



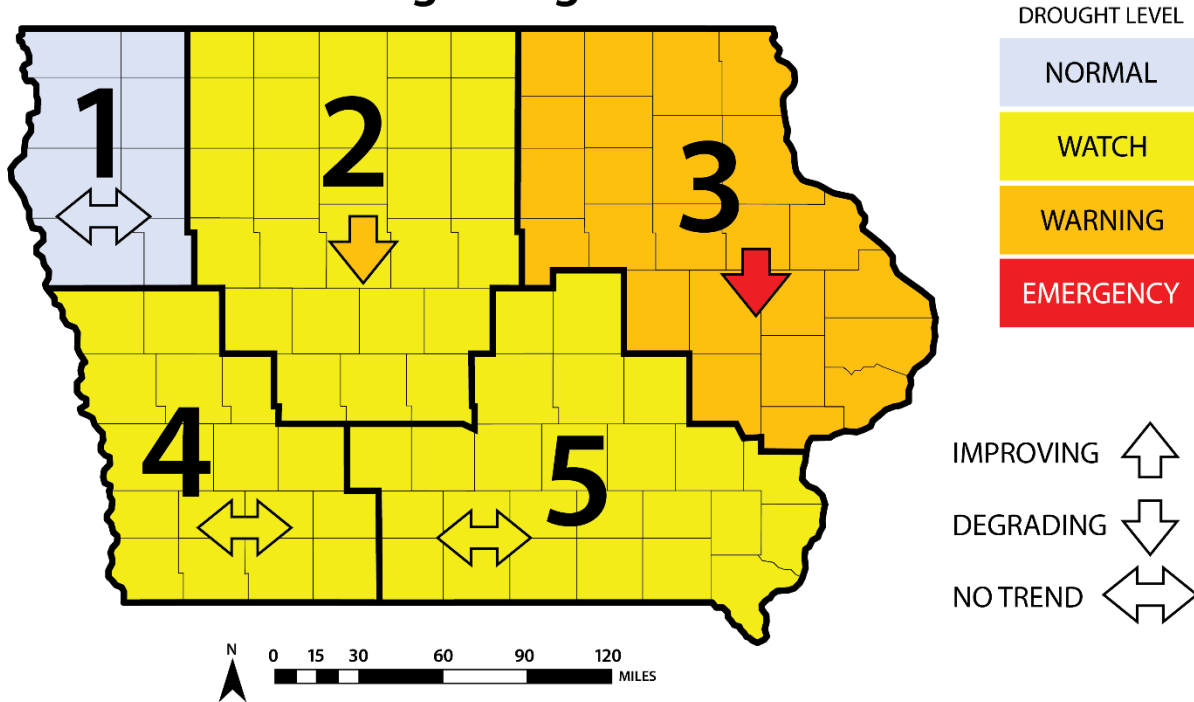
# WATER SUMMARY UPDATE

Published Date September 7, 2023 | Issue 147

## A snapshot of water resource trends for August 2023

### IOWA DROUGHT CONDITIONS

### Iowa Drought Regions



### CONDITION SUMMARY:

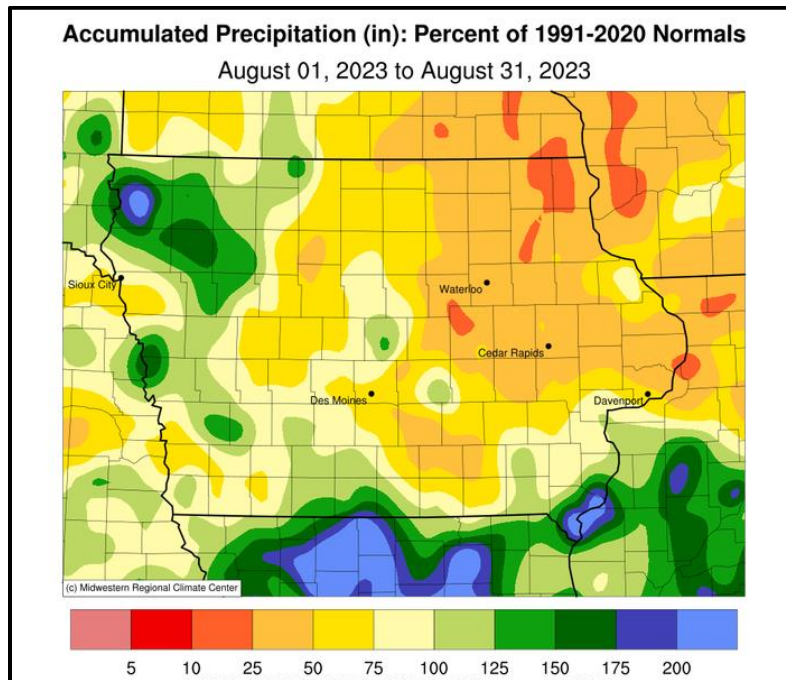
August ended with below normal rainfall for Iowa, making it six months in a row of drier than normal conditions. August rainfall was 3.25 inches, or 0.88 inches below normal. The summer months of June, July, and August brought 9.13 inches of rain, just 67 percent of the normal 13.56 inches, while temperatures averaged just under 73 degrees, or about two degrees above normal for August. Most of Iowa had below normal rainfall for the month, although some areas in northwest and southern Iowa saw above normal rainfall in August. Streamflow and soil moisture are also much below normal in the driest parts of the state. has recovered somewhat from the extremely low flows on early summer, but remains very low in parts of central and western Iowa. Soil moisture continues to be low across much of the state. The US Drought Monitor shows all of the state in some form of dryness or drought, with almost 25 percent rated as D3 – Extreme Drought. This represents the most significant D3 coverage since March 2013.

Conditions in Drought Region 3 (northeast Iowa) are rated as Drought Warning, but some areas are approaching conditions that would warrant designation as Drought Emergency. The Iowa Drought Team will be closely

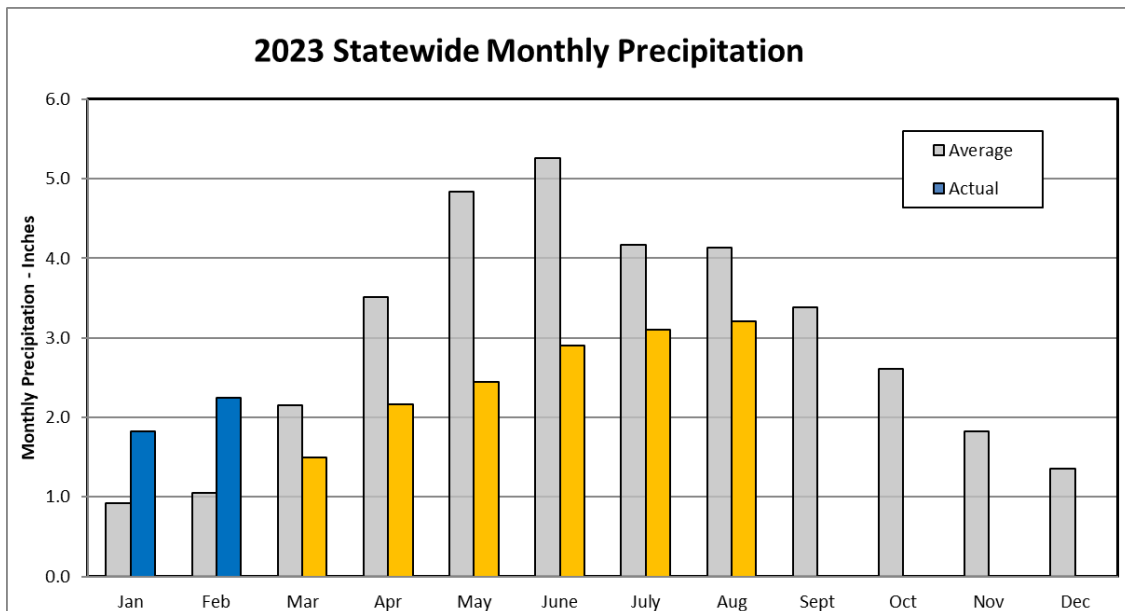
monitoring conditions, and may issue a targeted Water Summary Update on September 21, particularly if Drought Emergency Conditions are noted.

### August Precipitation and Temperature

A majority of Iowa's National Weather Service co-op stations reported precipitation deficits through August with widespread one to two-inch departures across much of eastern Iowa. Sections of northeastern Iowa experienced deficits above three inches. Stations across Iowa's western one-quarter reported above average totals as did stations along the Iowa-Missouri border. Monthly precipitation totals ranged from 0.62 inches in Clinton to 10.24 inches near Davis City.



The graph below shows monthly precipitation in Iowa compared to normal (the gray bars). Iowa has had six months of below normal precipitation, as shown by the orange bars. It is worth noting that each month that remains in the year typically brings less precipitation than the previous month, and by November the average monthly precipitation is less than half of August's.



Statewide average temperatures in July were above-normal across most of Iowa with near-normal conditions around the Iowa-Missouri border. Decorah and Waterloo Municipal Airport reported the month’s high temperature of 105 degrees on the 23rd, on average 23 degrees above normal. Elkader reported the month’s low temperature of 40 degrees on the 31st, 14 degrees below normal.

### 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 August (comparing June, July, and August precipitation) range from -0.3 to -1.4. Negative SPI values found across nearly all of Iowa, and show a mix of some improvement and some deterioration. 180-day SPI values are particularly low in Drought Region 3, falling to the Drought Warning range.

Drought Region	3-month SPI	6-month SPI	IDP Classification ↑ = improving ↓ = degrading ↔ = no trend
1	-0.4	-1.1	Normal ↑
2	-0.8	-1.2	Normal ↓
3	-1.2	-0.9	Drought Warning ↓
4	-0.3	-0.9	Normal ↓
5	-0.8	-1.4	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 August, the SSI for each drought region are:

Drought Region	30-Day SSI	365-Day SSI	IDP Classification ↑ = improving ↓ = degrading ↔ = no trend
1	-0.76	-0.82	Normal ↑
2	-1.05	-0.79	Drought Watch ↓
3	-1.05	-0.24	Drought Watch ↓
4	-1.29	-1.12	Drought Watch ↑
5	-0.99	-1.07	Drought Watch ↔

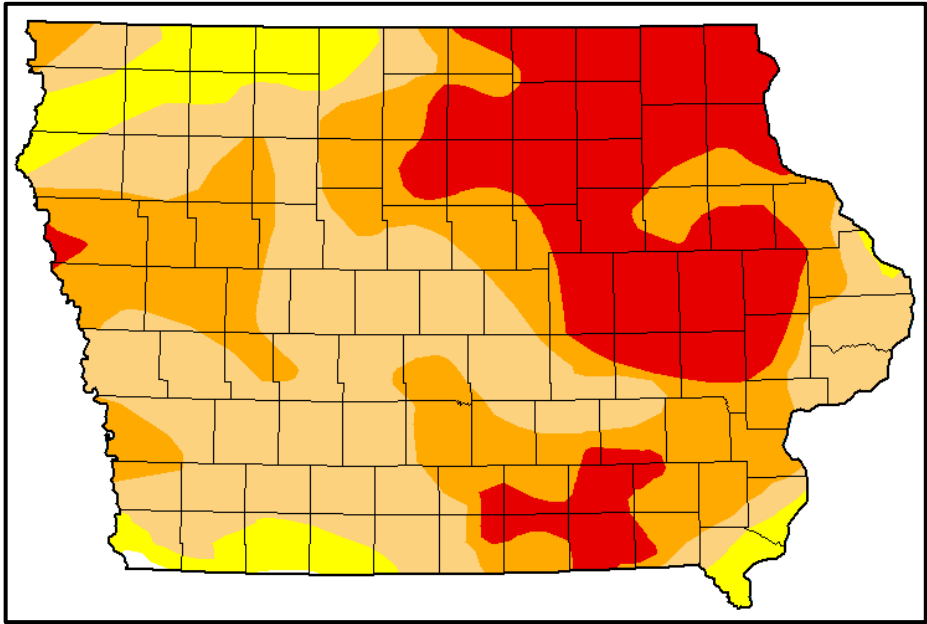
Some watersheds within Drought Regions 2 and 3 have SSI values that are close to Drought Warning. Should those SSI values grow to cover more area, those areas could be designated in Drought Warning.

During August, the USGS notes that streamflow conditions across most of the state remained below normal, with a few areas in much below-normal conditions. The Nishnabotna River remained in much below-normal conditions and the South Raccoon, West Fork Cedar, Wapsipinicon, and Iowa Rivers moved into the much below-normal condition over the last month. The Turkey, East Fork Des Moines, and Middle Des Moines Rivers moved into below-normal conditions.

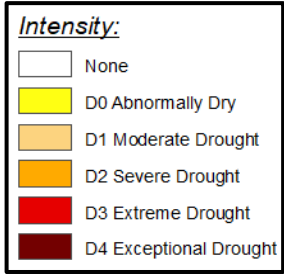
#### US DROUGHT MONITOR AND DROUGHT CONDITIONS

During the month of August, drought conditions deteriorated over much of the state, especially in north central and northeast Iowa. Late in August a large area of D3 – Extreme Drought was introduced in northeast Iowa. This week that area of D3 has been expanded to cover part or all of 28 counties in northeast Iowa, and another 10 counties in the southeast part of the state. There are now two areas of D4 – Exceptional Drought located just outside of Iowa in southern Minnesota and in southwest Wisconsin. At the end of August 24.6 percent of Iowa rated in D3 – Extreme Drought, 30.1 percent is rated D2 – Severe Drought, and 36.5 percent of the state is rated in D1 – Moderate Drought. 8.6 percent of the state is rated as D0 – Abnormally Dry. With the exception of a very small area of Fremont County along the Missouri border, all of Iowa has some level of drought or dryness designation at this time. The current coverage of D3 in Iowa is the most significant since March of 2013.

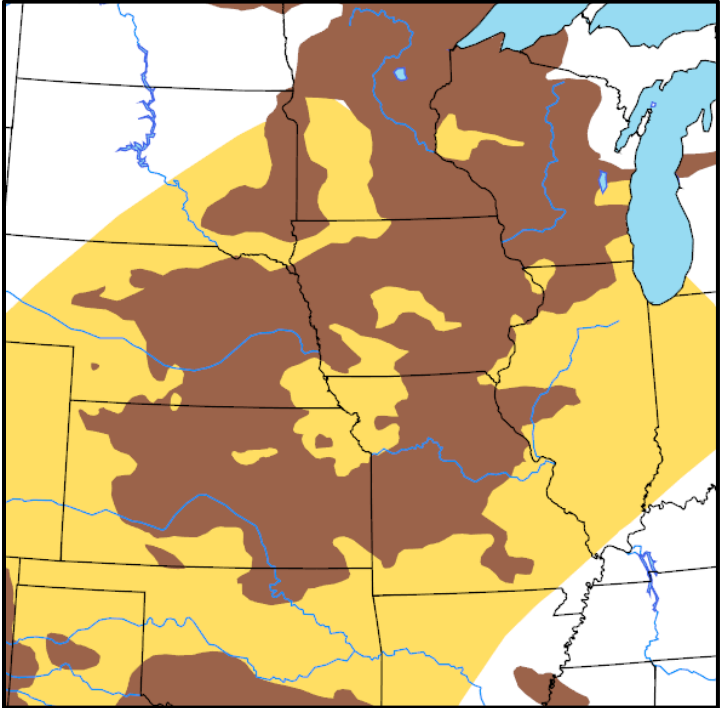
On a national scale, about half of the continental United States is free from dryness or drought, with the most significant drought conditions extending from Texas north and east thru Kansas, Nebraska, Missouri, Iowa, Wisconsin, and Minnesota.



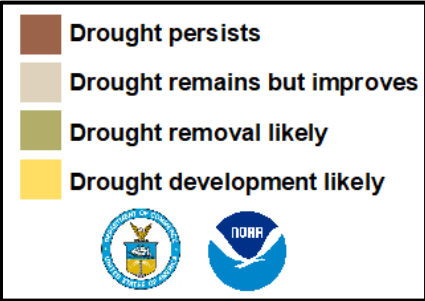
**September 5, 2023**  
 (Released Thursday, Sep. 7, 2023)  
 Valid 8 a.m. EDT



The Seasonal Drought Outlook issued by the Climate Prediction Center (CPC), valid for September 1 through November 30, shows all of Iowa with persisting drought or “drought development likely.” This is drier outlook than last month. This projection applies to the entire region as well, with the CPC showing persistent or developing drought for all of the area from Minnesota and Wisconsin south and west through Nebraska, Iowa, and Missouri, continuing into Oklahoma and Texas.



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

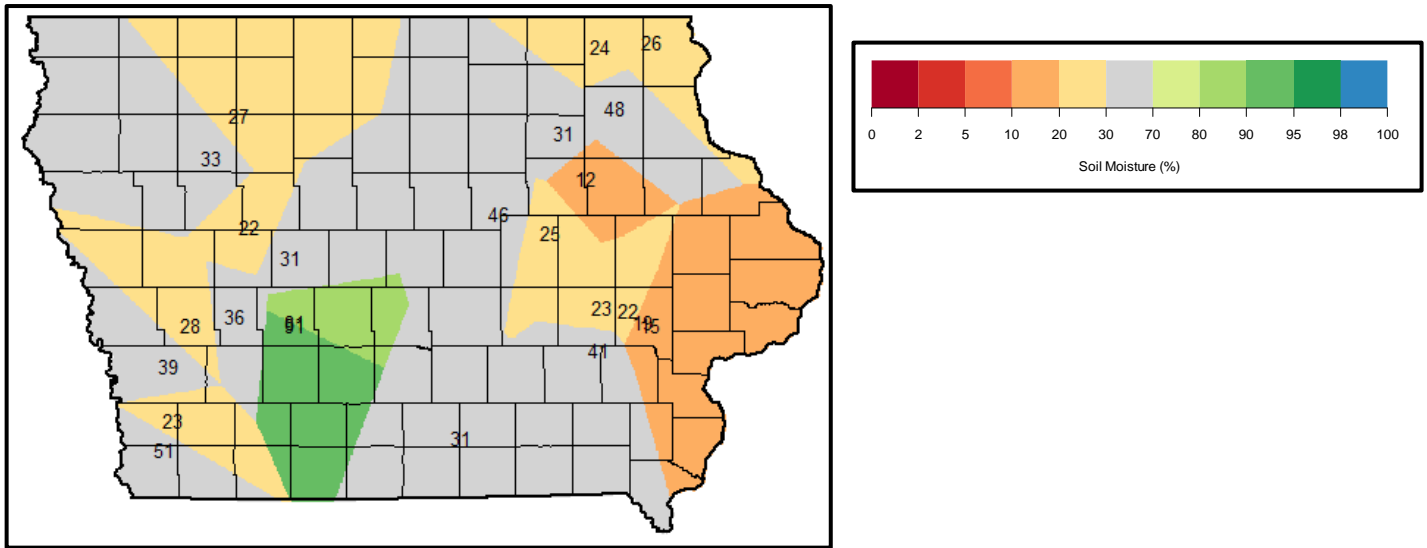


*Valid for September 1 - November 30, 2023*  
*Released August 31, 2023*

**OTHER WATER RESOURCE INFORMATION**

**AUGUST SOIL MOISTURE**

Soil moisture conditions continued to deteriorated in many parts of the state in August. Lower than normal rainfall combined with high levels of water use by crops and vegetation have dried out both shallow and deeper soils. The figure below shows shallow soil moisture conditions as of the end of August. This map was developed using the Iowa Flood Center hydrologic model combined with soil moisture gages.



The US Department of Agriculture’s National Agricultural Statistics Service’s (NASS) weekly report on September 5 indicates that across the eastern one-third of the state up to 94 percent of soils are reported as being short or very short of soil moisture. Conditions are better in western Iowa, however, over 50 percent of soil is reported as short or very short of soil moisture in the best region of Iowa (the southwest region).

### **BORDER RIVER CONDITIONS**

In their weekly update of Missouri River conditions dated September 5, the Army Corps of Engineers indicate that the volume of water stored in all of the Missouri River reservoirs is just below the average for this time of year at 55.3 million-acre feet (MAF). Runoff for 2023 is forecast to be 29.1 MAF, or 113% of average. NOAA’s Climate Prediction Center shows drought conditions persisting or expanding over the lower Basin and into eastern South Dakota, and drought persisting across the northern tier of the Basin. Flow in the Mississippi River is below normal for this time of the year, and drought conditions in Wisconsin and Minnesota are likely to result in a continuation of lower than normal flows.

### **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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