**A Multi-Scale Analysis of the 29 August 2020**

**Tornadic Event across Eastern New York**

 *Thomas A. Wasula and Brian J. Frugis*

*NOAA/National Weather Service, Albany, New York*

On 29 August 2020, a major severe weather event including tornadoes occurred across much of eastern New York (NY). The NCEP Storm Prediction Center posted a Slight Risk in the morning for much of eastern NY, eastern Pennsylvania, New Jersey, and western New England. Eastern NY and western New England typically have 3 tornado occurrences a season. A tornado event occurred on 27 August 2020 a few days earlier with a couple of touchdowns in the eastern Catskills, and northwest Connecticut. Two EF-1 tornadoes and one EF-0 would occur this afternoon from supercells across eastern NY in an area where SPC had 5% tornado probabilities within the Capital Region and Upper Hudson Valley. The tornadoes this day would bring the seasonal total to thirteen to the Albany forecast area. The NWS at Albany forecast area had 11 severe reports which were mostly wind damage (winds ≥ 50 knots), a few large hail (≥ 2.54 cm in diameter) and the three tornadoes with this event.

Observational data, as well as SPC Rapid Refresh Mesoanalysis data suggested a major severe weather outbreak would likely occur. A strong 500 hPa short-wave trough would be approaching from the Great Lake Region with a supportive 250 hPa 100+ knot jet streak that would reach upstate NY in the late afternoon. A warm front would lift north of the Mohawk Valley and Capital Region with sufficient surface heating and destabilization during the day. Precipitable water values would be anomalous in the 1.50 to 2.00 inch range with some low-level moisture from the remnant circulation of Tropical Cyclone Laura passing over the Mid-Atlantic States. Mixed layer convective available potential energy values were in the 500-1500 J kg-1 range with marginal mid-level lapse rates and low lifting condensation level heights. The effective bulk shear values were in the 35-45 knot range supportive for supercells with rotating updrafts capable of producing tornadoes. 0-1 km storm-relative helicity values were in the 100-200 m2 s-2 in the afternoon with increasing low-level backed flow in the Hudson River Valley enhancing the tornado threat.

This talk will focus on a detailed mesoscale and radar analysis of the tornadic event. Traditional base and derived WSR-88D radar products will also be shown in the analysis. The storm-scale analysis will focus on helpful forecast techniques, including applying results from a normalized rotation (Nrot) and tornado V-R Shear studies to determine what caused the tornadoes. Also, utilization of NYS Mesonet observations, and MRMS 0-2 km AGL Low-Level Azimuthal Shear Tracks will be shown in the tornadic analysis.