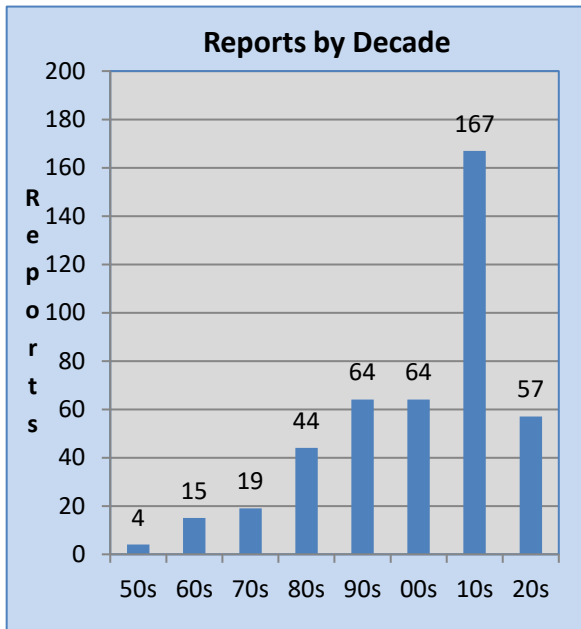


# Outagamie County Severe Weather Facts (1950-2023)

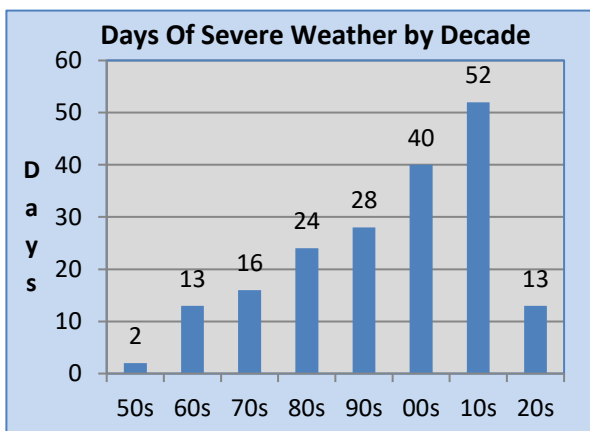
Updated: 01/01/24: Next Update January 2025

## Storm Reports by Decade



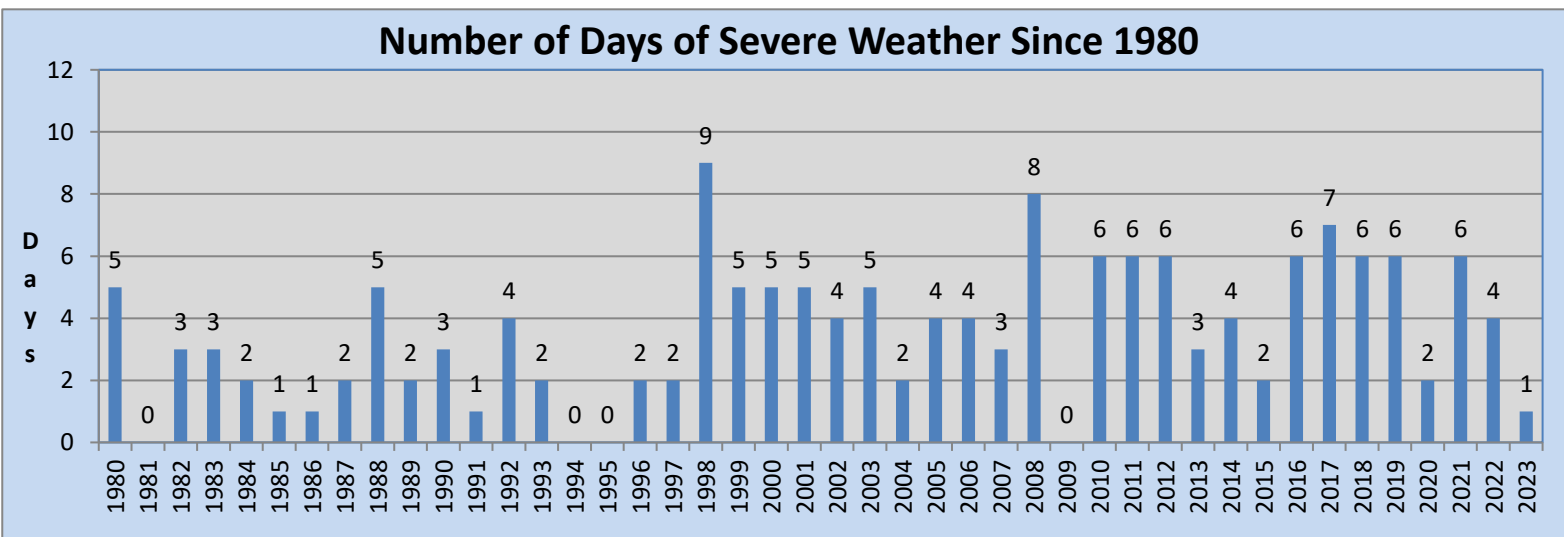
Since 1950 there have been 434 documented reports of large hail, damaging winds and tornadoes across Outagamie County. The population boom of the 1980s and 1990s combined with the SKYWARN program led to an increase in the number of reports of severe weather during both decades. The number of reports increased 134% 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. Those numbers may be biased on the higher side by one event in 2021. On September 7<sup>th</sup> a record 22 reports for one event (all hail), including a record hailstone of 4.5 inches near Apple Creek. 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. 2021 was the most active year with 28 reports, followed by 27 reports in 2011, 26 reports in 2013, 25 reports in 2022, 24 reports in 1998, 22 reports in 2016, 19 reports in 2017 and 2019, and 15 reports in 1999, 2008 and 2010. Since 1980, there were no reports of severe weather in the following years: 1981, 1994, 1995 and 2009. In 2023, there was only one report of severe weather - large hail on May 31<sup>st</sup>.

## 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 18% in the number of days of severe weather from the 2014 to 2023 period. 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, Outagamie County averages 4.6 days of severe weather per year. The long-term average from 1980-2023 is 3.6 days. The most active year was 1998 with nine days of severe weather, followed by eight days in 2008, seven days in 2017, and six days in 2010, 2011, 2012, 2016, 2018, 2019 and 2021. In 2023, there was one day of severe weather: large hail on May 31<sup>st</sup>.

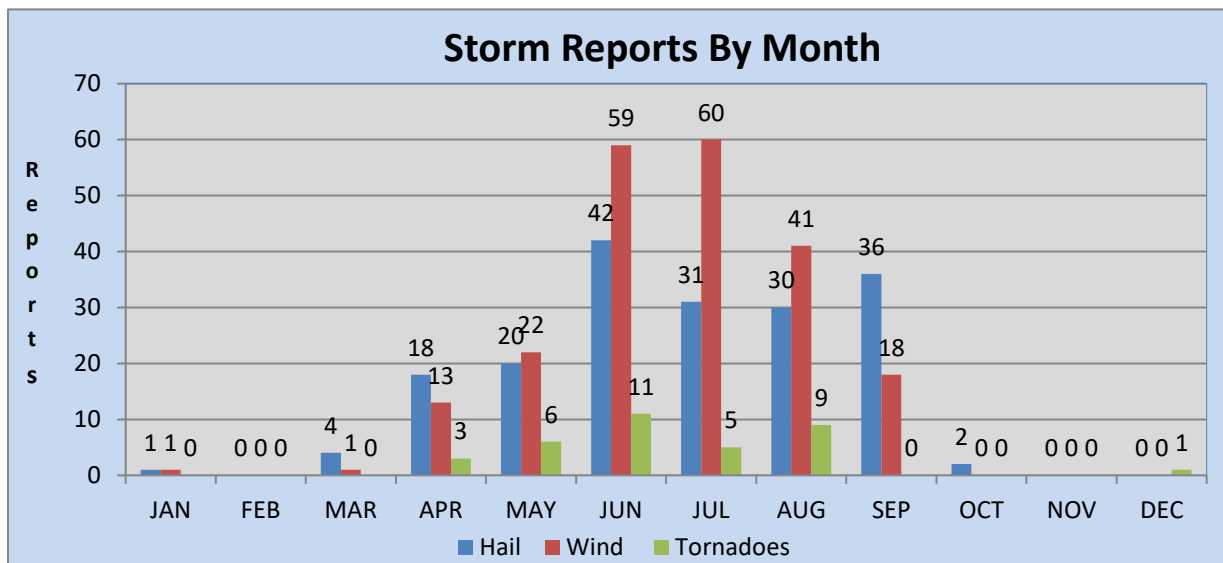
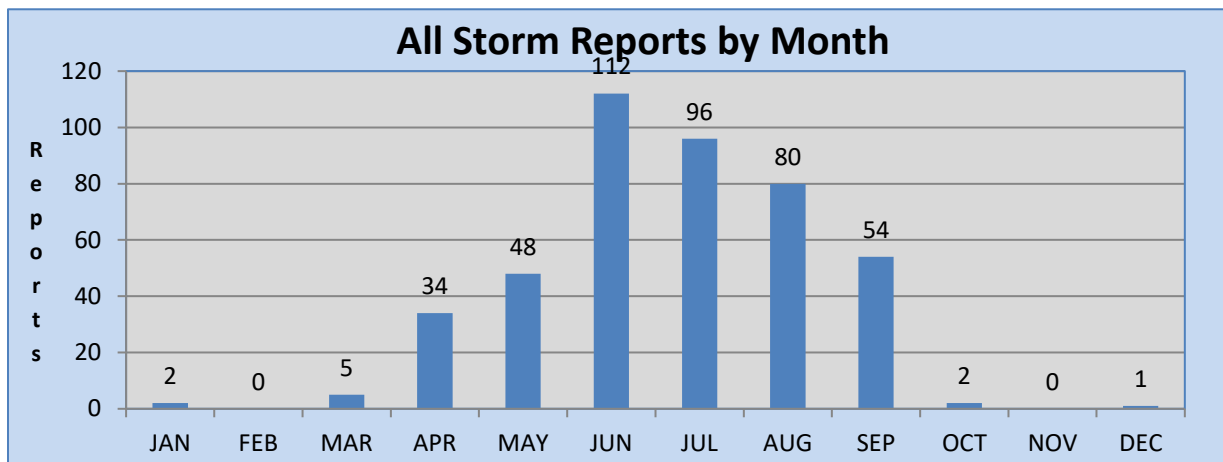
## Number of Days of Severe Weather Since 1980



# Outagamie County Severe Weather Facts (1950-2023)

## Storm Reports by Month

Severe weather has been reported in Outagamie County in every month except for February and November. 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 few occasions, severe weather breaks out during the month of March. In 2017, there was a report of strong wind gust/wind damage on March 1 about four miles west of Shiocton. The severe weather season begins in earnest in April. The heart of the convective season runs from May through September, which account for 90% of all reports during the year. Severe weather can occur from time to time in September. In 2021, there were 22 reports of large hail between 7:30 AM and 8:30 AM CST on September 7th. There were three reports of over 4-inch diameter hail, including a record hailstone for Outagamie County of 4.5 inches two miles west of Apple Creek around 7:47 AM CST. There were three other reports of 3-inch diameter hail. Isolated reports of severe weather have been noted during October and December. The latest report of severe weather during the year occurred on December 1, 1970 when an out of season F3 tornado touched down near Medina and dissipated near Rose Lawn in Shawano County.

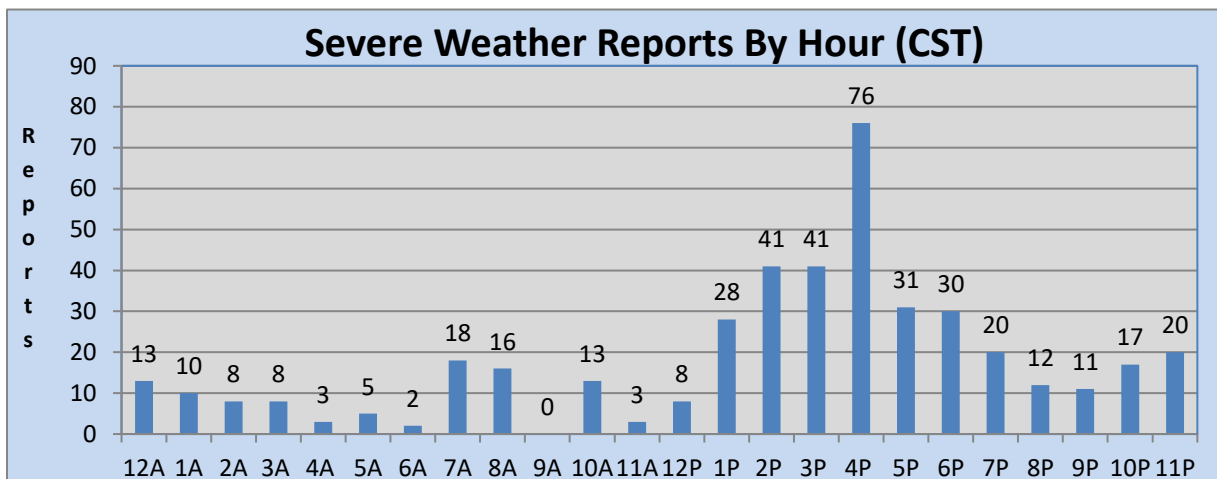
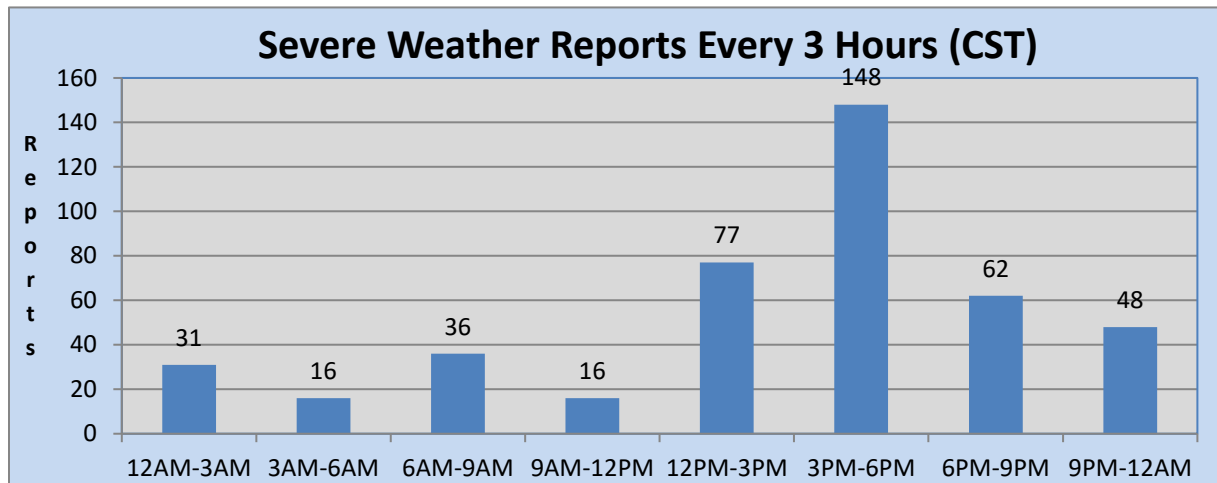


NOTE: The chart depicts storm type by month: (hail, wind/wind damage, tornadoes).

# Outagamie County Severe Weather Facts (1950-2023)

## Storm Reports by Time of Day

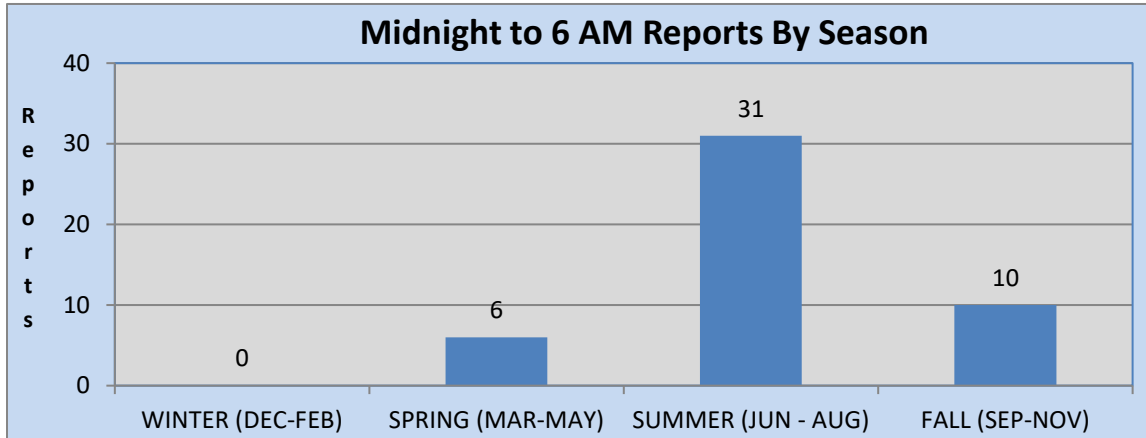
No matter the season, the afternoon and early evening hours are the peak time for severe weather across Outagamie County. Overall, 64% of all severe weather reports occur between 1 PM and 9 PM CST. This number dropped four percent in the last year, mainly due to a large hail event on September 7, 2021, when there were twenty-two reports between 7:30 AM and 8:30 AM CST. In Outagamie County, severe weather reports increased sharply after 1 PM CST with the peak activity between 1 PM and 6 PM. The peak in the storm activity corresponds to peak afternoon heating when the atmosphere is most unstable. Between May and September, there is a peak in overnight activity between midnight and 6 AM CST. In most events, thunderstorms develop across Minnesota and the Dakotas move into the county overnight.



# Outagamie County Severe Weather Facts (1950-2023)

## 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 64% of all overnight severe weather reports during the year.



# Outagamie County Severe Weather Facts (1950-2023)

## Outagamie County Tornadoes

Since record keeping began in 1950, there have been 35 documented tornadoes in Outagamie County. There have been three documented tornadoes of F/EF-3 or greater intensity. The strongest tornado was a F4 tornado on April 27, 1984. Around 3:20 pm that afternoon, the tornado formed near the town of Butte des Morts in northern Winnebago County. The violent storm moved northeast around 40 mph and tore through the town of Clayton, killing one person. The tornado then moved into Outagamie County, tracking across the northwest side of Appleton. Around 3:40 pm, the tornado wreaked havoc across the western edge of the Outagamie County Airport and near the town of Greenville. The tornado finally dissipated near Freedom. An estimated two dozen homes were destroyed and many more were damaged across the Fox Valley that afternoon. The storm killed one person and injured nineteen more. Total cost of the destruction over the Fox Valley was 15 million dollars (adjusted for inflation today). At one point, the tornado was one quarter mile wide and travelled over twenty miles. The most active year was 2013 with five tornadoes, followed by four tornadoes in 2017 and 2019, three tornadoes in 1959 and two tornadoes in 1968, 2011 and 2022. On August 6, 2013 into the early morning hours of August 7<sup>th</sup>, a record breaking five tornadoes occurred between 11:22 PM and 12:10 AM CST. Four tornadoes occurred in a single day across Outagamie County on June 14, 2017 and July 20, 2019. The latest tornado in a year occurred on December 1, 1970, when a F3 tornado moved from Medina to near Rose Lawn in Shawano County. A tornado was reported across Outagamie County in three consecutive years from 1968 to 1970. Since 2016, tornadoes were reported in 2016, 2017, 2019 and 2021 (four out of six years). Since 1950, tornadoes have touched down in 20 different years. A tornado strike in Outagamie County occurs on average just over two years.

Event #	Date			Time (CST)	Start / End Location	F/EF Rank
	Month	Day	Year			
1	5	6	1959	00:320	Symco - 3 SE Clintonville	2
2	5	6	1959	13:30	3 NE Shiocton	2
3	8	28	1959	14:04	3 N Appleton	2
4	5	8	1964	18:30-19:06	Winneconne - Wrightstown	2
5	8	5	1968	14:00	3 NW Seymour	1
6	8	16	1968	12:30	Kaukauna	2
7	6	26	1969	11:15-11:30	Black Creek - Pulaski	3
8	12	1	1970	10:15	Medina - Rose Lawn	3
9	7	12	1973	08:00	4 W Freedom	1
10	6	13	1976	20:00	5 E Seymour	1
11	5	30	1980	16:05-16:14	Black Creek	1
12	5	6	1982	14:30	2 S Stephenville - 1 S Black Creek	2
13	4	27	1984	15:20-15:40	1 NE Winneconne - Freedom	4
14	5	16	1992	19:20-19:30	Kaukauna - 3 N Holland	1
15	6	23	2004	20:00-20:08	Little Chute - Kaukauna	1
16	6	13	2005	14:49-14:50	4.1 NNE - 4 NNE Black Creek	0
17	4	10	2011	18:06-18:32	1.2 SW Saxeville - 1 SE Hortonville	1
18	4	10	2011	19:43-19:46	1.2 SW Kaukauna - 0.3 S Little Chute	2
19	8	6	2013	23:22-23:30	4 NNE Partridge - 0.8 S New London	2
20	8	6	2013	23:24-23:33	1.2 W New London - 0.4 WSW Greenville	1
21	8	6	2013	23:38-23:53	0.4 SE Mackville - 2.7 W Morrison	1

# Outagamie County Severe Weather Facts (1950-2023)

Event		Date			Time		F/EF
#		Month	Day	Year	(CST)	Start / End Location	Rank
22		8	6	2013	23:38-23:52	3.5 E Greenville - 2.6 NE Brillion	1
23		8	6	2013	23:40-00:10	2.7 ENE Mackville - 1.1 NNE Larabee	1
24		6	10	2016	19:00-19:03	1.3 SW Mackville - 1.8 SW Mackville	0
25		6	14	2017	14:28-14:37	2.6 SSW Appleton - 1.7 NNW Little Chute	0
26		6	14	2017	14:30-14:34	2.9 SSW - 2 S Mackville	0
27		6	14	2017	14:31-14:38	3.1 ENE Bear Creek - 2.3 WNW Leeman	0
28		6	14	2017	14:40-14:45	1.9 W Nichols - 1.2 WNW Briarton	0
29		7	20	2019	10:10-10:20	1.4 SSE New London - 2.9 SW Shiocton	1
30		7	20	2019	10:18-10:22	2.6 E Hortonville - 3.3 ESE Stephenville	1
31		7	20	2019	10:22-10:23	1.9 NE Greenville - 2.6 NE Greenville	0
32		7	20	2019	10:36-10:38	3.2 ENE Little Chute - 4.3 ENE Little Chute	0
33		8	10	2021	16:58-17:11	1.3 SE Stinson - 2.4 SW Drephal	1
34		6	15	2022	17:09-17:18	0.9 E Leeman - 1.5 WSW Landstad	1
35		6	15	2022	17:10-17:20	1 N Binghampton - 1.5 ESE Seymour	0

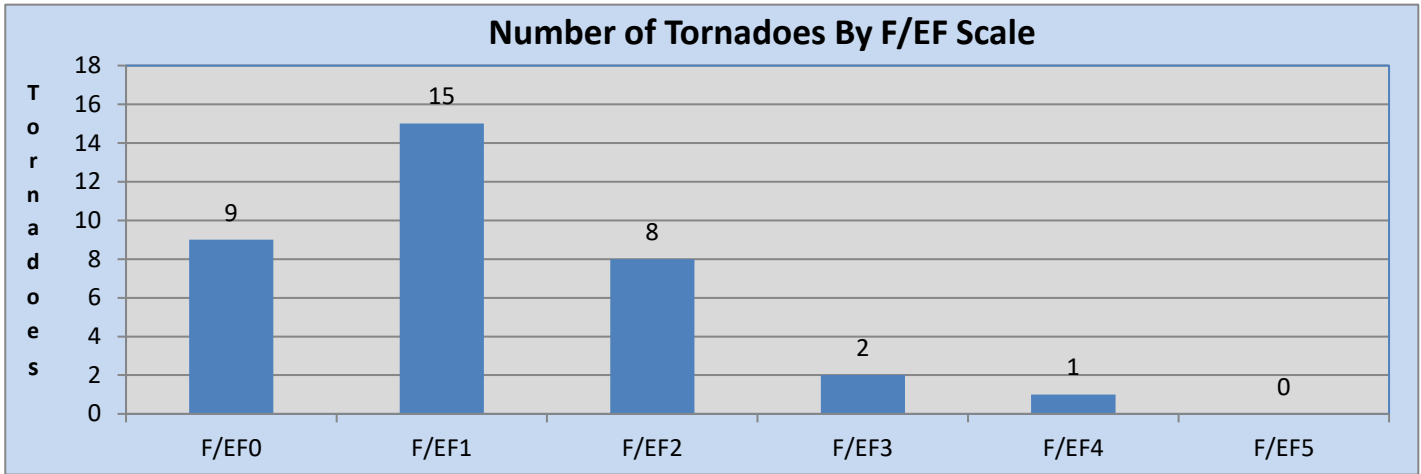
## F/EF2 or Greater Tornadoes in Outagamie County

Event		Date			Time		F/EF
#		Month	Day	Year	(CST)	Start / End Location	Rank
1		5	6	1959	03:20	Symco - 3 SE Clintonville	2
2		5	6	1959	13:30	3 NE Shiocton	2
3		8	28	1959	14:04	3 N Appleton	2
4		5	8	1964	18:30-19:06	Winneconne - Wrightstown	2
5		8	16	1968	12:30	Kaukauna	2
6		6	26	1969	11:15-11:30	Black Creek - Pulaski	3
7		12	1	1970	10:15	Medina - Rose Lawn	3
8		5	6	1982	14:30	2 S Stephenville - 1 S Black Creek	2
9		4	27	1984	15:20-15:40	1 NE Winneconne - Freedom	4
10		4	10	2011	19:43-19:46	1.2 SW Kaukauna- 0.3 S Little Chute	2
11		8	6	2013	23:22-23:30	4 NNE Partridge - 0.8 S New London	2

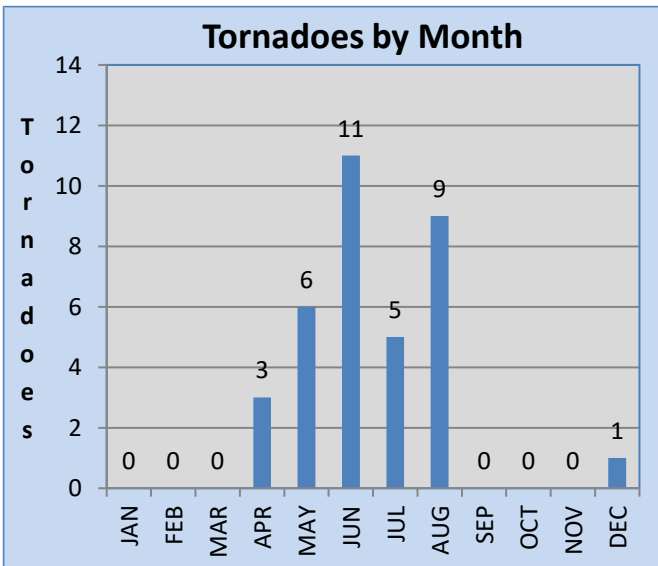
Additional tornado data can be found on the NWS Green Bay webpage at: <http://www.weather.gov/grb/severeclimate>

# Outagamie County Severe Weather Facts (1950-2023)

Across the county, one tornado was rated F/EF4, 3 tornadoes were rated F/EF3 intensity, 8 tornadoes were rated F/EF2, 15 tornadoes were rated F/EF1 and 9 tornadoes were rated F/EF0.



## Tornadoes by Month

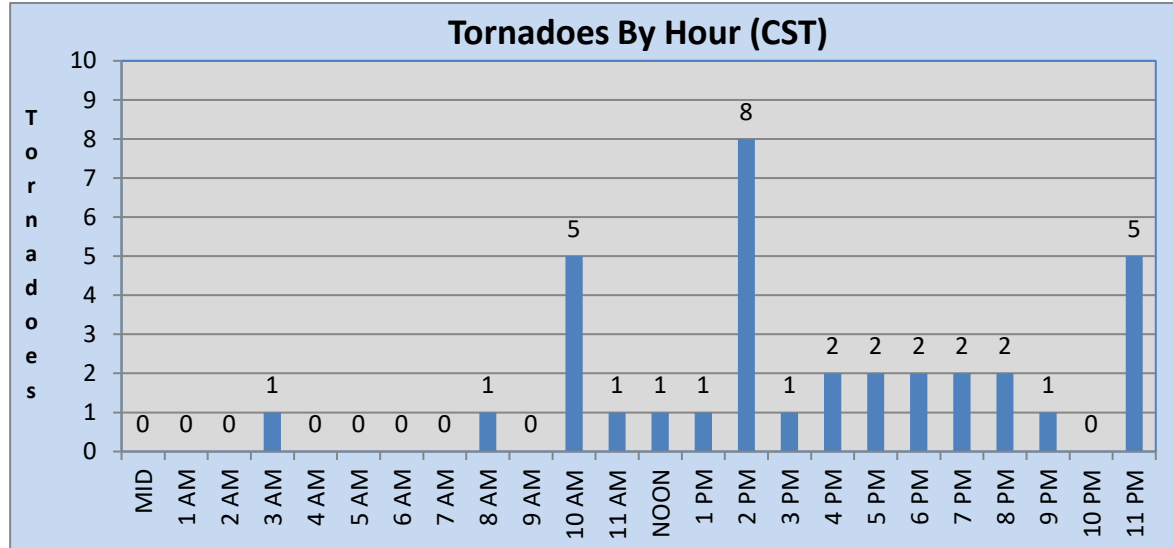


Documented tornadoes have occurred in Outagamie County from April to August, along with a rare out of season December tornado. The earliest documented tornado during a year occurred on April 10, 2011 when two tornadoes struck the county. The first tornado touched down 1.2 miles southwest of Saxeville in Waushara and moved to one mile southeast of Hortonville. The second tornado on this date was rated EF2 that touched down 1.2 miles southwest of Kaukauna and traveled to three tenths of a mile south of Little Chute between 7:43 PM and 7:46 PM CST. The strongest tornado on record for Outagamie County occurred on April 27, 2004 when a F4 tornado tore through the northwest side of Appleton. The tornado season peaks in May through August, which accounts for 89% of all tornadoes during the year. June and August are tied as the most active months for tornadoes with nine. The latest tornado on record during the year occurred on December 1, 1970. A F3 tornado touched down near Medina and travelled to near Rose Lawn in Shawano County before dissipating.

# Outagamie County Severe Weather Facts (1950-2023)

## Tornadoes by Hour

In Outagamie County, 18 documented tornadoes (54%) have occurred between 2 PM and 9 PM CST. In 2013, there was a rare nighttime tornado event (five tornadoes) early on August 7<sup>th</sup>. There have been no documented tornadoes between the midnight and 3 am, and from 4 am to 8 am local standard time.



## Predominant Storm Reports – Wind and Hail Only

Until 2021, March and October were predominately large hail reports. A record 22 large hail reports in September had now made that month predominately large hail over strong winds or wind damage. During the Spring and Fall, the atmosphere aloft is colder during this time of year to support large hail reaching the ground. During the remainder of the convective season, strong wind gusts and wind damage was the dominate report type. Over the course of the year, strong winds or wind damage was reported just over half the time compared to large hail.

Month	% Hail Reports	% Wind or Wind Damage	Month	% Hail Reports	% Wind or Wind Damage
Jan	50.0	50.0	Jul	34.1	65.9
Feb	0.0	0.0	Aug	42.3	57.7
Mar	80.0	20.0	Sep	66.7	33.3
Apr	58.1	41.9	Oct	100.0	0.0
May	47.6	52.4	Nov	0.0	0.0
Jun	41.6	58.4	Dec	0.0	0.0
			Year	46.0	54.0



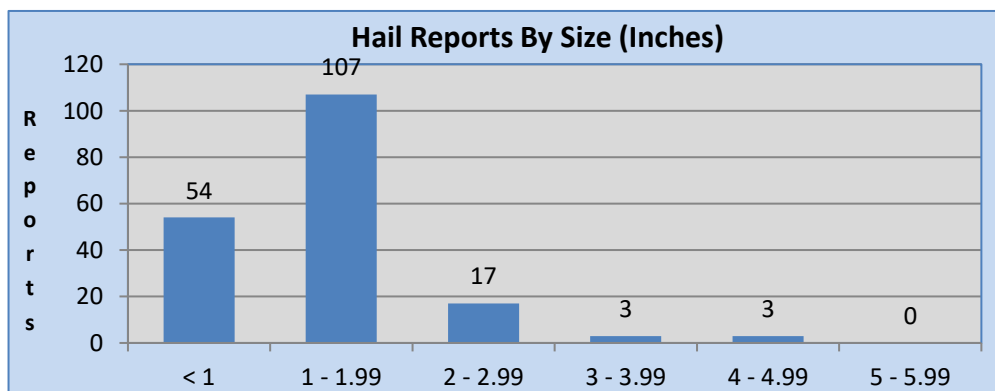
# Outagamie County Severe Weather Facts (1950-2023)

There have been twenty documented reports of large hail two inches or greater in diameter across the county. Twelve of these reports occurred on September 7, 2021 between 7:30 AM and 8:30 AM CST. On this date, a record breaking 4.5” hailstone for Outagamie County occurred two miles west of Apple Creek. On this date, there were three hailstones over four inches and diameter and

The largest hail stone of 2.5 inches in diameter occurred one mile west of Appleton on March 29, 1998 and again on June 17, 2013 just over a half mile south of Appleton. Overall, hail ranging in size from three quarters to one inch accounted for 63% of the documented large hail reports. Large hail reports of two inches or greater only accounted for 13% of the total large hail reports.

## Hail over 2 inches

Rank	Date			Time (CST)	Start / End Location	Hail (Inches)
	Month	Day	Year			
1	9	7	2021	07:47-07:48	2 W Apple Creek	4.50
2	9	7	2021	07:45-07:46	3.4 NE Greenville	4.10
3	9	7	2021	08:13-08:14	2 E Apple Creek	4.00
4	9	7	2021	07:47-07:48	0.9 NW Little Chute	3.75
5	9	7	2021	07:46-07:47	2.5 SE Mackville	3.00
6	9	7	2021	07:47-07:48	3 WSW Apple Creek	3.00
7	9	7	2021	07:48-07:49	2.4 NW Apple Creek	2.75
8	9	7	2021	07:55-07:56	Freedom	2.75
9	9	7	2021	07:50-07:51	2.8 S Mackville	2.50
10	6	7	2013	14:26	0.7 S Appleton	2.50
11	3	29	1998	12:10	1 W Appleton	2.50
12	9	7	2021	08:10-08:11	1.4 N Appleton	2.00
13	9	7	2021	07:57-07:58	Wrightstown	2.00
14	9	7	2021	07:53-07:55	2 W Hortonville	2.00
15	4	15	2003	18:00	5 NE Bear Creek	2.00
16	3	8	2000	19:20	Medina	2.00
17	8	12	1999	23:13	Darboy	2.00
18	9	26	1998	00:30	4 SE Shiocton	2.00
19	8	23	1998	15:44	Appleton	2.00
20	3	29	1998	12:03	3 WNW Appleton	2.00



# Outagamie County Severe Weather Facts (1950-2023)

## Outagamie County Summary

In Outagamie 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 between May and September. If you do experience severe weather, you are likely to see large hail early in the spring and in the fall while damaging winds or 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, Outagamie County ranks 2<sup>nd</sup> in the total number of storm reports and 3<sup>rd</sup> 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	Wausara-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

# Outagamie 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