# Summary of the Service Assessment for Super Tuesday Tornado Outbreak February 5-6, 2008

## Event Summary

During a twelve-hour period on February 5-6, 2008, an intense spring-like storm system generated 87 tornadoes causing 57 fatalities in nine states. This tornado outbreak was anticipated days in advance and all of the fatalities occurred within the boundaries of tornado watches and were preceded by tornado warnings. In spite of the excellent forecasting performance, several factors led to the high number of fatalities:

- Nearly two-thirds of the fatalities occurred in manufactured homes
- Most of the fatalities occurred at night and/or in heavily forested areas
- Most of the people interviewed associate tornado outbreaks with springtime or summer months. Many people minimized the threat since the event occurred outside the traditional tornado season.

## Challenge - Rapidly Moving Tornadic Storms

Many of the storms moved at 55 miles per hour (mph) due to a combination of the strong (nearly 70 mph) low-level jet stream and 90 mph westerly wind aloft. This presented a challenge to forecasters when defining tornado warning boxes. Since many of the offices recently switched to a "Warn-by-Polygon" technique, forecasters did their best to keep the size of the warning boxes small. However, since the supercells for which they were forecasting were moving so rapidly, forecasters were required to draw new polygons in rapid succession to keep these tornadic storms inside a warning area. In some cases, this scenario dramatically reduced the tornado warning lead times to as little as 5 minutes or less. In other cases much larger warning polygons were defined to cover multiple embedded mesocyclones which is contrary to training guidance given by the Warning and Decision Training Branch (WTDB).

## Challenge - Well-Coordinated Warnings between WFOs

Another challenge faced by forecasters is coordinating warnings that cross Weather Forecast Office (WFO) boundaries. During this event, one WFO issued a tornado warning directly adjacent to its WFO boundary. A second neighboring WFO was not convinced that the particular storm was tornadic until after this warning expired. Six minutes later the second WFO issued a tornado warning to cover this storm which caused fatalities 7 minutes after it was issued. National Weather Service (NWS) policy prevents WFOs from issuing warnings outside their County Warning Area (CWA). Media outlets believed that if WFOs were allowed to extend their warning polygons outside their CWA, the overall service they provide could be improved.

## Possible Solutions to Challenges

A system that allows forecasters to define a longer and larger swath indicating the area and time of severe weather would help address the challenge of rapidly moving supercells. Ideally this swath would define the probability of some severe weather event (e.g., tornado or damaging hail) so that customers could properly plan, prepare, and execute an appropriate course of action. The swath would also move in space and time corresponding to the motion of the storm. As the weather situation changes, forecasters would update the area and time attributes of the severe weather forecast in a digital database accessible by forecasters in other offices as well as the public.

Since the swath would naturally span across more than one WFO, much better coordination would need to occur in order to properly alert customers to approaching weather hazards. A digital database containing gridded probabilities of severe weather would keep forecasters apprised of the weather situation at all times over an area that covers several WFOs for better coordination. Interactive chat sessions with drawing capability would assist forecasters in communicating their thoughts to their colleagues. The same information in the digital database could be exported to public web sites in real-time so the public can make the best possible decisions to protect life and property.