NWS FORM E-5 **U.S. DEPARTMENT OF COMMERCE**
NOAA, NATIONAL WEATHER SERVICE

HSA OFFICE:
Grand Rapids, MI

REPORT FOR (MONTH &YEAR):
October 2019

MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS

DATE:
November 15, 2019

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

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).

☐ An **X** inside this box indicates that no significant flooding occurred within this Hydrologic Service Area.

Summary

October 2019 was consistently wetter than normal throughout the month and throughout the entire forecast area. The most significant rainmakers of the month occurred on Oct 1-3, the 11th, the 26th, and the 30th. By far the most impactful was the storm that started the month, with as much as 5 inches of rain falling overnight across a large portion of the Muskegon River basin. This resulted in areal as well as river flooding across portions of the area. The areal flooding was handled with areal flood advisories, but 8 river flood warnings were required, mainly across the Muskegon River and Grand River watersheds. All flooding was minor in nature (no points reached moderate flood stage). Overall, Grand Rapids, Lansing, and Muskegon each had the 2nd wettest September-October (combined monthly precip) on record.

Meanwhile, Lake Michigan levels held mostly steady throughout the month, instead of dropping like they typically would this time of year. This led to continued vulnerability to lakeshore flooding and erosion. Large storms with heavy winds/waves/surge on the 16th and again on the 22nd led to significant and widespread erosion of the lakeshore dunes/bluffs, and produced significant and unusual flooding along the lakeshore as well as slightly inland at the river mouth lakes.

Flood Conditions

The mainstem (larger) rivers spent most of the month above the 90th percentile, with virtually all of the mainstem points exceeding the previous monthly historical high water levels during at least one point during the month. The Kalamazoo River made the most progress recovering to near-normal levels for this time of year, and approached the median/50th percentile flow by the 3rd week of the month before again climbing to near the 90th percentile. 8 forecast points exceeded flood stage during the month.

Flood Stage Report

Flood stage was exceeded at the forecast points along the Muskegon River at Croton, Muskegon River at Newaygo, Muskegon River at Bridgeton, White River at Whitehall, Maple River at Maple Rapids, Rogue River near Rockford, Grand River at Comstock Park, and Grand River at Robinson Township. Thus, the NWS Form E-3 “Flood Stage Report” was issued.

River Conditions

The end of October percentage of normal flow for selected rivers is listed below:

Location	River	% of Normal
Scottville	Pere Marquette	242
Whitehall	White	226
Evart	Muskegon	247
Mt. Pleasant	Chippewa	372
Lansing	Grand	530
Grand Rapids	Grand	505
East Lansing	Red Cedar	773
Hastings	Thornapple	656
Battle Creek	Battle Creek	438
Battle Creek	Kalamazoo	304

General Hydrologic Information

October precipitation amounts for Grand Rapids, Lansing, and Muskegon, Michigan, were 7.13, 7.23, and 7.84 inches, respectively (Figure 1). Monthly departures were +3.87, +4.70, and +4.73 inches, respectively. Yearly departures were +12.45, +7.80 and +13.24 inches for Grand Rapids, Lansing and Muskegon respectively. Percent of mean precipitation for October 2019 is shown in Figure 2.

Temperatures for the month of October were near-normal at Grand Rapids, Lansing and Muskegon. The monthly average temperature departures for these sites were -0.8, +0.1, and -0.7 degrees Fahrenheit, respectively.

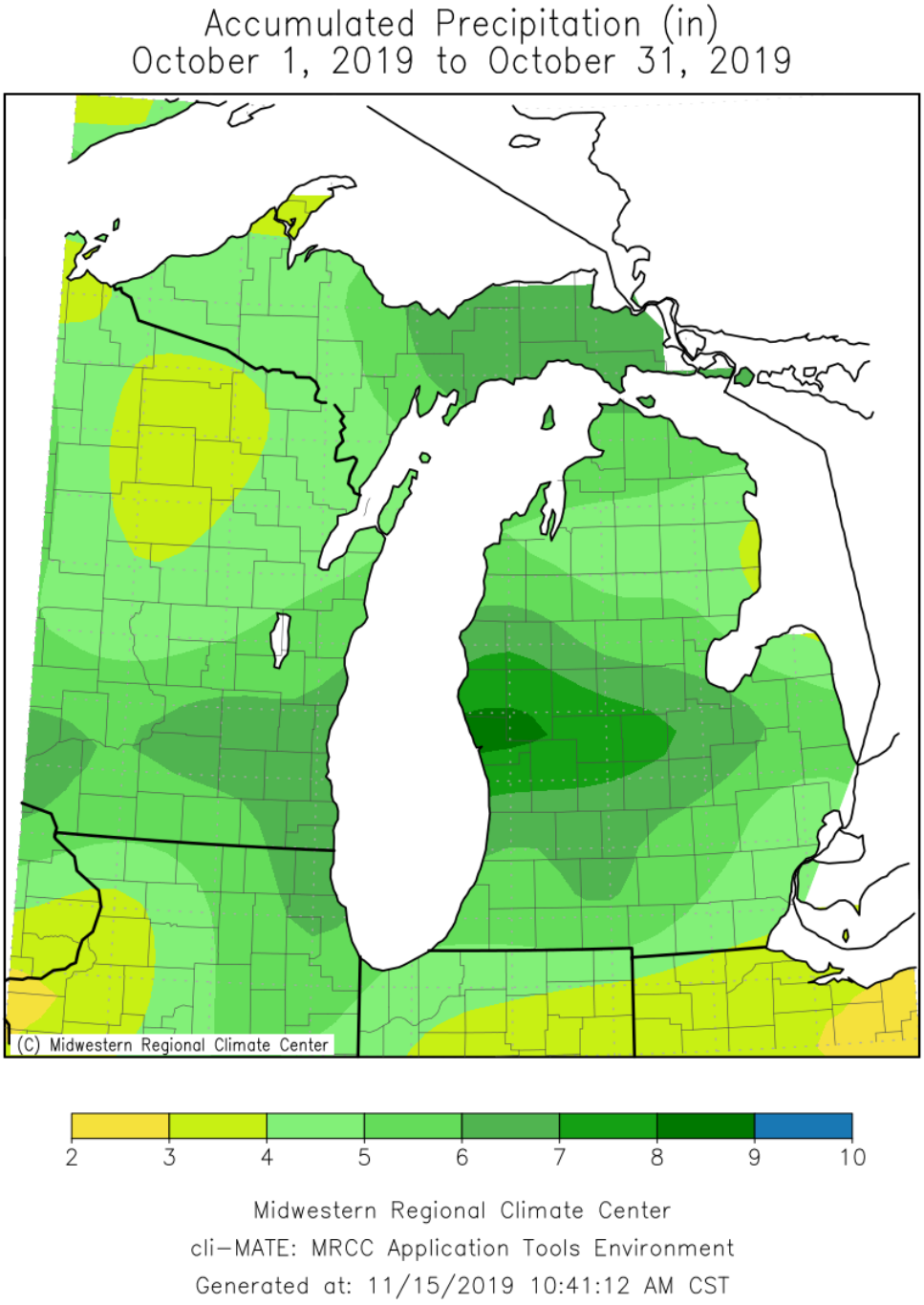


Figure 1. October 2019 Monthly Precipitation Totals.

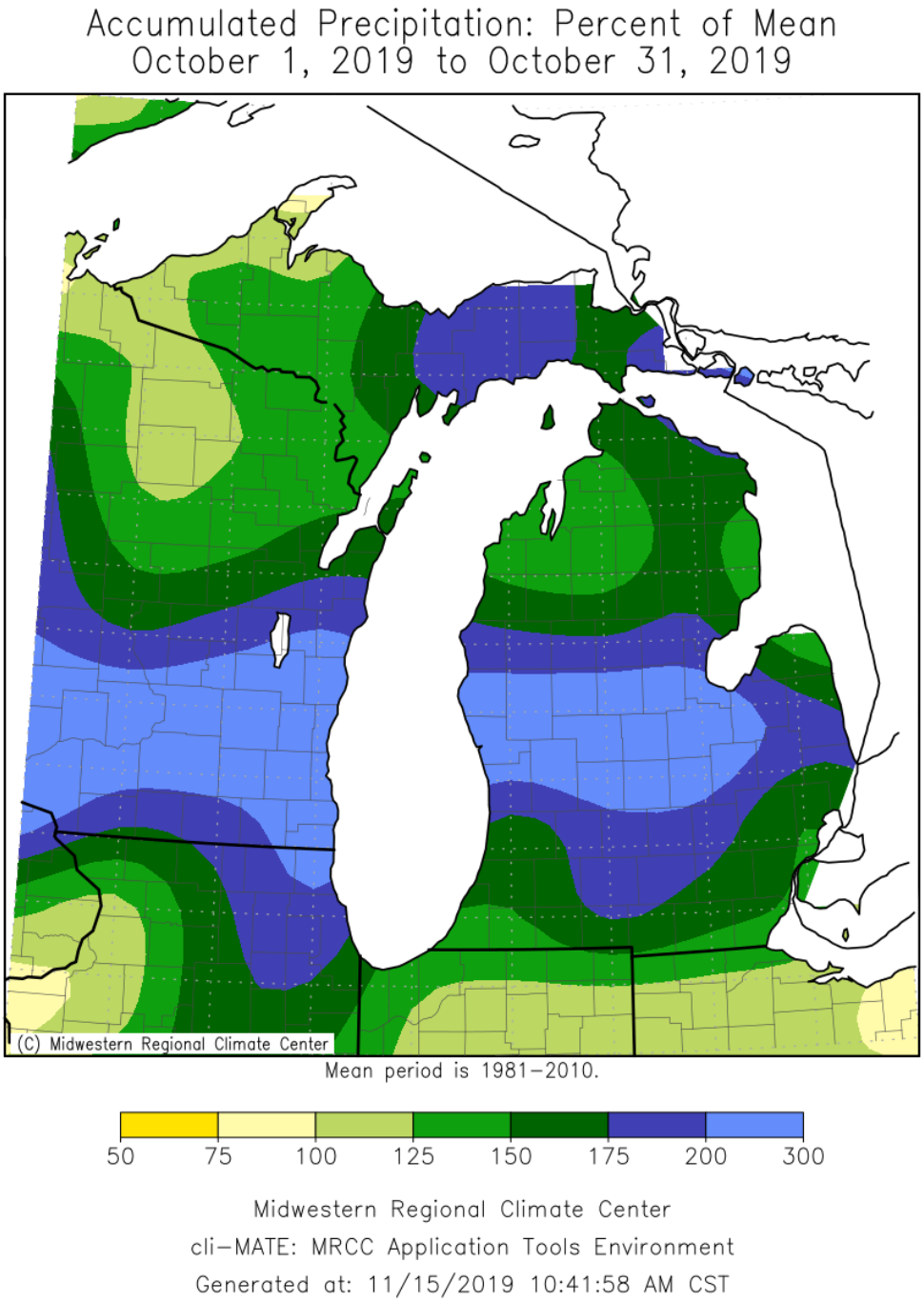
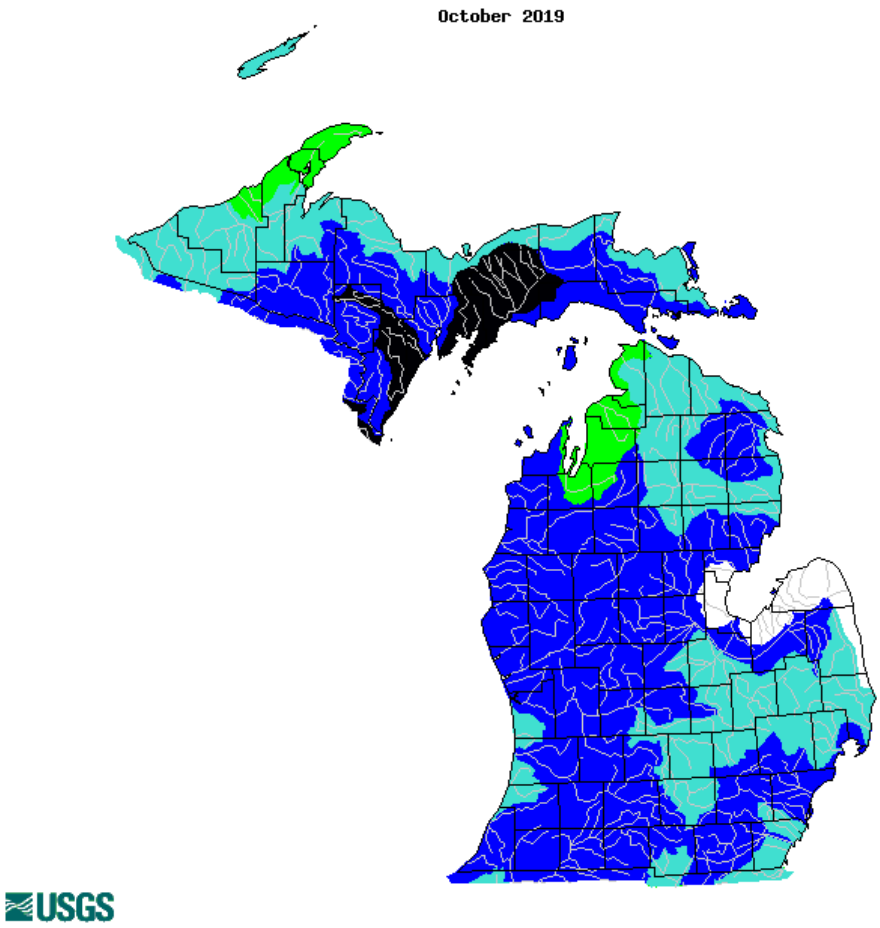


Figure 2. October 2019 Percent of Mean of Accumulated Precipitation. October was a continuation of much higher-than-normal monthly precipitation across West Michigan.



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 average streamflow for October, grouped by significant hydrologic units. Note streamflows across Lower Michigan widespread higher than the 90th percentile for the month.

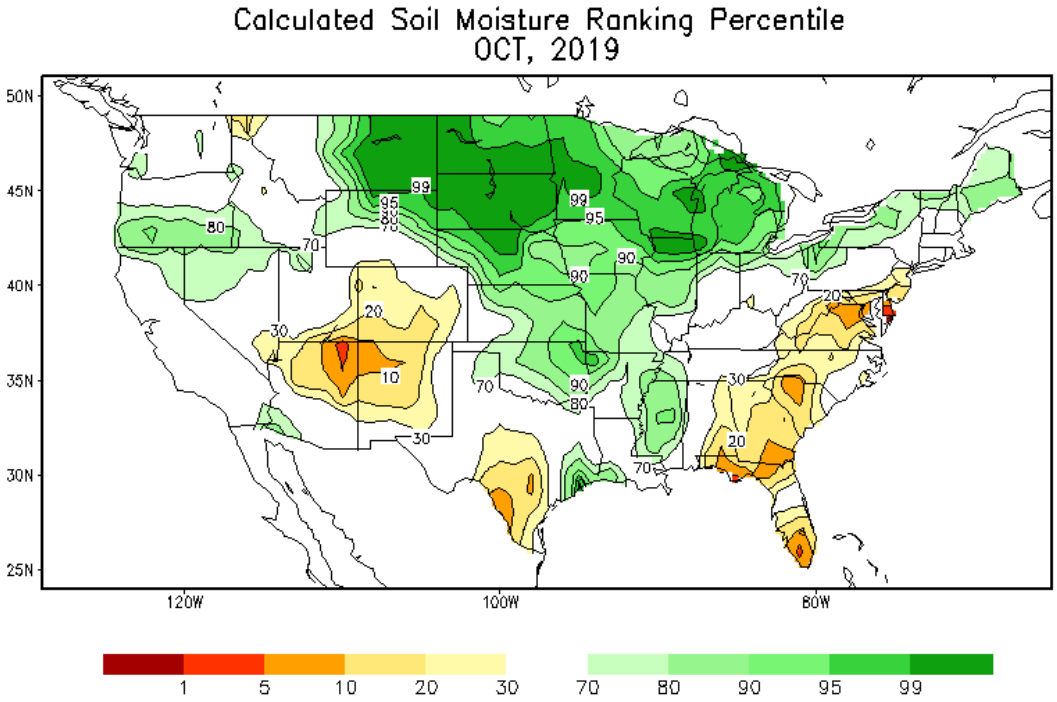


Figure 4. Chart of monthly values of soil moisture, by percentile ranking. This is the 13th consecutive month West Michigan has been at or above the 80th percentile. This saturated ground leads to increased runoff efficiency of rainfall into rivers and streams.

Hydrologic Products issued this month:

31 Hydrologic Summaries (ARBRVAGRR)
1 Probabilistic Hydrologic Outlook (ARBESFGRR)
3 Event-driven Hydrologic Outlook (ARBESFGRR)
26 Daily River Forecasts (ARBRVDGRR)
22 Areal Flood Advisory Statements (ARBFLSGRR)
7 Flood Warning Statements (ARBFLWGRR)
7 Flood Watch Statements (ARBFFAGRR)
32 River Statements (ARBRVSGRR)

News Articles and Related Documentation

https://www.mlive.com/news/muskegon/2019/10/flood-warning-along-muskegon-river.html

https://fox17online.com/2019/10/02/newaygo-county-dealing-with-river-flooding/

https://www.wzzm13.com/article/traffic/us-31-over-muskegon-river-closed/69-96884a15-ad8e-47d7-908a-8f6bf0239295

https://wwmt.com/news/local/large-waves-crash-over-piers-and-flood-west-michigan-beaches

October 16, 2019 and October 22, 2019 Lakeshore flooding and erosion event page