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RESEARCHERS DEMONSTRATE NEXRAD RADAR HELPS NATIONAL WEATHER SERVICE FORECASTERS SAVE LIVES

Tornado warnings have improved significantly and the number of tornado casualties has decreased by nearly half since a network of Doppler weather radars were installed nationwide by the National Oceanic and Atmospheric Administration's National Weather Service a decade ago, according to a study published in the June issue of *Weather and Forecasting*, a journal of the American Meteorological Society.

Researchers examined the impact of Weather Surveillance Radar-1988 Doppler (WSR-88D), also known as NEXRAD, which was installed in the 1990s during the National Weather Service's $4.5 billion modernization. They found the radars have significantly improved the quality of tornado warnings issued by NWS forecasters and lowered the number of tornado casualties nationwide.

The researchers, Kevin Simmons from the Department of Economics and Business at Austin College in Sherman, Texas, and Daniel Sutter from the Department of Economics and Cooperative Institute for Mesoscale Meteorological Studies at the University of Oklahoma in Norman, Okla., analyzed a dataset of tornadoes that occurred in the contiguous United States between 1986 and 1999. The date WSR-88D radars were installed at each National Weather Service Forecast Office was used to divide the sample for comparison.

The percentage of tornadoes warned for almost doubled - from 35 percent before WSR-88D installation to 60 percent after installation. In addition, the mean lead time of warnings increased more than four minutes, from 5.3 to 9.5 minutes.

The researchers also conducted a regression analysis of tornado casualties, which revealed expected fatalities and expected injuries were 45 percent and 40 percent lower for tornadoes occurring after WSR-88D radar was installed at NWS Weather Forecast Offices. Their analysis, which controlled for the characteristics of a tornado and its path, also found expected casualties were significantly lower for tornadoes occurring during the day or evening than late at night throughout the sample. This provided indirect evidence of the life saving effects of tornado warnings.

"Anytime public money is used to invest in a technology like Doppler radar, it is important that we evaluate the results," Simmons said. "Our study provides strong evidence that this investment has had a significant effect on reducing injuries and fatalities from these storms."

Harold Brooks, Editor of Weather and Forecasting and research meteorologist at the NOAA National Severe Storms Laboratory in Norman, Okla., said, "This is the first effort to quantify the impacts of the radar on the core National Weather Service mission of protecting lives and property from severe weather."

Radar is a vital tool for the 122 National Weather Service forecast offices as they issue nearly 3,000 tornado warnings each year. The average warning lead time continues to increase and in 2004 was 15 minutes.

Every year, an average of 1,200 tornadoes kill about 55 Americans, injure 1,500 people and cause more than $400 million in damage. Considered nature's most violent storms, tornadoes can occur any month of the year with peak activity from the months of March through July.

The American Meteorological Society (www.ametsoc.org) is the nation's leading professional organization for those involved in the atmospheric and related sciences. Founded in 1919, the AMS has more 11,000 international members, organizes nearly a dozen scientific conferences annually, and publishes nine peer-reviewed journals.

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Note to Editors and Assignment Desks: For PDF or faxed copies of the paper, "WSR-88D Radar, Tornado Warnings, and Tornado Casualties" contact Stephanie Kenitzer at (425) 432-2192 or kenitzer@ametsoc.org