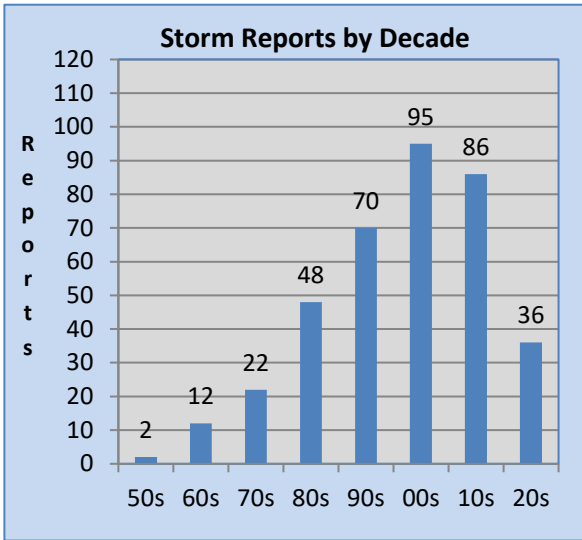


Winnebago County Severe Weather Facts (1950-2023)

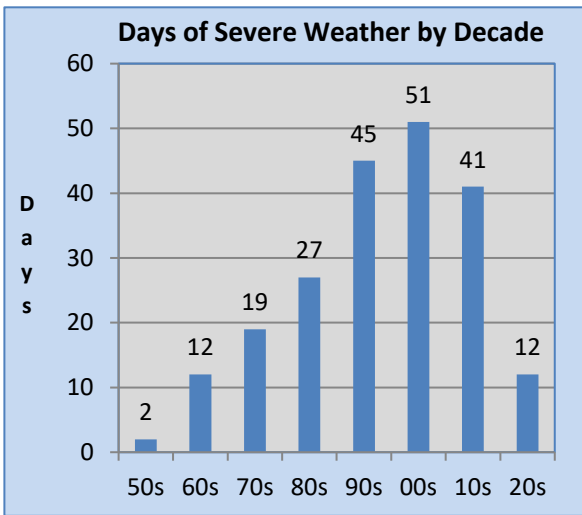
Updated: 01/01/24; Next Update January 2025

Storm Reports by Decade



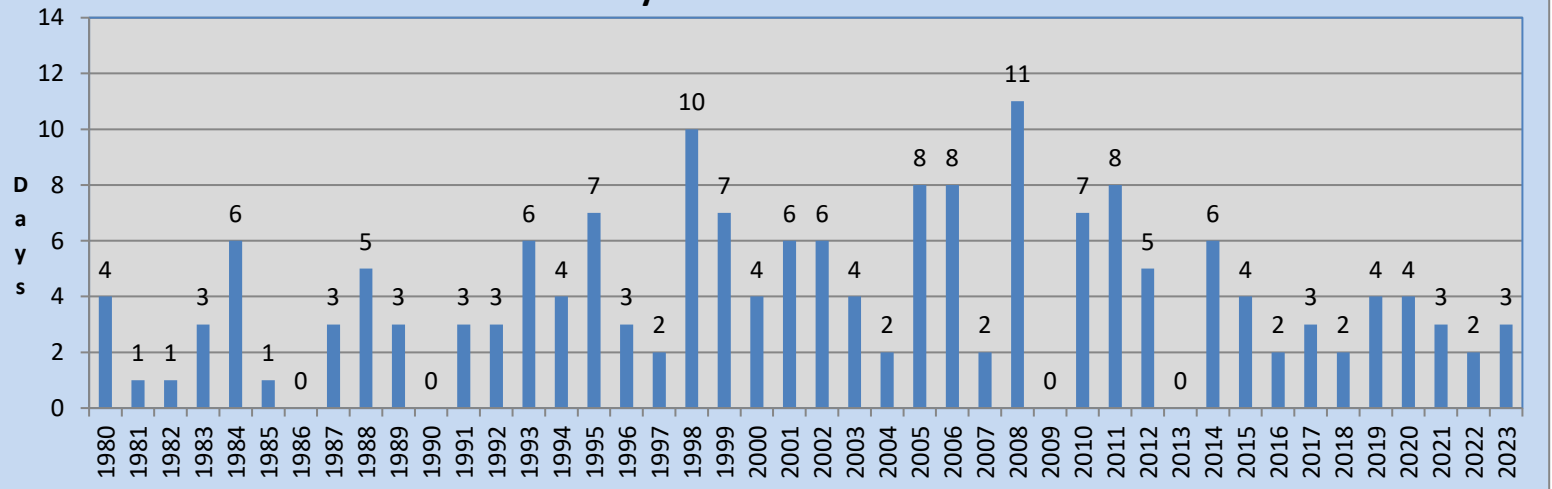
Since 1950 there have been 371 reports of large hail, damaging winds and tornadoes across Winnebago County. The population boom of the 1980s and 1990s combined with the SKYWARN program led to an increase in the number of reports of severe weather during both decades. The number of reports increased 2% from the 2014-2023 period compared to the 1990s. One can't say for sure there has been an increase in severe weather across northeast Wisconsin. One possible reason for the apparent increase in reports is that in some instances, multiple reports were received from a single location for the same storm due to more spotters today. Another reason for the increase in storm reports has been the focus by the National Weather Service (NWS) to improve warning verification. 2008 was the most active year with 24 reports followed by 19 reports in 2010, 18 reports in 1998 and 2011, and 15 reports in 2005 and 2006, and 14 reports in 2012. Since 1980, there were no reports of severe weather in 1986, 1990, 2009 and 2013. In 2023, there were 5 reports of severe weather: 2 large hail reports on April 4 while strong winds/wind damage was reported on July 16 (one report) and August 3 (two reports).

Days of Severe Weather by Decade



In order to address the impact of multiple reports for the same storm, the data was examined by the number of severe weather days. Since the reports were sporadic during the 1950s through the 1970s, only data from 1980 to present. There has been a 27% decrease in the number of days of severe weather from the 2014 to 2023 period compared to the 1990s, although most other counties in northeast Wisconsin have seen an increase in the number of severe weather days. This trend can be attributed to the increase in population, technology advances in reporting severe weather, and greater severe weather awareness by the public. Since 2010, Winnebago County averages 3.8 days of severe weather per year. The long-term average from 1980-2023 is 4.0 days. The most active year was 2008 with 11 days of severe weather; followed by 10 days in 1998 and 8 days in 2005, 2006 and 2011. Since 1980, no severe weather was reported during the following years: 1986, 1990, 2009 and 2013. In 2023, there were 5 reports of severe weather: 2 large hail reports on April 4 while strong winds/wind damage was reported on July 16 (one report) and August 3 (two reports).

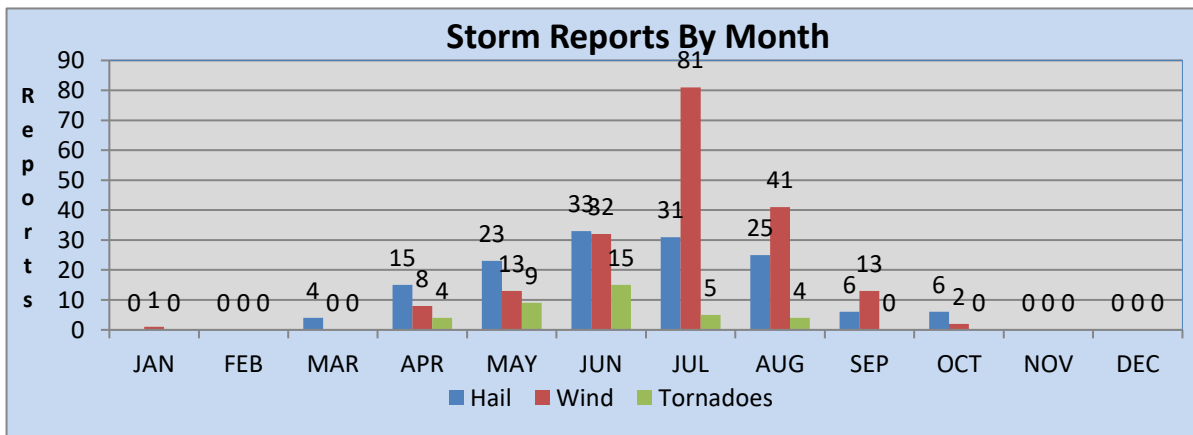
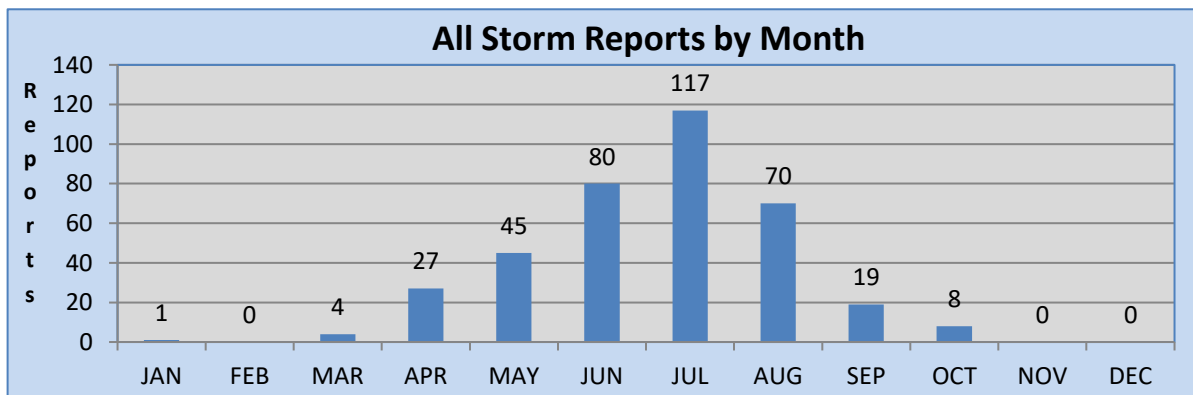
Number of Days of Severe Weather Since 1980



Winnebago County Severe Weather Facts (1950-2023)

Storm Reports by Month

Severe weather has been documented in Winnebago County in every month except February, November and December. Surprisingly, there has been one report of severe weather during the month of January. On January 24, 1967, a line of thunderstorms produced damaging winds across Brown, Winnebago and Outagamie counties during the early evening hours. On a rare occasion, severe weather breaks out during the month of March. The severe weather season begins in earnest in April, with the heart of the convective season between May and August. July is the peak month for the number of reports. The warm season period of May through September accounts for 89 percent of all severe weather reports during the year. Severe weather can occur from time to time in September with isolated reports during October. The latest report of severe weather during the year occurred on October 23, 2004. On this date, large hail or damaging winds were reported from near Winneconne and Omro to Oshkosh. In 2018, there two reports of large hail (one inch) near Poygan and just southwest of Zittau on October 9th.

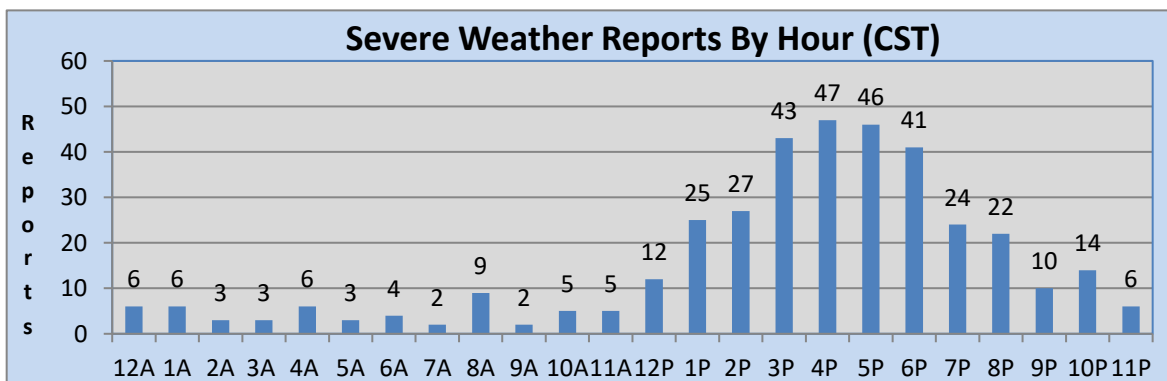
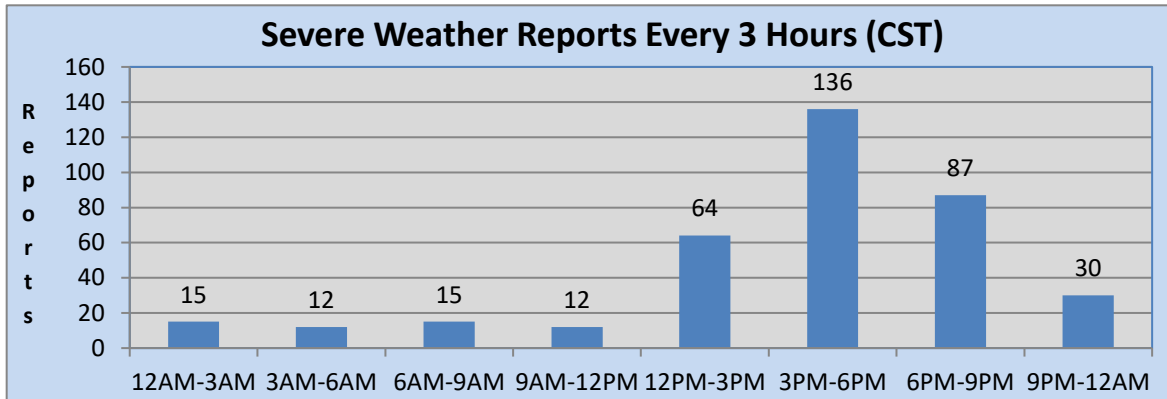


NOTE: The chart depicts storm type by month: (hail, wind/wind damage, tornadoes).

Winnebago County Severe Weather Facts (1950-2023)

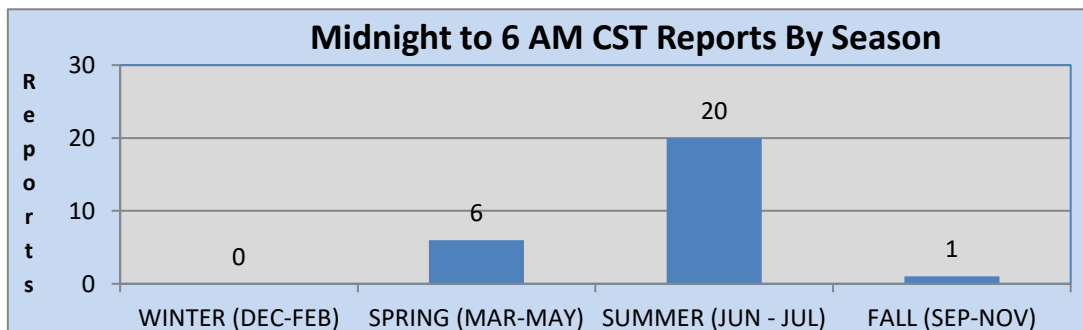
Storm Reports by Time of Day

No matter the season, the afternoon and early evening hours are the peak time for severe weather across Winnebago County. Since 1950, 74% percent of all severe weather reports occur between 1 PM and 9 PM CST. Severe weather reports increased sharply after 12 PM CST with a peak in storm reports between 3 PM and 7 PM CST. The peak in the storm activity corresponds to peak afternoon heating when the atmosphere is most unstable. There was another peak in the number of reports between midnight and 6 AM CST between May and August. The overnight reports correspond to convection that develops across Minnesota and Dakotas and moves into the county after midnight.



Overnight Severe Weather Reports (Midnight to 6 AM CST)

Overnight severe weather reports are most prominent during the summer (June through August) due to nocturnal convection along warm fronts, or from complexes of storms that develop across the Dakotas and Minnesota and roll through northeast Wisconsin during the early morning hours. The summer months of June through August account for 74 percent of all overnight severe weather reports during the year.



Winnebago County Severe Weather Facts (1950-2023)

Winnebago County Tornadoes

Since record keeping began in 1950, there have been 37 documented tornadoes or waterspouts (Lake Winnebago) across the county. Three tornadoes were rated an F/EF3 or greater intensity. Three F4 tornadoes have hit the county. The last F4 tornado occurred on April 27, 1984, when a tornado developed one mile northeast of Winneconne and traveled to near Freedom before dissipating. There have been zero F/EF3 tornadoes, one F/EF2 tornadoes, 11 F/EF1 tornadoes and 22 F/EF0 tornadoes. The most active year was 2005 when a total of seven tornadoes and waterspouts were reported. Three tornadoes and waterspouts were reported in 1971 and again in 2020, while there were two tornadoes and/or waterspouts in 1984, 2002, 2003, 2010 and 2014. A tornado was reported in consecutive years in 2002 and 2003 and again in 2010 and 2011. In 2020, there were three tornadoes (one waterspout on Lay Butte des Morts, one waterspout on Lake Winnebago, and one tornado in Oshkosh). Since 1950, tornadoes or waterspouts have touched down in 22 years. A tornado or waterspout strike in Winnebago County usually occurs about every two years.

Event #	Date			Time (CST)	Start / End Location	F/EF Rank
	Month	Day	Year			
1	4	3	1956	13:45-13:53	8 SW Eureka - 2 W Omro	4
2	5	28	1959	15:15	6 N - 9 NE Oshkosh	1
3	5	21	1960	17:30	15 W Oshkosh	1
4	5	8	1964	18:30-19:06	Winneconne - Wrightstown	2
5	6	6	1971	23:15	5 SW Oshkosh	1
6	6	13	1971	16:30	8 NW Oshkosh	1
7	7	30	1971	07:00	4 E Oshkosh (waterspout)	0
8	4	21	1974	14:40-14:50	5 S Ripon - Oshkosh	4
9	6	20	1979	13:45	3 S Oshkosh	1
10	4	27	1984	15:20-15:40	1 NE Winneconne - Freedom	4
11	7	26	1984	13:00-13:10	5 E Oshkosh (waterspout)	0
12	8	14	1987	17:40-17:43	1 W Menasha	1
13	5	24	1989	20:10-20:15	3 S Oshkosh	1
14	6	8	1993	17:35	1 E Pickett	0
15	7	18	1996	17:45	5 NE Oshkosh (waterspout)	0
16	8	23	1998	15:22	Menasha	0
17	5	6	2002	16:30-16:40	5 NW - 2.5 N Winneconne	0
18	5	6	2002	17:02	8 N Oshkosh - Wittman Field	0
19	6	8	2003	11:40	4 W Oshkosh - Wittman Field	0
20	6	8	2003	12:20-12:26	5 E - 5.5 ESE Oshkosh Wittman Field	0
21	5	6	2005	15:24-15:25	7 ESE - 7.8 ESE Oshkosh - Wittman Field	0
22	6	9	2005	17:40-17:50	5 SE - 5 E Oshkosh	0
23	6	10	2005	15:05	1 N Winneconne	0
24	6	10	2005	19:10	4 ESE Oshkosh	0
25	6	10	2005	19:22	3 E Oshkosh	0
26	6	10	2005	19:48	3 E Oshkosh	0
27	8	18	2005	18:40-18:48	4.5 W - 2.6 NW Neenah	0
28	7	19	2008	21:44-21:45	3.8 WNW - 3.4 WNW Menasha	1
29	5	4	2010	18:10-18:12	2.7 SE Zittau – 2.7 W Winchester	1
30	5	4	2010	18:13-18:17	2.2 SSW Winchester – 0.8 NNW Larsen	0

Winnebago County Severe Weather Facts (1950-2023)

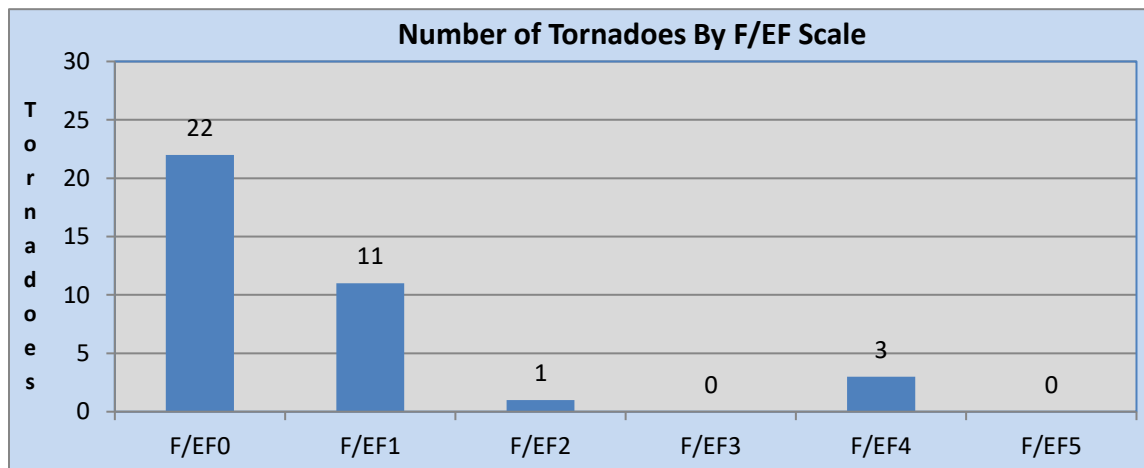
Winnebago County Tornadoes Continued

Event #	Date			Time	Start / End Location	F/EF Rank
	Month	Day	Year	(CST)		
31	4	10	2011	18:53-19:04	0.3 NW Poy Sippi - 2.3 WSW Winchester	1
32	7	27	2014	18:05	3.5 SE Oshkosh Wittman Field (waterspout)	0
33	8	18	2014	15:23-15:25	3.3 NE Winchester - 4.0 NNE Larsen	0
34	6	14	2017	15:28-15:29	2.6 SSW Appleton - 1.7 NNW Little Chute	1
35	6	20	2020	16:01-16:02	0.7 - 0.9 N Butte des Morts	0
36	6	20	2020	16:23-16:27	1.1 SSW - 0.5 SE Buttes des Morts	0
37	6	20	2020	16:35-16:41	5.2 ESE - 6.2 SE Wittman Field (waterspout)	0

Additional tornado data can be found on the NWS Green Bay webpage at: <http://www.weather.gov/grb/severeclimate>

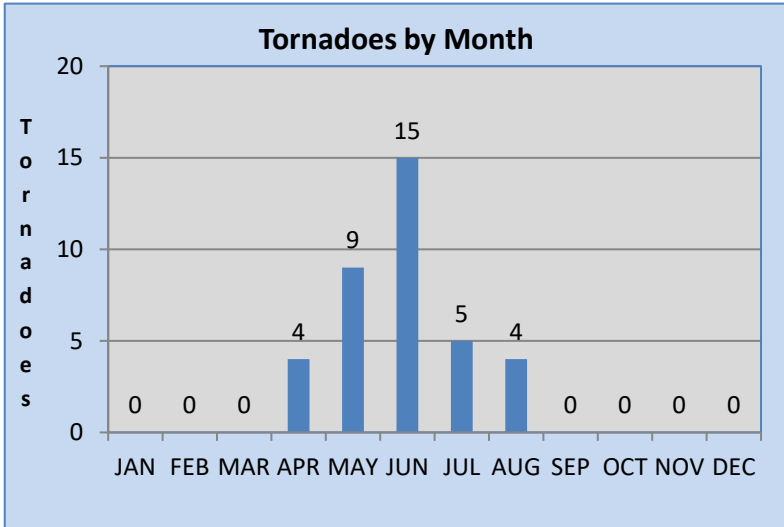
F/EF2 or Greater Tornadoes in Winnebago County

Event #	Date			Time	Start / End Location	F/EF Rank
	Month	Day	Year	(CST)		
1	4	3	1956	13:45-13:53	8 SW Eureka - 2 W Omro	4
2	5	8	1964	18:30-19:06	Winneconne - Wrightstown	2
3	4	21	1974	14:40-14:50	5 S Ripon - Oshkosh	4
4	4	27	1984	15:20-15:40	1 NE Winneconne - Freedom	4



Winnebago County Severe Weather Facts (1950-2023)

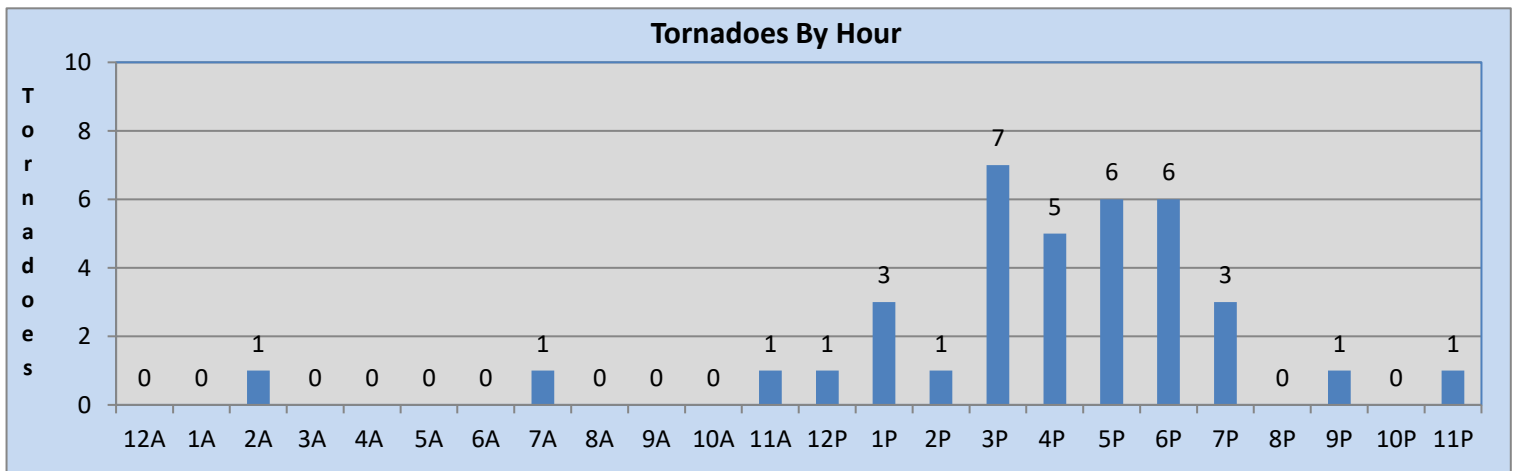
Tornadoes by Month



Documented tornadoes have occurred from April to August. The earliest documented tornado during the year occurred on April 3, 1956. On this date, a violent F4 tornado developed eight miles southwest of Eureka and moved to two miles west of Omro before dissipating. The height of the tornado season occurs in May and June which accounts for 65 percent of all tornado reports. The tornado season peaks in June and quickly wanes by August. The warm season months of May through August account for 89 percent of all tornado reports during the year. The latest documented tornado on record during the year occurred on August 23, 1998. On this date, a F0 tornado touched down in Menasha. In 2020, three tornadoes (2 waterspouts and 1 tornado) touched down on June 20th.

Tornadoes by Hour

In Winnebago County, 34 out the 37 (92%) documented tornadoes have occurred between NOON and 10 PM CST. There have been no documented tornadoes between midnight and 6 AM and from 8 AM to 10 AM CST. The lone report between midnight and 6 AM CST occurred before noon occurred on July 30, 1971 when a waterspout was reported east of Oshkosh at 7 AM.



Winnebago County Severe Weather Facts (1950-2023)

Predominant Storm Reports – Wind and Hail Only

During the spring (March through May) into June, and during October, large hail is the dominant weather event reported to the National Weather Service. During these months, the upper atmosphere is cold enough to support large hail. Over the remainder of the convective season, the dominant reports are strong wind gusts and wind damage. Over the course of the year, nearly 56% of all reports are strong wind gusts and wind damage compared to 44% for large hail reports.

	% Hail	% Wind or		% Hail	% Wind or
Month	Reports	Wind Damage	Month	Reports	Wind Damage
Jan	0.0	100.0	Jul	27.7	72.3
Feb	0.0	0.0	Aug	37.9	62.1
Mar	100.0	0.0	Sep	31.6	68.4
Apr	65.2	34.8	Oct	75.0	25.0
May	63.9	36.1	Nov	0.0	0.0
Jun	50.8	50.2	Dec	0.0	0.0
			Year	42.8	57.2

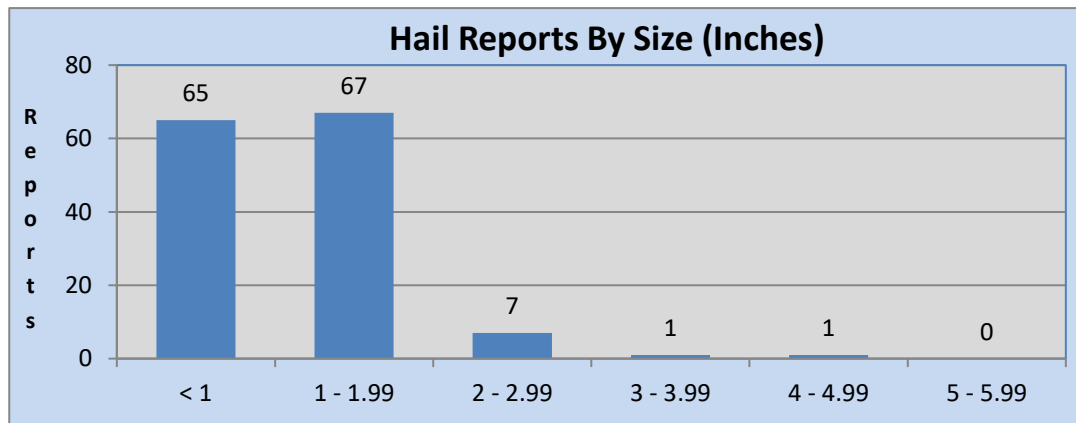
Winnebago County Severe Weather Facts (1950-2023)

Large Hail in Winnebago County

There have been nine documented reports of hail two inches or greater in diameter across the county. The largest hail stone reported in the county was 4.25 inches in diameter which occurred nearly one mile northwest of Winchester on May 22, 2011. The last hail stone of two inches or greater occurred on June 18, 2012 when 2.25 inch hail was reported three miles east of Winchester. Overall, hail ranging in size from three quarters to one inch accounted for 74% of the documented large hail reports. Hail reports of two inches or greater only accounted for 6% percent of the total large hail reports.

Hail over 2 inches

Rank #	Date			Time (CST)	Start / End Location	Hail (Inches)
	Month	Day	Year			
1	5	22	2011	15:05	0.8 NW Winchester	4.25
2	7	27	1989	10:50	1 N Oshkosh	3.00
3T	4	10	2011	19:11	1 E Lake Winneconne	2.75
3T	8	29	1984	18:12	Winchester	2.75
3T	8	29	1984	17:20	5 NE Omro	2.75
6	6	18	2012	17:00	3 E Winchester	2.25
7T	5	12	2000	10:05	Omro - Oshkosh	2.00
7T	8	23	1998	15:29	Appleton	2.00
7T	3	29	1998	11:49	Winchester	2.00



Winnebago County Severe Weather Facts (1950-2023)

Winnebago County Summary

In Winnebago County, the severe weather season begins in earnest in April, peaks in July and then wanes quickly by September. Severe weather usually occurs in the afternoon and early evening hours, with a secondary peak between midnight and 6 AM CST during the summer months. If you do experience severe weather, you are likely to see large hail in the spring and later in the fall. Damaging winds or reports of strong wind gusts are the dominant severe weather report during the remainder of the convective season. In the NWS Green Bay County Warning Area which includes 22 counties from central to northeast Wisconsin, Winnebago County ranks 3rd in the total number of storm reports and 2nd in the number of tornado reports since 1950.

Green Bay Forecast Area Severe Weather Climatology Summary

Across the Green Bay forecast area which covers 22 counties in north-central and northeast Wisconsin, severe weather has been documented in every month except February. This includes a rare event on January 24, 1967 in which a line of thunderstorms produced damaging winds across Brown, Winnebago, and Outagamie counties during the early evening hours. Another rare late season thunderstorm produced one inch hail in Florence County on December 5, 2001 while one inch hail was reported four miles west of St. Nazianz in Manitowoc County on December 20, 1967.

Tornadoes have occurred from March through December, with an extremely rare tornado outbreak occurring on December 1, 1970. On this date four tornadoes were reported across central and northeast Wisconsin during the morning. A strong area of low pressure brought unseasonably mild temperatures and severe thunderstorms to portions of central and northeast Wisconsin as a cold front swept across the state. The first tornado was reported twelve miles southeast of Marshfield in Wood County around 7 AM CST while another tornado was reported in the town of Hull in Portage County around 9 AM CST. Later that morning, a F2 tornado was reported in Waupaca and Shawano counties, from four miles southwest of Iola to near Marion and Pella. The last and strongest tornado occurred around 9:45 AM CST. The F3 tornado travelled from Medina in southwest Outagamie County to far southeast Shawano County, destroying about 20 barns and five homes.

Here are the strongest documented tornadoes in the Green Bay forecast area which covers 22 counties in central, north-central and northeast Wisconsin.

F/EF4 Tornadoes

Event	Date			Time		Tor in GRB Service Area
#	Month	Day	Year	(CST)	Start / End Location	County or Counties
1	6	25	1950	21:00	1 W Woodboro - 5 NE Rhinelander	Oneida
2	9	26	1951	15:45-16:08	9 SSW Amherst - 2 SW Bear Creek	Portage-Waupaca
3	4	3	1956	13:45-13:53	Berlin - 2 W Omro	Waushara-Winnebago
4	8	19	1968	16:10	3 SW Pound - Marinette	Marinette
5	4	21	1974	14:40-15:08	5 S Ripon - Oshkosh	Winnebago
6	4	27	1984	15:20-15:40	1 NE Winneconne - Freedom	Winnebago-Outagamie
7	7	5	1994	15:43-15:55	2.5 NW Maribel - 0.5 W Cooperstown	Manitowoc

Winnebago County Severe Weather Facts (1950-2023)

Green Bay Forecast Area Severe Weather Climatology Summary

The state record for the largest documented hail stone in Wisconsin occurred in Wausau on May 22, 1921. The hailstone measured 5.7 inches in diameter. More recently, a hailstone of 5.5 inches in diameter was reported in Port Edwards in southeast Wood County on June 7, 2007. In 2021, there were three reports of hail four inches in diameter or greater across northeast Wisconsin.

Hail	Month	Date	Year	Time (CST)	Start / End Location	County
5.70	5	22	1921	??	Wausau	Marathon
5.50	6	7	2007	15:23	Port Edwards - Wisconsin Rapids	Wood
4.50	9	7	2021	07:47-07:48	2 W Apple Creek	Outagamie
4.50	7	16	1997	14:15	8 NE Merrill	Lincoln
4.25	5	22	2011	15:05	0.8 NW Winchester	Winnebago
4.25	5	22	2011	14:35	0.5 E Redgranite	Waushara
4.10	9	7	2021	07:45-07:46	3 NE Greenville	Outagamie
4.00	9	7	2021	08:13-08:14	2 E Apple Creek	Outagamie
4.00	8	2	2015	13:32	2.8 S Brookside	Oconto
4.00	8	2	2015	13:24	0.5 E Abrams	Oconto
4.00	4	25	2008	17:50	0.8 SW Kings	Lincoln
4.00	7	1	2006	14:31	1 N Hayes - Suring	Oconto
4.00	3	29	1998	12:25	St. John	Calumet
3.75	9	7	2021	07:47-07:48	1 NW Little Chute	Outagamie
3.50	6	8	2000	22:30	10 W Middle Inlet	Marinette
3.25	7	1	2006	15:05	Oconto - 6 SE Oconto Falls	Oconto
3.00	10	24	2023	08:50-08:51	Nasonville	Wood
3.00	8	2	2015	14:06	Rudolph	Wood
3.00	5	22	2011	17:35	Plover	Portage
3.00	6	7	2007	15:50	5 W Langlade	Langlade
3.00	7	1	2006	19:29	Branch - Manitowoc	Manitowoc
3.00	4	18	2002	15:30	7 WSW Bloomville - 7 NW Bradley	Lincoln
3.00	8	9	2001	12:50	1S Sturgeon Bay	Door
3.00	6	5	1999	18:24	3 S - 8 SE Eagle River	Vilas
3.00	7	27	1989	10:50	1 N Oshkosh	Winnebago
3.00	8	19	1968	16:15	2 E Harmony	Marinette
3.00	7	19	1963	15:00	4 S Rhinelander	Oneida
3.00	7	1	1956	11:00	5 E Green Bay	Brown