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): **September 2019** DATE: **October 04, 2019** SIGNATURE: **Robin J. Turner, MIC** **Keith White, Hydrology Program Manager**
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.

September Precipitation

The month of September brought a return to wetter than normal conditions across the Upper Peninsula. Several heavy rainfall events took place during the month, culminating on September 30th when a widespread 1" to 2.5" of rain fell when two groups of showers and thunderstorms traversed the region. The highest rainfall totals were observed in the highly populated Ishpeming to Harvey corridor where there were multiple reports of minor ponding on roadways. There were several notable rain events prior to this, some widespread and others more localized. Early in the morning September 3rd, showers and storms brought a large swath of 0.5-1.5" to the region. A few lighter rain events occurred over the following week, with showers and storms returning on the 9th and 10th. This event brought up to an inch of rain to primarily southeastern Upper Michigan.

The next big rainmaker came on the 12th, and despite the lack of thunder rainfall totals of generally 0.5-2+" were observed, with the highest amounts over the south-central where several 2-2.75" reports came in. These areas, and Menominee County in particular, continued to receive the brunt of the rainfall through the middle part of the month as another 0.25-0.5" fell there on the 14th. On the morning of the 19th, a swath of 1.5 to as many as 6 inches of rain fell across Menominee, Delta, and southern Schoolcraft Counties. One report of 5.5" measured near Stephenson confirmed radar estimates in southern Menominee County, and the first Flash Flood Warning issued by our office in 2019 was issued in that area.

Yet another swath of 0.5-1" of rain fell across the Lake Michigan border counties on the 22nd into the 23rd, with lesser amounts to the west. But that was flip flopped on the 24th when the bulk of another 1-2 inch rain event came across the west half of the UP. A couple more light rain events came through the last week of the month before the second big widespread thunderstorm event on the 30th mentioned above.

Below is a chart of some of the larger cities in the Upper Peninsula, with monthly precipitation in inches and the percent of normal for the month. Any notable monthly ranks are also included. See figures 1 and 2 below for a smoothed out aerial view of these data, and figures 3 and 4 for the radar-estimated precipitation data. It is clear from these data that, with the exception portions of the Keweenaw Peninsula, the entire area received above normal to well above normal rainfall for the month. This has led to monthly average soil moistures above the 80th percentile over portions of the UP for the third fall in a row heading into the freeze-up season (see figure 5).

Location	Precipitation	% of normal	Rank
WFO Marquette	7.10”	191	2/57
Marquette City	4.08”	129	
Quincy Hill	3.45”	100	
Ironwood	4.53”	112	
Iron Mountain	5.56”	154	12/120
Manistique	6.99”	186	5/82
Munising	5.22”	128	
Newberry*	M	M	
Stambaugh	7.95”	224	3/121

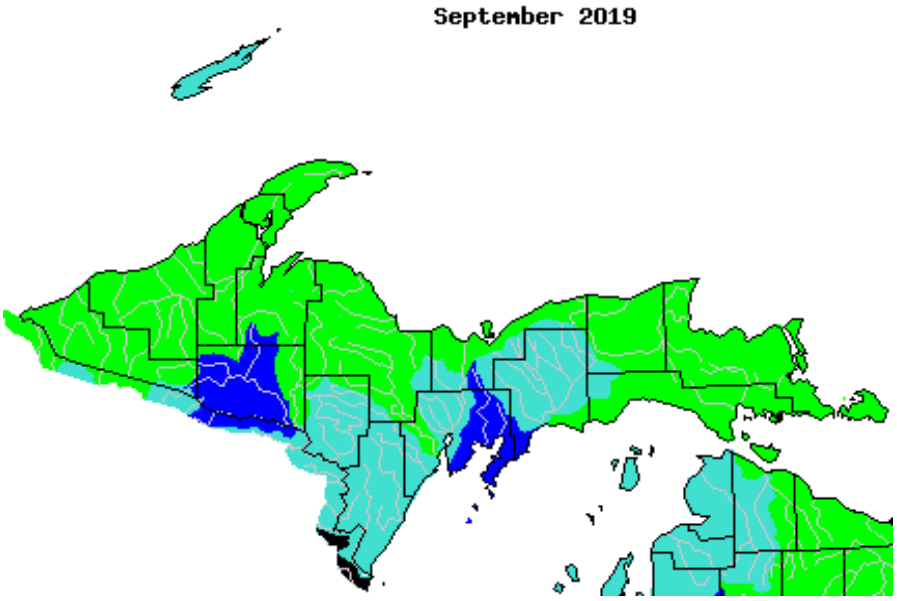
NOTE: Rainfall after 8am EST Sept. 30 will be counted in October stats for all but the NWS Marquette site due to the reporting structure of our cooperative observers.
*Newberry observer did not report a full month of data in September.

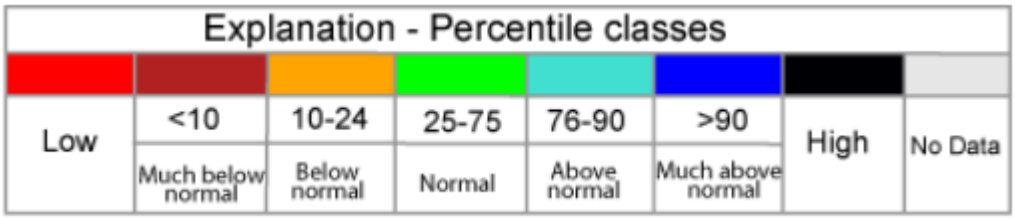
September Flooding

Minor flash flood impacts were reported in Menominee County on September 19th. County Road G-12 was closed briefly in the morning near Stephenson after 4-6” of rain fell over the area. A few other back roads also had minor flooding as reported by Menominee County Dispatch.
On September 30th, minor street flooding was also reported in Ishpeming and Trowbridge Park after 2-3 inches of rain fell in two rounds of storms on relatively saturated ground. These minor impacts were compounded by blocked storm drains as leaves have begun to fall off the trees already.

September River Levels

River levels across the NWS Marquette Hydrologic Service Area (HSA) have generally risen over the last month and are near or above normal over the entire area. Streamflows are the most abnormally high over south-central Upper Michigan, in the Sturgeon Basin of Delta County and the Brule Basin in Iron County.





Drought Discussion

The latest Drought Monitor indicates that earlier rainfall deficits have been wiped out by recent rainfall. No drought conditions are depicted in the Upper Peninsula. For the latest drought status, please go to http://www.drought.gov.

September Products Issued

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

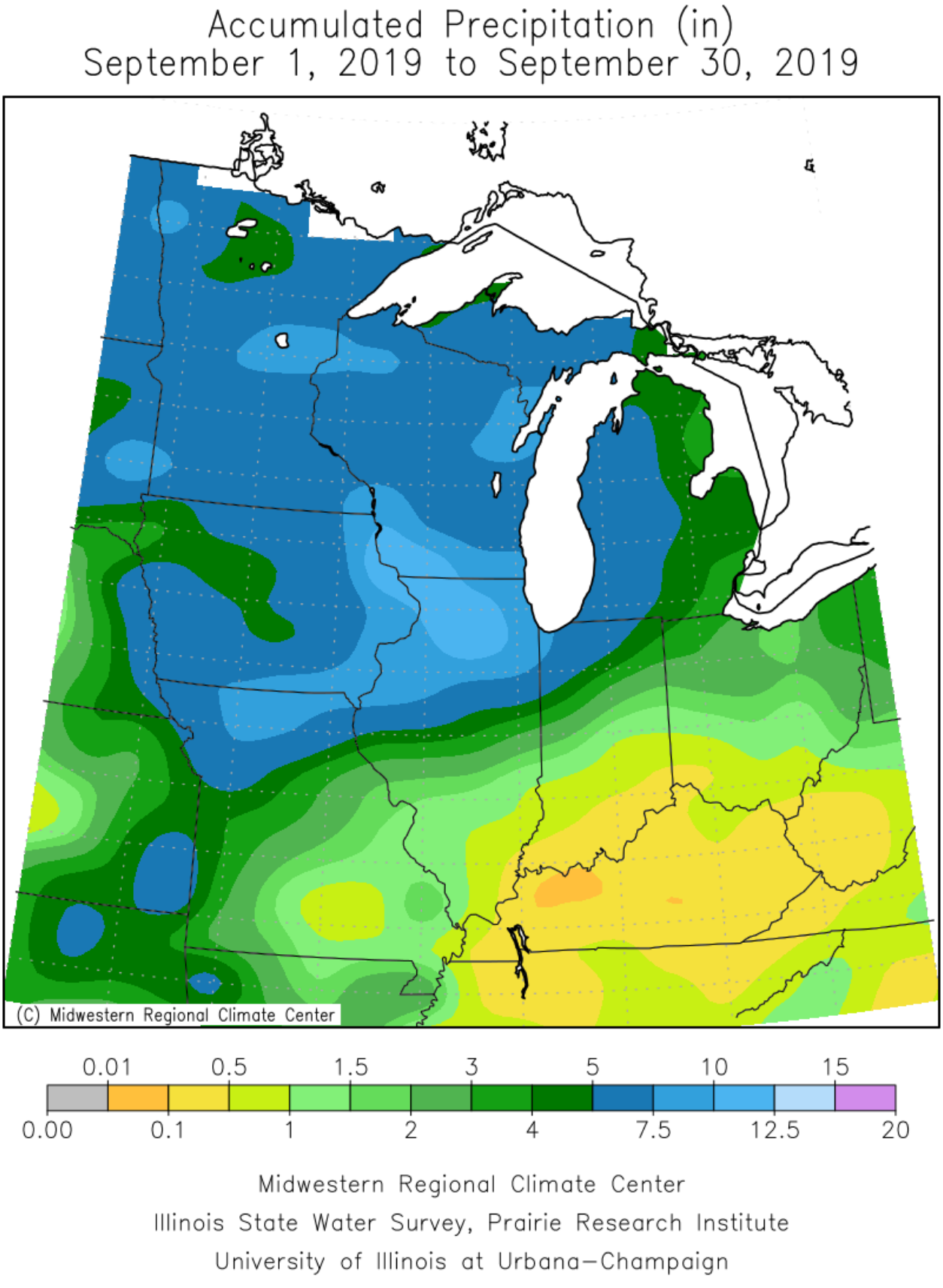


Figure 1. September 2018 Monthly Precipitation Totals.

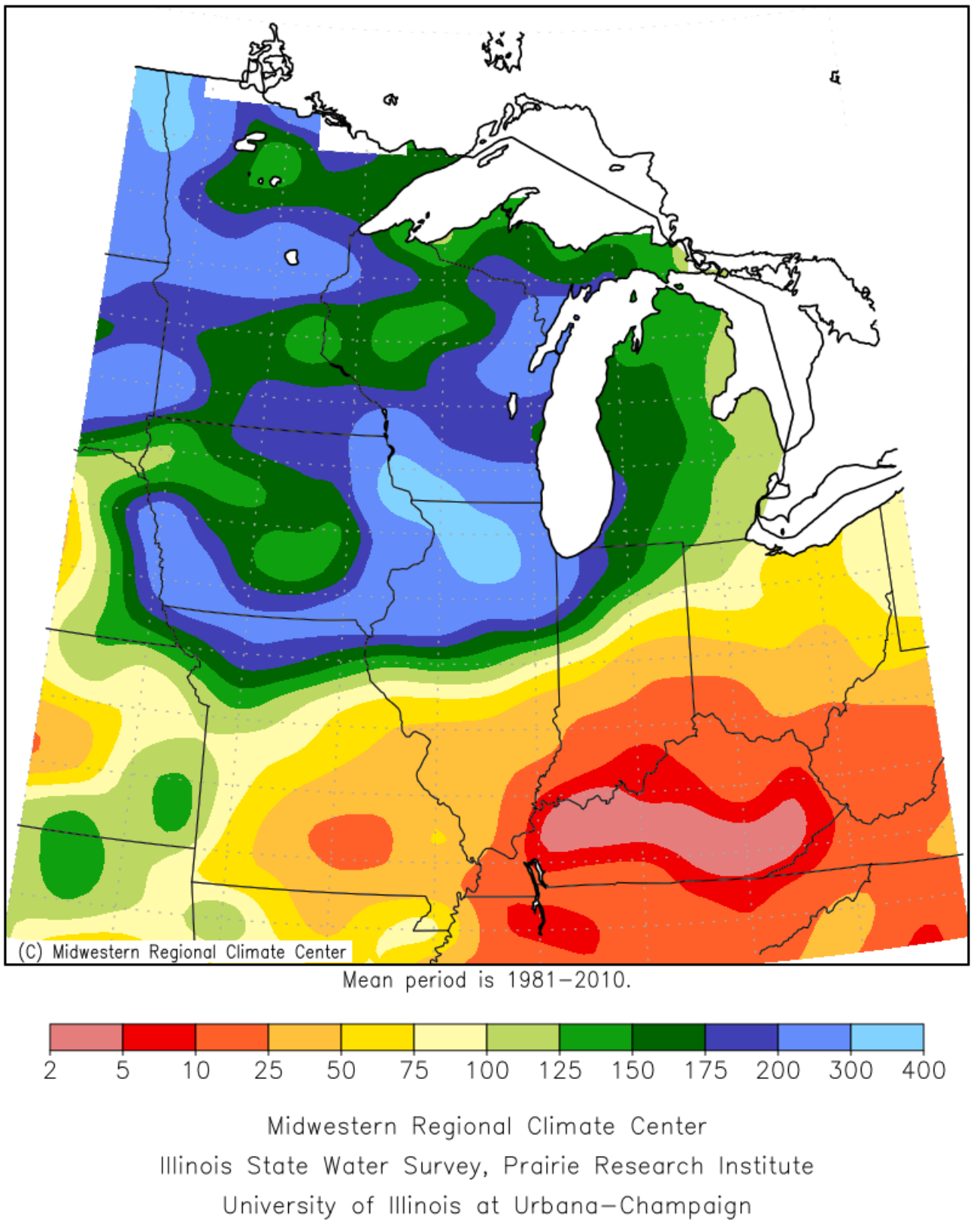


Figure 2. September 2018 Percent of Mean of Accumulated Precipitation

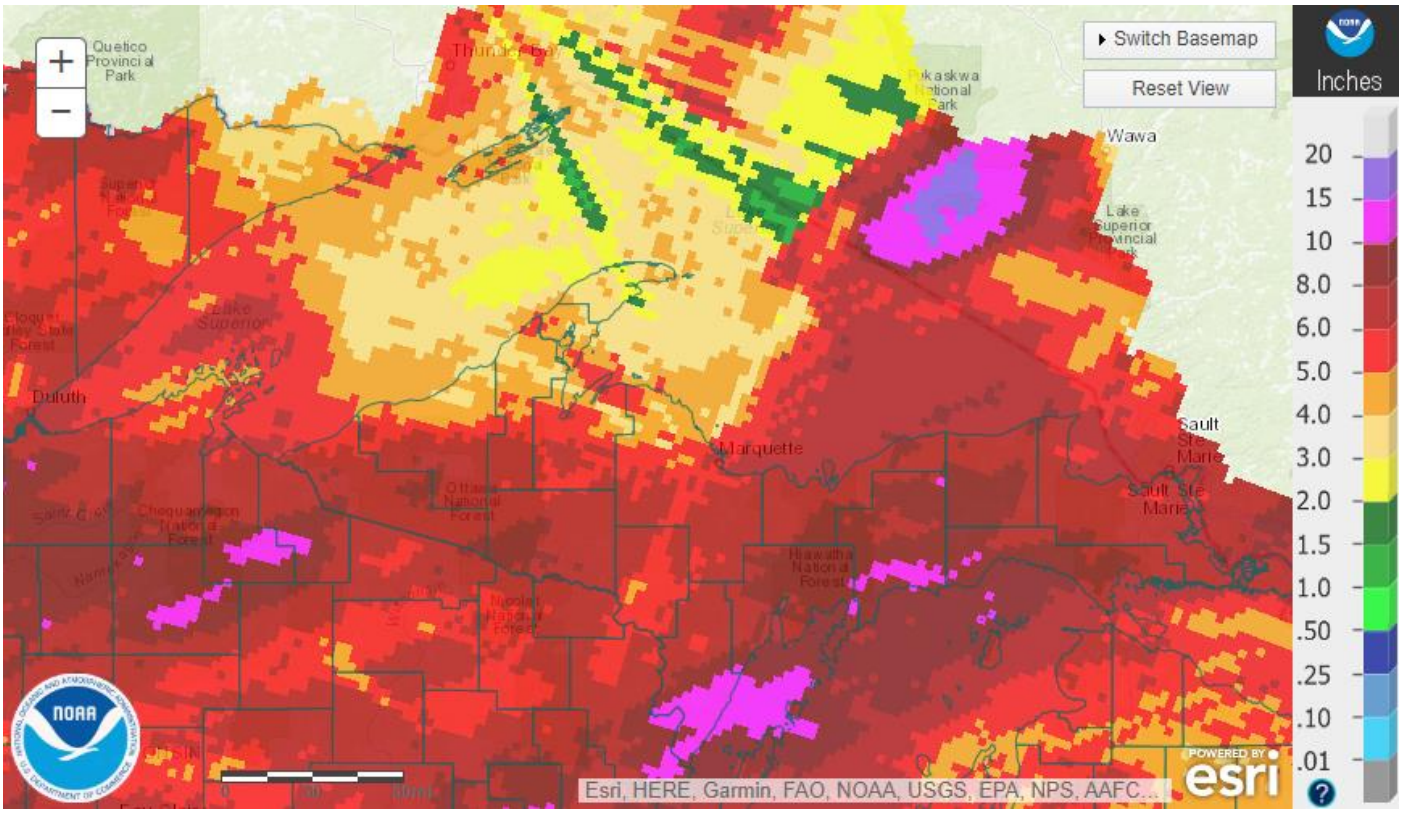


Figure 3. September 2019 AHPS Monthly Precipitation
Note: This data is subject to errors in the estimates produced by the radar, as well as beam blockage across portions of the NW UP.

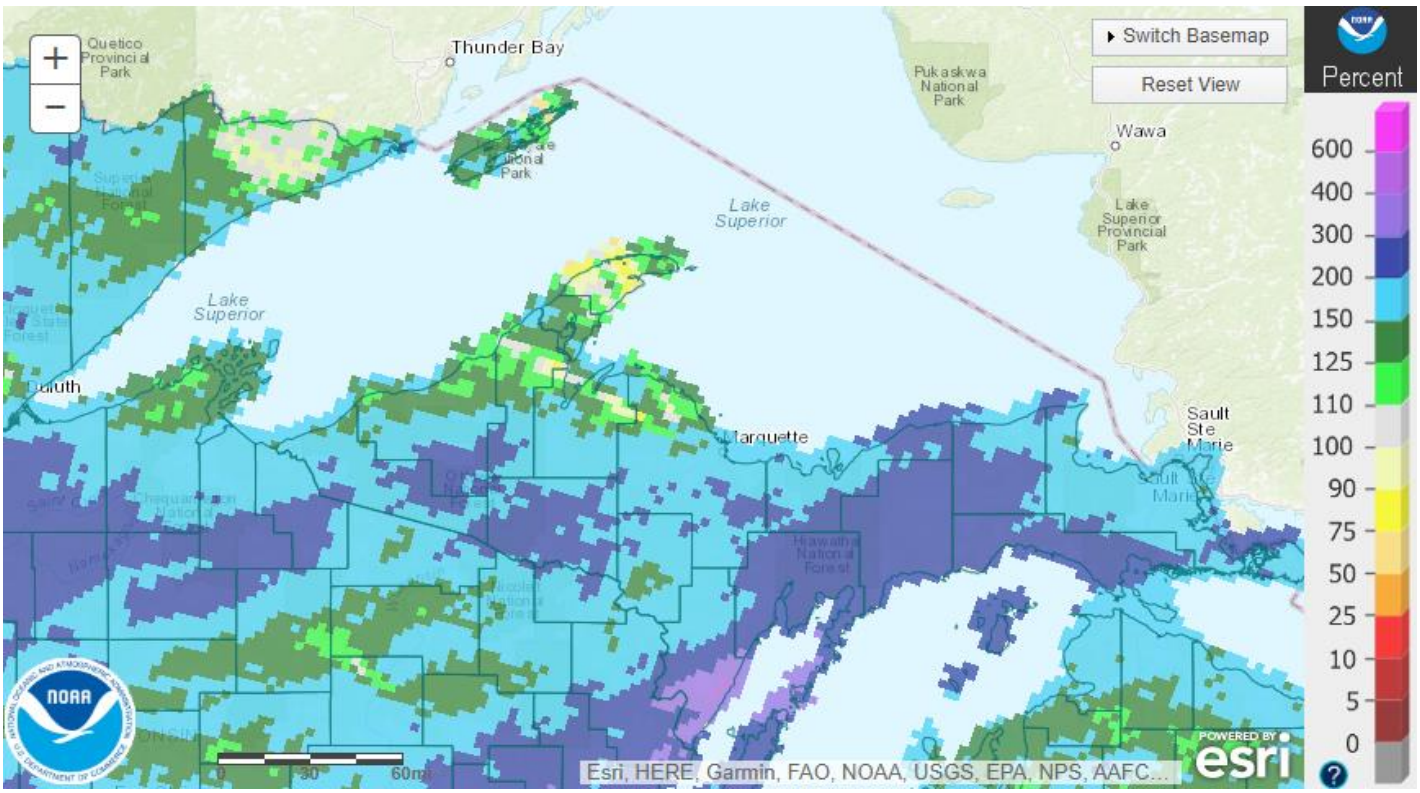


Figure 4. September 2019 AHPS Percent of Mean of Accumulated Precipitation
Note: This data is subject to errors in the estimates produced by the radar, as well as beam blockage across portions of the NW UP.

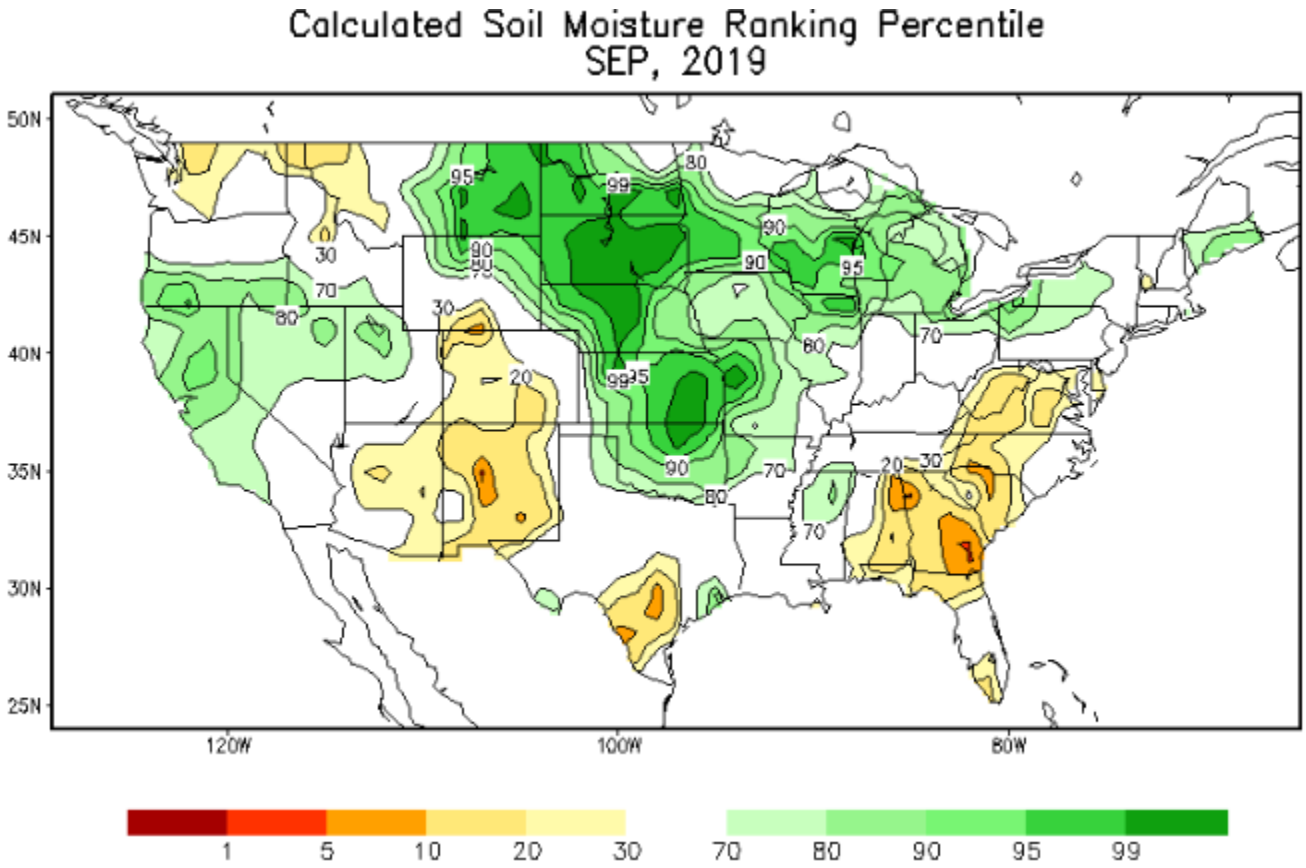


Figure 5: Climate Prediction Center monthly average soil moisture percentile for September 2019