

The Week of 413 of TORNADOES

By MICHAEL R. SMITH

Sirens wail. Television and radio stations interrupt programming. People take shelter.

Basement stairs took a beating from May 4-10, 2003, as 413 tornadoes occurred from California to Virginia – more tornadoes than in any other one-week period since 1950, the year reliable records became available.

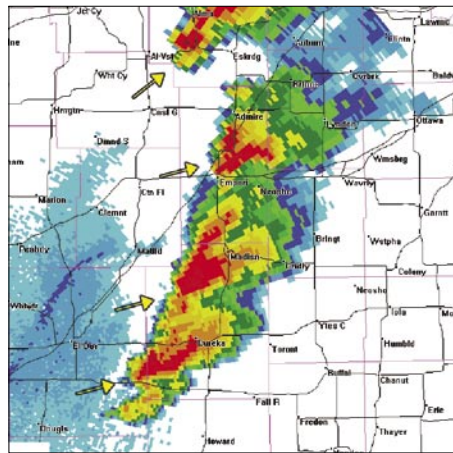
This was a week like no other. Major cities like Kansas City and Oklahoma City were hit. Small towns like Franklin, Kan., were nearly wiped off the map.

To put the scope of this event in perspective, consider just one day, May 8, 2003:

- Funnel clouds (tornadoes aloft) were photographed over downtown Sacramento.
- A tornado near Denver International Airport was broadcast live on national television.
- Oklahoma City was hit in the same area as the devastating May 3, 1999, tornado (and would be hit again the following evening).
- A large tornado barely visible through haze and rain near Lyndon, Kan., continued northeast to hit the town of Lawrence, damaging homes and apartments, barely missing the University of Kansas campus.

The tornadoes not only destroyed homes and apartments, they caused serious damage at a General Motors plant, Tinker Air Force Base, destroyed 50 parked aircraft, struck at least four colleges, and destroyed several elementary and high schools.

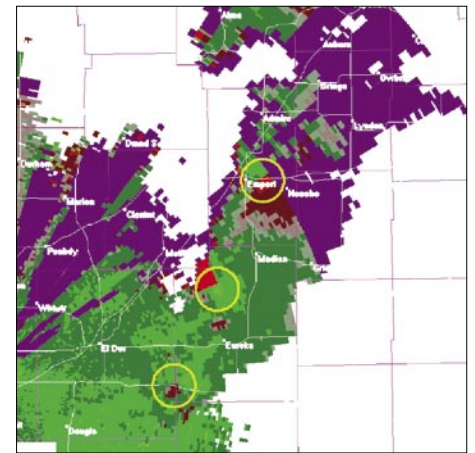
Remarkably, all these tornadoes striking cities large and small caused only 44 deaths.



Radar image of four thunderstorms over eastern Kansas on May 8, 2003. Each of the four thunderstorms indicated with arrows are “supercells” (long-lived intense thunderstorms) and are potentially capable of causing tornadoes.

To put that in some perspective, in 1925, a single tornado that moved across southern Missouri, Illinois and Indiana killed 695 people. The low death toll in 2003 is a triumph of improved meteorological science, improved communication of warnings by the media, and a population that has been educated how to protect itself.

The warnings issued on a county-by-county basis by the National Weather Service are highly effective in warning the public, since most people know what county they are in. While warning entire



Radar image of “storm relative velocity” which indicates where significant rotational winds are occurring. The three circles indicate major thunderstorm rotation (where the areas of red and green coincide) which can spawn tornadoes.

counties causes a great deal of over warning, the “false alarm cost” for a household is rather small. This is not true for businesses. Shutting down a factory and sheltering people on short notice can literally cost millions. Do that too many times and the organization starts ignoring tornado warnings – a dangerous situation that can cost lives when a genuine threat materializes.

There is a better way. The same meteorological science used to warn the public can also be used to produce highly effective “site-specific” warnings of tornadoes

and other serious storms. These site-specific warnings allow businesses, with a wide margin of safety, to make better decisions whether to shut down or continue operating. Avoiding an unnecessary shut down can have a major positive effect on efficiency and the bottom line.

The radar images accompanying this article demonstrate two of the tools meteorologists use to make precision warning decisions. In the weather radar reflectivity images (the type shown on television) the shape and color patterns within the storm are suggestive of tornado producing thunderstorms. Confirmation occurs in the “storm relative velocity” data display. Three of the storms have rotational couplets (the green and red colors coming together in the appropriate pattern) indicating tornado potential. Indeed, the southern two storms were producing tornadoes at the time of this image and the northern storm produced the Lyndon, Kan., tornado a few minutes later. The storm at the very top of the image does not have a rotational couplet and, at this time, is not a tornado threat.

To use the Lyndon tornado as an example, warnings were issued based on this radar data for organizations in the projected storm path prior to the tornado ever touching down. A business in the area using this type of service would have had nearly 30 minutes to prepare for the approach of the tornado. For most businesses 30 minutes is enough time to shut down in an orderly fashion and to move people to shelter. Warnings can be communicated through an innovative virtual private network (VPN) system that positively insures timely receipt. This type of service is extremely cost effective.

Hurricanes, tornadoes, floods, ice storms and blizzards are taking an ever-increasing toll on American business. Fortunately, meteorological science has made major advances the past five years that allow businesses and other organizations who wish to take a proactive approach to save money, time and, occasionally, lives.



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