

## **The 26 October 2010 Tornado Outbreak: Research Applied to Operations**

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Research into severe local storms has come a long way over the last several years with advancement in the understanding of both favorable synoptic and storm scale (meso/microscale) conditions conducive to severe thunderstorms and tornadoes. Technological advancements in the operational field have allowed the forecaster to analyze and review detailed observations, applying research findings to forecast and warning operations more effectively. Local severe storm research at National Weather Service Forecast Offices (NWS WFOs) that incorporate mainstream research can help further increase lead time and forecaster confidence in severe weather events through pattern recognition. This includes the outlook, forecasting, and warning phases of WFO operations.

The 26 October 2010 tornado outbreak was an example where research applied to operations allowed for a successful handling of a high impact weather event. A very intense line of thunderstorms in a highly sheared environment propagated through the Southern Great Lakes, directly impacting the Northern Indiana County Warning Area. Previous local research into synoptic patterns favorable for major tornado outbreaks in the Southern Great Lakes, allowed forecasters to key in on this potential several days out, with outlooks issued mentioning the threat for a major severe weather outbreak. By applying various research findings (including local research) during the event, warning forecasters were able to anticipate storm structure and severe potential, with preference toward tornado warnings at the start of the event. Warning templates designed to accentuate locally unique severe weather concerns were chosen during the event, as environmental concerns fit past analogs for a regional tornado outbreak. The lack of tornado reports concerned warning forecasters during the event, but persistence in warning methodology resulted in large average lead times and high probability of detection with respect to tornadoes. A review of the event will be presented that highlights meteorological features, comparison to past composites, and the operational handling of the event. The purpose of this talk is to highlight an event where both mainstream and local research geared toward operational severe weather forecasting can lead to advanced lead time in warnings, increasing public safety.