

NWS FORM E-5 U.S. Department of Commerce
NOAA, NATIONAL WEATHER SERVICE

HSA OFFICE:
Grand Rapids, MI

MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS

REPORT FOR (MONTH & YEAR):
June 2021

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

DATE:
July 15, 2021

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 flooding occurred within this hydrologic service area.

Summary

June was a tale of two months. The first half of the month continued the hot and dry conditions, with D2 "Severe Drought" depicted by the U.S. Drought monitor across a large swatch of southern Lower Michigan. Agricultural impacts were beginning to escalate, and river levels continued running well below typical values. A switch flipped around the middle of the month, as a stationary weather front stalled over Michigan for several days. Hot and humid air moving up from the south brought numerous rounds of storms and torrential rainfall to Lower Michigan, primarily from June 24 - 26. When all was said and done, much of the Grand River Basin had 3-day rain totals over 4 inches, with a significant part of the lower portions of the basin (from Lansing to Grand Rapids and on to Lake Michigan) receiving 6-8 inches of rain (Figure 6). This got all the rivers rising significantly, with a few of the smaller or more flood-prone places along the river eventually reaching minor flood stage. Overall, the dry soils and extremely low starting level for the rivers kept this major regional rainstorm from becoming a more significant event on our rivers. Nevertheless, that amount of rain over a day or two is bound to cause some problems, and the vast majority of West Michigan along and south of I-96 experienced some degree of unusual areal flooding. This was more than the typical nuisance flooding, and resulted in many roads closed for multiple days across numerous counties due to flooding and/or washouts, as well as public pictures of storm drains backflowing and geysering out of manhole covers, etc.

Following this pattern of heavy rain across Michigan, drought conditions steadily improved, and as the weekly drought update rolled over to July, the hardest-hit area in

the southwest corner of the state no longer had any drought depiction, and multiple category improvements were noted across the other areas of West Michigan.

While Lake Michigan levels have generally held steady so far this summer due to the dry conditions, the heavy rain in the latter portions of the month raised levels nearly 3 inches, as rains found their way through the rivers and into the big lake. On the whole, Lake Michigan is still more than 12 inches higher than long-term levels for this time of year, but is down more than 18 inches from record high levels in the summer of 2020.

Flood Conditions

Most of the major systems began the month (and spent the first half of the month) below the 10th percentile flow, which means that the water would be higher in June than it was this year 9 times out of 10. The Kalamazoo basin was even lower, setting some new record low levels for this time of year, since the drought was most intense in this southwest portion of the state. Obviously once the flip switched and the rain started falling, all of these river systems responded dramatically. In fact, several locations in the Grand and Kalamazoo basins went from less than 10th percentile levels to 90+ percentile levels in a 7 day period, including the Grand River at Grand Rapids. Obviously those numbers are only possible without major flooding this time of year, when the rivers are consistently near their seasonal low values.

Flood Stage Report

Flood stage was exceeded at the following forecast points: Buck Creek at Grandville, Grand River at Comstock Park, Kalamazoo River at New Richmond, Maple River at Maple Rapids, and the Thornapple River at Hastings. No forecast points exceeded flood stage during the month. Thus, the NWS Form E-3 "Flood Stage Report" was not issued.

River Conditions

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

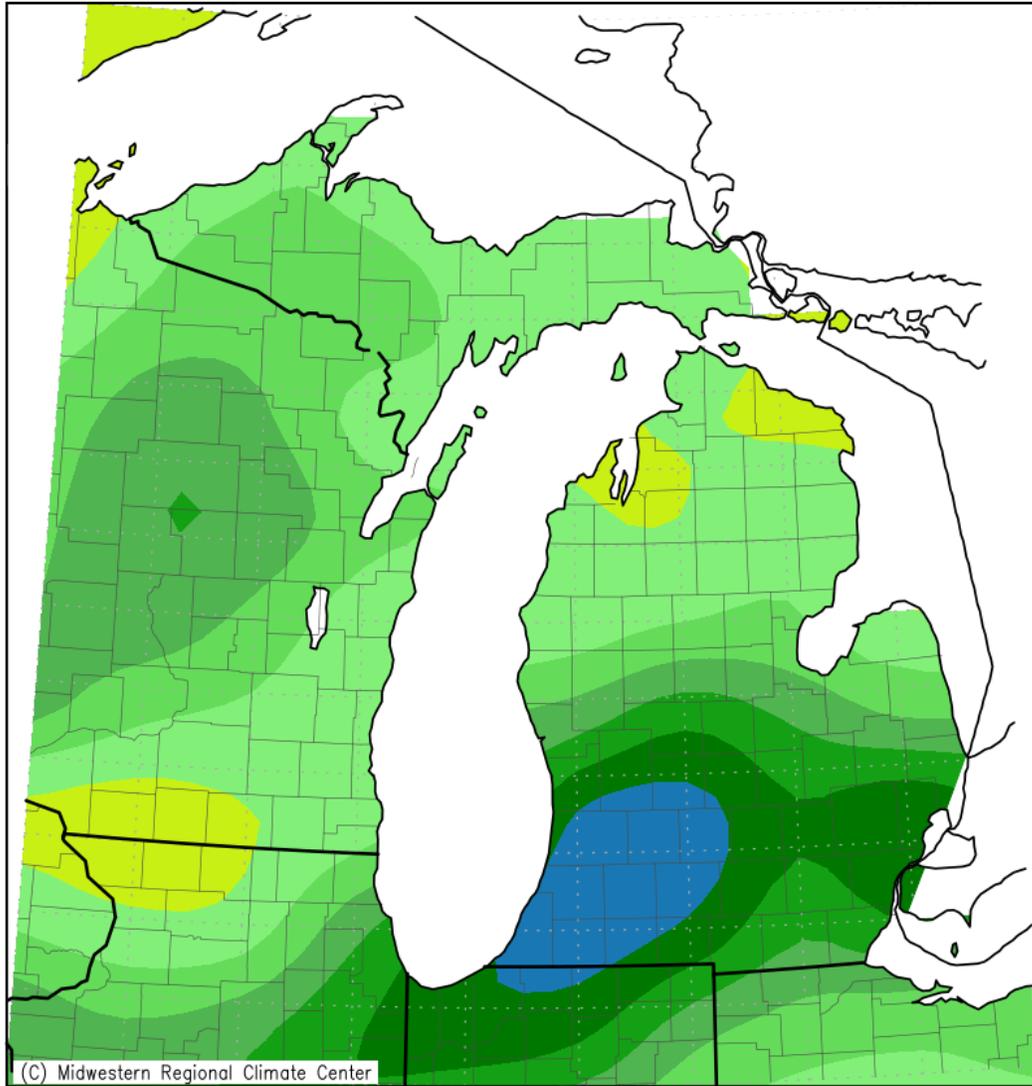
<u>Location</u>	<u>River</u>	<u>% of Normal</u>
Scottville	Pere Marquette	117
Whitehall	White	126
Evart	Muskegon	87
Mt. Pleasant	Chippewa	219
Lansing	Grand	N/A
Grand Rapids	Grand	660
East Lansing	Red Cedar	989
Hastings	Thornapple	1389
Battle Creek	Battle Creek	1000

General Hydrologic Information

June precipitation amounts for Grand Rapids, Lansing, and Muskegon, Michigan, were 8.49, 8.12, and 6.92 inches, respectively (Figure 1). Monthly departures were +4.55, +4.36, and +3.87 inches, respectively. Yearly departures were -1.92, -1.12 and -2.41 inches for Grand Rapids, Lansing and Muskegon respectively. Percent of mean precipitation for June 2021 is shown in Figure 2.

Temperatures for the month of June at Grand Rapids, Lansing and Muskegon were above average. The monthly average temperature departures for these sites were +2.0, +3.7, and +2.4 degrees Fahrenheit, respectively.

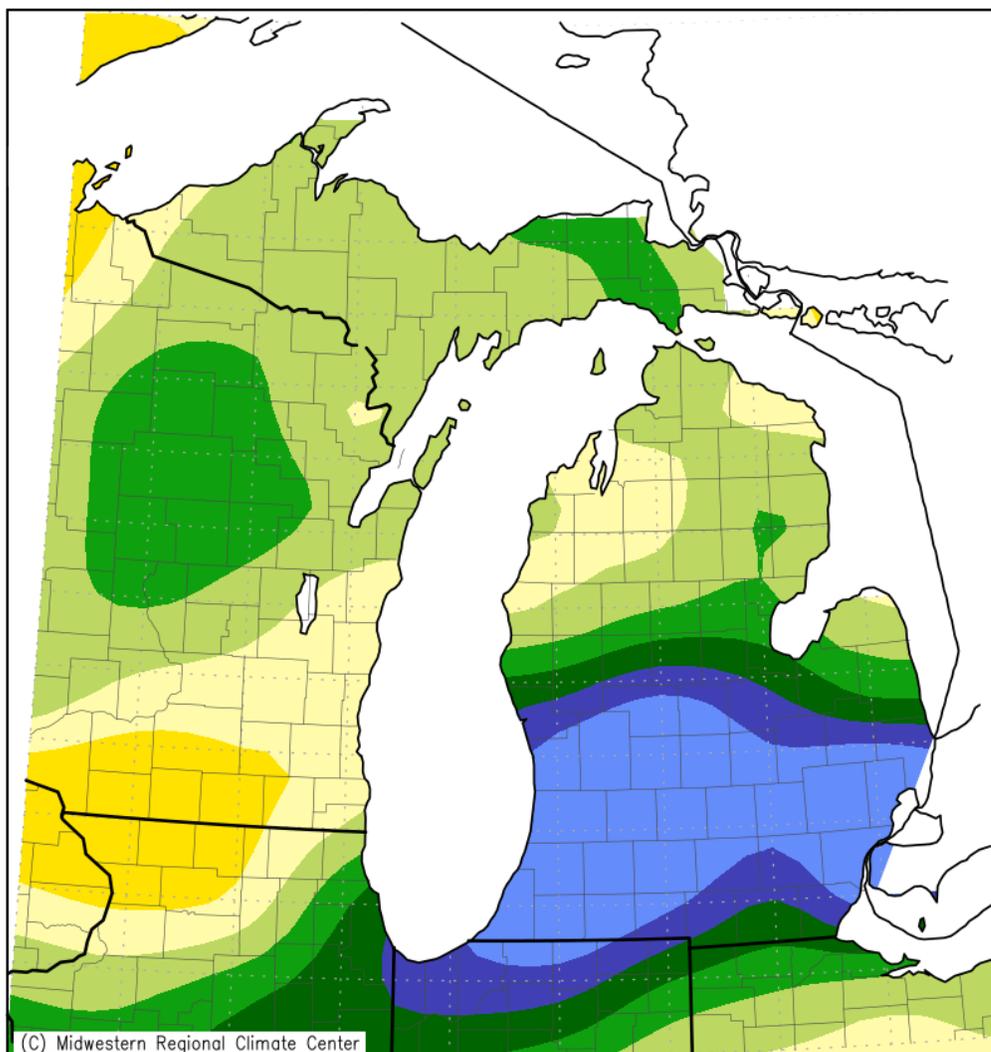
Accumulated Precipitation (in)
June 1, 2021 to June 30, 2021



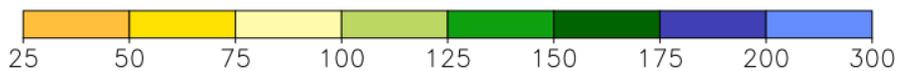
Midwestern Regional Climate Center
cli-MATE: MRCC Application Tools Environment
Generated at: 7/15/2021 9:40:31 AM CDT

Figure 1. June 2021 Monthly Precipitation Totals.

Accumulated Precipitation: Percent of Mean
June 1, 2021 to June 30, 2021



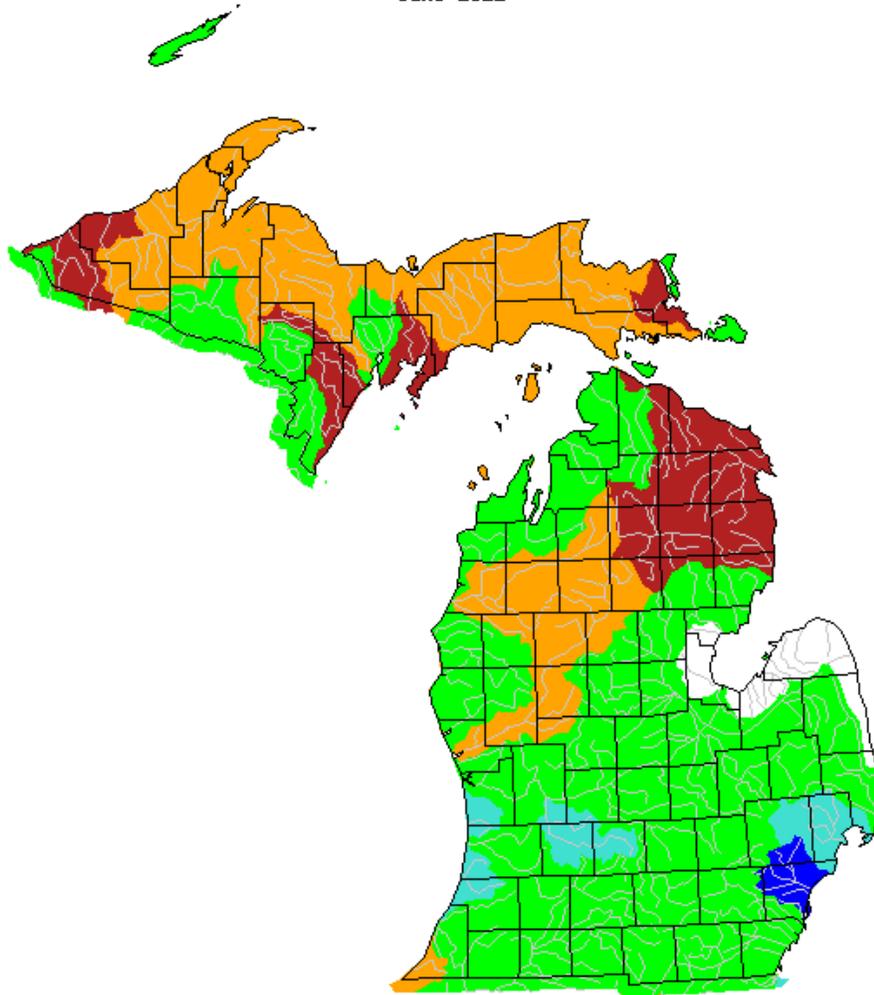
Mean period is 1991–2020.



Midwestern Regional Climate Center
cli-MATE: MRCC Application Tools Environment
Generated at: 7/15/2021 9:42:40 AM CDT

Figure 2. June 2021 Percent of Mean of Accumulated Precipitation.

June 2021



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 June, grouped by significant hydrologic units. Note streamflows across Lower Michigan significantly below-average, owing to several months of relatively dry conditions.

Calculated Soil Moisture Ranking Percentile
JUN, 2021

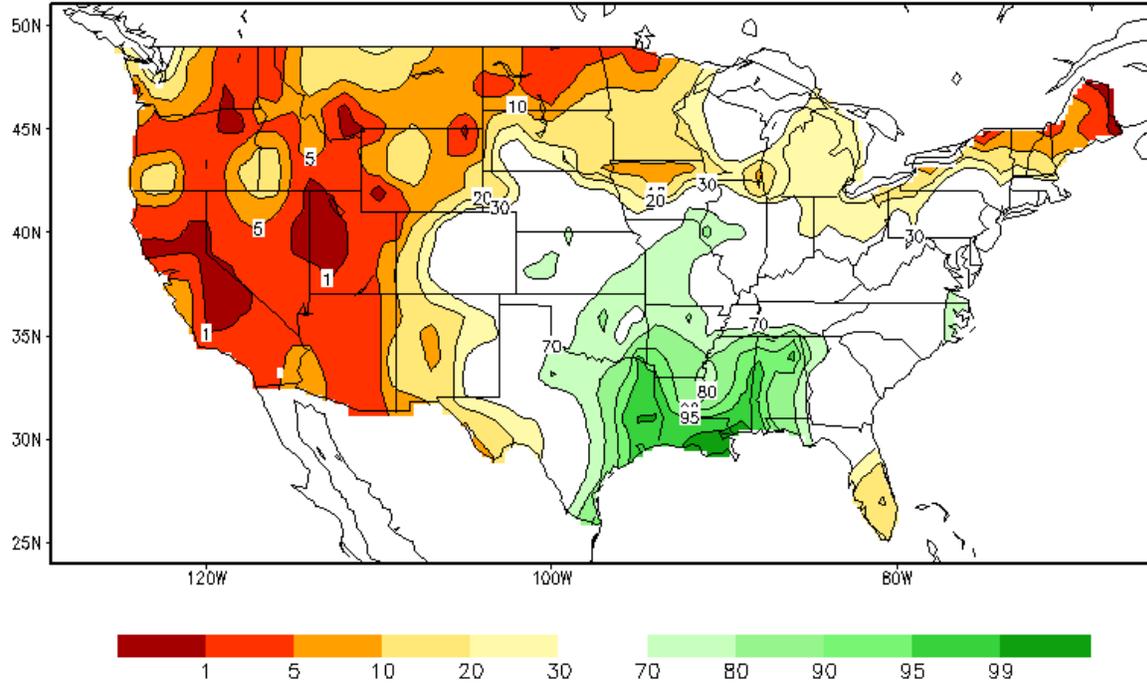
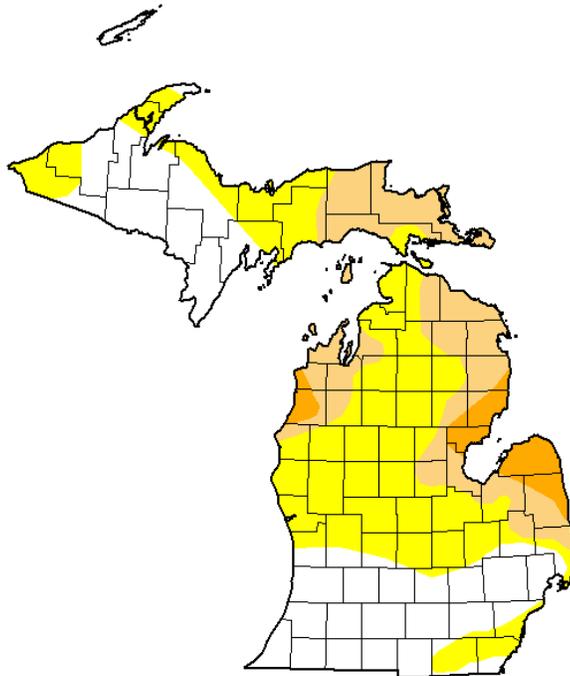


Figure 4. Chart of monthly values of soil moisture, by percentile ranking.

U.S. Drought Monitor
Michigan

July 6, 2021
(Released Thursday, Jul. 8, 2021)
Valid 8 a.m. EDT



Intensity:

-  None
-  D0 Abnormally Dry
-  D1 Moderate Drought
-  D2 Severe Drought
-  D3 Extreme Drought
-  D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:

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National Drought Mitigation Center



droughtmonitor.unl.edu

Figure 5. U.S. Drought Monitor analysis valid early July, 2021

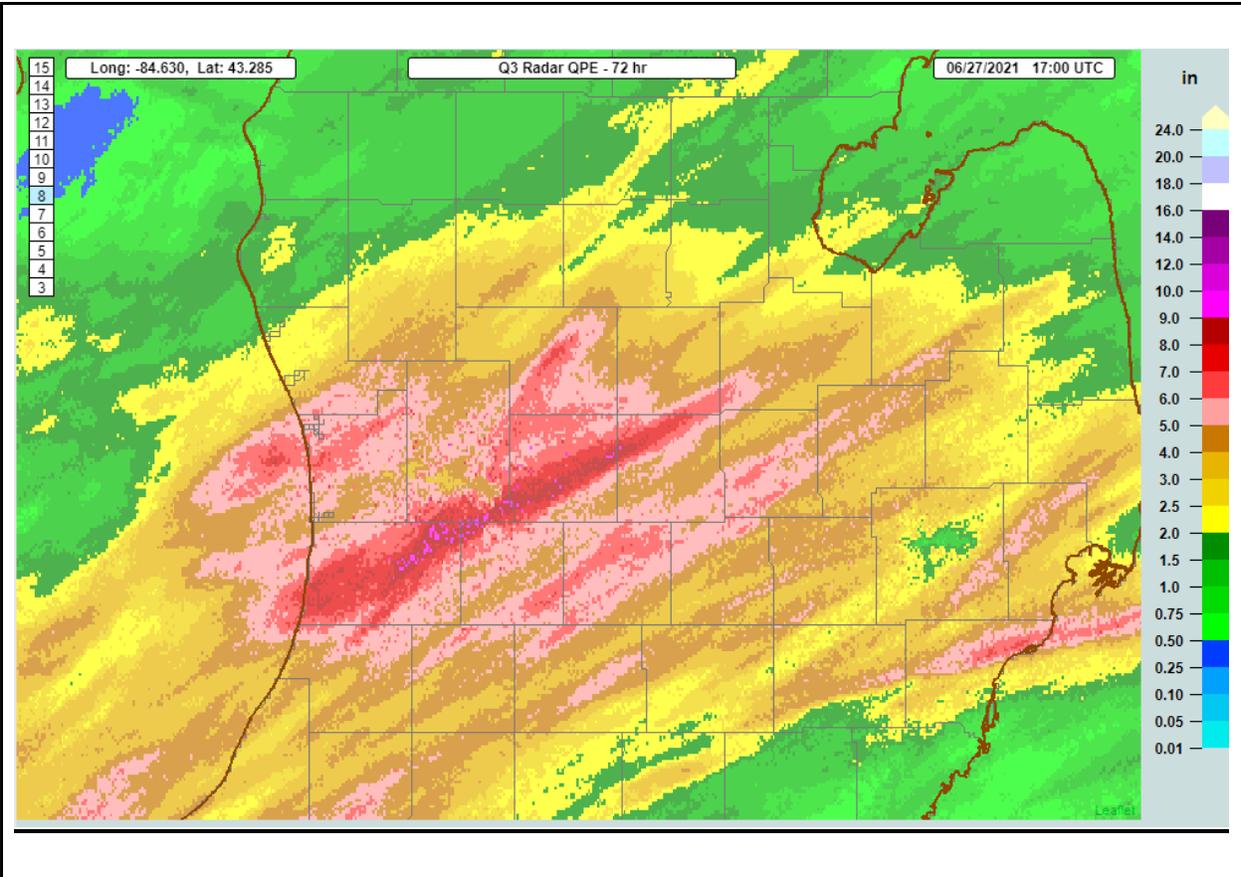


Figure 6. 3-day radar-estimated rain totals from June 24-June 26, 2021. Note a multi-county area of 6-8 inches, including Grand Rapids.

Hydrologic Products issued this month

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

News Articles and Related Documentation

<https://www.wzzm13.com/article/news/local/several-roads-closed-in-kent-county-due-to-water-over-road/69-ffaa0320-5e8a-4a47-acca-8bf2d8a802ce>

<https://wwmt.com/news/local/severe-drought-shrinks-with-soaking-rain-and-possible-flood-concerns-heading-into-weekend>

<https://www.lansingstatejournal.com/story/news/2021/06/28/why-michigan-flooded/5370702001/>

<https://www.cbsnews.com/news/michigan-governor-state-of-emergency-extraordinary-flooding/>