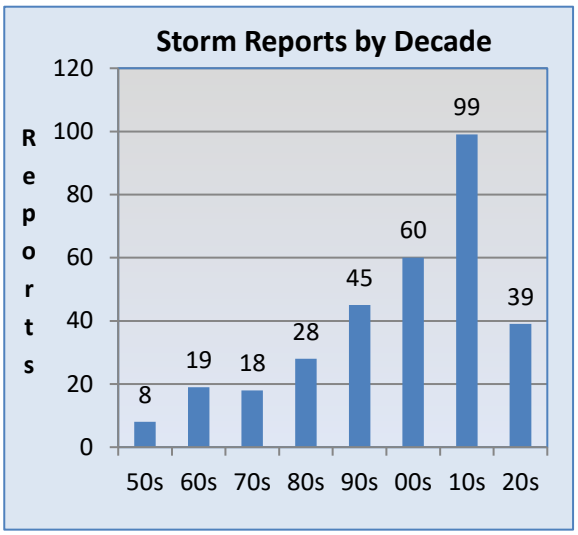
Brown County Severe Weather Facts (1950-2023)

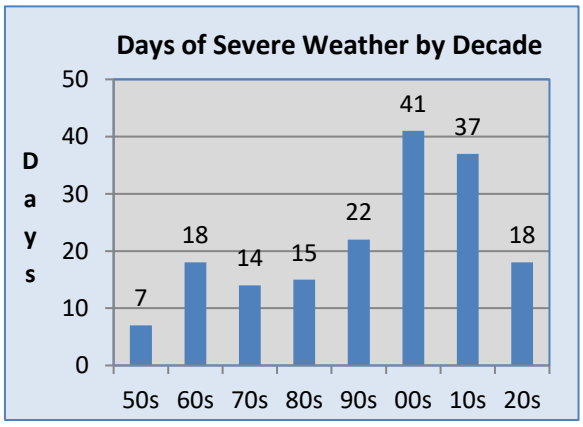
Updated: 01/01/24 – Next Update: January 2025

Storm Reports by Decade

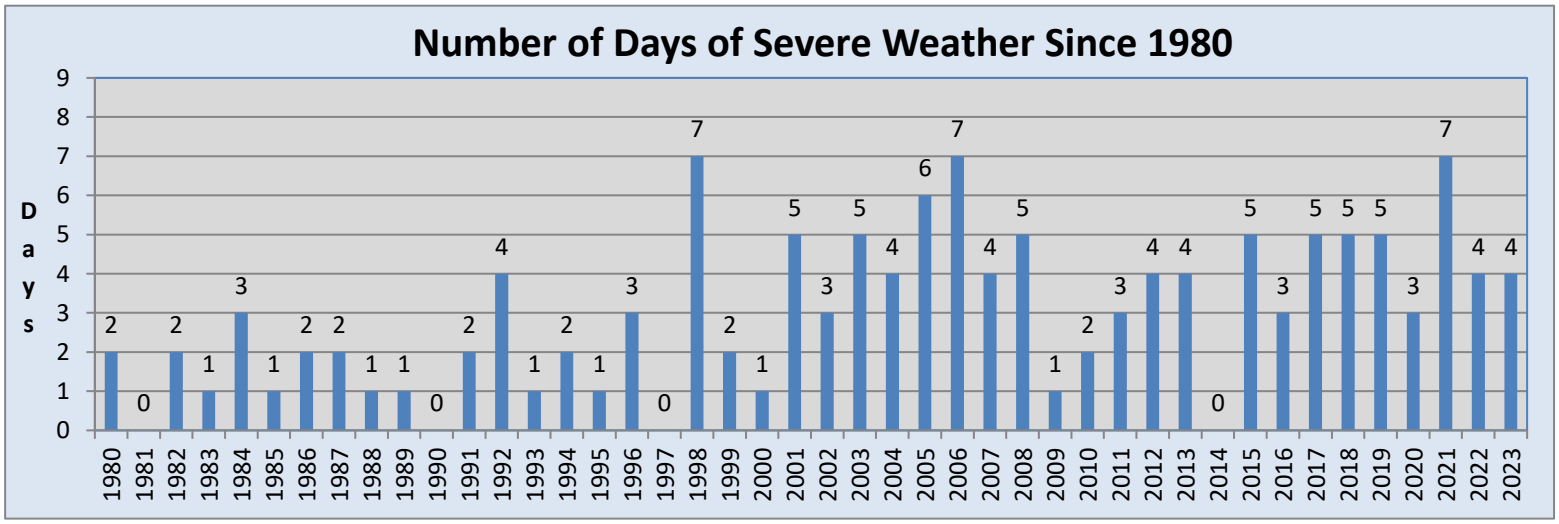


Since 1950 there have been 316 documented reports of large hail, damaging winds and tornadoes across Brown County (see graph to the left). The population boom of the 1980s and 1990s combined with the SKYWARN program led to an increase in the number of reports of severe weather during both decades. The number of reports increased 48% 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. 2012 was the most active year with 19 reports, followed by 17 reports in 2021, 16 reports in 1998, 13 reports in 2011, 2015, 2019, and 2022, and 12 reports in 2005. Since 1980, there were no reports of severe weather in the following years: 1981, 1990, 1997 and 2014. In 2023, there were three reports of large hail and two reports of strong winds/wind damage.

Days of Severe Weather by Decade



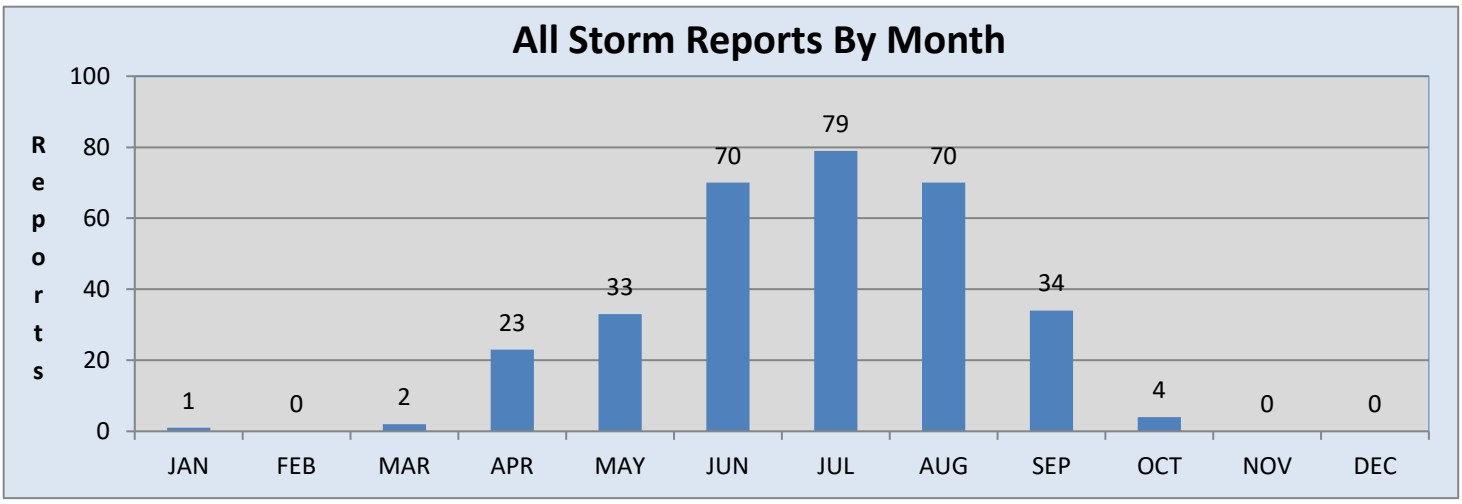
In order to address the impact of multiple reports for the same storm, the data was examined by the number of severe weather days. Since the reports were sporadic during the 1950s through the 1970s, only data from 1980 to present was used. There has been an increase of 86% in the number of days of severe weather from the 1990s compared to the 2014-2023 period (see graph to the left). 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, Brown County averages 3.9 days of severe weather per year. The long- term average from 1980-2023 is 3 days. The most active years were 1998, 2006 and 2021 with seven days of severe weather; followed by six days of severe weather in 2005 and five days in 2001, 2003, 2008, 2013, 2015, 2017, 2018 and 2019. There were 4 days of severe weather in 2023 (April 4, May 31, August 3 and September 6).

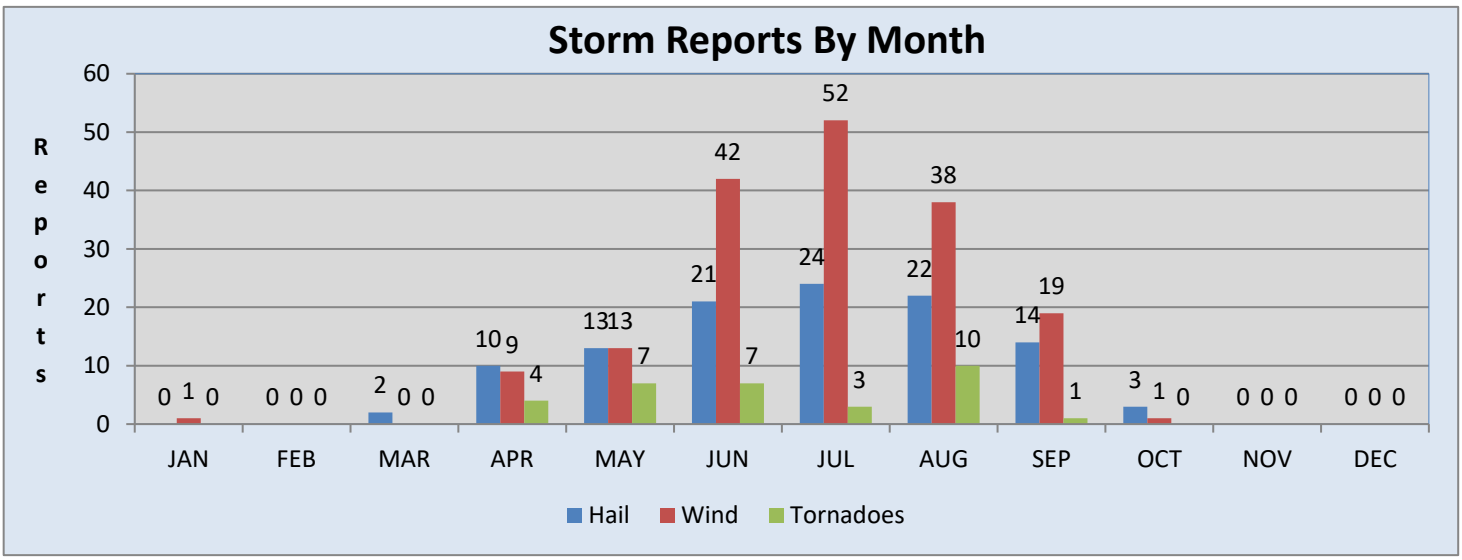


Brown County Severe Weather Facts (1950-2023)

Storm Reports by Month

Severe weather has been documented in Brown 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, Calumet, Winnebago and Outagamie counties during the early evening. On rare occasions, severe weather breaks out during the month of March. The severe weather season begins in earnest in April. The convective season peaks during June through August, with July recording the most reports of any month. The warm season period of May through September accounts for 91% of all severe weather reports during the year. In 2019, Brown County was struck by winds of 50 to 60 mph around 9:45 PM on the evening of July 19th. The next morning, a second round of severe storms brought winds of 50 to 70 mph during the late morning. The last tornado to strike the city of Green Bay occurred on August 11, 2021, when a tornado touched down nearly a mile northwest of Pulaski and travelled to 1.5 miles east of Pulaski between 1:14 to 1:22 PM CST. In 2021, an unusually large hail event struck portions of northeast Wisconsin between 8 AM and 9 AM CST on September 7th. In Brown County, hail up to 2.50 inches in diameter struck Wrightstown. In 2023, there were 3 reports of large hail (April 4, May 31 and September 6) and 2 reports of strong winds/wind damage on August 3.

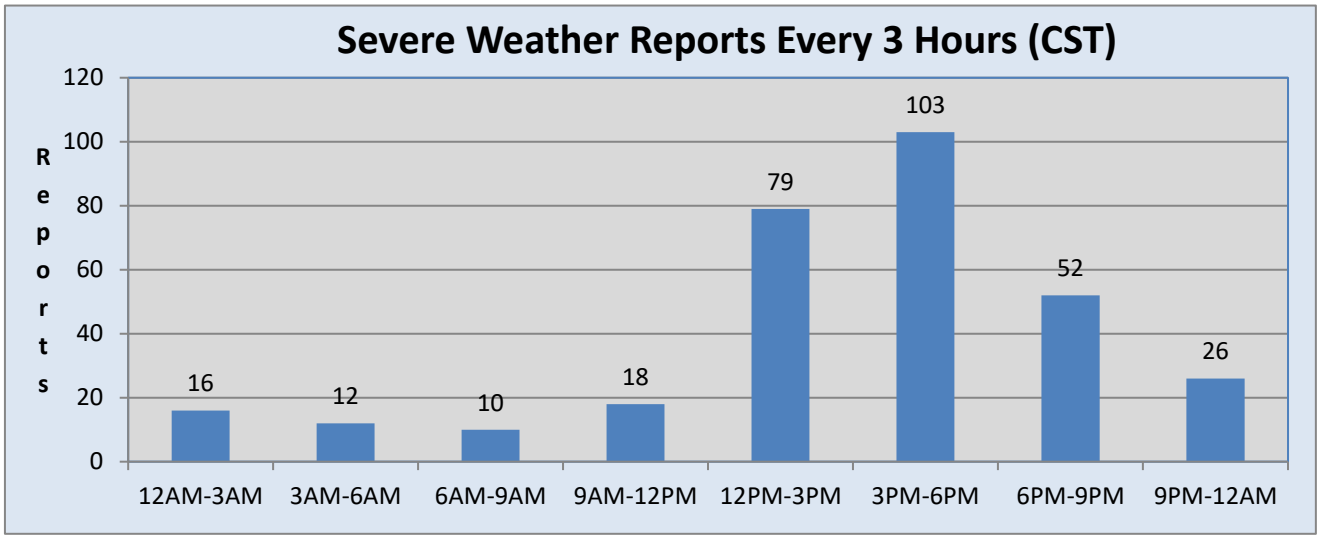


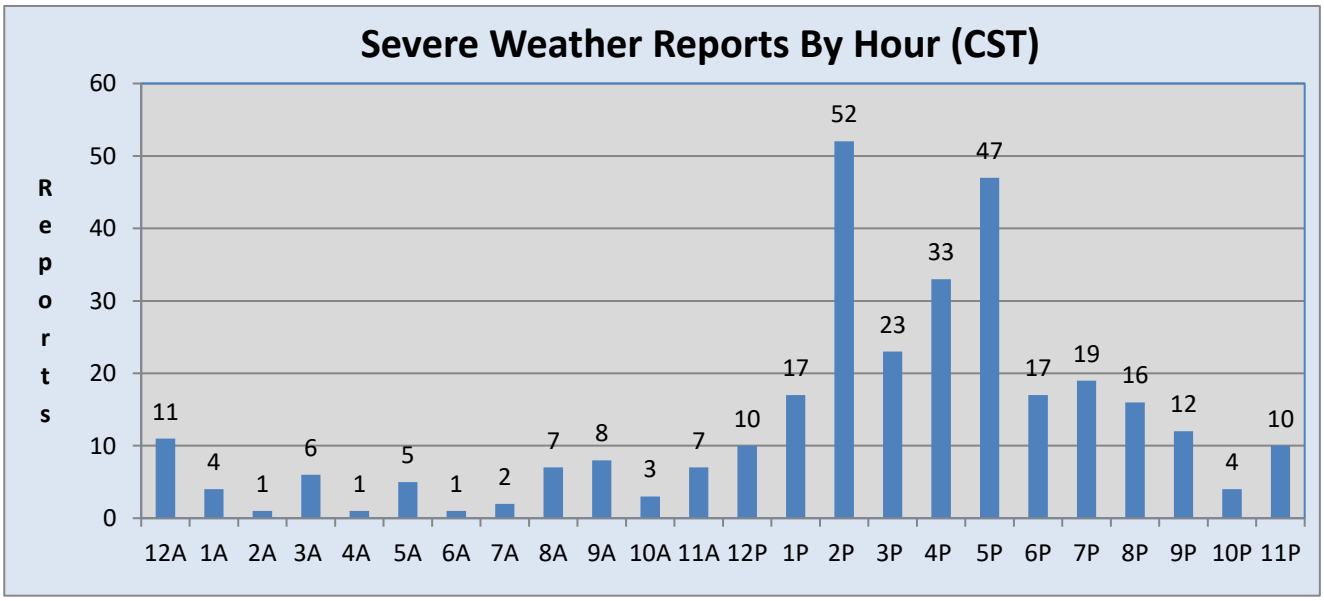


Brown County Severe Weather Facts (1950-2023)

Storm Reports by Time of Day

No matter the season, the afternoon and early evening hours are the peak time for severe weather across Brown County. Nearly 71% of all severe weather reports occur between 1 PM and 9 PM CST. Standard time was used in this study to avoid confusion between standard and daylight time when it was in effect. In Brown County, the peak number of reports occurred between 2 PM and 6 PM CST. The peak in the storm activity corresponds to peak afternoon heating when the atmosphere is most unstable. From May through September, there is another peak of severe weather that occurs between midnight and 3 AM CST. In these cases, convection that fires up across the Dakotas and Minnesota works its way into the county overnight. The minimum in severe weather activity occurred from 1 AM to 9 AM CST and only accounted for nine percent of all severe weather reports. However, on September 2, 2011 northeast Wisconsin experienced one of the strongest morning severe weather outbreaks in years when severe thunderstorms developed across east central and northeast Wisconsin and moved northeast into Brown County. Numerous reports of severe weather were reported across Winnebago, Waushara, Outagamie and Brown Counties. Hurricane force winds were reported near Wrightstown around 8:45 AM CST and winds were estimated at 95 mph in Outagamie County. In 2021, an unusually large hail event occurred across portions of northeast Wisconsin where hail up to 2.5 inches in diameter was reported at Wrightstown around 8 AM CST. Over in Outagamie County, 4.5-inch diameter hail was reported at Apple Creek.

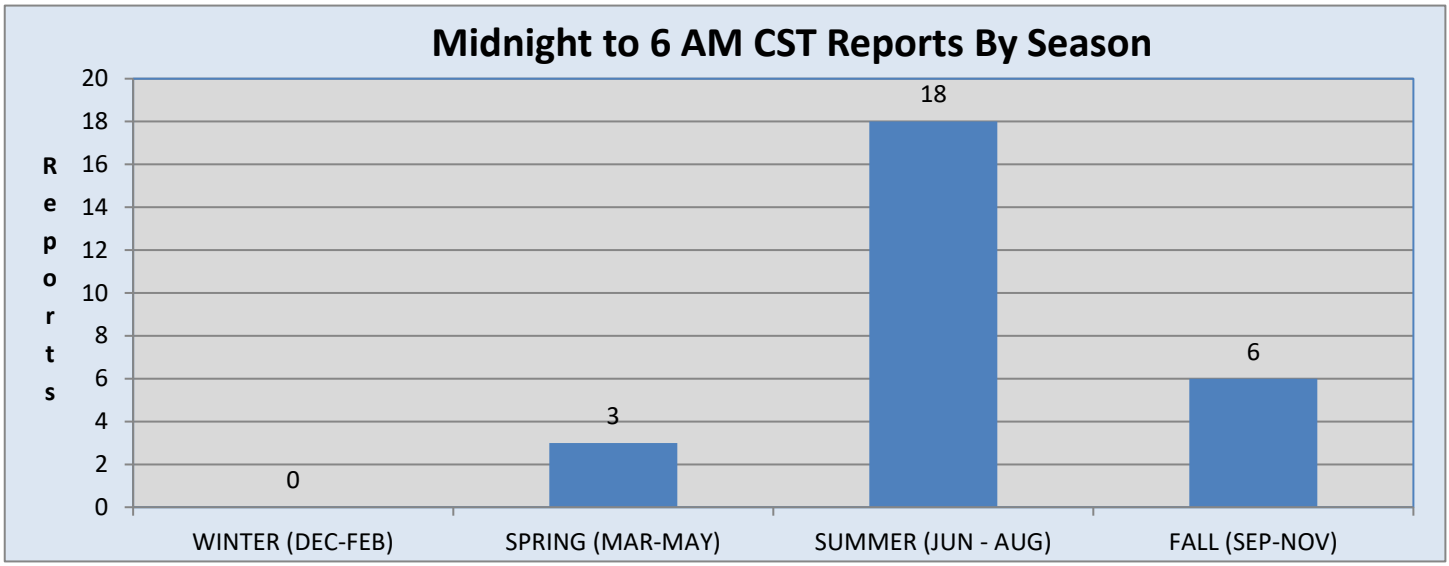




Brown County Severe Weather Facts (1950-2023)

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 67% of all overnight severe weather reports during the year.



Brown County Severe Weather Facts (1950-2023)

Since record keeping began in 1950, there have been 32 documented tornadoes in Brown County. There have been zero documented tornadoes of F/EF3 or greater intensity, while six tornadoes were rated F/EF2 intensity, 15 tornadoes were rated F/EF-1 and 11 tornadoes F/EF-0. The most tornadoes documented in a single year occurred in 1970 with five tornadoes. Four tornadoes were documented in 1959 and 2013; while two tornadoes were recorded in 1964, 1992 and 2005. A rare late evening/early morning tornado outbreak occurred on August 6-7, 2013 when four tornadoes struck Brown County when a fast moving (60 to 70 mph) line of thunderstorms raced across northeast Wisconsin. Tornadoes were reported in three consecutive years from 1968 to 1970. Since 1950, tornadoes have touched down in eighteen different years. The last tornado to hit Brown County occurred on August 11, 2021, when an EF0 tornado moved from nearly a mile west-northwest to a mile and a half east of Pulaski between 1:14 PM and 1:22 PM CST. A tornado touches down in Brown County about every two and a half years.

Brown County Tornadoes

Event		Date			Time		F/EF
#		Month	Day	Year	(CST)	Start / End Location	Rank
1		7	11	1957	13:45	4 SW Denmark	1
2		5	10	1959	20:50	Green Bay	2
3		5	28	1959	15:30	6 SW De Pere	0
4		5	28	1959	15:38	1 SW Greenleaf	1
5		6	11	1959	13:00	De Pere	1
6		6	23	1962	16:30	2 W Champion	1
7		5	8	1964	18:30-19:06	Winneconne-Wrightstown	2
8		5	30	1964	13:28	Green Bay - east side	0
9		8	16	1968	21:20	4 S Pulaski	2
10		6	26	1969	11:15-11:30	Black Creek - 2 NE Pulaski	2
11		4	22	1970	20:40	Ashwaubenon - Green Bay - north side	2
12		4	22	1970	21:00	De Pere - Green Bay	2
13		4	22	1970	21:10	2 NE Poland	1
14		5	21	1970	20:10	Green Bay - north side	0
15		7	30	1970	12:05	4 W Suamico	1
16		7	30	1977	22:45	0.5 N Forest Junction - 3 W Denmark	1
17		8	9	1979	18:56	Green Bay - northeast	1
18		5	16	1992	19:20-19:30	2 SW Wrightstown	1
19		6	17	1992	12:55	2 NE Denmark	0
20		6	23	2004	20:27	Green Bay - northwest	0
21		8	18	2005	19:45-19:49	6 ENE - 6.8 ENE Wrightstown	1
22		9	13	2005	17:09-17:12	De Pere - Allouez	0
23		8	20	2010	15:20-15:22	2 SE - 2.7 ESE Greenleaf	1
24		4	10	2011	19:53-19:55	1.2 NNE - 1.4 S Greenleaf	1
25		8	6	2013	23:38-23:53	0.4 SE Mackville - 2.7 W Morrison	1
26		8	6	2013	23:38-23:52	3.5 E Greenville - 2.6 NNE Brillion	1
27		8	6	2013	23:40-00:10	2.7 ENE Mackville - 1.1 NNE Larabee	0
28		8	6	2013	00:05-00:10	0.5 SSE Henrysville - 1 NE Stangelville	1
29		6	15	2015	14:09-14:10	1.5 - 1.4 NNW Glenmore	0
30		6	14	2017	14:53-14:55	1.2 SW Morrison - Morrison	0
31		8	7	2019	16:48-16:57	2.3 SE Green Bay - 1.9 N Pine Grove	0

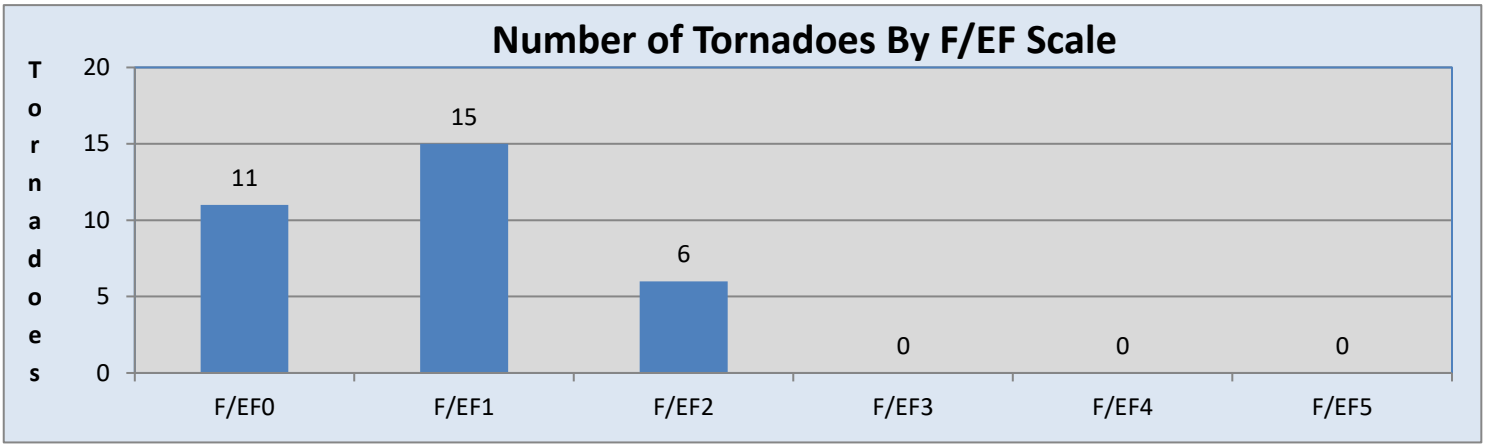
Brown County Severe Weather Facts (1950-2023)

Event		Date			Time		F/EF
#		Month	Day	Year	(CST)	Start / End Location	Rank
32		8	11	2021	13:14-13:22	0.8 WNW - 1.5 E Pulaski	0

F/EF2 or Greater Tornadoes in Brown County

Event		Date			Time		F/EF
#		Month	Day	Year	(CST)	Start / End Location	Rank
1		5	10	1959	20:50	Green Bay	2
2		5	8	1964	18:30-19:06	Winneconne - Wrightstown	2
3		8	16	1968	21:20	4 S Pulaski	2
4		6	26	1969	11:15-11:30	Black Creek - 2 NE Pulaski	2
5		4	22	1970	20:40	Ashwaubenon - Green Bay - north side	2
6		4	22	1970	21:00	De Pere - Green Bay	2

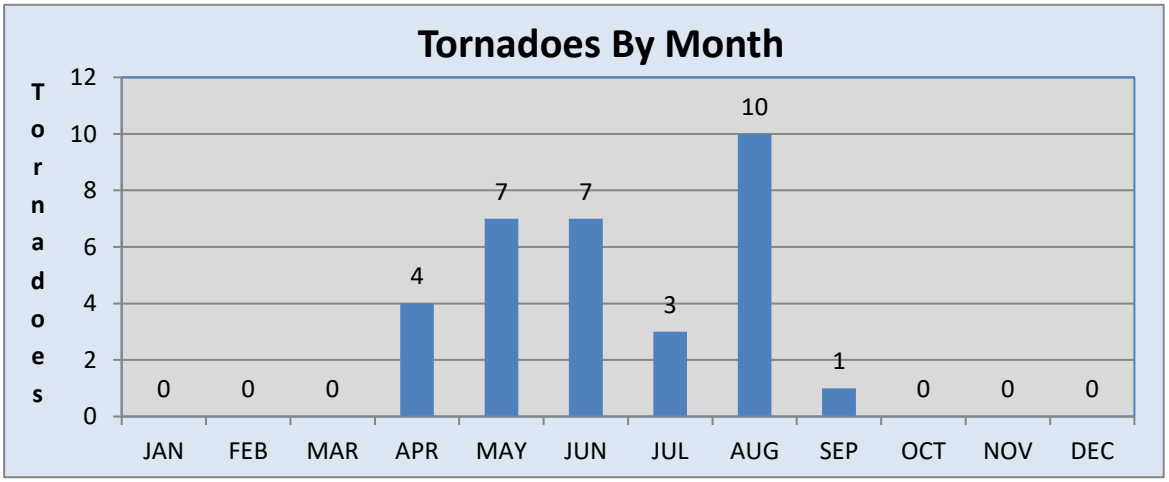
Additional tornado data can be found on the NWS Green Bay webpage at: **http://www.weather.gov/grb/severeclimate**



Brown County Severe Weather Facts (1950-2023)

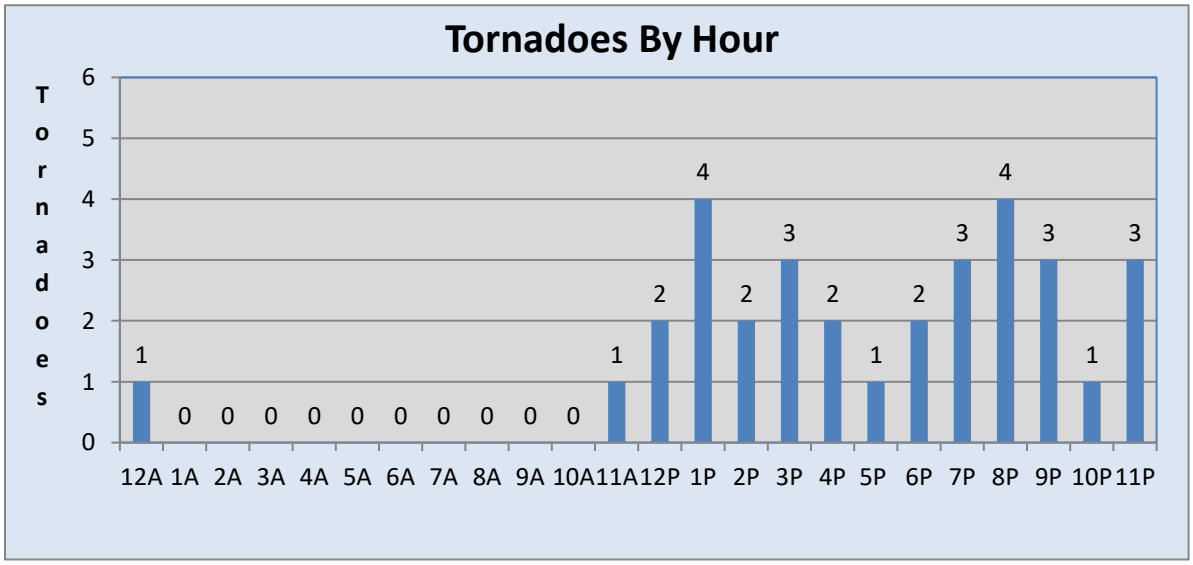
Tornadoes by Month

Tornadoes have occurred in Brown County from April to September. The earliest documented tornado during the year occurred on April 22, 1970. On this day, three tornadoes were documented across the county. Two tornadoes were documented in Green Bay, Ashwaubenon and De Pere. The third tornado occurred two miles northeast of Poland. A large tornado outbreak (August 6-7, 2013) with four tornadoes makes it the largest tornado outbreak across the county. Typically, June is the most active month for tornadoes across northeast Wisconsin, In Brown County, the most active month for tornadoes is August with 10 tornadoes. The warm months of May through August account for 28 out of the 32 (88%) of all documented tornadoes during the year. The latest tornado during a calendar year occurred on September 13, 2005, when a F0 touched down from De Pere to Allouez between 4:48 PM CST and 4:57 PM CST.



Tornadoes by Hour

In Brown County, twenty-eight of the thirty-two (87%) documented tornadoes have occurred between 1 PM and midnight CST. There have been no documented tornadoes between the 1 AM to 11 AM CST.



Brown County Severe Weather Facts (1950-2023)

Predominant Storm Reports – Wind and Hail Only

During March and October, large hail is the dominant weather event that is reported to the National Weather Service. The atmosphere is cold aloft during March and October which supports large hail. For the year, nearly six out of ten reports are high winds or wind damage compared to large hail.

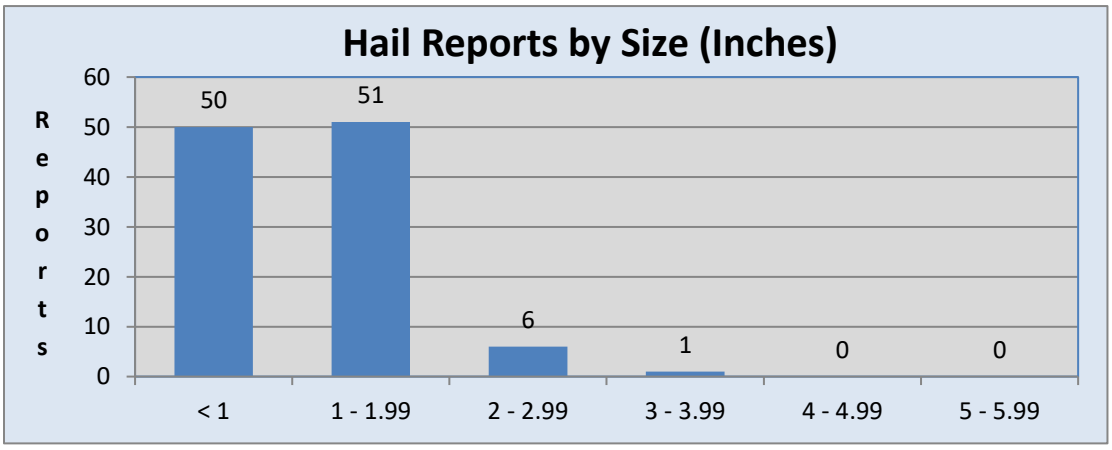
Month	% Hail Reports	% Wind or Wind Damage	Month	% Hail Reports	% Wind or Wind Damage
Jan	0.0	100.0	Jul	31.6	68.4
Feb	0.0	0.0	Aug	36.7	63.3
Mar	100.0	0.0	Sep	42.4	57.6
Apr	52.6	47.4	Oct	75.0	25.0
May	50.0	50.0	Nov	0.0	0.0
Jun	33.3	66.7	Dec	0.0	0.0
			Year	38.4	61.6

Large Hail in Brown County

There have only been seven documented reports of hail over two inches in diameter in the county. The largest hail stone 3.0 inches in diameter occurred five miles east of Green Bay on July 1, 1956. The most recent hail stone over two inches occurred on September 7, 2021, when 2.5-inch hail was reported in Wrightstown around 8 AM CST. Overall, hail ranging in size from three quarters to one inch accounted for 70% of the large hail reports. Large hail reports of two inches or greater accounted for only 6% of all reports.

Hail over 2 inches

Hail (inches)	Date	Time (CST)	Start / End Location
3.00	07/01/1956	11:00	5 E Green Bay
2.75	03/29/1998	12:40	3 E Wrightstown
2.75	03/29/1998	12:45	Greenleaf
2.38	05/28/1991	14:15	Green Bay
2.25	08/28/2003	17:35	Suamico
2.50	09/07/2021	07:59-08:00	Wrightstown
2.50	07/30/2012	16:54-16:57	0.9 SE Cormier



Brown County Severe Weather Facts (1950-2023)

Brown County Summary

In Brown County, the severe weather season begins in earnest in April and 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 early in the spring or late fall. Wind is 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, Brown County ranks 5th in the total number of storm reports and 4th 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

Brown 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