



# Monthly Hydrometeorological Report

## Report for August 2023

<b>NWS FORM E-5</b>	U.S. DEPARTMENT OF COMMERCE NOAA, NATIONAL WEATHER SERVICE	HSA OFFICE: <b>Marquette, MI</b>
<b>MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS</b>		REPORT FOR (MONTH / YEAR): <b>August 2023</b>
TO: NATIONAL WEATHER SERVICE (W/OH12x1) HYDROMETEOROLOGICAL INFO CENTER 1325 EAST-WEST HIGHWAY, RM 7116 SILVER SPRING, MD 20910		DATE: <b>September 11th, 2023</b>
		SIGNATURE: <b>Evan Kutta, Hydro Program Manager</b> <b>Robin J. Turner, MIC</b>
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.

### Summary

Rainfall was near to below-normal across Upper Michigan during August with values ranging from 1.97” at Manistique to 3.66” at WFO Marquette (Table 1). August temperatures were below normal at all sites with departures from normal ranging from -0.9°F to -2.5°F. Despite severe drought continuing across portions of Gogebic and Ontonagon Counties (Figure 4), streamflow was near normal during August across all of Upper Michigan (Figure 1). For the meteorological summer, rainfall was above normal and more than last year in the Marquette area and was less than last year elsewhere with values between 68% and 87% of normal (Table 2). For the year-to-date, observation sites ranged from 99% to 155% of normal precipitation with 35.54” of precipitation at WFO Marquette ranking as the wettest January through August time frame on record (Table 4). Summer temperatures were cooler than last year and were between -0.2°F and -2.0°F below normal except for Iron Mountain that ended up being 0.5°F above normal (Table 3). For the year-to-date, temperatures were warmer than last year and were between 0.7°F and 2.2°F above normal across Upper Michigan with WFO ranking as the 10<sup>th</sup> warmest January through August time period on record (Table 5).

Location	Precipitation	% of Normal	Snowfall	Average Temperature	Departure from Normal
WFO Marquette	3.66”	128%	0.0”	64.6°F	-1.2°F
Marquette City	2.56”	111%	0.0”	62.4°F	-1.6°F
Quincy Hill	2.66”	M	0.0”	M	M
Ironwood	3.30”	88%	0.0”	62.9°F	-1.3°F
Iron Mountain	3.05”	90%	0.0”	65.5°F	-1.2°F
Manistique	1.97”	64%	0.0”	61.3°F	-2.5°F
Munising	2.42”	77%	0.0”	62.5°F	-0.9°F
Stambaugh	2.39”	77%	0.0”	60.6°F	-0.9°F

**Table 1.** Observed precipitation at long-term climate sites across Upper Michigan for August 2023.  
**NOTE:** Precipitation after 8 AM EST August 31<sup>st</sup> was counted in September stats for all but the WFO Marquette site due to the reporting structure of our cooperative observers.



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## Summer (June – August) Precipitation Summary

Location	Precipitation	% of Normal	Rank	Last Year
WFO Marquette (Records: 1962-2023)	13.59"	142%	6 <sup>th</sup> wettest	9.86"
Marquette City (Records: 1875-2023)	10.14"	113%	46 <sup>th</sup> wettest	7.60"
Ironwood (Records: 1901-2023)	8.00"	68%	16 <sup>th</sup> driest	10.64"
Iron Mountain (Records: 1902-2023)	9.09"	84%	38 <sup>th</sup> driest	11.69"
Manistique (Records: 1938-2023)	6.59"	69%	13 <sup>th</sup> driest	8.55"
Munising (Records: 1912-2023)	8.34"	87%	45 <sup>th</sup> driest	9.45"
Stambaugh (Records: 1900-2023)	9.33"	81%	32 <sup>nd</sup> driest	10.05"

**Table 2.** Total observed precipitation at long-term climate sites across Upper Michigan for June, July, and August 2023.

## Summer (June – August) Temperature Summary

Location	Avg Temp	Departure	Rank	Last Year
WFO Marquette (Records: 1962-2023)	62.7°F	-0.2°F	27 <sup>th</sup> coolest	64.8°F
Marquette City (Records: 1875-2023)	62.5°F	-1.0°F	52 <sup>nd</sup> coolest	64.5°F
Ironwood (Records: 1901-2023)	63.6°F	-0.8°F	43 <sup>rd</sup> coolest	64.4°F
Iron Mountain (Records: 1902-2023)	66.1°F	+0.5°F	49 <sup>th</sup> warmest	67.0°F
Manistique (Records: 1938-2023)	60.7°F	-2.0°F	15 <sup>th</sup> coolest	62.0°F
Munising (Records: 1912-2023)	61.0°F	-1.3°F	34 <sup>th</sup> coolest	62.4°F
Stambaugh (Records: 1900-2023)	61.4°F	-1.5°F	30 <sup>th</sup> coolest	62.4°F

**Table 3.** Average temperature observed at long-term climate sites across Upper Michigan for June, July, and August 2023.



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## Year-to-Date Precipitation Summary

Location	Precipitation	% of Normal	Rank	Last Year
WFO Marquette (Records: 1962-2023)	35.54"	155%	1 <sup>st</sup> wettest	28.64"
Marquette City (Records: 1875-2023)	25.57"	128%	9 <sup>th</sup> wettest	19.02"
Ironwood (Records: 1901-2023)	27.21"	117%	25 <sup>th</sup> wettest	25.55"
Iron Mountain (Records: 1902-2023)	21.90"	108%	40 <sup>th</sup> wettest	24.30"
Manistique (Records: 1938-2023)	19.68"	103%	36 <sup>th</sup> driest	21.90"
Munising (Records: 1912-2023)	29.09"	132%	6 <sup>th</sup> wettest	26.26"
Stribling (Records: 1900-2023)	21.02"	99%	53 <sup>rd</sup> wettest	23.79"

**Table 4.** Total observed precipitation at long-term climate sites across Upper Michigan for January through August 2023.

## Year-to-Date Temperature Summary

Location	Avg Temp	Departure	Rank	Last Year
WFO Marquette (Records: 1962-2023)	43.3°F	+2.2°F	10 <sup>th</sup> warmest	41.1°F
Marquette City (Records: 1875-2023)	44.3°F	+1.5°F	45 <sup>th</sup> warmest	42.0°F
Ironwood (Records: 1901-2023)	43.0°F	+1.0°F	47 <sup>th</sup> warmest	39.6°F
Iron Mountain (Records: 1902-2023)	45.9°F	+2.2°F	17 <sup>th</sup> warmest	43.1°F
Manistique (Records: 1938-2023)	43.0°F	+0.7°F	42 <sup>nd</sup> warmest	40.4°F
Munising (Records: 1912-2023)	43.3°F	+1.4°F	28 <sup>th</sup> warmest	40.9°F
Stribling (Records: 1900-2023)	41.7°F	+0.7°F	52 <sup>nd</sup> warmest	38.5°F

**Table 5.** Total observed precipitation at long-term climate sites across Upper Michigan for January through August 2023.



Flooding Conditions

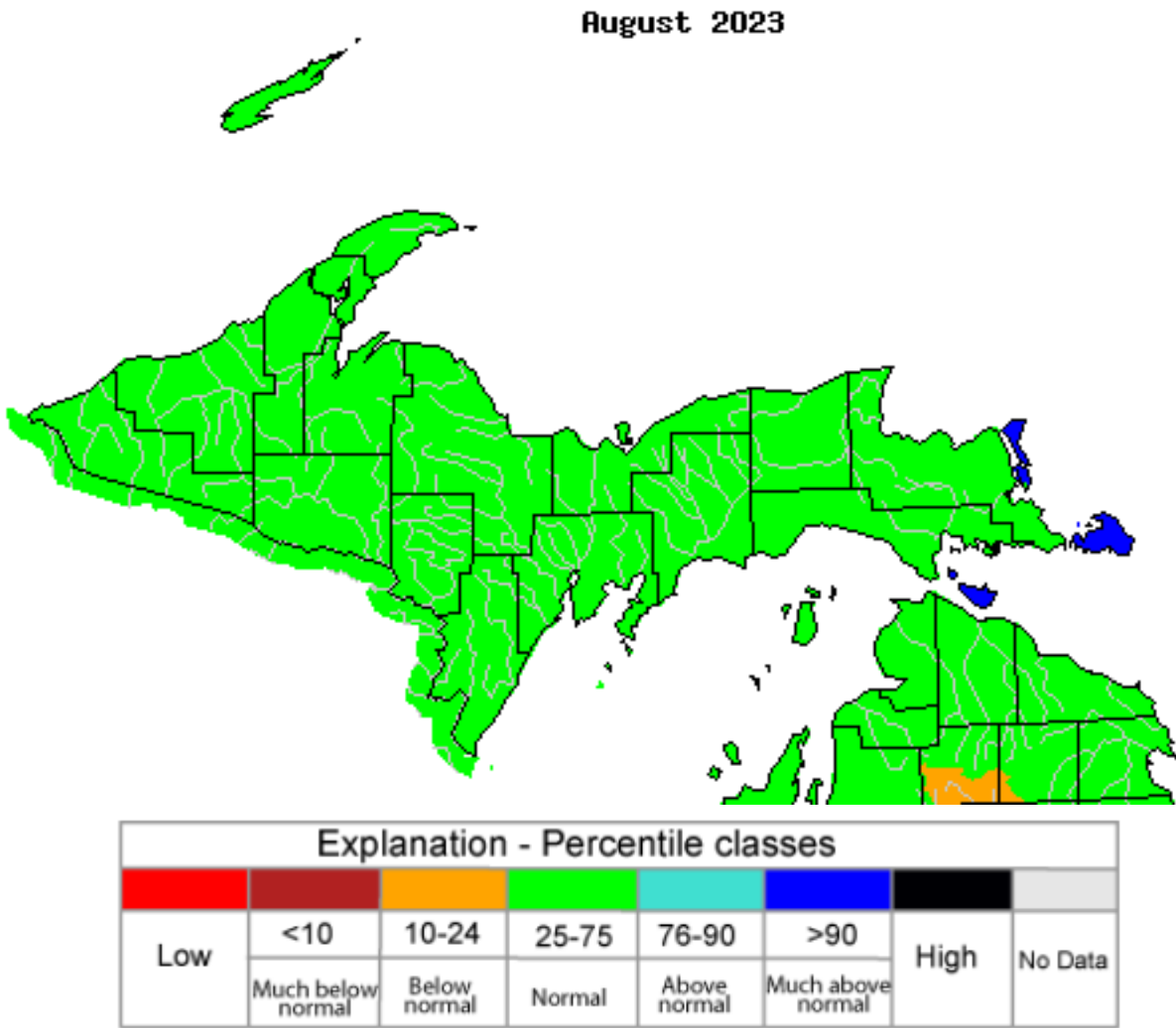
There were no flooding concerns during the month of August.

Media Links

None.

River Conditions

Streamflow was near normal across all of Upper Michigan during August 2023.



**Figure 1:** USGS monthly average streamflow in August 2023 across Upper Michigan

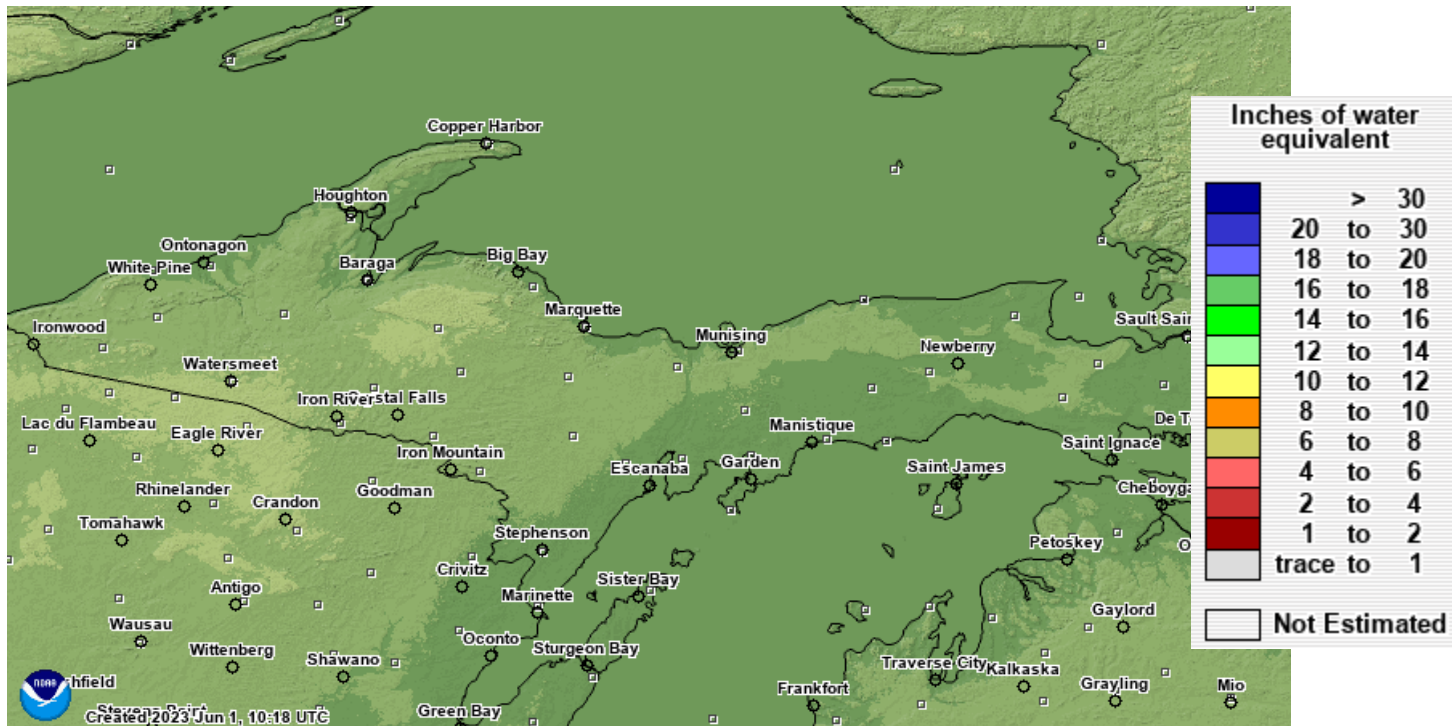


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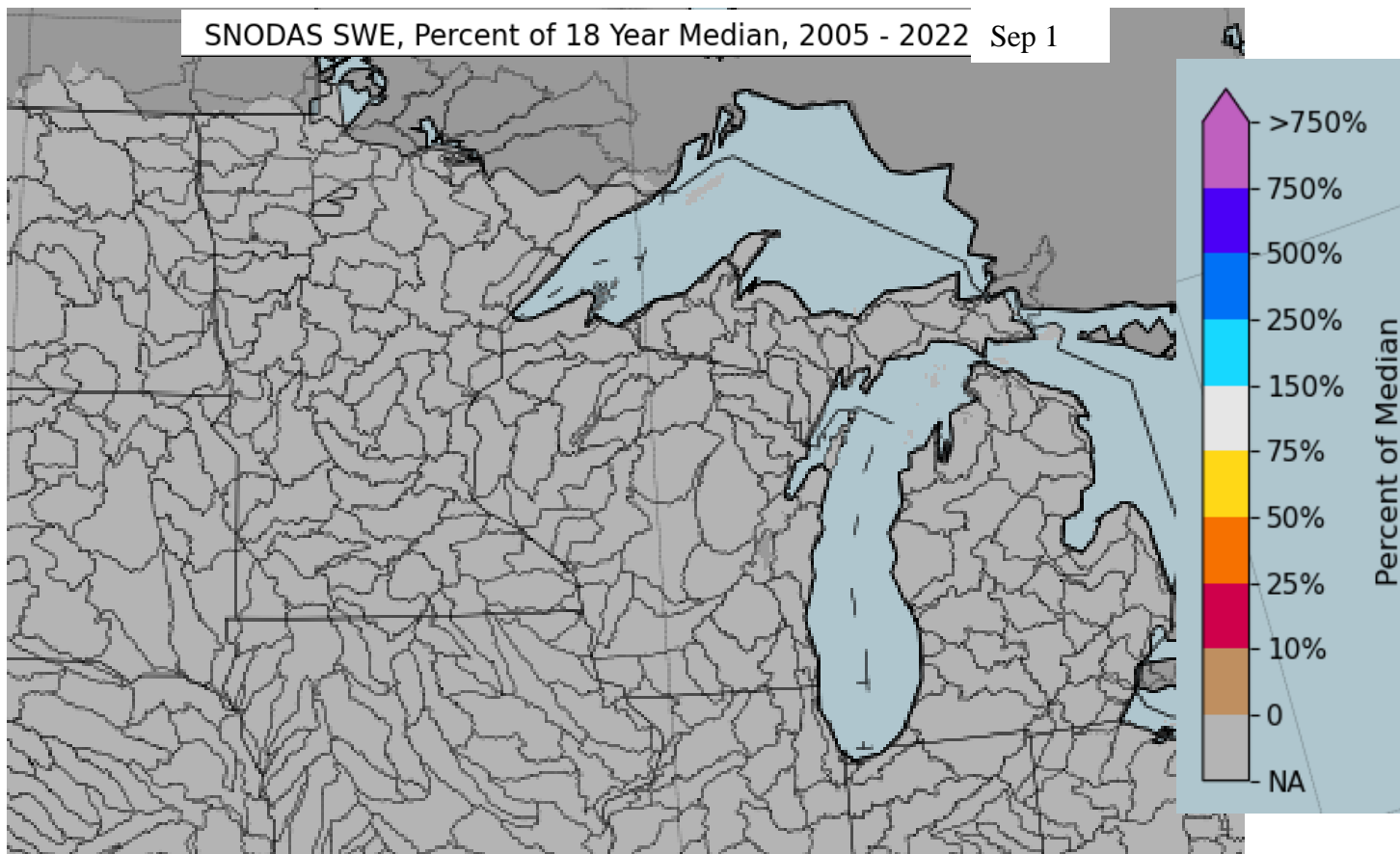
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## Snowpack SWE (Snow Water Equivalent) Conditions

On summer vacation!



**Figure 2:** Current modeled snowpack snow water equivalent on September 1<sup>st</sup>.



**Figure 3:** Modeled snow water equivalent for drainage basins on September 1<sup>st</sup> as a percent of 18-year median.

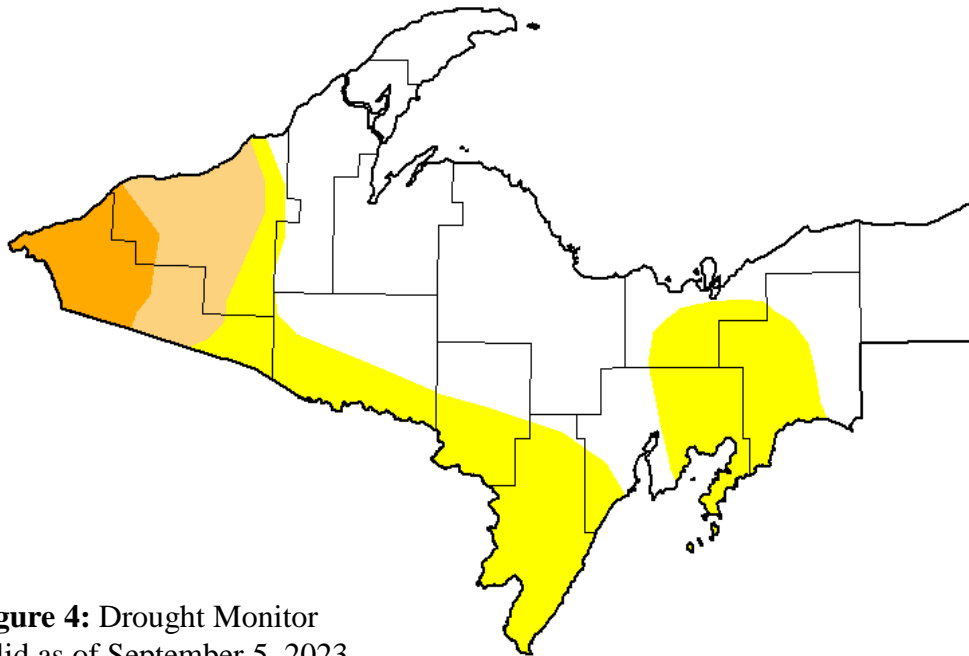


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## Drought Discussion

Severe drought continues across far western Upper Michigan with abnormally dry conditions near the Wisconsin state line and portions of the eastern UP. For the latest drought status, please visit <http://www.drought.gov>.



**Figure 4:** Drought Monitor valid as of September 5, 2023.

**September 5, 2023**

(Released Thursday, Sep. 7, 2023)

Valid 8 a.m. EDT

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	55.99	44.01	13.42	5.43	0.00	0.00
Last Week 08-29-2023	55.86	44.14	13.45	5.51	0.00	0.00
3 Months Ago 06-06-2023	91.79	8.21	0.00	0.00	0.00	0.00
Start of Calendar Year 01-03-2023	93.80	6.20	0.00	0.00	0.00	0.00
Start of Water Year 09-27-2022	88.48	11.52	1.94	0.00	0.00	0.00
One Year Ago 09-06-2022	94.97	5.03	0.00	0.00	0.00	0.00

### Intensity:

None	D2 Severe Drought
D0 Abnormally Dry	D3 Extreme Drought
D1 Moderate 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:

Richard Tinker  
CPC/NOAA/NWS/NCEP



[droughtmonitor.unl.edu](http://droughtmonitor.unl.edu)

## Hydro Products Issued

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



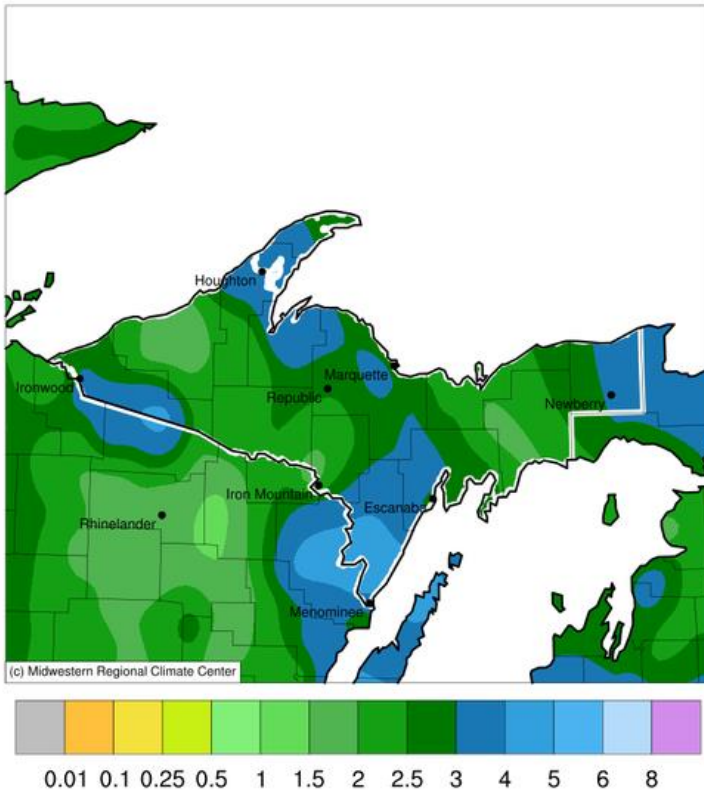


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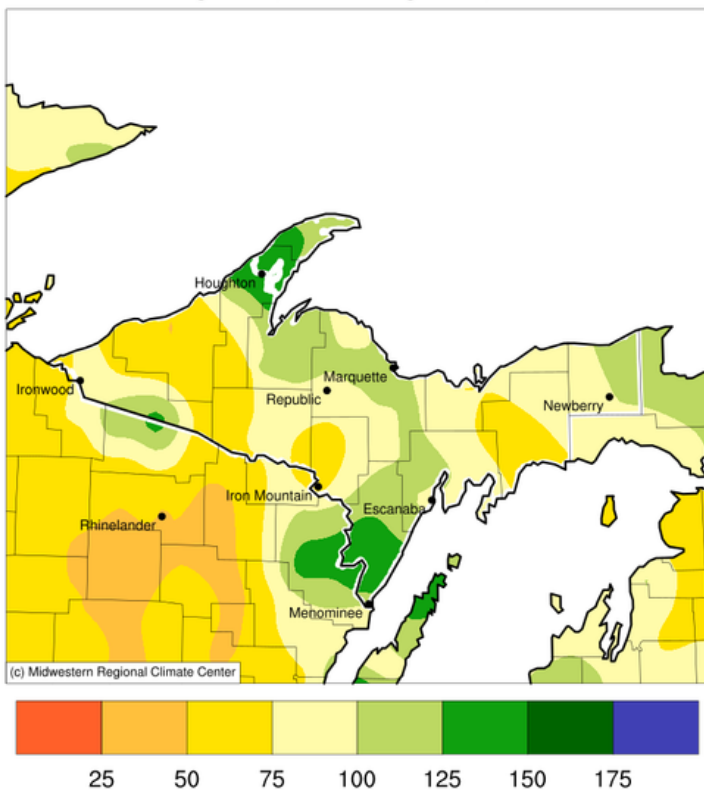
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## Precipitation Summary

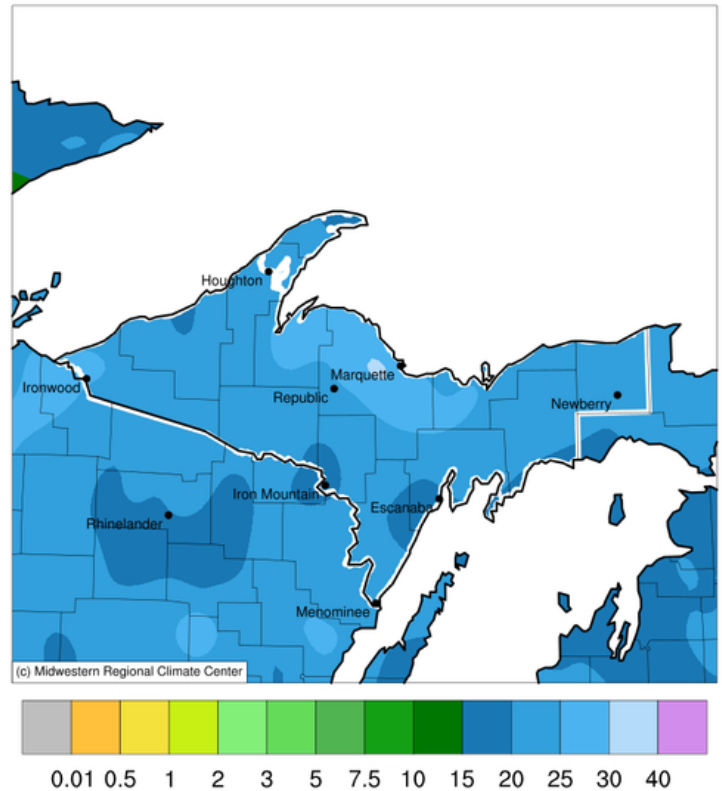
**Accumulated Precipitation (in)**  
August 01, 2023 to August 31, 2023



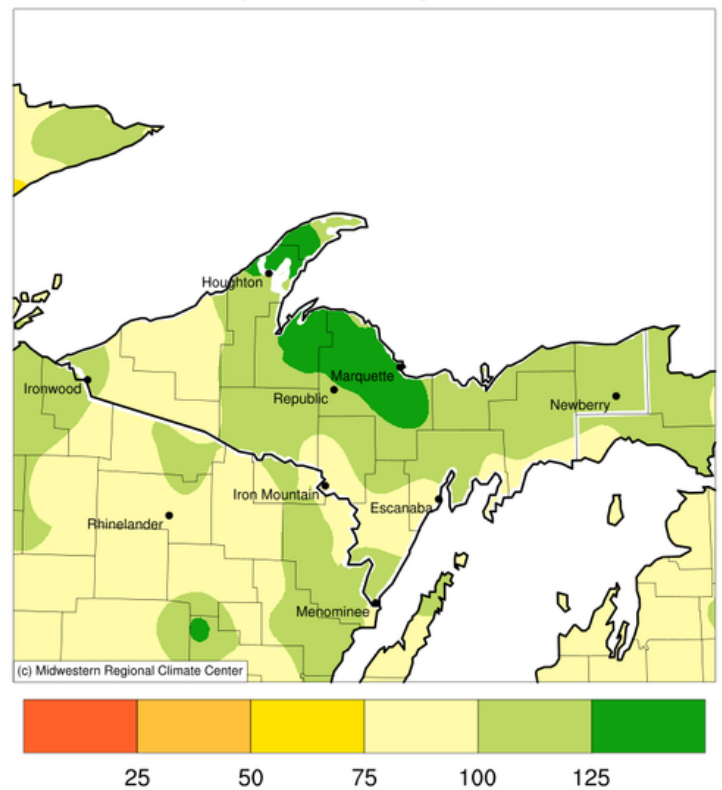
**Accumulated Precipitation (in): Percent of 1991-2020 Normals**  
August 01, 2023 to August 31, 2023



**Accumulated Precipitation (in)**  
January 01, 2023 to August 31, 2023



**Accumulated Precipitation (in): Percent of 1991-2020 Normals**  
January 01, 2023 to August 31, 2023



**Figure 5:** August 2023 Monthly Precipitation Totals (top left), year-to-date accumulated precipitation (top right), August 2023 percent of normal precipitation (bottom left), year-to-date percent of normal precipitation (bottom right).



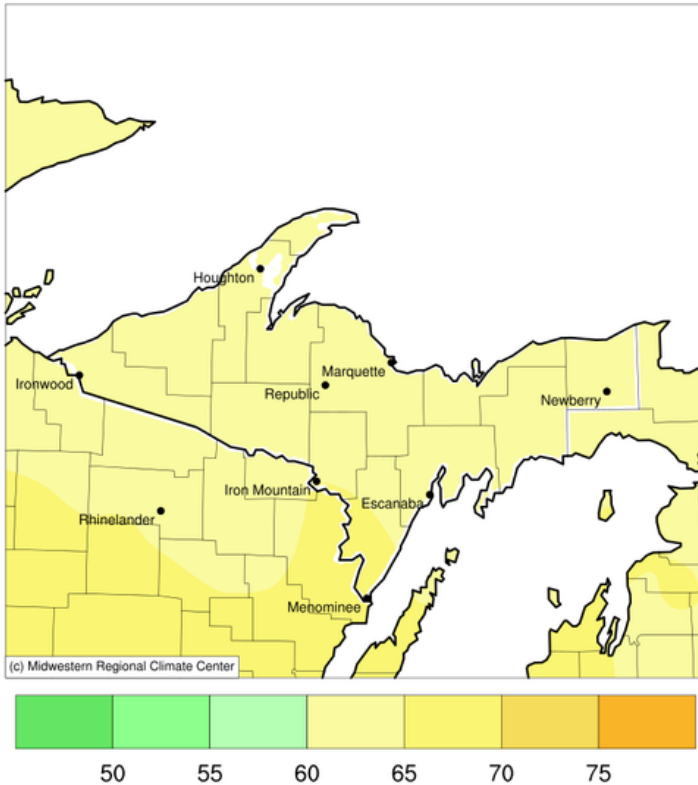
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## Temperature Summary

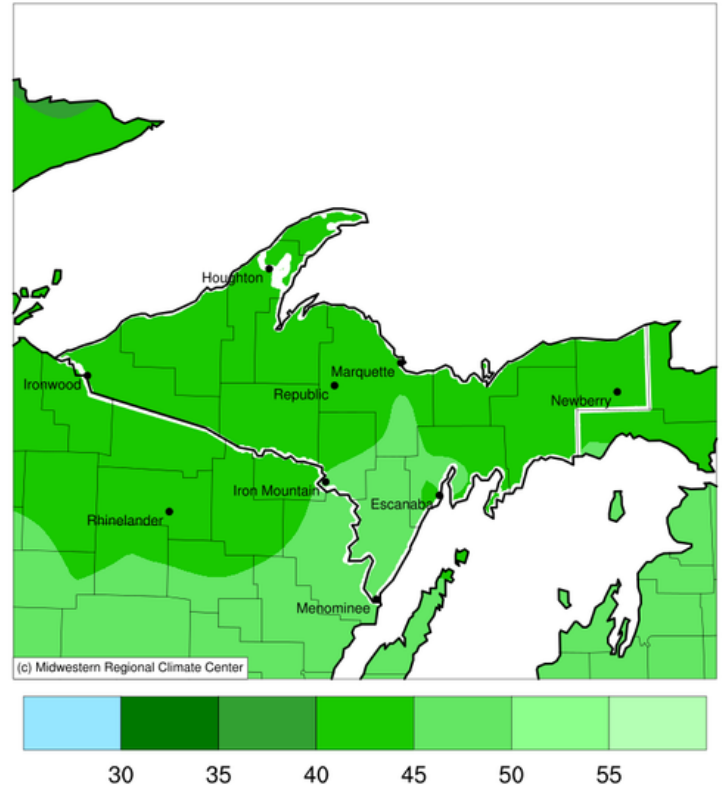
Average Temperature (°F)

August 01, 2023 to August 31, 2023



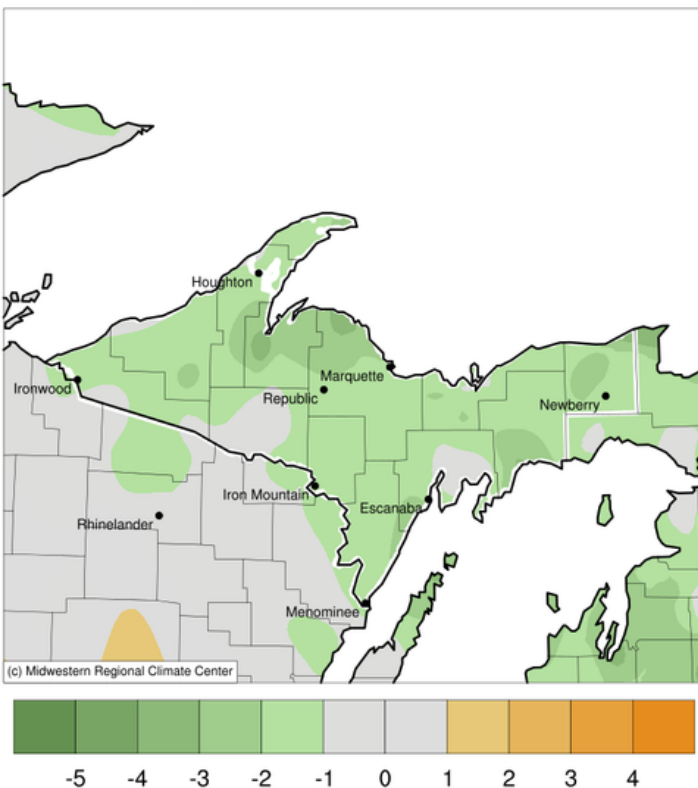
Average Temperature (°F)

January 01, 2023 to August 31, 2023



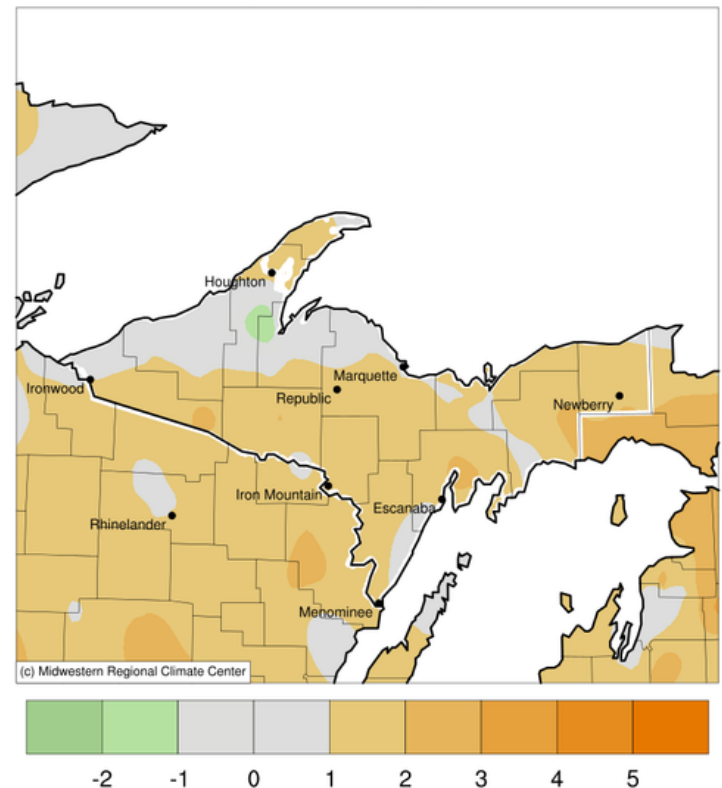
Average Temperature (°F): Departure from 1991-2020 Normals

August 01, 2023 to August 31, 2023



Average Temperature (°F): Departure from 1991-2020 Normals

January 01, 2023 to August 31, 2023



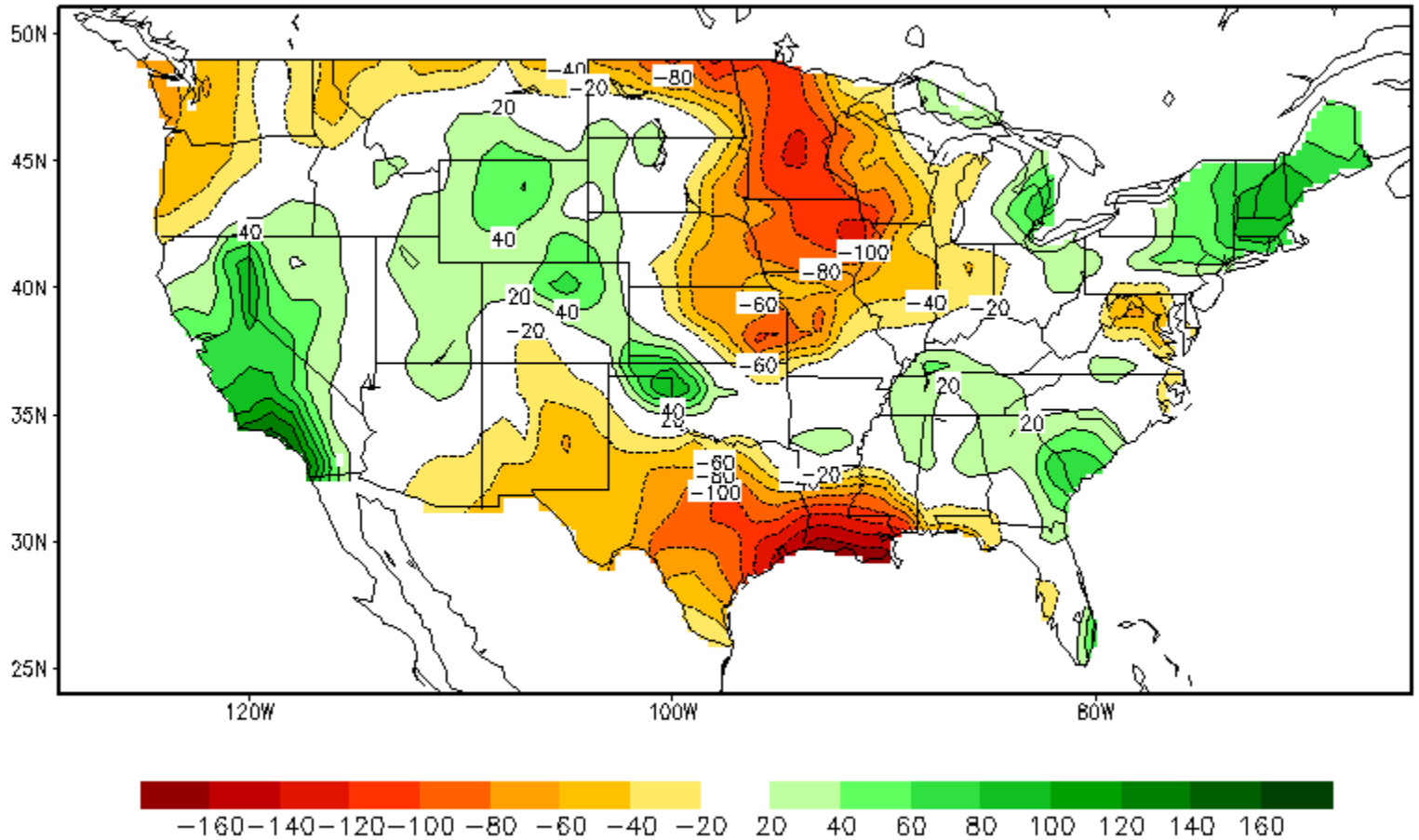
**Figure 5:** August 2023 monthly temperature (top left), year-to-date temperature (top right), August 2023 temperature departure from normal (bottom left), year-to-date temperature departure from normal (bottom right).





### Soil Moisture Anomaly

Calculated Soil Moisture Anomaly (mm)  
AUG, 2023



**Figure 7:** Climate Prediction Center's monthly average soil moisture anomaly for August 2023.