



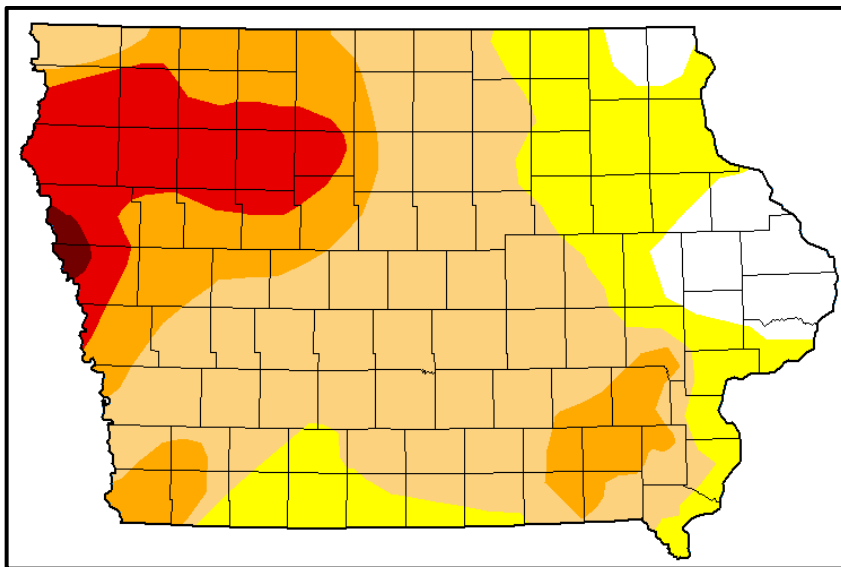
WATER SUMMARY UPDATE

Published Date December 8, 2022 | Issue 138

A snapshot of water resource trends for November, 2022

Drought Monitor - Conditions as of December 6, 2022

National Drought Mitigation Center and partners

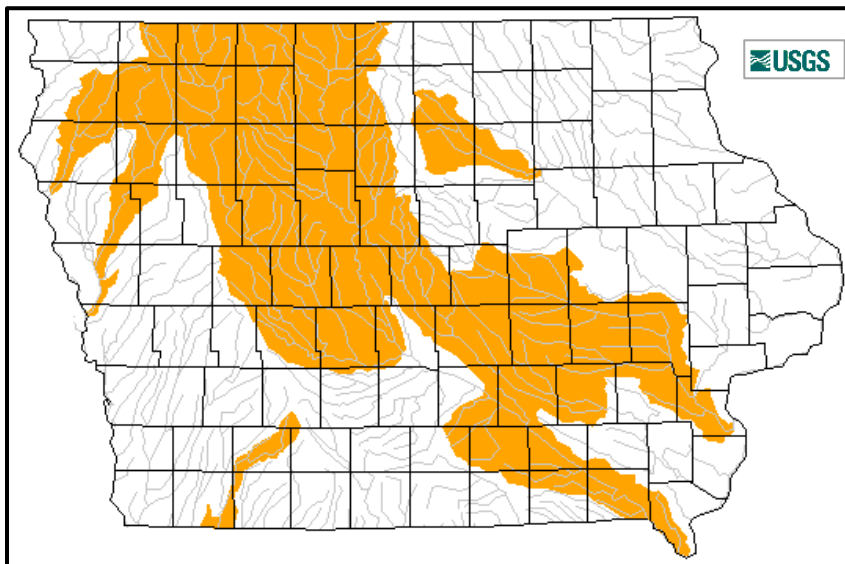


Intensity:

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

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

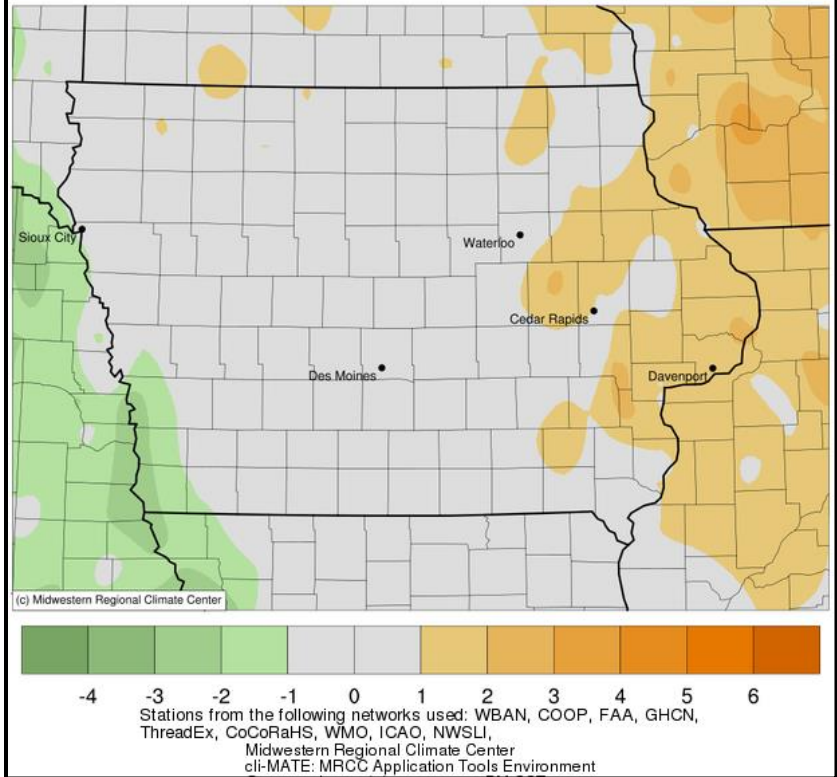
Stream Flow – November, 2022



Explanation - Percentile classes						
Low	<10	10-24	25-75	76-90	>90	High
	Much below normal	Below normal	Normal	Above normal	Much above normal	

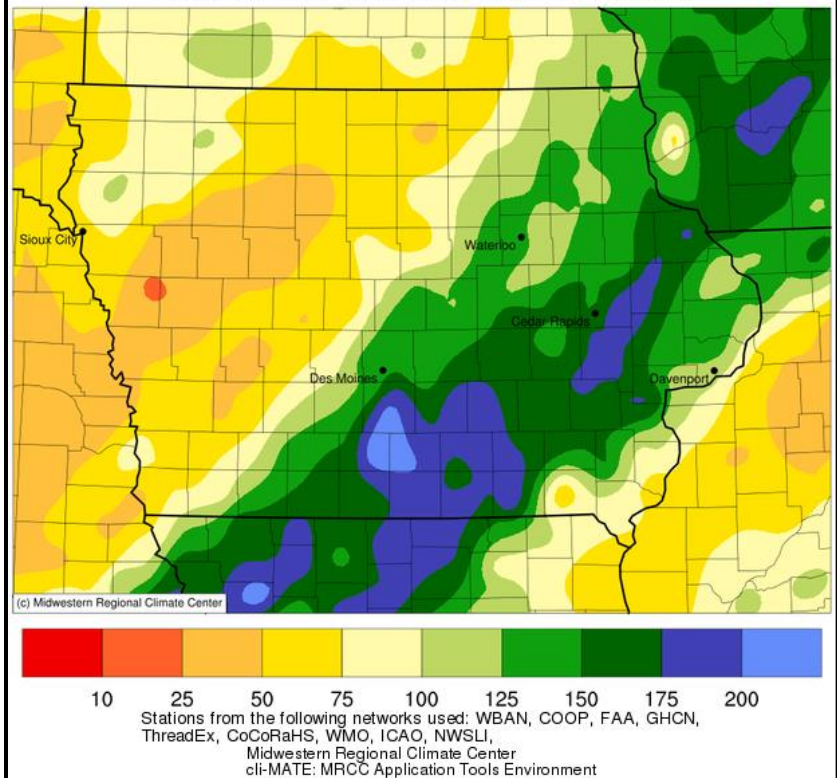
Average Temperature (°F): Departure from 1991-2020 Normals

November 01, 2022 to November 30, 2022



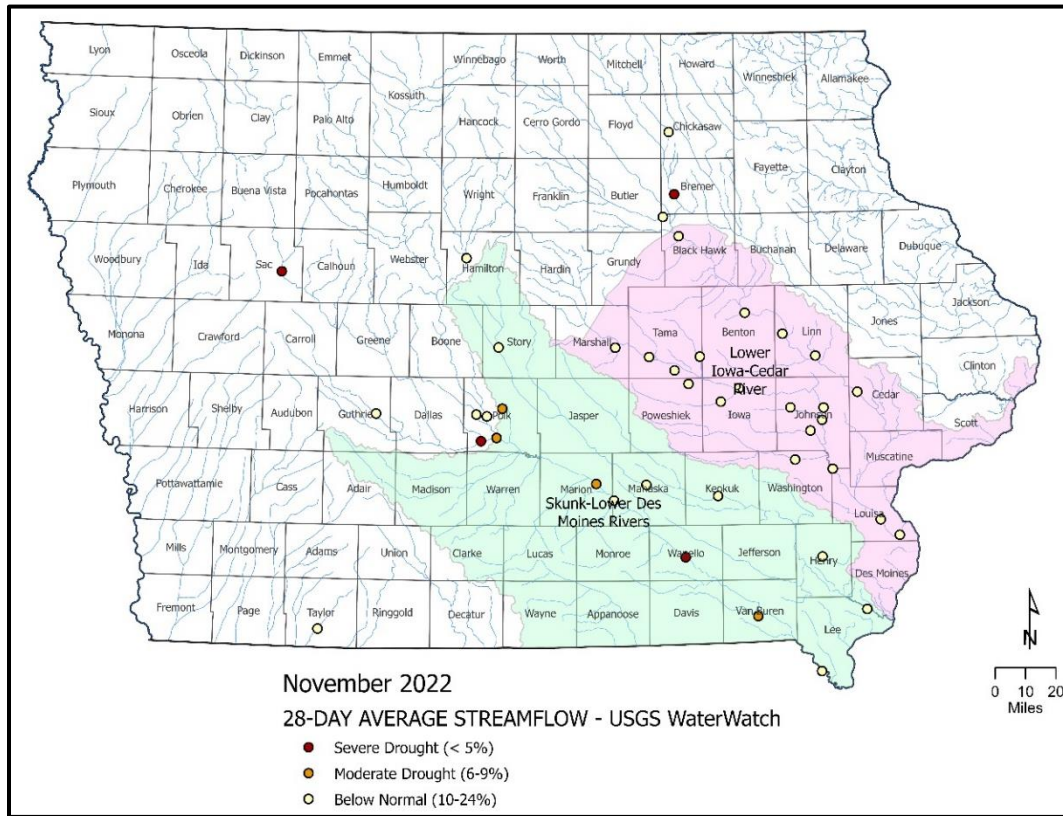
Accumulated Precipitation (in): Percent of 1991-2020 Normals

November 01, 2022 to November 30, 2022



Shallow Groundwater - Conditions for November 2022

Iowa DNR and IIHR-Hydroscience and Engineering



RECENT DEVELOPMENTS AND CHANGES

SUMMARY

The month of November brought near normal rainfall across the state of Iowa, with western and northwest Iowa receiving less than normal rainfall and eastern and northeast Iowa seeing above normal rainfall. On average, the near two inches of precipitation that fell in November helped to stabilize and, in some areas, improve long-standing drought conditions. The US Drought Monitor continues to show extreme and exceptional drought conditions (D3 and D4) in northwest Iowa, but some reduction in D2 - Severe Drought has occurred in south central and southeast Iowa over the last month. Although still lower than normal in many locations, streamflow conditions show some improvement across the state. Soil moisture and shallow groundwater conditions are showing improvement, but the winter season is a time of generally low demand for water use.

DROUGHT MONITOR

Over the last month the US Drought Monitor showed some improvement in conditions across eastern Iowa. The improvements were one class improvements (D2 to D1, D1 to D0, or D0 to no designation). The remainder of the state showed steady conditions, with small areas of one class degradation. Currently, 7.4 percent of Iowa has no drought or dryness (compared to none of the state one month ago). The area designated as D0 – Abnormally Dry is at 19 percent, up from 11 percent one month ago. The area designated as D1 – Moderate Drought is almost unchanged at 43 percent, down from 44 percent one month ago. The area designated as D2 – Severe Drought has shown the largest reduction, and stands at 18 percent of Iowa (down from 34 percent one

month ago). The areas of D3 – Extreme Drought and D4 – Exceptional Drought are nearly unchanged over the last month at 11 percent and 0.6 percent respectively. Consistent rainfall is needed to continue this improvement. Large areas of significant drought conditions exist to our west and south in Nebraska, Kansas, and Oklahoma. Improvement in drought conditions is expected in southern Illinois and southern Indiana, as well as across much of Kentucky and Tennessee.

FALL PRECIPITATION AND TEMPERATURE

Temperatures over the three autumn months (September-October-November) averaged 50.8 degrees or 0.3 degree above normal while precipitation totaled 4.77 inches, 3.22 inches below normal. Fall 2022 ranks as the 77th (74th) warmest (coldest) fall among the period of record; it was also the 19th driest fall on record. Fall 2021 was warmer while 2011 was drier.

NOVEMBER PRECIPITATION AND TEMPERATURE

November was the only fall month in which the state received above-average precipitation. Stations across the southeastern half of Iowa reported totals on the order of one to two inches above normal. While rain and snow were widespread across northwestern Iowa, negative departures over one inch were observed at several stations. Iowa also received measurable snow from several winter systems with most station experiencing near-normal to slightly above average accumulations.

Statewide average precipitation totaled 1.95 inches or 0.13 inches above normal, ranking as the 49th wettest November on record; a wetter November last occurred in 2020. Monthly precipitation totals ranged from 0.24 inches near Manson to 4.87 inches at a in Bloomfield. The statewide average snowfall was 2.5 inches, which is just 0.2 inches below average. Swea City reported the highest monthly snowfall at 14.0 inches.

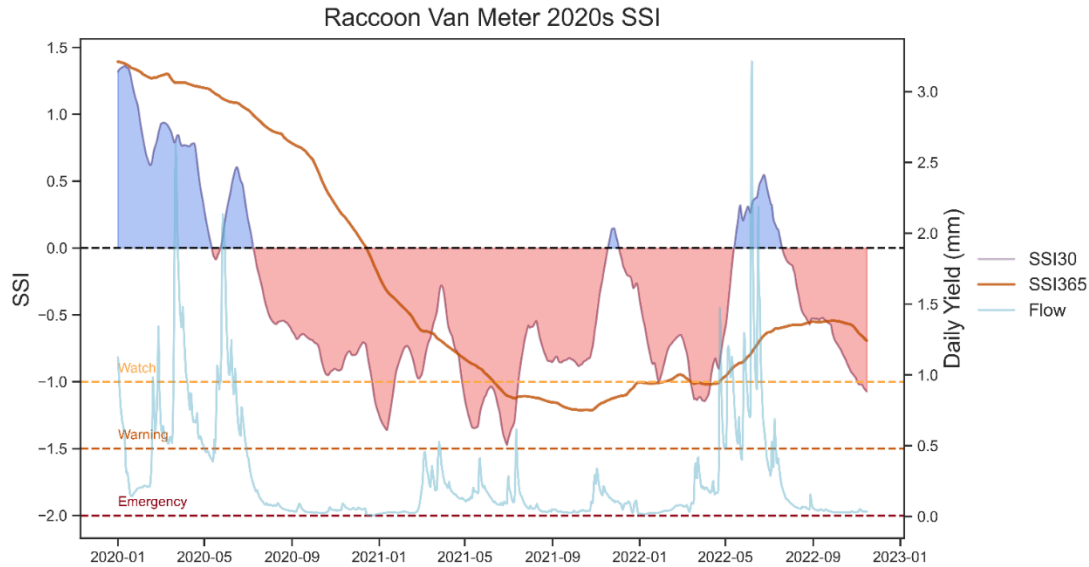
Temperatures through the month were generally near normal with southwestern Iowa experiencing slightly cooler conditions while warmer conditions were found across portions of eastern Iowa. November temperatures averaged 37.0 degrees, 0.1 degree above normal, ranking as the 73rd warmest on record; a warmer November occurred just last year. Lamoni and Little Sioux reported the month's high temperature of 80 degrees on the 2nd, on average 24 degrees above normal. Spencer Municipal Airport reported the month's low temperature of two degrees on the 30th, 17 degrees below normal.

NOVEMBER STREAM FLOW

During the month of November, streamflow conditions improved across the state from much below-normal conditions to below normal and normal conditions. The Little Sioux, Raccoon, Boone, and portions of the Skunk River improved to below conditions. Portions of the Skunk, Lower Des Moines, Nishnabotna, Lower Iowa, Chariton, Thompson, Nodaway Rivers have improved to normal condition or in some locations remained steady at below normal conditions since the last water summary update. It should be noted that during the winter season, USGS streamflow data may be impacted by ice formation and backwater.

As part of the development of the Iowa Drought Plan, the Iowa Geological Survey is working on another tool for evaluating drought by using stream flow conditions. This tool, the Standardized Streamflow Index (SSI) compares current streamflow against the historical record to determine how far above or below current streamflow is from a river's historical normal flow for the same date. SSI can be applied to longer time scales, such as a river's previous 30 days of streamflow, and establishes an index number describing how high or how low the flow is compared to historical observations. Drought values typically range from 0 (streamflow is the same as the mean) to -3, which indicates the current streamflow is extremely low - three standard deviations

less than the historical mean for the period. Below is a graph showing current SSI values for the Raccoon River at Van Meter. The shaded area looks back at the prior 30 days, and the solid orange line looks back at the last year. The 30-day SSI (looking back one month) is less than -1, while the 365-day SSI (looking back one year) is -0.7. These values are not as low as they were in 2021, and provide a historical context for current drought and stream flow conditions for the entire basin. The designations of “drought watch”, “drought warning”, and “drought emergency” are referenced in the Iowa Drought Plan (IDP), which is nearing completion. The IDP will be discussed in future Water Summary Updates.

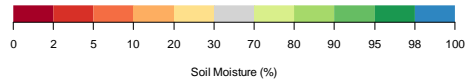
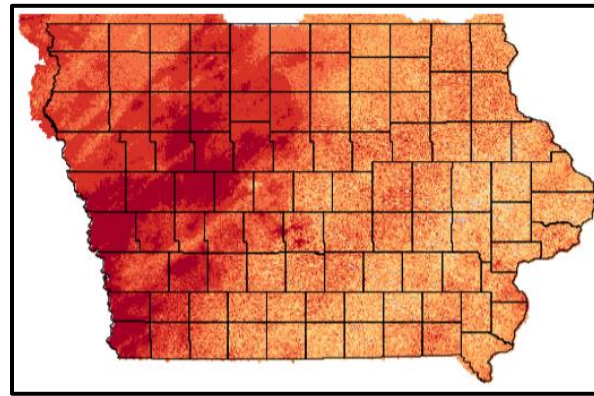


NOVEMBER SHALLOW GROUNDWATER

November shallow groundwater level conditions are much improved over summer and early-fall conditions, and shallow groundwater levels across much of the state are inferred to be recovering. November conditions appear markedly better than previous months, especially for areas in northwest Iowa which had been experiencing intense drought stress, which now are seeing some relief. Below normal dry conditions persist in east-central to southeast Iowa in the Lower Iowa River and Cedar River hydrologic unit, and moderate to severe conditions persist in areas along the Skunk River and Lower Des Moines River in south-central Iowa. 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.

NOVEMBER SOIL MOISTURE

Recent rainfall as well as a drop in evaporative demand has improved soil moisture. Shallow soil moisture (at the 8-inch depth) is shown below. This figure shows soil wetness in percentage, aggregated to 8-inch depth for the last day of November. The map shows the driest areas across west central and southwest Iowa. With the end of the growing season the Iowa Crop Progress & Condition report from the National Agricultural Statistics Service has been paused, but will be started again in early spring of 2023.



MISSOURI RIVER BASIN CONDITIONS

The total volume of water in the Missouri River reservoir system continues to decrease, and now stands at 46 Million Acre Feet (MAF). At the start of November the total storage was 47.2 MAF. Normal storage volume at the start of December is 56.1 MAF, the base of flood control. Current storage levels mean that less water is available in the system, but more capacity exists for spring flood runoff storage. Releases from the Gavins Point reservoir are being stepped down to winter levels, and will reach 12,000 cubic feet per second (cfs) on December 11. Mountain snowpack is slightly above average across the mountain regions of the basin, with 25 percent of the accumulation period completed. Colder-than-normal temperatures are expected in much of the Basin in December. Increased chances for above-normal precipitation are indicated in MT and WY, and below-normal precipitation in parts of the lower Basin.

ADDITIONAL INFORMATION

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

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