

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):
October 2022

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

DATE:
November 14, 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

The first half of October 2022 featured a continuation of the chilly fall conditions of late September. Several rounds of rain fell, primarily over the northern and western portions of the Lower Peninsula, but was not enough to cause any issues with flooding. The 2nd half of the month featured a return to much warmer weather (which is unusual during the fall/spring transition seasons when the climatology is changing so quickly), with additional minor rain events affecting the same areas as before. While precipitation for the month was normal in these northern and western areas, it was the middle and eastern portions of the Lower Peninsula that slipped deeper into D1 moderate drought conditions (see Figure 5 below), which is unusual for this time of year.

Flood Conditions

Water levels on the primary river systems in West Michigan all began a gradual rise, as typically happens this time of year with diminished evaporation and interception of rain via fields/forests. Water levels on all 3 of the main river systems in West Michigan were very close to normal for this time of year, spending almost the entire month between the 25th and 75th percentile values. The good news is that as we head into the cold winter months the soil is NOT saturated, and water levels are NOT higher than normal. While it's still too early to make much of a guess at spring flood risk, these two factors would tend to DECREASE spring flood risk.

Another impact of fall/early winter water levels is the resulting risk of ice jams in the spring. Assuming it gets cold enough to establish a good ice cover this winter, starting out at LOWER water levels makes ice jams slightly MORE likely, but also means that

any ice jams that form will likely only result in minor flooding risks (since there is still lots of “room” in the rivers to handle a jump in water levels behind an ice jam).

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 October percentage of normal flow for selected rivers is listed below:

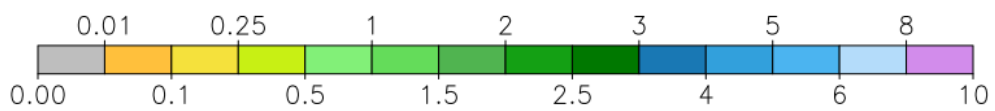
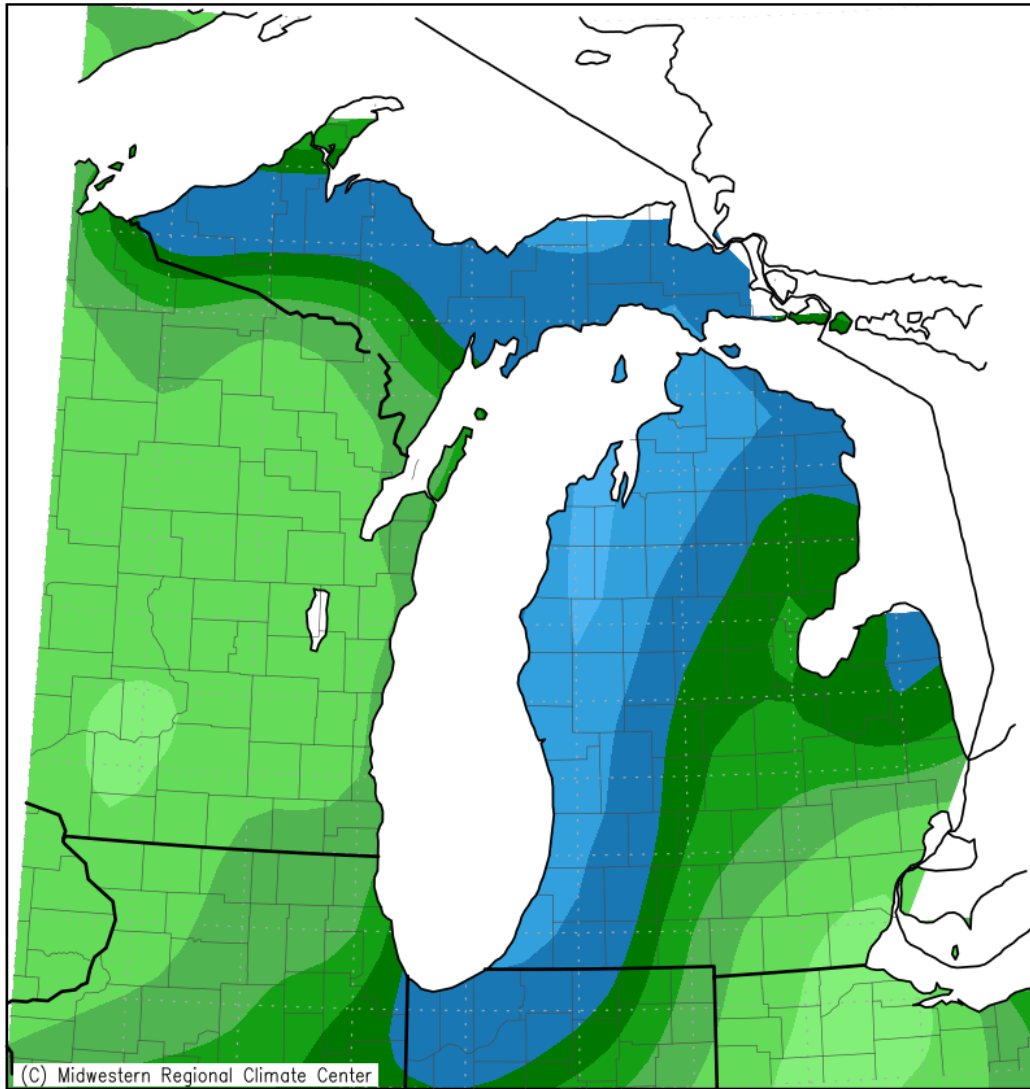
| <u>Location</u> | <u>River</u> | <u>% of Normal</u> |
|-----------------|----------------|--------------------|
| Scottville | Pere Marquette | 117 |
| Whitehall | White | 112 |
| Ewart | Muskegon | 94 |
| Mt. Pleasant | Chippewa | 115 |
| Lansing | Grand | 100 |
| Grand Rapids | Grand | 105 |
| East Lansing | Red Cedar | 66 |
| Hastings | Thornapple | 103 |
| Battle Creek | Battle Creek | 85 |
| Battle Creek | Kalamazoo | 73 |

General Hydrologic Information

October precipitation amounts for Grand Rapids, Lansing, and Muskegon, Michigan, were 3.74, 1.84, and 4.53 inches, respectively (Figure 1). Monthly departures were -0.28, -1.32, and +0.73 inches, respectively. Yearly departures were -1.17, +0.51 and -0.13 inches for Grand Rapids, Lansing and Muskegon, respectively. Percent of mean precipitation for October 2022 is shown in Figure 2.

Temperatures for the month of October at Grand Rapids, Lansing and Muskegon were generally near normal. The monthly average temperature departures for these sites were -0.9, +1.0, and +0.2 degrees Fahrenheit, respectively.

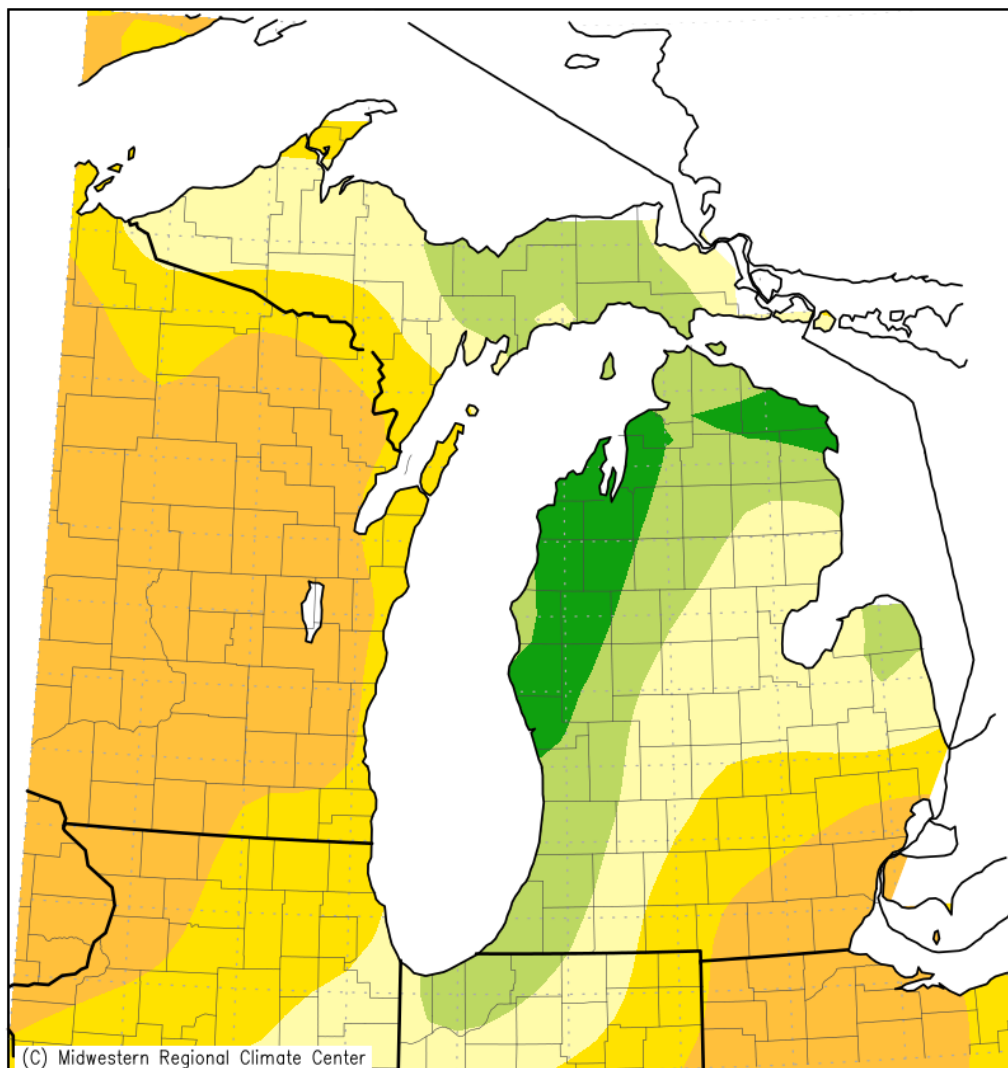
Accumulated Precipitation (in)
October 1, 2022 to October 31, 2022



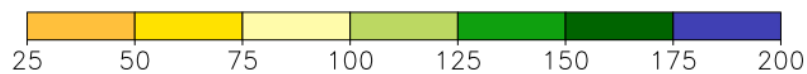
Midwestern Regional Climate Center
cli-MATE: MRCC Application Tools Environment
Generated at: 11/14/2022 7:29:18 AM CST

Figure 1. October 2022 Monthly Precipitation Totals.

Accumulated Precipitation: Percent of Mean October 1, 2022 to October 31, 2022



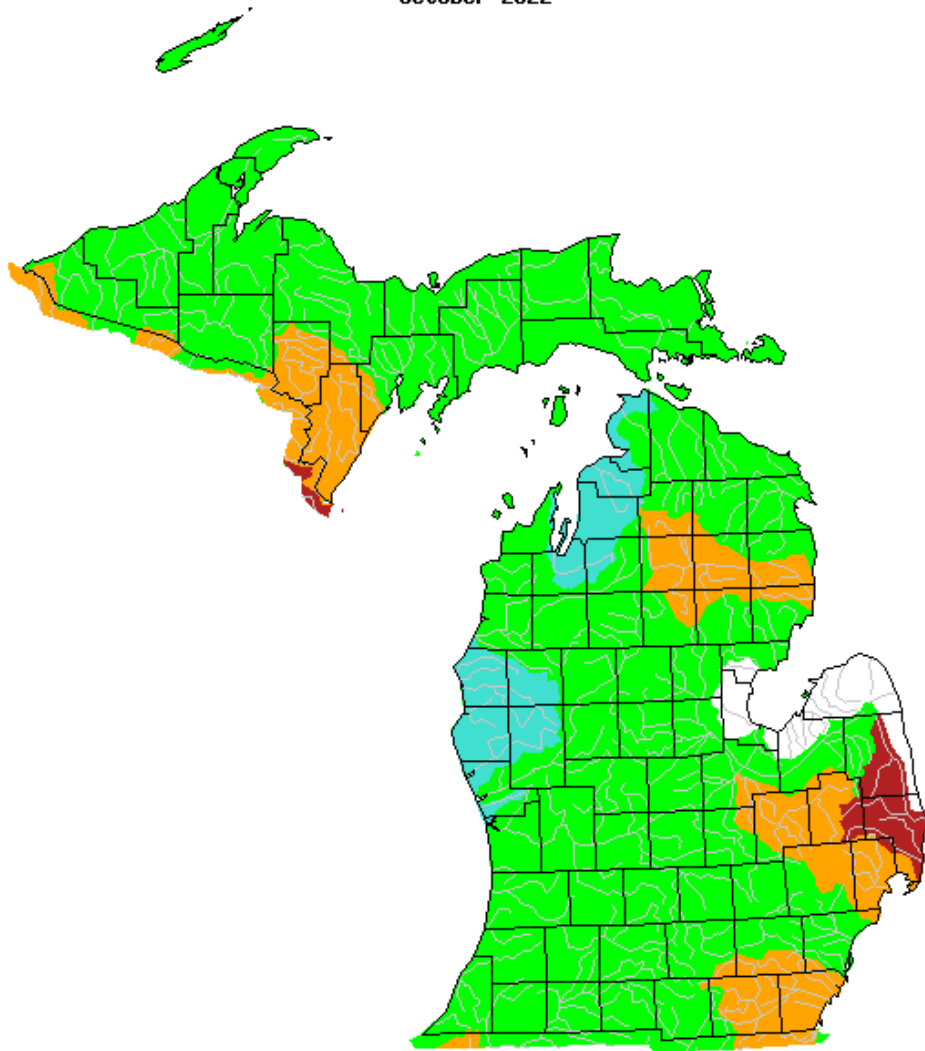
Mean period is 1991-2020.



Midwestern Regional Climate Center
cli-MATE: MRCC Application Tools Environment
Generated at: 11/14/2022 7:29:54 AM CST

Figure 2. October 2022 Percent of Mean of Accumulated Precipitation.

October 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 average streamflow for October, grouped by significant hydrologic units. Note streamflows within a typical range across most of Western Lower Michigan for this time of year.

Calculated Soil Moisture Ranking Percentile
OCT, 2022

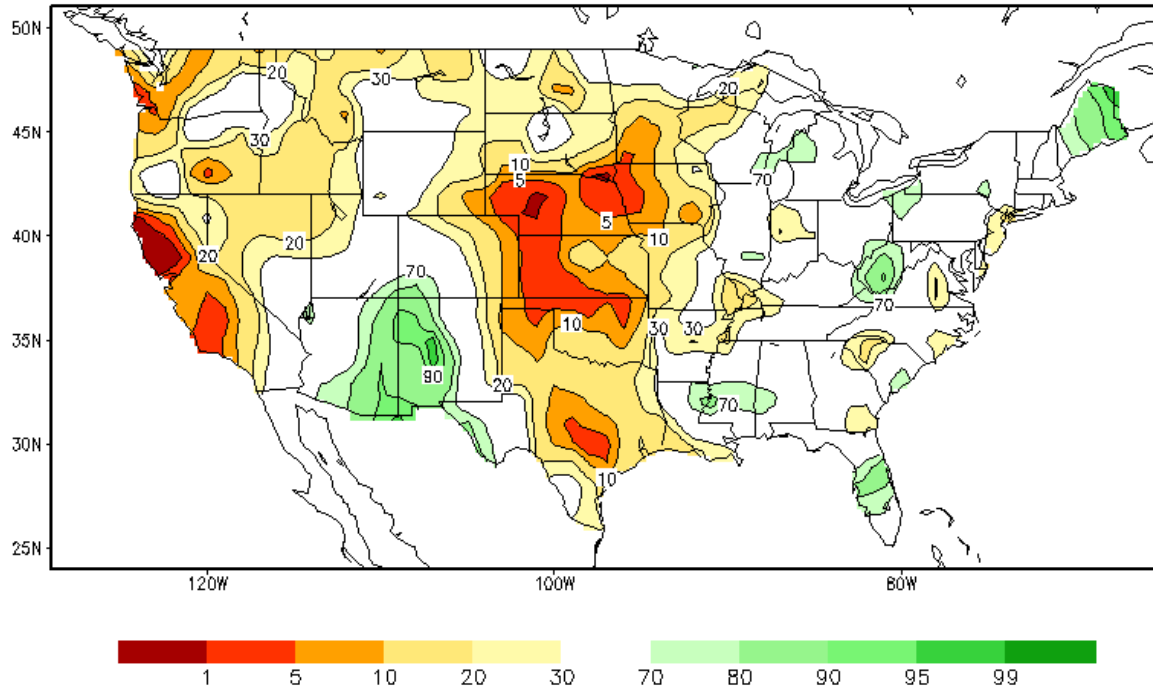
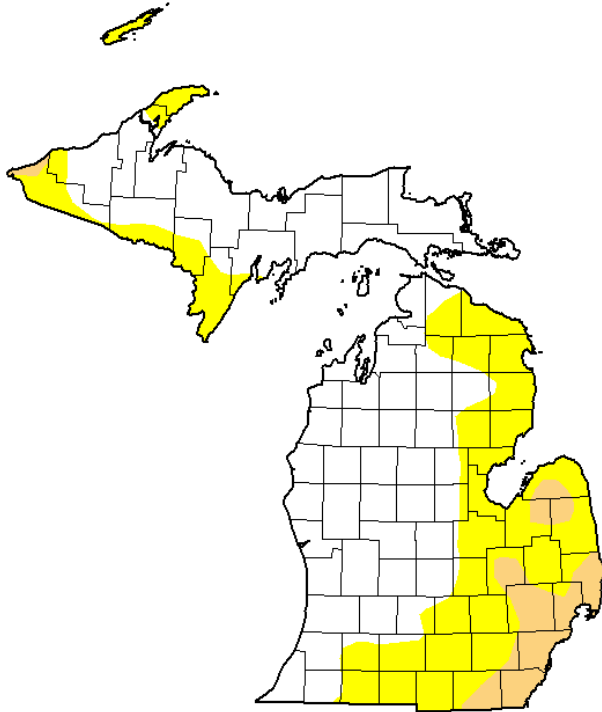


Figure 4. Chart of monthly values of soil moisture, by percentile ranking. This supports the idea that soil moisture levels are near-normal for this time of year.

U.S. Drought Monitor Michigan

November 1, 2022
(Released Thursday, Nov. 3, 2022)
Valid 8 a.m. EDT



Drought Conditions (Percent Area)

| | None | D0-D4 | D1-D4 | D2-D4 | D3-D4 | D4 |
|---|-------|-------|-------|-------|-------|------|
| Current | 59.54 | 40.46 | 7.71 | 0.00 | 0.00 | 0.00 |
| Last Week 10-25-2022 | 58.91 | 41.09 | 7.71 | 0.00 | 0.00 | 0.00 |
| 3 Months Ago 08-02-2022 | 51.57 | 48.43 | 13.05 | 0.00 | 0.00 | 0.00 |
| Start of Calendar Year 01-04-2022 | 69.48 | 30.52 | 9.05 | 0.12 | 0.00 | 0.00 |
| Start of Water Year 09-27-2022 | 59.10 | 40.90 | 5.76 | 0.00 | 0.00 | 0.00 |
| One Year Ago 11-02-2021 | 59.98 | 40.02 | 10.12 | 0.12 | 0.00 | 0.00 |

Intensity:

| | |
|---------------------|------------------------|
| None | D2 Severe Drought |
| D0 Abnormally Dry | D3 Extreme Drought |
| D1 Moderate Drought | D4 Exceptional Drought |

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

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National Drought Mitigation Center



droughtmonitor.unl.edu

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

Hydrologic Products issued this month

- 31 Hydrologic Summaries (ARBRVAGRR)
- 1 Probabilistic Hydrologic Outlook (ARBESFGRR)
- 0 Event-driven Hydrologic Outlook (ARBESFGRR)
- 31 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