

2022 Northern Michigan Climate Summary

Alpena

Average Temp	Avg. Temp Departure	Precip	Precip Departure	Snowfall	Snowfall Departure
44.6°	+0.2°	30.52"	+0.85"	63.3"	-14.3"

Houghton Lake

Average Temp	Avg. Temp Departure	Precip	Precip Departure	Snowfall	Snowfall Departure
44.1°	0.0°	28.13"	-1.46"	48.0"	-17.9"

Sault Ste. Marie

Average Temp	Avg. Temp Departure	Precip	Precip Departure	Snowfall	Snowfall Departure
42.0°	-0.4°	39.03"	-3.37"	154.5"	+34.4"

Gaylord

Average Temp	Avg. Temp Departure	Precip	Precip Departure	Snowfall	Snowfall Departure
44.3°	+1.6°	33.47"	-4.41"	142.0"	-6.8"

Traverse City

Average Temp	Avg. Temp Departure	Precip	Precip Departure	Snowfall	Snowfall Departure
47.6°	+0.7°	40.41"	+4.21"	113.1"	+12.1"

All photographs courtesy of Harold Dippman unless otherwise noted.

We have moved on to 2023, and that means it is time for the annual climate summary for the year 2022. While the year may have seemed mundane for an overwhelming portion of the year, there was actually quite a bit of noteworthy activity that occurred throughout. From wild temperature swings, tornadoes, and major snowfall events despite persistent warmth, 2022 will certainly be a year to reflect on for years to come.

The year began on the chillier side of things, with January finishing colder than normal across our climate sites. The first two weeks of the month featured several instances of nights with lows falling below zero across the region. Temperatures recovered some shortly after mid-month, with much of the area seeing their warmest temperature of the month on the 19th as highs peaked in the low 30s to near 40. The warmth was very short-lived, with temperatures falling back below normal on the 20th through the end of the month, including several nights that featured temperatures that dipped below -20°F on January 28th and 29th. Snowfall in January was near to slightly below normal across the region. A cold front passed through on January 9th and left portions of the region in favorable conditions for lake effect snow, with Sault Ste. Marie observing an official two day total of 16.1" from January 9th-10th, which led to the Soo being the only climate site to report above normal snows for the month.



The Gaylord Ice Tree shines bright in the sunshine on February 24th, 2022.

Much of February was dictated by near to slightly below normal temperatures. Most nights were not overwhelmingly cold until around mid-month. Valentine's Day was quite cold-hearted across the region, featuring widespread low temperatures in the teens and twenties below zero, including readings of -27°F observed in Grayling and Rudyard. Temperatures quickly spiked back above normal for a day on the 16th, with most places topping out in the 40s, and Traverse City even

observed a high of 50°F! It was also on this day that some spots across the NWS Gaylord footprint observed rainfall. The combination of the high-moisture airmass and warmer temperatures led to some places losing snowpack, but this was quickly reversed at the end of the month. Following the mild day on the 16th, most places cooled back to or just below normal, and quick-moving systems moved through the region. The weather highlight of the month occurred on February 22nd when a strong low pressure system brought wintry precipitation to the region, including localized areas across interior northern lower Michigan that saw 0.25-0.50" of freezing rain. Then, a series of quick hitting systems brought a couple of 3-6" snowfalls across much of northern Michigan through the end of the month. Despite the snowy end to the month, the only climate site that featured above normal snowfall in February was Sault Ste. Marie.

March lived up to the billing as a transitional month from winter to spring, featuring periods of temperatures well above normal and below normal as well. Temperatures largely remained below normal at the start of the month before soaring well above normal around mid-month, with northern lower Michigan experiencing highs well into the 60s on St. Patrick's Day, while the eastern U.P. was limited to highs in the 40s and 50s. Temperatures then fell back below normal toward the end of the month, culminating in most places ending right around average, despite spending very little time near normal. Snowfall was once again below normal, with much of the snow in March limited to the beginning of the month, but interestingly enough, liquid precipitation soared well-above normal thanks to rainier systems later in the month, some of which produced significant icing across interior northern lower Michigan.



Ice covers trees in St. Helen after freezing rain fell through the morning of March 23rd, 2022.



Snowy trees along US 131 near Mancelona in Antrim County on April 3rd, 2022.

Spring was slow to show in April as a deep cold air mass encompassed much of eastern North America, and northern Michigan was no exception. As a matter of fact, during the first 20 days of April, THIRTEEN days saw observed snowfall across the NWS Gaylord footprint. While snow is not unusual in April across northern Michigan, the frequency in which it occurred conjured back memories of April 2018, which also featured a slow start to spring. That being said, the snow

in April 2022 was much more nuisance than excessive, with all climate sites still seeing below normal snowfall for the month. Temperatures briefly recovered later in the month, with northern lower Michigan experiencing their first high temperatures exceeding 70°F late in the month, while the eastern U.P. held in the 50s and 60s. Despite the late month warmth, temperatures still largely remained below normal for the month, largely in part to another colder period right at the end of the month, which saw

Pellston observe a daily record low of 17°F on April 28th. The end of the month also featured several rainy systems, which helped propel liquid precipitation averages above normal for a second straight month.



The smoke plume from a wildfire burning in Montmorency County on May 13th, 2022, as seen from a hill on Seymore Road northeast of Gaylord.

Following the chilly end to April, temperatures hovered near to slightly below normal at the start of May, with colder high pressure. The tables quickly turned between May 9th-14th as a 4-5 day period of summer-like heat soared into the

Great Lakes, which saw most of northern lower Michigan exceed 90°F, and the eastern U.P. reach into the upper 80s. As a matter of fact, on May 12th, Traverse City observed a high of 96°F, which set the all-time monthly maximum temperature! The heat helped dry out conditions across the region considerably, and raised fire danger across northern lower Michigan in particular. This came to a head on May 13th when a 2,200+ acre wildfire erupted in far northwest Montmorency County, just outside of Pigeon River Country State Forest. Following a brief cooler period between May 15th-18th, temperatures quickly warmed back to above normal, this time featuring an abnormally moist air mass.



Left: A tornado moves into Gaylord on May 20th, 2022. The tornado would ultimately be rated an EF3 with estimated maximum winds of 150mph (photo: McKenzie Morrison). Right: A violent hailstorm with hailstones as large as 3" in diameter is observed on Grand Lake in Presque Isle County on May 20th, 2022 (photo: Mary Brunette Taglarini).

This spelled disaster on the afternoon of May 20th as a cold front was passing through, initially driving an area of strong thunderstorms across Leelanau and Antrim Counties, which produced widespread significant wind damage, particularly across Bellaire. As these storms interacted with the very unstable airmass over land (complete with changing wind directions aloft), the storm

that went through Bellaire quickly transitioned into a powerful supercell thunderstorm that began producing hail as large as 2" in diameter near Elmira. This particular storm also quickly spawned a tornado that initially touched down east of Alba near Lakes of the North before rapidly strengthening as it approached Gaylord, ultimately inflicting major damage across the city. Two people lost their lives and 44 people were injured by the tornado, which was ranked an EF3 with peak winds of 150mph as it moved through the city of Gaylord. This tornado was the first tornado to impact Gaylord since records began in 1950. It was also the first EF3 tornado in the state of Michigan since 2012 (Dexter) and the first to cause multiple fatalities in the state since 2007 (Williamston). The tornado eventually lifted north of Sparr, but the storm was not done inflicting damage just yet. The supercell thunderstorm remained potent given the favorable airmass and relatively isolated nature of the storm, which allowed for the updraft of the storm to

continue to produce large hailstones. As the storm finally crossed into Lake Huron, the storm had produced baseball sized hail (2.75") near Posen, and 3" hail near Grand Lake.



Top: a thunderstorm over the Straits as seen from Petoskey on June 9th, 2022. Bottom: sunset over Little Traverse Bay as seen from Petoskey on June 10th, 2022.

As the calendar turned to June, a high pressure center with origins from Canada allowed for seasonable high temperatures across northern Michigan, but the clear and calm airmass allowed for one last widespread round of frost/freeze activity across interior northern lower Michigan, as temperatures bottomed out in the upper 20s and low 30s on the morning of June 4th. The rest of the month would feature mainly dry conditions and isolated thunderstorms, with temperatures largely hovering near or above normal during the day and slightly below normal at night. A few intrusions of well-above normal warmth built into the region periodically through the month, with the peak being when Alpena registered a high

temperature of 96°F on June 15th. On the heels of the mid-month warmth, a strong cold front brought about a period of thunderstorms the night of June 15th, followed by a rare period of strong synoptic winds for the month of June, featuring wind gusts exceeding 60mph on June 16th. The remainder of the month continued the theme of dry airmasses, which featured near to above normal daytime temperatures and below normal lows. Overall, average temperatures across the region largely hovered around normal owing to the cooler and dry nights offsetting the abnormal daytime warmth. As far as precipitation goes, most spots were near or slightly below normal, with localized thunderstorms giving more of a “feast or famine” rain profile across



Top: A shower illuminated by the sunset in Gaylord on July 22nd, 2022. Bottom: A beautiful day looking east on Robinson Road in Emmet County on August 11th, 2022.

the region. Much of the rain that fell across the region came from a rainstorm in early June that dropped a soaking 1-2” of rain across the region, with little to no widespread precipitation thereafter.

July started off with the building of a more typical summer airmass before a warm and muggy airmass built in for the 4th of July holiday, featuring highs well into the 80s and high humidity. While there was no instances of severe weather, a weak disturbance moved through late in the day bringing a widespread rain that was very rare across the region throughout the summer. Much of the rest of the month featured dry airmasses with the occasional intrusion of humid air, which largely led to another month of near average temperatures, driven again by warmer than normal days and cooler than normal nights. As a matter of fact,

most places saw highs in the upper 70s and low 80s on July 3rd, but that warmth was offset by lows in the low-to-mid 40s, with some spots across the interior registering lows in the upper 30s! The warmest weather during July occurred just after mid-month, peaking when Traverse City reached a high of 96°F on July 23rd. Overall, the dry airmasses that dominated the month also contributed to another month of largely below normal rainfall across the region, continuing the theme of a largely dry summer highlighted by “feast or famine” rain showers across northern Michigan.

As August rolled around, a more humid air mass infiltrated the region, which brought about one of the rainier periods of the summer. Most spots saw multiple days with observable rainfall, some of which exceeded 1.00”. This provided a temporary reprieve from the overall dry conditions that dominated the summer. The period also saw warmer than normal temperatures, with highs occasionally peaking into the low 90s across northern lower Michigan and well into the 80s north of the Mackinac Bridge. Around mid-month, a cooler air mass brought in a more seasonable feel to the region, but it was quickly offset by another period of warmer and more humid air, bringing about another rainier period to the region, this time with more scattered thunderstorm activity as opposed to more widespread rainfall. All in all, the warmer and more humid temperatures helped drive monthly mean temperatures above normal, while the rainier periods brought about near to slightly above normal precipitation.

The warmth and humidity carried into September, with Labor Day weekend starting out quite warm. A stalled stationary boundary orchestrated a round of heavy thunderstorms across northern lower Michigan during the early morning hours of September 3rd. Given the abnormally humid air mass, rainfall rates were torrential, particularly across Emmet County, where an inch of rain fell over an estimated fifteen minutes elapsed time in Harbor



The last sunset of astronomical summer, as seen from West Branch on the evening of September 21st, 2022.

Springs. This torrential rain resulted in part of Bluff Drive (M-119) being washed out from erosion. Eventually, the frontal boundary cleared northern Michigan, leaving the area with a mild but dry airmass into mid-month. Several areas began to see low temperatures creep back into the lower 40s, with isolated interior spots seeing low temperatures in the upper 30s. Eventually, more normal temperatures began to return to the region later in the month, with highs ranging from the mid 60s to low 70s, and overnight lows primarily in the upper 40s to low 50s. Eventually, a much colder airmass moved in at the end of the month, which first brought about an inaugural autumnal feel to the region as a cold and damp stretch commenced, followed by a much drier and cooler airmass bringing the first widespread frost and freezes to the



Top: Peak fall colors as seen from Flott Lake near Elmira on October 10th, 2022.
Bottom: Snow clashes with lingering fall colors near Gaylord on October 18th, 2022.

region, with several interior areas seeing low temperatures in the mid 20s the last two nights of the month. Overall, temperatures ran above normal across the region, and precipitation was variably above or below normal, with several spots that saw above normal rainfall for the month being pushed over average by the rains on Labor Day weekend.

At the start of October, the dry airmass contributed to high temperatures swelling well above normal, while nighttime lows fell below average. As a matter of fact, at one point, some spots were seeing highs in the mid 70s and lows in the low-to-mid 30s! Eventually, another colder airmass intruded into the region, and was cold enough to bring the first instance of snowfall to the region. The period between October 17-21 was marked by damp days from a mix of rain and

snow, with Sault Ste. Marie even seeing a day that had 2.1" of snow accumulation. Eventually, the milder weather battled back and largely closed out the month. Because of the persistent milder air, temperatures warmed above normal for the month. In fact, most places observed a lower minimum temperature in September than at any point in October! In addition, the dryer airmasses led to rainfall being near to below normal for the month. Finally, because of the lack of persistent colder air intrusions, despite the snowier period around mid-month, all climate sites came back below normal for snowfall in October 2022.

Despite temperatures normally trending cooler into November, the atmosphere failed to get the memo...at least initially! The first two weeks of the month were largely dictated by an exceptionally warm airmass that spawned record-shattering temperatures to the region. A dynamic system produced heavy rainfall of 1-2" and gusts as high as 65mph across the region on November 4-5. The warmth peaked on November 10th, with most places seeing a day that resembled mid-summer as opposed to November. Highs peaked well into the 70s for most, with lows in the 50s. As a matter of fact, both Gaylord and Alpena set all-time monthly high temperatures with readings of 77°F and 78°F respectively, and Rogers City observed the highest temperature, with a high of 79°F!

Eventually, a bit of whiplash set in as the overall mode of weather



Top: Sunset on a mild evening as seen from NWS Gaylord on November 9th, 2022.

Bottom: Contrasting skies seen with a lake effect snow squall near Lakes of the North in Antrim County on November 12th, 2022.

flipped from summer straight into winter, with snow falling across parts of the region less than 30 hours after temperatures were pushing 80°F. From November 12-20, the cold airmass combined with the unusually warm Great Lakes unleashed numerous bouts of heavy lake effect snowfall to the region. In particular, a burst of heavier snow associated with a mesolow brought significant accumulations in excess of two feet across northern Antrim and southern Charlevoix Counties, particularly in the vicinity of East Jordan. All in all, over a 5 day period, the East Jordan area observed over 33" of snowfall, easily the highest total in the area. Closer to Thanksgiving, a milder airmass kicked back in, with highs peaking in the 50s alongside brilliant sunshine that, melted a majority of, if not all of the snow that fell the prior week over the span of 2-3 days. November 2022 will be remembered for its unusual extremes, with much of the area finishing well above normal for temperatures, while also seeing well above normal snowfall.



Top: Snow piles up at NWS Gaylord on Christmas Eve 2022 (photo: Dan Cornish). Bottom: A snow drift in Sault Ste. Marie on Christmas Eve 2022 (photo: Kierstin Loomis).

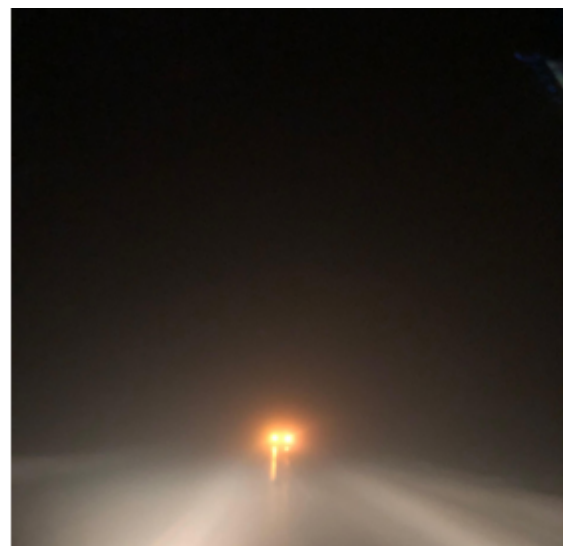
Much of December was dominated by above normal temperatures, particularly for overnight lows, which were anywhere from three to five degrees above normal, with several overnight lows failing to reach below 30°F through much of the month. This contributed to a prolonged absence of wintry weather, with several instances of light rain mixed with snow. That's not to say the region was spared from active weather. As a matter of fact, a strong area of low pressure passed through the region on the morning of December 15th and brought several instances of wind gusts exceeding 50mph, with the highest gust occurring in Mackinaw City at 62mph! This milder trend would quickly change heading into the holiday season.

A rapidly strengthening area of low pressure passed through Ohio and into

Ontario on December 22nd, putting northern lower Michigan on the colder side of the system for a change. The snowfall associated with the system itself was rather mundane (most spots observed a general 4-8", while some spots in the hills near Grand Traverse Bay saw localized totals around or exceeding 10"). The bigger story was the lake effect snow on the backside of the system. The low pressure continued deepening considerably, and while it was doing so, largely stalled out just southeast of James Bay. This left a cold cyclonic flow in place across the Great Lakes through Christmas, which coincided with numerous high impact and historic lake effect snow events across the lakes, including across northern lower and eastern upper Michigan. By the time the system cleared, there were several places across northwest lower and eastern upper Michigan that saw totals well in excess of 18".

As a matter of fact, Gaylord saw their second highest daily snowfall with 16.8" on December 23rd, and also saw the highest two-day snowfall since records began, with 25.1" of snow falling on December 23rd and Christmas Eve. Sault Ste. Marie observed their 4th largest daily snowfall on record on Christmas Eve, with 17.6", and ultimately saw their second highest all-time two-day snowfall for an event with 25.8", only surpassed by the infamous December 1995 snowfall event. The overall maximum snowfall observed during the event was 36.7" near Mancelona. The heavy snowfall was compounded with wind gusts that reached as high as 50mph across the region, creating several hours of blizzard conditions. The blizzard resulted in numerous Christmas services being canceled, along with several instances of stranded motorists in the most impacted areas. In addition, the magnitude of this event was enough to put several locations above normal for December snowfall, despite the limited instances of snowfall.

While there was plentiful snow across the region for the Christmas holiday, things quickly reverted back to above normal temperatures shortly after Christmas,



Thick fog billows through the air on December 29th, 2022 as an abnormally warm and moist airmass leads to the rapid melting of the snowpack from the Christmas Blizzard.

with several sites actually setting daily record highs, as temperatures broke the 50°F mark on December 28th - 30th, with Traverse City even reaching 56°F on December 30th. This resulted in much of, if not, all of the snow from the Christmas blizzard melting over the course of this period, though owing to a lack of very warm temperatures north of the Mackinac Bridge, the eastern U.P. was able to cling onto a fraction of their snowpack into the new year.

As a whole, 2022 was a year that was filled with all sorts of variety meteorologically across northern Michigan. The numerous instances of generational weather events will make the year nothing short of memorable in a sense of how extreme certain aspects of the observed weather were, be it extreme severe weather or the contrasting variables of well-above normal temperatures and well-above normal snowfall colliding in consecutive months.



The view from Mount McSaubia in Charlevoix on October 25th, 2022.