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): **September 2023**
TO:	NATIONAL WEATHER SERVICE (W/OS31) HYDROMETEOROLOGICAL INFO CENTER 1325 EAST-WEST HIGHWAY, RM 13468 SILVER SPRING, MD 20910	DATE: October 9th, 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

September brought below normal precipitation and warmer than normal temperatures. While most of the region has no drought there remains a D0 drought along the lakeshore north of Muskegon and along the I 94 corridor between Kalamazoo and Jackson. Looking ahead the Climate Prediction Center is anticipating an El Nino through the winter. This is typically associated with a lack of river ice during the winter for Lower Michigan. For more information you can read their discussion.

https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.shtml

Flood Conditions

The month began with flows well above normal, especially on the Grand River. Flows on the Grand River at Grand Rapids began the month around 3,250 CFS which is approximately 200 percent above normal. However the flows on the Grand, as well as most of the rivers, fell through most of the month. The sole exception was a spike around the 12th of September from precipitation which occurred on the 11th. The Grand Rapids area received a little over an inch of precipitation. After this rise most rivers then continued to fall through the end of the month. So most rivers ended the month around or slightly below normal flow.

There was locally heavy rainfall on the 17th over Kalamazoo. This event saw around 2 to 4 inches which caused minor urban and small stream flooding. Conditions improved quickly. There were sharp rises on the Portage creek but no forecast points reached flood stage.

There was a round of storms that moved through central lower Michigan on the 27th. These showers and storms brought a rise in river levels on the Red Cedar river at East Lansing. None of these spikes came close to flood stage. So the Red Cedar ended the month with above normal flow.

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

Location	River	% of Normal
Scottville	Pere Marquette	81
Whitehall	White	85
Evart	Muskegon	62
Mt. Pleasant	Chippewa	82
Lansing	Grand	150
Grand Rapids	Grand	106
East Lansing	Red Cedar	204
Hastings	Thornapple	58
Battle Creek	Battle Creek	83
Battle Creek	Kalamazoo	90

General Hydrologic Information

September precipitation amounts for Grand Rapids, Lansing, and Muskegon Michigan were 1.25, 1.92, and 1.5 inches, respectively (Figure 1). Monthly departures were -2.18, -0.89, and -1.76 inches respectively. Yearly departures are through September, 1.22, 3.41, -0.80 inches for Grand Rapids, Lansing and Muskegon, respectively. Percent of mean precipitation for September 2023 is shown in Figure 2.
Temperatures for the month of September at Grand Rapids, Lansing and Muskegon were all warmer than normal. The monthly average temperature departures for these sites were +1.1, +2.1 and +3.3 Fahrenheit, respectively.

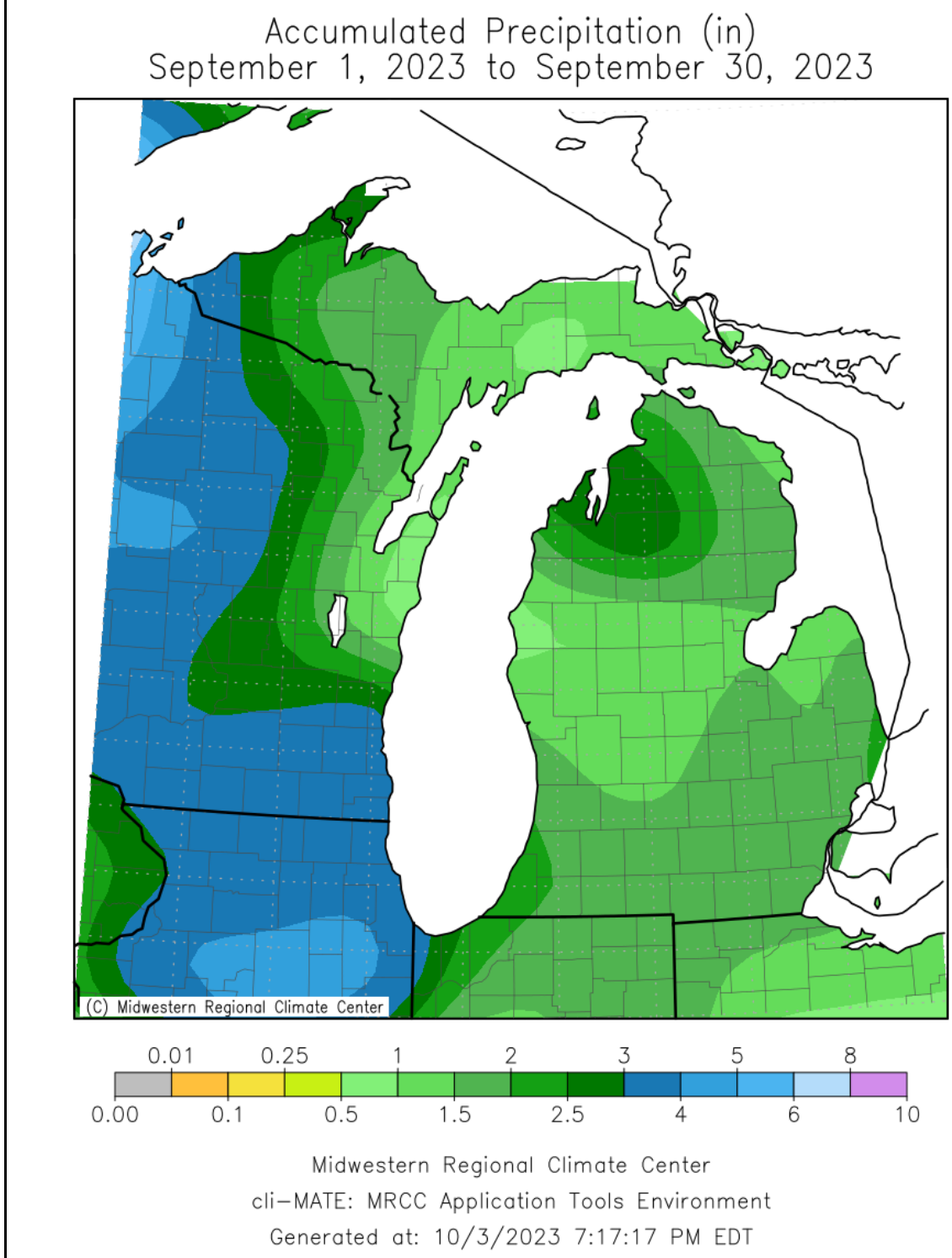

Figure 1 September 2023 Monthly Precipitation Totals.

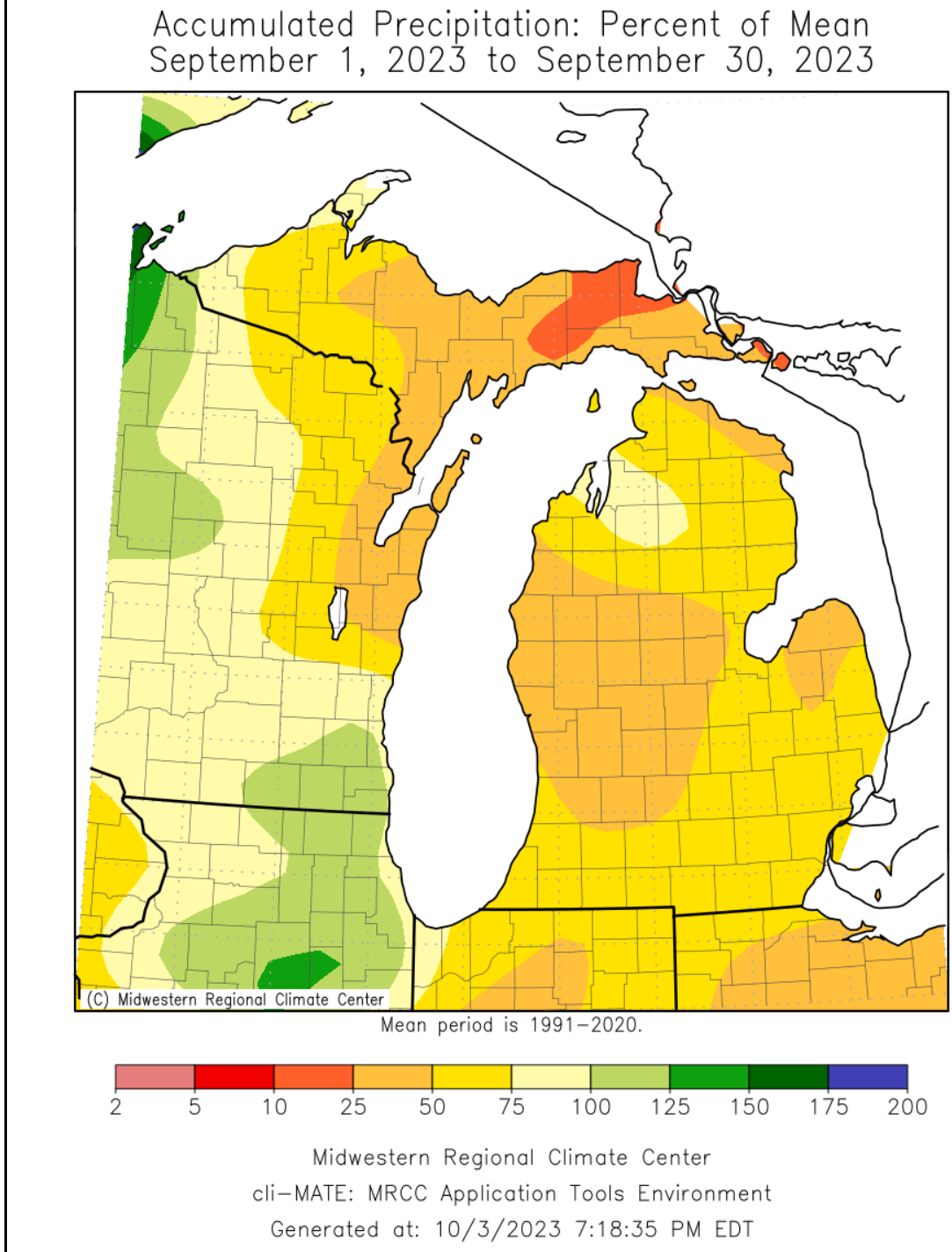

Figure 2. September 2023 Percent of Mean of Accumulated Precipitation.

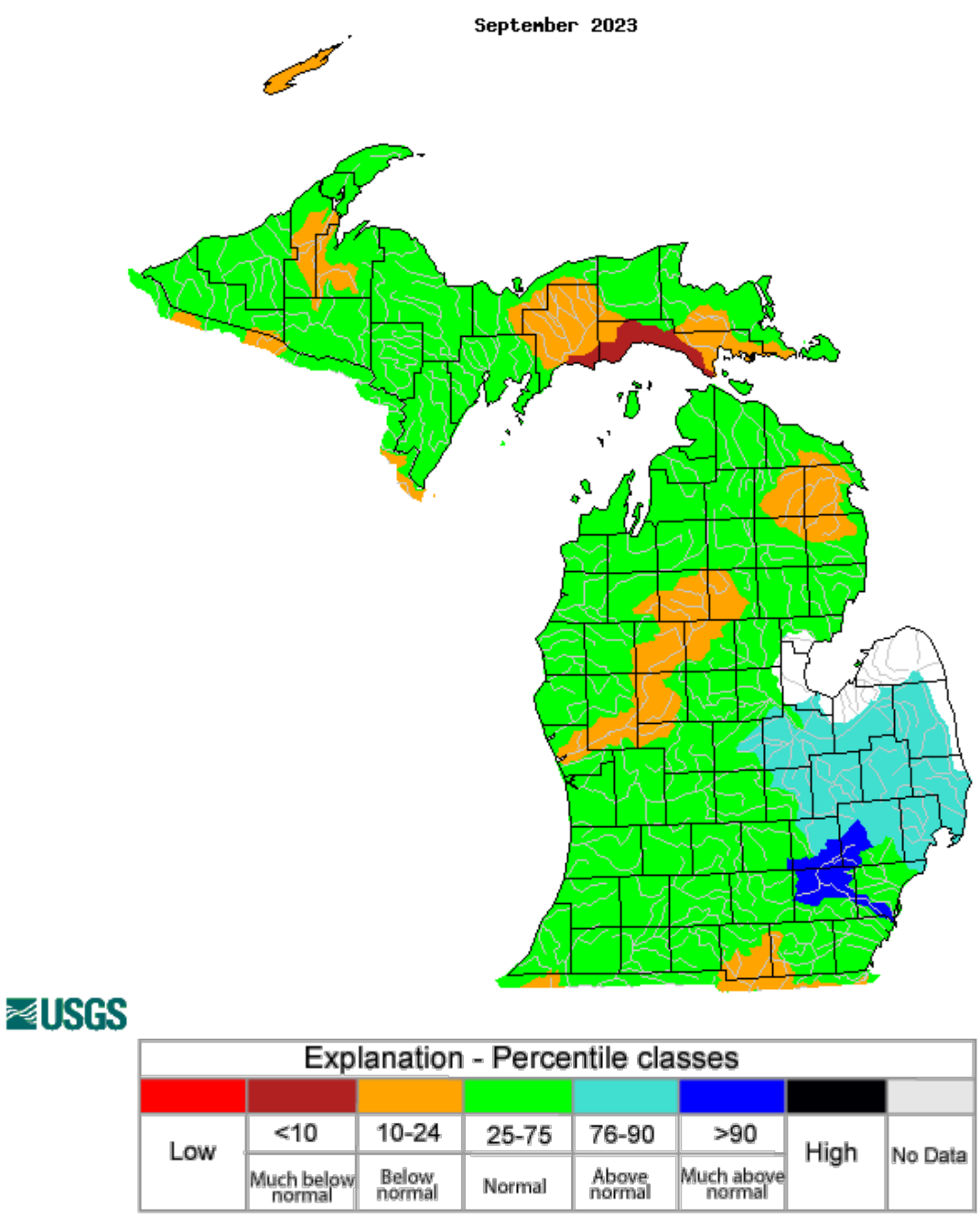

Figure 3. USGS monthly streamflow for September, grouped by significant hydrologic units. Note streamflows for the Grand River watershed are much above normal for this time of year. Much of northern lower Michigan remains around normal. Several basins through central and eastern Michigan are much above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

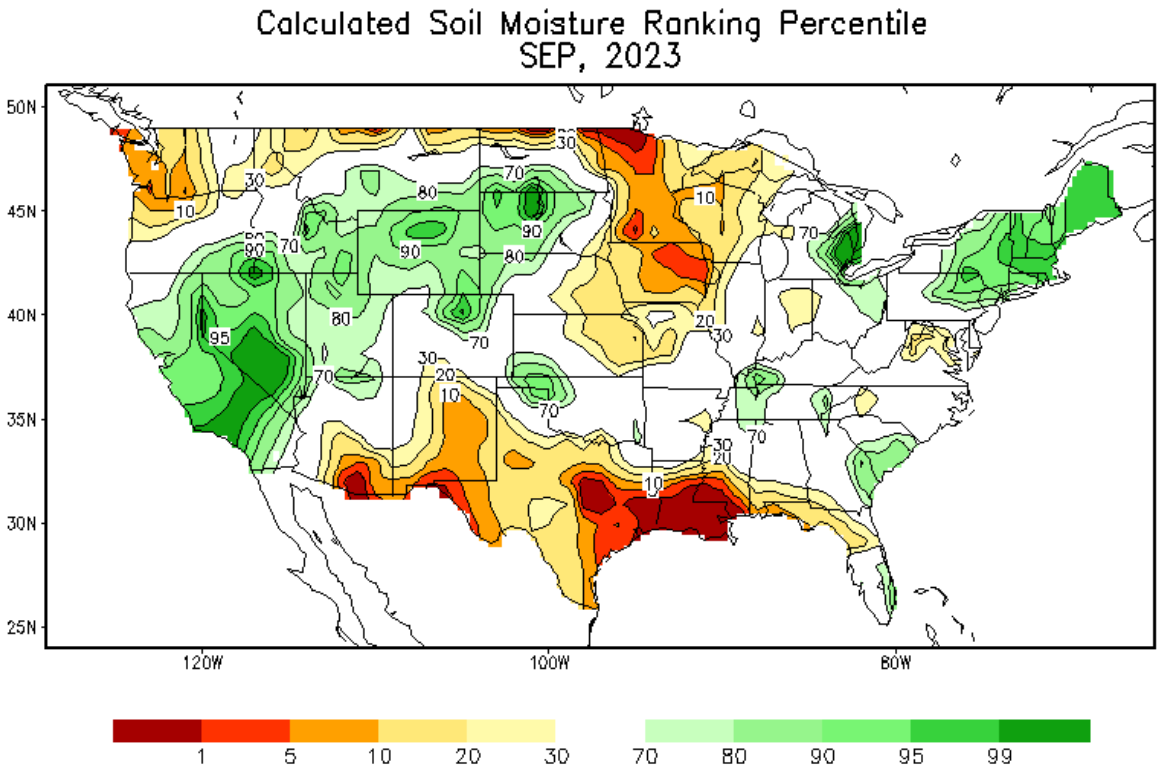

Figure 4.Calculated Soil Moisture Percentile for September, 2023. This supports conditions becoming more normal through much of lower Michigan.

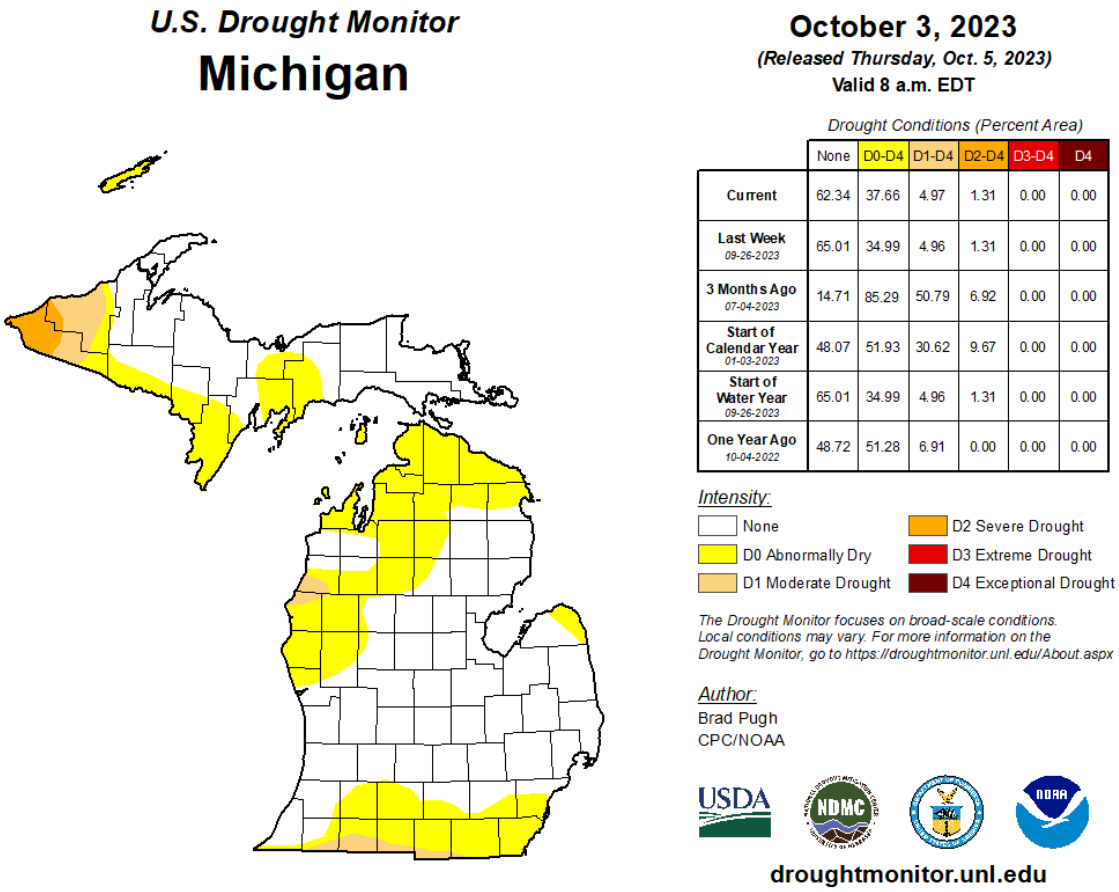

Figure 5.U.S. Drought Monitor showing severe drought through northern lower Michigan and a reduction in the drought through southern lower Michigan.

Hydrologic Products issued this month

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

News Articles and Related Documentation

https://www.mlive.com/news/kalamazoo/2023/09/flood-warning-issued-for-kalamazoo-county.html