National Weather Service
Storm Based Warnings

On October 1st, 2007, the National Weather Service introduced Storm Based Warnings for tornadoes, severe thunderstorms, flash floods and marine hazards that are more geographically specific for these short-duration weather events. When issuing a warning, the National Weather Service will specify areas within a county and refer to commonly known landmarks such as highways or rivers.

Why Storm Based Warnings?

Storm Based Warnings will show the specific meteorological or hydrological threat area and are not restricted to geopolitical boundaries. By focusing on the true threat area, warning polygons (a shape with many sides as depicted on the right) will improve NWS warning accuracy and quality. Storm Based Warnings will promote improved graphical warning displays, and in partnership with the private sector, support a wider warning distribution through cell phone alerts, pagers, and web-enabled Personal Data Assistants (PDAs). The media will be able to display the polygons showing the public at large where the area of maximum threat is, and better depict who or what is at greatest risk.

From County-Based Warnings to Storm-Based Warnings

Three simultaneous tornadoes within line of severe thunderstorms

- More specific
- Increased clarity
- Supports new dissemination technology

County-Based Tornado Warnings — 8 counties under warning. Almost 1 million people warned

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

If the typical Storm Based Warning was one-quarter the size of the typical warned county, the economic value to the public due to reduced cost of sheltering is a minimum of $100 million per year.I Emergency managers will be able to make better decisions on what resources may be required and where. Law Enforcement and Fire Departments can know which areas need to be put on alert. Schools and businesses can more accurately determine whether they may or may not need to activate their tornado procedures and close down operations. Other government agencies and customers, such as the FAA and airlines, will be able to make better risk assessments. For example, airport operators will be able to better ascertain whether or not they need to temporarily shut down an airport.

Storm Based Warning Process

Instead of issuing warnings by county, your local NOAA NWS Weather Forecast Office will be able to narrow their focus on a portion of a county (or counties) that have the greatest threat for being impacted by severe weather. The warned area is defined by latitude and longitude coordinates and depicted by polygons (as illustrated on the right). Utilizing Doppler radar algorithms, the calculated movement of severe storms can be indicated through this technique as well. All of this information will be appended to the bottom of NOAA NWS Storm Based Warnings.

For audio broadcasts, portions of counties are described by compass points (e.g. northeast, south central, etc.) The use of familiar landmarks such as highways or rivers as reference points will also help describe the warned area. Warning polygons can shrink in area, but never expand. If a severe storm is expected to track outside of the current warning area, a new Storm Based Warning will be issued for the region now at risk. When severe weather is no longer expected, your local NOAA NWS Weather Forecast Offices allows the warning to expire.

Short-term Challenges

With any change in service, come a few short-term challenges that must be overcome. The most significant with Storm Based Warnings is there will be times where multiple warnings are in effect for the same county. This possibility must be managed with clear wording in NOAA NWS messages, and by raising the awareness of NOAA NWS customers and partners.

A second challenge is that legacy warning dissemination technologies cater to the 'warning by county' culture. The advent of digital technology has, almost overnight, revolutionized communication. Storm Based Warnings, unlike textual warnings by county, meshes well with digital communication technologies such as Graphical Information Systems (GIS).

For more information on Storm Based Warnings, please visit www.weather.gov/sbwarnings