Widespread Damaging Wind Severe Thunderstorm Event of 4 May 2018 across the NWS Albany, NY County Warning Area

Christina Speciale
NOAA/NWS/WFO Albany, New York

A cold front and unseasonably strong mid-tropospheric trough produced a powerful squall line resulting in widespread damaging winds across eastern NY and parts of western New England on 4 May 2018. A neutrally tilted 500hPa trough at 12 UTC 4 May 2018 quickly became negatively tilted as it traveled from the Great Lakes into southern Canada, resulting in rapid cyclogenesis and a 990 hPa surface low over the Saint Lawrence River Valley by 02 UTC 05 May 2018.

Since this event occurred in the transitional spring season, a detailed investigation of the Albany 12 UTC 4 May and 00 UTC 05 May 2018 soundings show this event featured characteristics typical of both the cold and warm seasons. One of the most notable features was the very impressive kinematics throughout the troposphere with southwesterly flow ranging from 35-45 kts at 925hPa to 50-60 kts at 700hPa. In addition, a strengthening southerly flow in the deeply mixed boundary layer east of the system enhanced the warm sector over NY and western New England. Afternoon temperatures at KALB, KGFL and KPOU peaked near 27-29^{o}C and dew points around 17-18ºC as sfc-3km lapse rates steepened impressively to 7.0-7.5ºC/km in the pre-storm environment. Despite this warm, humid air mass, instability values remained low with MLCAPE values less than 1000J/kg. This was mostly likely attributed to marginal mid-level lapse rates between 5.0 and 6.0ºC/km. With a high shear low cape convective environment in place, the resulting squall line led to nearly 60,000 power outages in eastern NY and 2,500 in southern VT. Governor Cuomo visited parts of Washington County, NY and deployed the National Guard to assist restoration efforts.

This presentation will also provide a radar analysis focusing on the hardest hit areas of Washington, Saratoga and Warren Counties in NY where we can successfully identify mesovortex development using a three step process. First, reflectivity data clearly shows a Quasi-Linear Convective System (QLCS) in this region with evidence of both front and rear inflow notches, bounded weak echo regions (BWER) and strong bowing segments along the leading edge of convection. Second, an investigation of the velocity data illustrates that the updraft downdraft convergence zone (UDCZ) was balanced and even slightly shear dominate. Lastly, we can see the 0-3km bulk shear vectors were oriented perpendicular to the line of forcing with the line normal vectors greater than 30 knots. In the end, numerous trees fell or were snapped in Washington County, some in concentrated areas, with impacts to cars and structures. This demonstrates the operational utility of the three step process as it can alert warning forecasters to radar segments that may lead to particularly high impacts.