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

MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS

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

HSA OFFICE:
Grand Rapids, MI

REPORT FOR (MONTH &YEAR):
November 2019

DATE:
December 13, 2019

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

November 2019 came in a bit drier than normal across most of the area, which represented a much-needed break from the incredibly wet conditions experienced over the last several months. The month was also significantly colder than normal, which meant that some of this precipitation fell as snow. The first of two significant storms during the month occurred on the 11th and 12th, and dropped nearly a foot of snow on some parts of the Kalamazoo River basin, with more than 2 feet falling along the lakeshore (lake-effect snow developed as the main storm was departing). See figure 5 for snow totals from this storm. The second storm occurred on November 27th, and dropped more than an inch of rain across much of the Grand and Muskegon River Basins. Overall, the rivers made slight progress moving toward more normal levels during the month, but remained much higher than normal for this time of year.

Lake Michigan water levels continued a slower seasonal decline than normal, owing to all of the precipitation over the last few months continuing to move through the system and into Lake Michigan. Several small lakeshore flood events happened during the month, but the most significant of the season so far occurred during the November 27th storm, which featured 65+ mph winds and 15 ft waves along the lakeshore, leading to the most widespread and significant flooding along the lakeshore of the year so far, as well as the ongoing erosion concerns.

Flood Conditions

The Maple River started the month above flood stage, in response to the heavy October rains, and crested on Nov 2 about 3 inches above flood stage before beginning a very gradual drop. The Grand River threatened to overflow in Comstock Park and Robinson Township in response to this same heavy rain, but stayed near bankfull before beginning to fall. Another complicating factor at Robinson Township is the proximity to Lake Michigan, which now periodically creates backwater on the Grand River at Robinson Township during certain strong storm events. Overall, the mainstem rivers all spent the majority of the month above the 90th percentile flow for this time of year. As with previous months, many rivers reached near-bankfull at least once, if not twice, as the heavy precipitation events were spaced out just enough to avoid any significant flooding. Nevertheless, it is worth noting that many reports from local officials, employees, and the general public all paint a picture of huge areas of standing water and saturated ground around West Michigan,

particular across the Muskegon River, White River, and Pere Marquette River basins. This water will likely help maintain elevated streamflows throughout the winter, even if precipitation totals trend back closer to normal.

Flood Stage Report

Flood stage was exceeded at the forecast points along the Maple River at Maple Rapids and the Grand River at Robinson Township. Thus, the NWS Form E-3 "Flood Stage Report" was issued.

River Conditions

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

Location	River	% of Normal
Scottville	Pere Marquette	221
Whitehall	White	198
Evart	Muskegon	225
Mt. Pleasant	Chippewa	280
Lansing	Grand	254
Grand Rapids	Grand	348
East Lansing	Red Cedar	440
Hastings	Thornapple	328
Battle Creek	Battle Creek	234
Battle Creek	Kalamazoo	156

General Hydrologic Information

November precipitation amounts for Grand Rapids, Lansing, and Muskegon, Michigan, were 2.62, 1.85, and 3.34 inches, respectively (Figure 1). Monthly departures were -0.89, -0.93, and -0.02 inches, respectively. Yearly departures were +11.56, +6.87 and +13.22 inches for Grand Rapids, Lansing and Muskegon respectively. Percent of mean precipitation for November 2019 is shown in Figure 2.

Temperatures for the month of November were significantly colder than normal at Grand Rapids, Lansing and Muskegon. The monthly average temperature departures for these sites were -5.5, -6.1, and -4.3 degrees Fahrenheit, respectively.

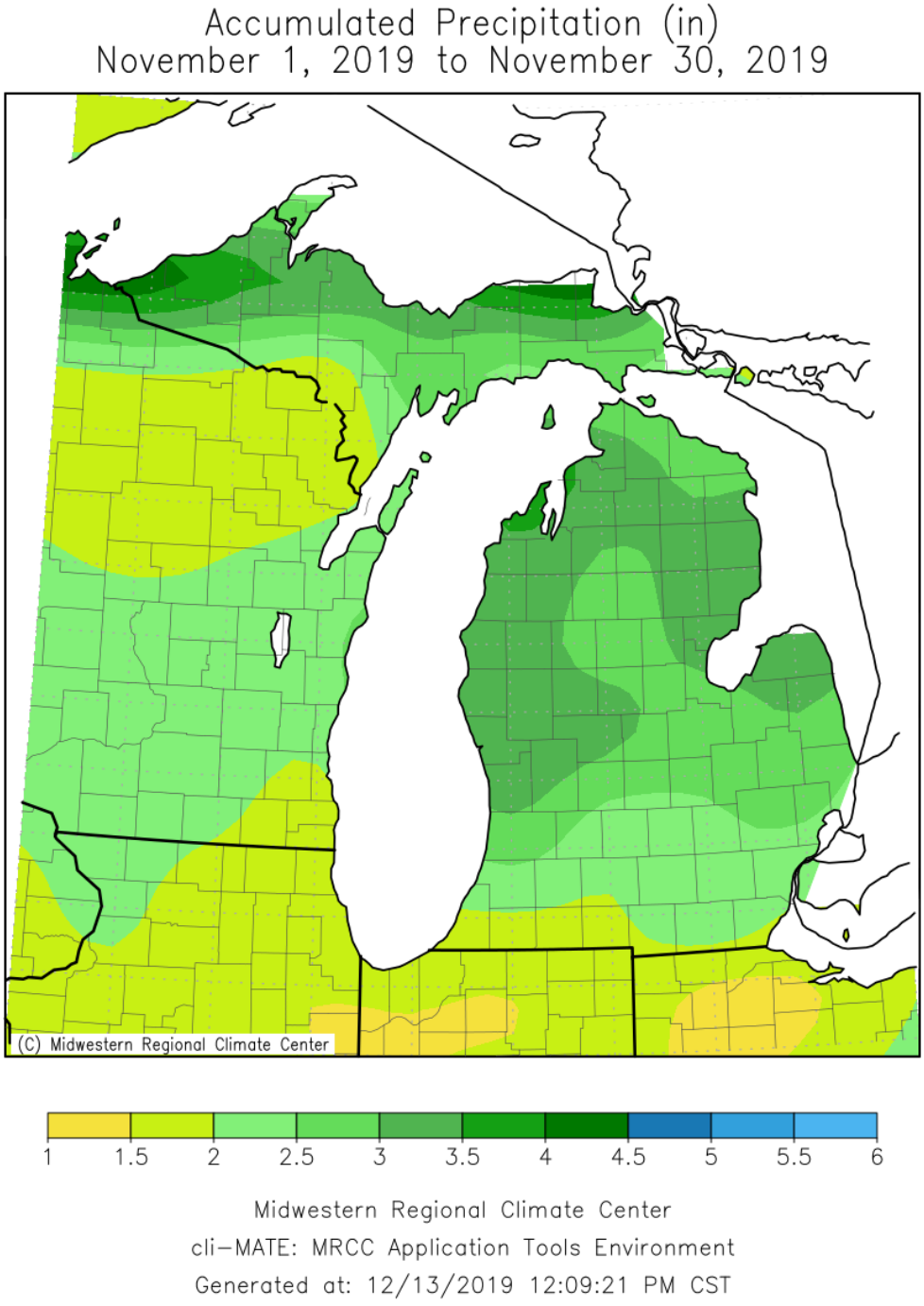


Figure 1. November 2019 Monthly Precipitation Totals.

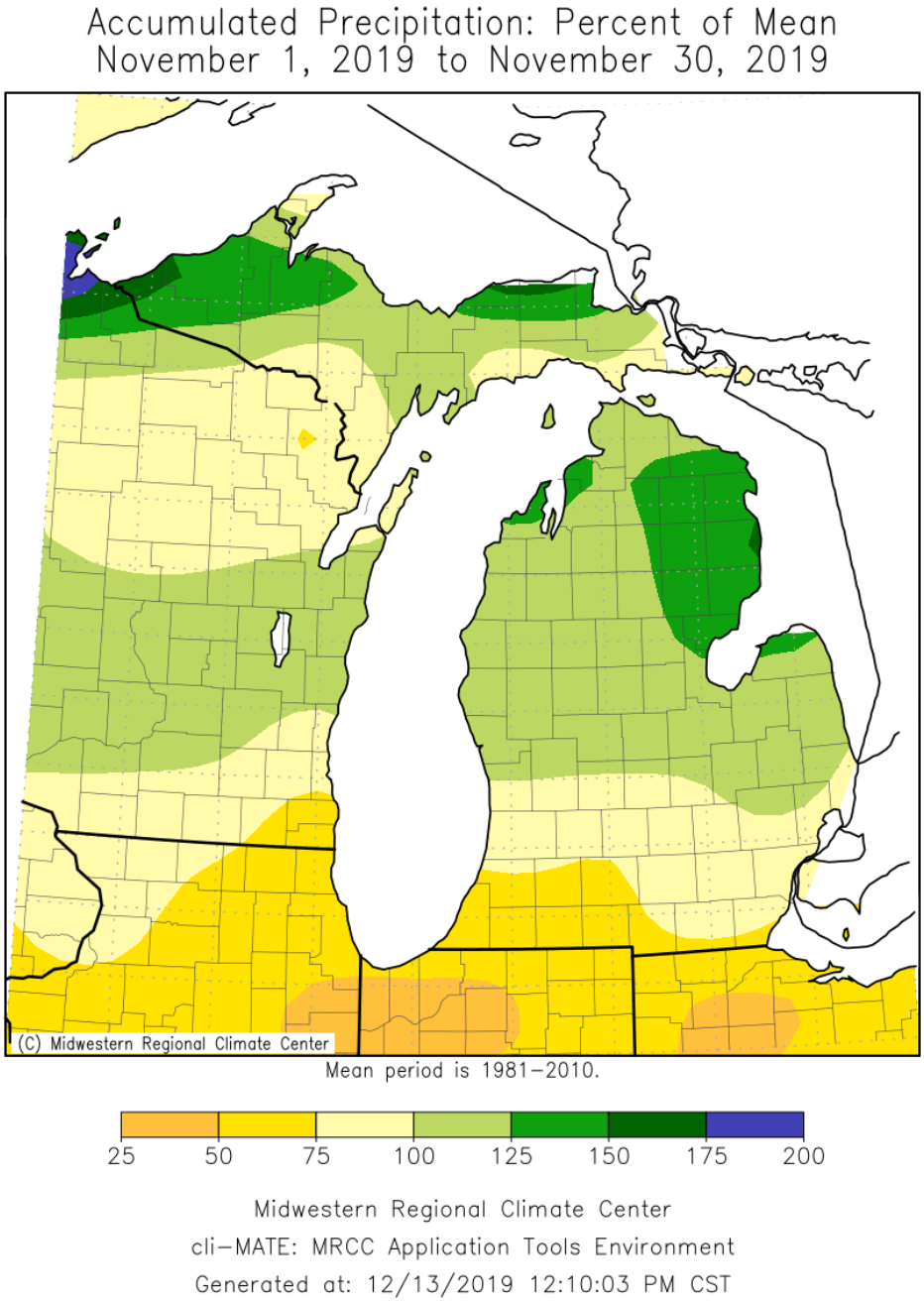
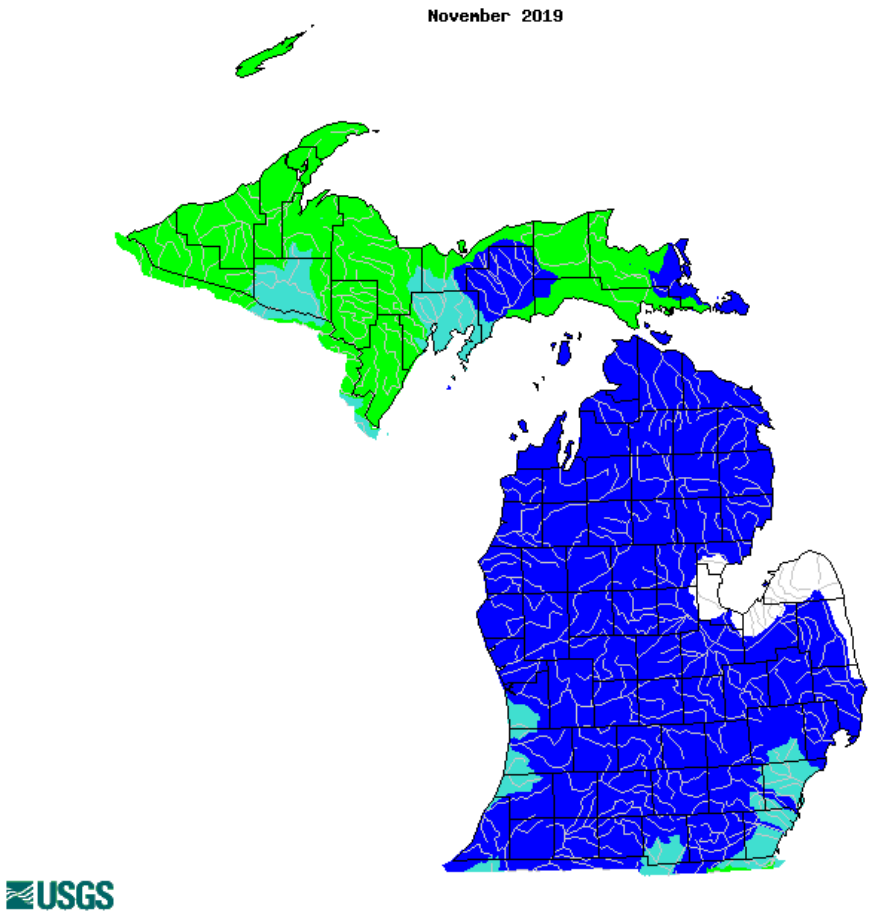


Figure 2. November 2019 Percent of Mean of Accumulated Precipitation. November was a much-needed break in the significantly above-average precipitation of recent months across West Michigan.



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

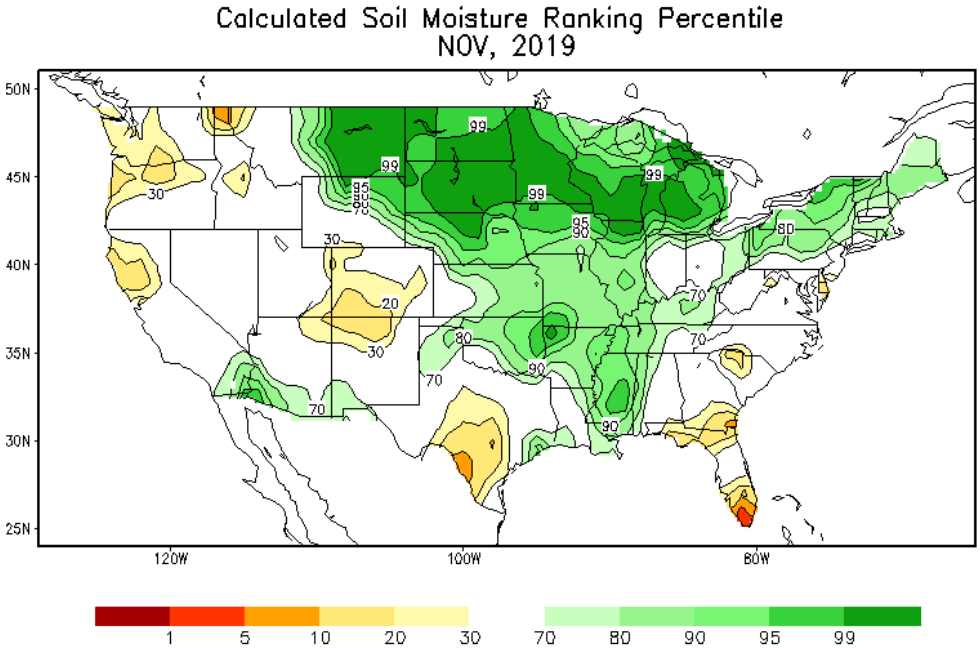


Figure 4. Chart of monthly values of soil moisture, by percentile ranking. This is the 14th consecutive month West Michigan has been at or above the 80th percentile. This saturated ground leads to increased runoff efficiency of rainfall into rivers and streams.

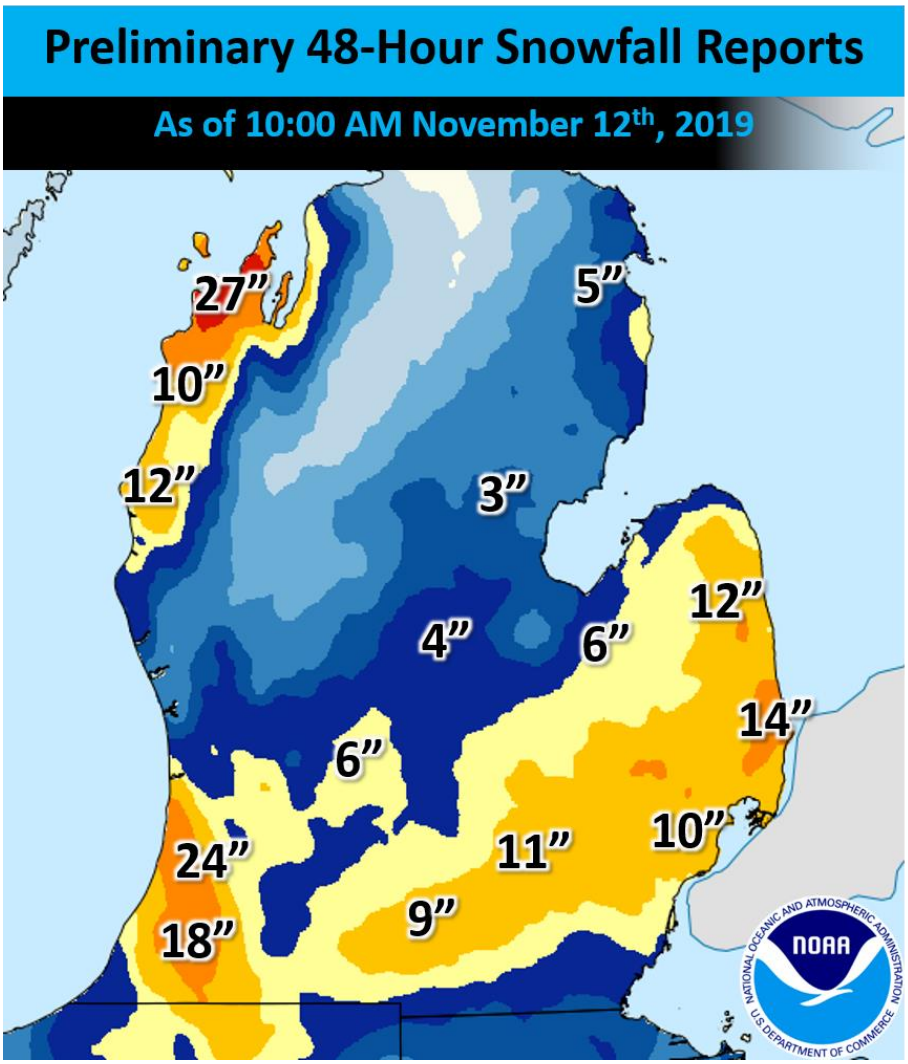


Figure 5. Preliminary snow totals from the Nov 11-12 early winter storm.

Hydrologic Products issued this month:

30 Hydrologic Summaries (ARBRVAGRR)
1 Probabilistic Hydrologic Outlook (ARBESFGRR)
0 Event-driven Hydrologic Outlook (ARBESFGRR)
23 Daily River Forecasts (ARBRVDGRR)
5 Areal Flood Advisory Statements (ARBFLSGRR)
0 Flood Warning Statements (ARBFLWGRR)
2 Flood Watch Statements (ARBFFAGRR)
36 River Statements (ARBRVSGRR)

News Articles and Related Documentation

https://wwmt.com/news/local/lake-michigan-water-levels-expected-to-break-records-in-latest-forecast

https://www.mlive.com/news/g66l-2019/11/9b84d7d22b7496/high-winds-batter-lake-michigan-shoreline-result-in-flooding-and-power-outages.html

https://wwmt.com/weather/severe-weather-center/high-waves-along-the-lakeshore-prompt-erosion-and-flooding-concerns-once-again

https://www.wzzm13.com/article/news/local/lakeshore/nws-warns-lakeshore-homeowners/69-68e33e91-4c9b-44d7-9d80-2a17f68d6f7d