VORTEX

VERIFICATION OF THE ORIGINS OF ROTATION IN TORNADOES EXPERIMENT

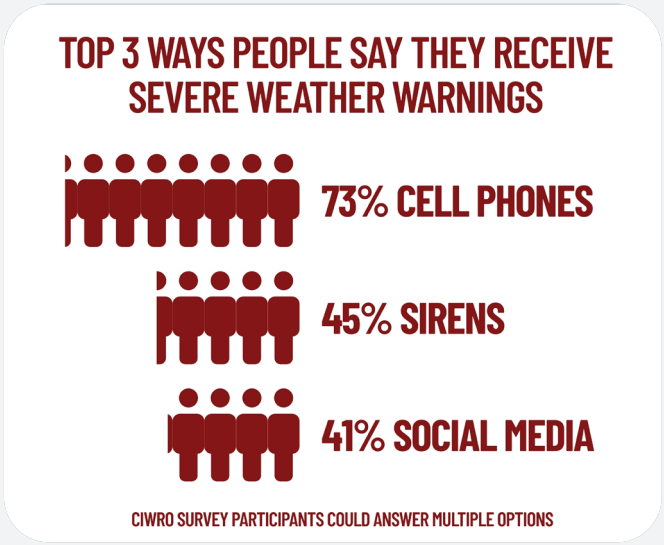
National Weather Center
University of Oklahoma

Since 2016, the VORTEX program is focused on improving tornado forecasts with greater lead time through better observations, models, and risk communication. One primary goal is understanding how tornado environments impact their characteristics. These objectives directly address research priorities set by Congress, while also serving a critical strategic goal of both the National Severe Storms Laboratory and NOAA: understanding and predicting changes in weather, and sharing that knowledge to support informed decision-making.

VORTEX initiatives at CIWRO improve how forecasters issue tornado warnings, while also developing products to improve forecaster confidence and increase lead times of tornado warnings.

The success of VORTEX-funded research and development work at CIWRO can be seen in three main areas:

- unique observations of tornadic storms
- the development of tools to improve tornado forecasts and ultimately save lives
- research improving the understanding of tornado occurrence



PRIORITIZING PUBLIC SAFETY

VORTEX-funded work at CIWRO has helped save lives through developing novel products to improve tornado forecasts and gain a greater understanding of how people access and perceive tornado warning information. VORTEX also supports social science research at CIWRO to help National Weather Service forecasters improve how they communicate with the public. Preliminary results show that most people are aware of tornado warnings via a variety of means, although their response to these warnings is complex and requires continuing research.

5
operational forecast products developed since 2021

28
field campaign intensive observing periods supported since 2021

12
testbed experiments conducted since 2021

47
journal articles supported since 2021

DEMYSTIFYING TORNADOES

CIWRO researchers travel across the country in field campaigns to observe both tornadoes and thunderstorms as part of the VORTEX program. Researchers use the data they collect to push the science forward to ultimately improve forecasts. Recent field observations have included the closest-ever sampling of a tornadic storm by mobile radars. Researchers also captured the first comprehensive set of squall line observations. Squall line tornadoes, which often occur at night, are notoriously difficult for forecasters to predict. Leveraging these observations, researchers have found differences in the vertical structure of winds near storms that produce a tornado versus storms that do not - a first step to identifying tornadic storms with greater confidence. Forecasters at the Storm Prediction Center now use these key findings from CIWRO scientists to shape their national daily outlooks.

The UNIVERSITY of OKLAHOMA