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): **February 2021**
TO:	NATIONAL WEATHER SERVICE (W/OS31) HYDROMETEOROLOGICAL INFO CENTER 1325 EAST-WEST HIGHWAY, RM 13468 SILVER SPRING, MD 20910	DATE: March 15, 2021
		SIGNATURE: Daniel K. Cobb, 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).

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

Summary

February 2021 started with near-normal temperatures and continued dry conditions. By the start of the 2nd week of the month, a significant blast of arctic air had moved into the Great Lakes, bringing much colder than normal temperatures and widespread snow and lake-effect snow. The cold snap lasted about 2 weeks, before temperatures warmed to above-average for the end of the month and the snowpack began to melt. Ironically, despite having nearly twice as much snowfall during the month compared to normal, precipitation was near or slightly below-average at most locations. Obviously the precipitation that did fall fell primarily as snow. Despite the snowy month, seasonal snow totals were still well below average. The cold snap did cause nearly all of the rivers in the area to freeze over, however no freezeup ice jams or flooding occurred.

Continued fairly dry conditions allowed Lake Michigan to continue its seasonal decline. By the end of the month, water levels were nearly 2 feet lower than they were last summer during the annual high-water mark, and were now significantly lower than 1 year ago (in February 2020). Nevertheless, water levels remain significantly higher than the long-term average levels.

Flood Conditions

With the month being very cold, no significant snowmelt showed up in any of the rivers until the final days of the month. This allowed our 3 big river systems to all spend the vast majority of the month below long-term average levels - generally between the 25th and 50th percentile for February. If not for the years of wet weather leading up to this

winter, the rivers would be even lower, but the baseflow is elevated due to the higher groundwater tables discharging into the streams.

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

Location	River	% of Normal
Scottville	Pere Marquette	101
Whitehall	White	92
Evart	Muskegon	88
Mt. Pleasant	Chippewa	84
Lansing	Grand	164
Grand Rapids	Grand	107
East Lansing	Red Cedar	208
Hastings	Thornapple	141
Battle Creek	Battle Creek	135
Battle Creek	Kalamazoo	102

General Hydrologic Information

February precipitation amounts for Grand Rapids, Lansing, and Muskegon, Michigan, were 1.84, 1.30, and 1.61 inches, respectively (Figure 1). Monthly departures were +0.05, -0.17, and -0.22 inches, respectively. Yearly departures were -0.67, -0.26 and -0.60 inches for Grand Rapids, Lansing and Muskegon respectively. Percent of mean precipitation for February 2021 is shown in Figure 2.

Temperatures for the month of February at Grand Rapids, Lansing and Muskegon were well below normal. The monthly average temperature departures for these sites were -6.0, -5.3, and -5.3 degrees Fahrenheit, respectively.

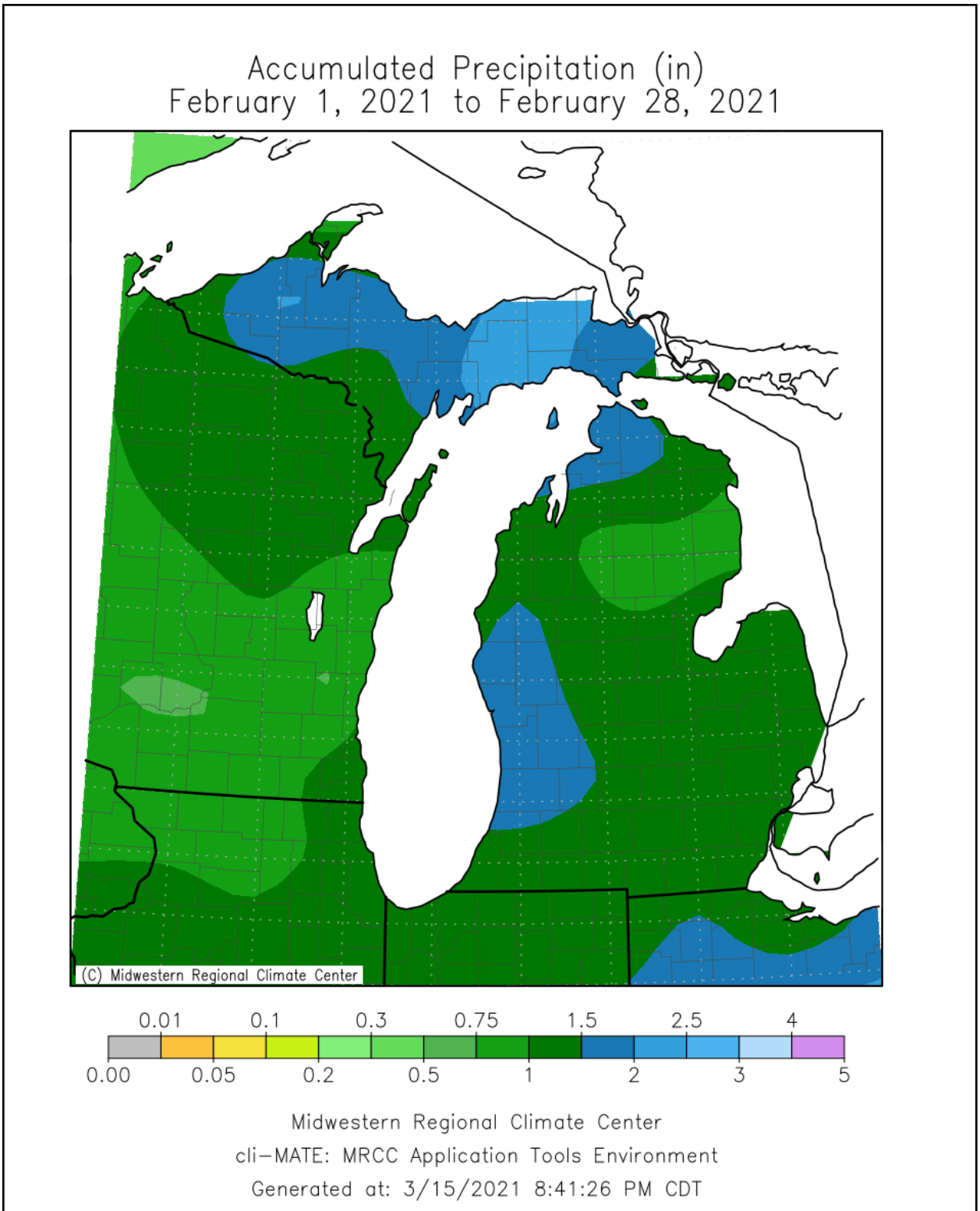

Figure 1. February 2021 Monthly Precipitation Totals.

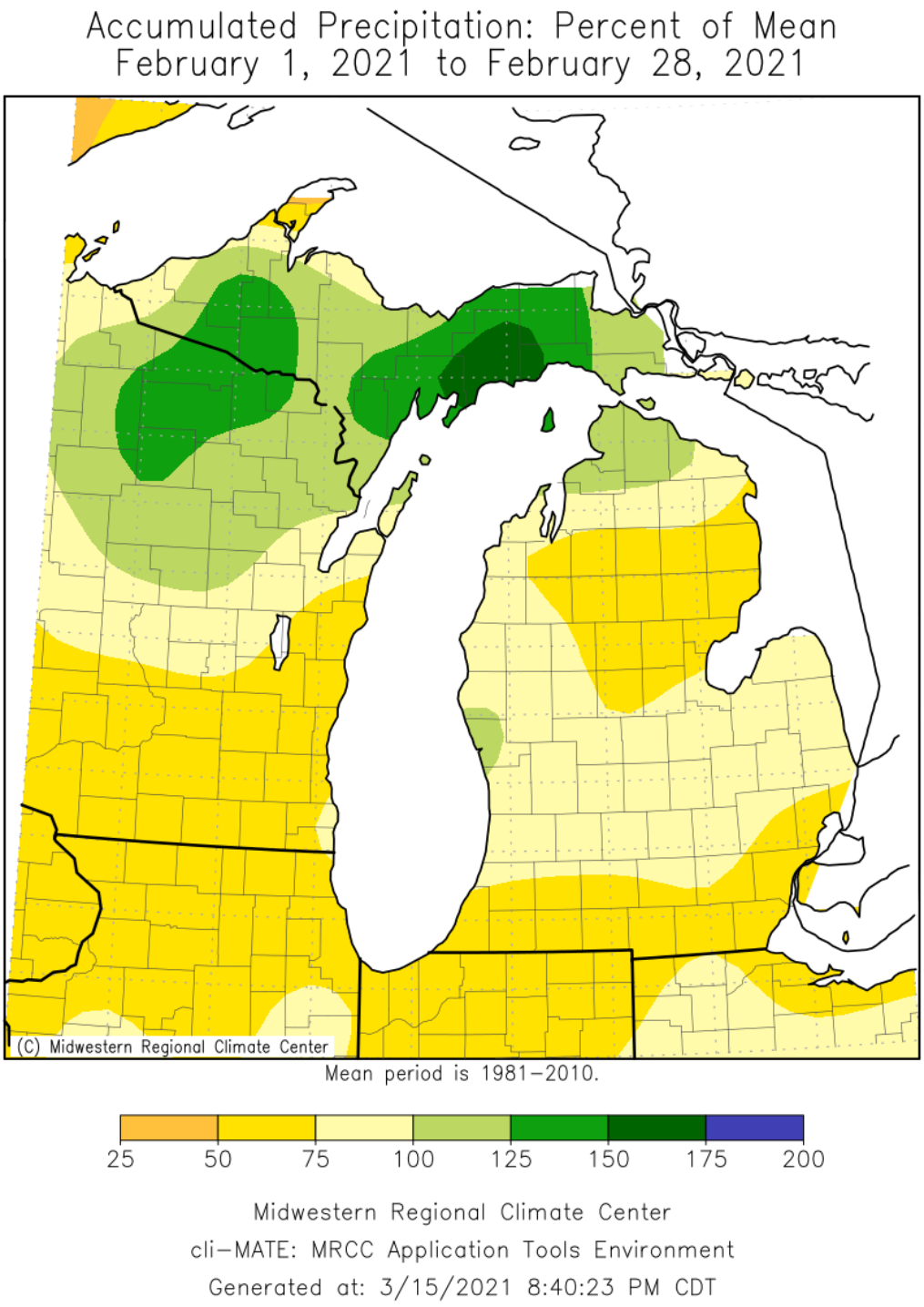

Figure 2. February 2021 Percent of Mean of Accumulated Precipitation.

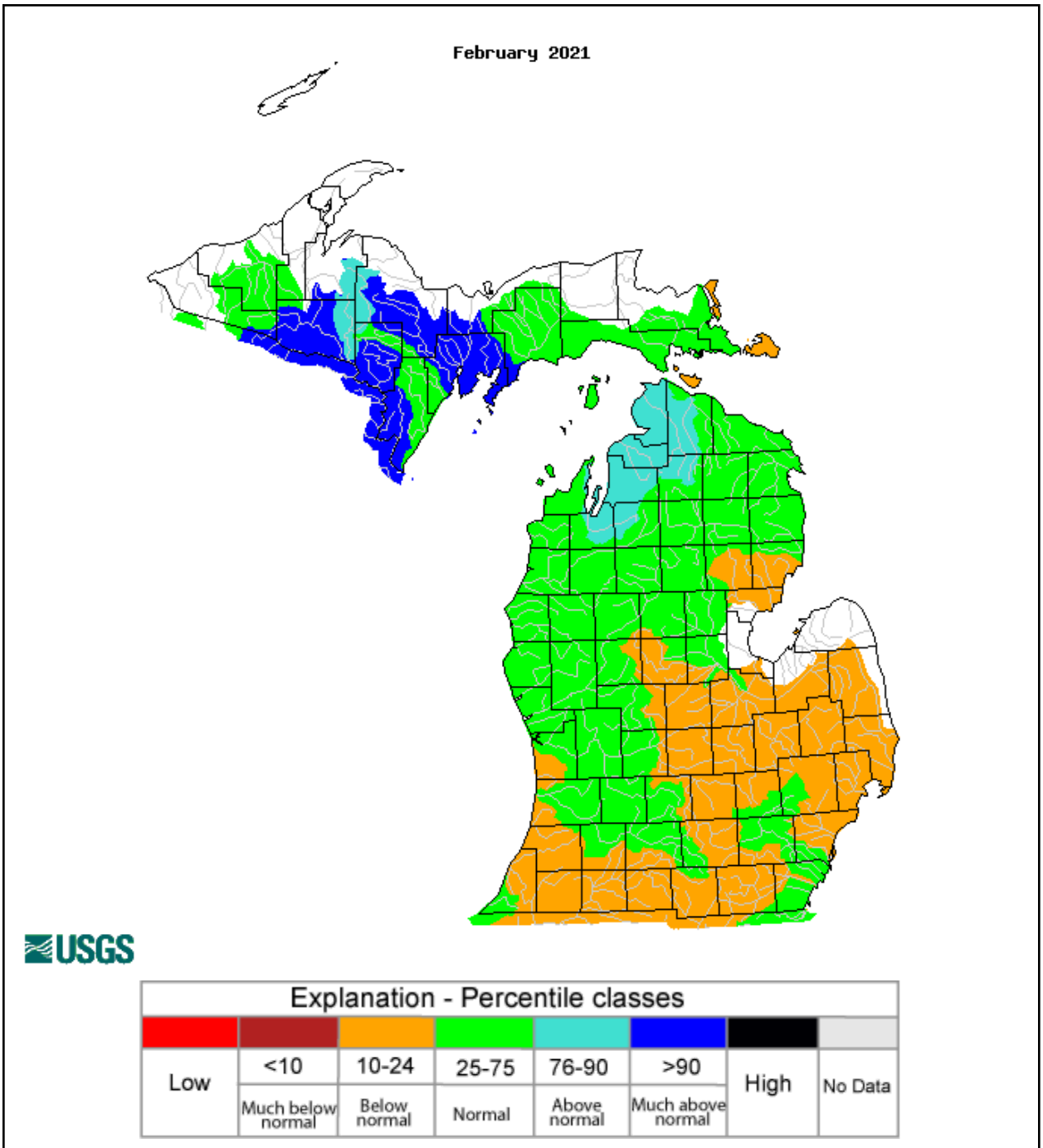

Figure 3. USGS monthly average streamflow for February, grouped by significant hydrologic units. Note streamflows across Lower Michigan generally below-average, owing to several months of relatively dry conditions and the fact that February was very cold with all very little melting happening.

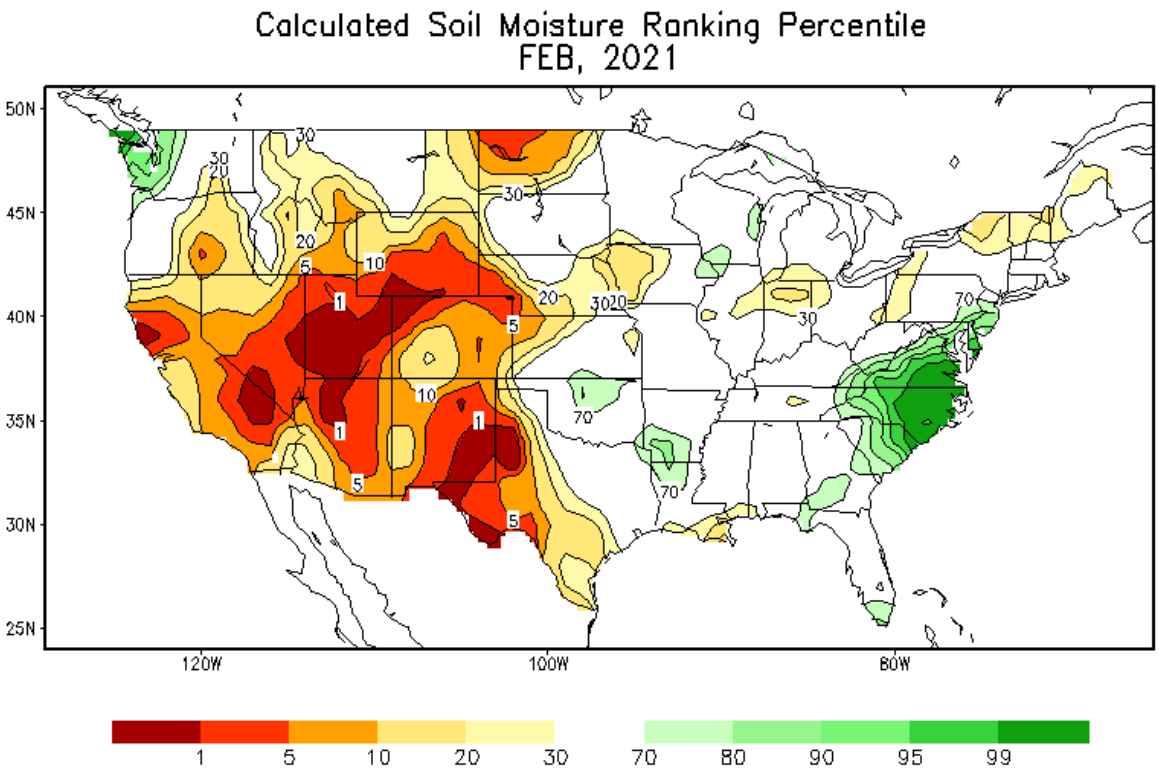

Figure 4. Chart of monthly values of soil moisture, by percentile ranking.

Hydrologic Products issued this month

28 Hydrologic Summaries (ARBRVAGRR)
2 Probabilistic Hydrologic Outlook (ARBESFGRR)
0 Event-driven Hydrologic Outlook (ARBESFGRR)
0 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