

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

**HSA OFFICE:**  
**Grand Rapids, MI**

**MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS**

REPORT FOR  
(MONTH & YEAR):  
**October 2023**

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

DATE:  
October 15th, 2023

SIGNATURE:  
Joe Ceru,  
Meteorologist

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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).

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

**Summary**

For much of southwest Michigan, October 2023 was among the top 15% wettest on record. Precipitation was around an inch to 2 inches of above average for the month. The end of the month ended with a record 8.8 inch snowfall event in Muskegon. A more fall pattern was observed with clipper systems routinely moving through the region bringing persistent rainfall. Even so, none of the rivers reached flood stage.

Drought conditions improved across most of southern Lower with the exception of Central West Michigan in which much of that area along the US 10 corridor remains in a D2 drought. (Figure 5)

**Flood Conditions**

The month began with flows either near or a little below normal. The first 5 days were dry with flows decreasing. However a large precipitation event brought flows to well above normal by the 8th to 9th of October. These flows fluctuated over the month, The rivers through south central and southern lower Michigan remained well above normal through the end of the month. The rivers northward, such as the Muskegon and Pere Marquette Rivers began and ended with flows below normal.

The Muskegon River at Ewart began the month with a discharge of 390 CFS and ended the month at 590 CFS. So while flows did rise, the normal on October 1st is 590 CFS and the normal on the 31st is 790 CFS. So Muskegon remains 200 CFS below normal for the month.

Most other watersheds and rivers received well above normal precipitation and as you can see below were at to above normal flows by the end of the month. However, as stated above none reached flood stage.

### **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	96
Whitehall	White	105
Evert	Muskegon	75
Mt. Pleasant	Chippewa	111
Lansing	Grand	193
Grand Rapids	Grand	173
East Lansing	Red Cedar	353
Hastings	Thornapple	189
Battle Creek	Battle Creek	142
Battle Creek	Kalamazoo	102

### **General Hydrologic Information**

October precipitation amounts for Grand Rapids, Lansing, and Muskegon Michigan were 5.51, 4.77 and 5.96 inches, respectively (Figure 1). Monthly departures were +1.49, +1.61 and +2.16 inches respectively. Yearly departures through October 31st 2023 are -0.64, -0.70 and -1.30 inches for Grand Rapids, Lansing and Muskegon, respectively. Percent of mean precipitation for October 2023 is shown in Figure 2. Temperatures for the month of October at Grand Rapids, Lansing and Muskegon were all warmer than normal. The monthly average temperature departures for these sites were +1.1, +1.6 and +2.4 Fahrenheit, respectively.

Accumulated Precipitation (in)  
October 1, 2023, to October 31, 2023

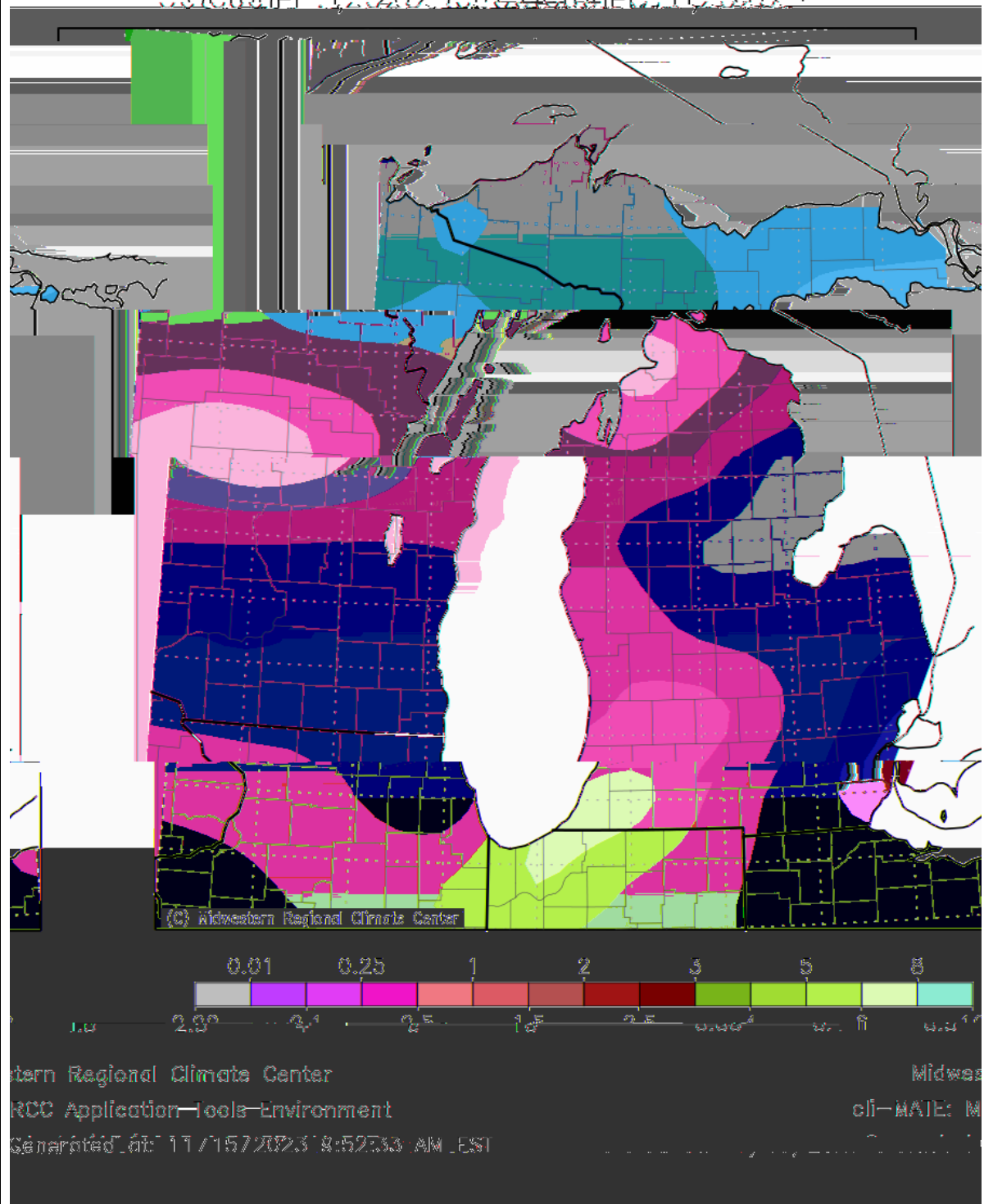


Figure 1 October 2023 Monthly Precipitation Totals.

Accumulated Precipitation: Percent of Mean  
 October 1, 2023 to October 31, 2023

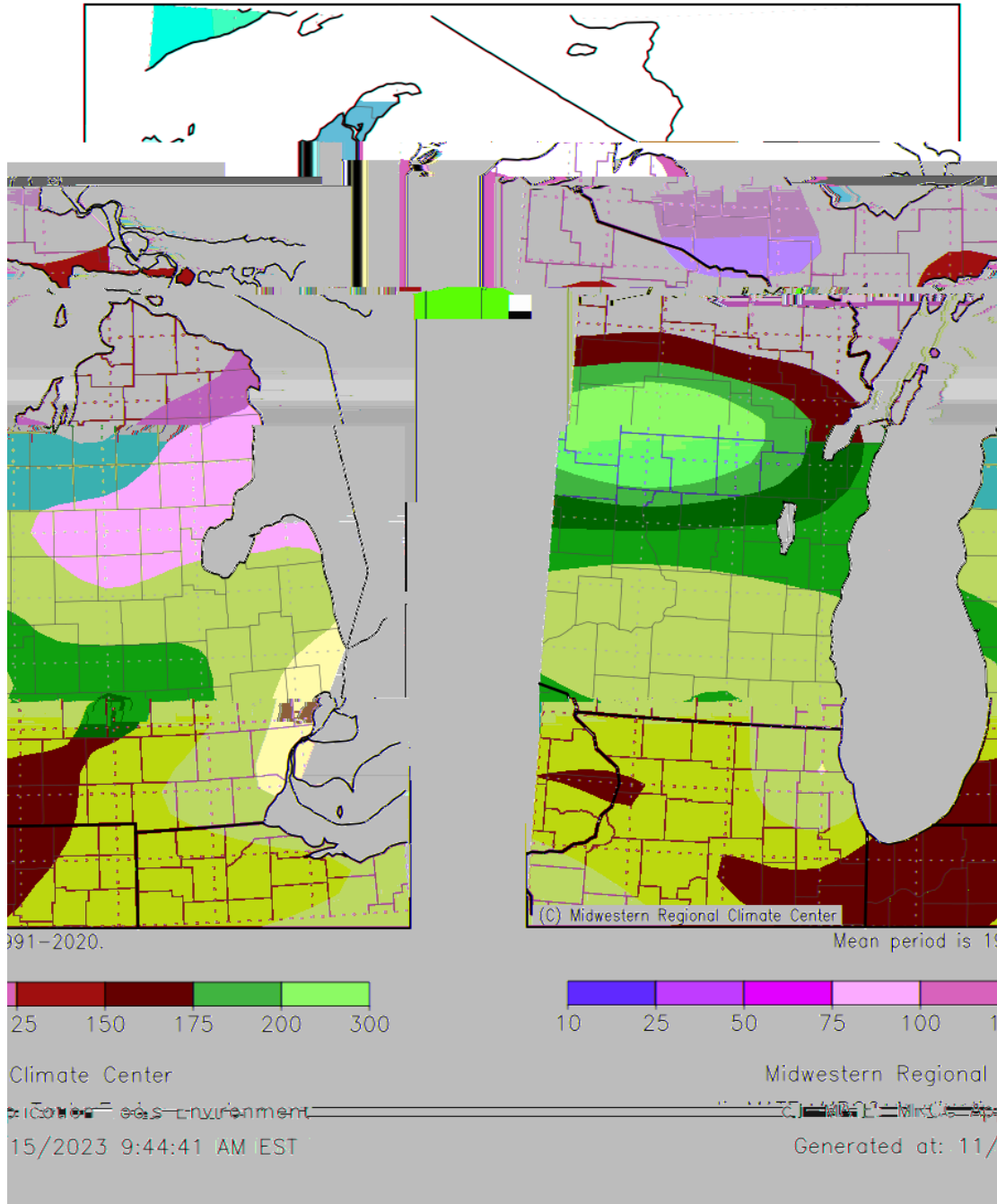
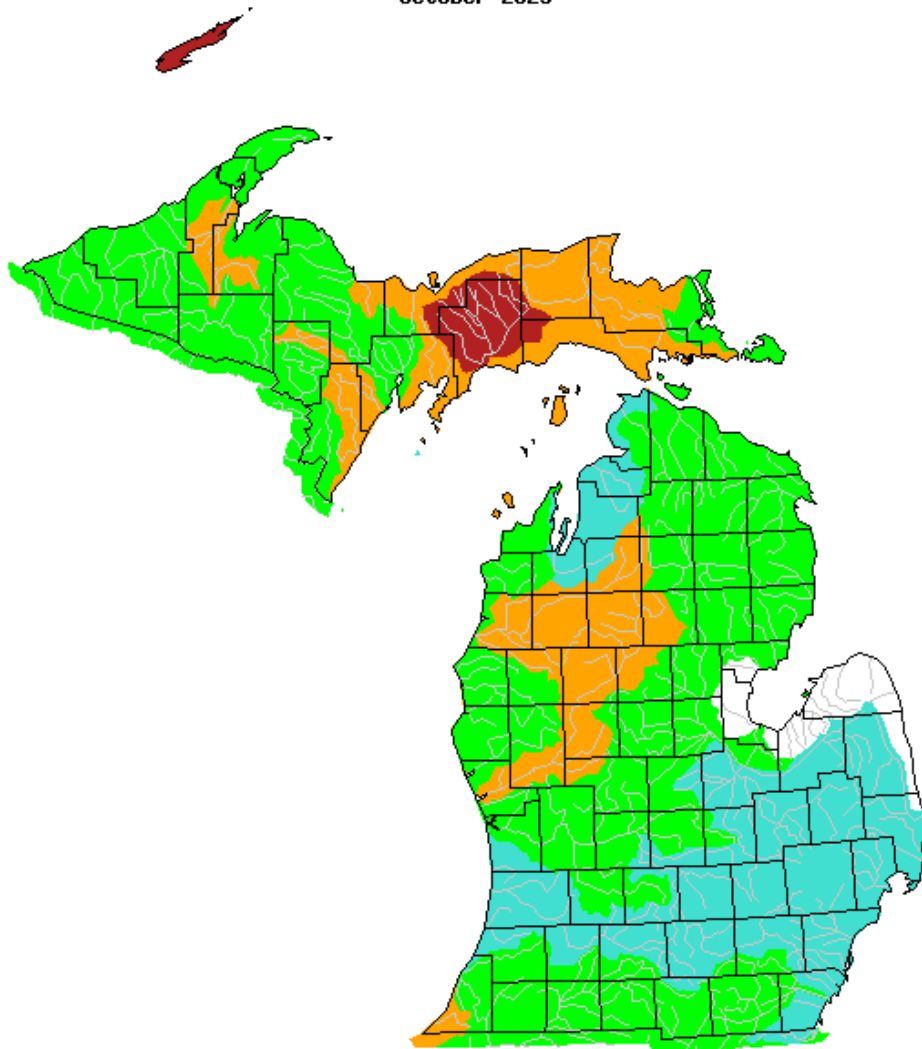


Figure 2. October 2023 Percent of Mean of Accumulated Precipitation.

October 2023



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 October, grouped by significant hydrologic units. Note streamflows for the Grand River watershed are much above normal for this time of year. Much of northern lower Michigan remains around normal. Several basins through central and eastern Michigan are much above normal to high.

### Calculated Soil Moisture Ranking Percentile OCT, 2023

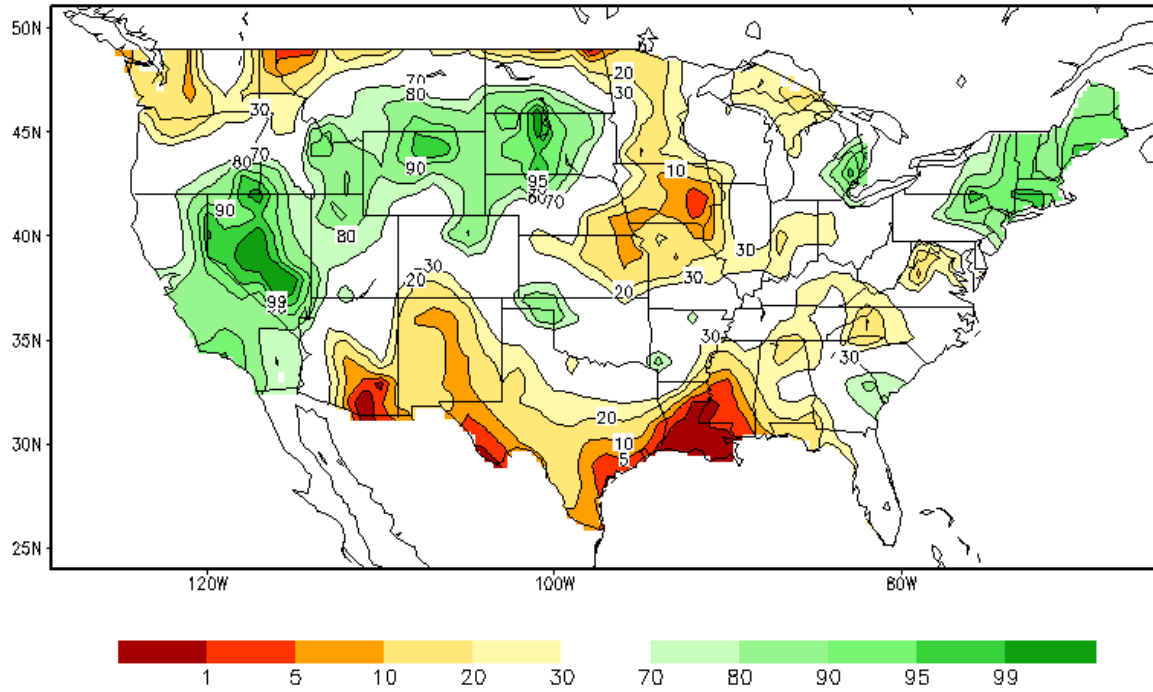
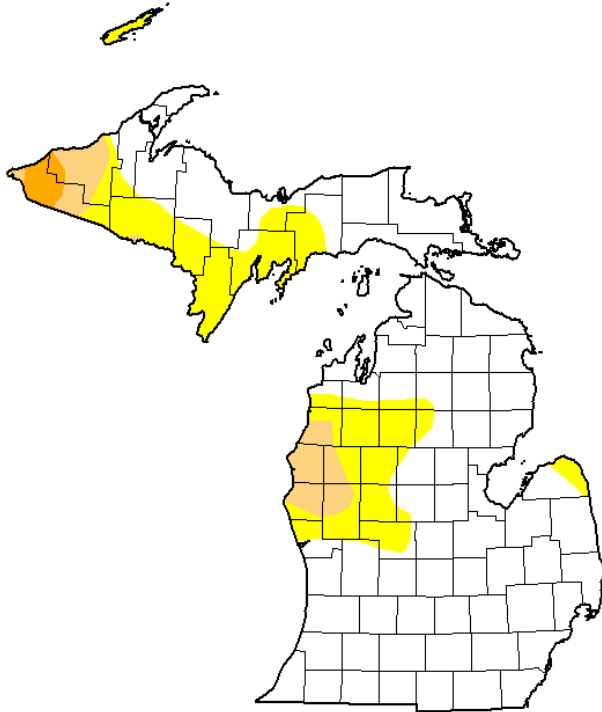


Figure 4. Calculated Soil Moisture Percentile for October, 2023. This supports conditions becoming more normal through much of lower Michigan.

## U.S. Drought Monitor Michigan

**November 7, 2023**  
(Released Thursday, Nov. 9, 2023)  
Valid 7 a.m. EST



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	74.48	25.52	6.49	1.19	0.00	0.00
<b>Last Week</b> 10-31-2023	76.92	23.08	6.43	1.31	0.00	0.00
<b>3 Months Ago</b> 08-08-2023	39.68	60.32	13.95	2.58	0.00	0.00
<b>Start of Calendar Year</b> 01-03-2023	48.07	51.93	30.62	9.67	0.00	0.00
<b>Start of Water Year</b> 09-26-2023	65.01	34.99	4.96	1.31	0.00	0.00
<b>One Year Ago</b> 11-08-2022	63.11	36.89	7.70	0.00	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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[droughtmonitor.unl.edu](https://droughtmonitor.unl.edu)

Figure 5. U.S. Drought Monitor showing moderate drought through west central Michigan and a reduction in the drought through the rest of lower Michigan.

### Hydrologic Products issued this month

- 31 Hydrologic Summaries (ARBRVAGRR)
- 0 Probabilistic Hydrologic Outlook (ARBESFGRR)
- 0 Event-driven Hydrologic Outlook (ARBESFGRR1)
- 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