

WFO Huntsville Quick Event Review

Date/Time of Event: Saturday, May 14, 2005
Forecaster(s) performing review: Brian Carcione
Type (and significance) of event: Isolated Severe Thunderstorms

Overview of event:

A summer-like pattern had dominated much of the week with a strong upper-level ridge, temperatures approaching 90 degrees, and dewpoints rising into the mid 60's. A closed upper-level low east of the Rockies evolved into an amplified open trough, then translated into the Great Lakes. This was reflected at the surface by a strong cold front.

The front was analyzed along a Chicago-St. Louis-Tulsa line at 8 am/13Z. An MCS had developed along the front across Texas and Oklahoma overnight, but quickly dissipated towards morning. A pre-frontal trough or outflow boundary from the earlier MCS developed ahead of the front and moved into increasingly unstable air. Higher dewpoints in the upper 60's channeled along this boundary, while 12Z soundings from OHX and BMX showed CAPE values in the 1000-2000 J/kg range. A broken line of thunderstorms developed across northern Mississippi and western Tennessee, though none were thought to be severe. These storms produced an outflow boundary ahead of the main line in the vicinity of Booneville, MS, and rapid thunderstorm development occurred.

SPC had maintained a slight risk of severe thunderstorms north of the Tennessee River since the previous day. At 10 am, a SWOMCD statement was issued indicating that they were considering issuing a watch for middle Tennessee and points north and east. While winds did not exceed about 25 knots throughout the entire column over northern Alabama, winds were stronger (40-50 knots at 500mb) across Tennessee and Kentucky closer to the low. OHX began issuing severe thunderstorm warnings along the prefrontal squall line, and at 11:10 am, severe thunderstorm watch #276 was issued.



Figures 1a & 1b: The 12Z/14 day 1 convective outlook, and severe thunderstorm watch #276.

Strong thunderstorms moved into northwest Alabama but produced generally only heavy rain and frequent lightning. Another “jump” in the storm activity occurred as the broken line approached I-65, with strong pulse storms developing across Madison, Morgan, Jackson, and Franklin County Tennessee. As forecast, storms along the line strengthened to marginally severe criteria as they approached the Tennessee-Alabama state line, with wind damage (mainly downed trees) noted across northern Limestone and Lincoln counties. While the overall severe threat remained rather isolated, there were plenty of outdoor events and activities interrupted by lightning.

The outflow boundary stalled and turned to more of a southwest to northeast orientation across the area during the afternoon hours. The boundary served to channel more moisture and rainfall that lasted well into the overnight hours, while very little activity was noted along the front itself. The system was a good rain producer, with amounts generally between 0.25 and 0.75 inches. Hytop, Chase, and Anderson reported nearly 1.5 inches.

Overall motivation for the event review:

The warning forecaster wanted to take a second look at the radar data and try to look for clues that would have enhanced the warning decision-making. Also, this event was one of the better ones we have dealt with this year.

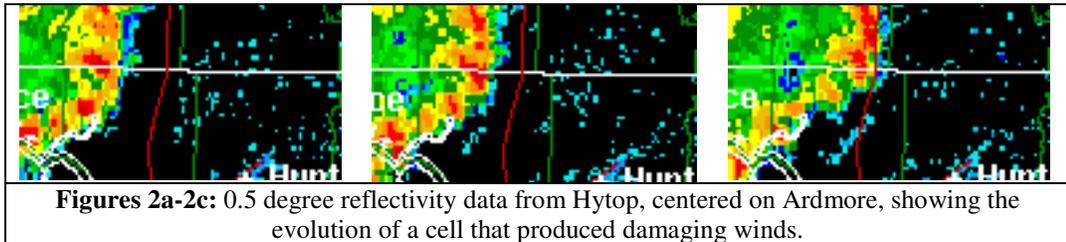
Thing(s) that went well or as expected (and why):

- As expected, the severe threat was quite isolated. Weak winds aloft did not support much storm organization; consequently updrafts were rarely able to sustain themselves for more than about 30 minutes at a time. Hazardous weather outlooks were appropriately worded for the overall threat level.
- The WarnGen significant weather alert template has proven to be a significant timesaver during active weather. The ability to quickly send an SPS for strong thunderstorms gives the warning forecaster more time to interrogate radar data.
- SPC did an excellent job forecasting the area and extent of the severe weather. Severe thunderstorm watch #276 was well-coordinated, and the reasoning behind its placement and size was dead-on.

Thing(s) that didn't go so well or as expected (and why):

- Lead time on the northern Limestone warning could have been longer. 0.5 degree

data out of Hytop showed 50-55 knots of inbound velocities along the state line. A recent event on April 30 showed the drawbacks of using velocity because of a strong low-level jet that never made it to the surface. However, winds at or below 850mb were 20 knots or less, and this should have been a clue that damaging winds were possible earlier than first thought. A review of the HTX 0.5° reflectivity from 1703 to 1718Z may indicate a very small-scale bow echo, but it is not terribly obvious.



- Interaction with outflow boundaries allowed thunderstorms to develop across the area much earlier than initially thought. The 12Z/13 NAM run indicated that storms would not move into the northwest corner of Alabama until after 4pm or so. The 06Z/13 run did a better job, showing a prefrontal band entering the area by 15Z.
- Storms along the secondary cold front were stronger than first anticipated. It was widely believed that rainfall and cloud cover would inhibit further strong convection, but apparently this was not the case.

Other lessons we can apply to future events:

- Timing of events in the models continues to be rather suspect. While we'd like to provide our customers with more detailed information, the timing in this case was almost 6 hours off. Indicating uncertainty in our public products (HWO, AFD, etc.) and in our 800 MHz briefings is important.