POPULATED AREAS IN THE MIDWEST AND HOW THEY ARE AFFECTED BY TORNADO ALLEY

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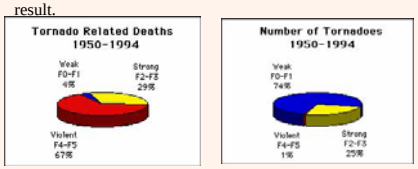
Introduction

Class F4 and F5 tornadoes occur each year throughout the Midwestern portion of the United States known as "Tornado Alley." If these destructive events happen in areas of low population, very little impact is felt. However, if a F5 tornado happens to come into contact with an area which is high in population, the impact can be quite different. With loss of property and life, a huge social and economic burden can, and often does result.



Materials and methods

For this exercise , data and information on tornadoes was gathered from several sources and on several different aspects. I first defined what class F4/F5 tornadoes were and looked at why they are born, where in the United States they are more likely to occur, and finally, how major areas of population might be affected.

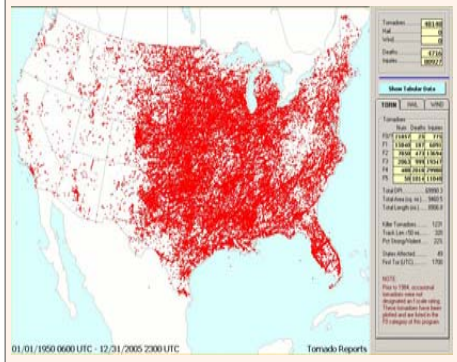


Fig. 3 Recorded tornadoes from 1950-2005

Data analysis

Theodore Fujita, a scientist at the University of Chicago developed the tornado damage scale in 1971. The scale includes the F from his name along with typical wind velocity and damage estimates for 5 classes of tornadoes (0-5).

F0 - Less than 73 mph winds.
F1 - Winds from 73 to 112 mph.
F2 - Winds at 113-157 mph.
F3 - Winds of 158-206 mph.
F4 - 207 to 260 mph winds. Well-constructed homes leveled. Structures with a weak foundation blown some distance away. Vehicles thrown. Large missiles generated.
F5 - Winds of at least 261 mph. Strong frame homes leveled at foundation and swept away. Car-sized missiles flown through air in excess of 109 yards (100 meters). Trees debarked. Incredible phenomena.

Tornadoes are born when cold, dry air moves into warm, moist air and starts to rise and rotate.

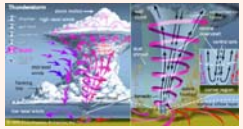


Fig. 4 Shows the birth of a tornado.

Tornadoes can be widely spread throughout the eastern half of the United States, but seem to be concentrated in the Midwest U.S in an area known as "Tornado Alley." Within this area, several areas have, over the years, produced a very high concentration of F4 and F5 tornadoes.

Fig. 5 Shows highest concentrations of tornadoes

Results

As a result of gathering, comparing and analyzing the data and information several facts became apparent.

1.Unlike other scientific data, to record data on tornadoes the event has to witnessed. This is not as big of an issue today because most areas of the United States has at least some population and with the use of doppler radar spotting and tracking tornadoes has become much more accurate.

2.Because of the location of the Rocky Mountains, the shape of the jet stream, and the warm, moist climate of the Midwest, we can, to some degree predict areas of the United States that are more likely to experience an upper class tornado.

3.Although tornadoes can occur at anytime of the year, the months that have proven to produce a larger number of storms are in the late spring and summer.

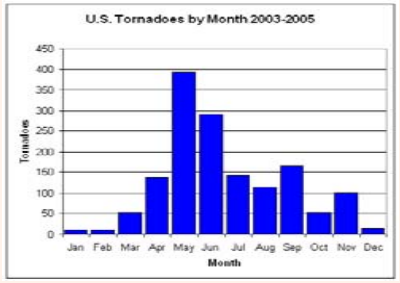


Fig. 6 Tornado frequency by month.
(http://www.ncdc.noaa.gov/oa/climate/severeweather/tornadoes.html#history)

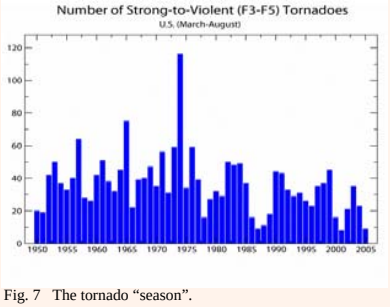


Fig. 7 The tornado "season".
(http://www.ncdc.noaa.gov/oa/climate/severeweather/tornadoes.html#history)

Conclusions

Tornadoes can be some of the most catastrophic weather events. When they build to class F4/F5 strength and follow a path towards a large metro area, the results will be devastating to property and life. Since these storms are so unpredictable in terms of when they will form and where they will go, the best defense we have for protection is early warning. With Doppler radar, satellite imagery, and the involvement of Homeland Security, we able to better predict where these storms are heading and warn the urban areas. We will never be able to harness a tornado's destructive power, but we can certainly strive to save lives.

Literature Cited

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For further information

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