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): **August 2023**
TO:	NATIONAL WEATHER SERVICE (W/OS31) HYDROMETEOROLOGICAL INFO CENTER 1325 EAST-WEST HIGHWAY, RM 13468 SILVER SPRING, MD 20910	DATE: September 15th 2023
		SIGNATURE: Joe Ceru, Meteorologist

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).

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

Summary

While precipitation for the month varied at climate locations, overall it was near to above normal. Temperatures were colder than normal overall. However the gains in precipitation did mean there was some improvement to the drought conditions with only the northwest corner remaining in a D0 drought.

Flood Conditions

The month began pretty dry with dips to around normal flow. There were two heavy precipitation events during the month, the first on August 14th,and the second on August 24th. These two events caused two major spikes through the middle and latter half of the month through the rivers.

The event on the 14th had a flood watch, and both events on the 14th and 24th corresponded with several urban and small stream flood warnings and flood advisories. While there were significant rises on the rivers, none reached flood stage and only a few reached action stage.

With peak flow at Grand Rapids of 5600 cfs on the 19th of August it was around 330% above normal. However, no river flooding occurred. River levels then fell over the next week.

The next major event on the 24th caused river rises, with the highest flows in and around the Lansing area. The Grand River at Lansing went up to 1800 CFS which was 200% above normal. However, that did not reach flood stage either.

Flows by the end of the month were back down to normal for most locations outside of the rivers around Lansing which had seen higher precipitation totals. Red Cedar Creek was up, as was the Grand River at Lansing.

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

Location	River	% of Normal
Scottville	Pere Marquette	92
Whitehall	White	83
Evart	Muskegon	87
Mt. Pleasant	Chippewa	120
Lansing	Grand	241
Grand Rapids	Grand	188
East Lansing	Red Cedar	700
Hastings	Thornapple	136
Battle Creek	Battle Creek	103
Battle Creek	Kalamazoo	95

General Hydrologic Information

August precipitation amounts for Grand Rapids, Lansing, and Muskegon Michigan were 2.93, 4.28, and 3.00 inches, respectively (Figure 1). Monthly departures were -0.62, 0.80, and 1.32 inches respectively. Yearly departures were 0.05, 2.85, -2.30 inches for Grand Rapids, Lansing and Muskegon, respectively. Percent of mean precipitation for August 2023 is shown in Figure 2.

Temperatures for the month of August at Grand Rapids and Lansing were colder than normal with Muskegon just above normal. The monthly average temperature departures for these sites were -1.8, -0.8, and +0.2 degrees Fahrenheit, respectively.

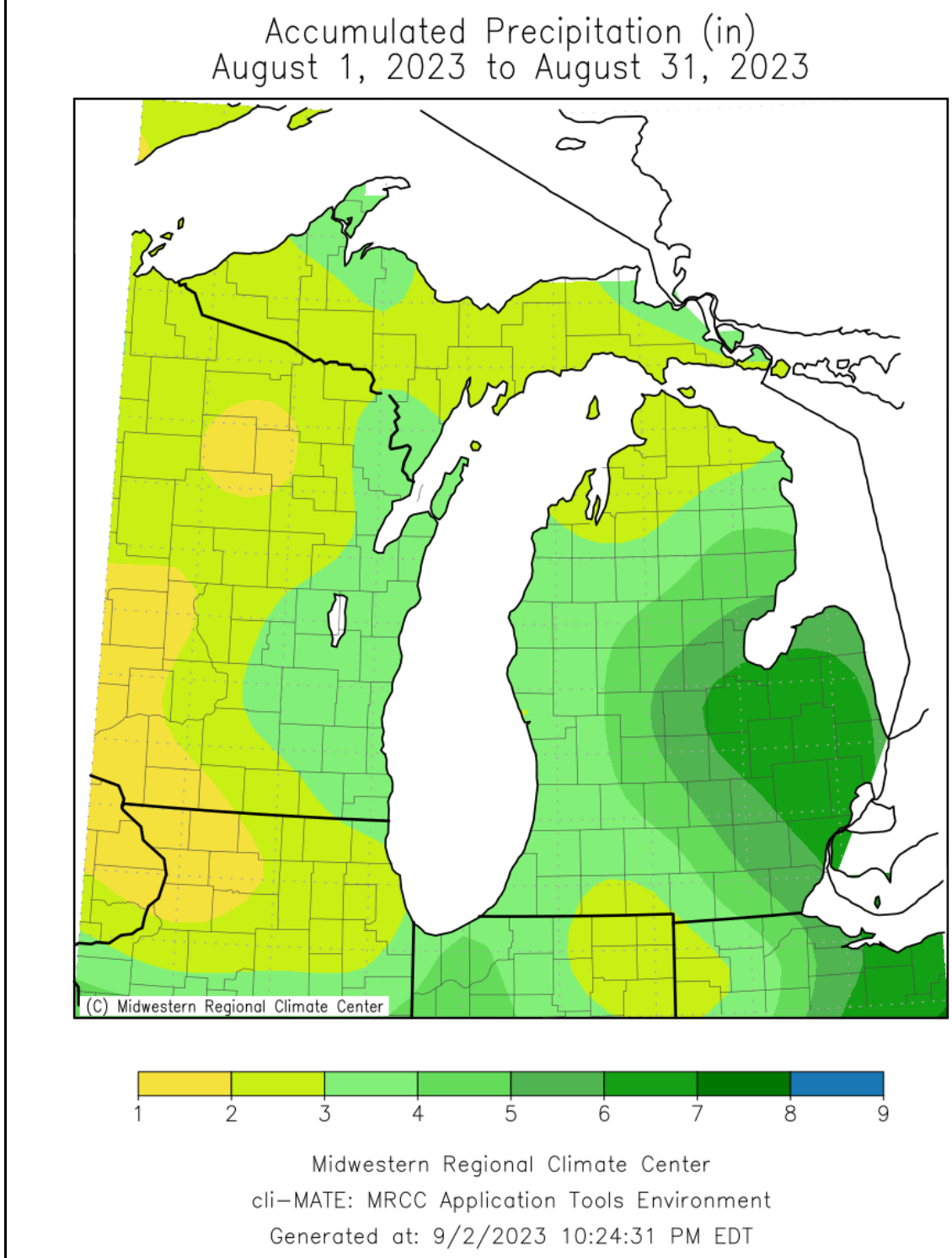

Figure 1. August 2023 Monthly Precipitation Totals.

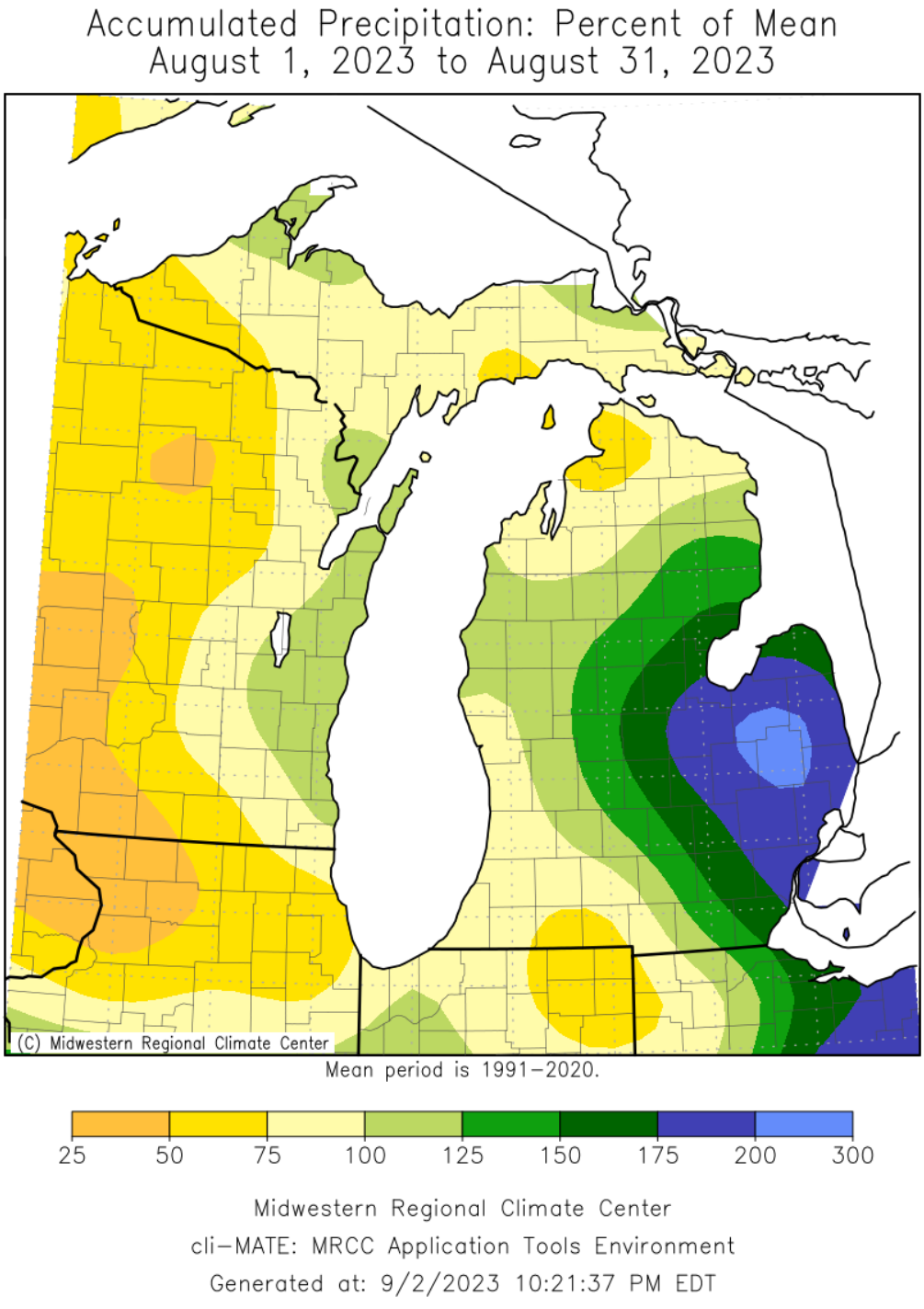

Figure 2. August 2023 Percent of Mean of Accumulated Precipitation.

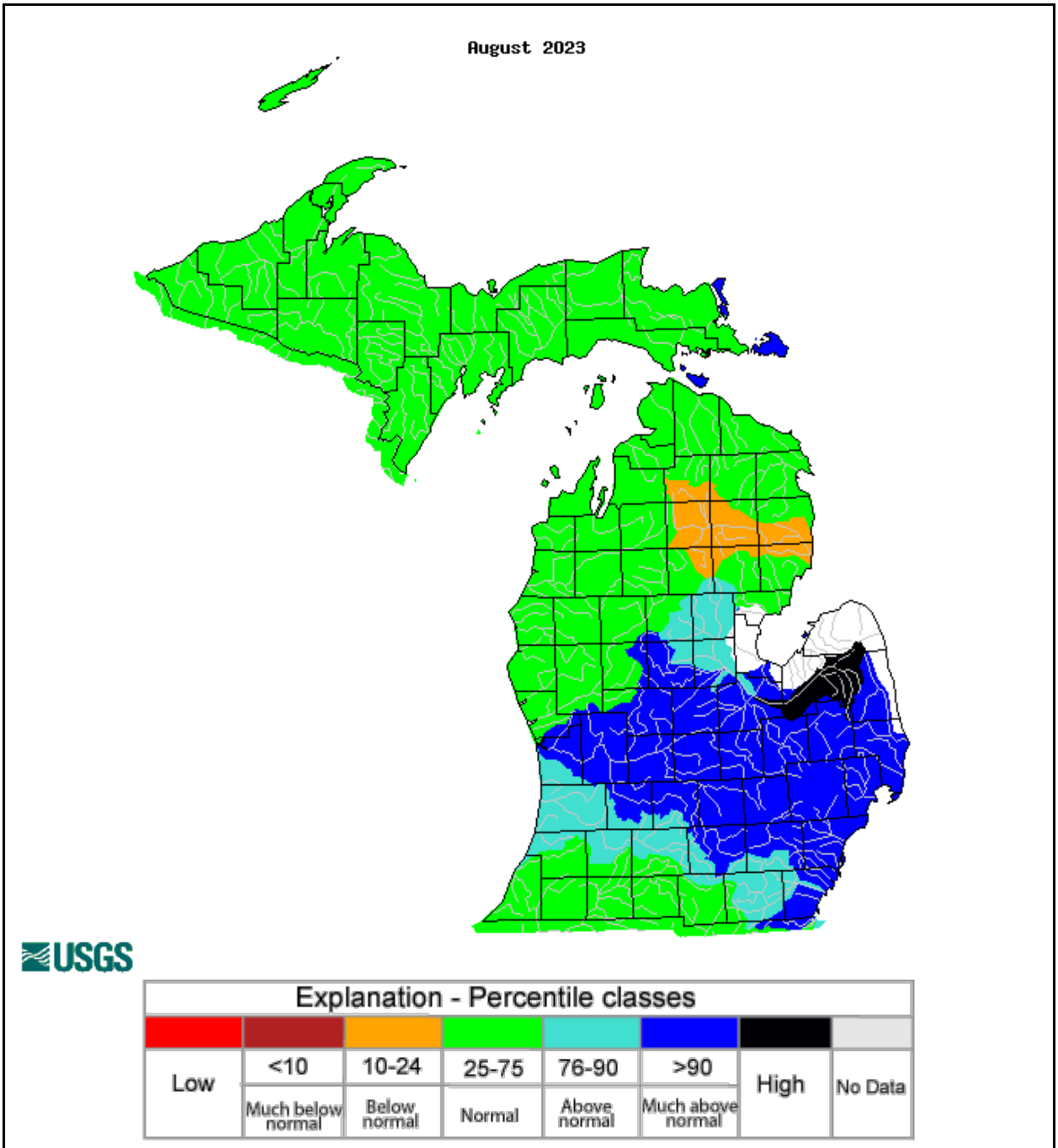

Figure 3. USGS monthly streamflow for August, grouped by significant hydrologic units. Note streamflows for the Grand River watershed are much above normal for this time of year. Much of northern lower Michigan remains around normal. Several basins through central and eastern Michigan are much above normal to high.

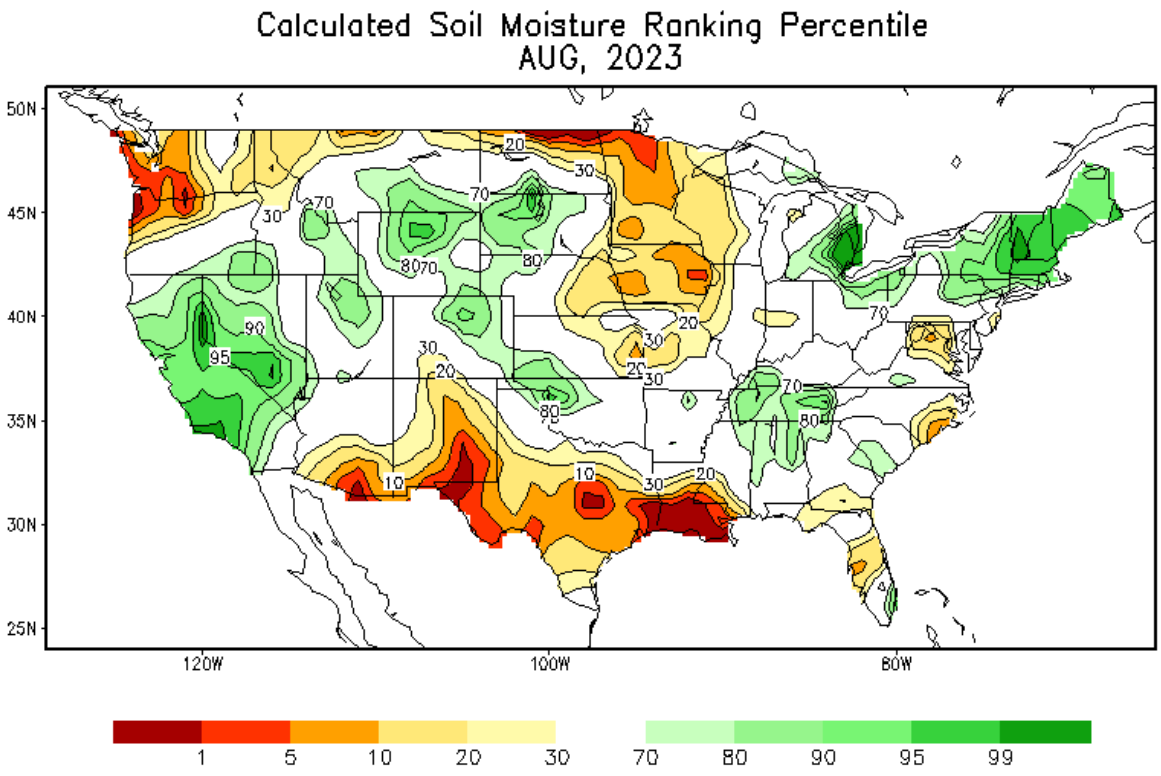

Figure 4.Calculated Soil Moisture Percentile for August, 2023. This supports conditions becoming more normal through much of lower Michigan.

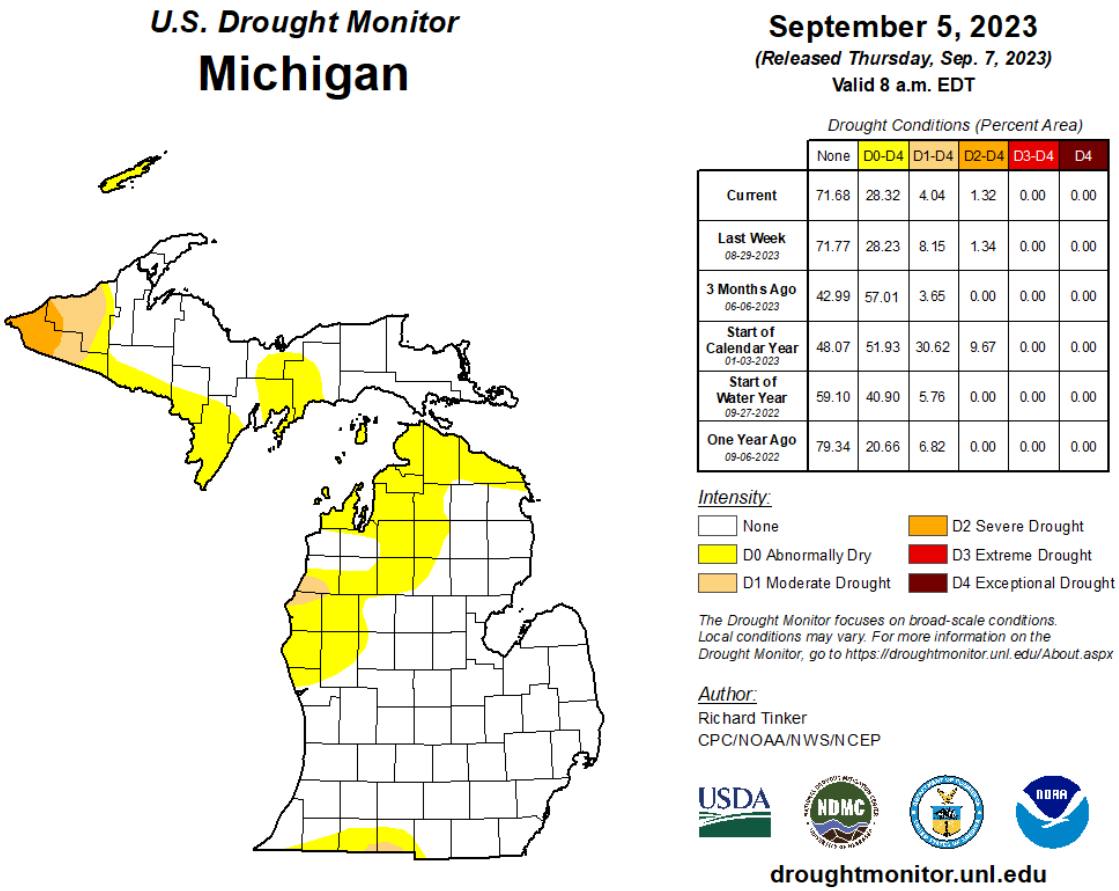

Figure 5.U.S. Drought Monitor showing severe drought through northern lower Michigan and a reduction in the drought through southern lower Michigan.

Hydrologic Products issued this month

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

News Articles and Related Documentation