

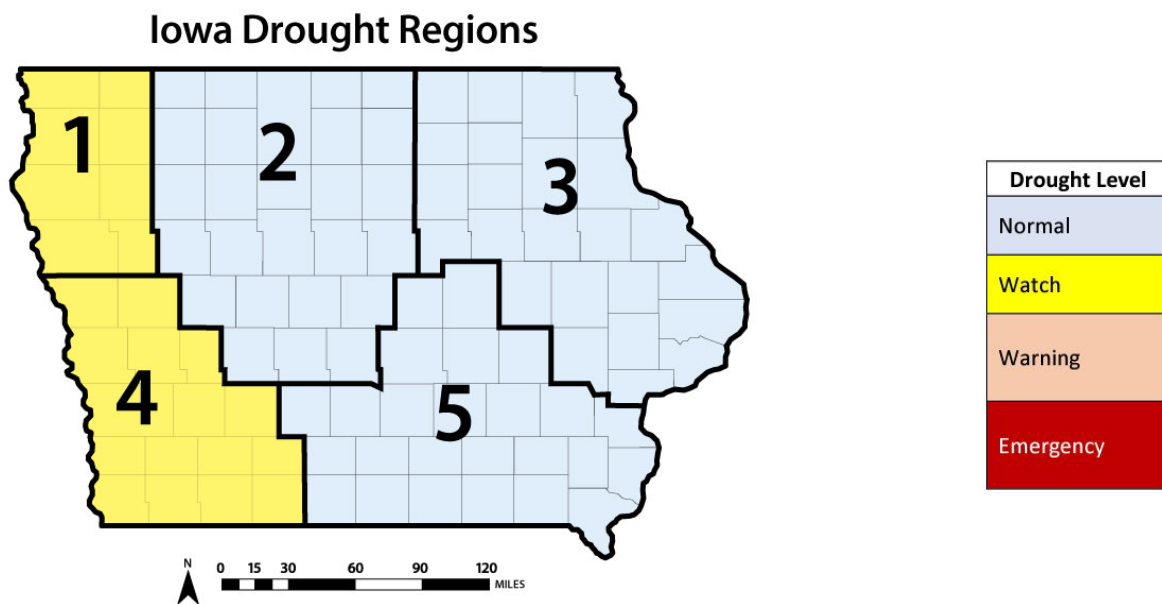


# WATER SUMMARY UPDATE

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## A snapshot of water resource trends for March, 2023

### IOWA DROUGHT CONDITIONS

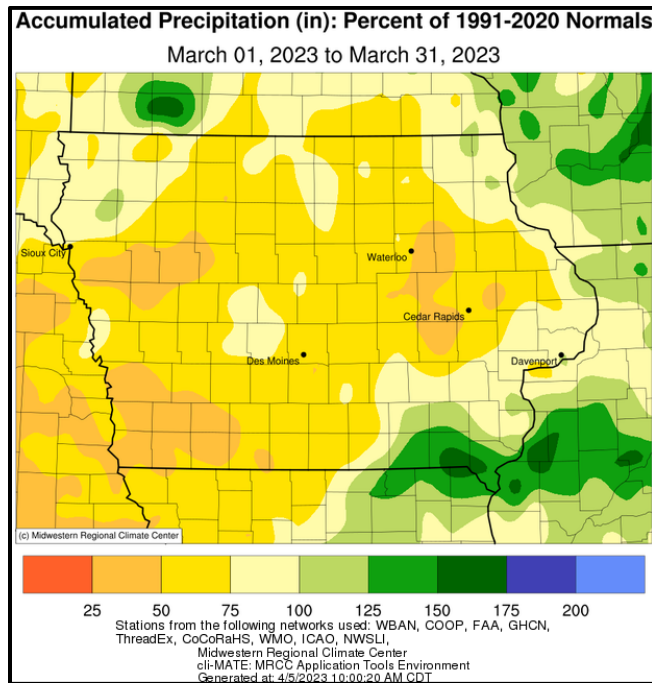


**INTRODUCTION:** This edition of the Water Summary Update is the second to reflect the 2023 Iowa Drought Plan (IDP), which was developed as a collaborative effort between the Department of Natural Resources, the Department of Agriculture and Land Stewardship, and the Department of Homeland Security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

**CONDITION SUMMARY:** After several months of wetter than normal conditions, March turned out to be a bit of a disappointment. Precipitation was below normal for most of the state, but over the past 90 days precipitation has been above normal, due to unseasonably wet conditions in January and February. Using the IDP’s drought triggers, this month sees Drought Regions 1 and 4 rated as “Drought Watch.” This is due to a dry March, 180 day precipitation deficits, lower than normal streamflow indices, and the continued coverage of those parts of the state by US Drought Monitor designations. It should be noted that “Drought Watch” is the least severe of the IDP designations, and should serve as a reminder for Iowans to be attentive to conditions. Normal April rainfall should be adequate to restore these two drought regions to normal conditions.

**Iowa Drought Plan Triggers:** The IDP uses precipitation, the Standardized Precipitation Index (SPI), a standardized streamflow index (SSI) and the US Drought Monitor to establish drought levels for the state. Three out of four of these indicators can trigger a drought determination under the IDP.

### March Precipitation



For the month of March, preliminary statewide temperatures averaged 33.6 degrees or 2.8 degrees below normal while precipitation totaled 1.49 inches, 0.50 inch below normal.

A majority of the state’s National Weather Service co-op stations reported below-average precipitation in March with only the southeast corner of Iowa measuring above-average totals. Pockets of precipitation deficits approaching 1.50 inches were found in east-central, western and southwestern Iowa. Monthly precipitation (melted snow and sleet plus rain) totals ranged from 0.55 inch at Sac City to 4.55 inches in Augusta. Statewide snowfall averaged 6.3 inches, 1.6 inches above normal.

Average temperatures in March were unseasonably cold across much of Iowa with near-normal conditions over portions of eastern Iowa. Departures of up to six degrees were observed in northwestern Iowa where above-normal snowpack was present. Ames Municipal Airport reported the month’s high temperature of 81 degrees on the 31st, 26 degrees above average. Emmetsburg reported the month’s low temperature of -1 degree on the 18th, 26 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 March (comparing December, January, and February precipitation) range from 0.9 to 1.9. Since all are positive values, SPI indicates conditions wetter than normal for the past 90 days, despite a drier than normal March.

### Standardized Streamflow Index (SSI)

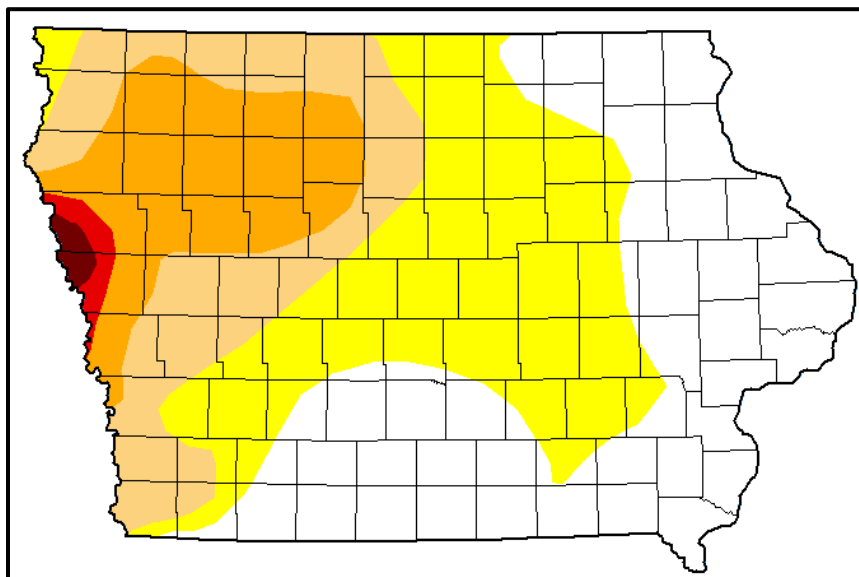
SSI is a metric that compares current streamflow against the historical record to determine how far away the current streamflow value is from the river’s historical mean observed on the same date. For this WSU daily streamflow yields from approximately six to 12 rivers in each region are averaged to create the region’s mean daily flow, which is then compared to historical streamflow since 1960 to determine how current streamflow fits into historical context. 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 March, the SSI for drought regions are:

Drought Region	30-Day SSI	365-Day SSI	IDP Classification ↑ = improving ↓ = degrading ↔ = no trend
1	-0.16	-1.0259	Drought Watch ↑
2	0.19	-0.4642	Normal ↓
3	0.08	0.42	Normal ↔
4	-0.79	-0.55	Normal ↓
5	-0.37	-0.76	Normal ↓

Of concern are the degrading (↓) drought regions, particularly drought region 4, which is close to the “drought watch” trigger.

### US DROUGHT MONITOR



**April 4, 2023**  
 (Released Thursday, Apr. 6, 2023)  
 Valid 8 a.m. EDT

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

Over the last month the US Drought Monitor shows generally steady conditions with Iowa's northwestern one-third generally under some drought designation. Over the last month Iowa has seen a 10 percent reduction in the area designated as D0 – Abnormally Dry across eastern and central Iowa, portions of IDP Drought Regions 3 and 5. The area designated as D4 – Exceptional Drought stands at 0.57 percent of the state, and the area of D3 – Extreme Drought stands at 0.94 percent. These areas of drought conditions are in Woodbury and Monona Counties in western Iowa. The area of D2 – Severe Drought covers 14 percent of Iowa, while D1 – Moderate Drought covers about 16 percent of the state. 38 percent of the state is free from any drought designation. At the start of 2023 only 10 percent of Iowa was free from any drought designation, so improvement has been seen over the last 3 months.

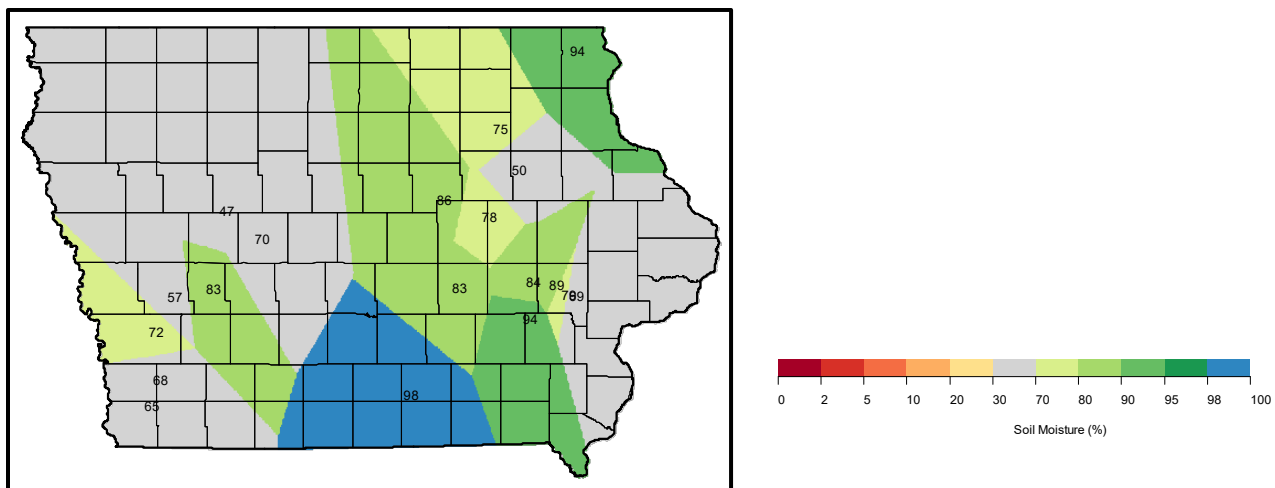
The most significant drought conditions nationally are in the states of Nebraska, Kansas, Oklahoma, and Texas. California now shows no D4, no D3, and only a small area of D2 drought. Meanwhile, more than half of the state of Kansas is designated as D3 or D4 drought.

## OTHER WATER RESOURCE INFORMATION

### MARCH SHALLOW GROUNDWATER

March shallow groundwater levels across the state are inferred to be stable, with no known reported water level issues. There is a slightly heightened risk going-forward reflected in the below normal (10-24%) classification of numerous stream gages located along an east-west band across the center portion of the state. In lieu of a direct shallow groundwater monitoring network the USGS's 28-day average stream baseflow statistical trends are used as an indicator of longer-term water level changes in shallow aquifers. As Iowa enters the growing season, shallow groundwater (and soil moisture) can be more readily depleted as demand or water grows.

### MARCH SOIL MOISTURE

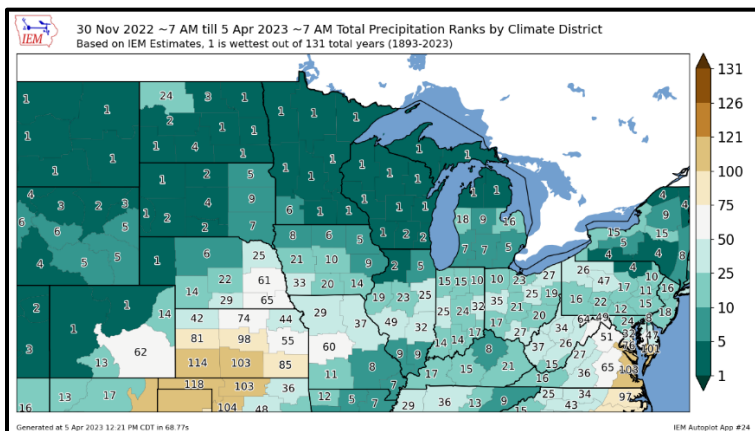


Deep soil moisture conditions at 20 inch depth range between 47 to 98% soil moisture saturation, with the lower values at western Iowa. Soil moisture has decreased in eastern Iowa since the last WSU.

## BORDER RIVER CONDITIONS

As of April 4, the Corps of Engineers upgraded its forecast for runoff in the Missouri River Basin from 84% of average to 103% of average. Plains snowmelt runoff began to occur in late March, with snowpack still present across northeastern MT, eastern SD, and all of ND. Localized areas of up to 8 inches of snow water equivalent are present. A second major winter storm is currently hitting the Basin. An additional 12-18” of snow depth is expected to fall in eastern WY, western and northern SD, and eastern ND (lower right). Available storage capacity in the reservoirs remains above normal.

The Mississippi River basin is much wetter, with the National Weather Service’s River Forecast Center predicting that multiple locations along the Mississippi River are either at “Action Level” or are projected to be by mid-April. Considerable snow is on the ground in Minnesota and Wisconsin, and will drive this flooding. The 2023 winter has produced record or near record snowfall in Minnesota and Wisconsin. As shown in the following figure nearly all of Minnesota and Wisconsin (which drain into the Upper Mississippi River) had the wettest winter in 131 years of record. How the snowpack melts off will greatly impact flooding along the river in Iowa.



## ADDITIONAL INFORMATION

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

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