

Storm-Based Warnings and the Future of Severe Storms Services

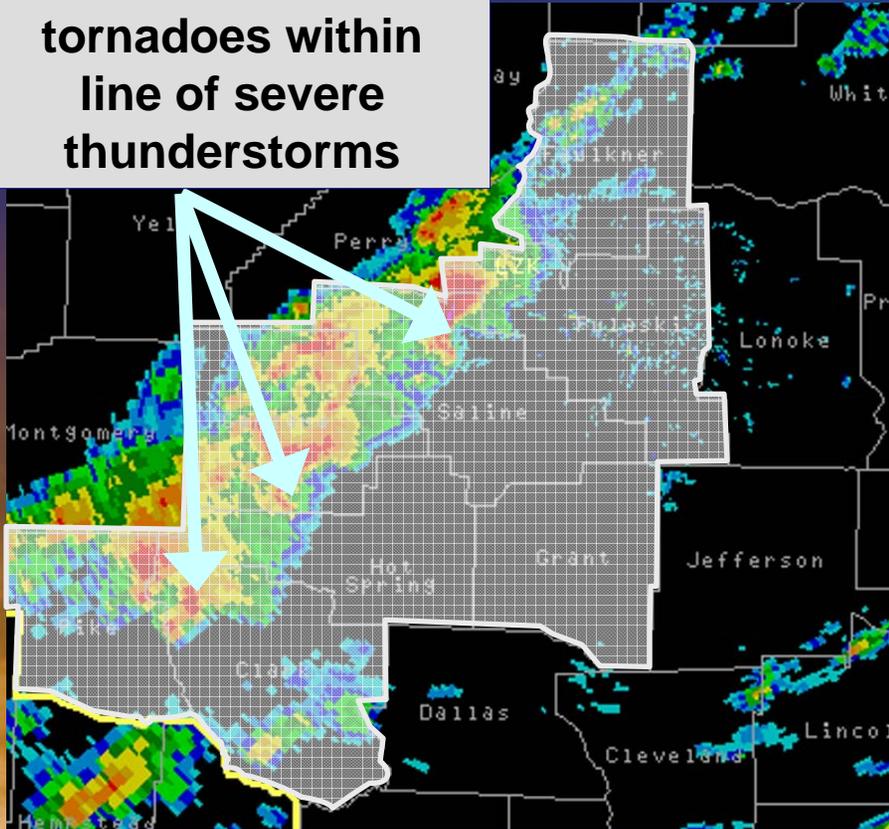
John Ferree

Severe Storms Service Leader

National Severe Weather Workshop – March 6-8, 2008

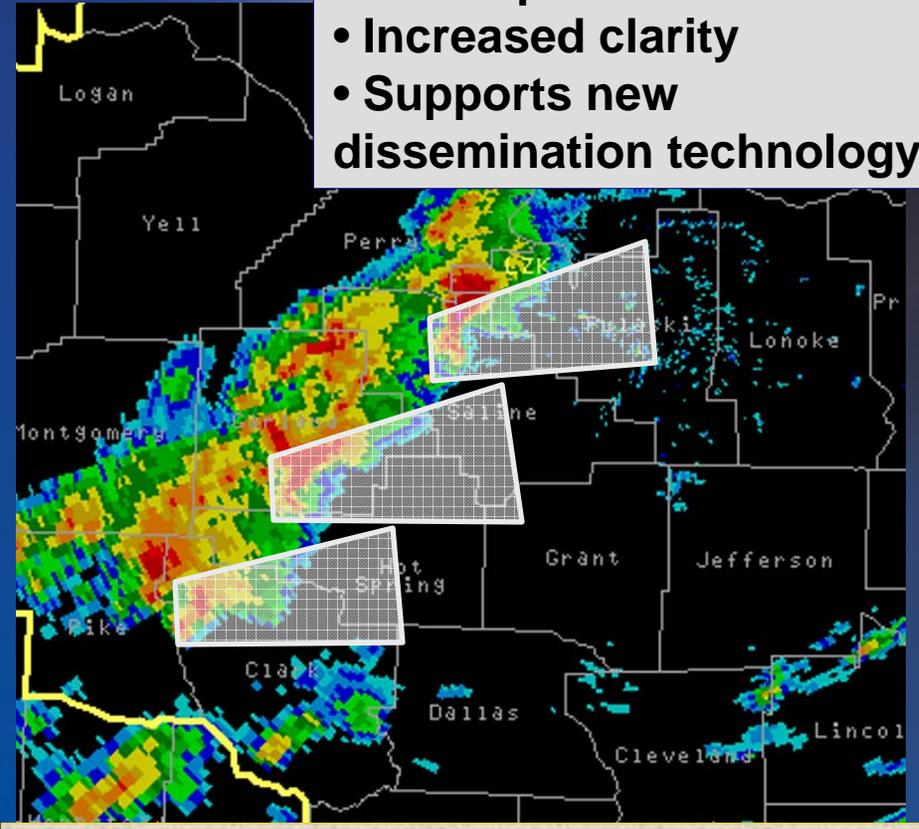
Storm-Based Warnings Implemented October 1, 2007

Three simultaneous
tornadoes within
line of severe
thunderstorms



County-Based Tornado Warnings
8 Counties under warning
Almost 1 million people warned

- More specific
- Increased clarity
- Supports new dissemination technology

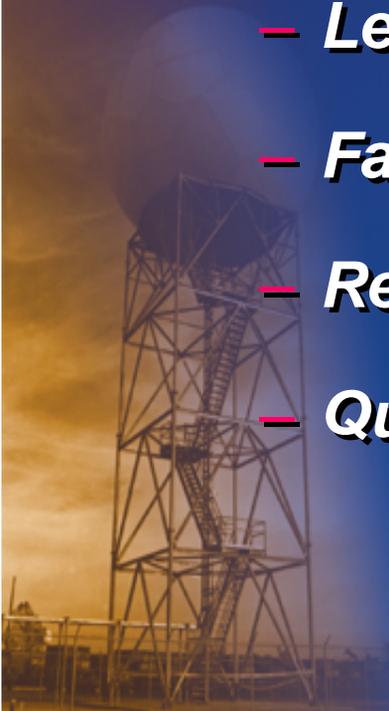


Storm-Based Tornado Warnings
70% less area covered
~600,000 fewer people warned

Storm-Based Warnings

How are we doing so far?

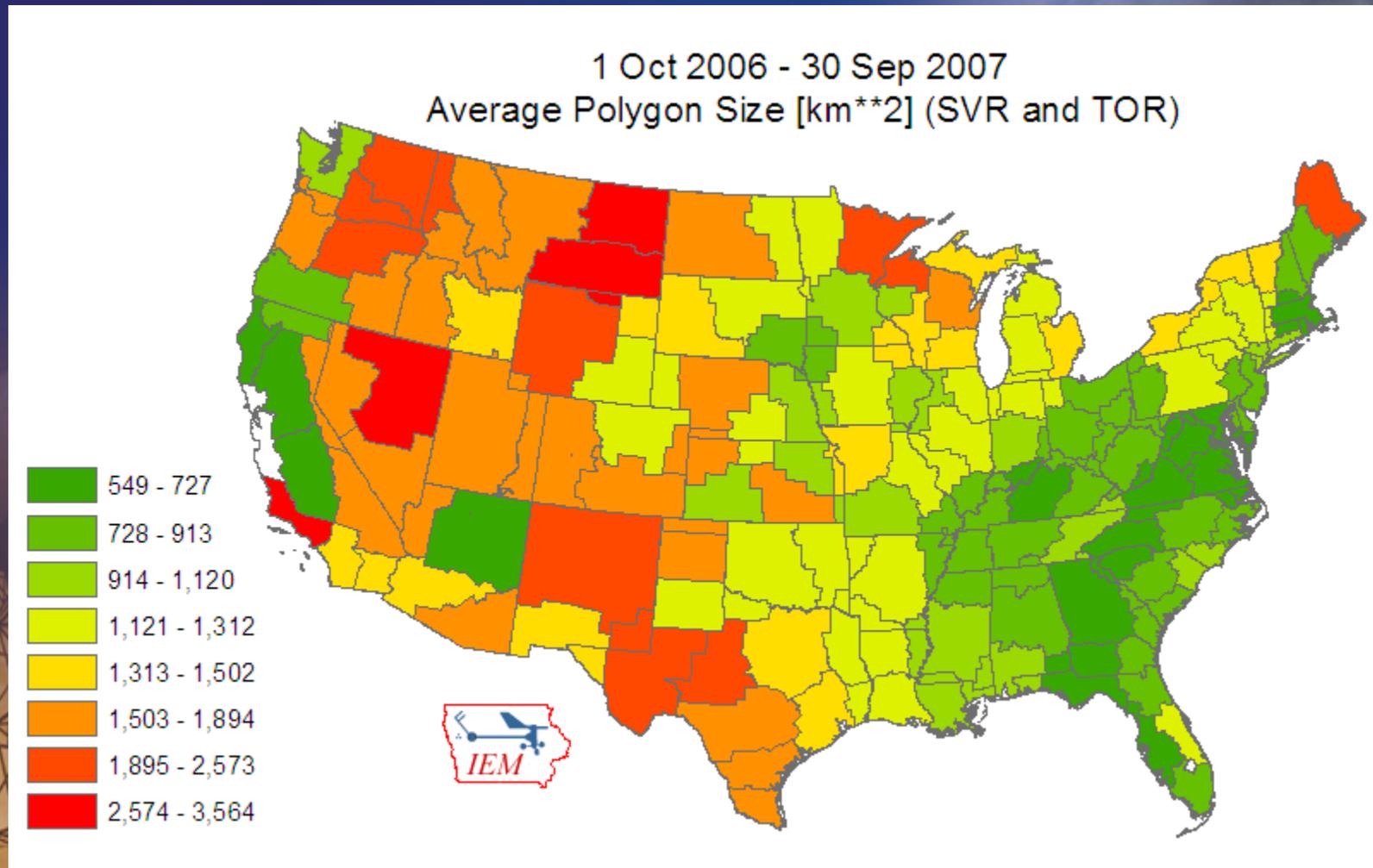
- **Lot of ways to measure success**
 - ***Probability of Detection (Accuracy)***
 - ***Lead Time***
 - ***False Alarm Rate***
 - ***Reduction in False Alarm Area***
 - ***Qualitative Assessment***



Performance Measure Implications

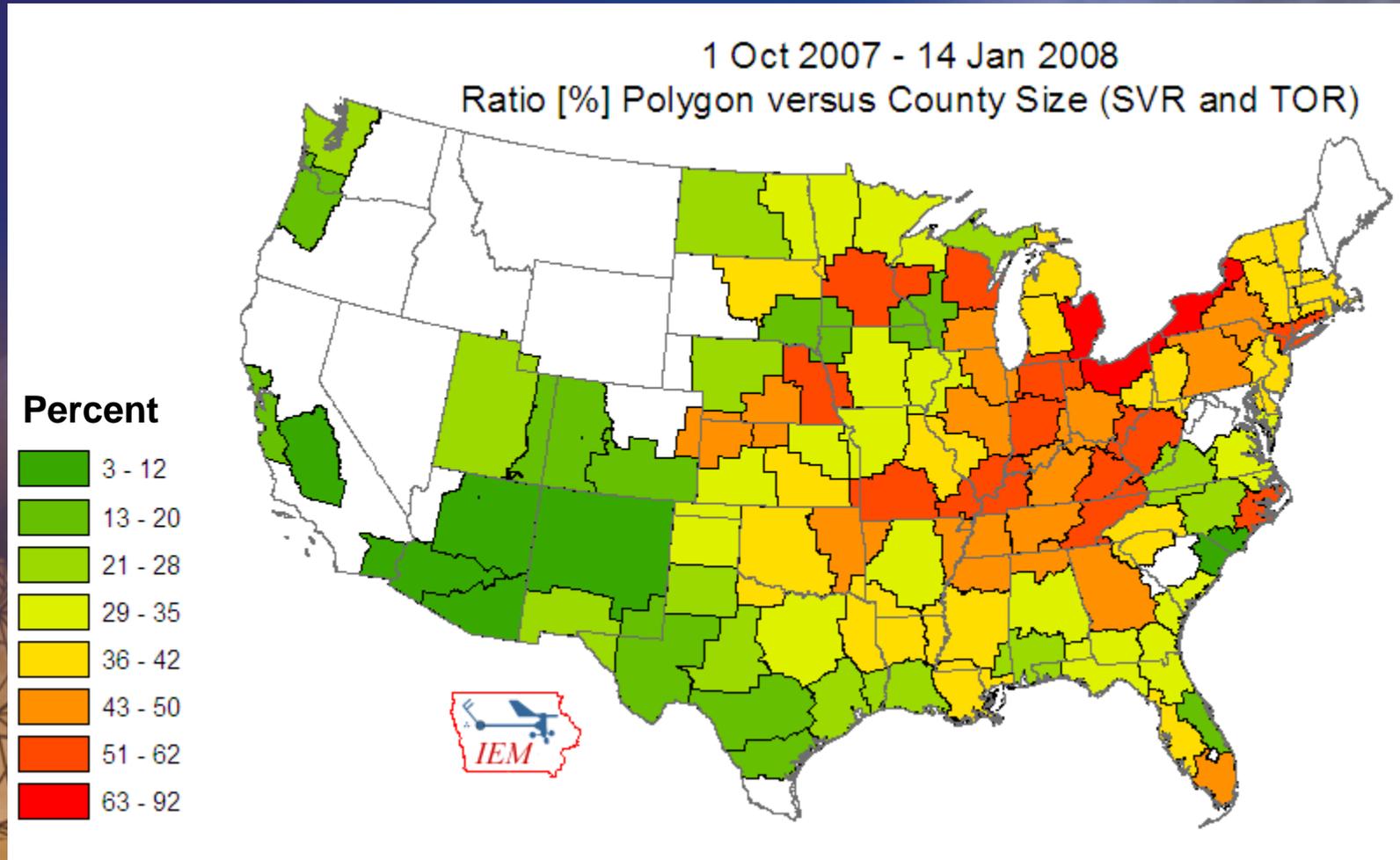
- **From 1987 to 2007, tornado warning:**
 - *Lead time increased from 5 min. to 13 min.*
 - *Probability of detection (accuracy) increased from 40 % to 78%*
 - *False alarm rate from fell from 80% to 76%*
- **Storm-based warnings:**
 - *Reduce the area unnecessarily warned*
 - *Are not expected to improve historical performance measures (Lead Time, Probability of Detection and False Alarm Rate)*

Polygons Size in the County-Based Warning Service



Compliments of Daryl Herzmann at Iowa Environmental Mesonet

County Area Ratio Ratio of Polygon size to County Size



Compliments of Daryl Herzmann at Iowa Environmental Mesonet

Super Tuesday Tornado Outbreak February 5 and 6, 2008

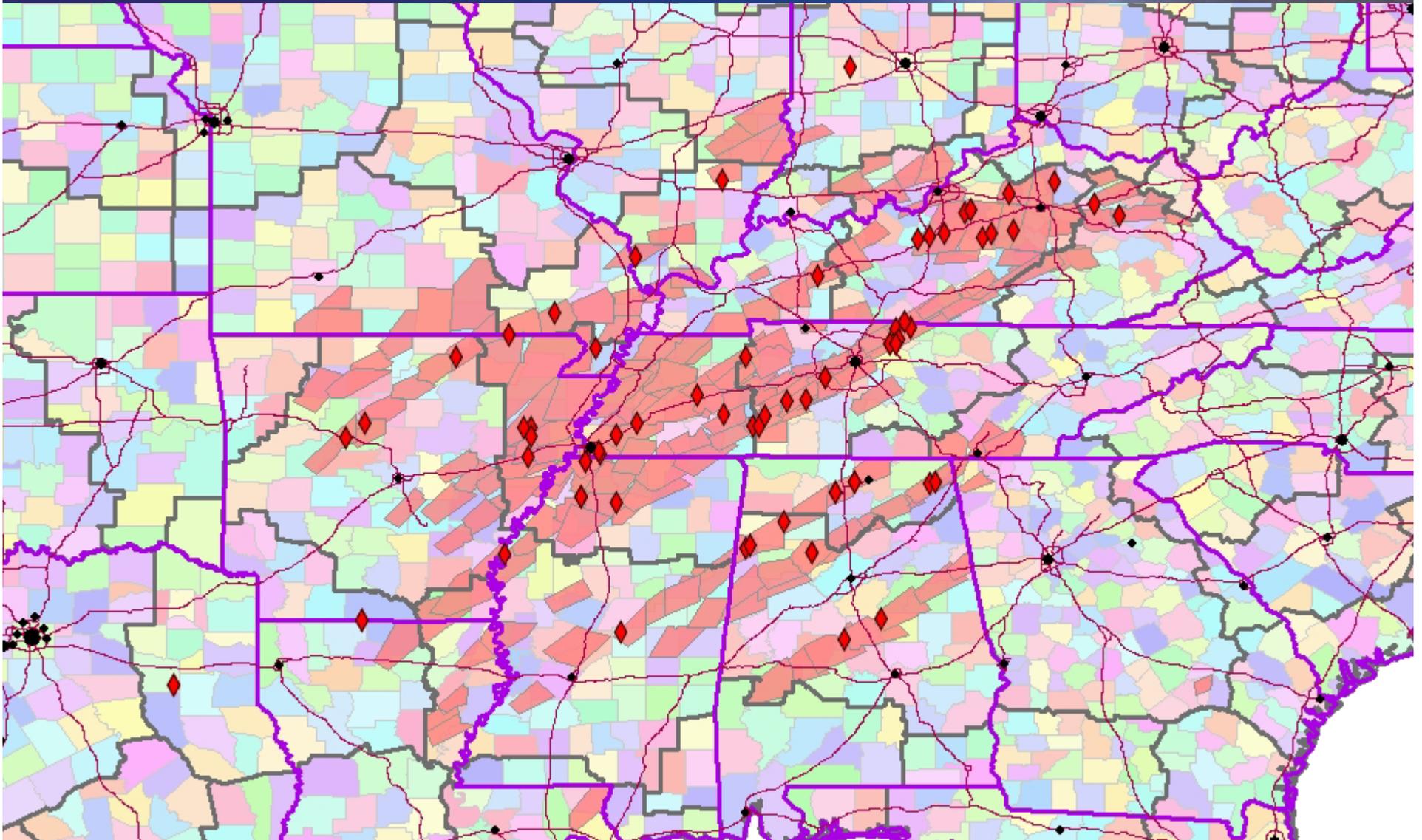
- **Ongoing Service Assessment**
 - *Timeliness, quality, accuracy and usefulness of NWS hazardous weather products and services*
 - *Effectiveness of NWS:*
 - **Internal and external coordination/collaboration**
 - **End-to-end information dissemination**
 - **Office procedures**
 - **Severe weather awareness activities**
- **This presentation is not a service assessment**

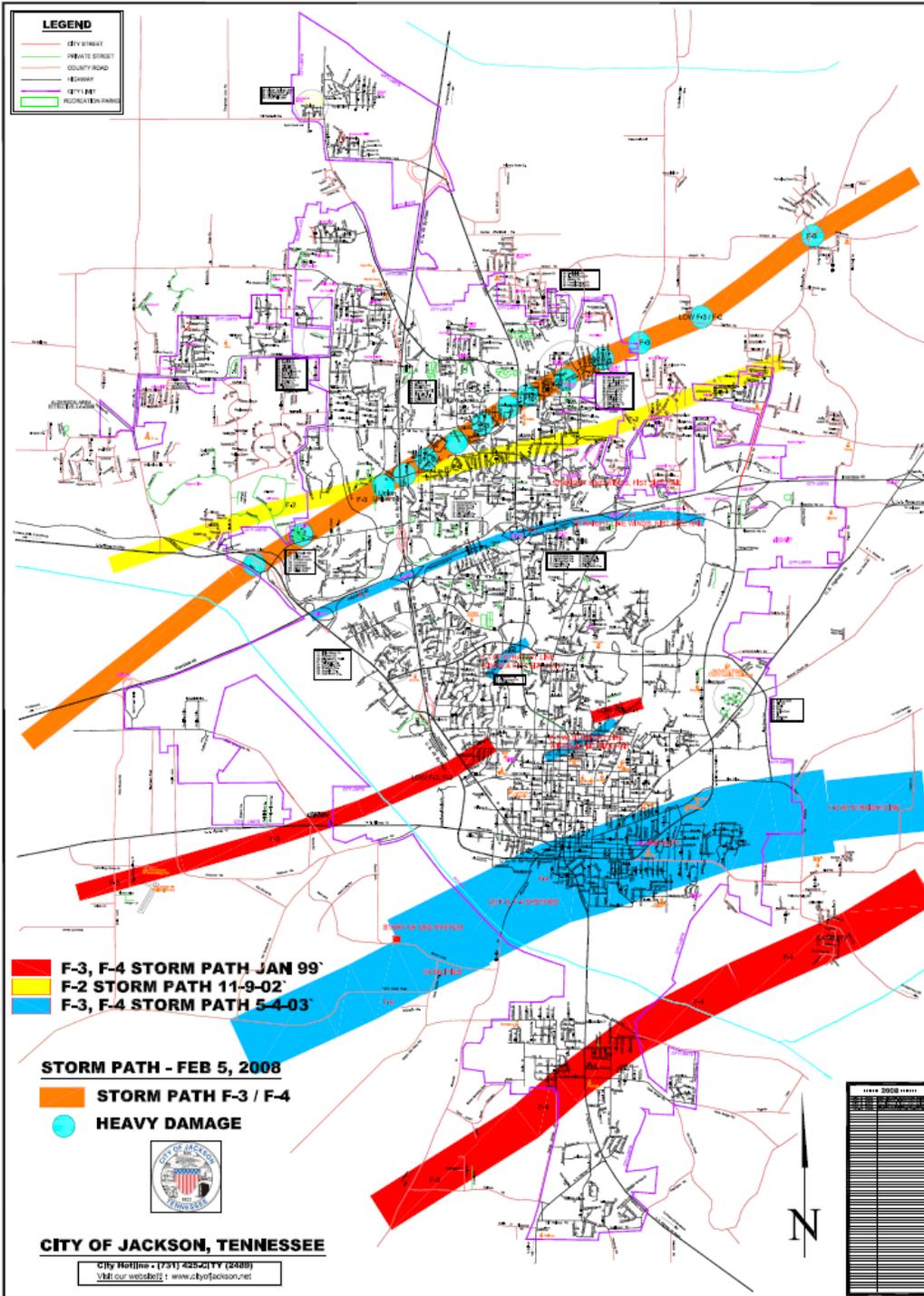
Super Tuesday Tornado Outbreak February 5 and 6, 2008

- Outlook Day 6
- High risk on Day 1
 - 10 hours prior to first TOR
- 100% Watch accuracy
- 2 Hour watch lead time
- Early cancellation of schools N MS and W TN



Super Tuesday Tornado Outbreak February 5 and 6, 2008





Jackson Tennessee Hit Again

Improving Performance in Severe Storm Services through 2012

1. Forecaster training
2. New visualization tools
 - *Four-dimensional storm scale investigator –FSI*
3. Improved radar data
 - *Less range folding , Super-res and Dual-Pol*
4. Improved dissemination via digital technology
 - *Common Alerting Protocol (CAP), Geographic Information Systems (GIS), Digital Emergency Alert System (EAS)*
5. Local Storm Report (LSR) improvements

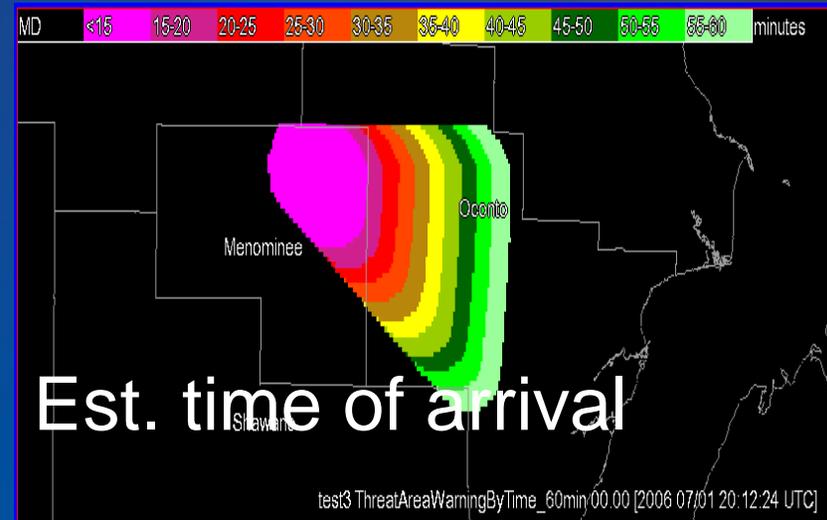
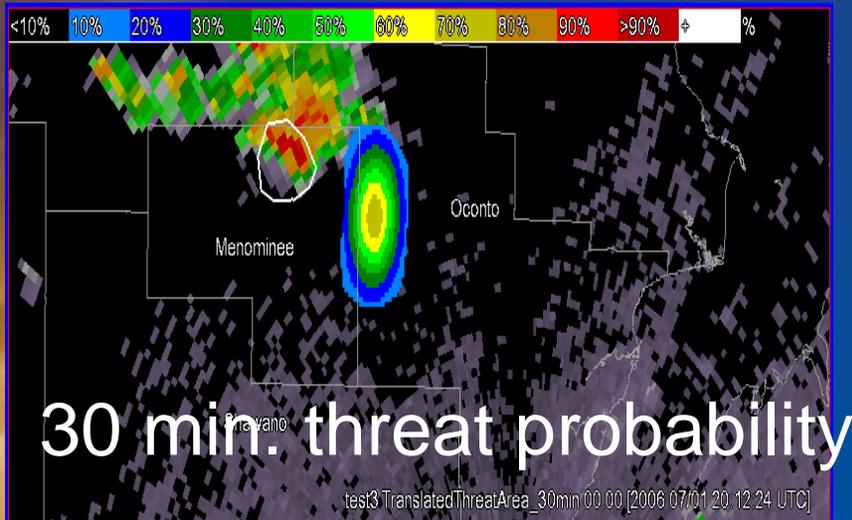
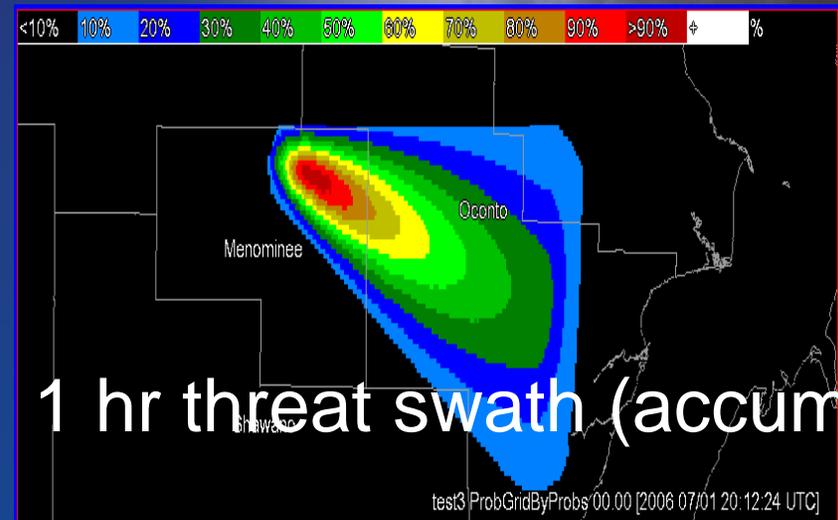
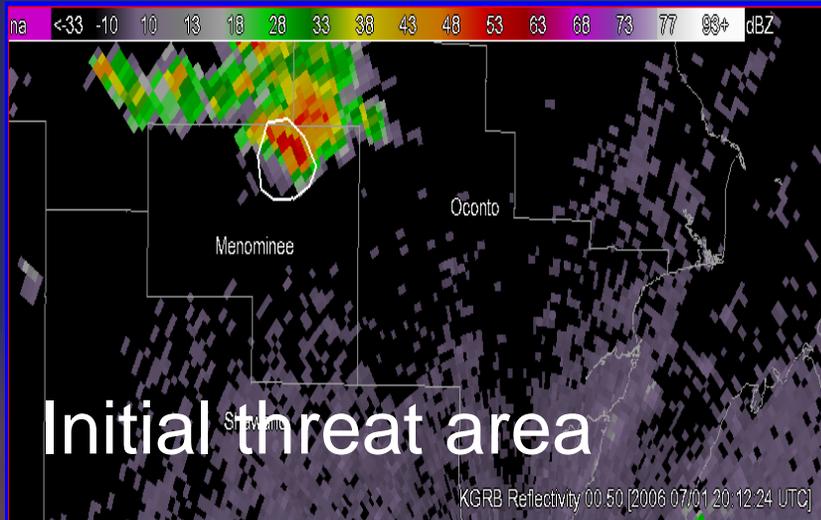
Uncertainty in Warnings

“For optimal decision-making, users need to consider the range of possible events beyond the most likely outcome in determining the appropriate action....This expression of forecast uncertainty is an area warranting improvement and will require increased communication between users and producers of weather forecasts.”

Weather Analysis and Forecasting Information
Statement of the American Meteorological Society
Adopted by AMS Council on 8 August, 2007

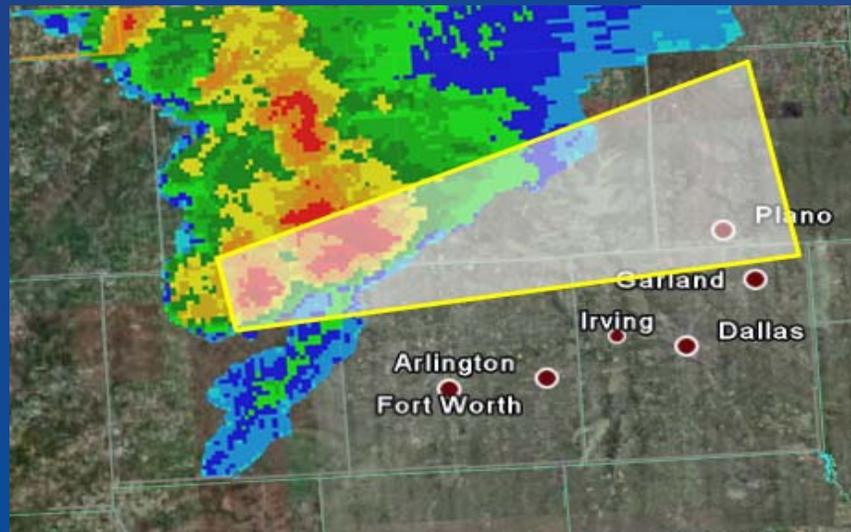
<http://www.ametsoc.org/policy/2007weatheranalysisforecasting.html>

Early Look at Uncertainty in Warnings



Questions?

- **Contact information**
 - *E-mail: John.T.Ferree@noaa.gov*
 - *Phone: 405-325-2209*
- **Success depends on all of us!**



Backup Slides



www.weather.gov/sbwarnings



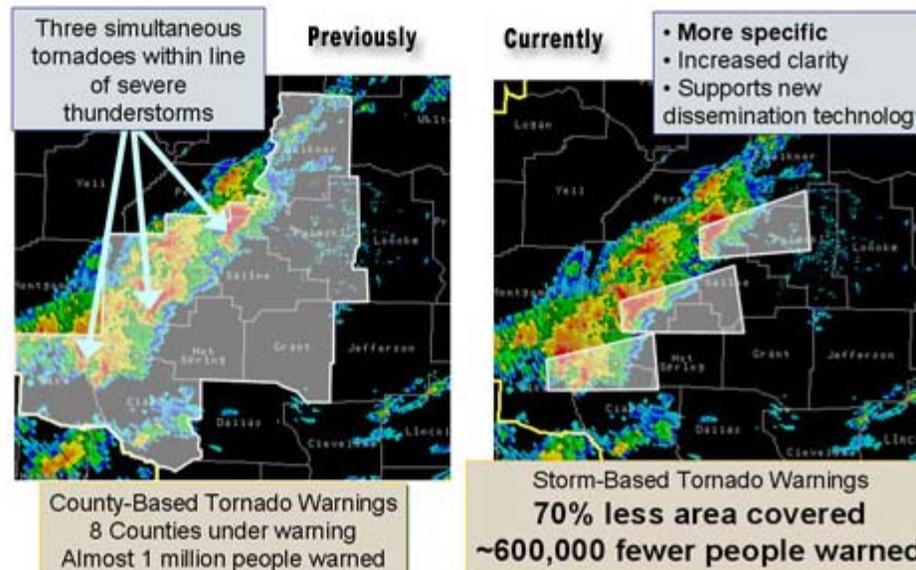
National Weather Service Storm-Based Warnings

Site Map

News

Organization

Why Storm-Based Warnings?



NOTE: A higher resolution version of these graphics is available for download (2.62 MB TIF file).

The National Weather Service (NWS) mission is defined as the provision of weather forecasts and warnings for the protection of life and property and the provision of weather information for the Nation's economic well-being. The NWS previously issued and disseminated warnings for tornado, severe thunderstorm, flood and marine hazards using geopolitical boundaries. Realizing the continuing need to improve the specificity and accuracy of warnings for tornadoes, severe thunderstorms, floods and marine hazards, the NWS currently implements **Storm-Based Warnings** (as of October 1, 2007).

Storm-Based Warnings (threat-based polygon warnings), are essential to effectively warn for severe weather. **Storm-Based Warnings** show the specific meteorological or hydrological

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