

NWS FORM E-5	U.S. DEPARTMENT OF COMMERCE NOAA, NATIONAL WEATHER SERVICE	HSA OFFICE: Marquette, MI			
MONTHLY REPORT OF R	RIVER AND FLOOD CONDITIONS	REPORT FOR (MONTH / YEAR): November 2024			
TO: NATIONAL WEATHER SERVICE (W/OH12x1) HYDROMETEOROLOGICAL INFO CENTER 1325 EAST-WEST HIGHWAY, RM 7116 SILVER SPRING MD 20910		DATE: December 15th, 2024			
		SIGNATURE: James Salzwedel, OPL			
	20010	Ryan Metzger, 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).					

An X inside this box indicates no flooding occurred within this Hydrologic Service Area.

Summary

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November rain made a statement across Upper Michigan during the month with each of the climate stations receiving in excess of 200% percent the normal rainfall. This has eased the drought conditions across large sections of the U.P. Ironwood was the only exception for the second month in a row. This time Ironwood had just slightly above normal precipitation for the month. Monthly rainfall values at the climate stations ranged from 3.61" inches at Ironwood to 8.28" inches at Munising (Table 1). The tally at Munising marked its' wettest November. WFO Marguette in Negaunee Township and Manistique both reached a 2nd place finish for the month. Snowfall was generally on the lighter side except for the snow belts from Munising across the east half where significant lake effect snow piled up. The Copper Country snow belts also made up for the lack of snow and the snow persisted the last week of the month over the northwestern sections and eastern snow belts. The significant snow held off until the last week of the Month. Well above normal temperatures continued during the month. The monthly average temperatures at the shorelines along Lake Superior and Lake Michigan were greater than 5.0°F above normal at the City of Marquette and at Manistique. The average monthly temperatures at the Emerald City were their 4th warmest (Table 1). Each of the climate stations were distinctly warmer than normal for the third month in a row to conclude the very warm fall season. WFO Marquette observed its' warmest fall season on record and each of the climate sites were exceptionally warm as well reaching a second or third place warmest fall season. The exception was Stambaugh which experienced its' 11th warmest fall. The U.S. Drought Monitor graphic depicts easing drought conditions across the region. Severe drought conditions over the west have eased over the interior west sections, but still remain in the moderate drought category. The abnormally dry conditions over the northwest quarter and the north-central U.P. have faded away with ample precipitation in November. The remaining sections of the U.P. still remain dry (Figure 4); despite the ample rain and snow over the east half during the tail end of the month. Streamflow returned to normal for much of the U.P., but remained below normal for the Chocolay and Manistique River Basins (Figure 1). Overall soil moisture values also ended November substantially below normal (Figure 7). Shallow soil moisture was very dry over the far west sections and eastern sections (Figure 8) while the deep soil moisture was very dry over the north half of the U.P. (Figure 9). For the year-to-date, the climate observation sites all managed to range above normal, except Ironwood which is slightly below normal at 94% percent of normal precipitation for January through November. Year-to-date, temperatures were significantly above normal at all the climate stations. WFO Marquette, Munising and Iron Mountain each achieved the top ranking as the warmest January through November time period on record (Table 5). Ironwood topped out as a fourth-place finish while the City of Marquette was in 5th place for the year-to-date rankings.



November Precipitation & Temperature Summary

Location	Precipitation	% of Normal	Snowfall	Avg Temp	Departure
WFO Marquette	7.05" (2 nd wettest)	243%	11.5"	35.8°F (7 th warmest)	+5.2°F
Marquette City	5.49" (6 th wettest)	227%	0.6"	40.3°F (7 th warmest)	+5.6°F
Quincy Hill	4.32"	М	7.7"	М	М
Ironwood	3.61"	125%	13.3"	34.8°F	+4.7°F
Iron Mountain	4.66" (6 th wettest)	245%	5.5"	37.0°F	+4.7°F
Manistique	5.82" (2 nd wettest)	222%	Trace	40.1°F (4 th warmest)	+5.4°F
Munising	8.28" Wettest	239%	27.5"	39.0°F (8 th warmest)	+5.2°F
Stambaugh	3.82"	217%	5.8"	34.2°F	+4.4°F

Table 1. <u>NOTE:</u> Precipitation after 8 AM EST Nov 30th was counted in Dec stats for all but the WFO Marquette site due to the reporting structure of our NWS Cooperative Observers.

Fall (September-November) Precipitation Summary

Location	Precipitation	% of Normal	Rank	Last Year
WFO Marquette (Records: 1962-2023)	11.51"	106%	21 st wettest	7.17"
Marquette City (Records: 1875-2023)	7.99"	87%	61 st driest	6.05"
Ironwood (Records: 1901-2023)	8.62"	86%	46 th driest	9.20"
Iron Mountain (Records: 1902-2023)	7.14"	90%	53 rd driest	5.74"
Manistique (Records: 1938-2023)	7.76"	86%	30 th driest	8.50"
Munising (Records: 1912-2023)	11.57"	102%	46 th wettest	9.19"
Stambaugh (Records: 1900-2023)	6.64"	81%	39 th driest	5.48"

Table 2. Total observed precipitation at long-term climate sites across the U.P. for Sep, Oct, and Nov 2024.



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Fall (September-November) Temperature Summary

Location	Avg Temp	Avg Temp Departure		Last Year
WFO Marquette (Records: 1962-2023)	48.8°F	+5.5°F	Warmest	46.2°F
Marquette City (Records: 1875-2023)	53.0°F	+6.0°F	2 nd warmest	48.9°F
Ironwood (Records: 1901-2023)	48.7°F	+4.8°F	3 rd warmest	45.6°F
Iron Mountain (Records: 1902-2023)	50.2°F	+4.9°F	2 nd warmest	47.3°F
Manistique (Records: 1938-2023)	50.9°F	+4.8°F	3 rd warmest	46.5°F
Munising (Records: 1912-2023)	50.6°F	+4.9°F	2 nd warmest	47.5°F
Stambaugh (Records: 1900-2023)	45.9°F	+3.1°F	11 th warmest	44.3°F

Table 3. Average temperature observed at long-term climate sites across the U.P. for Sep, Oct, and Nov 2024.

Year-to-Date Precipitation Summary

Location	Precipitation	% of Normal	Rank	Last Year
WFO Marquette (Records: 1962-2023)	37.96"	111%	18 th wettest	42.71"
Marquette City (Records: 1875-2023)	30.47"	106%	60 th wettest	31.62"
Ironwood (Records: 1901-2023)	31.62"	94%	54 th driest	36.41"
Iron Mountain (Records: 1902-2023)	29.20"	104%	43 rd wettest	27.64"
Manistique (Records: 1938-2023)	31.06"	107%	21 st wettest	28.18"
Munising (Records: 1912-2023)	42.05"	126%	9 th wettest	38.28"
Stambaugh (Records: 1900-2023)	29.42"	102%	51 st wettest	26.50"

Table 4. Total observed precipitation at long-term climate sites across the U.P. for Jan through Nov 2024.

Year-to-Date Temperature Summary

Location	Avg Temp	Departure	Rank	Last Year		
WFO Marquette (Records: 1962-2023)	46.1°F	+4.1°F	Warmest	44.1°F		
Marquette City (Records: 1875-2023)	48.4°F	+3.7°F	5 th warmest	45.6°F		
Ironwood (Records: 1901-2023)	45.8°F	+3.0°F	4 th warmest	43.7°F		
Iron Mountain (Records: 1902-2023)	48.5°F	+4.1°F	Warmest	46.3°F		
Manistique (Records: 1938-2023)	45.5°F	+1.9°F	14 th warmest	44.0°F		
Munising (Records: 1912-2023)	46.8°F	+3.4°F	Warmest	44.5°F		
Stambaugh (Records: 1900-2023)	44.2°F	+2.3°F	11 th warmest	42.4°F		

Table 5. Total observed precipitation at long-term climate sites across the U.P. for Jan through Nov 2024.



Flooding Conditions

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

Media Links

None.

River Conditions

Streamflow was near normal across much of Upper Michigan during November 2024. Streamflow for the Manistique and Chocolay basins across the east half of Upper Michigan was below normal.



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



Snowpack SWE (Snow Water Equivalent) Conditions

One to two inches of SWE was observed over the Superior Uplands of the west half and 2" to 4" inches of SWE was observed in the east half snowbelt east of Munising at the start of December, 2024.



Figure 2: Current modeled snowpack snow water equivalent on December 1st, 2024.

SNODAS SWE, Percent of 20 Year Median, 2004 - 2023 Dec 01

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



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Drought Discussion

Moderate drought conditions continue over the interior west sections of Upper Michigan. Abnormally dry conditions continue over much of the remainder of the U.P. despite the heavy snow and high snow water equivalent liquid content that was observed over the snowbelts east of Munising. The Keweenaw and the north-central sections of the U.P. are clear of drought intensity conditions. For the latest drought status, please visit <u>http://www.drought.gov</u>.



(Released Thursday, Dec. 12, 2024) Valid 7 a.m. EST



	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	22.13	77.87	22.12	0.00	0.00	0.00
Last Week 12-03-2024	22.13	77.87	30.53	0.00	0.00	0.00
3 Month s Ago 09-10-2024	32.30	67.70	0.00	0.00	0.00	0.00
Start of Calendar Year 01-02-2024	0.01	99.99	15.20	4.96	0.00	0.00
Start of Water Year 10-01-2024	1.50	98.50	64.78	40.63	0.00	0.00
One Year Ago 12-12-2023	0.01	99.99	15.20	4.96	0.00	0.00

Intensity:



D2 Severe Drought D3 Extreme 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:

Curtis Riganti National Drought Mitigation Center



droughtmonitor.unl.edu



Hydro Products Issued Product Number Hydrologic Outlook (ESF) 0 Flood Watch (FFA) 0 Flood Warning (FLW) 0 0 Flood Advisories and Statements (FLS) 0 Flash Flood Warning (FFW) Flash Flood Statement (FFS) 0 30 Hydrologic Summary (RVA)

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Figure 5: Total monthly precipitation for November 2024.



Precipitation Summary Continued

Accumulated Precipitation: Percent of Mean November 1, 2024 to November 30, 2024



Figure 6: Percent of normal total precipitation for November 2024.



Soil Moisture Anomaly



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



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Shallow and Deep Soil Moisture Percentiles

SPoRT-LIS 0-40 cm Soil Moisture percentile valid 01 Dec 2024



Figure 8: NASA's Short-term Prediction Research and Transition (SPoRT) Center's shallow (0-40 cm) soil moisture percentile valid December 1st, 2024.



NOTE **Experimental**

Figure 9: NASA's Short-term Prediction Research and Transition (SPoRT) Center's deep (0-200 cm) soil moisture percentile valid December 1st, 2024.