

Examining Methods to Accurately Predict Significant Severe Thunderstorm Wind Damage across the Northeastern United States

Brian Frugis, NOAA/NWS - Albany, New York, Albany, NY

The Storm Prediction Center (SPC) considers severe thunderstorms that produce measured or estimated wind gusts of at least 65 knots (74.8 mph), hail two inches in diameter or greater or an EF2 or greater tornado to be significant. Between 2012 and 2015, the Northeast (New England, New York, New Jersey and central and eastern Pennsylvania) saw 174 severe thunderstorm wind or hail reports that were either significant or produced injuries or fatalities. This is nearly double the number of tornadoes that were reported over the same time period (95). Many of these significant severe thunderstorm wind damage reports had a much larger societal impact as compared to the tornadic events as well. Considering the National Weather Service's implementation of Impact-Based Warnings, knowledge of a severe thunderstorm's damage potential is critical information for forecasters to have when issuing severe thunderstorm warnings.

Pinpointing which particular severe thunderstorms will produce significant wind damage can be a difficult challenge for the warning forecaster. Out of the 859 severe wind reports received to NWS Albany between 2012 and 2015, only 31 (about 3%) were considered significant. However, these particular storms had a major impact on the lives of many people in the region and these storms received a large amount of media attention as well. Doppler radar radial velocity data may not always provide a clear picture on the scope of the storm, due to inherent problems regarding the radar beam's height and angle. This study will attempt to examine some other sources of guidance in addition to traditional velocity data, including lightning data, dual-polarization radar products, and mesoscale parameters to help provide better guidance on when a thunderstorm will have the potential to produce significant wind damage.