

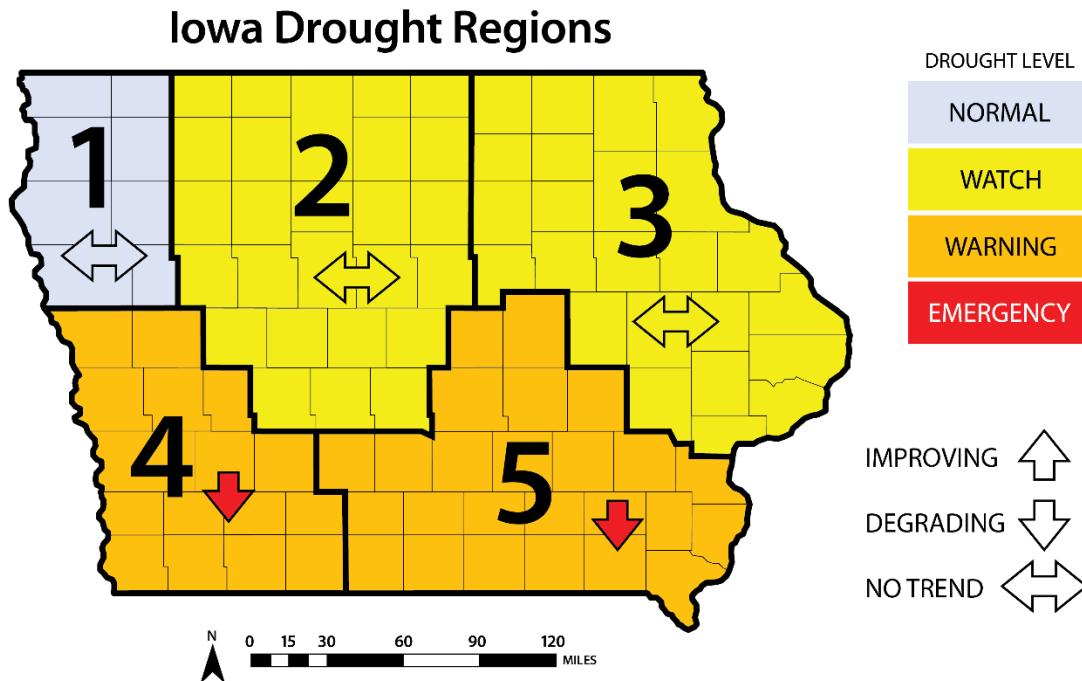


# WATER SUMMARY UPDATE

Published Date December 7, 2023 | Issue 150

## A snapshot of water resource trends for November 2023

### IOWA DROUGHT CONDITIONS



#### CONDITION SUMMARY:

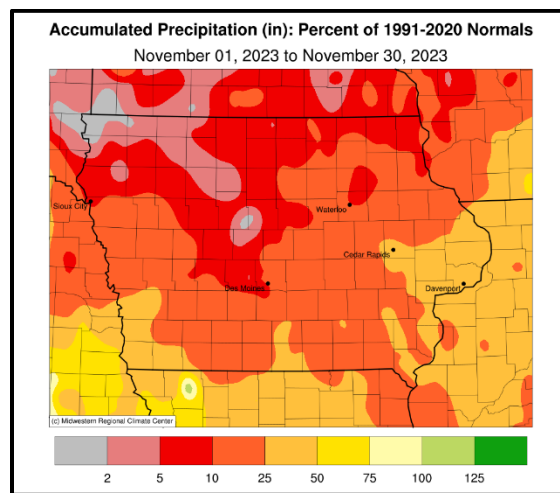
After a wet October, the month of November saw a return to below normal precipitation, both rain and snow, in Iowa. November’s preliminary statewide average precipitation was only 0.38 inches, or 1.44 inches below normal. Iowa’s year-to-date average precipitation is 25.40 inches, nearly eight inches below normal. Temperatures averaged 39.0 degrees, or about 2.1 degrees above normal for the month. Sibley recorded only 0.01 inches of rain for the month of November. Stream flow remains low across much of the state. After a dry November, soil moisture has continued to degrade. The US Drought Monitor shows nearly all of the state in some form of dryness or drought, with almost 28 percent rated as D3 – Extreme Drought the worst conditions in located in north-to-south swath in eastern Iowa.

Conditions in Drought Regions 4 and 5 (southern Iowa) are rated as Drought Warning, with below-average precipitation and low streamflow values in November. 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.

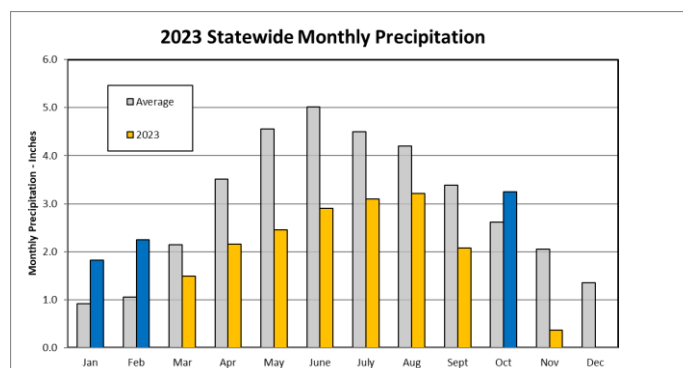
## November Precipitation and Temperature

November was the second fall month and the eighth month of 2023 in which the state received below-average precipitation. Most stations reported at most 25% of their normal expected precipitation for November, which is climatologically the fourth driest month of the year. Statewide preliminary average precipitation totaled 0.38 inches or 1.44 inches below normal. Monthly precipitation totals ranged from 0.01 inches at Sibley to 1.01 inches near College Springs. The statewide average snowfall was 1.7 inches, 1.0 inches below average. Muscatine reported the highest monthly snowfall at 4.5 inches. For the meteorological fall months (September-October-November) precipitation totaled 5.55 inches, 2.44 inches below normal. This fall deficit is despite the much wetter than normal month of October.

November temperatures averaged 39.0 degrees, 2.1 degrees above normal. Several southern stations reported the month's high temperature of 72 degrees on the 6th, on average 19 degrees above normal. Fayette reported the month's low temperature of -5 degrees on the 28th, 24 degrees below normal. Temperatures over the three autumn months (September-October-November) averaged 53.1 degrees or 3.0 degrees above normal.



The graph below shows monthly precipitation in Iowa compared to normal (gray bars). After the above normal rainfall in October, the graph shows the return on a dry month in November. It is worth noting that the next three months are normally the driest months of the year. December, January, and February normally bring just over three inches of moisture to the state. 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 November (comparing September, October, and November precipitation) range from +0.4 to -0.9. Negative SPI values are found across nearly all of Iowa, but show improvement from the wet October, despite the dry November. 180-day SPI values are particularly low in Drought Regions 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	+0.4	-0.1	Normal ↔
2	-0.4	-0.9	Normal ↔
3	-0.4	-1.3	Drought Watch ↑
4	-0.9	-0.8	Drought Watch ↔
5	-0.9	-1.1	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 November, the SSI for each drought region is:

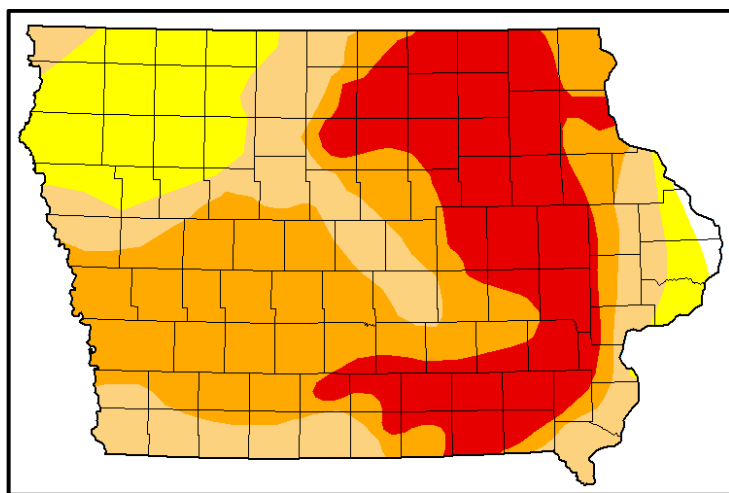
Drought Region	30-Day SSI	365-Day SSI	IDP Classification ↑ = improving ↓ = degrading ↔ = no trend
1	-0.52	-0.67	Normal ↔
2	-1.39	-0.90	Drought Watch ↓
3	-1.25	-0.54	Drought Watch ↓
4	-1.62	-1.34	Drought Warning ↔
5	-1.99	-1.27	Drought Warning ↔

During November, according to USGS data, streamflow conditions remained low across the state. Most streams have below normal flow, with a few areas in showing much below normal conditions. Since October, portions of the Skunk, Thompson, and Upper Iowa Rivers have all moved into below normal conditions. The Chariton and lower and middle portions of the Iowa River have moved into much below-normal conditions.

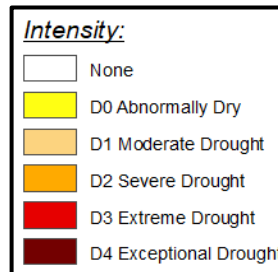
## US DROUGHT MONITOR AND DROUGHT CONDITIONS

The US Drought Monitor remained generally unchanged during the month of November. A large area of D3 – Extreme Drought covers over one quarter of the state, and has been present in that location for three months. Some improvement was seen in drought conditions as indicated by the US Drought Monitor. Currently about 28 percent of Iowa is rated as D3 – Extreme Drought, 35 percent is rated as D2 – Severe Drought, and 22 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. Parts of Jackson and Clinton Counties, along the Mississippi River, are the only parts of the state that are shown with normal conditions. This week marks the 187th week with some classification of drought or dryness in Iowa, dating back to May 5, 2020.

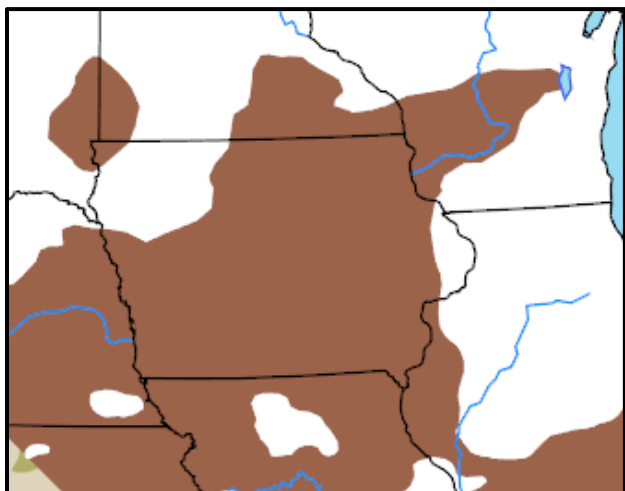
On a national scale, many of the western states are free from dryness or drought. The most significant drought conditions are located in the south and southeast – from New Mexico east to Alabama, and up into Tennessee and the Carolinas. Recent rains have brought some improvement to the state of Louisiana, but nearly a third of that state is still 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.



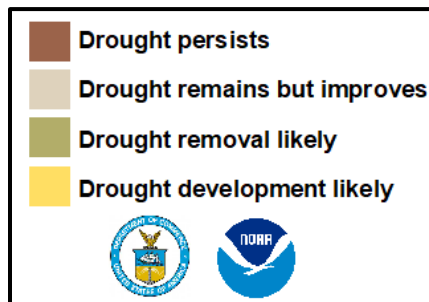
**December 5, 2023**  
(Released Thursday, Dec. 7, 2023)  
Valid 7 a.m. EST



The Seasonal Drought Outlook issued by the Climate Prediction Center (CPC), valid for December 1 through February 29, has become less optimistic over the last month. The outlook now shows all but northwestern part of Iowa with a tendency to remain in drought through the winter months.



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

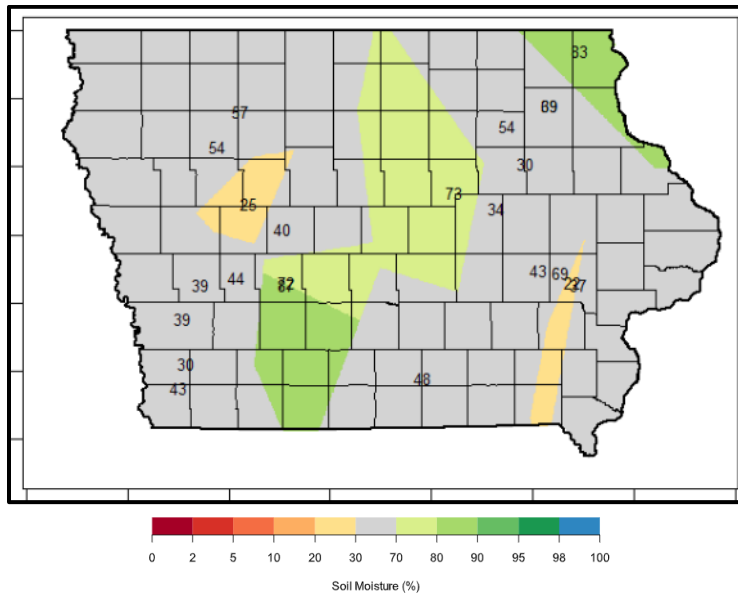


Valid for December 1, 2023 - February 29, 2024  
Released November 30, 2023

## OTHER WATER RESOURCE INFORMATION

### NOVEMBER SOIL MOISTURE

Soil moisture conditions showed degradation in November, with overall soil moisture remaining low in much of the state. Drier soil conditions exist in western Iowa, with conditions moving from wet to normal in south and central Iowa over the past month.



### BORDER RIVER CONDITIONS

In their weekly update of Missouri River conditions dated December 5, the Army Corps of Engineers indicate that the volume of water stored in the system of reservoirs is 52.6 Million Acre-Feet (MAF), and is forecast to remain at that general level through the end of the year. The December runoff forecast for the Basin above Sioux City is 29.9 MAF, or 116% of average. Gavins Point releases are currently 14,000 cfs and are being gradually reduced to the winter release rate of 13,000 cfs. Mountain snowpack is currently below average in both reaches; however, it is too early in the season to project a trend.

### 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:

General Information, Tim Hall, Iowa DNR . . . . . [Tim.Hall@dnr.iowa.gov](mailto:Tim.Hall@dnr.iowa.gov) 515-452-6633  
State Climatologist and  
Drought Coordinator, Justin Glisan, IDALS . . . . . [Justin.Glisan@iowaagriculture.gov](mailto:Justin.Glisan@iowaagriculture.gov) 515-281-8981  
Standardized Streamflow Index (SSI), Elliot Anderson, IGS . . . . . [elliot-anderson@uiowa.edu](mailto:elliot-anderson@uiowa.edu) 319-335-1575  
Stream Flow, Dan Christiansen, USGS . . . . . [dechrist@usgs.gov](mailto:dechrist@usgs.gov) 319-358-3639  
Stream Flow, Mike Anderson, Iowa DNR . . . . . [Michael.Anderson@dnr.iowa.gov](mailto:Michael.Anderson@dnr.iowa.gov) 515-725-0336  
Soil Moisture, Filipe Quintero Duque, Iowa Flood Center . . . . . [felipe-quintero@uiowa.edu](mailto:felipe-quintero@uiowa.edu) 319-384-1727