



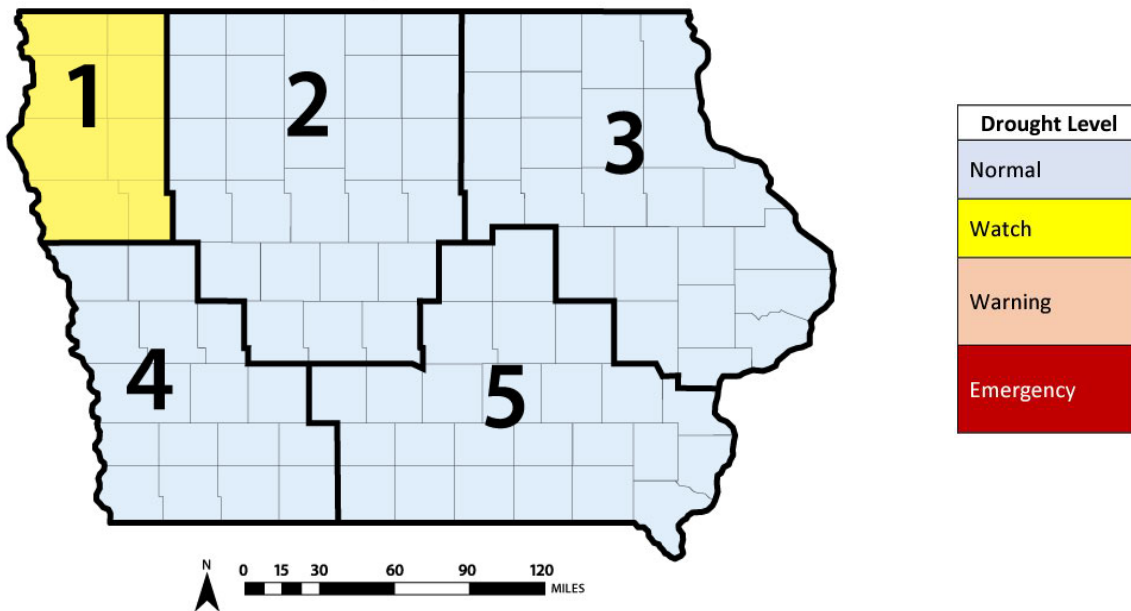
WATER SUMMARY UPDATE

Published Date March 9, 2023 | Issue 141

A snapshot of water resource trends for February, 2023

IOWA DROUGHT CONDITIONS

Iowa Drought Regions

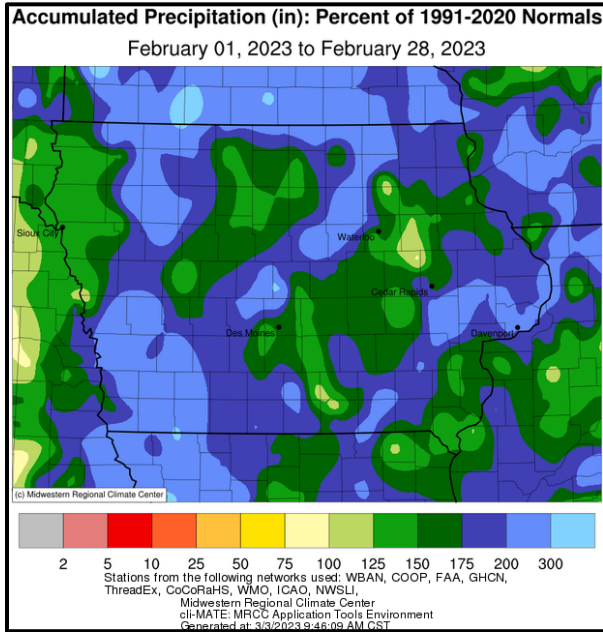


INTRODUCTION: This edition of the Water Summary Update is the first to reflect the 2023 Iowa Drought Plan (IDP), which was developed as a collaborative effort between the Department of Natural Resources, the Department of Agriculture and Land Stewardship, and the Department of Homeland Security and Emergency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

CONDITION SUMMARY: Over the winter months (December, January, and February) indicators of drought are all showing improvement. February was the fourth wetter-than-normal month in a row, and streamflow and soil moisture show improvement as well. With the exception of Drought Region 1, all of Iowa is classified in normal conditions, and indicators are for continued improvement in conditions. These improved conditions come after nearly three years of dryness and drought conditions in Iowa.

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.

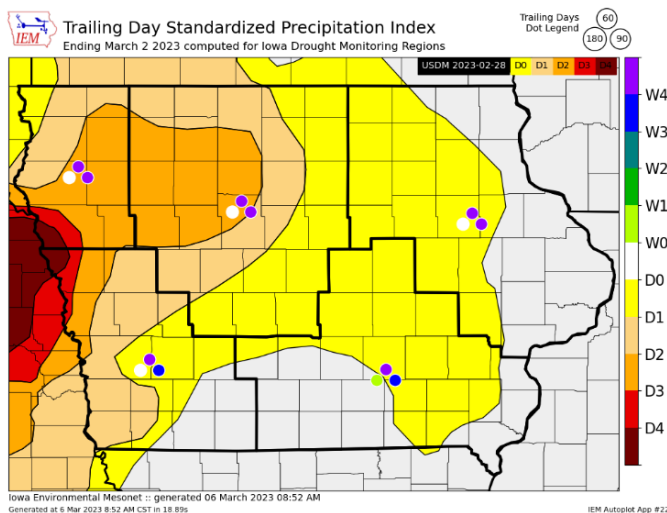
February Precipitation



All of the state's National Weather Service co-op stations reported above-average precipitation in February, which is normally the third driest month for Iowa. Precipitation totaled 2.04 inches, 0.87 inches above normal for the month, ranking February 2023 as 7th wettest in 151 years records. Positive precipitation departures were generally in the 0.50 inch to 1.00-inch range. Monthly precipitation (melted snow and sleet plus rain) totals ranged from 1.03 inches in Sioux Center to 4.53 inches in Iowa City. Statewide snowfall was below normal with an average of 4.3 inches, 2.5 inches below normal. Temperatures averaged 26.3 degrees or 2.2 degrees above normal for the month.

For the three winter months of December, January and February (DJF) temperatures averaged 23.9 degrees or 1.1 degrees above normal while precipitation totaled 5.63 inches or 2.12 inches above normal. DJF 2022-2023 ranks as the 4th wettest on record. Statewide average snowfall was 21.6 inches, which is near normal for those three months.

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.

On the figure above, the US Drought Monitor map serves as the base map, and the small dots in each of the drought regions are indicators of SPI for that region. The upper of the three dots is the 60-day SPI, the right dot is the 90-day SPI, and the left dot is the 180-day SPI. For each of the regions the 60 and 90-day SPI is W3 or W4 (very wet), with the 180-day SPI rated as W0 or W1 (normal to slightly wet). These are all good signs for drought conditions in the state.

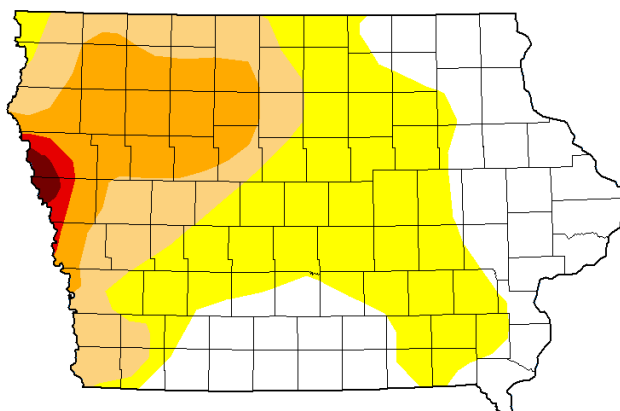
Standardized Streamflow Index (SSI)

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 February, the SSI for drought regions are:

Drought Region	30-Day SSI	IDP Classification
1	-1.48	Drought Watch
2	-0.04	Normal
3	-0.18	Normal
4	+0.33	Normal
5	-0.25	Normal

US DROUGHT MONITOR



U.S. Drought Monitor
Iowa
 March 7, 2023
 (Released Thursday, Mar. 9, 2023)
 Valid 7 a.m. EST

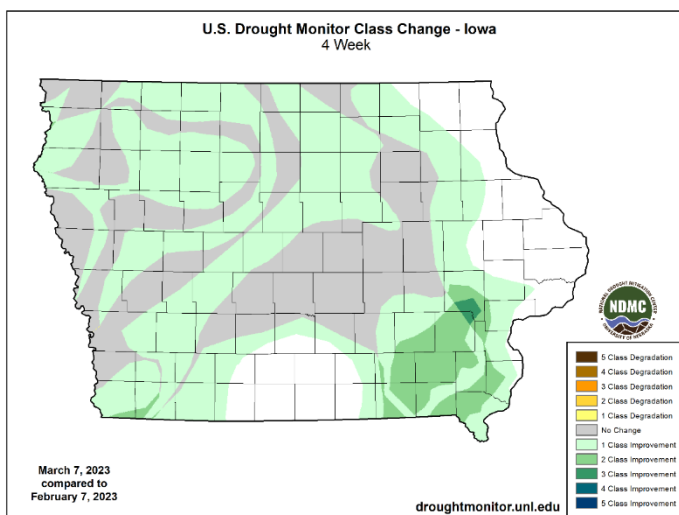
Intensity:

■ D0 Abnormally Dry	■ D3 Extreme Drought
■ D1 Moderate Drought	■ D4 Exceptional Drought
■ D2 Severe Drought	

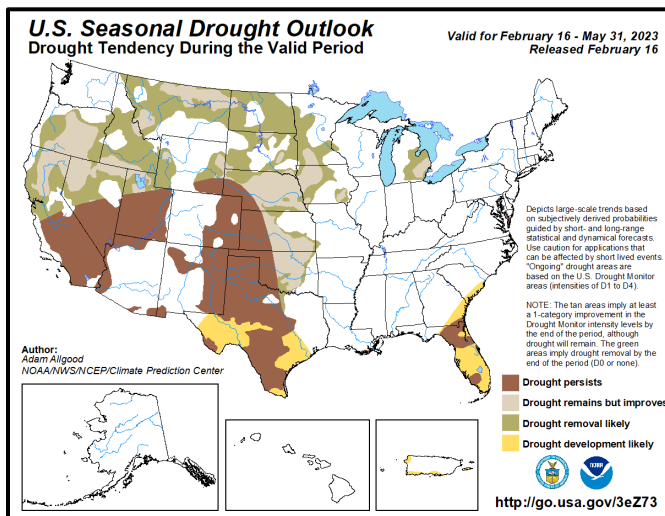
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Over the last month the US Drought Monitor continued to show improvement across nearly all of Iowa. While the area designated as D4 – Exceptional Drought remained constant, other designated areas improved. The area of D3 – Extreme Drought decreased from 8 percent of the state down to 1 percent. The area of D2 – Severe Drought decreased from 20 percent of the state down to 14 percent. The area of D1 – Moderate Drought decreased from 25 percent of the state down to 17 percent. Much of this improvement came in the southeast and northwest parts of Iowa. Over 25 percent of Iowa is now free from any drought designation according to the US Drought Monitor.

Over the past 30 days the USDM has shown consistent improvement in conditions across the state, as shown in the figure below. Green colors indicate drought classification improvement, with the darker the color the greater the improvement. Drought improvement in Iowa during the winter months is not a common occurrence, but despite this, widespread drought improvement is depicted across much of the state. This is encouraging as Iowa heads into the spring season.



Another drought tool prepared by the Climate Prediction Center at NOAA is the Seasonal Drought Outlook. This depiction, shown below, indicates that much of the upper Midwest, including western and southeast Iowa, are expected to see improvement in drought conditions, or removal of drought conditions in during the spring months.

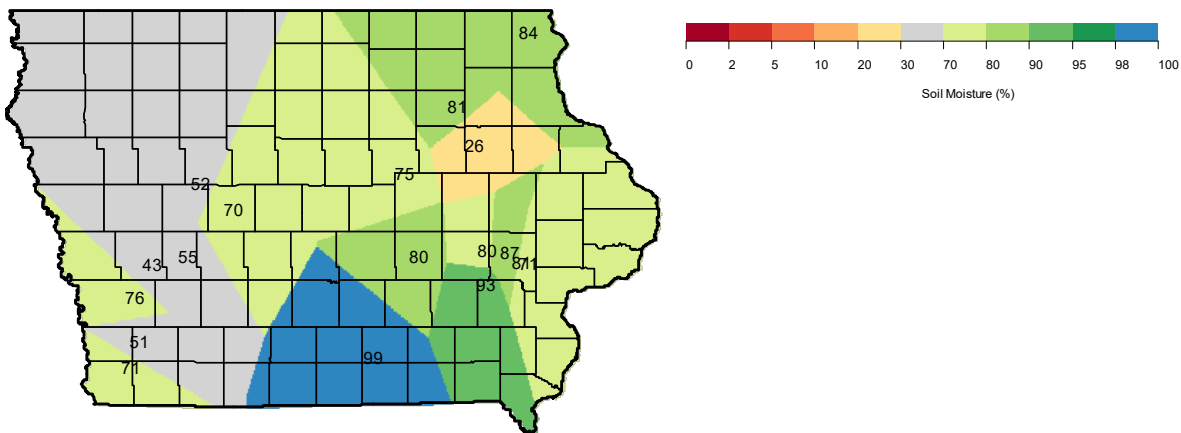


OTHER WATER RESOURCE INFORMATION

FEBRUARY SHALLOW GROUNDWATER

Groundwater level conditions have improved across the state, with water levels in shallow alluvial aquifers inferred to be normal. There are no reported issues with water level decline or deficit. 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. Currently, there are no gage stations recording below normal 28-day average streamflow.

FEBRUARY SOIL MOISTURE



Iowa soil moisture conditions have improved significantly over the last month. At a depth of 20 inches data indicates increased soil moisture in eastern Iowa, with close to saturation levels for southeastern Iowa. Conditions for western Iowa are normal. Data for 8 inches depth show slightly dryer conditions for western Iowa.

BORDER RIVER CONDITIONS

Conditions in the Missouri River basin remain drier than normal. System storage as of March 7 is 46.2 MAF, up slightly over the past month. The calendar year runoff forecast, updated on March 1, for the upper Missouri River Basin above Sioux City, IA is 21.5 MAF (84% of average). This would be the third consecutive year of below normal runoff into the Missouri River. Mountain snowpack is near average, and plains snow coverage still exists across eastern South Dakota and much of North Dakota.

The Mississippi River basin is much wetter, with the National Weather Service forecasting a much above normal spring flood threat for the Mississippi River. Probabilities for significant flooding on the Mississippi River have increased, with the potential for flooding along the Mississippi River to be similar to conditions that occurred in 2019.

ADDITIONAL INFORMATION

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

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