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):
December 2018

DATE:
January 15, 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).

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

Summary

The first week of December 2018 continued with the generally cooler-than-normal conditions that prevailed for much of November. The final 3 weeks of the month flipped to consistently warmer- and drier-than-normal conditions. More active weather moved back in during the final few days of the month, but conditions remained warm enough for these precipitation events to fall as rain across most of the area. As the month came to a close, precipitation finished near to slightly-below the long term averages, but due to the warmth (and resulting lack of snow) snowfall totals were significantly below average (Figure 4).

Flood Conditions

Most rivers and streams in West Michigan started the month in the 50th to 75th percentile flows for this time of year. After a wet several days at the beginning of the month, streams generally rose to near the 90th percentile (though because the average values for this time of year are still somewhat low, this did not produce any significant flooding). Generally dry conditions for the middle 2 weeks of the month allowed the rivers to drop back down to the 50th to 75th percentile values, with the continued effect of saturated soils coming out of a very wet fall limiting how much the rivers were able to drop. Area-wide moderate rainfall to end the month again caused a jump back up into the 75th to 90th percentile range on most of the rivers.

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

Location	River	% of Normal

Scottville	Pere Marquette	127
Whitehall	White	132
Evart	Muskegon	143
Mt. Pleasant	Chippewa	188
Lansing	Grand	206
Grand Rapids	Grand	161
East Lansing	Red Cedar	203
Hastings	Thornapple	139
Battle Creek	Battle Creek	134
Battle Creek	Kalamazoo	149

General Hydrologic Information

The month of December featured near to slightly below-normal precipitation across most of the HSA, with the Kalamazoo Basin the driest of the major watersheds in the area. Additionally, most precipitation that did fall occurred in the form of rain, which ran off into the streams but made no progress building a winter snowpack. In fact, most of the HSA ended the month with virtually zero snow on the ground.

December precipitation amounts for Grand Rapids, Lansing, and Muskegon, Michigan, were 1.99, 2.34, and 2.19 inches, respectively (Figure 1). Monthly departures were -0.51, 0.47 and -0.36 inches, respectively. Yearly departures were +6.18, +5.89, and +8.74 inches for Grand Rapids, Lansing and Muskegon respectively. Percent of mean precipitation for December 2018 is shown in Figure 2. Of note, Muskegon's yearly precipitation total of 42.23 inches represents the 6th wettest calendar year on record dating back more than 120 years (1897).

Temperatures for the month of December were above average at Grand Rapids, Lansing and Muskegon. The average monthly temperature departures for these sites were 3.3, 3.3 and 3.4 degrees Fahrenheit, respectively.

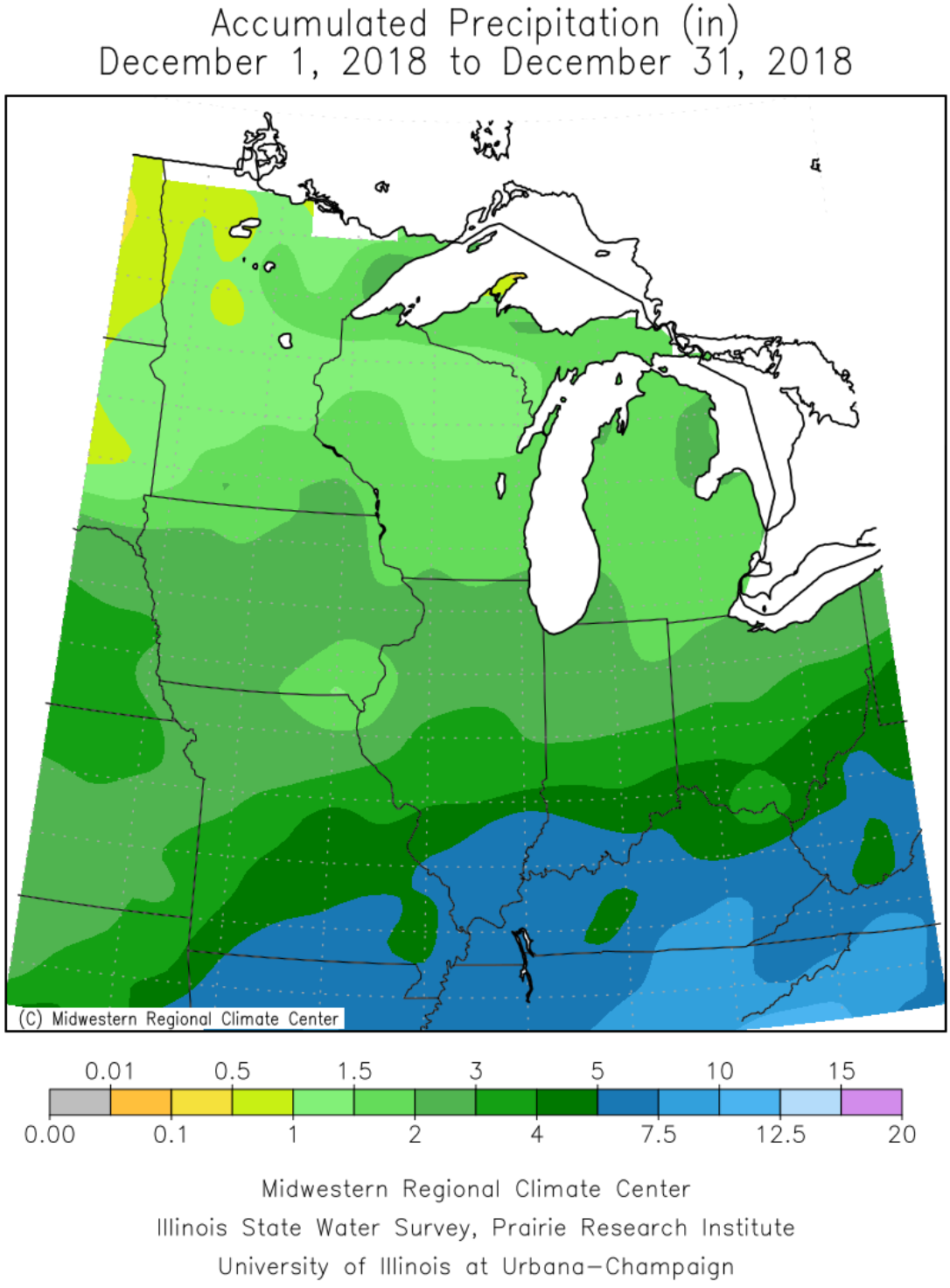


Figure 1. December 2018 Monthly Precipitation Totals

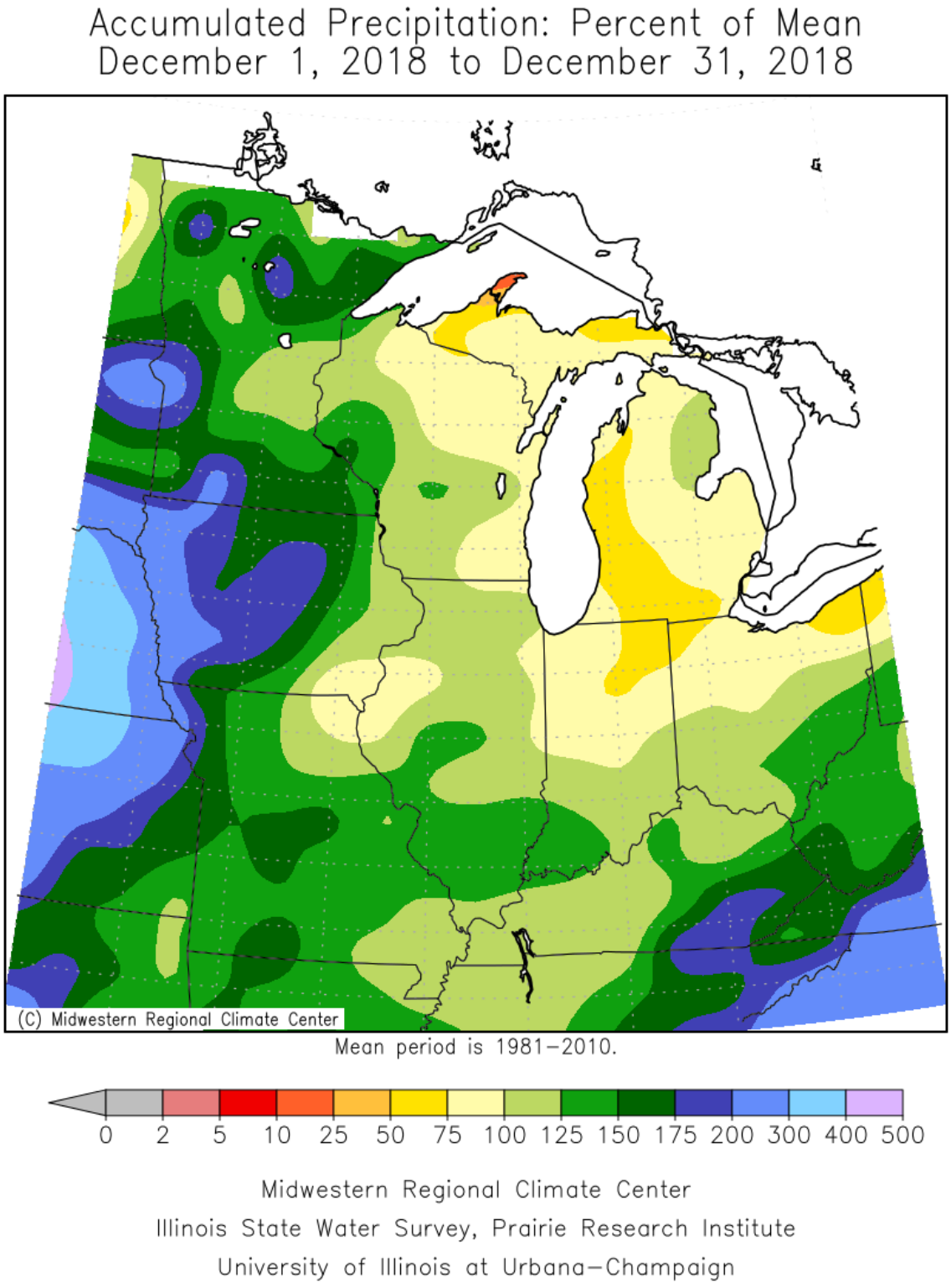
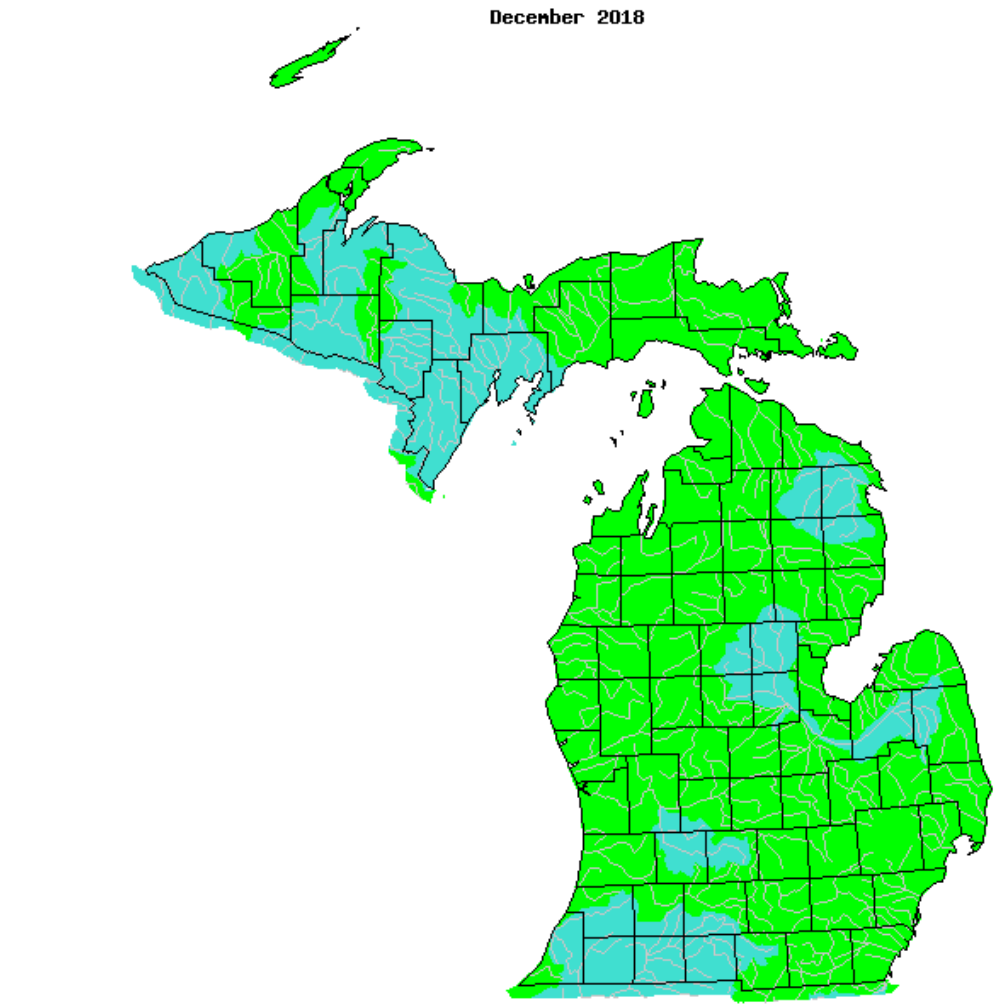


Figure 2. December 2018 Percent of Mean of Accumulated Precipitation



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

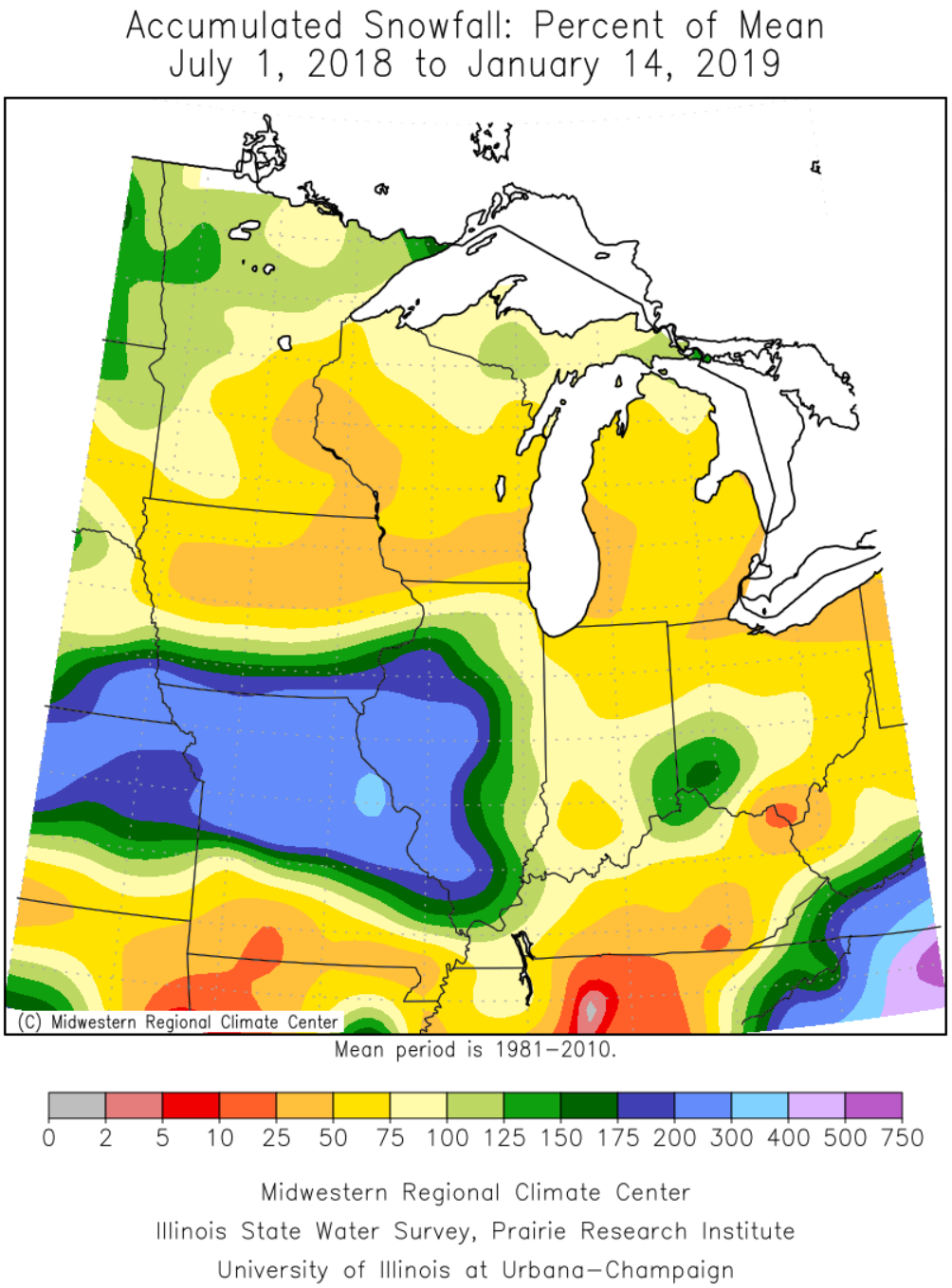


Figure 4. Accumulated season-to-date snowfall (thru Mid January) as a percent of the long term normal. Note extensive snow-drought across Lower Michigan.

Hydrologic Products issued this month:

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

News Articles and Related Documentation

https://www.mlive.com/weather/2018/12/michigan-has-been-in-snow-desert-for-december.html