

**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 2021**

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

DATE:  
December 15, 2021

SIGNATURE:  
Richard Wagenmaker, 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 2021 was a bit cooler than normal and overall drier than normal. However, of the precipitation that did occur, much of it fell as snow, so the monthly snow totals were actually near or slightly above normal. No heavy rain events led to any flooding concerns. Also, temperatures were not cold enough to begin producing ice on any of the West Michigan rivers, but water temperatures did decline as is typical this time of year.

**Flood Conditions**

While we avoided significant river flooding during the month, the river systems in Lower Michigan did generally continue to pass more water than normal this time of year. This was largely a result of the very wet late October weather - especially over the Grand and Kalamazoo river basins. So while the Muskegon basin spent most of the month near or very slightly above normal for this time of year, the Grand and Muskegon basins started the month above the 90th percentile flow and then steadily dropped down to near normal by the end of the month. The one exception here was the mainstem Kalamazoo river, that actually dropped down to below typical seasonal levels by the end of the month.

**Flood Stage Report**

No forecast points exceeded flood stage. 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:

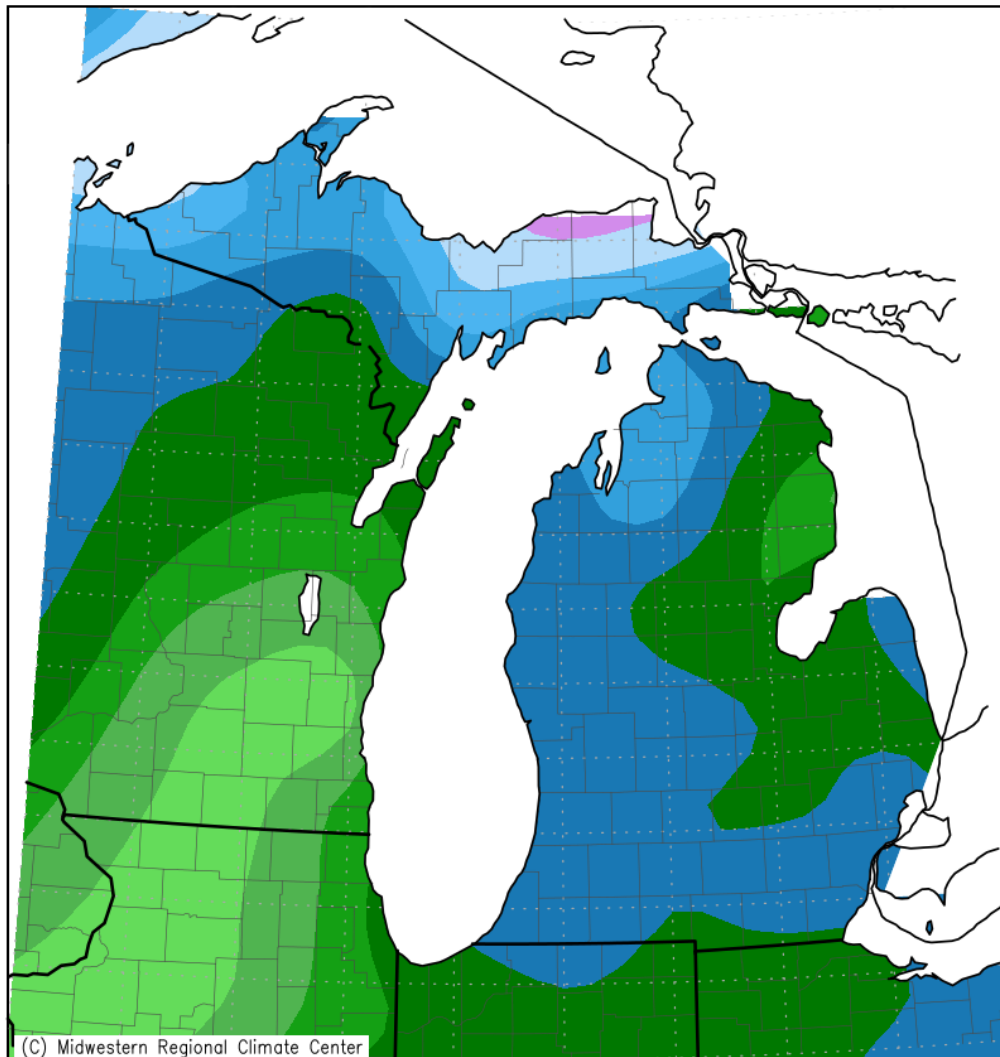
<u>Location</u>	<u>River</u>	<u>% of Normal</u>
Scottville	Pere Marquette	116
Whitehall	White	74
Ewart	Muskegon	80
Mt. Pleasant	Chippewa	95
Lansing	Grand	170
Grand Rapids	Grand	126
East Lansing	Red Cedar	192
Hastings	Thornapple	105
Battle Creek	Battle Creek	142
Battle Creek	Kalamazoo	114

### **General Hydrologic Information**

November precipitation amounts for Grand Rapids, Lansing, and Muskegon, Michigan, were 2.22, 1.47, and 1.86 inches, respectively (Figure 1). Monthly departures were -0.88, -0.99, and -1.06 inches, respectively. Yearly departures were -1.11, +1.01 and -4.03 inches for Grand Rapids, Lansing and Muskegon respectively. Percent of mean precipitation for November 2021 is shown in Figure 2.

Temperatures for the month of November at Grand Rapids, Lansing and Muskegon were slightly below normal. The monthly average temperature departures for these sites were -1.5, -0.5, and -0.2 degrees Fahrenheit, respectively.

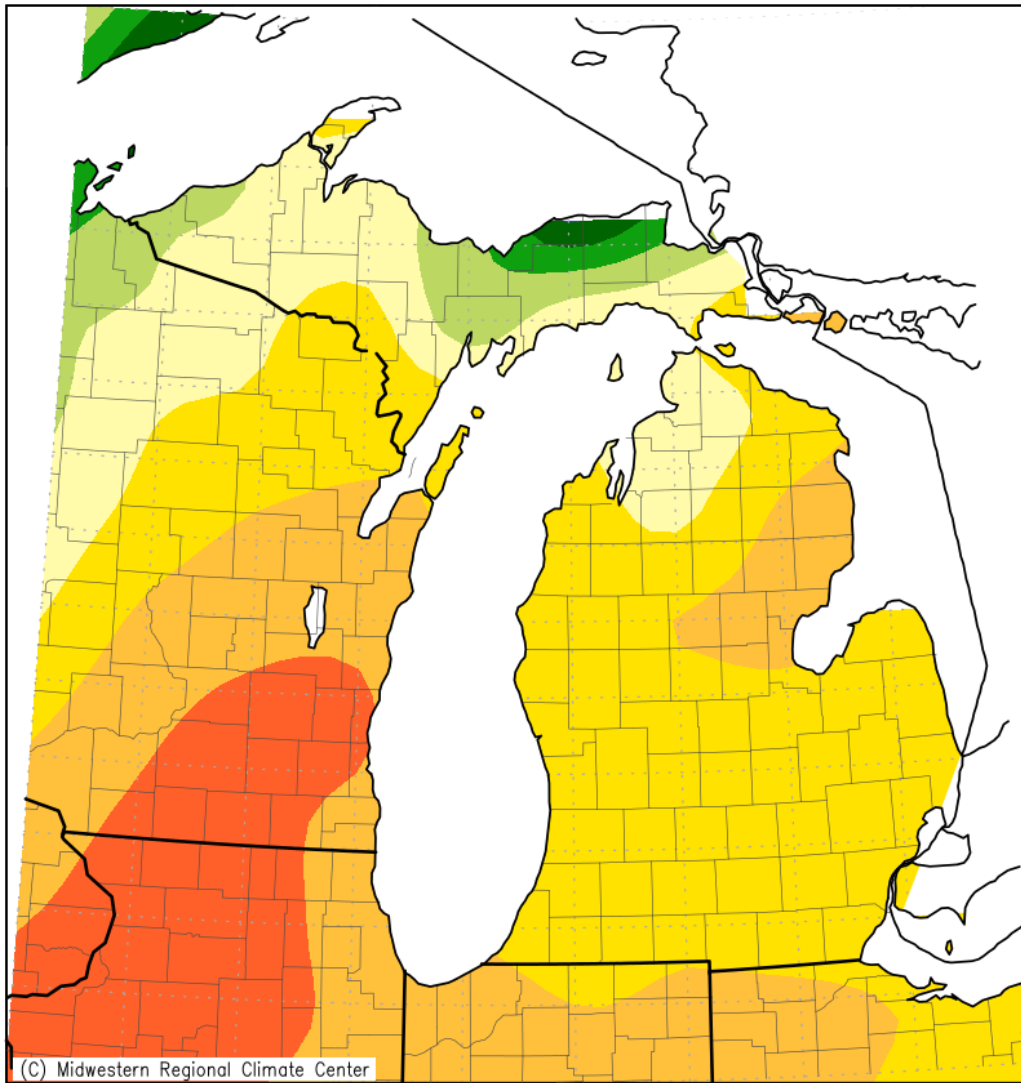
Accumulated Precipitation (in)  
November 1, 2021 to November 30, 2021



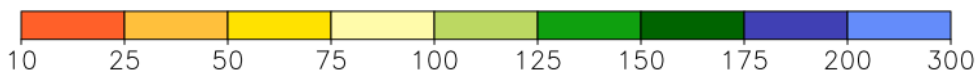
Midwestern Regional Climate Center  
cli-MATE: MRCC Application Tools Environment  
Generated at: 12/15/2021 4:04:27 PM CST

Figure 1. November 2021 Monthly Precipitation Totals.

Accumulated Precipitation: Percent of Mean  
November 1, 2021 to November 30, 2021



Mean period is 1991–2020.



Midwestern Regional Climate Center  
cli-MATE: MRCC Application Tools Environment  
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Figure 2. November 2021 Percent of Mean of Accumulated Precipitation.

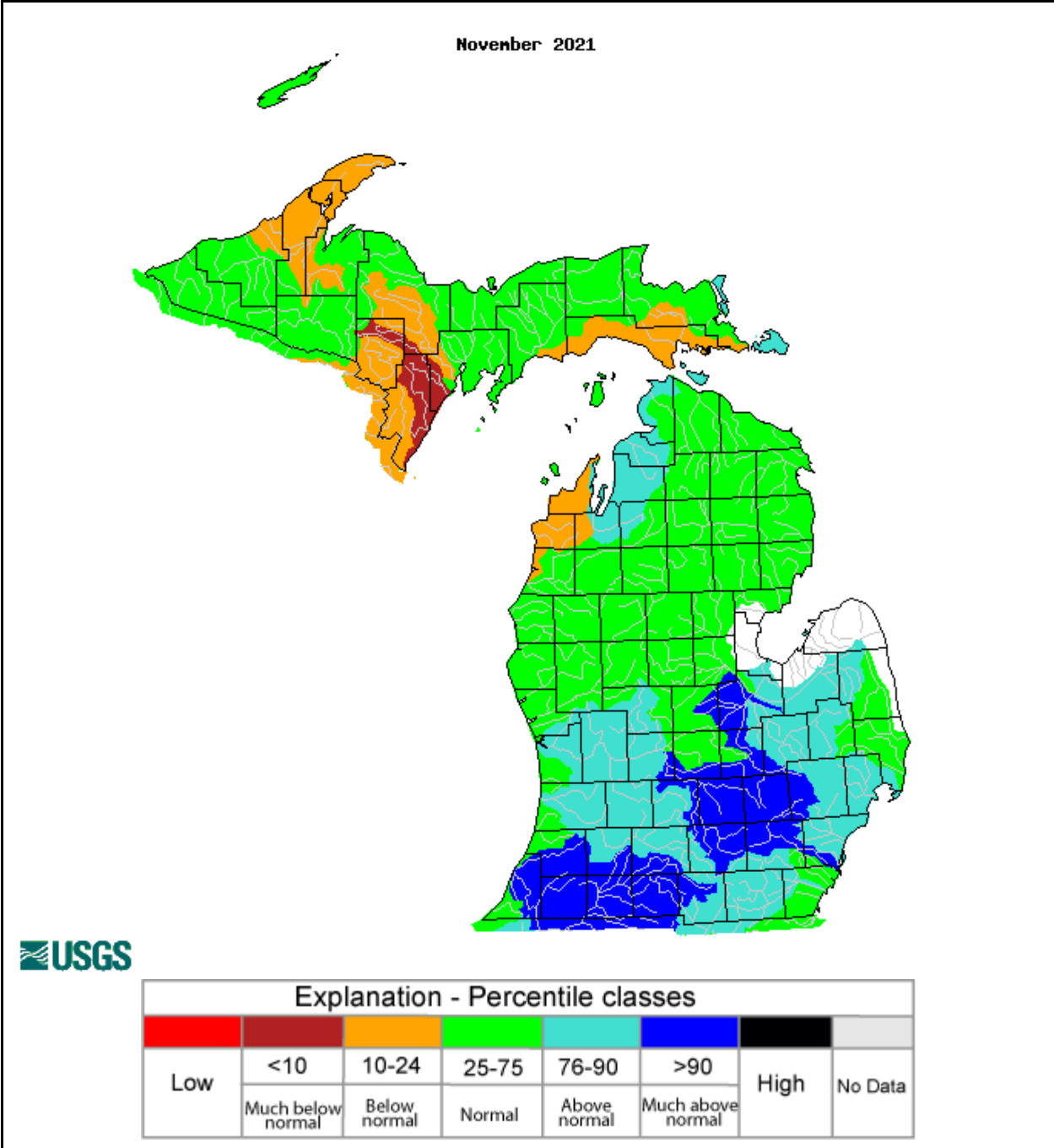


Figure 3. USGS monthly average streamflow for November, grouped by significant hydrologic units. Note streamflows across Lower Michigan generally near or slightly above average for this time of year.

Calculated Soil Moisture Ranking Percentile  
NOV, 2021

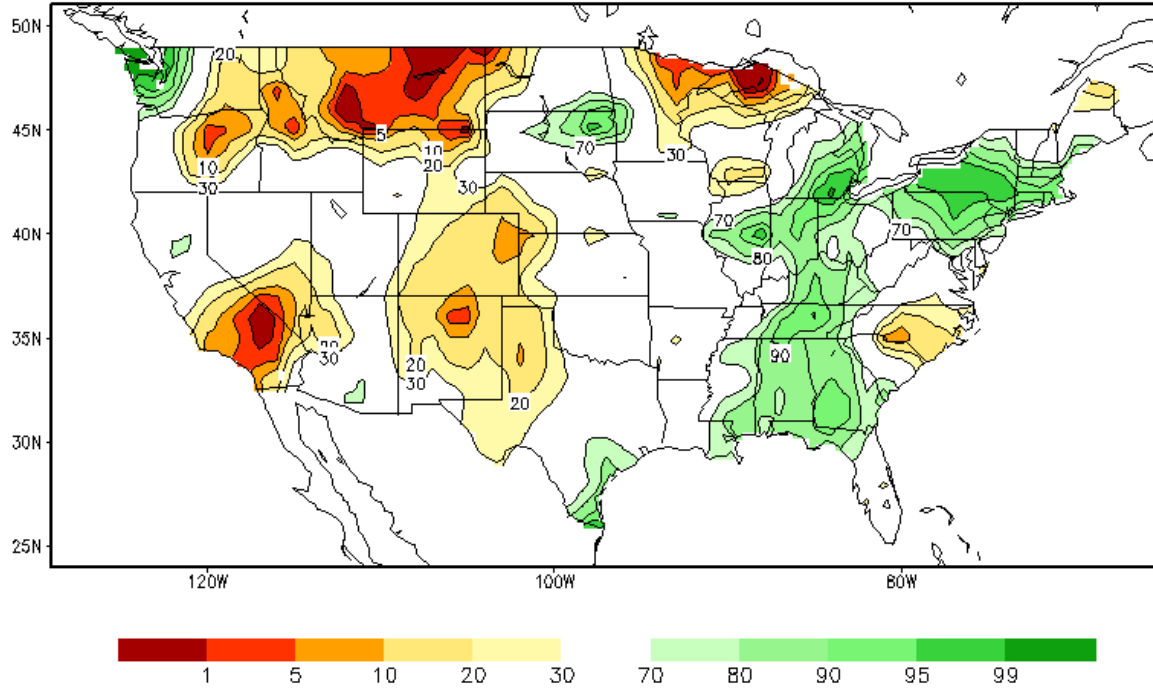


Figure 4. Chart of monthly values of soil moisture, by percentile ranking.

### **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