

## **Importance of Rapid-scan Radar Data During a Tornado Outbreak**

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On 31 May 2013, a supercell produced a violent tornado in El Reno, Oklahoma that was sampled by the Phased Array Radar (PAR) at the National Weather Radar Testbed in Norman, Oklahoma. Following such an event, a question often asked regards the operational benefit of rapid-scan PAR data. This data set provided the opportunity to address this question from an operational forecaster's perspective. A radar data-focused interview was performed with the NWS forecaster who worked the event. Questions posed first sought to gain an understanding of his tornado warning decision process, and included asking him to point out in WSR-88D data the most relevant features. Thereafter, he was asked to review the PAR data and to point out and comment on the importance of any differences he saw in supercell evolution.

During the interview, the forecaster identified two primary storm features as being important: 1) intensity of rotation in the low and midlevel mesocyclone and 2) area and magnitude of low-level inflow. While viewing the PAR data, he reported seeing more detail in the evolution of these features. He also noticed interactions of the supercell with other storms that were not sampled by the WSR-88D and that he thought would have aided his decisions. To quantify differences in the intensity of rotation and inflow sampled by the PAR and the WSR-88D, 1) maximum delta V within each mesocyclone, and 2) the area of velocities 20 m s<sup>-1</sup> and higher and mean velocity within the inflow region were computed during the 42-min period preceding tornadogenesis. Analysis showed the advantages of high-temporal resolution data in observing each of these crucial elements. In particular, the PAR provided a more complete picture regarding the intensification and dissipation of each of the three mesocyclone signatures produced during the analysis window. PAR data also sampled periods of increased inflow magnitude that closely corresponded to mesocyclone intensification periods.