**The Heavy Wintry Mixed Precipitation and Localized Ice Storm on 3-4 February 2022 in Eastern New York Part II: Warnings, Communication of Hazards and Verification**

*Christina Speciale, Thomas A. Wasula, Dan B. Thompson, Michael S. Evans and Neil A. Stuart*

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

A heavy mixed precipitation and localized ice storm occurred on 3-4 February 2022 across eastern New York (NY) and western New England in the National Weather Service (NWS) Albany New York County Warning Area. Heavy snow (8 – 16 inches) occurred north and west of the Capital Region over the Mohawk Valley, southern Adirondacks and the Lake George Area. H~~h~~eavy accumulating sleet (up to and in excess of 2 inches) occurred in the Greater Capital Region. The spatial distribution of ice accretion and associated significant societal impacts were modulated by the complex terrain and were extremely variable. While most of the freezing rain impacts were minor, a localized yet significant ice storm occurred over portions of the Mid-Hudson Valley in eastern NY. In portions of Ulster County, heavy ice accretions (0.25 – 0.50 inches of flat ice) resulted in power outages for roughly half of the county.

The second part of this case study highlights some of the challenges associated with communicating hazards and impacts of this storm to NY and western New England federal, state and community partners, as well as verification. Challenges included expressing uncertainty with the exact wintry precipitation amounts and transition zones (snow vs. sleet vs. freezing rain) as well as discussing the overall timeline and duration of the event. NWS Albany briefings to partners began on 30 January 2022 and continued twice daily through the event. Briefings provided deterministic snow/sleet and ice forecasts and 10th and 90th percentile probabilistic information for snow/sleet amounts. Probabilistic guidance is designed to provide partners with reasonable “high end” and “low end” scenarios to ensure they are properly prepared. We also annotate forecast graphics to highlight areas with the most uncertainty. NWS Albany accommodated our transportation partners request for daily briefings. Lastly, the Freezing Rain Accumulation Model (FRAM) provided some assistance in predicting flat ice amounts.

While verification statistics for the storm as a whole exceeded performance goals, our ice forecasts were underdone in the Mid-Hudson Valley where the most significant impacts occurred. Errors in the icing forecast were mainly due to uncertainty with respect to thermal profiles and timing of precipitation type changes during the heaviest precipitation. Due to the complicated evolution of precipitation types, the warning versus advisory decisions were not straightforward, even in hindsight. For future icing events, the NYS Mesonet data has proven useful for verification efforts as it can be used as input into the FRAM. The output has shown to be a realistic proxy for flat ice amounts in areas where trained spotter data are not available.

Finally, a survey after this event revealed that partners struggle with flat ice accretion forecasts and request that the NWS provide radial ice forecasts since radial ice is used to assess possible power outages, tree damage and additional impacts.