

Multiple consecutive days of tornado activity spawn worst events

April 30 2014, by Elizabeth K. Gardner



Credit: Lyndon State College from VORTEX2

Significant tornado outbreaks and especially strong tornadoes are more likely occur within periods of activity lasting three or more days, according to a Purdue University tornado expert.

Jeff Trapp, a professor of earth, atmospheric and planetary sciences, examined 30 years of U.S. weather records and found that an outbreak

of 20 or more reported tornadoes had a 74 percent probability of occurring during a period of tornado activity lasting three or more days. During those same periods, a tornado rated 3 or higher on the Enhanced Fujita scale had a 60 percent probability of hitting.

The Enhanced Fujita scale rates tornadoes from EF0 to EF5 with damage rated as "light," including broken branches and windblown signs, to "incredible," including leveling of strong-frame houses.

"Two extreme tornado events last year led to 32 deaths, injured more than 377 and cost \$2 billion in damage and inspired this study," Trapp said. "Unfortunately, the devastating tornadoes these past few days, tragically, seem to be bearing out the results."

Tornadoes swept through Arkansas, Oklahoma, Kansas, Missouri, Nebraska, Iowa and Mississippi on Sunday (April 27); Mississippi, Alabama and Tennessee on Monday (April 28); and North Carolina on Tuesday (April 29). The National Weather Service received 100 preliminary tornado reports for April 27 and 28, and multiple deaths have been attributed to the violent storm system.

Trapp also found the multiple-day periods were more likely to occur during the warm months of April through July.

"The encouraging news is that the larger, more slowly evolving and moving systems that appear to contribute to multiple-day tornado periods may be more predictable," he said. "The weather system responsible for the tornadoes this week falls in this category and was revealed in the forecast models at least five days in advance with good fidelity."

Trapp examined tornado activity entered into the National Oceanic and Atmospheric Administration's historical record of [tornadoes](#) in the

United States from 1983-2012, which included 3,129 tornado days and 1,406 unique periods of [tornado activity](#). Multiple-day periods made up 24 percent of the unique periods of activity.

A paper detailing his study and the results was published in the April issue of the journal *Monthly Weather Review* and is available online.

The idea for the research began while Trapp was participating as a lead investigator in the National Science Foundation's Mesoscale Predictability Experiment (MPEX), a national field project to improve predictions of severe [weather](#).

More information: On the Significance of Multiple Consecutive Days of Tornado Activity, by Robert J. Trapp, *Monthly Weather Review* , 2014.

Provided by Purdue University

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