# East Central Florida Severe Weather Climatology: A Look at the Last 70 Years

Megan Tollefsen

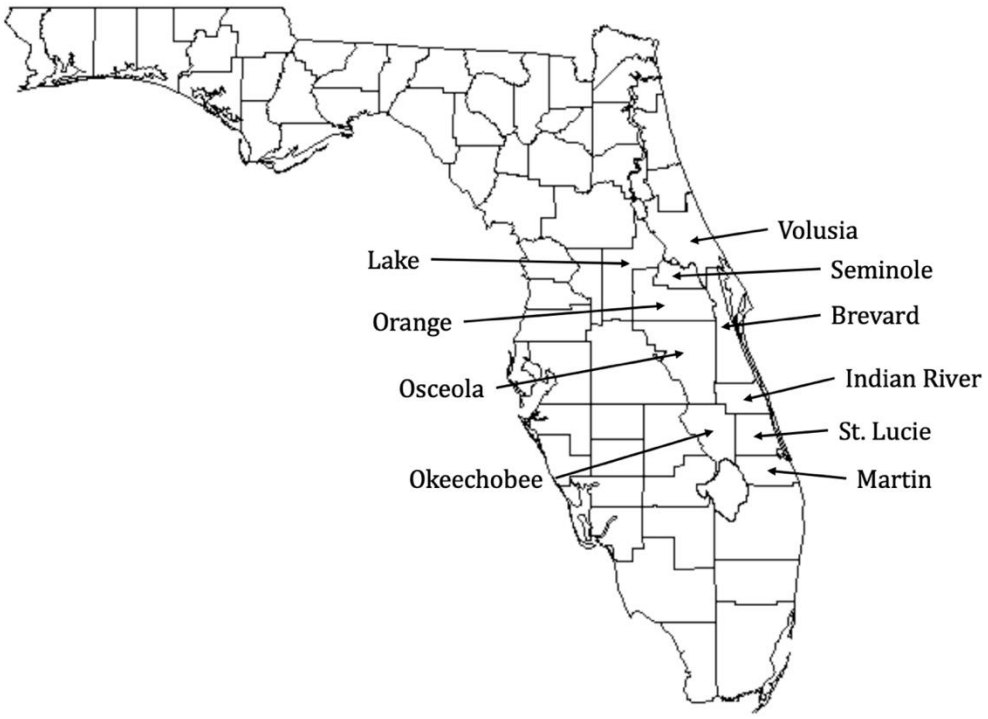
Climatology helps forecasters gain a deeper understanding of the weather that impacts their area. While older data may not always capture the full spectrum of events that occur within an area, analyzing this data only serves to help gain a better idea of the NWS Melbourne's climatology.

This climatological report will focus on three primary severe weather impacts: tornadoes, large hail, and severe thunderstorm wind gusts. The range of time for this climatology report starts on January 1st, 1950 and ends on December 31st, 2020. Tornadoes are rated on the Fujita scale (0-5) from 1950 to January 31st, 2007 and are then rated on the Enhanced Fujita scale (0-5) from February 1st, 2007 to 2020. Hail reports are included for stones that were 0.75 inches in diameter and greater. However, it is important to note that on January 5th, 2010, the National Weather Service criteria for large hail changed from 0.75 inches to 1 inch (thunderstorms containing large hail are considered severe). Severe thunderstorm wind reports were included for gusts of 58 miles per hour (50 knots) and greater.

Data for this climatological report were pulled from the Storm Events Database[1]. The data were then compiled into an Excel spreadsheet, and the various graphs within this report were created using Excel.

The document is split into two distinct sections. The first section will show the East Central Florida climatology, the second section will show a breakdown by the ten counties within the NWS Melbourne County Warning Area (CWA).

## Melbourne County Warning Area

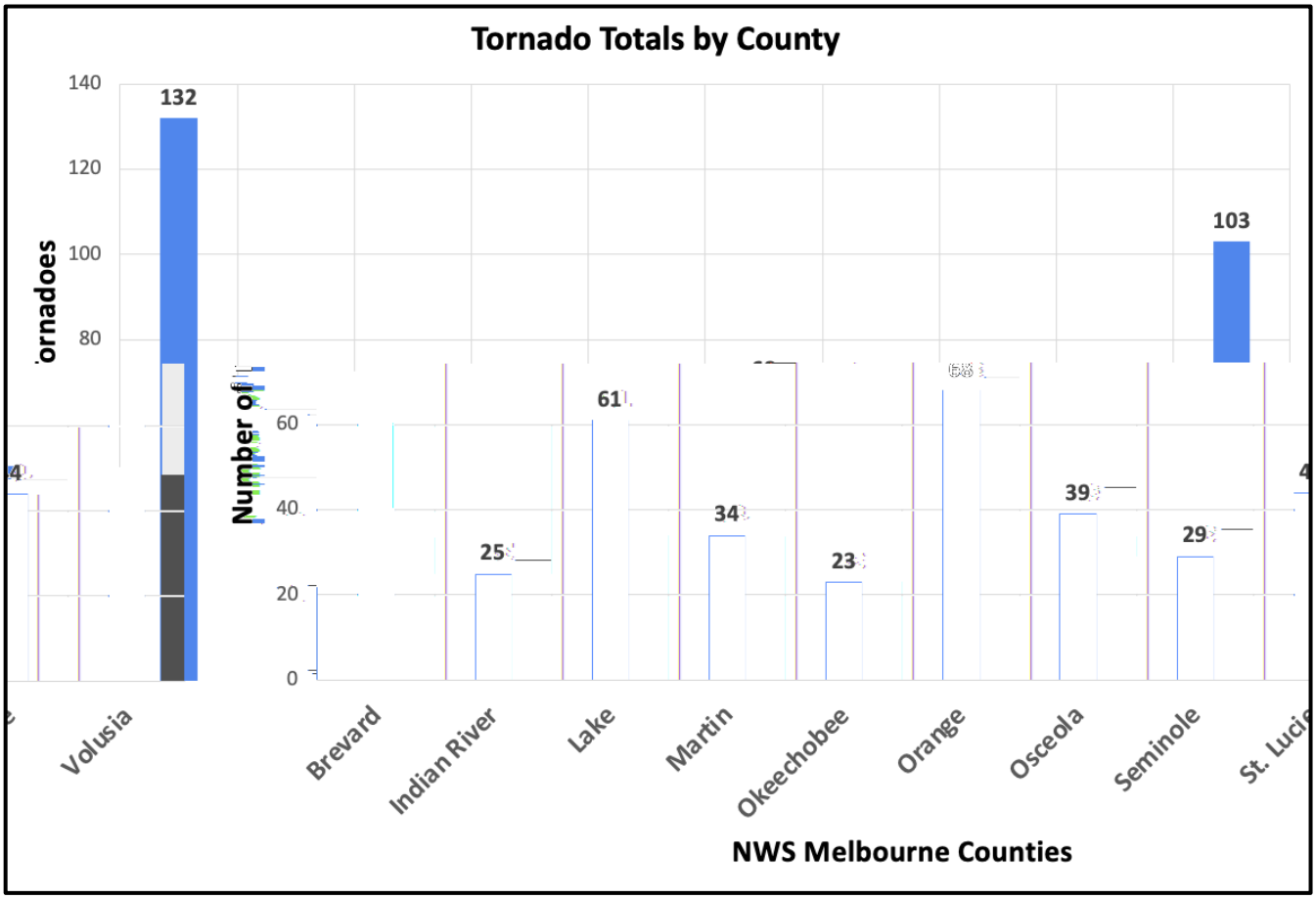


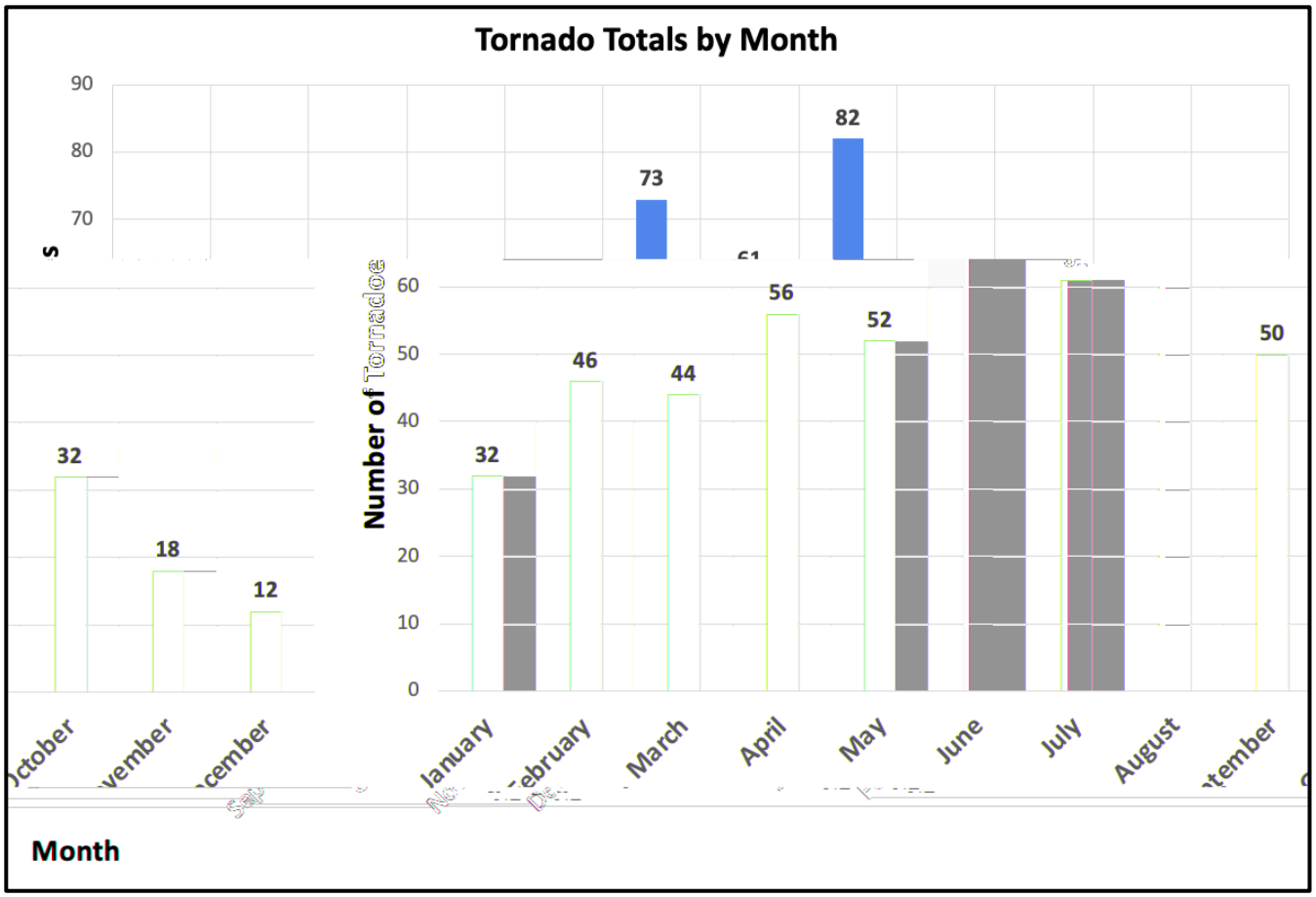

[1] The Storm Events Database archive can be accessed at https://www.ncdc.noaa.gov/stormevents/ .

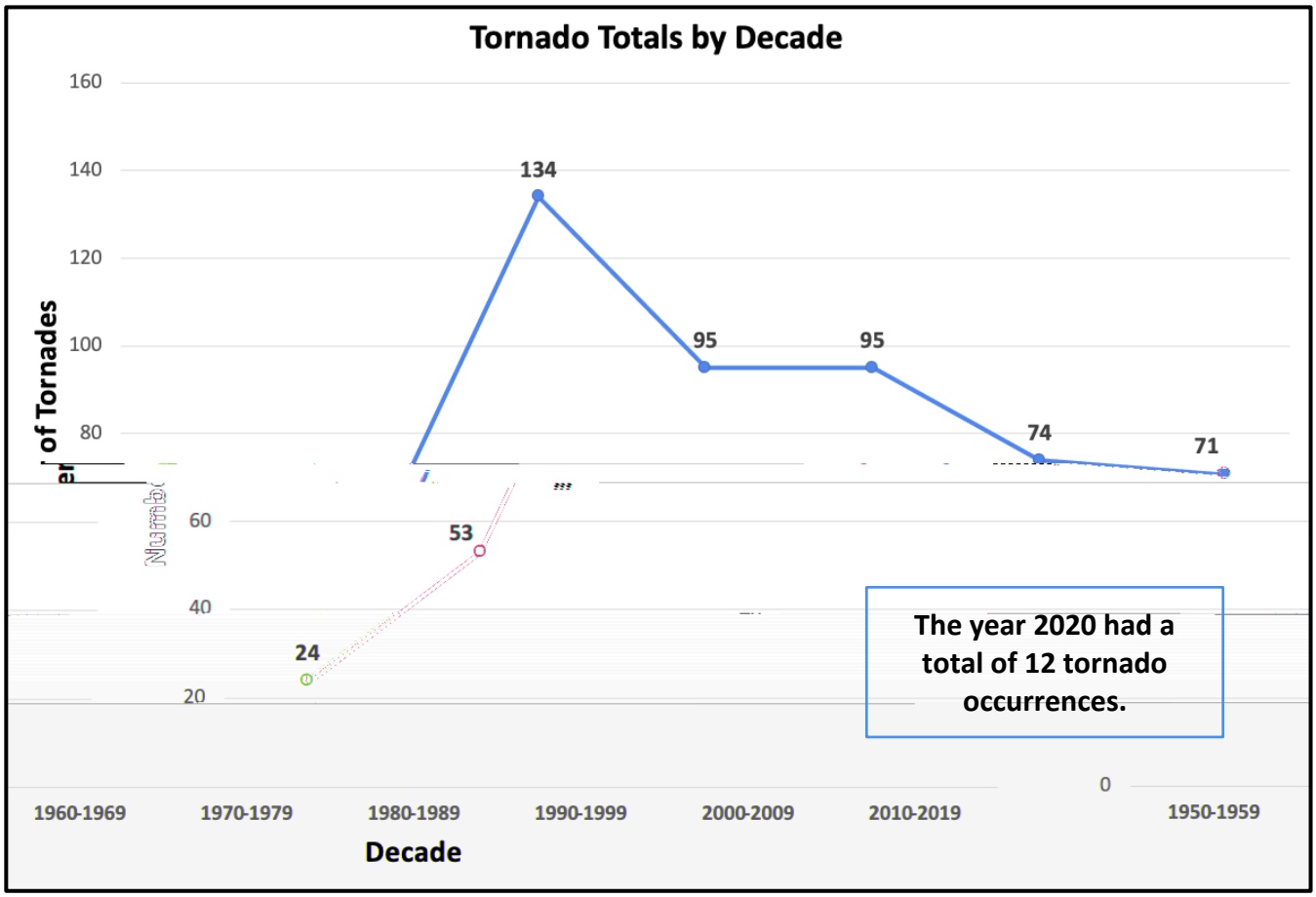
# Part 1: Melbourne County Warning Area Climatology

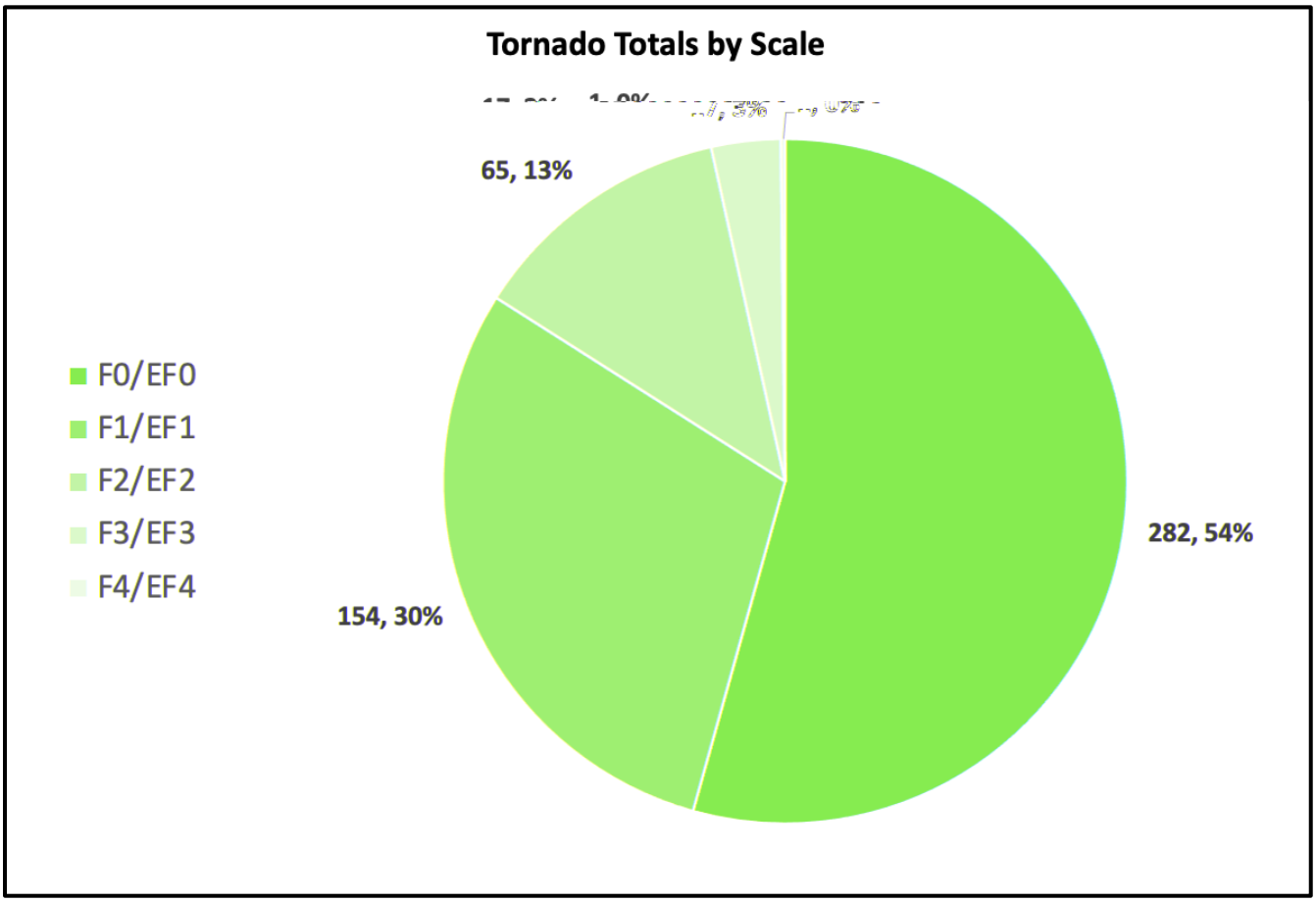
## Tornado Overview

The period of time from January 1st, 1950, to December 31st, 2020, had a total of 558 tornadoes within the NWS Melbourne WFO. Brevard County saw the greatest number of tornadoes over this time period. The month of August saw the greatest number of tornadoes, and the decade that had the greatest number of tornado occurrences was the 1970-1979 period. The strength of these tornadoes never surpassed an F4/EF4, with 1 tornado during the period being categorized as an F4/EF4. As for injuries and deaths associated with tornadoes, there were a total of 821 injuries attributed to tornadoes within the NWS Melbourne area, and 77 fatalities.




Tornado Totals by Month
Number of Tornadoes
90
80
70
60
50
40
30
20
10
0
32
18
12
32
46
44
56
52
82
73
50
January
February
March
April
May
June
July
August
Month


Tornado Totals by Decade
160
140
120
100
80
60
40
20
0
134
95
95
74
71
53
24
1960-1969
1970-1979
1980-1989
1990-1999
2000-2009
2010-2019
1950-1959
Decade
The year 2020 had a total of 12 tornado occurrences.

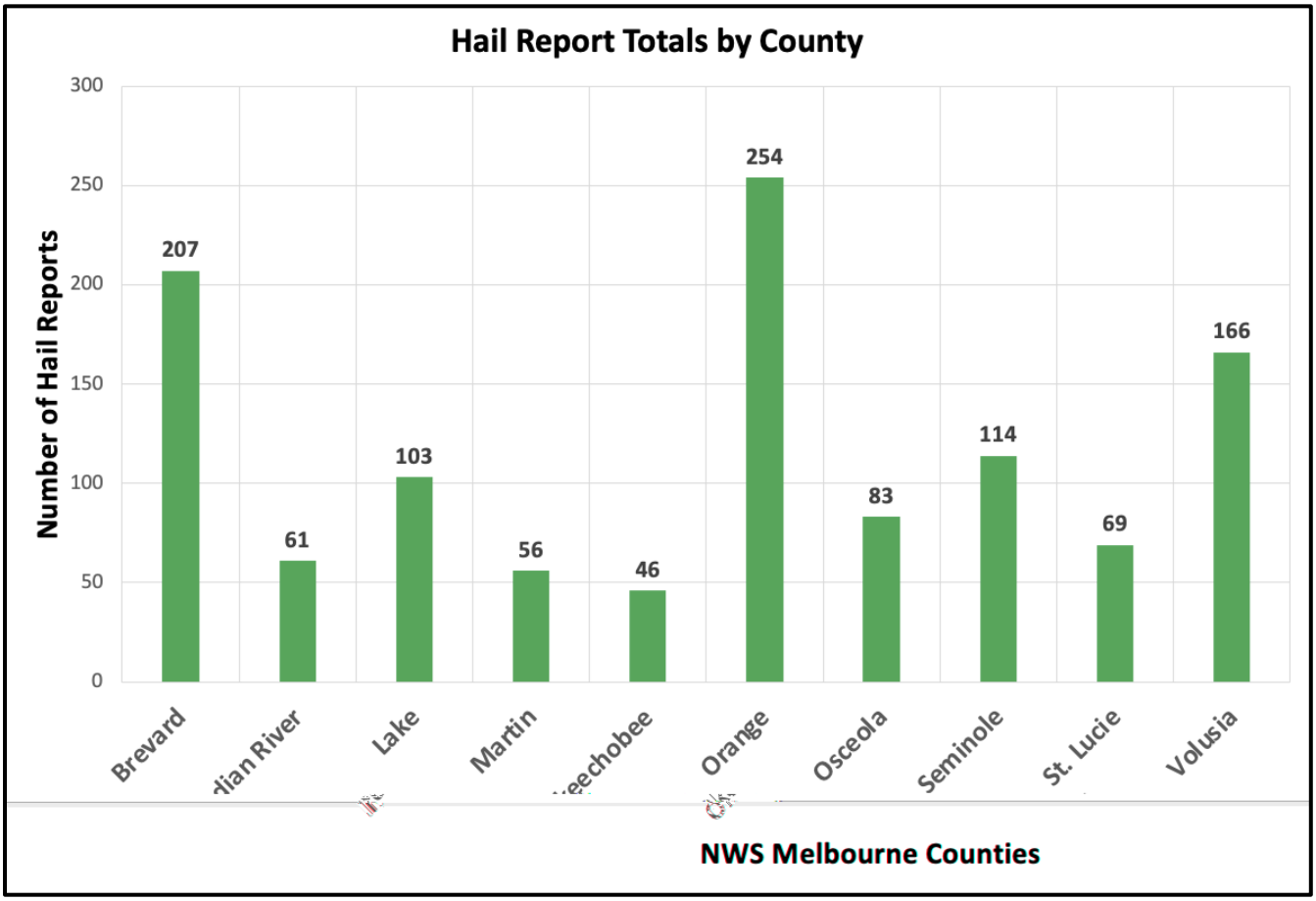


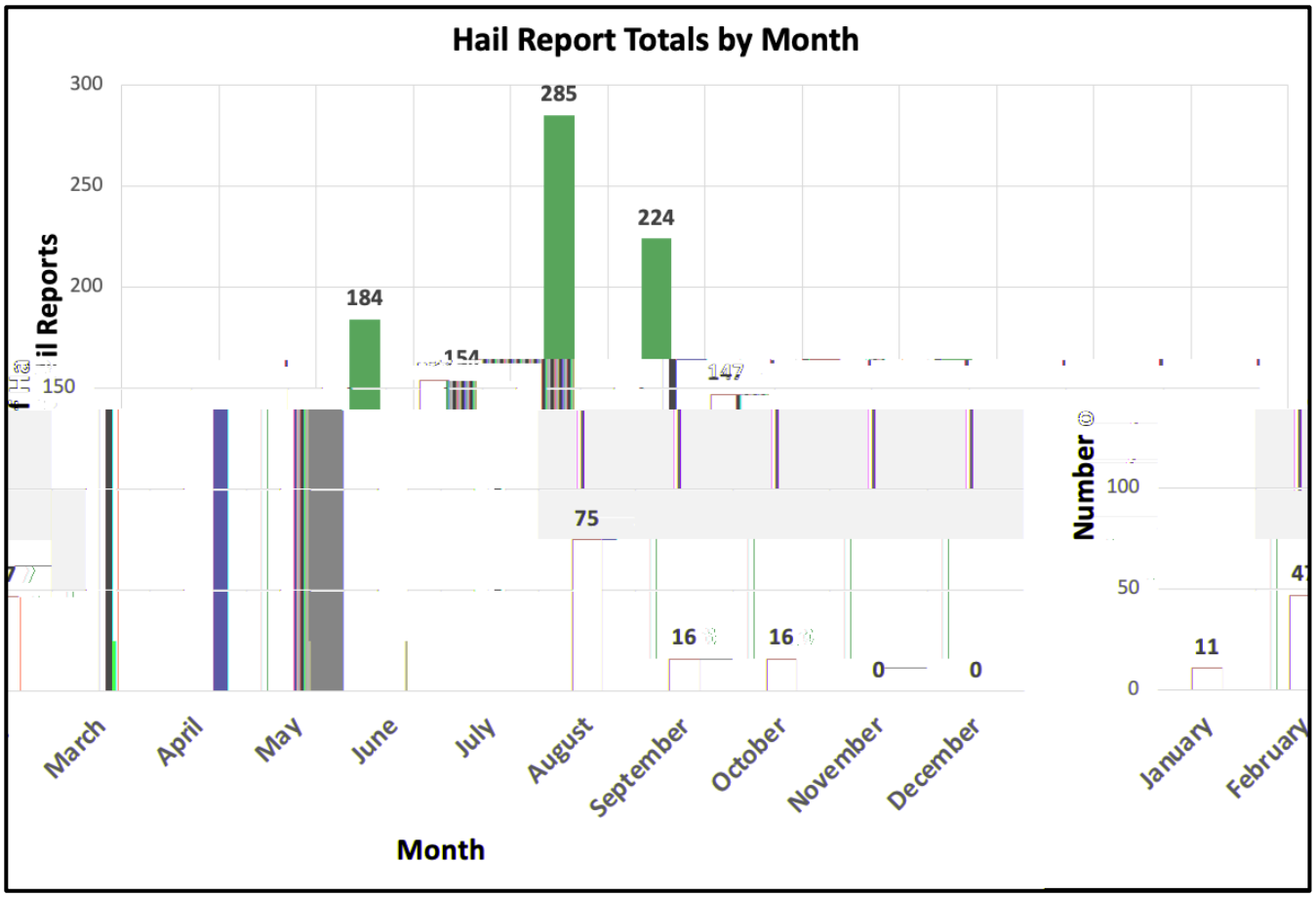

# Top 10 Tornado Events within the NWS Melbourne CWA

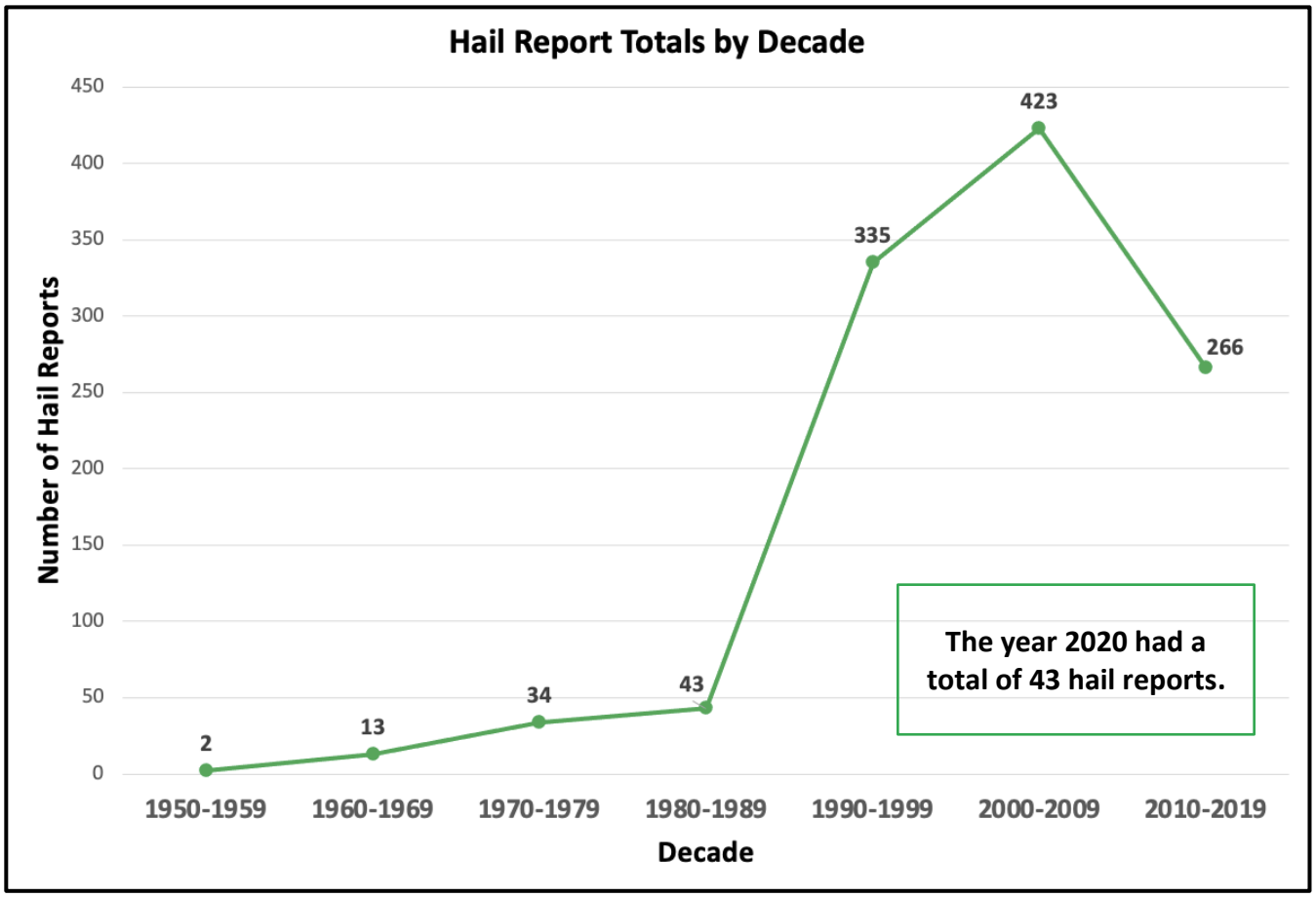
| Rank | Date | County | Scale | Fatalities | Injuries |
|---|---|---|---|---|---|
| 1 | April 4, 1966 | Osceola | F4 | 0 | 0 |
| 2 | February 23, 1998 | Osceola | F3 | 25 | 145 |
| 3 | February 2, 2007 | Lake | EF3 | 13 | 9 |
| 4 | February 23, 1998 | Seminole | F3 | 12 | 36 |
| 5 | February 2, 2007 | Lake | EF3 | 8 | 10 |
| 6 | February 22, 1998 | Orange | F3 | 3 | 70 |
| 7 | September 18, 1954 | St. Lucie | F3 | 2 | 2 |
| 8 | February 23, 1998 | Volusia | F3 | 1 | 0 |
| 9 | February 2, 2007 | Volusia | EF3 | 0 | 42 |
| 10 | November 2, 1997 | Volusia | F3 | 0 | 32 |

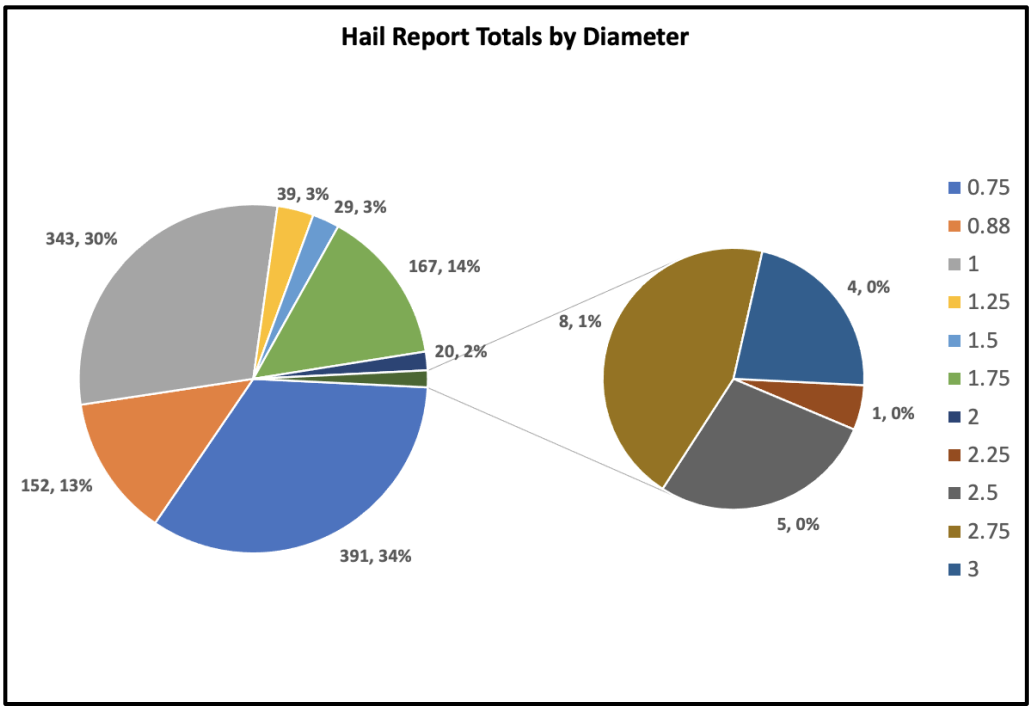
# Hail Overview

The period of time from January 1st, 1950, to December 31st, 2020, had a total of 1,159 hail reports within the NWS Melbourne CWA. Orange County saw the greatest number of hail reports over this time period. The month of May saw the greatest number of hail reports, and the decade that had the greatest number of hail reports was the 2000-2009 period. The diameter of hail stone that was the most reported was 0.75 inches. There were 4 injuries associated with hail in the Melbourne area and no fatalities. Also of note, the large increase in hail reports during the 1990-1999 period can be directly attributed to the NWS Melbourne office being established in 1989.



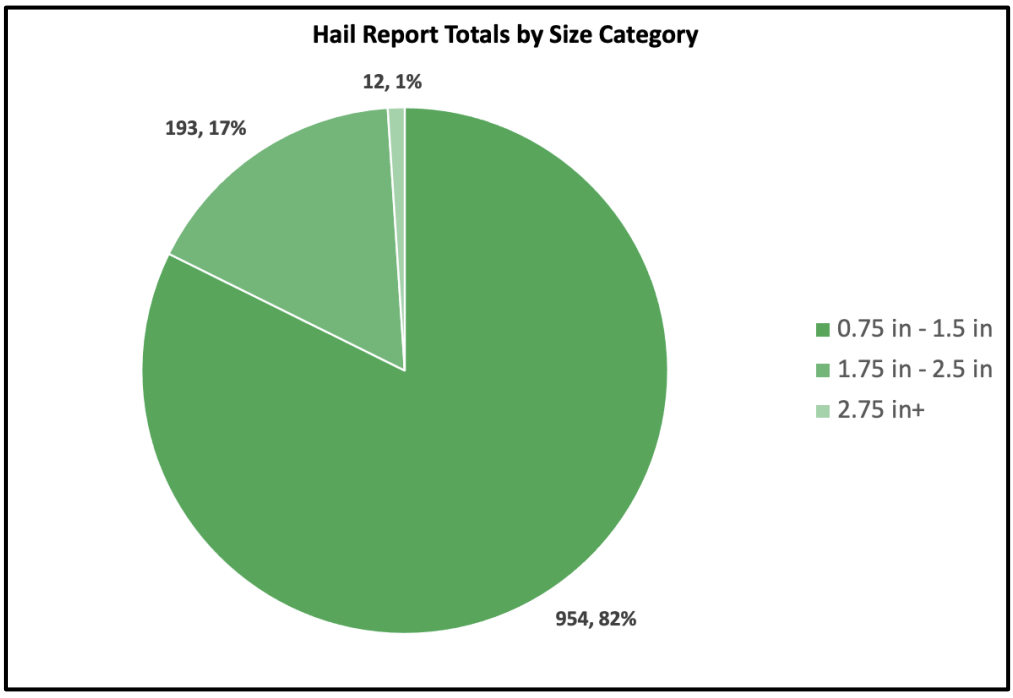

Hail Report Totals by Month
300
250
200
150
285
224
184
154
147
75
16
16
0
0
11
100
50
0
Number
March
April
May
June
July
August
September
October
November
December
January
February
Month


Hail Report Totals by Decade
450
400
350
300
250
200
150
100
50
0
Number of Hail Reports
2
13
34
43
335
423
266
1950-1959
1960-1969
1970-1979
1980-1989
1990-1999
2000-2009
2010-2019
Decade
The year 2020 had a total of 43 hail reports.




NOTE: The pie chart that is to the left shows the 0.75 inches to 2 inches distribution of hail while the smaller pie chart to the right coming out of the dark green section shows the 2.25 inch to 3 inches distribution, as it was too small on a single pie chart.

This graph to the right has grouped hail sized based on the newly implemented standards of damage threats associated with thunderstorms that went into effect on August 2, 2021. For hail, the baseline criteria is 0.75 inches to 1.5 inches. Hail stones ranging from 1.75 inches to 2.5 inches meets the "considerable" damage threat criteria. Finally, hail stones that are 2.75 inches and greater meet the "destructive" damage threat criteria. For more information on these new damage threat categories, visit https://www.weather.gov/news/072221-svr-wea .

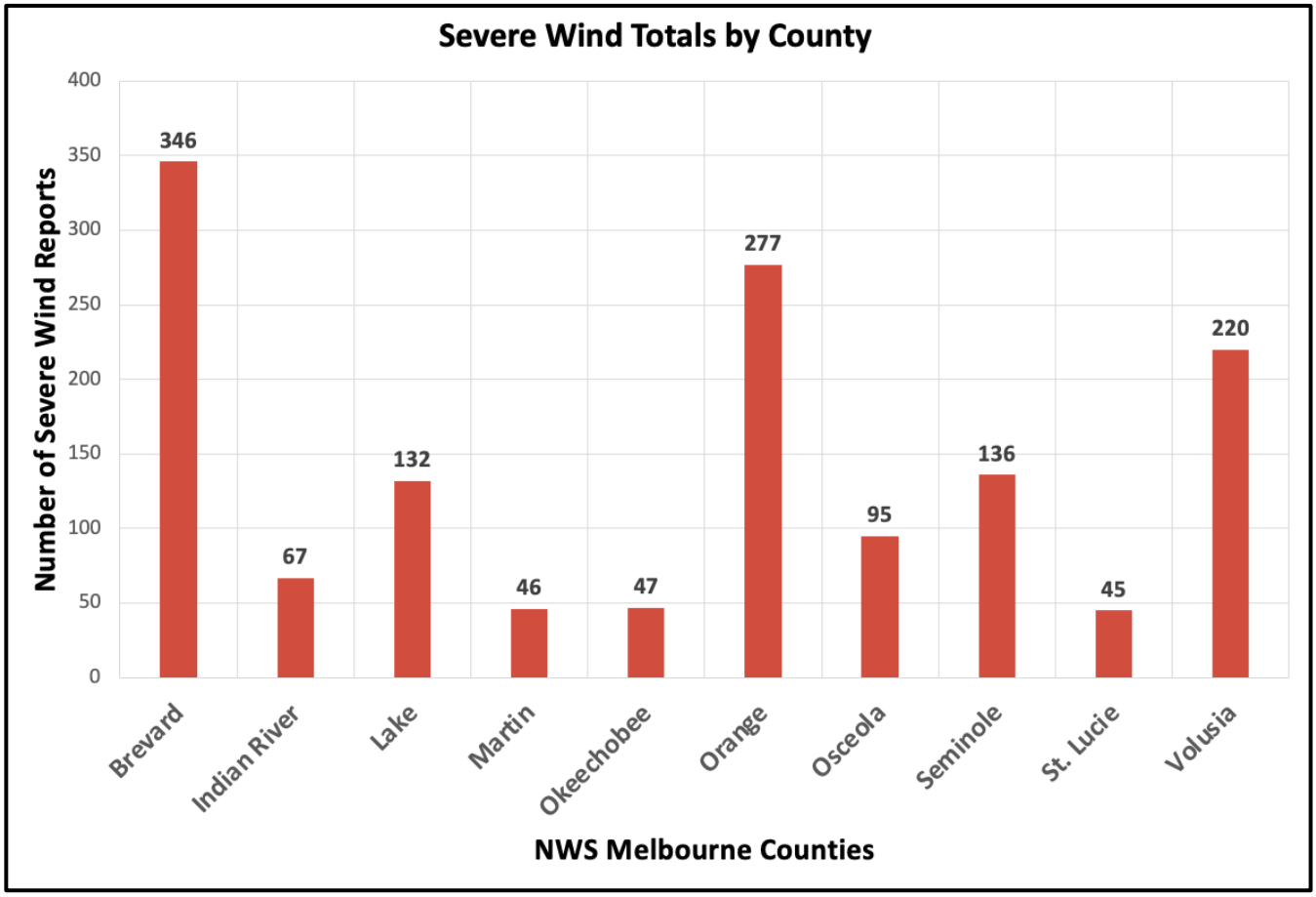


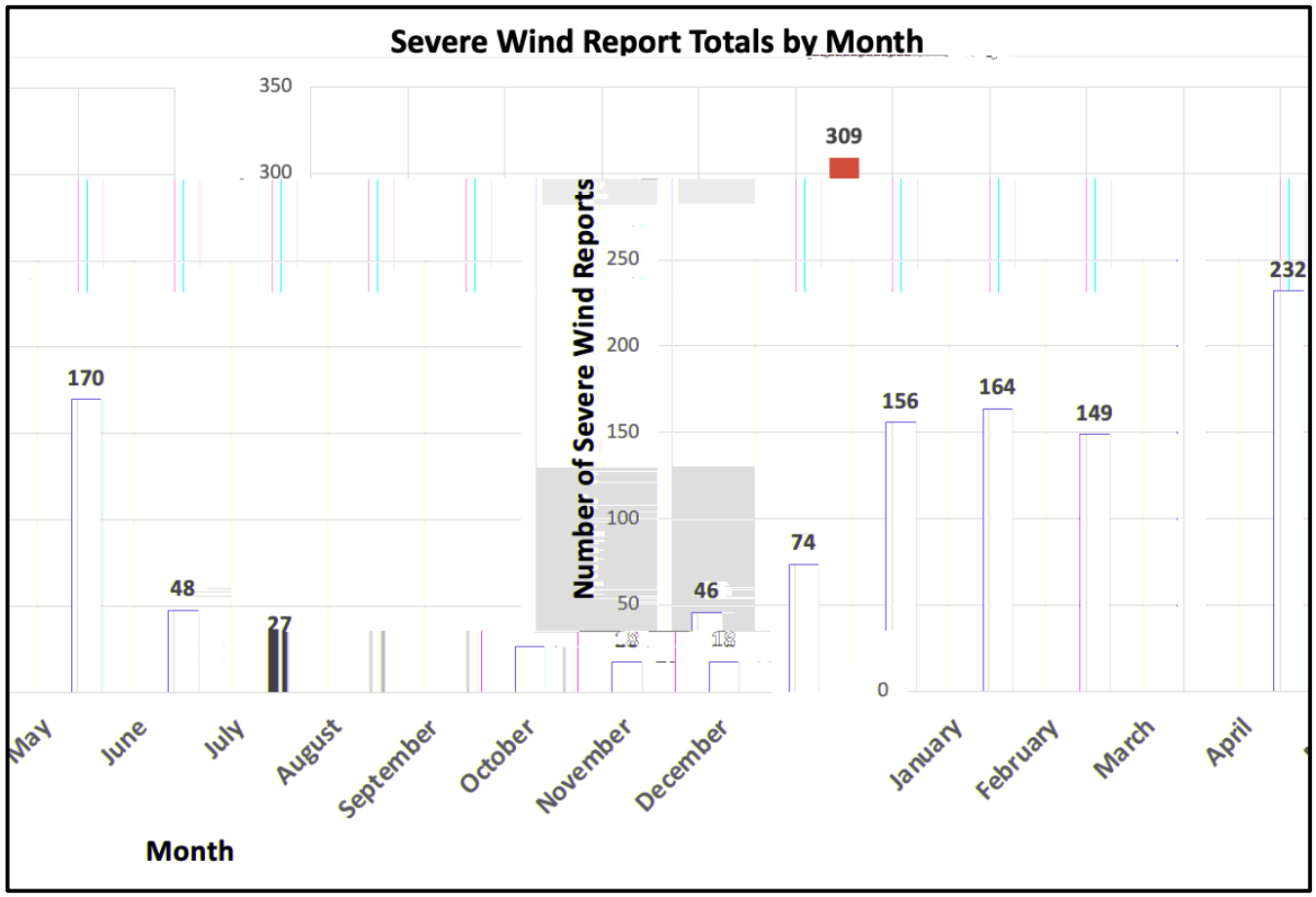
# Top 10 Hail Events within the NWS Melbourne CWA

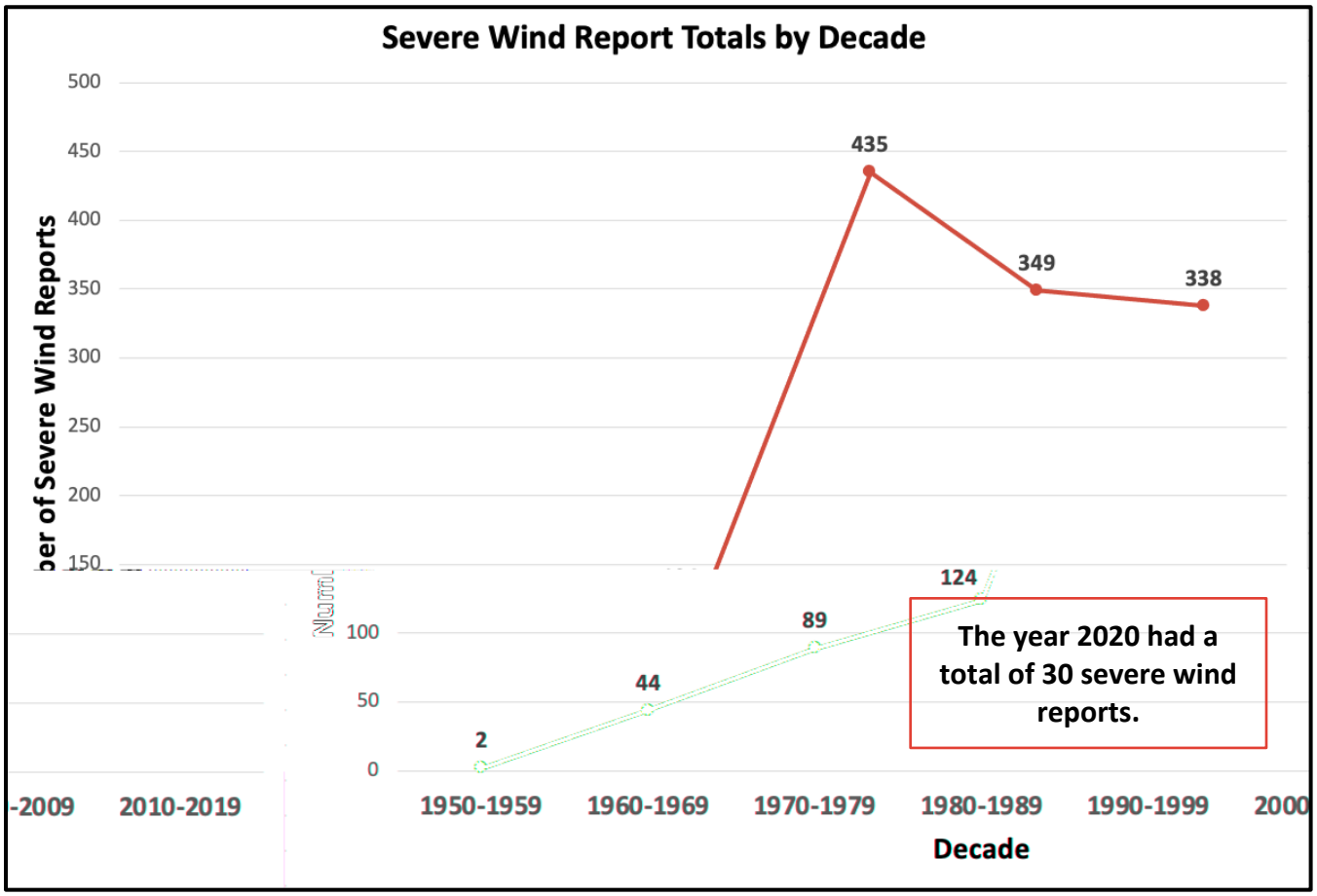
| Rank | Date | County | Diameter (inches) |
|---|---|---|---|
| 1 | May 21, 2020 | Seminole | 3.00 |
| 2 | February 13, 1995 | Indian River | 3.00 |
| 3 | February 13, 1995 | St. Lucie | 3.00 |
| 4 | March 25, 1992 | Orange | 3.00 |
| 5 | May 3, 2007 | St. Lucie | 2.75 |
| 6 | April 7, 2005 | Orange | 2.75 |
| 7 | March 25, 1992 | Orange | 2.75 |
| 8 | March 25, 1992 | Orange | 2.75 |
| 9 | May 31, 1976 | Seminole | 2.75 |
| 10 | May 7, 1975 | St. Lucie | 2.75 |

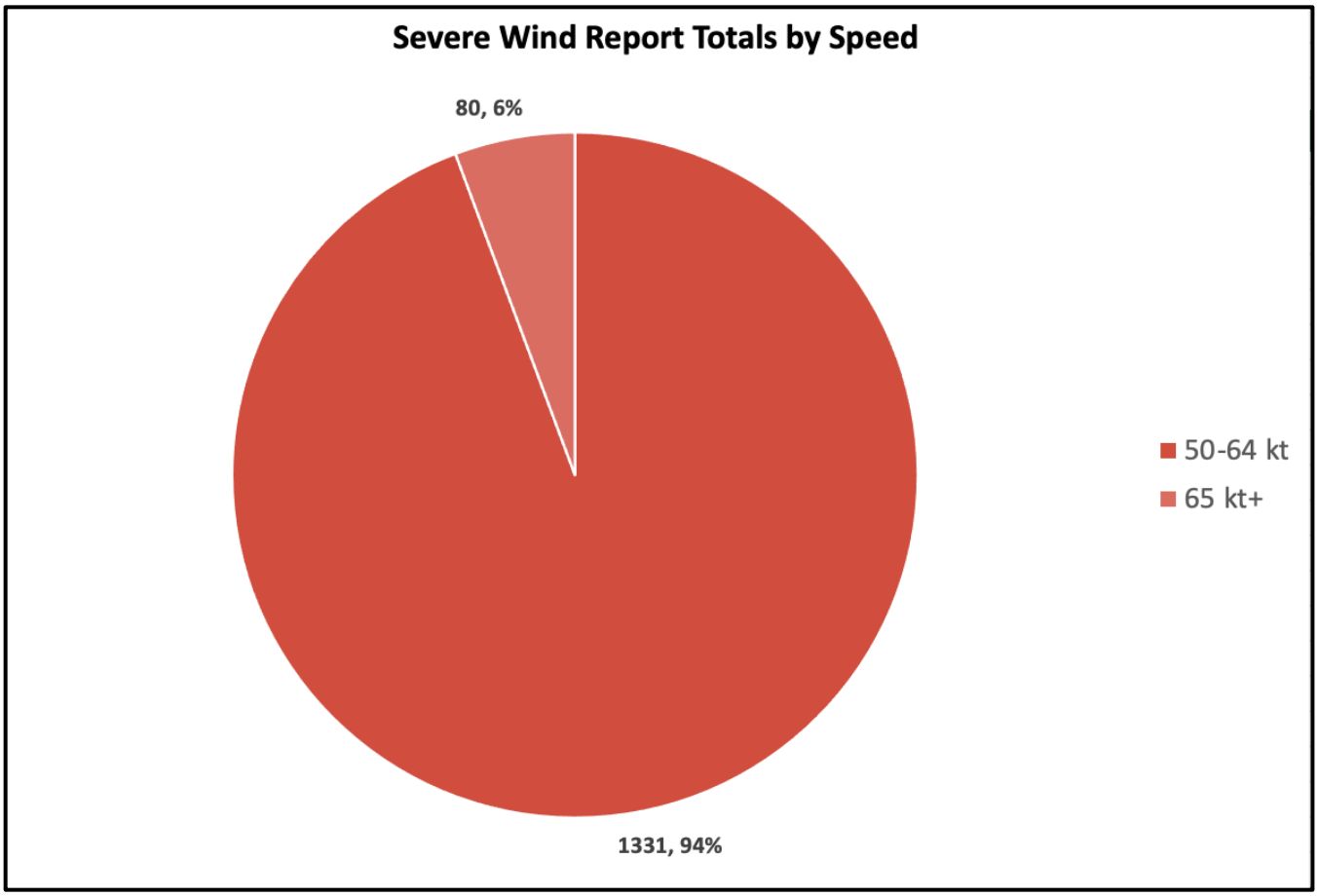
# Severe Wind Overview

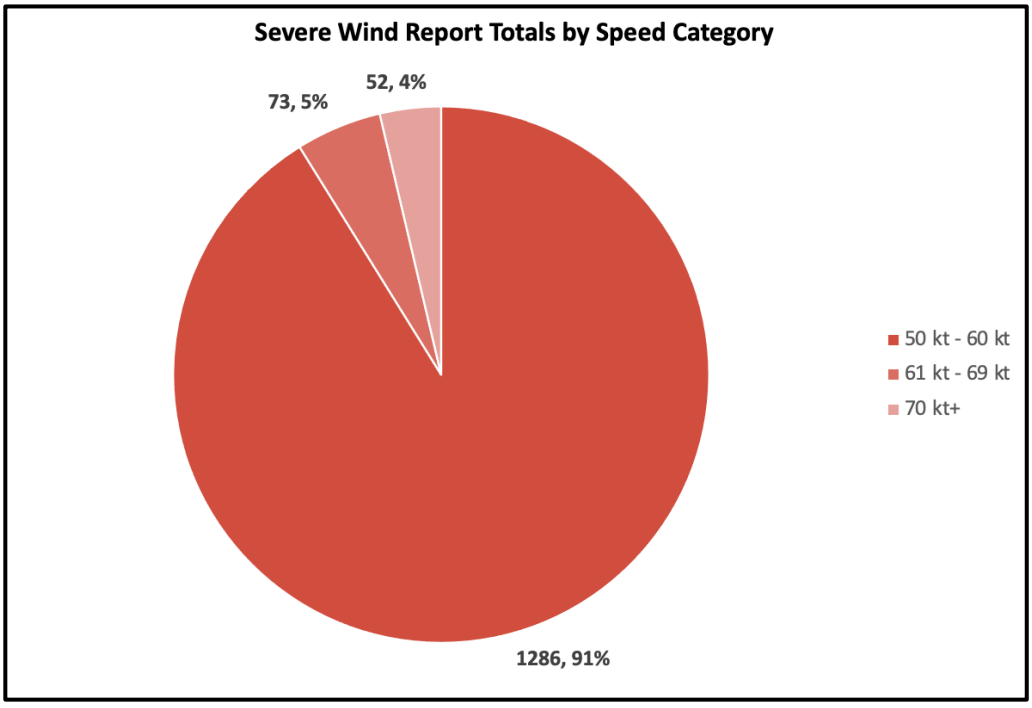
The period of time from January 1st, 1950, to December 31st, 2020, had a total of 1,411 severe wind reports within the NWS Melbourne CWA. Brevard County saw the greatest number of severe wind reports over this time period. The month of June saw the greatest number of reports, and the decade that had the greatest number of severe wind reports was the 1990-1999 period. Out of the 1,411 severe wind reports, 80 reports had gusts of 74 miles per hour (65 knots) or greater. As for injuries and deaths associated with severe wind gusts, there were a total of 80 injuries attributed to severe wind within the NWS Melbourne area, and 4 fatalities. Also of note, the large increase in severe wind reports during the 1990-1999 period can be directly attributed to the NWS Melbourne office being established in 1989.




Severe Wind Report Totals by Month
Number of Severe Wind Reports
350
300
250
200
150
100
50
0
170
48
27
46
74
309
156
164
149
232
May
June
July
August
September
October
November
December
January
February
March
April
Month


Severe Wind Report Totals by Decade
500
450
400
350
300
250
200
150
100
50
0
435
349
338
124
89
44
2
-2009
2010-2019
1950-1959
1960-1969
1970-1979
1980-1989
1990-1999
2000
Decade
The year 2020 had a total of 30 severe wind reports.




This graph to the left has grouped wind speed based on the newly implemented standards of damage threats associated with thunderstorms that went into effect on August 2, 2021. For severe wind, the baseline criteria is 50 knots (58 mph) to 60 knots (69 mph). Wind speeds ranging from 61 knots (70 mph) to 69 knots (79 mph) meets the "considerable" damage threat criteria. Finally, wind speeds that are 70 knots (81 mph) and greater meet the "destructive" damage threat criteria. For more information on these new damage threat categories, visit https://www.weather.gov/news/072221-svr-wea .

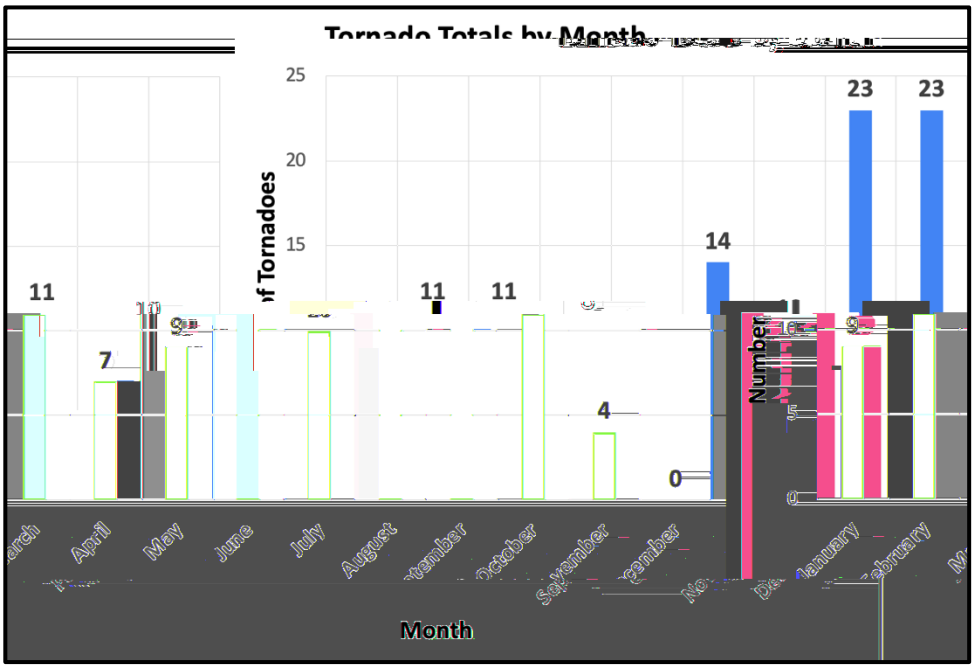
# Top 10 Severe Wind Events within the NWS Melbourne CWA

| Rank | Date | County | Speed (knots) | Speed (mph) |
|---|---|---|---|---|
| 1 | February 2, 1983 | Orange | 98 | 113 |
| 2 | March 23, 2017 | Indian River | 87 | 100 |
| 3 | March 23, 2017 | St. Lucie | 87 | 100 |
| 4 | July 9, 1968 | Brevard | 85 | 98 |
| 5 | June 10, 2015 | Brevard | 84 | 97 |
| 6 | March 6, 2008 | Martin | 84 | 97 |
| 7 | June 30, 1980 | Brevard | 84 | 97 |
| 8 | January 24, 2019 | Lake | 83 | 95 |
| 9 | March 19, 2003 | Volusia | 80 | 92 |
| 10 | October 21, 2002 | Brevard | 80 | 92 |

# Part 2: NWS Melbourne County Climatology

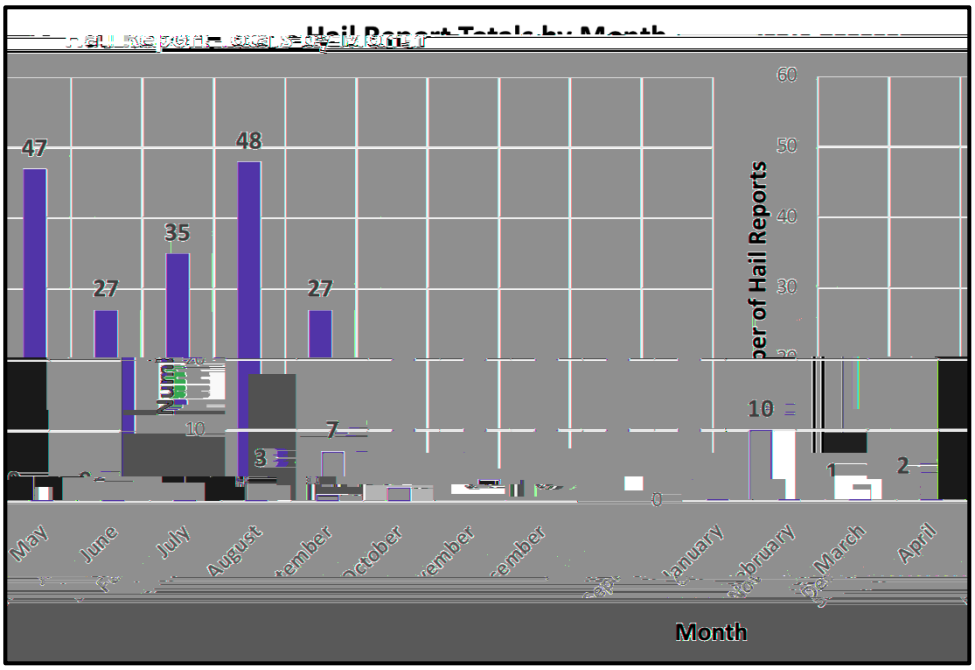
## Brevard: Overview

### Tornado Overview



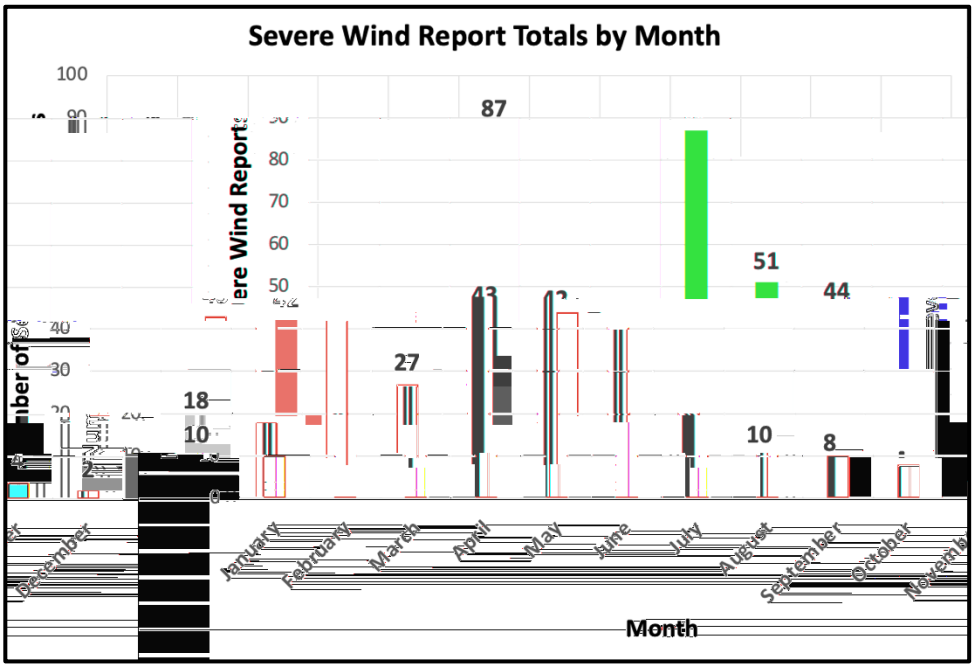

Brevard County experienced a total of 132 tornadoes from 1950 to 2020. There were 62 F0/EF0 tornadoes, 44 F1/EF1 tornadoes, 16 F2/EF2 tornadoes, and 3 F3/EF3 tornadoes during this period of time. Seven tornadoes had an unknown scale. Between 1950 and 2020, August and September were the months with the greatest number of tornado occurrences (23 tornadoes each).

### Hail Overview




Brevard County had a total of 207 hail reports from 1950 to 2020, with hail stones ranging from 0.75 to 2.5 inches in diameter. Between 1950 and 2020, June was the month with the greatest number of hail reports (48 hail reports).

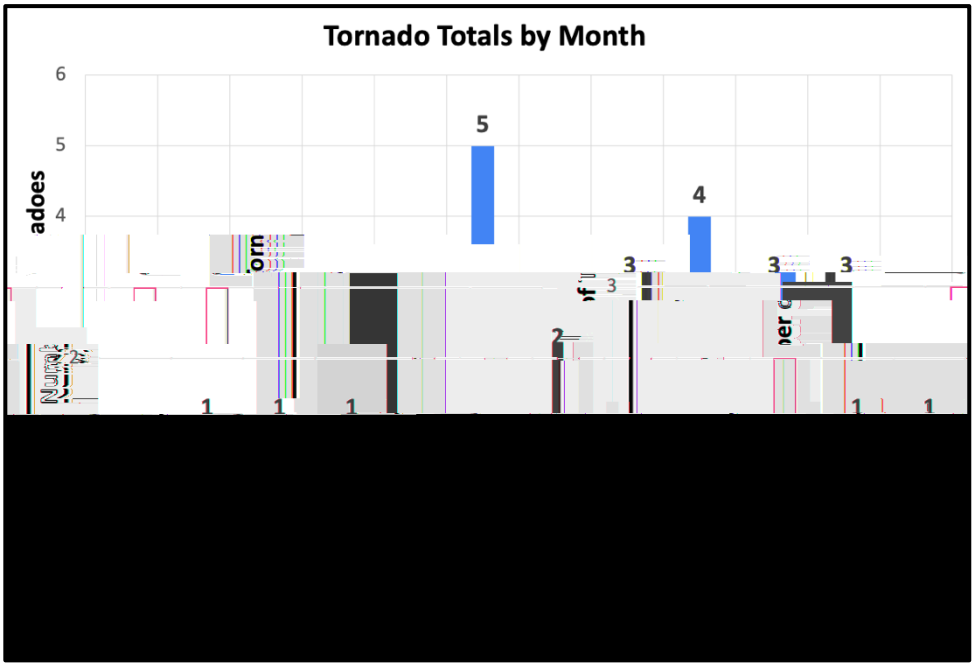
# Severe Wind Overview




Brevard County had a total of 346 severe wind reports from 1950 to 2020. 26 of these reports involved winds 74 miles per hour (65 knots) and greater. The other 320 severe wind reports fell between 58 miles per hour (50 knots) and 73 miles per hour (64 knots). Between 1950 and 2020, June was the month with the greatest number of severe wind reports (87 severe wind reports).

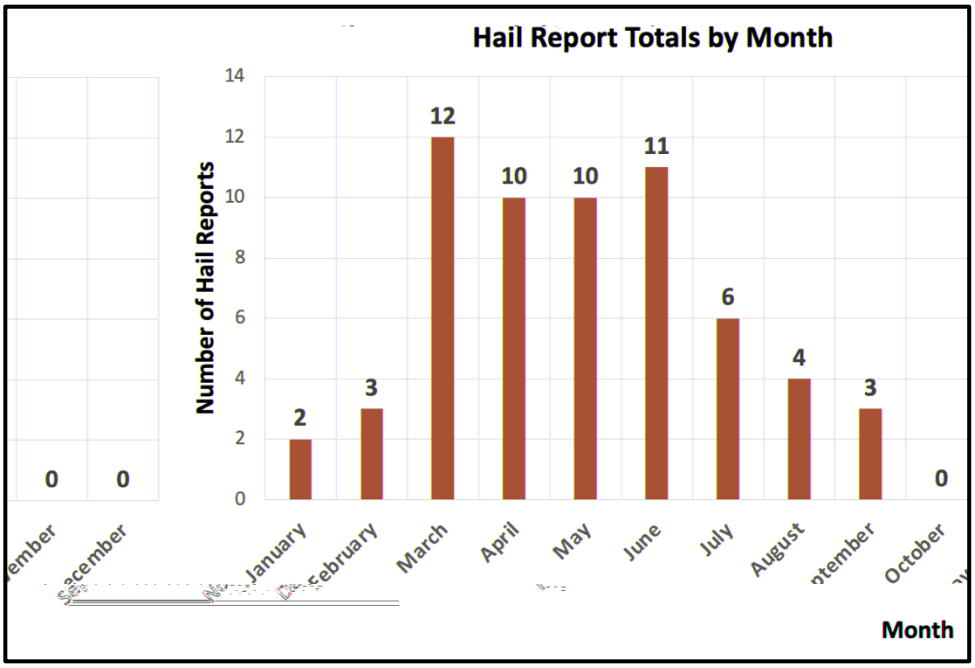
# Indian River

## Tornado Overview



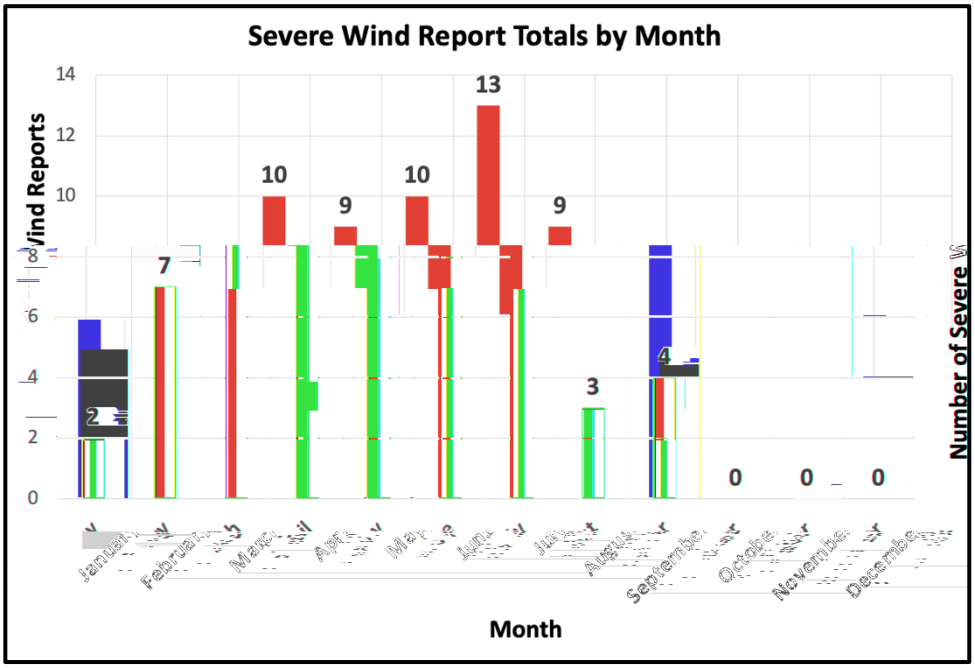

Indian River County experienced a total of 25 tornadoes from 1950 to 2020. There were 13 F0/EF0 tornadoes, 7 F1/EF1 tornadoes, and 2 F2/EF2 tornadoes during this period of time. Three tornadoes had an unknown scale. Between 1991 and 2020, June was the month with the greatest number of tornado occurrences (5 tornadoes).

## Hail Overview




Indian River County had a total of 61 hail reports from 1950 to 2020, with hail stones ranging from 0.75 to 3 inches in diameter. Between 1950 and 2020, March was the month with the greatest number of hail reports (12 hail reports).

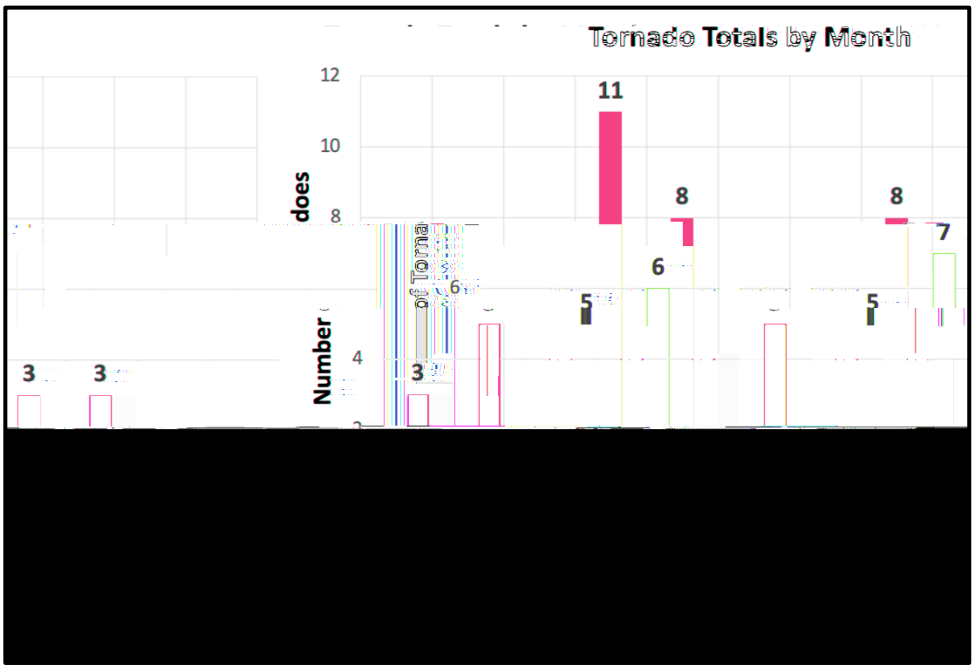
# Severe Wind Overview




Indian River County had a total of 67 severe wind reports from 1950 to 2020. 7 of these reports involved winds 74 miles per hour (65 knots) and greater. The other 60 severe wind reports fell between 58 miles per hour (50 knots) and 73 miles per hour (64 knots). Between 1950 and 2020, June was the month with the greatest number of severe wind reports (13 severe wind reports).

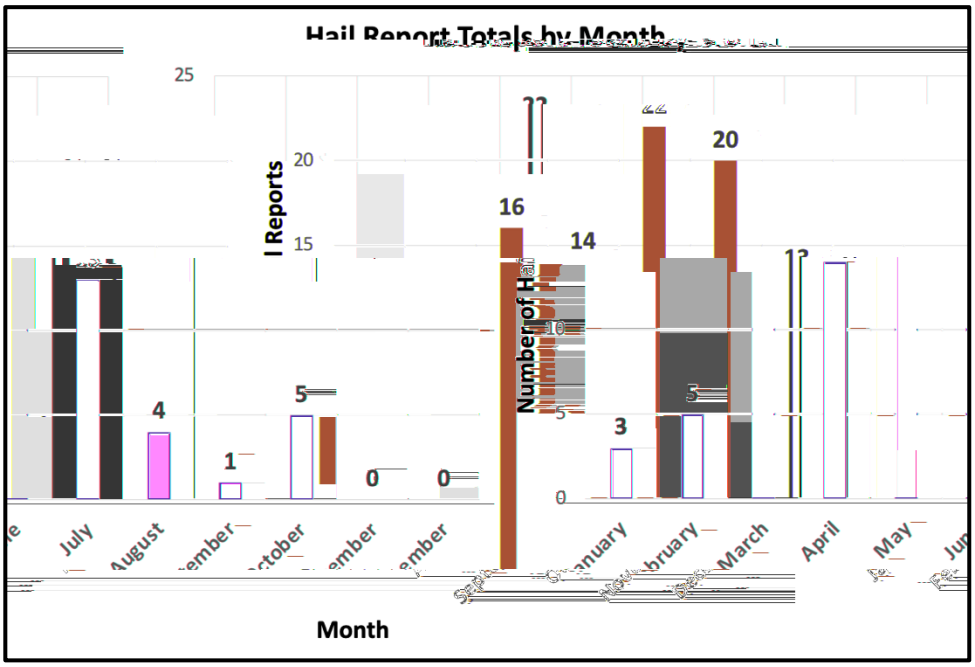
# Lake: Overview

## Tornado Overview



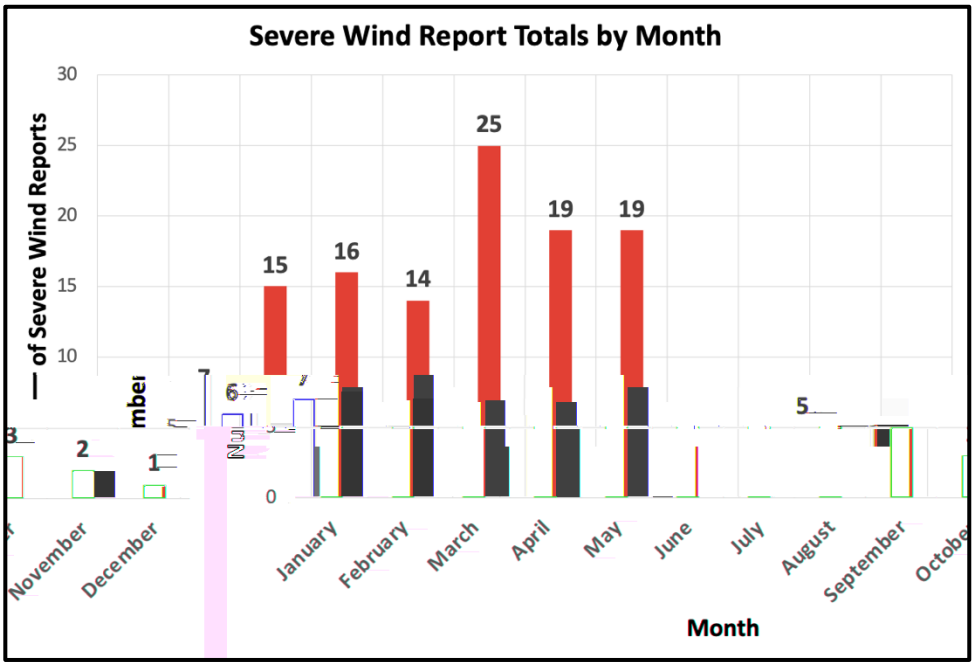

Lake County experienced a total of 61 tornadoes from 1950 to 2020. There were 28 F0/EF0 tornadoes, 20 F1/EF1 tornadoes, 7 F2/EF2 tornadoes, and 3 F3/EF3 tornadoes during this period of time. Three tornadoes had an unknown scale. Between 1950 and 2020, April was the month with the greatest number of tornado occurrences (11 tornadoes).

## Hail Overview




Lake County had a total of 103 hail reports from 1950 to 2020, with hail stones ranging from 0.75 to 2 inches in diameter. Between 1950 and 2020, May was the month with the greatest number of hail reports (22 hail reports).

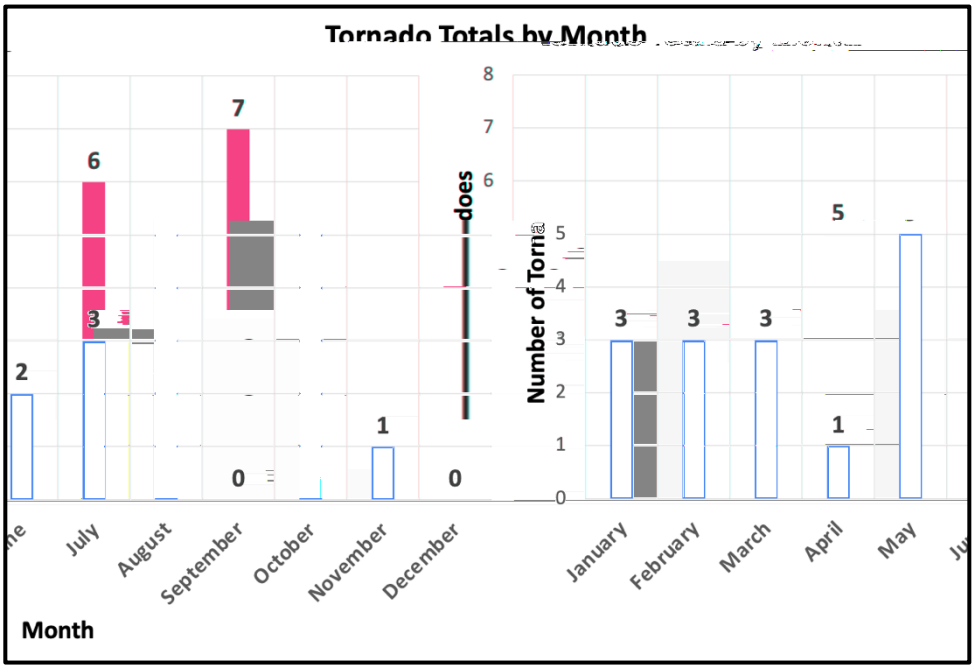
# Severe Wind Overview




Lake County had a total of 132 severe wind reports from 1950 to 2020. 5 of these reports involved winds 74 miles per hour (65 knots) and greater. The other 127 severe wind reports fell between 58 miles per hour (50 knots) and 73 miles per hour (64 knots). Between 1950 and 2020, June was the month with the greatest number of severe wind reports (25 severe wind reports).

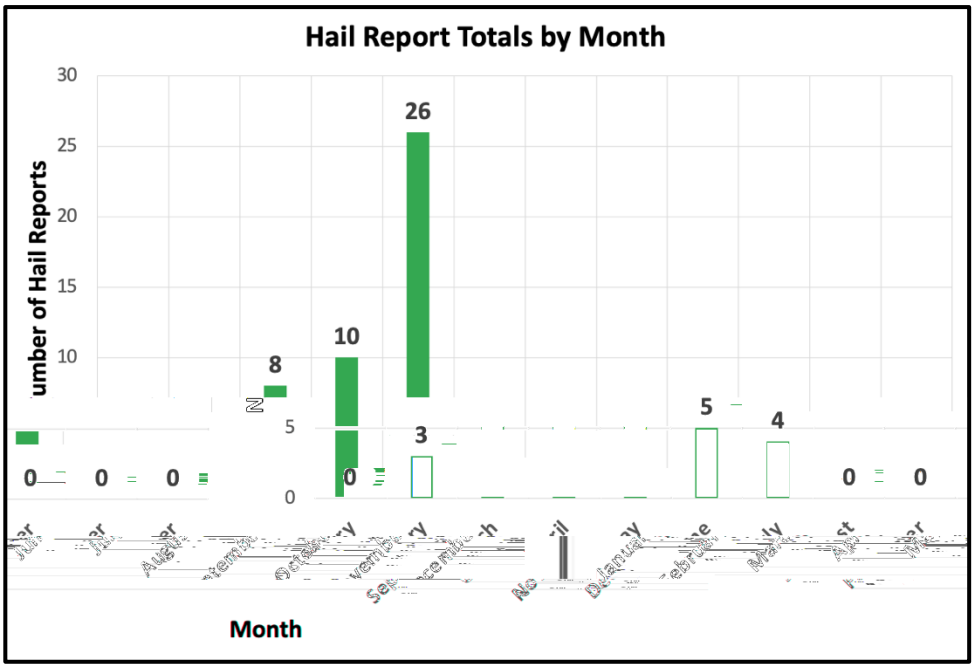
# Martin: Overview

## Tornado Overview



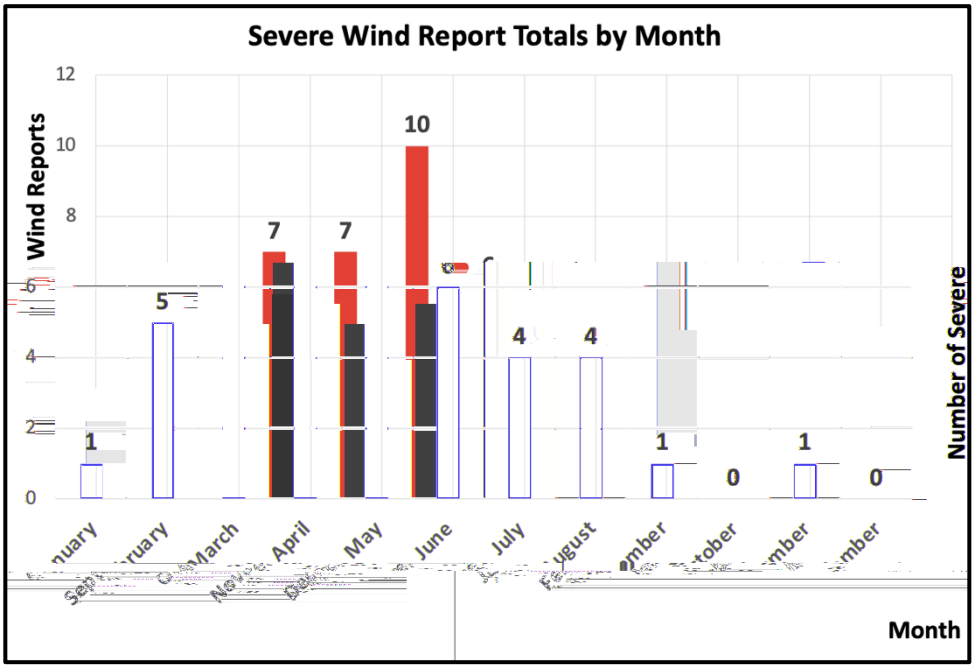

Martin County experienced a total of 34 tornadoes from 1950 to 2020. There were 20 F0/EF0 tornadoes, 5 F1/EF1 tornadoes, 3 F2/EEF2 tornadoes, and 1 F3/EF3 tornado during this period of time. Five tornadoes had an unknown scale. Between 1950 and 2020, October was the month with the greatest number of tornado occurrences (7 tornadoes).

## Hail Overview




Martin County had a total of 56 hail reports from 1950 to 2020, with hail stones ranging from 0.75 to 1.75 inches in diameter. Between 1950 and 2020, May was the month with the greatest number of hail reports (26 hail reports).

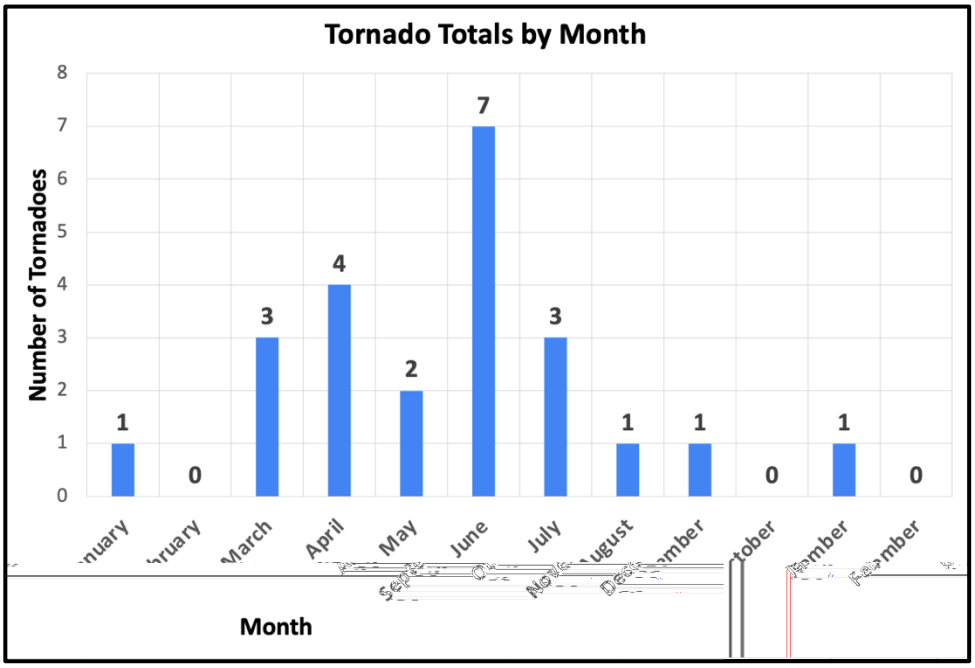
# Severe Wind Overview




Martin County had a total of 46 severe wind reports from 1950 to 2020. 3 of these reports involved winds 74 miles per hour (65 knots) and greater. The other 43 severe wind reports fell between 58 miles per hour (50 knots) and 73 miles per hour (64 knots). Between 1950 and 2020, May was the month with the greatest number of severe wind reports (10 severe wind reports).

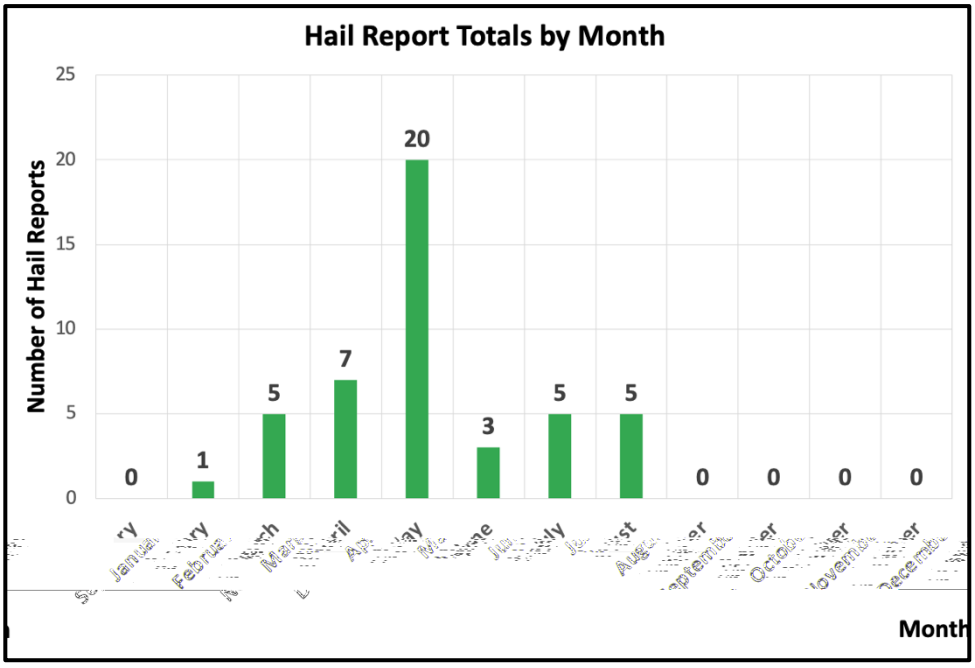
# Okeechobee: Overview

## Tornado Overview



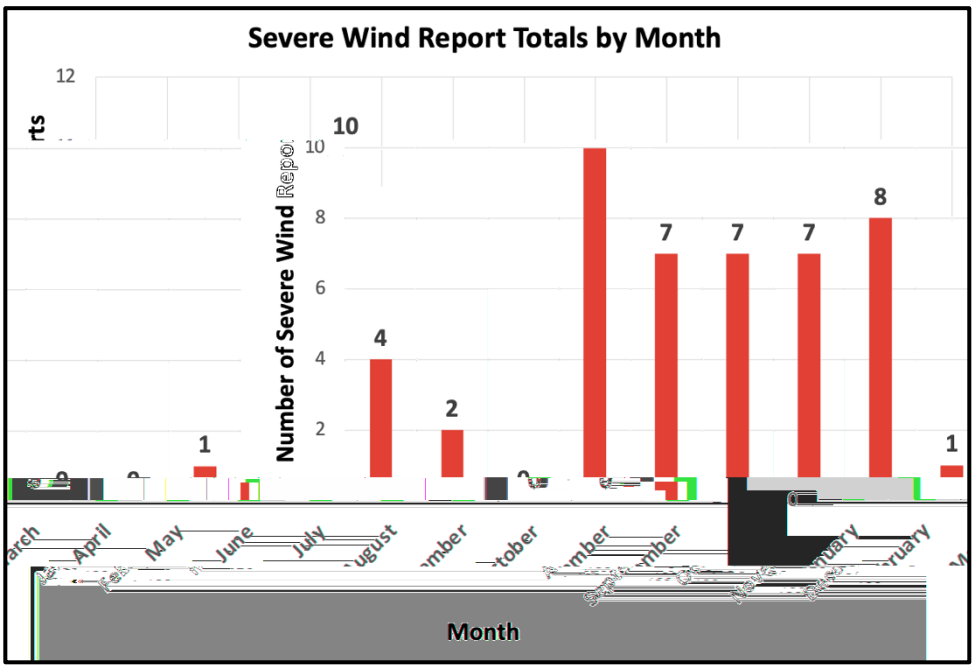

Okeechobee County experienced a total of 23 tornadoes from 1950 to 2020. There were 10 F0/EF0 tornadoes, 4 F1/EF1 tornadoes, and 5 F2/EF2 tornadoes during this period of time. Four tornadoes had an unknown scale. Between 1950 and 2020, June was the month with the greatest number of tornado occurrences (7 tornadoes).

## Hail Overview




Okeechobee County had a total of 46 hail reports from 1950 to 2020, with hail stones ranging from 0.75 to 2.5 inches in diameter. Between 1950 and 2020, May was the month with the greatest number of hail reports (20 hail reports).

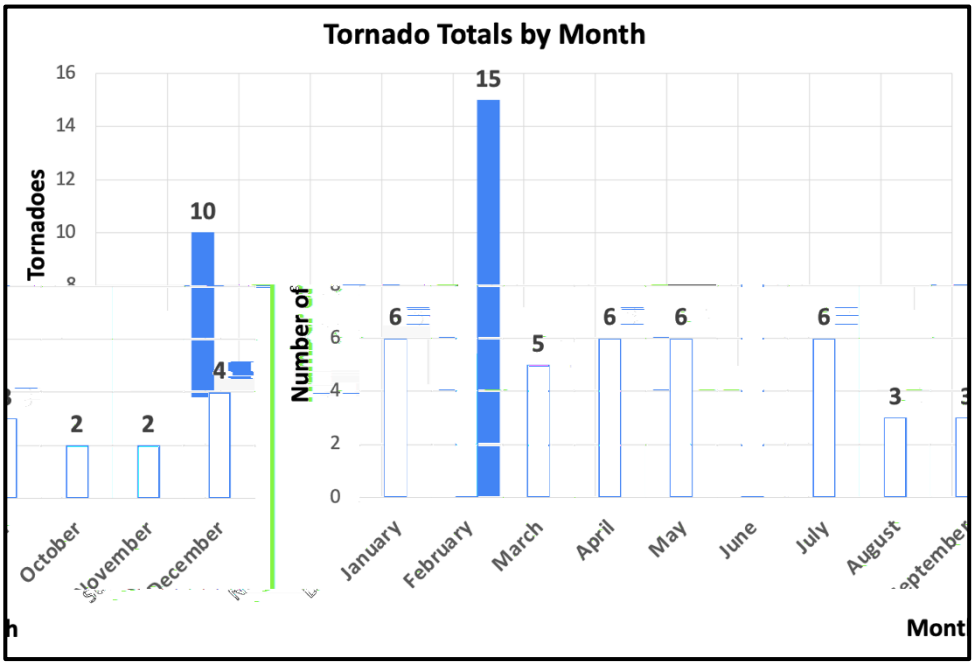
# Severe Wind Overview




Okeechobee County had a total of 47 severe wind reports from 1950 to 2020. 3 of these reports involved winds 74 miles per hour (65 knots) and greater. The other 43 severe wind reports fell between 58 miles per hour (50 knots) and 73 miles per hour (64 knots). Between 1950 and 2020, April was the month with the greatest number of severe wind reports (10 severe wind reports).

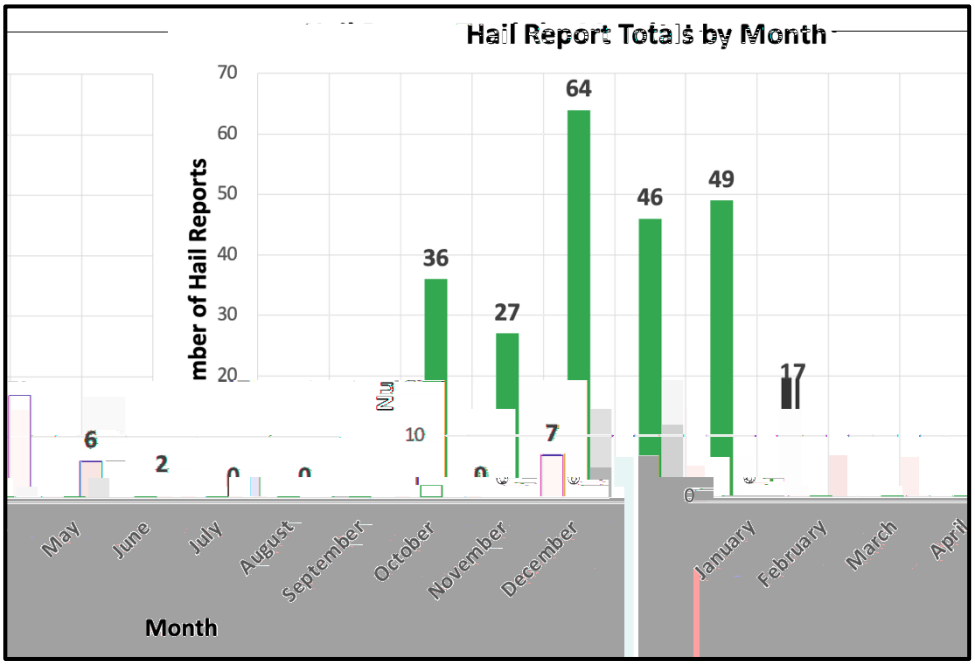
# Orange: Overview

## Tornado Overview



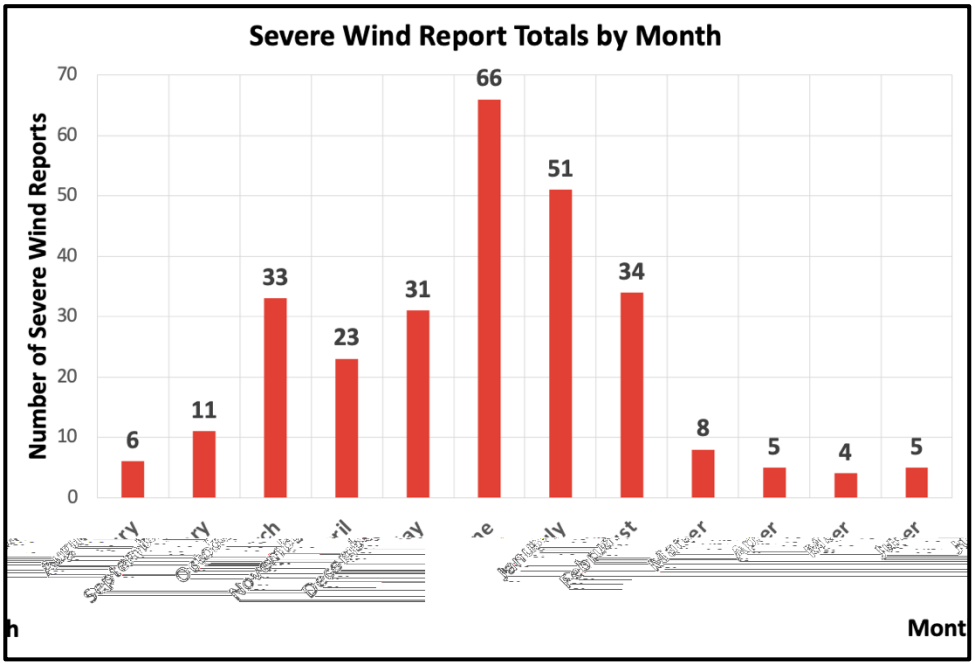

Orange County experienced a total of 68 tornadoes from 1950 to 2020. There were 32 F0/EF0 tornadoes, 20 F1/EF1 tornadoes, 9 F2/EF2 tornadoes, and 3 F3/EF3 tornadoes during this period of time. Four tornadoes had an unknown scale. Between 1950 and 2020, June was the month with the greatest number of tornado occurrences (15 tornadoes).

## Hail Overview




Orange County had a total of 254 hail reports from 1950 to 2020, with hail stones ranging from 0.75 to 3 inches in diameter. Between 1950 and 2020, May was the month with the greatest number of hail reports (64 hail reports).

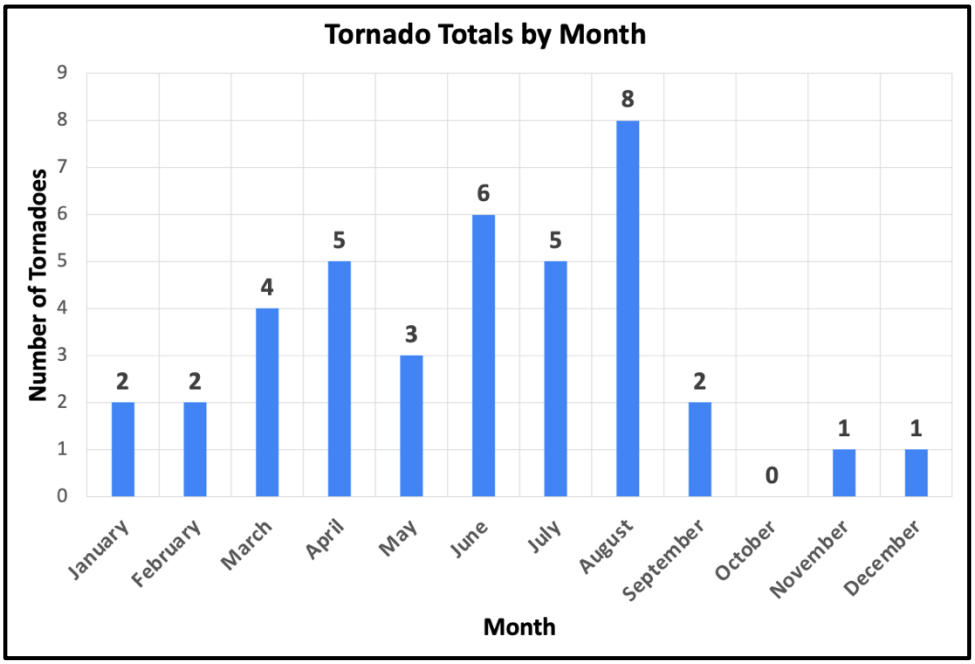
# Severe Wind Overview




Orange County had a total of 277 severe wind reports from 1950 to 2020. 12 of these reports involved winds 74 miles per hour (65 knots) and greater. The other 265 severe wind reports fell between 58 miles per hour (50 knots) and 73 miles per hour (64 knots). Between 1950 and 2020, June was the month with the greatest number of severe wind reports (66 severe wind reports).

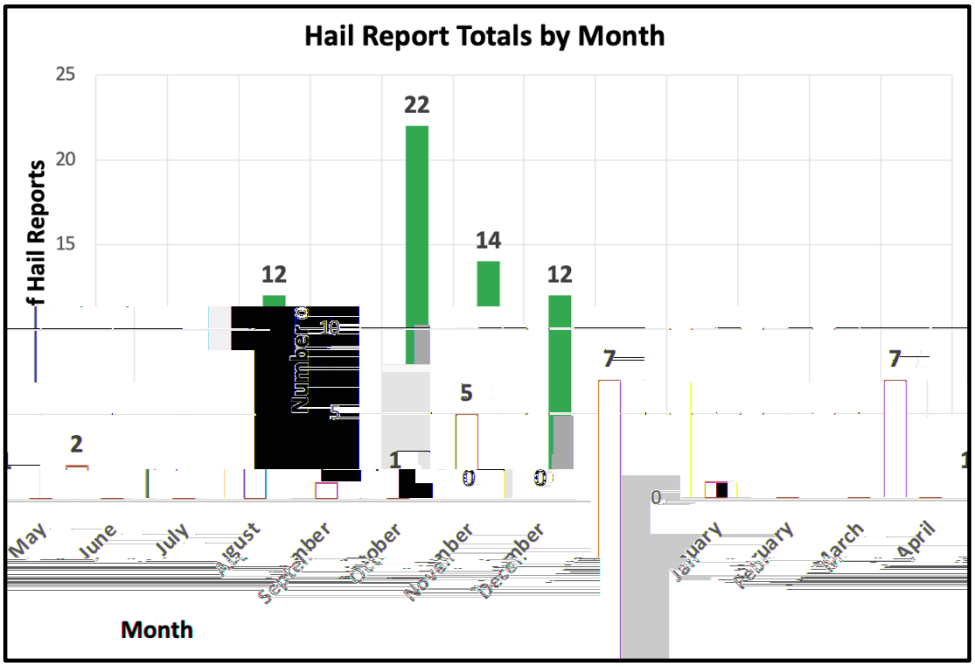
# Osceola: Overview

## Tornado Overview



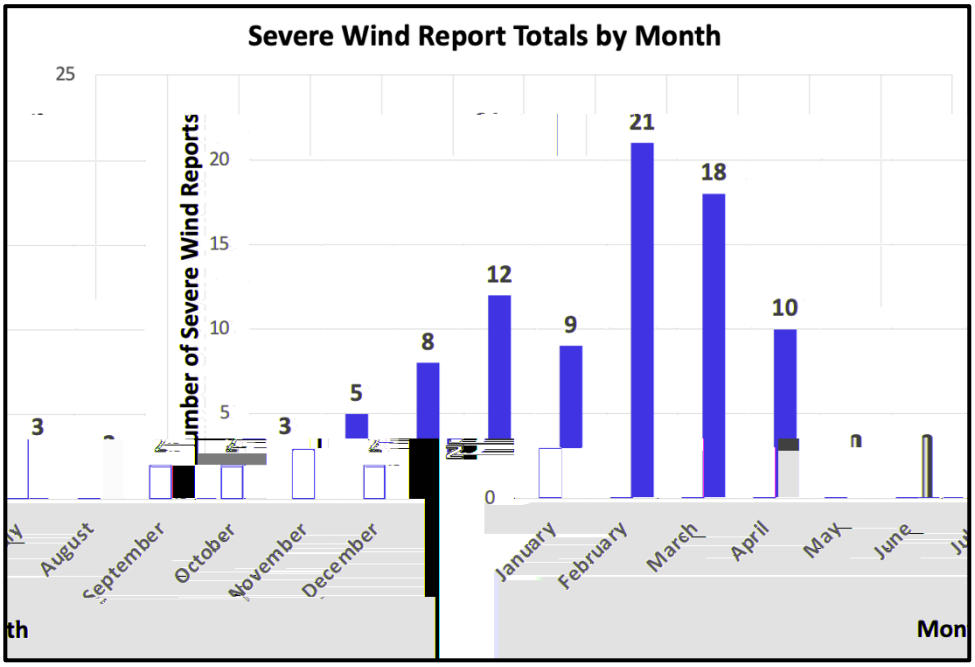

Osceola County experienced a total of 39 tornadoes from 1950 to 2020. There were 22 F0/EF0 tornadoes, 12 F1/EF1 tornadoes, 3 F2/EF2 tornadoes, 1 F3/EF3 tornado, and 1 F4/EF4 tornado during this period of time. Between 1950 and 2020, August was the month with the greatest number of tornado occurrences (8 tornadoes).

## Hail Overview




Osceola County had a total of 83 hail reports from 1950 to 2020, with hail stones ranging from 0.75 to 2 inches in diameter. Between 1950 and 2020, May was the month with the greatest number of hail reports (22 hail reports).

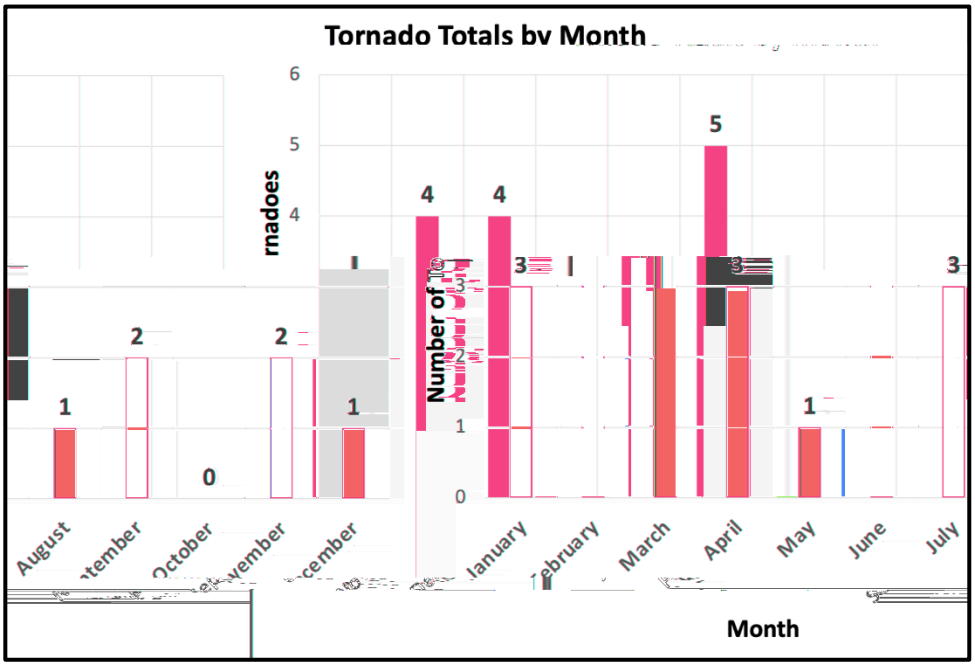
# Severe Wind Overview




Osceola County had a total of 95 severe wind reports from 1950 to 2020. 3 of these reports involved winds 74 miles per hour (65 knots) and greater. The other 92 severe wind reports fell between 58 miles per hour (50 knots) and 73 miles per hour (64 knots). Between 1950 and 2020, June was the month with the greatest number of severe wind reports (21 severe wind reports).

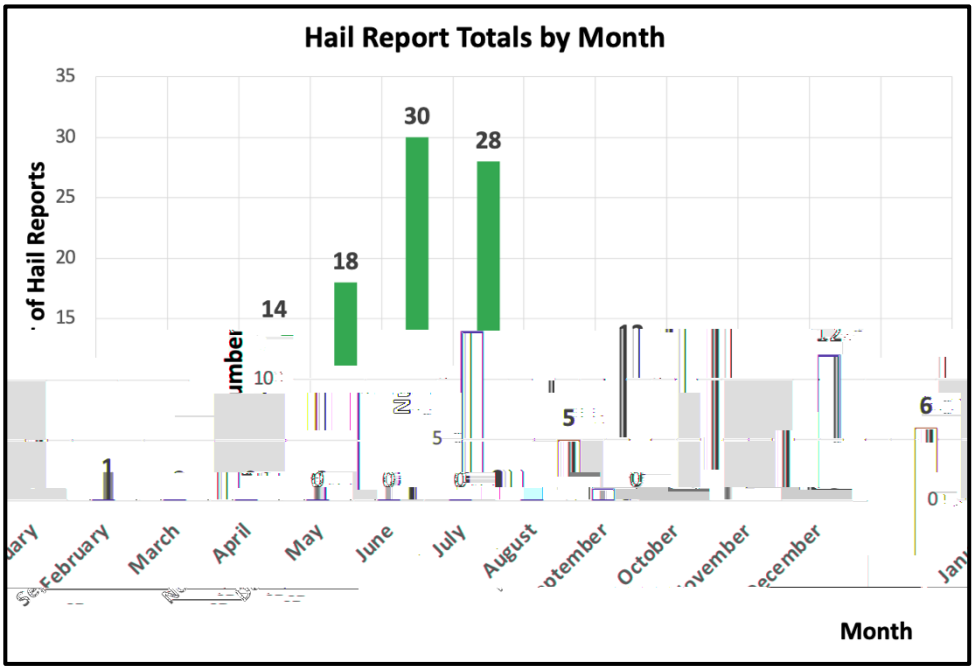
# Seminole: Overview

## Tornado Overview



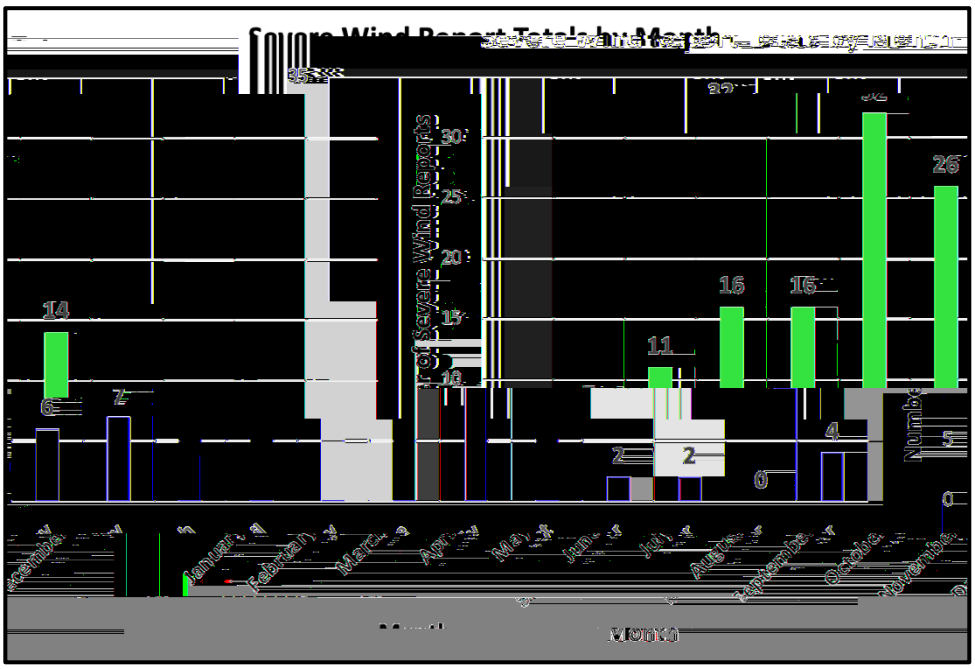

Seminole County experienced a total of 29 tornadoes from 1991 to 2020. There were 12 F0/EF0 tornadoes, 9 F1/EF1 tornadoes, 5 F2/EF2 tornadoes, and 1 F3/EF3 tornado during this period of time. Two tornadoes had an unknown scale. Between 1950 and 2020, June was the month with the greatest number of tornado occurrences (5 tornadoes).

## Hail Overview




Seminole County had a total of 114 hail reports from 1950 to 2020, with hail stones ranging from 0.75 to 3 inches in diameter. Between 1950 and 2020, May was the month with the greatest number of hail reports (30 hail reports).

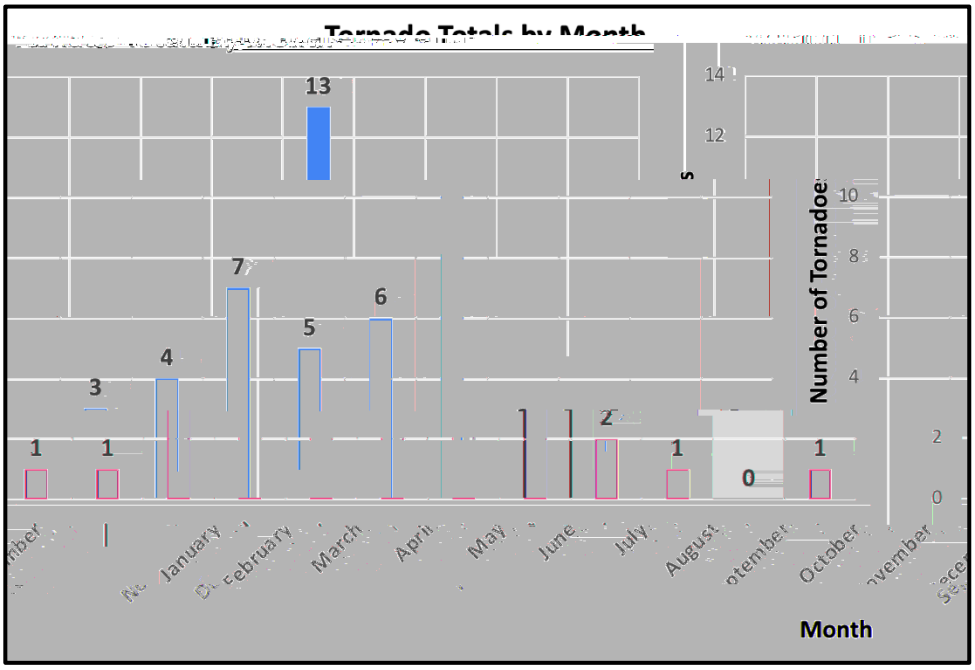
# Severe Wind Overview




Seminole County had a total of 136 severe wind reports from 1991 to 2020. 6 of these reports involved winds 74 miles per hour (65 knots) and greater. The other 130 severe wind reports fell between 58 miles per hour (50 knots) and 73 miles per hour (64 knots). Between 1950 and 2020, June was the month with the greatest number of severe wind reports (32 severe wind reports).

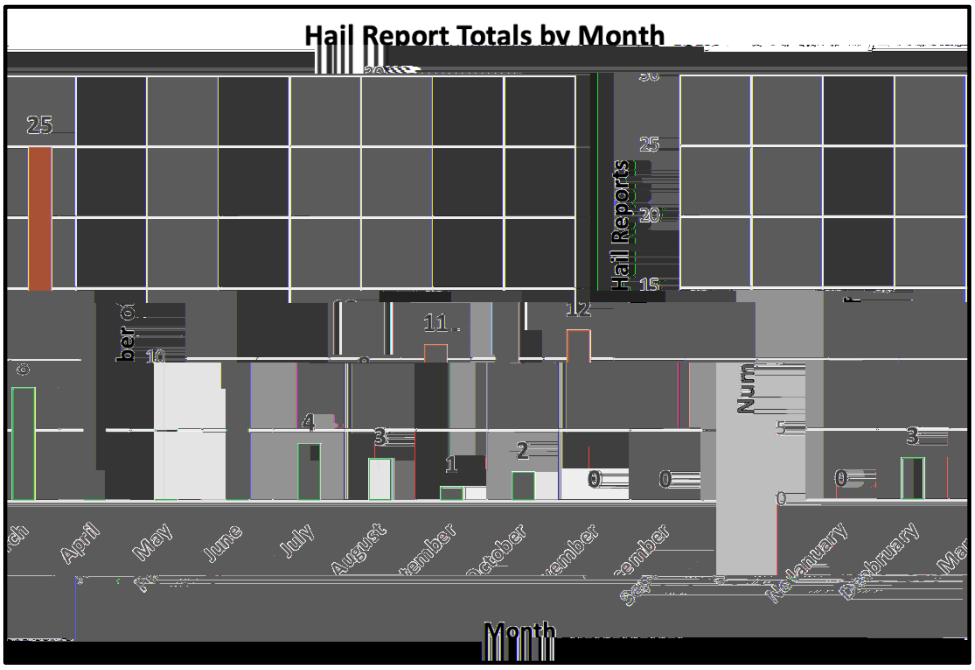
# St. Lucie: Overview

## Tornado Overview



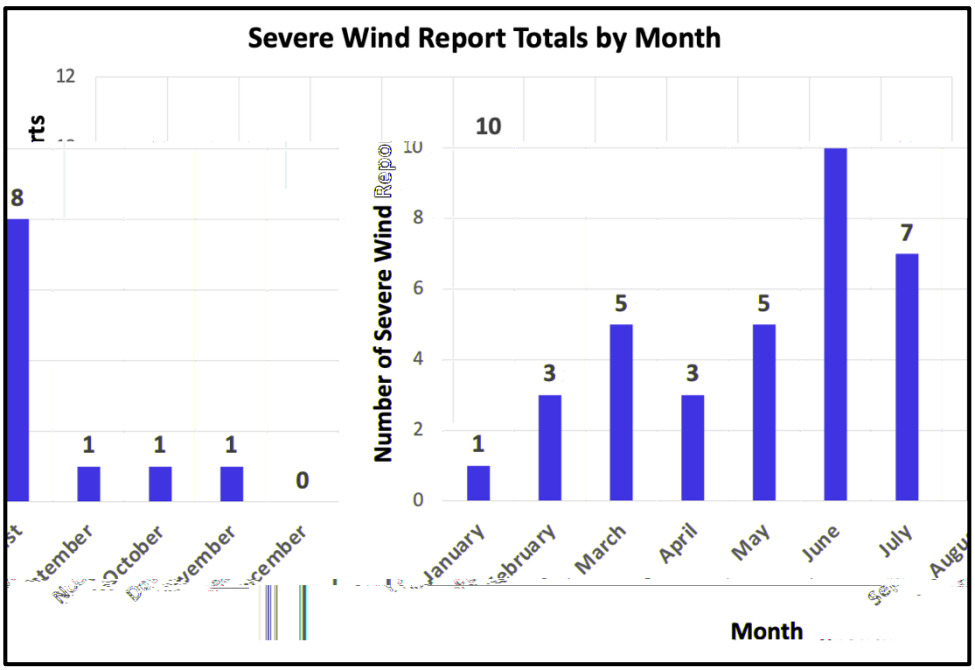

St. Lucie County experienced a total of 44 tornadoes from 1950 to 2020. There were 31 F0/EF0 tornadoes, 8 F1/EF1 tornadoes, 2 F2/EF2 tornadoes, and 2 F3/EF3 tornadoes during this period of time. One tornado had an unknown scale. Between 1950 and 2020, August was the month with the greatest number of tornado occurrences (13 tornadoes).

## Hail Overview




St. Lucie County had a total of 69 hail reports from 1991 to 2020, with hail stones ranging from 0.75 to 3 inches in diameter. Between 1950 and 2020, May was the month with the greatest number of hail reports (25 hail reports).

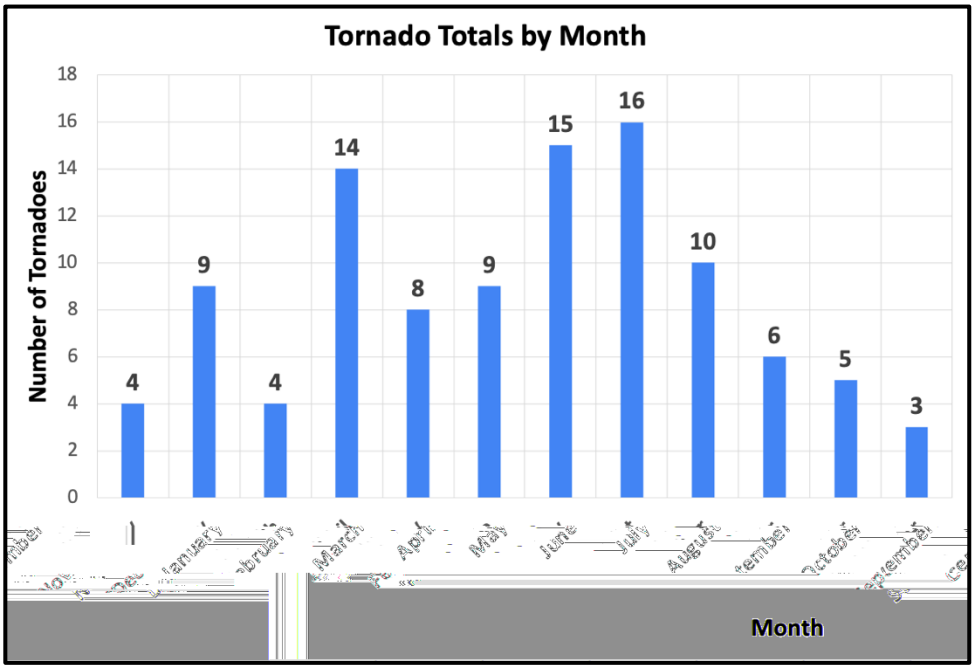
# Severe Wind Overview




St. Lucie County had a total of 45 severe wind reports from 1991 to 2020. 3 of these reports involved winds 74 miles per hour (65 knots) and greater. The other 42 severe wind reports fell between 58 miles per hour (50 knots) and 73 miles per hour (64 knots). Between 1950 and 2020, June was the month with the greatest number of severe wind reports (10 severe wind reports).

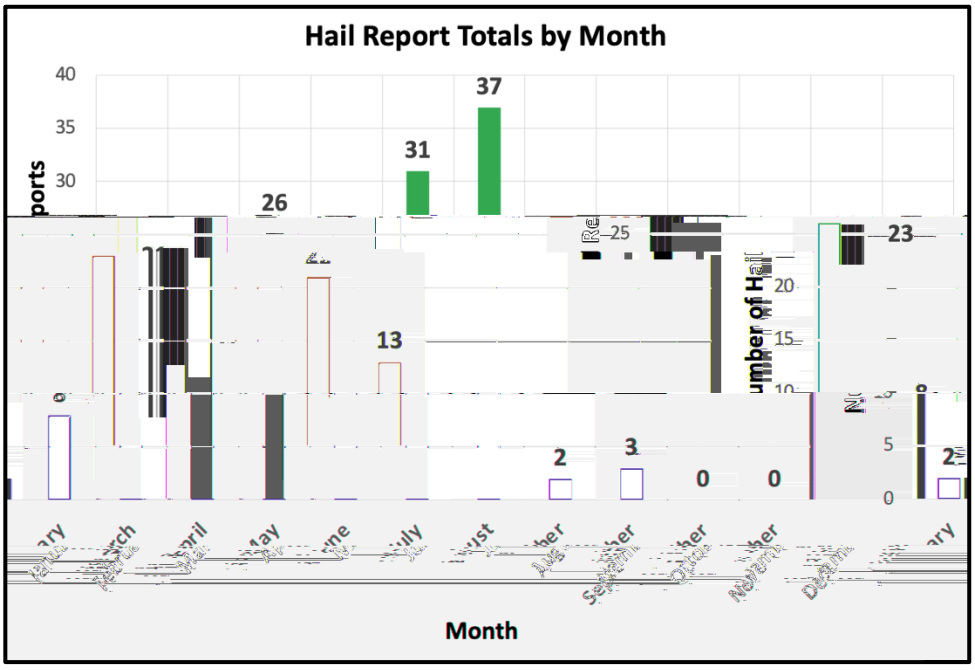
# Volusia: Overview

## Tornado Overview



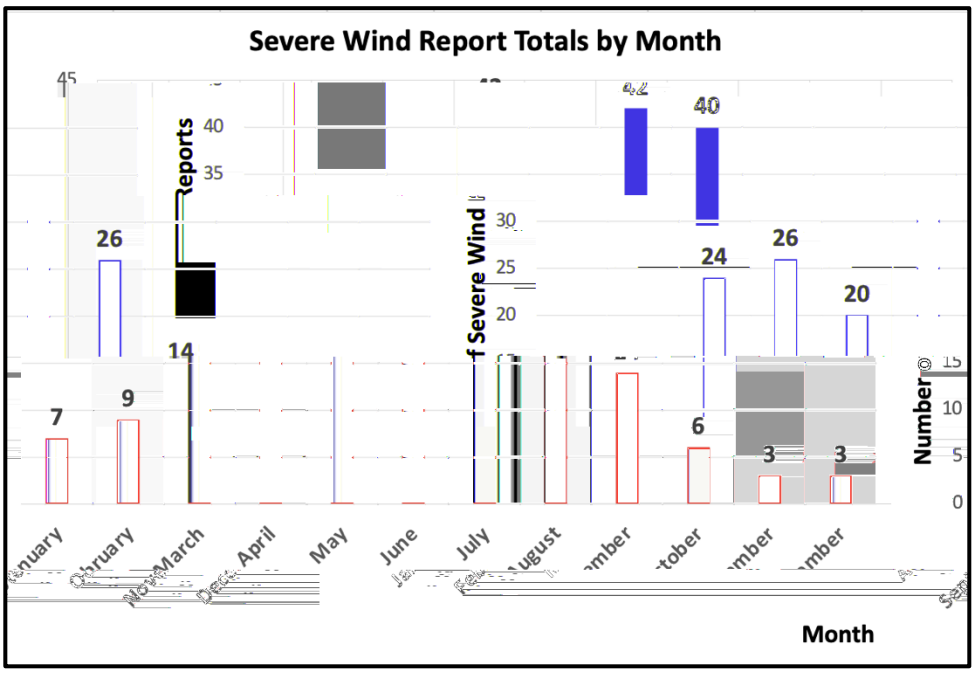

Volusia County experienced a total of 103 tornadoes from 1950 to 2020. There were 52 F0/EF0 tornadoes, 25 F1/EF1 tornadoes, 13 F2/EF2 tornadoes, and 3 F3/EF3 tornadoes during this period of time. Ten tornadoes had an unknown scale. Between 1950 and 2020, August was the month with the greatest number of tornado occurrences (16 tornadoes).

## Hail Overview




Volusia County had a total of 166 hail reports from 1950 to 2020, with hail stones ranging from 0.75 to 2.75 inches in diameter. Between 1950 and 2020, June was the month with the greatest number of hail reports (37 hail reports).

# Severe Wind Overview




Volusia County had a total of 220 severe wind reports from 1950 to 2020. 12 of these reports involved winds 74 miles per hour (65 knots) and greater. The other 208 severe wind reports fell between 58 miles per hour (50 knots) and 73 miles per hour (64 knots). Between 1950 and 2020, June was the month with the greatest number of severe wind reports (42 severe wind reports).

For any questions regarding this study on East Central Florida severe weather, please email: megan.tollefsen@noaa.gov