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/OH12x1) HYDROMETEOROLOGICAL INFO CENTER 1325 EAST-WEST HIGHWAY, RM 7116 SILVER SPRING, MD 20910	HSA OFFICE: **Marquette, MI** REPORT FOR (MONTH / YEAR): **March 2020** DATE: **April 4th, 2020** SIGNATURE: **Jordan Wendt, Hydrology Program Manager** **Robin J. Turner, MIC**
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 no flooding occurred within this Hydrologic Service Area.

March Summary

Essentially all of Upper Michigan received above normal values of precipitation during the month of March. This is mostly due to a rain event on March 28-29th, where most of the HSA received roughly 1.0 to 1.5 inches of precipitation. Before this rain event, there was some melting ongoing with highs in the 30s and lows in the teens…but not too much, as seen by a fairly consistent snow depth at WFO MQT (roughly 32 inches). After this rain event, daytime highs remained above freezing, with lows above or near the freezing mark. This allowed for an increase in snowpack melting and the rivers began to respond. Although most rivers saw a noticeable hydrologic response, the basins that saw the most impact were the Chocolay, Manistique, and Sturgeon-Delta. These basins are discussed in further detail below in the "Snowpack" section.

With anomalous high soil moisture remaining from the Fall of 2019 and an extensive snowpack remaining, Upper Michigan is not "out of the woods" yet with respect to flooding potential. Although any impacts are expected to be minor, the areas shaded in blue in Figure 1 below represent areas with the higher than normal potential to seem these minor flooding impacts quite well.

Location	Precipitation	% of normal	Snowfall
WFO Marquette	4.26"	141%	23.8"
Marquette City	2.79"	140%	6.0"
Quincy Hill	2.87"	M	13.9"
Ironwood	3.39"	171%	17.3"
Iron Mountain	3.16"	192%	2.0"
Manistique	3.62"	202%	4.0"
Munising	3.86"	185%	15.2"
Stambaugh	2.56"	167%	5.6"

NOTE: Rainfall after 8am EST Feb. 29th was counted in March stats for all but the NWS Marquette site due to the reporting structure of our cooperative observers.

March Flooding Conditions
Rivers did not reach flood stage in the Upper Peninsula.

March River Conditions

River levels across the NWS Marquette Hydrologic Service Area were above-normal across the central basins and slightly above normal across much of the remaining area.

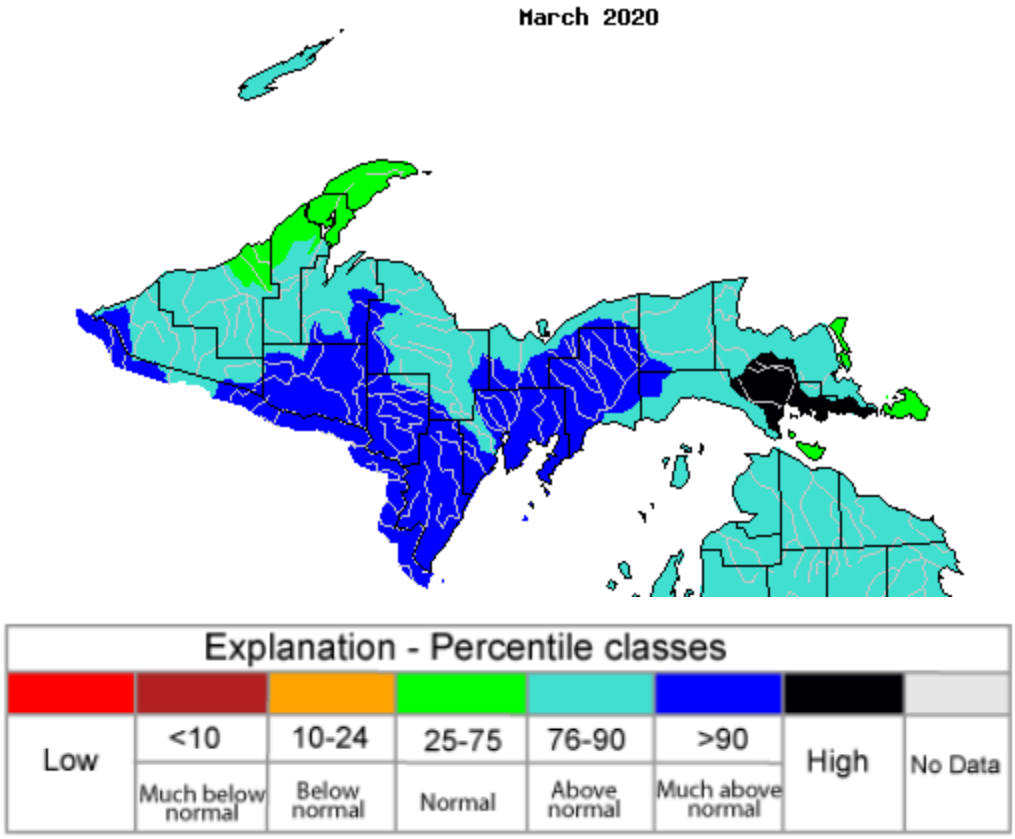

Figure 1: USGS monthly average streamflow in March 2020 across Upper Michigan

Snowpack Discussion

As seen in Figure 6 at the end of this document, there is still a decent snowpack across much of Upper Michigan's river basins. The Chocolay, Manistique, and Sturgeon-Delta basins are relatively flat, and encompass areas within the more dominant lake-effect snow belts. As snow began melting across the UP towards the end of March with nearly an inch of rain, these two basins were slower to respond, but still remain elevated in the first week of April. With snowmelt still expected through at least the first half of April, we are expecting the high content of ground water and soil moisture to work its way into these rivers with elevated levels continuing.

Drought Discussion

No drought conditions are depicted in the Upper Peninsula. For the latest drought status, please go to http://www.drought.gov.

Media Links

https://www.miningjournal.net/news/front-page-news/2020/03/melting-snow/

March Products Issued

1 – Hydrologic Outlook (ESF)
0 – Flood Watch (FFA)
0 – Flood Warning (FLW)
6 – Flood Advisories and Statements (FLS)
0 – Flash Flood Warning (FFW)
0 – Flash Flood Statement (FFS)
31 – Hydrologic Summary (RVA)
0 – Daily River Forecasts (RVD)

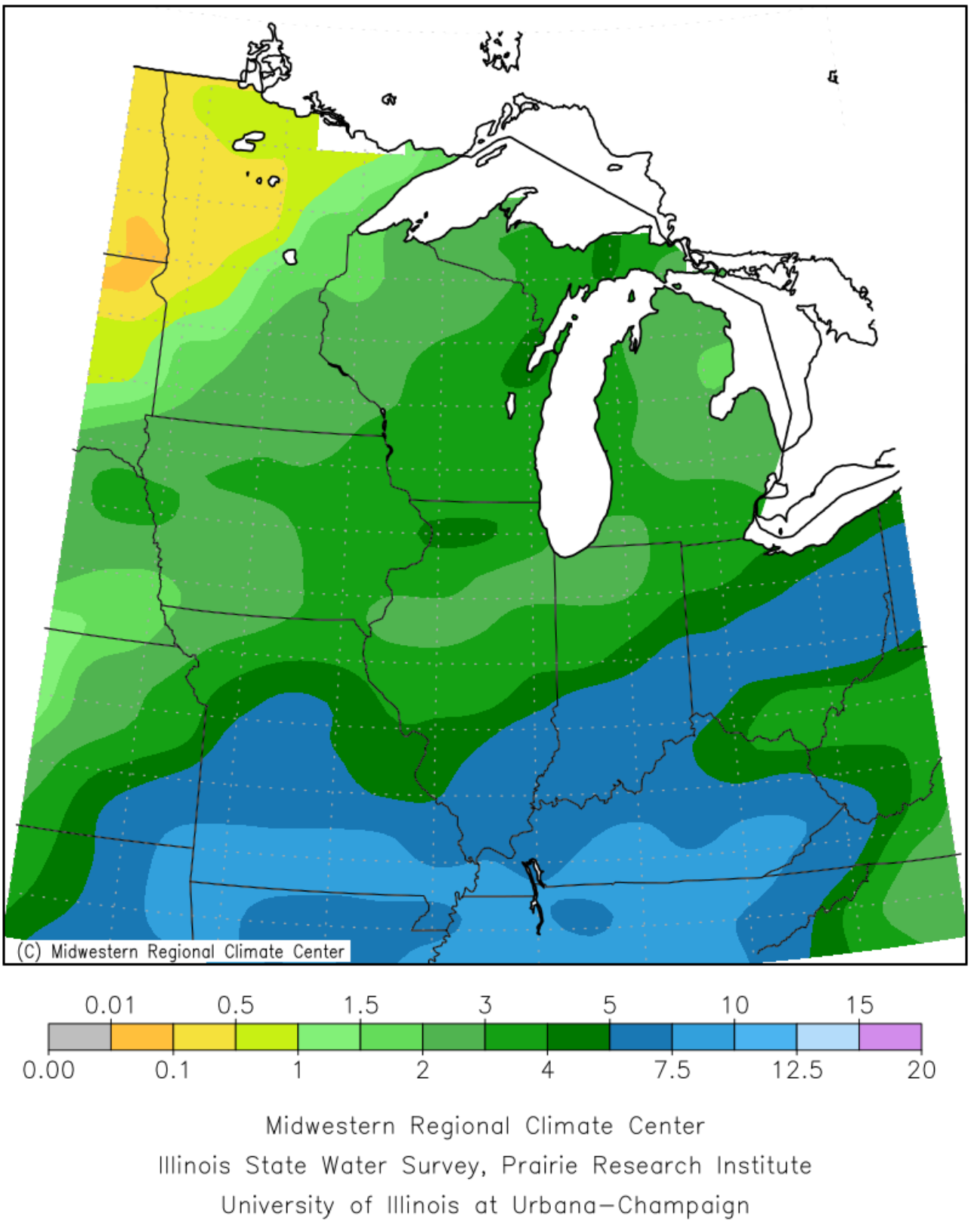

Figure 2. March 2020 Monthly Precipitation Totals.

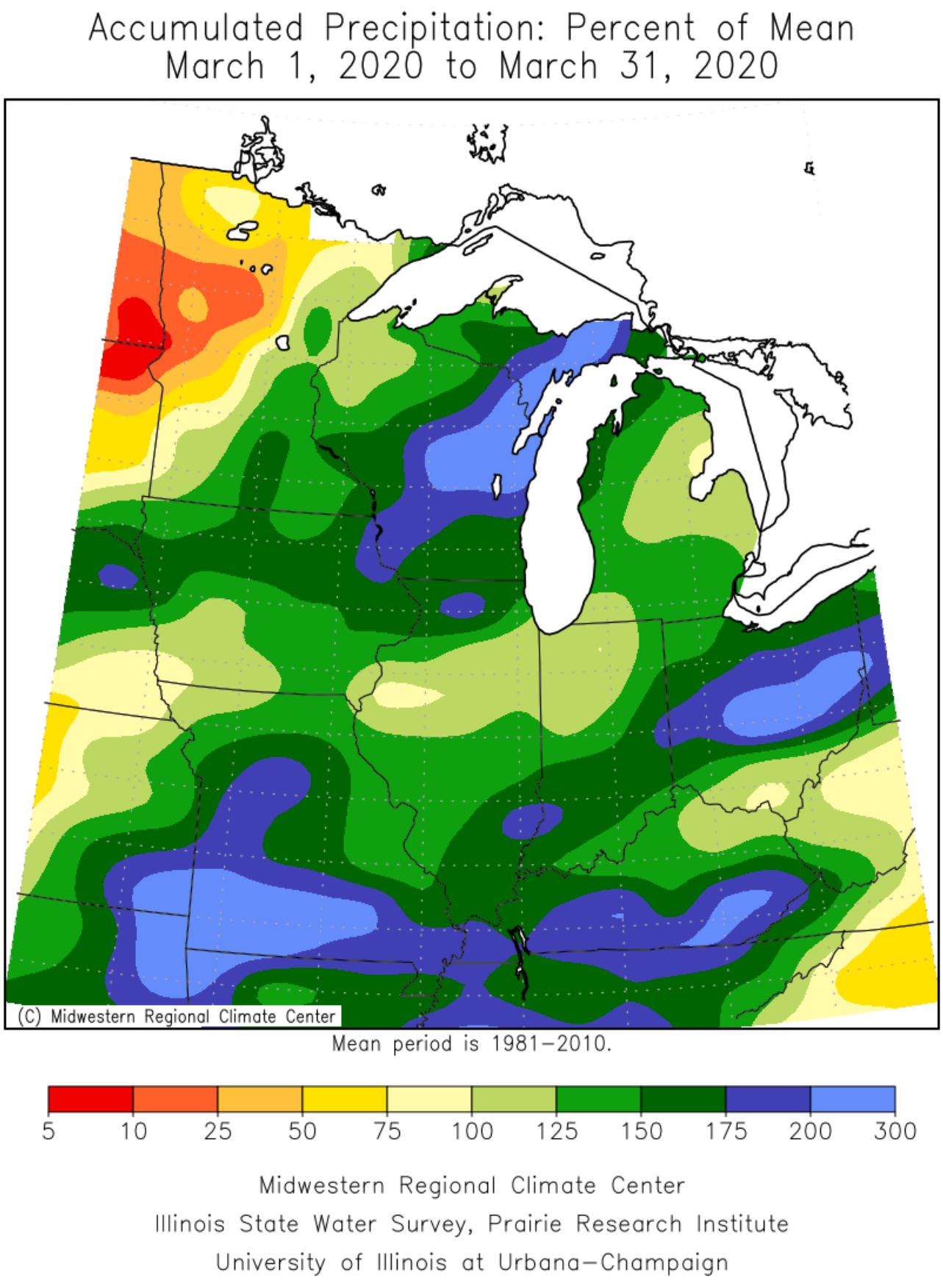

Figure 3. March 2020 Percent of Normal of Accumulated Precipitation

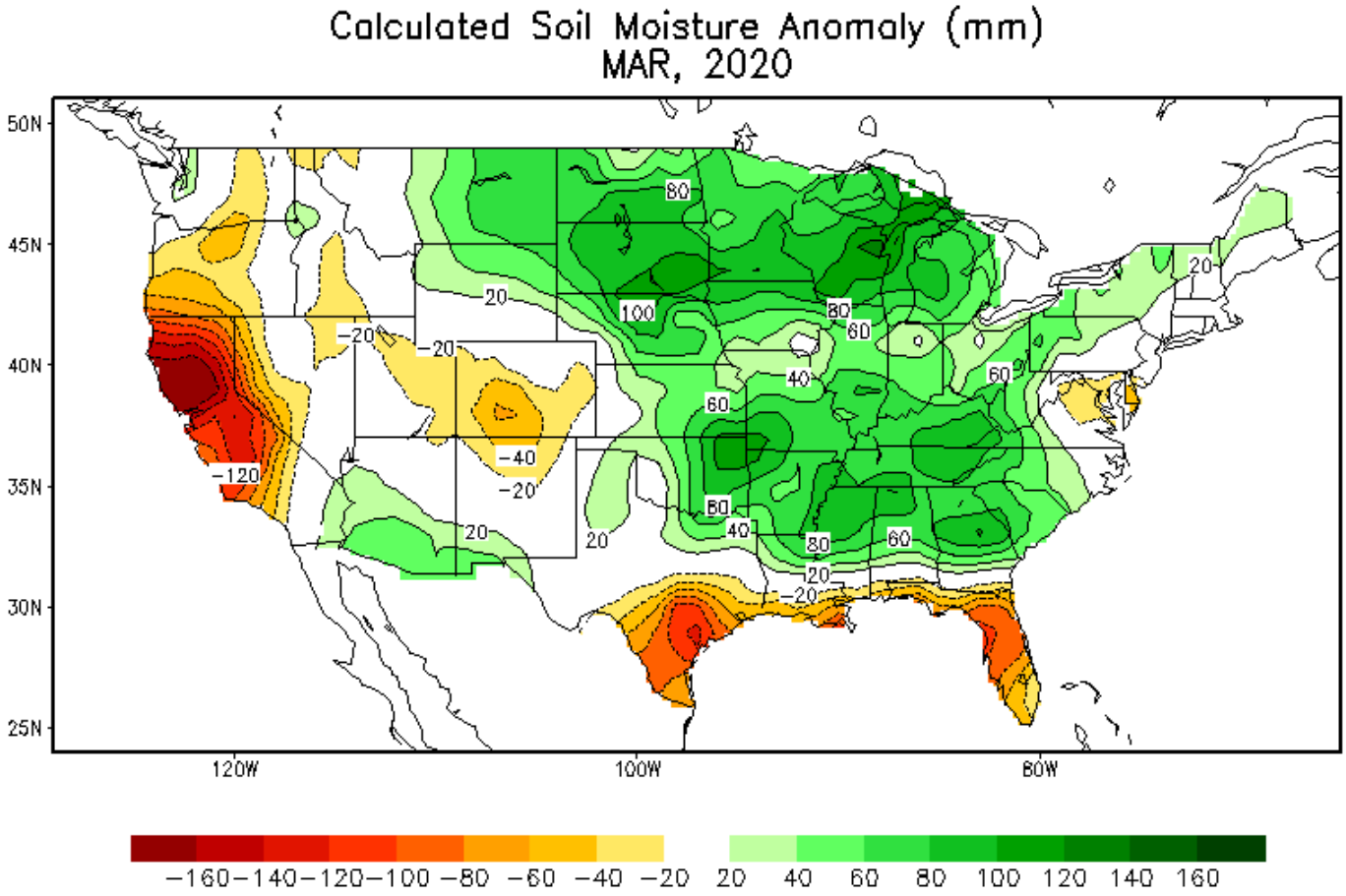

Figure 4: Climate Prediction Center monthly soil moisture anomaly for March 2020

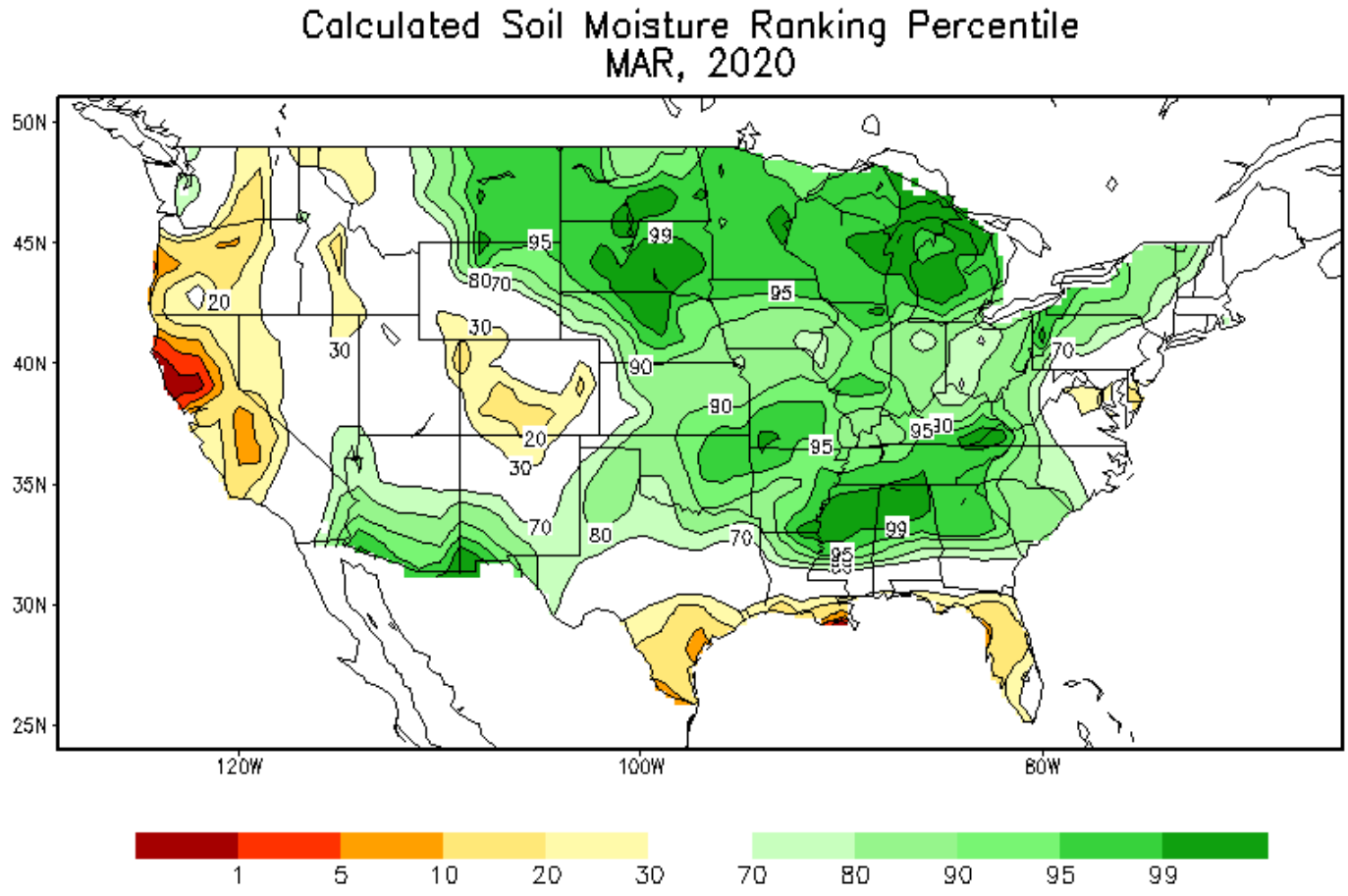

Figure 5: Climate Prediction Center monthly average soil moisture percentile for March 2020

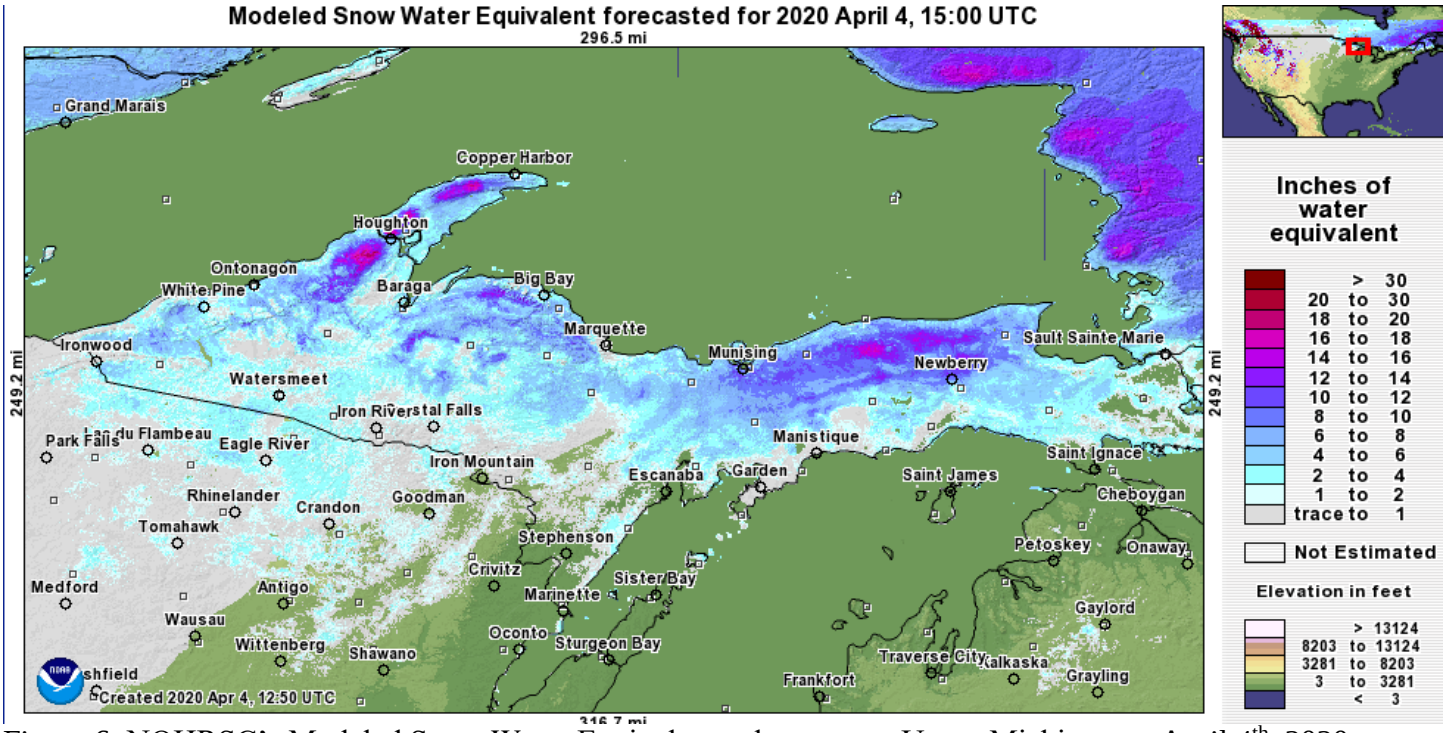

Figure 6: NOHRSC's Modeled Snow Water Equivalent values across Upper Michigan on April 4th, 2020