Quarterly Climate Impacts and Outlook

Midwest Region

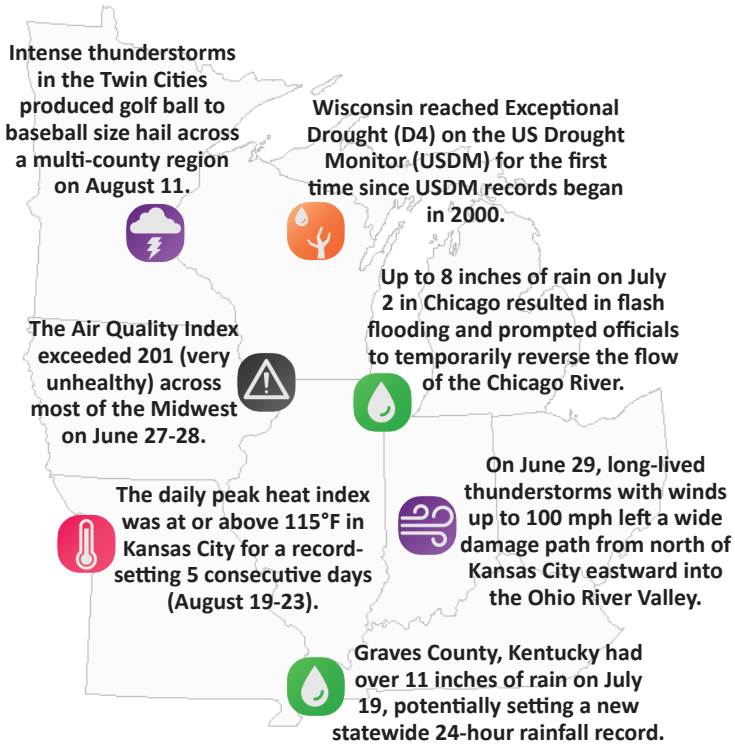
September 2023

Midwest Significant Events – *June - August 2023*

Conditions in June were characterized by a lack of rainfall, low humidity, and abundant sunshine that resulted in rapid drought expansion across the Midwest. Persistent northerly airflow, which is atypical for June, and historically large Canadian wildfires brought repeated and widespread air quality alerts, too.

Rain and storms abruptly returned to the eastern and southern Midwest in July and August, leading to rapid drought recovery. Southeast Missouri, southern Illinois, and western Kentucky had multiple heavy rain events on July 19-20, Aug 3-4, and Aug 14, resulting in flash flooding after spending early summer in severe drought. The Chicago area had also been in severe drought when storms on July 2 brought up to 8 inches of rain and flash flooding to the area. However, the drought worsened in the Upper Mississippi River Valley in July and August.

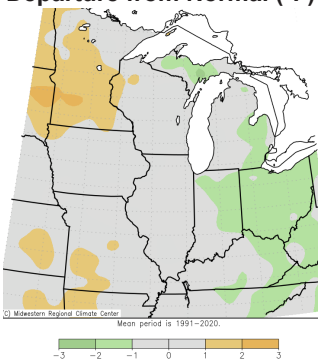
An unusually strong, persistent upper atmospheric heat dome trapped a humid air mass across the Midwest from August 19-25. Triple-digit heat index values were paired with excessively warm overnight temperatures, prompting widespread excessive heat warnings.



Regional Climate Overview – *June - August 2023*

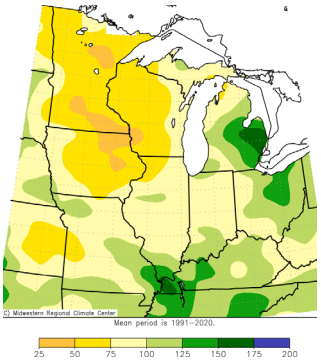
Summer Temperature

Departure from Normal (°F)



Summer Precipitation

% of Normal



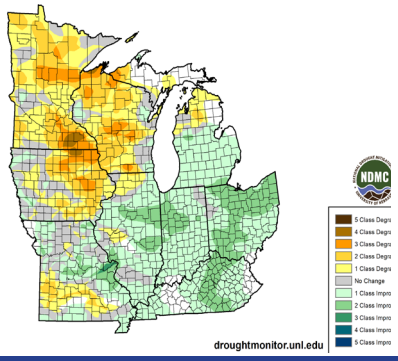
Summer temperatures were near normal for most of the Midwest, with slightly above-normal temperatures in the west and slightly below-normal temperatures in the east. June and August followed a similar west-to-east pattern. Minnesota tied for the 4th warmest June since 1895. Conditions were reversed in July, with cooler-than-normal temperatures in the west and near-normal temperatures elsewhere.

Summer precipitation was 84 percent of normal for the Midwest. Deficits of 4-10 inches were widespread across the northwest, while surpluses of 2-8 inches were observed across the south-central and eastern Midwest. The 5th driest summer was recorded in Minnesota and Wisconsin. June was dry region-wide, and the Midwest, Michigan, and Wisconsin had the 5th driest June since 1895. Precipitation was above normal in the south and east in July and August and below normal in the northwest. Minnesota had the 3rd driest July, while Michigan had the 6th wettest July. Missouri had the 6th wettest August.

Rapid drying that started in late Spring continued during Summer. In the south and east, the drought was short-lived, with rapid recovery occurring in July. By late August, abnormal dryness and drought affected 60 percent of the region, mostly in the northwest and Missouri. There were portions of Iowa, Minnesota, and Wisconsin that had 4 categories of degradation on the U.S. Drought Monitor over the summer. Iowa reached its longest duration in drought with 166 consecutive weeks.

Midwest Drought

Change from June 6 to Aug 29



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Regional Impacts – *June - August 2023*

Agriculture

Poor pasture quality was widespread in Missouri due to drought stress, resulting in health problems in cattle from toxic weed consumption. Cattle in Iowa, Missouri, and western Illinois were stressed by extreme heat in mid-July and mid-August. Hay prices in Wisconsin were 3-4 times higher than normal due to drought. Despite the drought, mild summer temperatures helped most corn and soybeans remain in decent condition throughout the Midwest, along with timely rainfall in the central and eastern portions of the region.

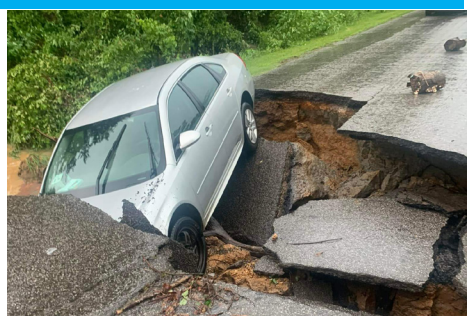
Crop failure in Minnesota (credit: CMOR/NDMC)

Drought and Water Supply

Summer drought resulted in low flows on the Upper Mississippi River, navigation load restrictions, and increased dredging. Communities in drought-stricken areas implemented water conservation measures. Above-normal wildfire activity, fish kills, and low water tables were reported in Wisconsin.

Severe Weather

Intense storms brought golf ball to baseball size hail to the Twin Cities on August 11, resulting in over $1 billion in damages to vehicles and buildings. On August 24-25, damaging thunderstorms and tornadoes moved across southern Michigan and northern Ohio, resulting in 5 fatalities. Heavy rain paired with 70-80 mph wind gusts created extremely hazardous driving conditions, downed trees, and knocked out power to over 500,000 customers in Michigan.



Record rainfall washed away roads in western Kentucky on July 19 (credit: Graves County Sheriff's Office)

August Heat Wave

The August 19-25 humid heat wave resulted in school closures, pavement buckling, and livestock fatalities. Record to near-record energy demands caused Midwest grid operators to seek usage reductions.

Regional Outlook – *October - December 2023*

NOAA forecasters are predicting increased chances of above-normal temperatures in the far northeastern portion of the region, with equal chances of above-, below-, and near-normal temperatures across the rest of the Midwest

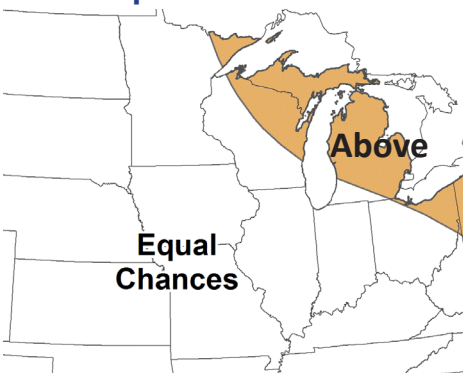
The precipitation outlook leans slightly towards below-normal precipitation in Michigan, with equal chances of above-, below-, or near-normal precipitation across the rest of the Midwest.

An El Niño Advisory has been issued. El Niño conditions are present in the equatorial Pacific and expected to strengthen in the coming months.

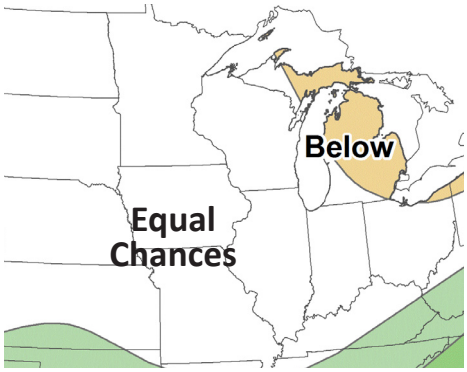
Concerns for the fall season include:

- -Soil moisture recharge
- -Streamflow recovery
- -Water availability
- -Fire potential
- -Fall planting (cover crops, winter wheat)

Temperature Outlook



Precipitation Outlook



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