

NWS FORM E-5 U.S. Department of Commerce
NOAA, NATIONAL WEATHER SERVICE

HSA OFFICE:
Grand Rapids, MI

MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS

REPORT FOR (MONTH & YEAR):
November 2022

TO: NATIONAL WEATHER SERVICE (W/OS31)
HYDROMETEOROLOGICAL INFO CENTER
1325 EAST-WEST HIGHWAY, RM 13468
SILVER SPRING, MD 20910

DATE:
December 13, 2022

SIGNATURE:
Bruce Smith, MIC
Andrew Dixon, Service Hydrologist

When no flooding occurs, include miscellaneous river conditions, such as significant rises, record low stages, ice conditions, snow cover, droughts, and hydrologic products issued (WSOM E-41).

An **X** inside this box indicates that no flooding occurred within this hydrologic service area.

Summary

November 2022 started out much warmer and drier than normal, transitioned to a week of cold weather in the middle of the month, then returned to warmer weather to finish the month. The cold snap mid-month featured a 3 day lake-effect snowstorm that got the seasonal snowpack off to a great start around West Michigan. However, the warm weather to end the month led to the complete meltout of that snowpack. Despite the mid-month record snowstorm, November ended with below-average monthly precipitation. Temperatures were not cold enough for any significant ice growth on the rivers in the area, so the risk of ice jams had not yet developed for the winter.

While virtually all of the Lower Peninsula end the month with below-average precipitation, once again the most dramatic dry conditions remained over southeast Lower Michigan (Figure 2). D1 drought conditions crept further westward, and by the end of the month had expanded to the Lansing and Jackson areas (headwaters of the Grand and Kalamazoo River systems, see Figure 5). Because drought impacts in Lower Michigan are primarily agricultural, this posed only a limited problem, but if this trend holds the spring flooding risk in these areas may start to be reduced as the winter moves along.

Flood Conditions

Water levels on the main river systems spent most of the month near the low-end of what we would consider a normal range (25th to 75th percentile). The melting snowpack during the 2nd half of the month kept the water levels a bit closer to normal than they otherwise would have been during another drier-than-normal month. It's somewhat

unusual that water levels remained largely the same throughout the month, especially considering how consistently the water levels usually start to rise this time of year. Because the driest conditions over the last few months have been in the headwaters regions of the Grand and Kalamazoo river systems, these areas are where the water levels are starting to be more dramatically lower than “normal” for this time of year. Overall, the long-term statistics suggest that the water levels on our rivers are higher than they currently are about 80% of years, and lower than they currently are about 20% of years. So, while it’s starting to be more unusual, we are definitely not close to any uncharted territory.

Flood Stage Report

No forecast points exceeded flood stage during the month. Thus, the NWS Form E-3 “Flood Stage Report” was not issued.

River Conditions

The end of November percentage of normal flow for selected rivers is listed below:

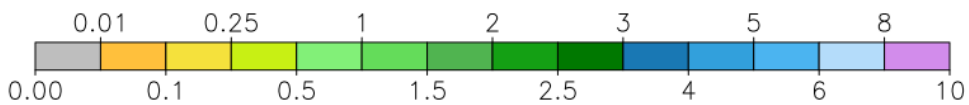
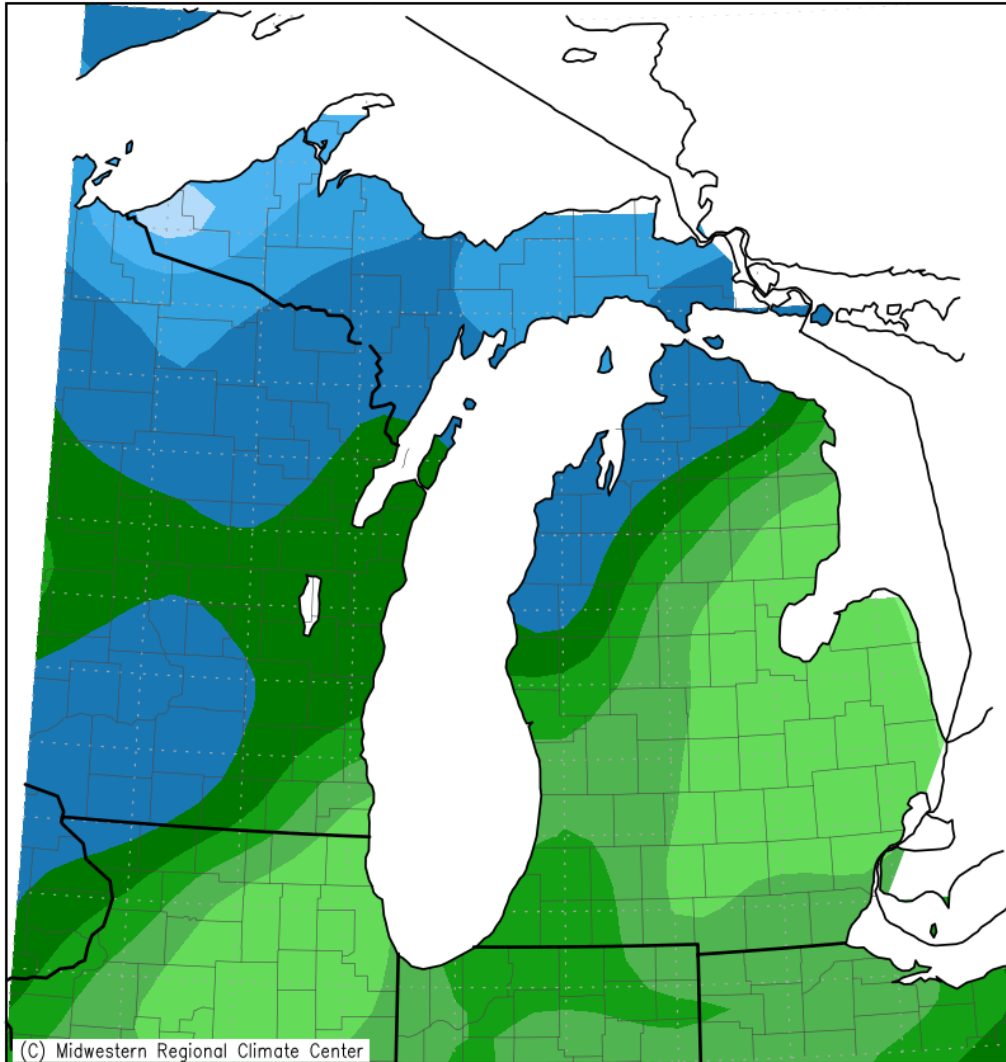
| <u>Location</u> | <u>River</u> | <u>% of Normal</u> |
|-----------------|----------------|--------------------|
| Scottville | Pere Marquette | 105 |
| Whitehall | White | 93 |
| Evart | Muskegon | 89 |
| Mt. Pleasant | Chippewa | 87 |
| Lansing | Grand | 71 |
| Grand Rapids | Grand | 93 |
| East Lansing | Red Cedar | 54 |
| Hastings | Thornapple | 93 |
| Battle Creek | Battle Creek | 94 |
| Battle Creek | Kalamazoo | 78 |

General Hydrologic Information

November precipitation amounts for Grand Rapids, Lansing, and Muskegon, Michigan, were 2.33, 1.07, and 1.52 inches, respectively (Figure 1). Monthly departures were -0.77, -1.39, and -1.40 inches, respectively. Yearly departures were -1.94, -0.88 and -1.53 inches for Grand Rapids, Lansing and Muskegon, respectively. Percent of mean precipitation for November 2022 is shown in Figure 2.

Temperatures for the month of November at Grand Rapids, Lansing and Muskegon were above average. The monthly average temperature departures for these sites were +0.9, +2.5, and +2.9 degrees Fahrenheit, respectively.

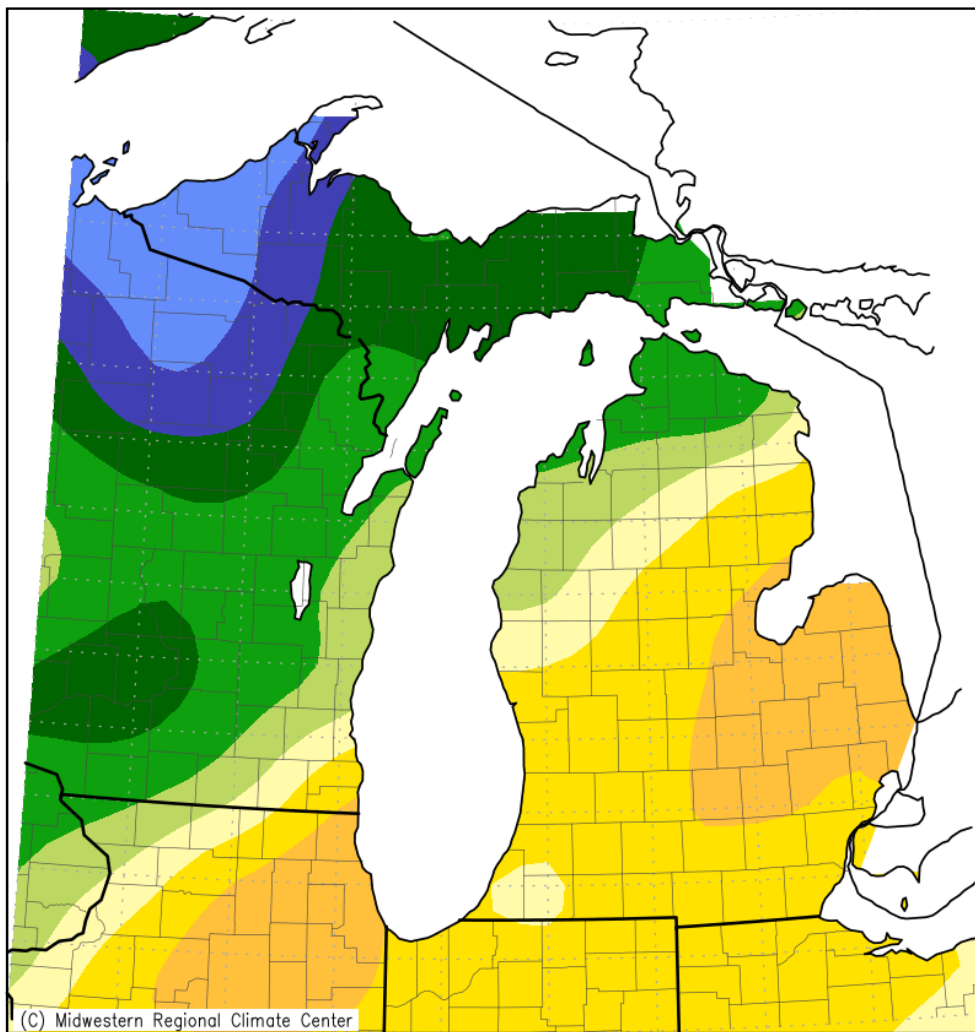
Accumulated Precipitation (in)
November 1, 2022 to November 30, 2022



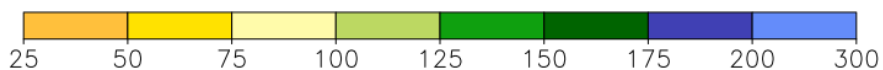
Midwestern Regional Climate Center
cli-MATE: MRCC Application Tools Environment
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Figure 1. November 2022 Monthly Precipitation Totals.

Accumulated Precipitation: Percent of Mean
November 1, 2022 to November 30, 2022



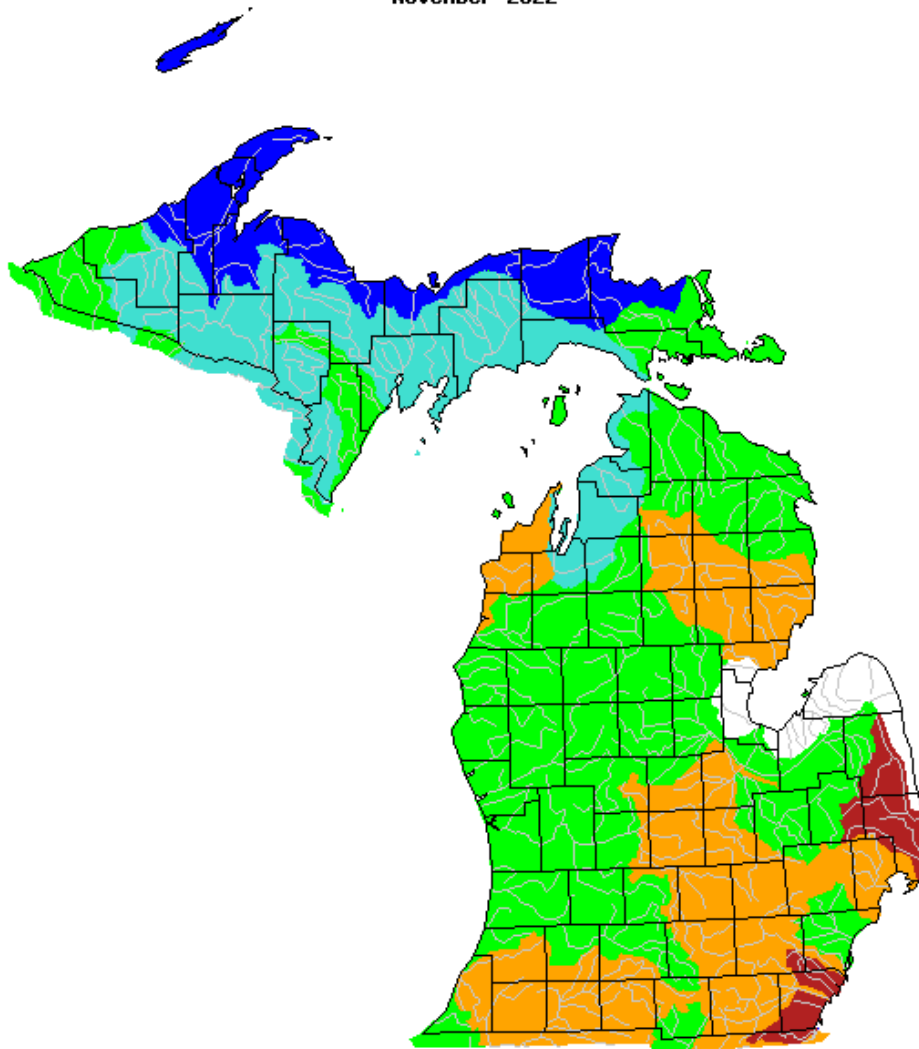
Mean period is 1991–2020.



Midwestern Regional Climate Center
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Figure 2. November 2022 Percent of Mean of Accumulated Precipitation.

November 2022



Explanation - Percentile classes

| | | | | | | | | |
|-----|-------------------|--------------|--------|--------------|-------------------|------|---------|--|
| | | | | | | | | |
| Low | <10 | 10-24 | 25-75 | 76-90 | >90 | High | No Data | |
| | Much below normal | Below normal | Normal | Above normal | Much above normal | | | |

Figure 3. USGS monthly streamflow for November, grouped by significant hydrologic units. Note streamflows somewhat below normal over western Lower Michigan, but much below normal in eastern Lower Michigan for this time of year.

Calculated Soil Moisture Ranking Percentile
NOV, 2022

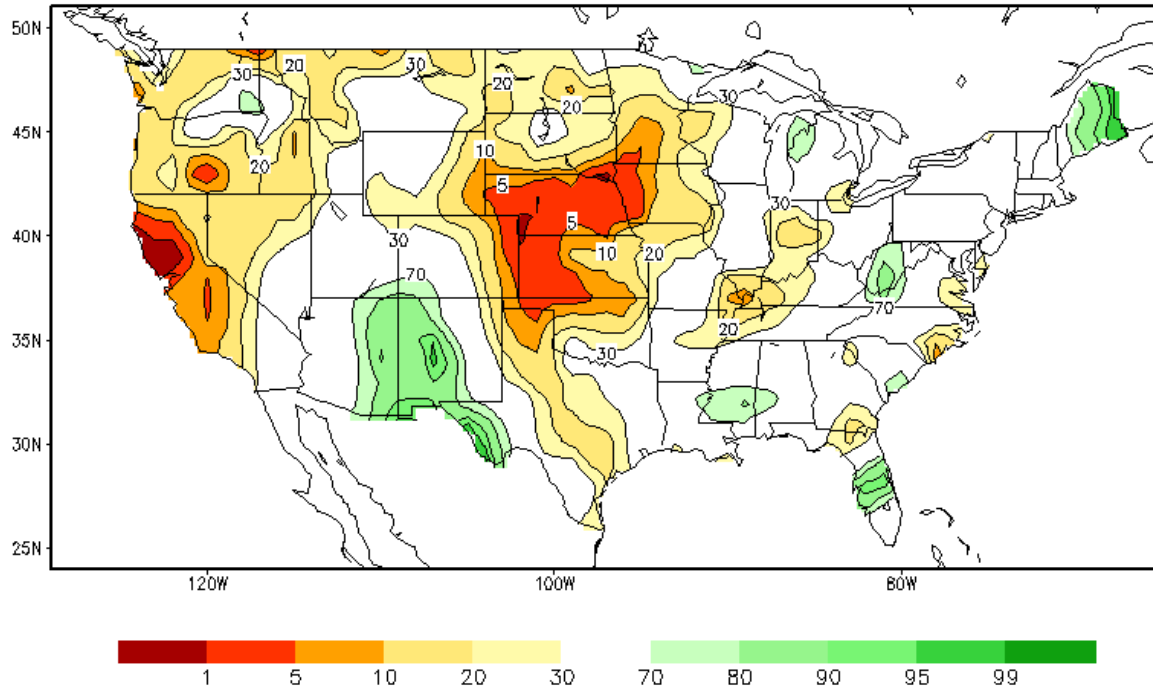


Figure 4. Chart of monthly values of soil moisture, by percentile ranking. This supports the idea that soil moisture levels are near-normal for this time of year.

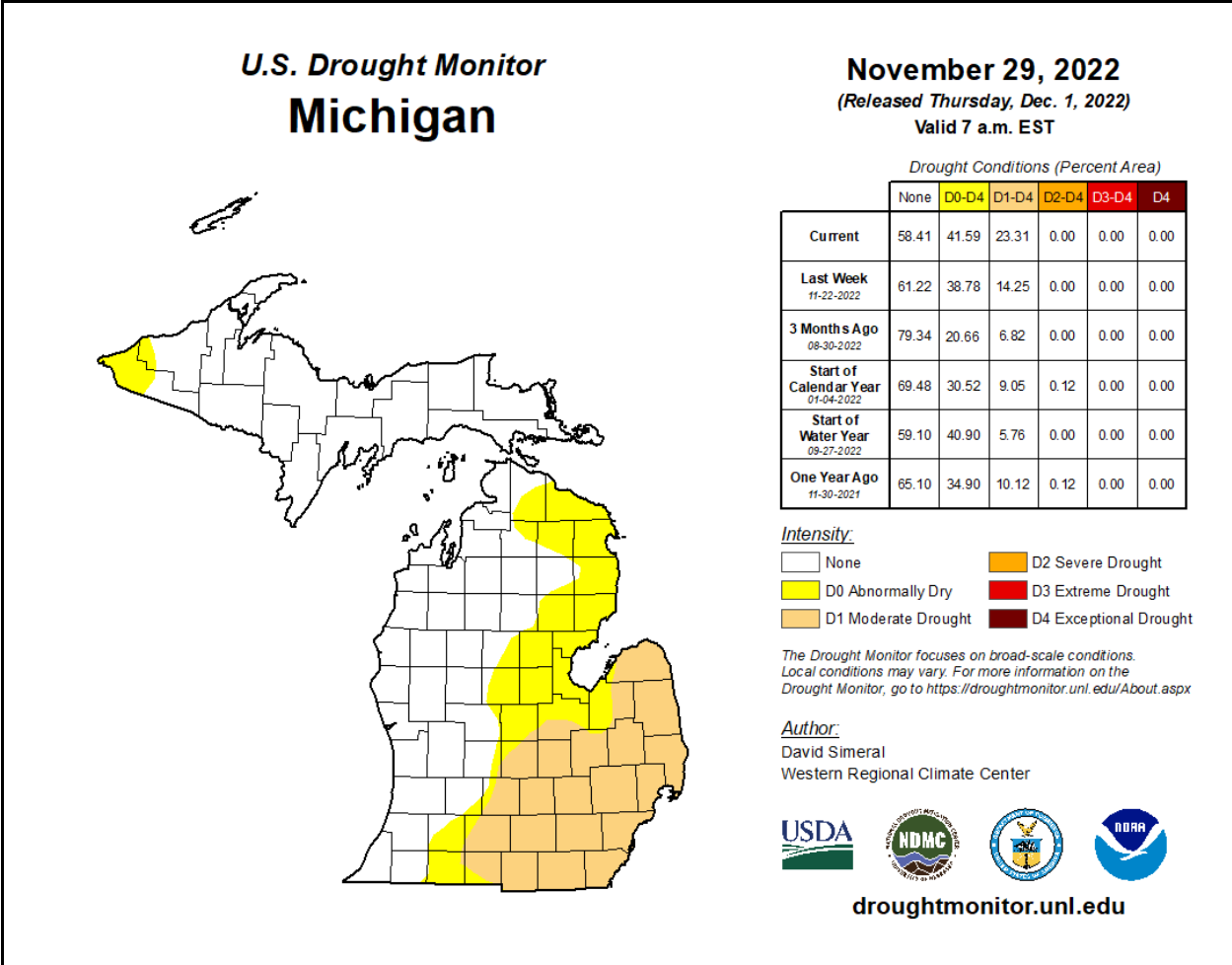


Figure 5. U.S. Drought Monitor showing fairly typical fall conditions across Western Lower Michigan, but more entrenched drought conditions persisting over the southeastern half of Lower Michigan

Hydrologic Products issued this month

- 30 Hydrologic Summaries (ARBRVAGRR)
- 1 Probabilistic Hydrologic Outlook (ARBESFGRR)
- 0 Event-driven Hydrologic Outlook (ARBESFGRR)
- 30 Daily River Forecasts (ARBRVDGRR)
- 0 Areal Flood Advisory Statements (ARBFLSGRR)
- 0 Flood Warning Statements (ARBFLWGRR)
- 0 Flood Watch Statements (ARBFFAGRR)
- 0 River Statements (ARBRVSGRR)

News Articles and Related Documentation

None