

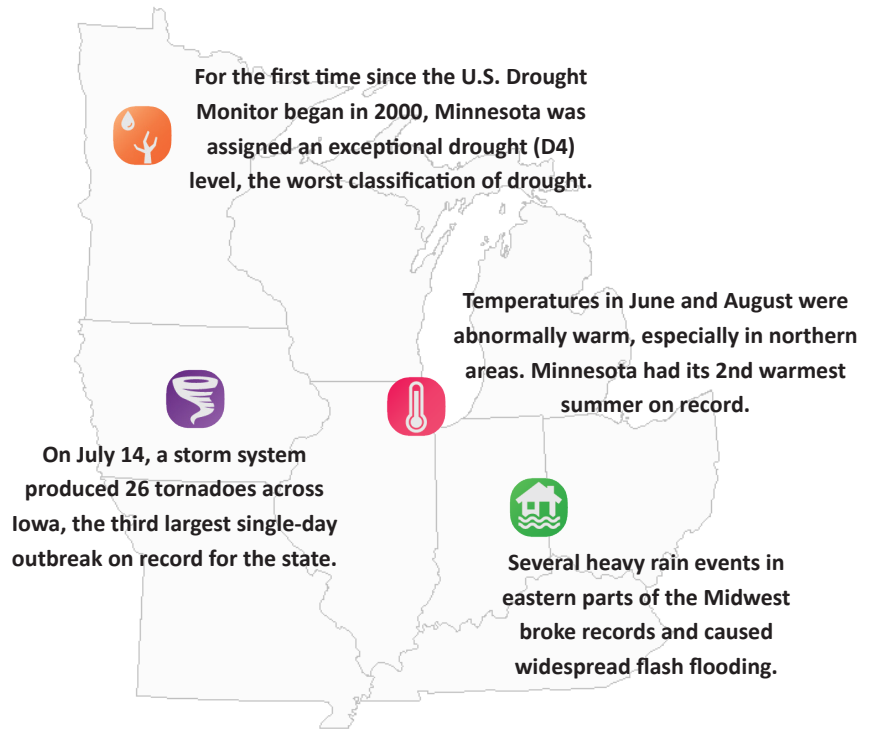


### Midwest – Significant Events for June – August 2021

Warm temperatures and regionally variable precipitation led to a variety of significant events across the Midwest this Summer. In the arrowhead region of Minnesota, worsening drought and warm conditions led to the rapid spread of several fires, with one destroying over 40 square miles of forest.

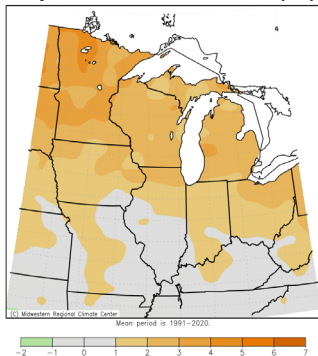
In central and eastern portions of the region, several heavy precipitation events broke records and caused flash flooding. On August 9th, Ionia, IA reported 11 inches of rain in 24 hours. On August 12th, Gibson City received a remarkable 10 inches of rain in just 6 hours which led to widespread flooding throughout the community.

On July 14, a storm system produced 26 tornado reports in just a few hours across central and eastern Iowa, the third largest single-day outbreak in the state's history. Fortunately, most of the tornadoes only reached a magnitude of EF-1, and no injuries or fatalities have been reported.



### Regional – Climate Overview for June – August 2021

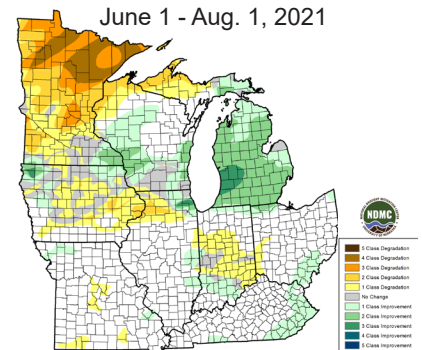
#### Summer Temperature Departure from Normal (°F)



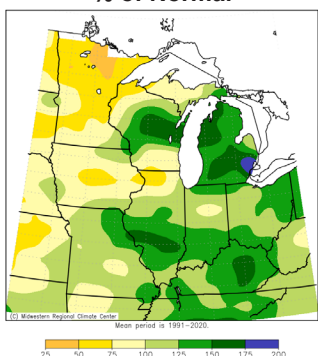
The Summer of 2021 was warm across most of the Midwest, with temperatures 1-5°F above normal. The unseasonably warm temperatures were felt most towards the north. Minnesota's average temperature was 3.3°F above normal, while Michigan and Wisconsin's were 2.3°F and 2.2°F above normal, respectively. There was variability in the timing of the heat this summer. June was much warmer, with temperatures 2.8°F above normal, while July experienced near-normal temperatures. The heat then returned in August, with temperatures on average 2°F above normal.

#### U.S. Drought Monitor 13-week change

June 1 - Aug. 1, 2021



#### Summer Precipitation % of Normal



Precipitation was quite variable across the Midwest this summer, with generally wetter conditions to the east and drier conditions in the northwest portions of the region. In central and eastern areas of the Midwest, several heavy rain events led to above-normal precipitation accumulation. Michigan's June rainfall was notable at 143% of normal while August in Kentucky was also wet with 152% of normal. By contrast, Minnesota and Iowa received dramatically reduced rainfall, with June being particularly dry at 40% and 64% of normal, respectively. The below-normal precipitation and above-normal temperatures led to worsening drought conditions, and Minnesota was designated its first exceptional drought (D4) level since the U.S. Drought Monitor began in 2000. Fortunately, above-normal precipitation amounts in August for both states brought some relief from the dry conditions.

## Regional Impacts – June – August 2021

### Wildfires

Warmer conditions and worsening drought allowed fires to spread across the northeastern portion of Minnesota, [burning over 25,000 acres of land](#) in and around Superior National Forest, [forcing evacuations](#). The smoke from this and other fires out in the mountain west led to poor air quality conditions, leading



*A smoke-obscured highway in northeastern Minnesota (credit: Lorie Shaull)*

National Weather Service Offices across the region to [issue air quality alerts](#). The Duluth, MN office, which serves the region of Minnesota most heavily affected by the fires, issued 49 air quality alerts over the course of the summer. As August came to a close, wetter conditions and the [efforts of firefighters](#) led to [increased containment](#) of the fire.



*The Mississippi River in June near Dayton, MN (credit: Brett Whaley)*

### Industry and Agriculture

The drought in portions of the Upper Midwest also impacted other sectors including agriculture, recreation, and energy generation. The dry conditions stressed crops and [threatened livestock](#), leading many officials to [seek aid for suffering farmers](#). Water levels only 4 feet deep on the Mississippi River were the second lowest on record and forced the St. Cloud dam to [turn off its generators](#) for the first time since the drought of 1988.

While Iowa's drought conditions were alleviated slightly due to several rain events, these same storms led to the [runoff of large amounts of fertilizer](#). The result was an increase in [harmful algal blooms and E. coli](#) across several lakes during the 4th of July weekend and led officials to advise locals to stay out of the water for their own safety.

## Regional Outlook – October – December 2021

NOAA forecasters [are predicting](#) an increased likelihood of above-normal temperatures in southern and eastern regions of the Midwest for the final quarter of 2021. Minnesota, Iowa, and Wisconsin are the exception and have an equal chance of above-, below-, or near-normal temperatures.

The precipitation outlook shows an equal chance of above-, below-, or near-normal precipitation amounts for southern, central, and western portions of the Midwest. This uncertainty offers little insight into how drought conditions might change. If conditions do not improve, it could negatively impact the start of next year's growing season. The outlook is somewhat different further east. In northern Ohio, northeastern Indiana, and the Lower Peninsula of Michigan, the outlook suggests an increased probability of above-normal precipitation.

NOAA has also predicted an increased likelihood of La Niña conditions arising in the coming months. While it's possible a La Niña could increase the potential for above-normal precipitation, such impacts are often mild and hard to predict.

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## Midwest Region Partners

[Midwestern Regional Climate Center](#)

[American Association of State Climatologists](#)

[National Oceanic and Atmospheric Administration](#)

[NWS Climate Prediction Center](#)

[National Centers for Environmental Information](#)

[National Weather Service Central Region](#)

[North Central River Forecast Center](#)

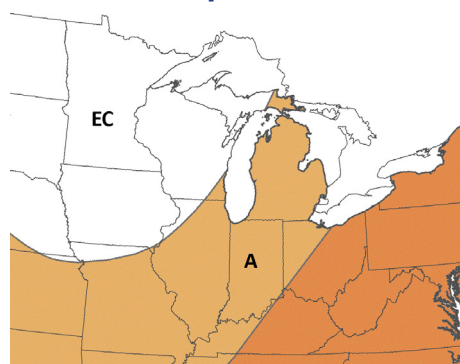
[Ohio River Forecast Center](#)

[National Drought Mitigation Center](#)

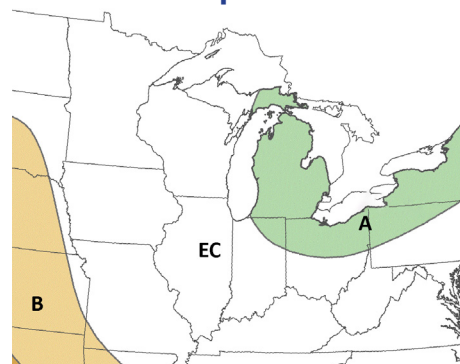
[National Integrated Drought Information System](#)

[USDA Midwest Climate Hub](#)

### Temperature



### Precipitation



A = Above normal    N = Normal  
B = Below normal    EC = Equal chances

