IOWA DEPARTMENT OF NATURAL RESOURCES

WATER SUMMARY UPDATE

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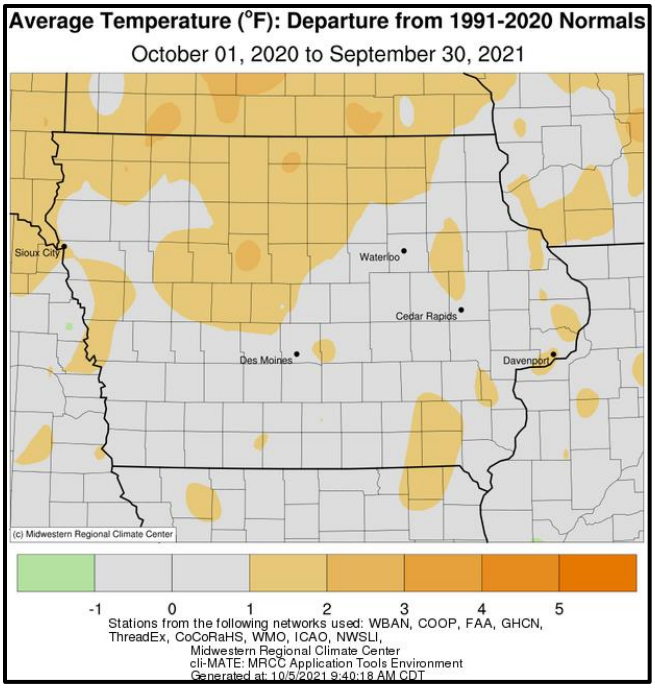
A snapshot of water resource trends for the 2021 Water Year

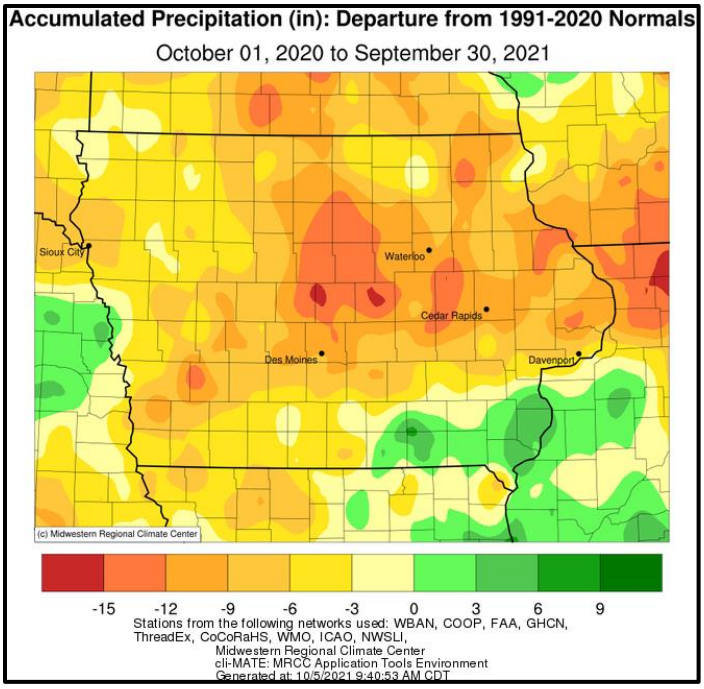
2021 Water Year Summary

OVERVIEW – WATER YEAR ENDS WITH DROUGHT CONDITIONS HANGING ON

The "Water Year" is defined as the period between October 1st and September 30th. This period of time is used because accumulating snow is the primary source of water runoff into streams during the next calendar year for many parts of the United States. The 2021 Water Year ended on September 30th, 2021 and the preliminary precipitation total for the 12-month period was 29.15 inches, or 6.53 inches below normal. Temperatures averaged 49.0 degrees, which is 0.9 degree above the 30-year normal for Iowa. This was the 42nd driest and ties 1893 as the 47th warmest Water Year among the observational records, with 2011 being drier and 2016 being warmer.

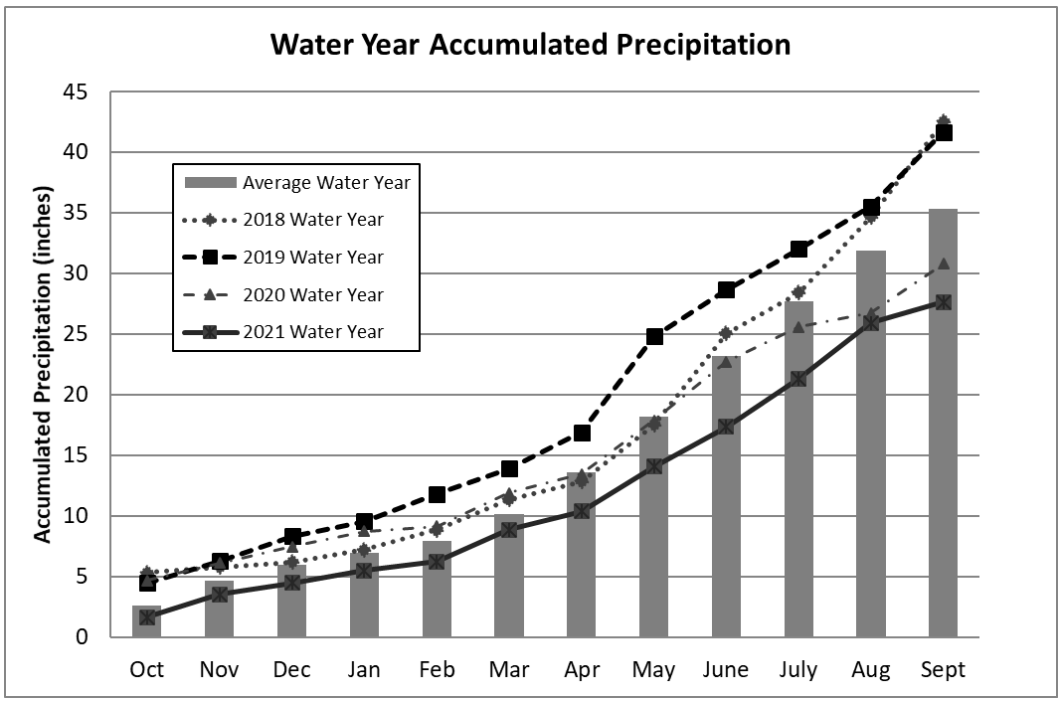
A vast majority of the state's National Weather Service (NWS) co-op stations and Community Collaborative Rain, Hail and Snow (CoCoRaHS) network rain gauges reported precipitation deficits for the water year, with portions of north-central Iowa measuring 12 inches to 15 inches below the 30-year climatological normal. A broad swath of the state had negative departures above six inches with only stations in extreme southeast Iowa observing surplus precipitation.





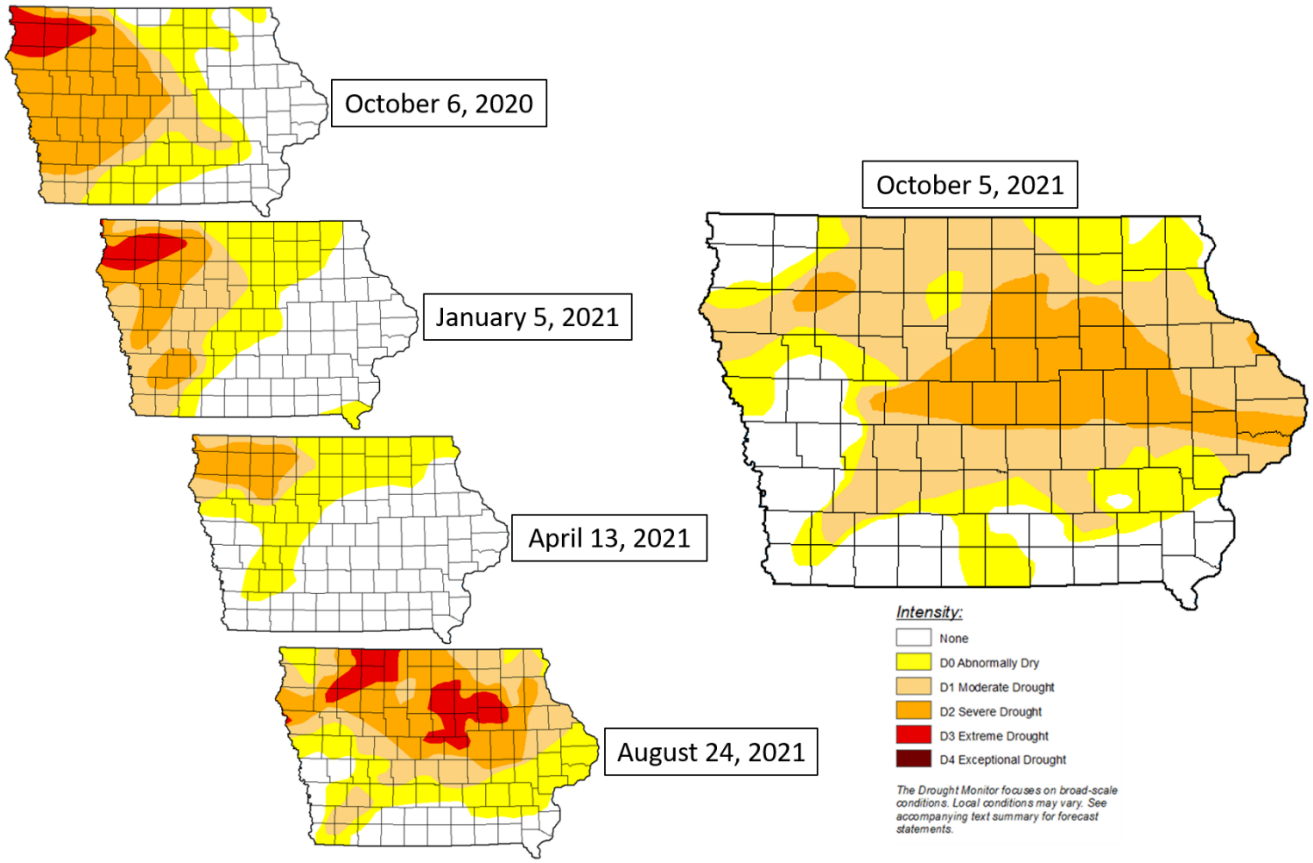
Notable months and periods during the water year include the 8th coldest October, 10th warmest November, 8th coldest February, 12th warmest March and 13th coldest June. Meteorological winter 2020-2021 (December-January-February) was also the 12th snowiest in 134 years of snowfall records. Iowa averaged 32.2 inches of snowfall, 9.4 inches above normal.

The graph below shows the contrast between the wet water years of 2018 and 2019, and the dry water years of 2020 and 2021. The 2018 and 2019 water years each ended with accumulated precipitation of around 42 inches, a surplus of about seven inches for each of those years. After those two wet years, the 2020 and 2021 water years each ended with accumulated precipitation at or below 30 inches. These water year totals are significant, and show one of the reasons for the existence of drought conditions over the past two year.



DROUGHT MONITOR

The National Drought Monitor (NDM) provides a simplified way of looking at regional and statewide trends in drought conditions. Over the course of the 2021 Water Year drought concerns have shifted from the northwest parts of Iowa into the east central part of the state. At the start of the water year 30 percent of the state was free from any drought or dryness, with 5 percent of Iowa rated in D3 – Extreme Drought, and another 30 percent of Iowa rated in D2 – Severe Drought. Drought conditions remained steady and then became less severe over the winter months and into the spring to 2021, with the best conditions occurring in mid-April of 2021 when 60 percent of Iowa was free from all drought and dryness. At that time the worst conditions parts of the state were rated as being in D2 - Severe Drought, but D2 conditions covered only 7 percent of the state. Drought conditions then began to expand, and by late August 10 percent of Iowa was rated as D3, with some level of drought and dryness covering 82 percent of Iowa. Since that time conditions have improved, and concerns for drought have concentrated in east central Iowa. Current conditions in Iowa are still concerning, with 18 percent of the state rated in Severe Drought, and a total of 75 percent of the state in some form of dryness or drought.

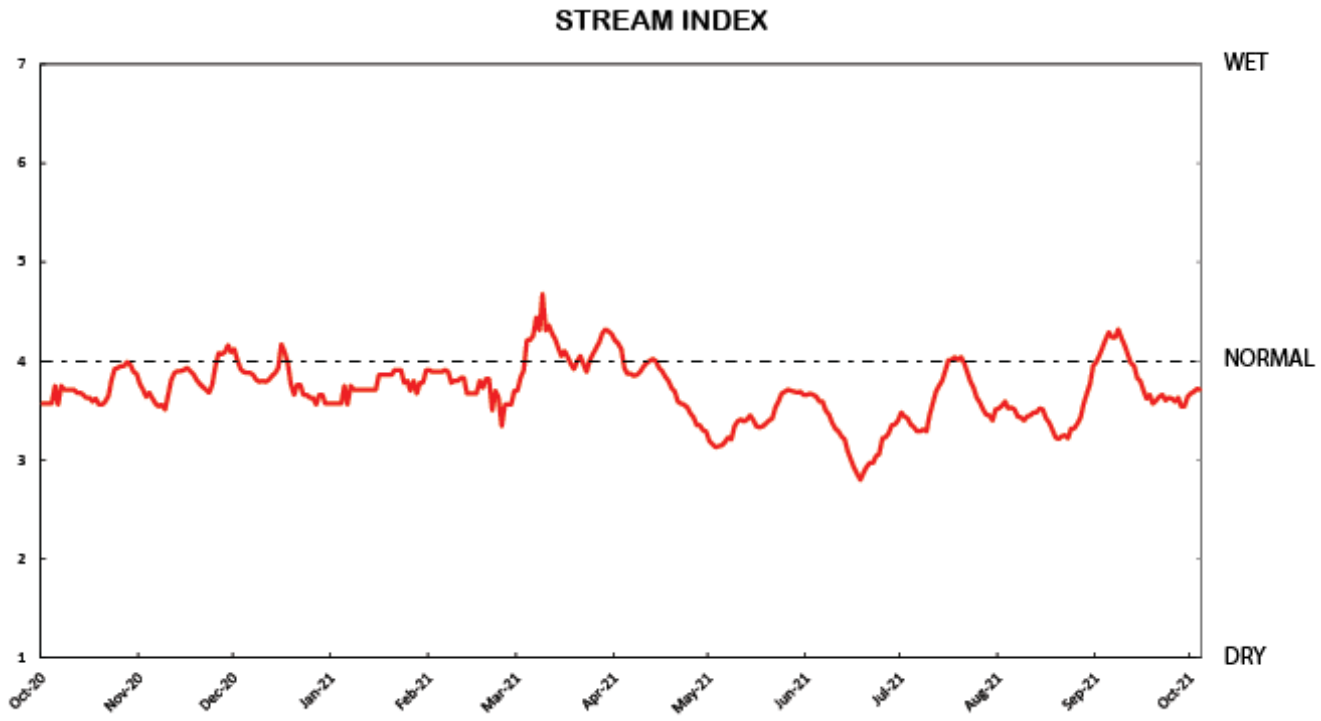


STREAMFLOW

The U.S. Geological Survey (USGS) streamflow index is an average of streamflows at all USGS streamgages across the state compared to the average streamflow at all those points at that time. This index provides a simplified way of looking at streamflows throughout the year. It does, however, smooth out any abnormally high or low

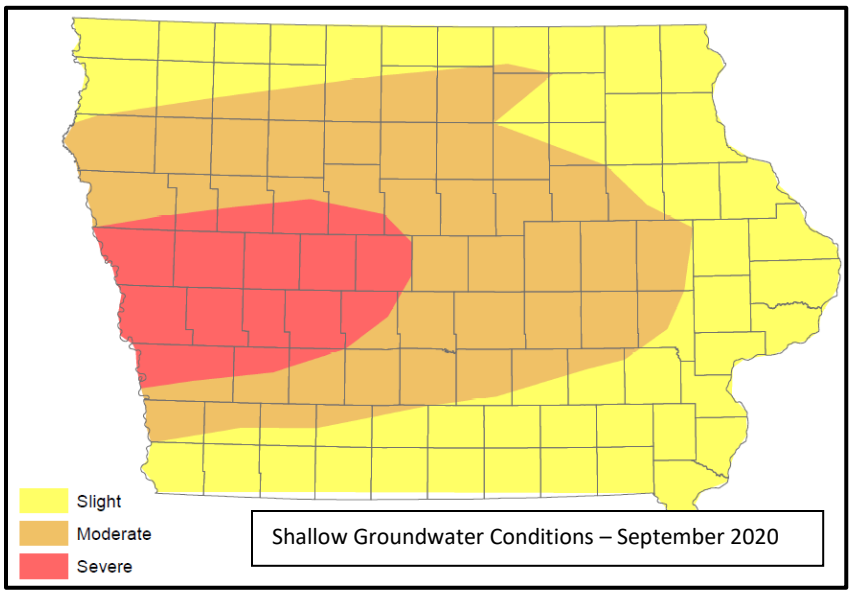
flows that may exist in a small number of watersheds in the state. It is also important to note that average streamflow is typically much lower in the winter than in the spring and early summer.

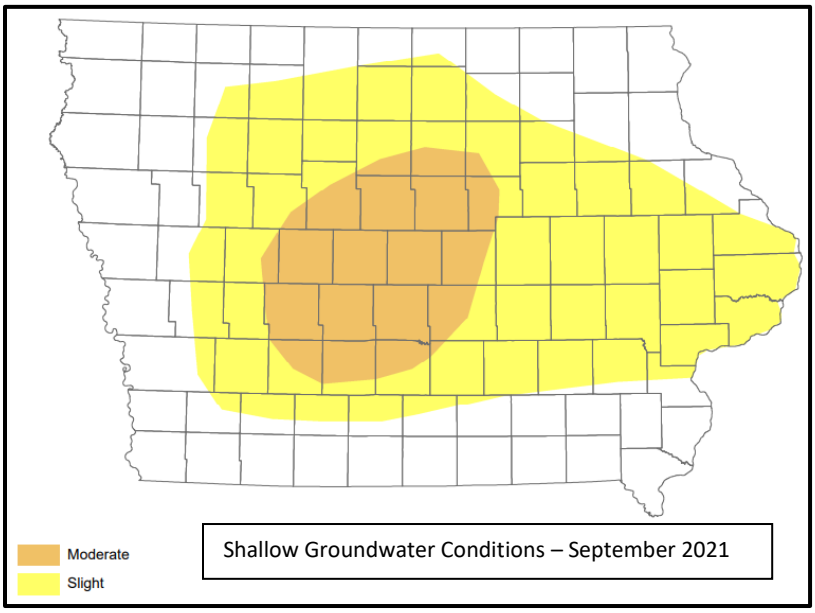
The 2021 Water Year began with below normal streamflows as a result of the near to below normal end 2020 Water Year. As the year progressed average streamflow remained steady in the range of below normal to normal flows. In March and April average streamflow increased to the above normal range after some welcomed precipitation, but then trended down to the below normal range the remainder of the summer. A wet early September pushed average streamflow back above normal, but then the early fall dryness has resulted in streamflows generally staying below normal since the middle of September. The 2021 Water Year ended about where it began.



SHALLOW GROUNDWATER

At the start of the 2021 water year the western half of Iowa had shallow groundwater conditions that resulted in moderate to extreme concern for water supplies. By June 2021 shallow groundwater conditions had deteriorated across most of the state, with moderate to severe conditions found across all of Iowa except the far southeast corner. By September shallow groundwater conditions had improved slightly across Southern, Northwest, North Central, and Northeast Iowa. Slight to moderate concerns still persist in parts of Central, North Central, and East Central Iowa. Low groundwater levels are found throughout the state, especially along the Raccoon and Skunk rivers in Central Iowa and along the Iowa and Cedar rivers in East Central Iowa. Particular concern exists in areas where deeper groundwater resources are not available.

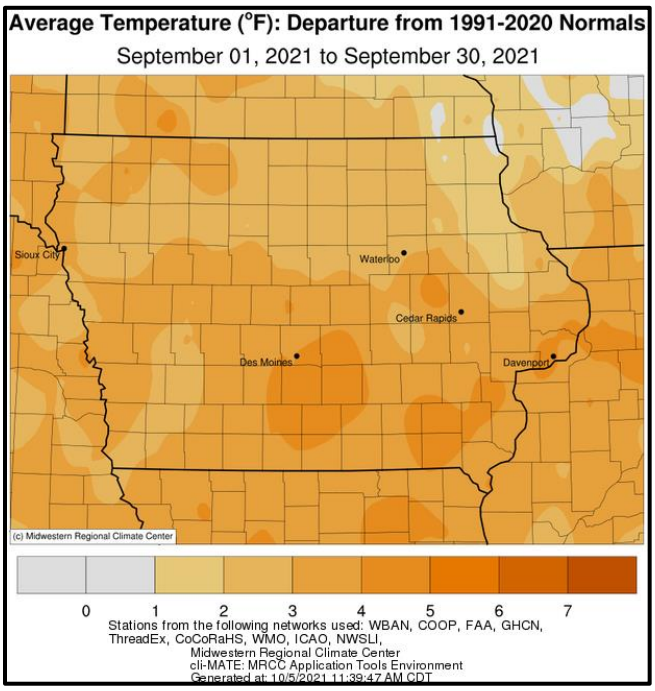


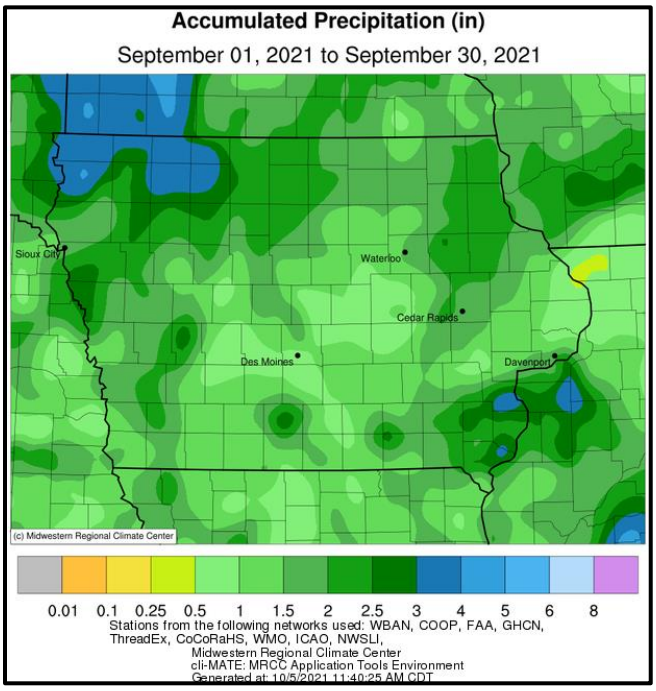


SEPTEMBER PRECIPITATION AND TEMPERATURE

Iowa's preliminary statewide average precipitation totaled 1.75 inches, or about half of normal rainfall. A drier September last occurred in 2012. While widespread rain fell statewide, only the extreme northwest corner of Iowa reported above average totals. The driest conditions were found across portions of central, south-central and eastern Iowa, where precipitation departures approached three inches. Monthly precipitation totals ranged from 0.44 inch at Clutier to 4.87 inches at Sioux Center.

The preliminary statewide average temperature was 66.4 degrees, 2.7 degrees warmer than normal with a warmer September last reported in 2019. Red Oak observed the month's high temperature of 95 degrees on the 28th, 21 degrees above normal. Atlantic, Audubon and Guthrie Center reported the month's low temperature of 32 degrees on the 25th, on average 14 degrees below normal.





ADDITIONAL INFORMATION

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