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 2018

DATE:
December 15, 2018

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 significant flooding occurred within this Hydrologic Service Area.

Summary

November 2018 overall was significantly cooler than normal across Southwest Michigan, with below-normal precipitation but above-average snowfall. Climo temperatures are dropping rapidly this time of year (daily average temperatures fall from the mid 40s to the mid 30s during the month) so even though 80% of the days in the month were below normal, conditions were still warm enough for rain during the start of the month. A regional rainstorm came through the area on November 5 and 6, producing upwards of an inch of rain at many locations. This caused water levels on rivers to rise, with a few of the small and medium-sized streams near bankfull, but no flooding occurred.

By the 10th of the month, a cold northwest flow weather pattern was generally established, allowing most additional precipitation during the month to fall as snow. Three regional snowfall episodes occurred on the 10th, 15th, and 26th, though daytime high temperatures in the upper 30s allowed most or all of the snowpack to melt off between the snow events.

Flood Conditions

Moderate but widespread rainfall in the final few days of October start the rivers rising again, which continued through the first week of November. By November 7th, many of the medium and larger-sized rivers in the area were near the 90th percentile flow for this time of year. Thankfully, the long-term averages are still fairly low in November, which is how 90th percentile flow was possible without any flooding. As temperatures overall cooled off even more dramatically for the final 3 weeks of the month, the rivers responded with a very gradual fall in the water levels. This very slow drop despite below-average precipitation across the area is due largely to the relatively slow snowmelt runoff process acting like a time-release capsule, as well as the continued high soil moisture for this time of year from the very wet fall season. By the end of the month, even though the actual amount of water flowing through the rivers had not dropped significantly, the long-term averages had steadily increased (as they do all winter). Because of this, while the area as a whole started the month in the 75th to 90th percentile flows, by the end of the month the percentile flows had dropped generally to the 50th to 75th percentile flows.

Flood Stage Report

No forecast points exceeded flood stage during the month. Thus, no 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	91
Whitehall	White	93
Evart	Muskegon	99
Mt. Pleasant	Chippewa	128
Lansing	Grand	113
Grand Rapids	Grand	153
East Lansing	Red Cedar	142
Hastings	Thornapple	151
Battle Creek	Battle Creek	130
Battle Creek	Kalamazoo	105

General Hydrologic Information

The month of November featured below normal precipitation across most of the HSA, with only the upper sections of the Kalamazoo and Grand River basins near or slightly above normal. However, since a significant portion of the precipitation that did occur fell as snow, monthly snowfall totals were actually much higher than normal (200-300% of normal).

November precipitation amounts for Grand Rapids, Lansing, and Muskegon, Michigan, were 2.73, 2.07, and 2.74 inches, respectively (Figure 1). Monthly departures were -0.78, -0.71 and -0.62 inches, respectively. Yearly departures were +6.69, +5.42, and +9.10 inches for Grand Rapids, Lansing and Muskegon respectively. Percent of mean precipitation for November 2018 is shown in Figure 2.

Temperatures for the month of November were well below normal at Grand Rapids, Lansing and Muskegon. The average monthly temperature departures for these sites were -5.5, -6.0 and -4.7 degrees Fahrenheit, respectively.

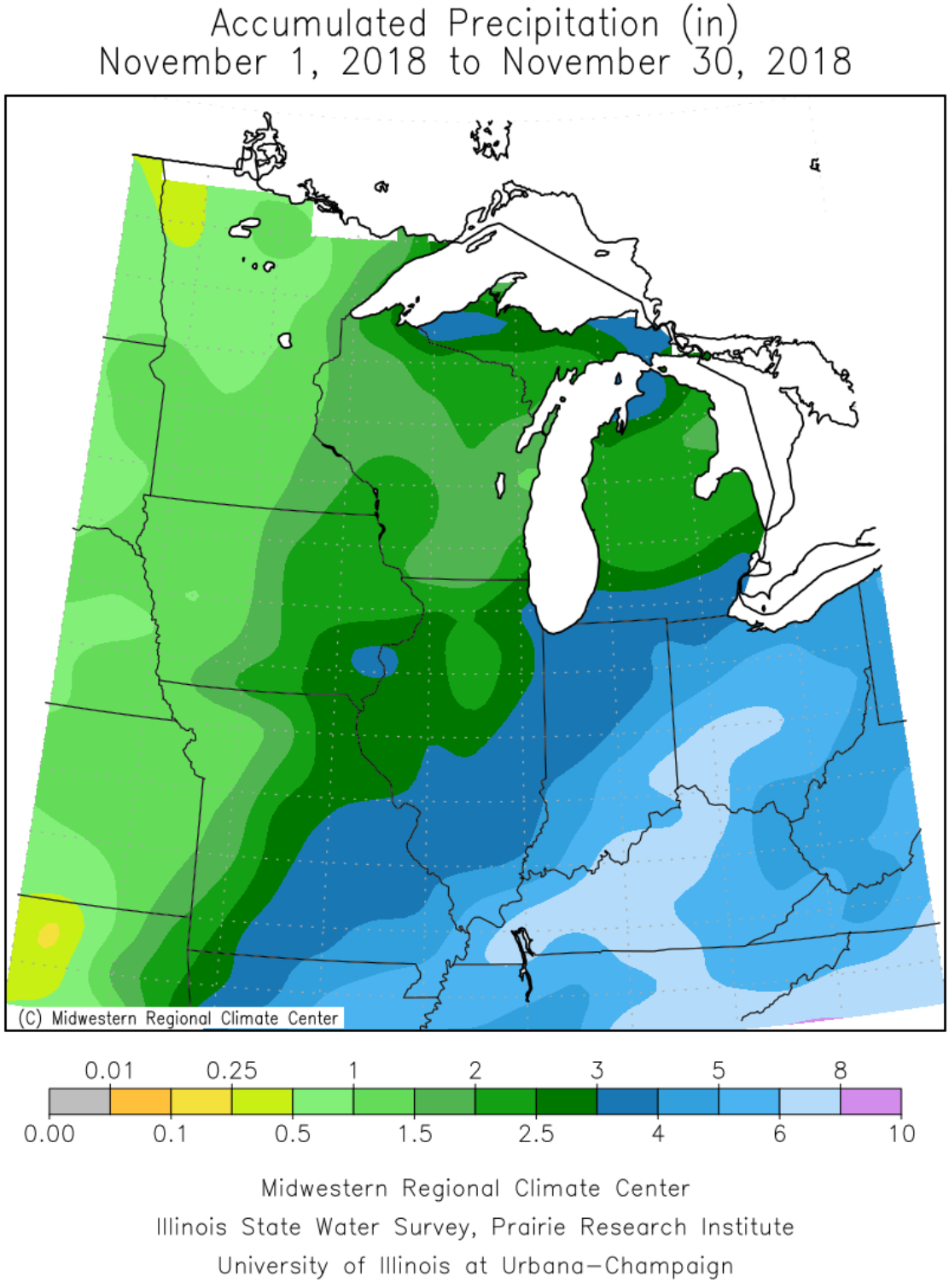


Figure 1. November 2018 Monthly Precipitation Totals

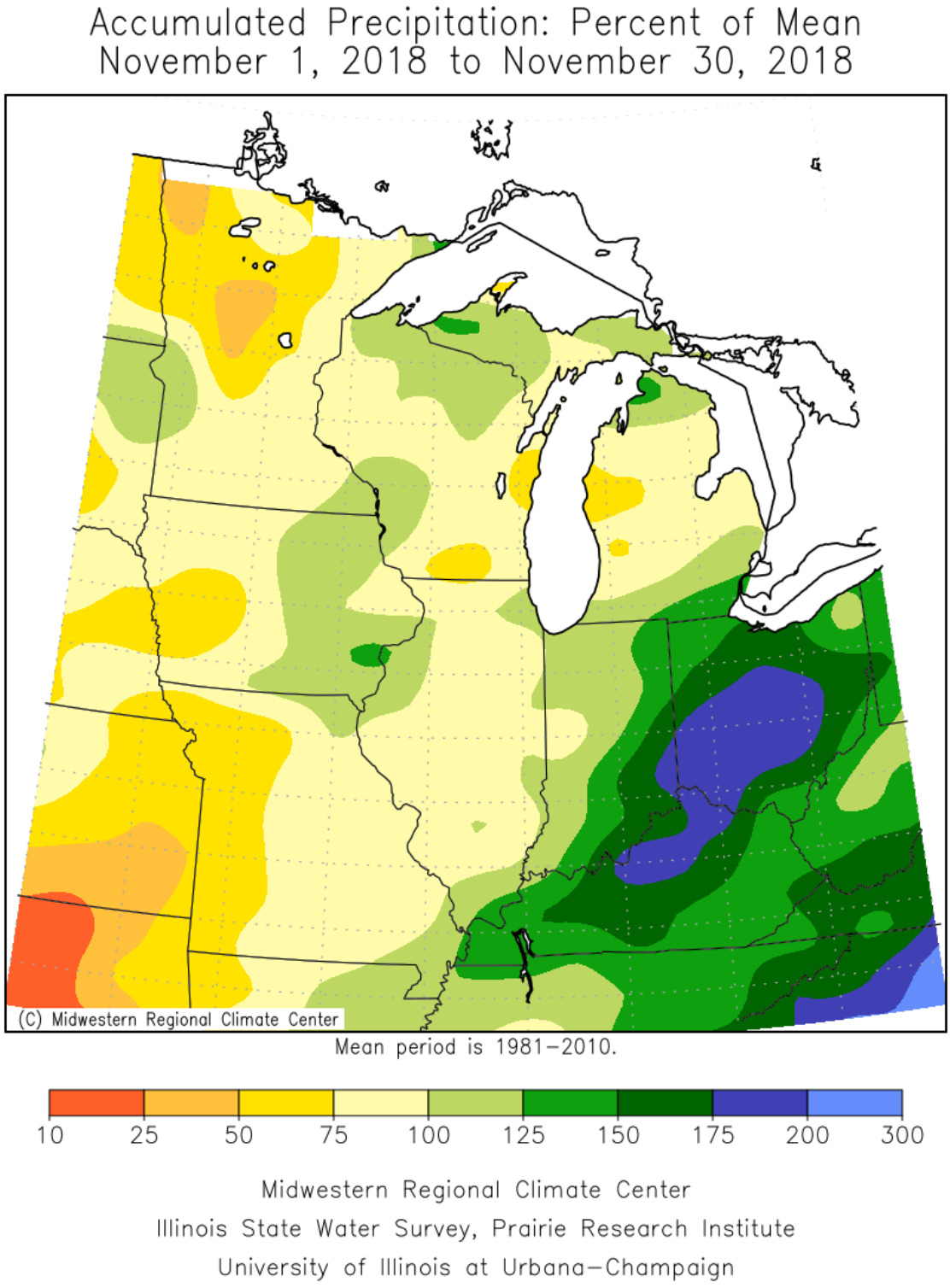
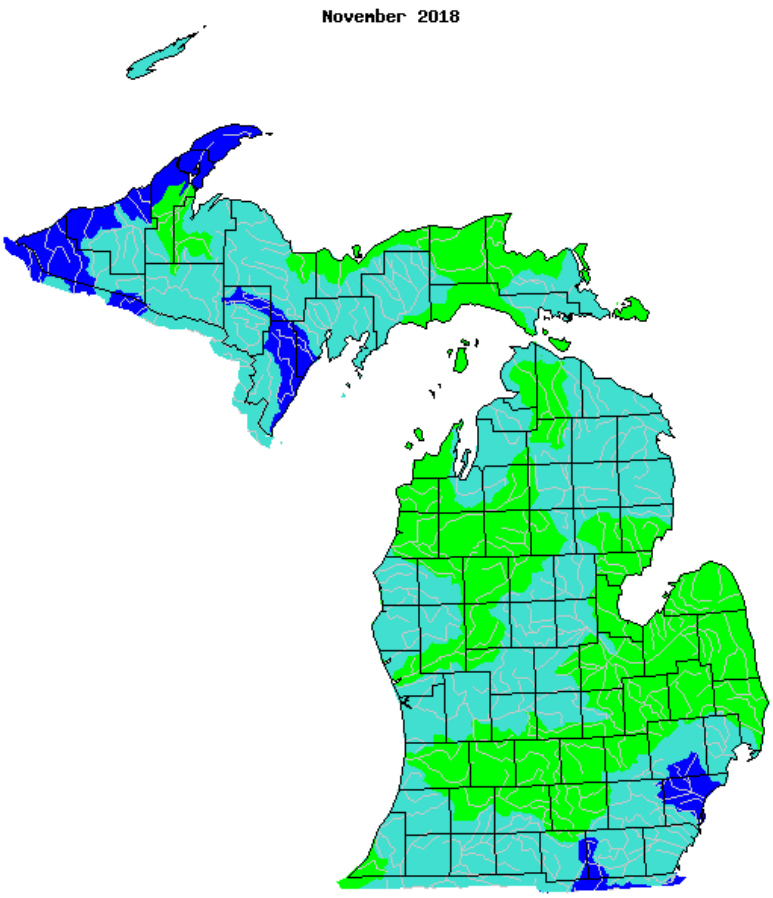


Figure 2. November 2018 Percent of Mean of Accumulated Precipitation



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. November 2018 monthly average streamflow by significant hydrologic units. Note generally above-average flows across most of Upper and Lower Michigan.

Hydrologic Products issued this month:

29 Hydrologic Summaries (ARBRVAGRR)
1 Probabilistic Hydrologic Outlook (ARBESFGRR)
30 Daily River Forecasts (ARBRVDGRR)
0 Areal Flood Advisory Statements (ARBFLSGRR)
0 Flood Warning Statements (ARBFLWGRR)
0 Flood Watch Statements (ARBFFAGRR)
17 River Statements (ARBRVSGRR)

News Articles and Related Documentation

None