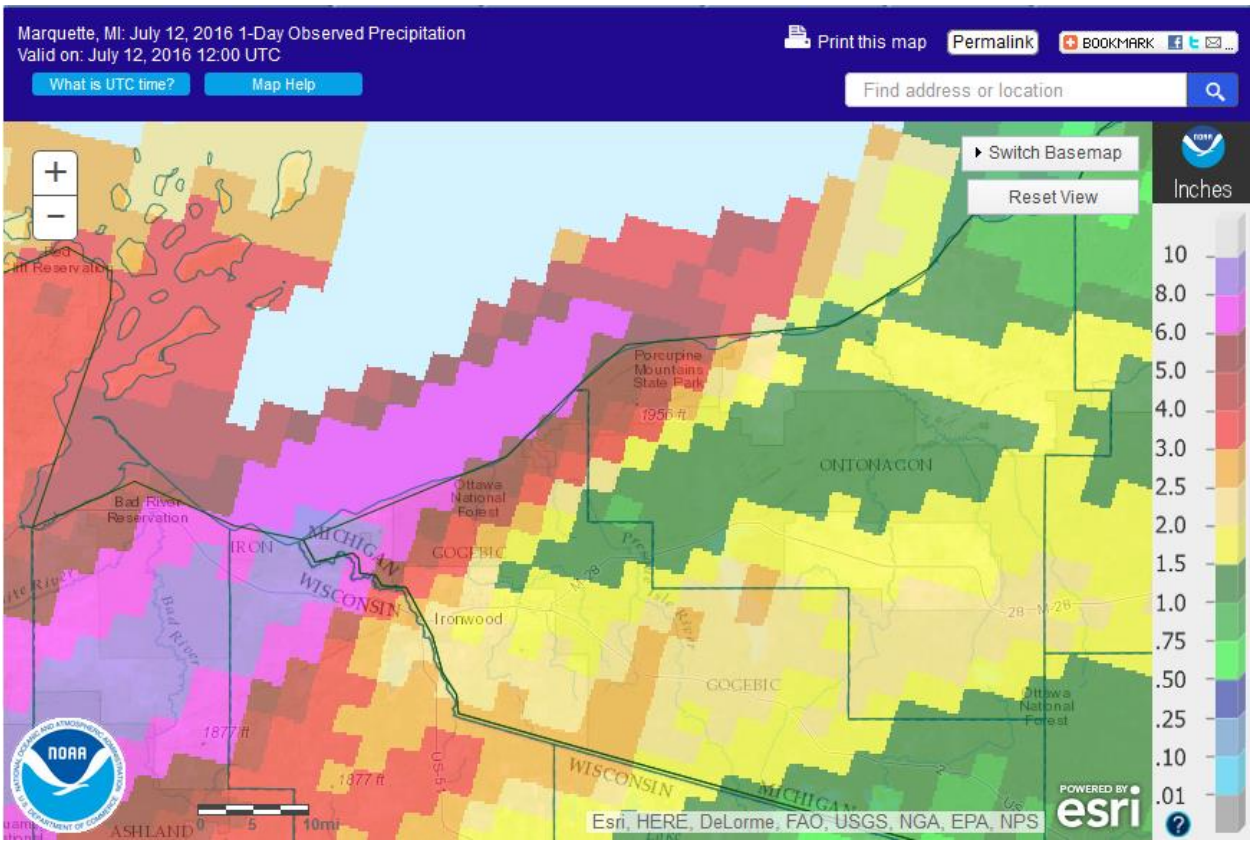
NWS FORM E-5 U.S. DEPARTMENT OF COMMERCE NOAA, NATIONAL WEATHER SERVICE **MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS** TO: NATIONAL WEATHER SERVICE (W/OH12x1) HYDROMETEOROLOGICAL INFO CENTER 1325 EAST-WEST HIGHWAY, RM 7116 SILVER SPRING, MD 20910	HSA OFFICE: **Marquette, MI** REPORT FOR (MONTH / YEAR): **July 2016** DATE: **August 9, 2016** SIGNATURE: **Robin J. Turner, MIC** **Justin Titus, Meteorologist**
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 no flooding occurred within this Hydrologic Service Area.

July Flooding

A flash flood event took place over extreme western Gogebic and Ontonagon Counties from late on July 11th into the 12th. A line of strong to severe thunderstorms stalled for a few hours over western Lake Superior and adjacent land areas from northwest Wisconsin to Saxon Harbor, WI, Little Girl's Point in Michigan, and the far western portions of Porcupine Mountains State Park. Radar estimates and ground observations show that 6 to 10 inches of rain fell in less than 6 hours in the narrow area (see AHPS precipitation estimate graphic below), which is slightly greater than the 1000 year average occurrence interval.



AHPS precipitation estimate from 12:00 UTC Jul 11 to 12:00 UTC Jul 12. Linked here.

Impacts from the event were mainly confined to the narrow area of greatest precipitation near the lakeshore, and included significant damage to road infrastructure along Lake Road between Little Girl's Point and the Wisconsin Border. Due to the extent of that damage, over a hundred

residents were stranded along Lake Road. Additional impacts included culverts being washed out on nearby Powers Road and Brace Road, damage to some trails and a trail bridge in Porcupine Mountains State Park, and damage to infrastructure at Black River Harbor. Thankfully, there were no deaths or injuries reported in Michigan. A state of disaster was declared for Gogebic County. Impacts from the flooding were magnified by damage from 70-90 mph thunderstorm winds and two tornadoes that also hit western Gogebic County from the same line of storms that caused the flooding, resulting in further straining of emergency resources and widespread power outages.

For the impacted area, NWS Marquette issued a Flood Advisory 1 hour and 24 minutes prior to the first report of flooding and a Flash Flood Warning 50 minutes prior to the first report. NWS Marquette also provided decision support services to Gogebic County for almost 3 weeks following the event as recovery efforts were underway.

July Precipitation

July precipitation was generally near to well above normal (110-250% of normal) over far western Upper Michigan as well as southern Schoolcraft and far southern Luce Counties. Elsewhere, precipitation was generally near to below normal (50-110% of normal).

Below is a chart of some of the larger cities in the Upper Peninsula, with monthly precipitation in inches, the amount of inches above or below normal for the month and any applicable record high or low rank.

Location	Precipitation	Above/Below	Rank
WFO Marquette	3.49	0.65	
Marquette City	3.51	0.69	
Houghton Airport	2.43	-0.06	
Ironwood	5.93	1.83	
Iron Mountain	2.32	-1.13	
Manistique	4.73	1.74	
Munising	4.49	-1.22	
Newberry	4.68	No Data	

Drought Discussion

The August 2, 2016 release of the U.S. Drought Monitor did not indicate drought conditions across Upper Michigan. For the latest drought status, please go to http://www.drought.gov.

July River Levels

According to the United States Geological Survey, Upper Michigan July average streamflow generally ranged from above normal (75-90 percentile) in basins from Ironwood through the Keweenaw and across the northern Huron Mountains) to normal (25-75 percentile) in most other basins. The Paint and Ford River Basins were below normal (10-24 percentile).

July Products Issued

31 – Hydrologic Summary
2 – Flash Flood Statement
1 – Flash Flood Warning
1 – Flood Advisory
1 – Hydrologic Outlook