

NWS FORM E-5	U.S. DEPARTMENT OF COMMERCE NOAA, NATIONAL WEATHER SERVICE	HSA OFFICE: Marquette, MI
MONTHLY REPORT O	F RIVER AND FLOOD CONDITIONS	REPORT FOR (MONTH / YEAR): December 2024
TO: NATIONAL WEATHER SERVICE (W/OH12x1) HYDROMETEOROLOGICAL INFO CENTER 1325 EAST-WEST HIGHWAY, RM 7116 SILVER SPRING, MD 20910		DATE: January 10th, 2025
		SIGNATURE: James Salzwedel, OPL Daniel Jablonski, HPM Ryan Metzger, MIC
When no flooding occur	s include miscellaneous river conditions such	as significant rises record low stages ice

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

X

December saw near below normal precipitation over the south-central, far west, and in the Keweenaw while the east half observed normal precipitation (Figure 6). Abnormally dry to moderate drought conditions continue over the interior west; especially along the Wisconsin line (Figure 4). The exception to this was in the northeast Upper Peninsula where Munising saw 179% of normal precipitation (Table 1). The highest precipitation totals were observed from Grand Marais east to Whitefish Point (Figure 5). This portion of Michigan Climate Zone 02 received 150% to 175% percent of the normal accumulated precipitation for the month of December (Figure 6). A big contributing factor to this was a period of prolonged northwest wind lake effect snow, which over the course of a week or so, dropped multiple feet of snow in the snow-belt east of Munising along Lake Superior.

The Year-to-Date temperature summary displays each of the climate stations ranked as a 10th place warmest or better. WFO Marquette experienced the warmest year on record as the average temperature was 44.1°F (Table 3). This narrowly exceeds the previous warmest year in 2012. In fact, temperatures have been above normal in 15 out of the last 16 months at WFO Marquette in Negaunee Township. The average temperature departure from normal was 4.1 degrees at both WFO Marquette and at Iron Mountain. Munising and Iron Mountain both achieved their second warmest years (Table 3). December was no exception to this year-long pattern, with temperatures later in the month warming well above normal. Overnight lows at times stayed mainly above freezing. This contributed to more rainfall over snow with passing systems and enabled near normal precipitation for much of Upper Michigan, despite most seeing below normal snowfall (Table 1). The observed precipitation did keep river conditions near normal in December; the only outlier was the Sturgeon River Basin in Baraga and Houghton counties which yielded above normal streamflow (Figure 1). Munising ended the year in a top five wettest standing.

Below normal snowfall also produced below normal SWE values. Only one region in the east half; over the Manistique River Basin showcased above normal SWE conditions (Figure 3). Despite six feet of snowfall observed at Painesdale during December; the Copper Country shoreline and the Keweenaw saw below normal SWE (Figure 3). The soil moisture anomaly was just below normal for most of the U.P. during the month of December (Figure 7) while shallow soil moisture conditions were mainly wet.



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Report for December 2024

Location	Precipitation	% of Normal Precip / Snow	Snowfall
WFO Marquette	2.44"	94% / 73%	29.0"
Marquette City	1.70"	84% / 71%	15.5"
Quincy Hill	4.40"	М	55.2"
Ironwood	2.04"	91% / 68%	24.3"
Iron Mountain	1.77"	113% / 43%	6.0"
Manistique	2.27"	123%	16.0"
Munising	5.59"	179% / 185%	63.7"
Stambaugh	1.26"	92% / 64%	9.3"

Table 1. Observed liquid equivalent precipitation, percent of normal, and snowfall at long-term climate sites across the U.P. for Dec. 2024.

<u>NOTE</u>: Precipitation after 8 AM EST Dec. 31st was counted in Jan. stats for all but the WFO Marquette site due to the reporting structure of our cooperative observers.

Year-to-Date Precipitation Summary

Location	Precipitation	% of Normal	Rank	Last Year
WFO Marquette (Records: 1962-2023)	40.40"	110%	17 th wettest	44.83"
Marquette City (Records: 1875-2023)	32.17"	105%	62 nd wettest	33.63"
Ironwood (Records: 1901-2023)	33.66"	94%	55 th driest	38.66"
Iron Mountain (Records: 1902-2023)	30.97"	104%	40 th wettest	28.65"
Manistique (Records: 1938-2023)	33.33"	107%	19 th wettest	29.95"
Munising (Records: 1912-2023)	47.64"	131%	5 th wettest	41.24"
Stambaugh (Records: 1900-2023)	30.68"	101%	53 rd wettest	27.25"

Table 2. Total observed precipitation at long-term climate sites across the U.P. for Jan. through Dec. 2024.

Year-to-Date Temperature Summary

Location	Avg Temp	Departure	Rank	Last Year
WFO Marquette (Records: 1962-2023)	44.1°F	+4.1°F	Warmest	42.8°F
Marquette City (Records: 1875-2023)	46.5°F	+3.7°F	5 th warmest	44.4°F
Ironwood (Records: 1901-2023)	43.7°F	+3.0°F	4 th warmest	42.3°F
Iron Mountain (Records: 1902-2023)	46.3°F	+4.1°F	2 nd warmest	44.8°F
Manistique (Records: 1938-2023)	43.9°F	+1.9°F	10 th warmest	42.8°F
Munising (Records: 1912-2023)	45.0°F	+3.4°F	2 nd warmest	43.3°F
Stambaugh (Records: 1900-2023)	42.2°F	+2.3°F	9 th warmest	41.0°F

Table 3. Total observed average temperatures at long-term climate sites across the U.P. for Jan. through Dec. 2024.



Flooding Conditions

There were no flooding concerns during the month of December 2024.

Media Links

None.

River Conditions

Streamflow was near normal across much of Upper Michigan during December 2024. Streamflow for the Sturgeon River basin in Baraga and Houghton counties was above normal for the month.



Figure 1: USGS monthly average streamflow in December 2024 across Upper Michigan



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Inches of water

equivalent

20 to

18 to

16

14

12 to

10 to

8

6 to

4 to

2

1 to trace to

to

to

to

to

Not Estimated

30 30

20

18

16

14

12

10

8

6

4

2

1

Snowpack SWE (Snow Water Equivalent) Conditions

The highest SWE values were over the higher terrain areas of the Copper Country and locations south and east of Munising in eastern Alger and northern Schoolcraft Counties on January 01, 2025.



Figure 2: Current modeled snowpack snow water equivalent on January 1st, 2025.



SNODAS SWE, Percent of 20 Year Median, 2005 - 2024 Jan 01

Figure 3: Modeled snow water equivalent for drainage basins on January 1st as a percent of 20-year median.



Drought Discussion

Moderate drought conditions continue over the interior west sections of Upper Michigan; especially over Gogebic, Iron and Dickinson Counties. Abnormally dry conditions continue over the south central sections of the U.P. and from the Porcupine Mountains southeast through Iron County.

For the latest drought status, please visit http://www.drought.gov.



January 7, 2025
(Released Thursday, Jan. 9, 2025)
Valid 7 am EST



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





Figure 4: Drought Monitor valid as of Jan. 1st, 2025

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



Precipitation Summary



Figure 5: December 2024 Monthly Precipitation Totals.



Precipitation Summary Continued







Soil Moisture Anomaly



Figure 7: Climate Prediction Center's monthly average soil moisture anomaly for December 2024.



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NOTE **Experimental**

Figure 8: NASA's Short-term Prediction Research and Transition (SPoRT) Center's shallow (0-40 cm) soil moisture percentile valid January 1st, 2025.



SPoRT-LIS 0-200 cm Soil Moisture percentile valid 01 Jan 2025

NOTE **Experimental**

Figure 9: NASA's Short-term Prediction Research and Transition (SPoRT) Center's deep (0-200 cm) soil moisture percentile valid January 1st, 2025.