

## 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

DATE:

May 6, 2019

SIGNATURE:

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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

March 2019 started out cold and snowy (continuing the theme from February), with 2 warmups happening during the middle of the month. The first warmup was the smaller of the 2, and melted off a decent chunk of the modest snowpack over the southern ½ of the HSA (south of Grand Rapids). The 2<sup>nd</sup> and much more substantial warmup occurred around March 14, with significant warmth and wind pushing all the way into the northern areas, in addition to widespread rainfall of 0.5 to 1.5 inches. This combination of heavy rain, snowmelt, and frozen ground led to widespread (mostly minor) areal flooding across the northern half of the HSA, with Newaygo County particularly hard-hit. Even after the storm had passed, the ground remained frozen and parts of Newaygo County continued to have standing water and flooded conditions for more than a week afterward.

### Flood Conditions

The rivers across the area began the month elevated, but were in the process of receding after the fairly minor rain and snowmelt event near the end of February. By the 2<sup>nd</sup> week of the month, flows on the large rivers were near or even slightly below the long-term average flows for this time of year. That all changed during the significant warmup in the middle of the month, with all the larger rivers rising to above the 90<sup>th</sup> percentile flow. A slow recovery then followed for the rest of the month as the weather pattern remained relatively calm without significant additional inflows. The Kalamazoo basin avoided any flooding from the big warmup due to the limited amount of snow on the ground to melt. The Grand River experienced minor flooding on the mid-sized tributaries like the Rogue and Maple Rivers, as well as on the Grand itself at Comstock Park and in Robinson Township. Meanwhile, the Muskegon Basin was the hardest hit due to the heavy snowpack, with flooding from Croton to Newaygo and Bridgeton, as well as on other northern streams like the Pine, Chippewa, and White Rivers. This was in addition to the areal flooding mentioned earlier, that was particularly concentrated in Newaygo County (where the factors of rainfall, snowmelt, and frozen ground were all maximized). In Newaygo County, more than 100 roads were closed due to flooding, and over 130 homes and businesses were damaged, with more than 2 dozen rated at least “major damage”.

## **Flood Stage Report**

The forecast points on the Muskegon River at Croton, Bridgeton and Newaygo; the Grand River at Comstock Park and Robinson Township; the Rogue River near Rockford; the Maple River at Maple Rapids; the Pine River near Alma; the Chippewa River at Mount Pleasant; and the White River near Whitehall exceeded flood stage during the month. Thus, the NWS Form E-3 “Flood Stage Report” was issued.

## **River Conditions**

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

<u>Location</u>	<u>River</u>	<u>% of Normal</u>
Scottville	Pere Marquette	135
Whitehall	White	129
Ewart	Muskegon	156
Mt. Pleasant	Chippewa	172
Lansing	Grand	100
Grand Rapids	Grand	104
East Lansing	Red Cedar	159
Hastings	Thornapple	92
Battle Creek	Battle Creek	91
Battle Creek	Kalamazoo	100

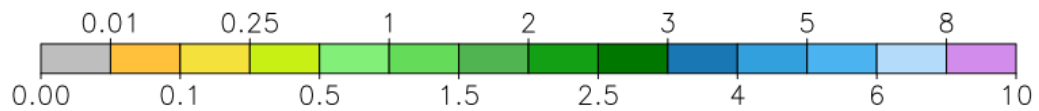
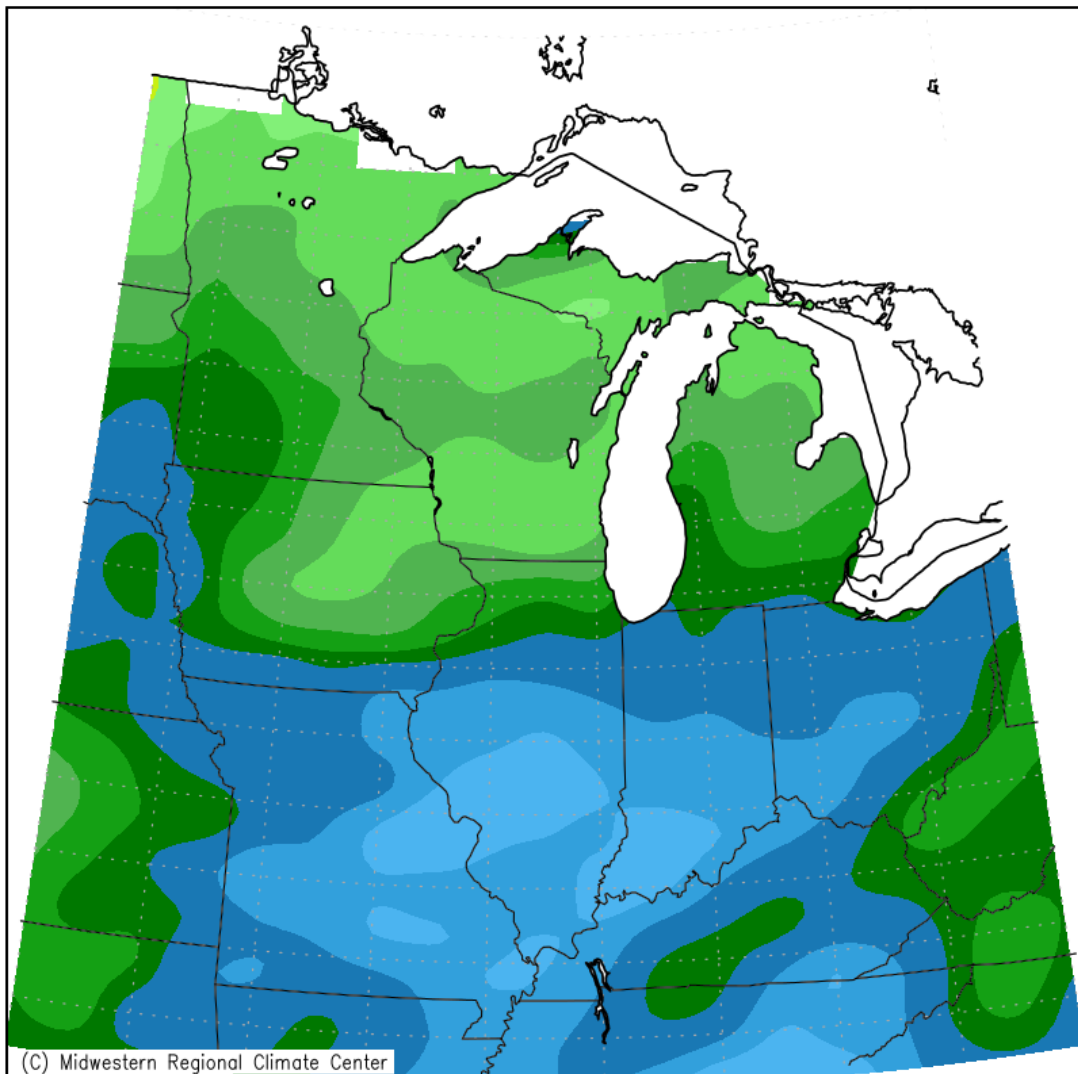
## **General Hydrologic Information**

The month of March featured slightly below-normal precipitation across most of the area, except along the Lake Michigan coastline and over most of the Kalamazoo basin, where slightly above-average precipitation occurred.

March precipitation amounts for Grand Rapids, Lansing, and Muskegon, Michigan, were 2.23, 1.96, and 3.19 inches, respectively (Figure 1). Monthly departures were -0.14, -0.10 and +0.94 inches, respectively. Yearly departures were +2.31, +1.22 and +3.25 inches for Grand Rapids, Lansing and Muskegon respectively. Percent of mean precipitation for January 2019 is shown in Figure 2.

Temperatures for the month of March were below average at Grand Rapids, Lansing and Muskegon. The average monthly temperature departures for these sites were -3.4, -3.2 and -3.2 degrees Fahrenheit, respectively.

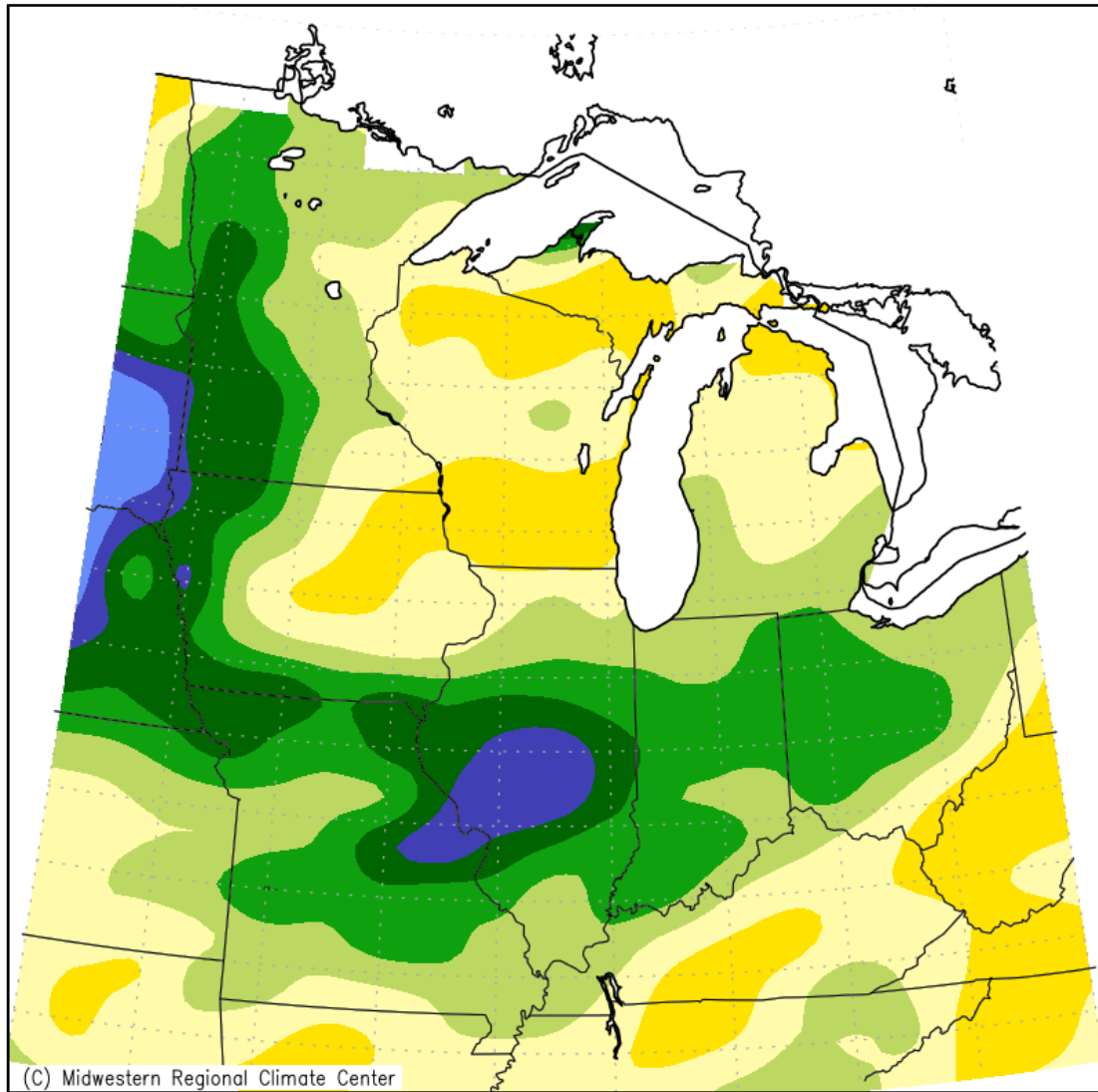
Accumulated Precipitation (in)  
March 1, 2019 to March 31, 2019



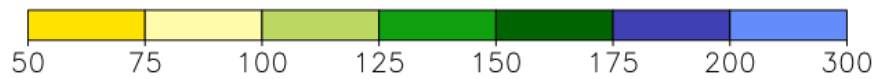
Midwestern Regional Climate Center  
Illinois State Water Survey, Prairie Research Institute  
University of Illinois at Urbana-Champaign

Figure 1. March 2019 Monthly Precipitation Totals

Accumulated Precipitation: Percent of Mean  
March 1, 2019 to March 31, 2019



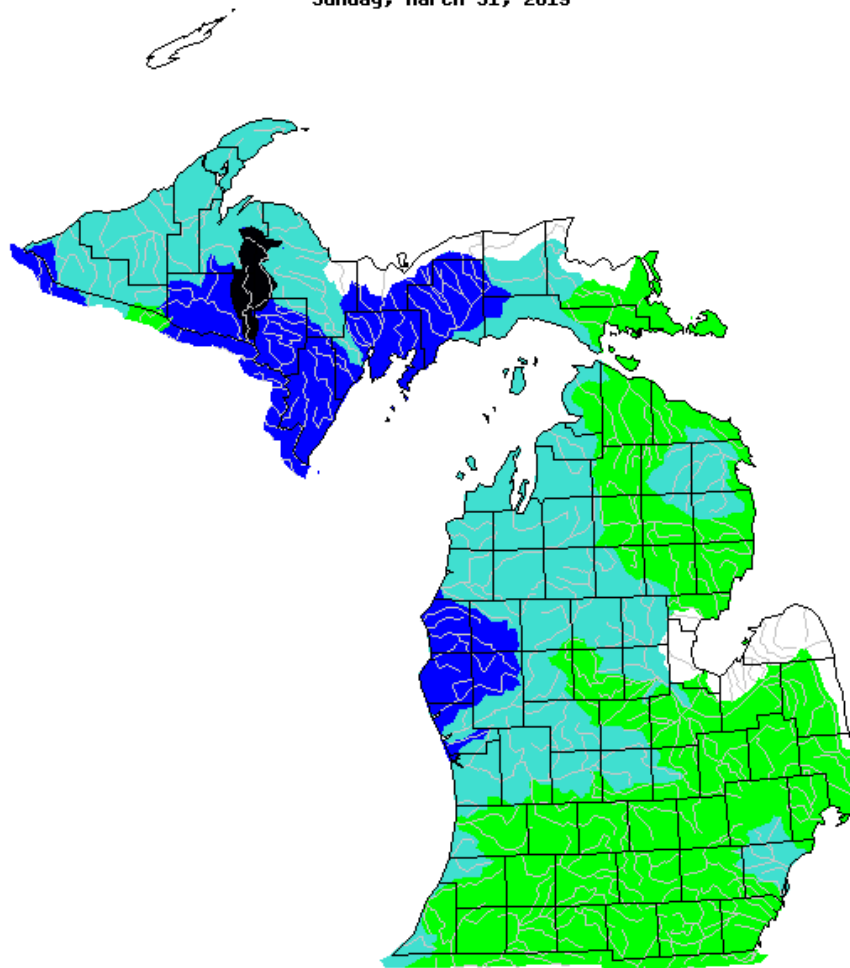
Mean period is 1981–2010.



Midwestern Regional Climate Center  
Illinois State Water Survey, Prairie Research Institute  
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Figure 2. March 2019 Percent of Mean of Accumulated Precipitation

Sunday, March 31, 2019



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 28-day average streamflow significant hydrologic units. Note generally above-average flows across most of Lower Michigan, especially the Muskegon Basin and lower portions of the Grand River basin.

**Hydrologic Products issued this month:**

- 28 Hydrologic Summaries (ARBRVAGRR)
- 1 Probabilistic Hydrologic Outlook (ARBESFGRR)
- 6 Event-driven Hydrologic Outlook (ARBESFGRR)
- 2 Daily River Forecasts (ARBRVDGRR)

27 Areal Flood Advisory Statements (ARBFLSGRR)  
6 Flood Warning Statements (ARBFLWGRR)  
10 Flood Watch Statements (ARBFFAGRR)  
46 River Statements (ARBRVSGRR)

**News Articles and Related Documentation**

<https://fox17online.com/2019/03/15/fast-flooding-catches-residents-off-guard-river-still-rising-in-newaygo-co/>

<https://www.detroitnews.com/story/news/local/michigan/2019/03/19/winter-weather-flooding-western-michigan/39223431/>

<https://www.mlive.com/news/grand-rapids/2019/03/flood-warnings-as-west-michigan-rivers-rise-wash-out-roads.html>

<https://www.freep.com/story/news/local/michigan/2019/03/19/emergency-flooding-western-michigan/3211078002/>

<https://www.usnews.com/news/best-states/michigan/articles/2019-03-19/heavy-rains-snowmelt-blamed-for-western-michigan-flooding>