastern Iowa in the 125-175 percent of normal range. Southwestern Iowa was the driest part of the state with widespread 50-75 percent of normal precipitation totals. Monthly precipitation totals ranged from 0.95 inches in Bloomfield to 7.31 inches in Sioux Rapids.

The statewide average temperature was 53.4 degrees, 2.4 degrees warmer than normal. This ties 1902, 1955 and 2011 as the 48th warmest October in 151 years of statewide records. Spencer Municipal Airport reported the month's high temperature of 95 degrees on the 1st, 25 degrees above normal. Primghar reported the month's low temperature of 16 degrees on the 30th, 18 degrees below normal.



The graph below shows monthly precipitation in Iowa compared to normal (gray bars). After seven months of below normal precipitation (orange bars) October ended with above normal precipitation. It is worth noting that the next four months are the four driest months of the year. November, December, January, and February normally bring less total moisture than the month of June. These normal precipitation numbers during the drier winter months make it difficult to see significant drought recovery.



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 October (comparing August, September, and October precipitation) range from -0.1 to -1.3. Negative SPI values are found across nearly all of Iowa, and show a mix of some improvement and some stabilization. 180-day SPI values are particularly low in Drought Regions 3, 4, and 5, but remain no worse than the Drought Watch range.

Drought Region	3-month SPI	6-month SPI	IDP Classification ↑ = improving ↓ = degrading ↔ = no trend
1	-0.1	-0.1	Normal ↑
2	-0.7	-0.8	Normal ↑
3	-0.7	-1.5	Drought Watch ↑
4	-1.3	-1.0	Drought Watch ↔
5	-1.3	-1.3	Drought Watch ↔

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 October, the SSI for each drought region is:

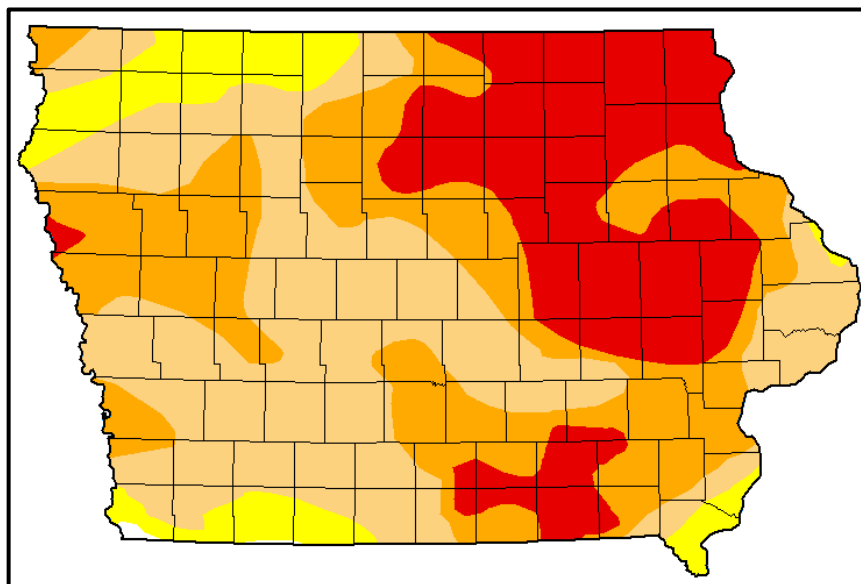
Drought Region	30-Day SSI	365-Day SSI	IDP Classification ↑ = improving ↓ = degrading ↔ = no trend
1	-0.46	-0.71	Normal ↑
2	-1.10	-0.91	Drought Watch ↑
3	-1.02	-0.45	Drought Watch ↔
4	-1.57	-1.29	Drought Warning ↔
5	-1.46	-1.16	Drought Watch ↔

As of the end of October, streamflow USGS data shows that streamflow is below normal or much below normal across much of eastern and southern Iowa. Among the watersheds with the lowest flow levels in Iowa are the Nishnabotna and the Middle Raccoon Rivers.

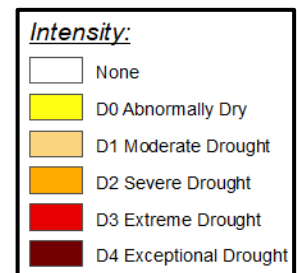
US DROUGHT MONITOR AND DROUGHT CONDITIONS

During the month of October some improvement was seen in drought conditions as indicated by the US Drought Monitor. Some parts of northwest Iowa saw improvements by two drought classification levels, while eastern Iowa also saw noticeable improvement. Currently about 24 percent of Iowa is rated as D3 – Extreme Drought, 30 percent is rated as D2 – Severe Drought, and 29 percent is rated as D1-Moderate Drought. D0 – Abnormally Dry, is technically not considered drought, and 15 percent of Iowa is now rated in this category. Portions of Jackson, Clinton, and Scott Counties, along the Mississippi River, are the only parts of the state that are shown with normal conditions. This week marks the 183rd week with some classification of drought or dryness in Iowa, dating back to May 5, 2020.

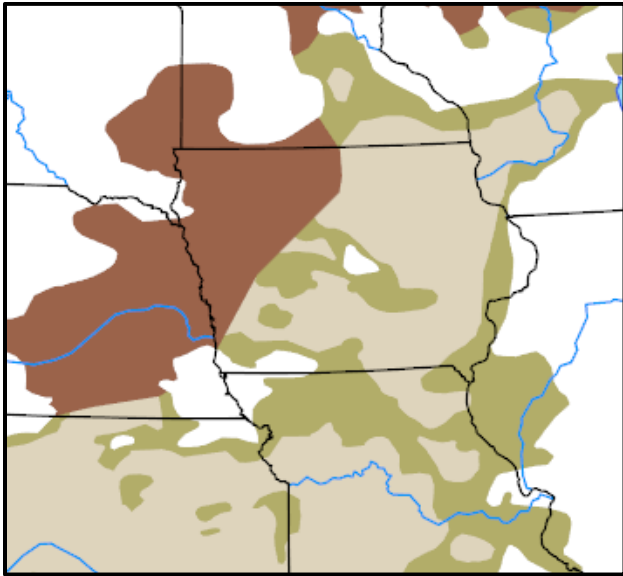
On a national scale, much of the continental United States is free from dryness or drought, with the most significant drought conditions predominantly in the south and southeast. Currently about 75 percent of the state of Louisiana is rated as the worst drought conditions, D4 – Exceptional Drought. In comparison, the greatest extent of D4 drought in Iowa occurred in September of this year, with coverage nearing 5 percent of the state.



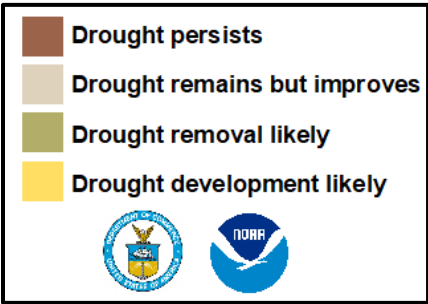
September 5, 2023
 (Released Thursday, Sep. 7, 2023)
 Valid 8 a.m. EDT



The Seasonal Drought Outlook issued by the Climate Prediction Center (CPC), valid for November 1 through January 31, shows the northwestern one third of the state with a tendency for drought to persist, with the remainder of Iowa showing a tendency towards drought improvement or drought removal.



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

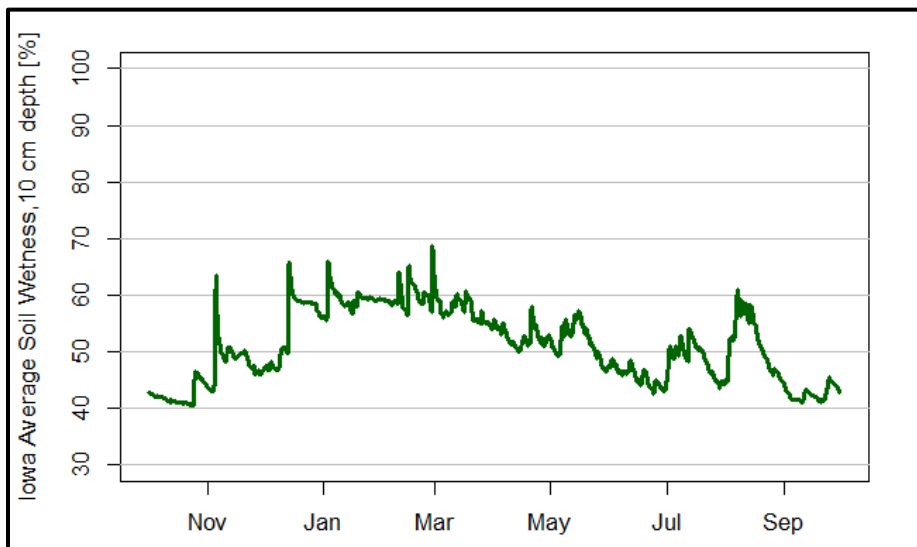


Valid for November 1, 2023 - January 31, 2024
Released October 31, 2023

OTHER WATER RESOURCE INFORMATION

OCTOBER SOIL MOISTURE

Soil moisture conditions showed some improvement in October, but overall soil moisture is low in much of the state. The US Department of Agriculture’s National Agricultural Statistics Service’s (NASS) weekly report released on November 6 indicates that across the state 55 percent of topsoil is rated as short or very short for soil moisture, while 70 percent of subsoil is rated as short or very short for soil moisture. The graph below shows average soil moisture across the state at a depth of four inches.



BORDER RIVER CONDITIONS

In their weekly update of Missouri River conditions dated November 7, the Army Corps of Engineers indicate that the volume of water stored in the system of reservoirs is 53.1 Million Acre-Feet (MAF), and is forecast to remain at that approximate level through the end of the year. The calendar year runoff forecast for the Missouri River Basin above Sioux City, IA, is currently 29.8 MAF, which is 116 percent of average. Mountain snowpack has begun accumulating and is currently below average in the Fort Peck reach, and slightly above average in the Garrison reach. Flow in the Mississippi River remains below normal for this time of the year.

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](#).

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