New weather radar network in Dallas area to provide more frequent, precise storm data

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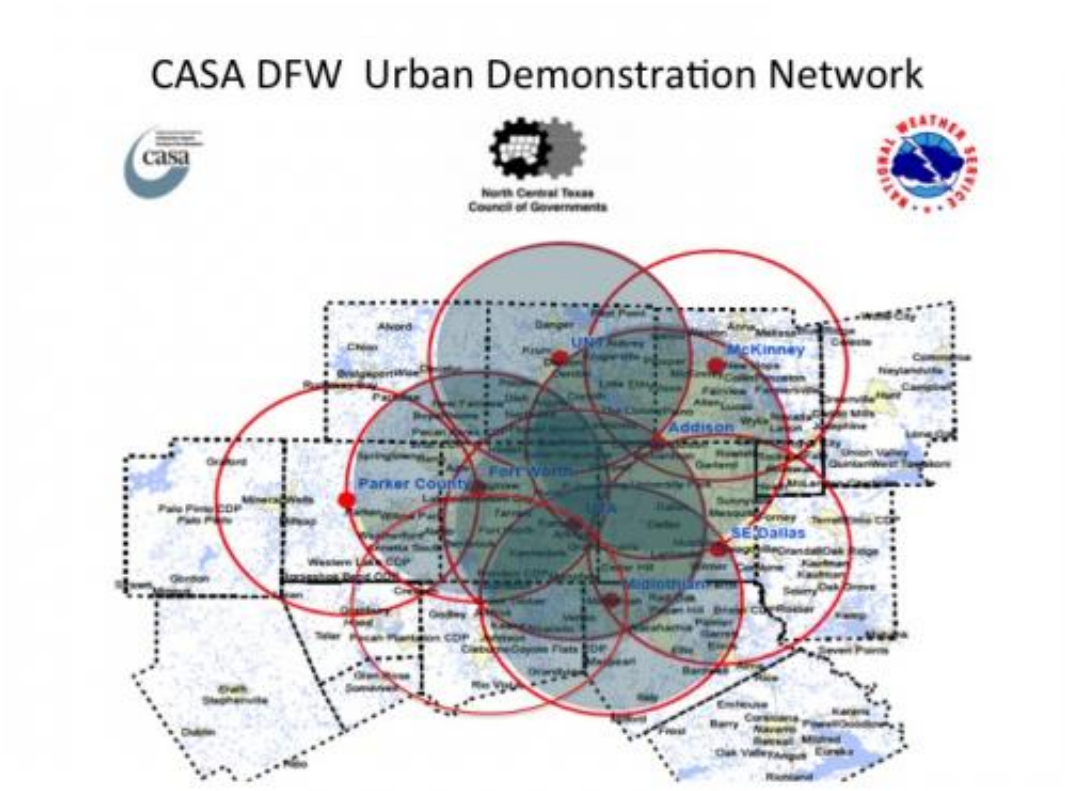

CASA's overlapping network of four radar units, which will eventually grow to eight, can look for storms closer to the ground where tornados actually form. They report data every minute instead of every five, as the national system in use does now. Also, networked radars offer much finer resolution and provide significantly improved data on rainfall amounts, wind shear and tornado signatures within a storm. Credit: UMass Amherst

To better protect lives and property, a new radar network offering higher resolution data and potentially earlier warning of severe weather goes live this month in the Dallas-Fort Worth metroplex as government, university and industry partners led by the University of Massachusetts Amherst begin operating a network that could become a national model. A key radar is expected was installed today, Tuesday, Feb. 11 in Addison, Texas.

The DFW area becomes first in the nation to host this next generation of small, near-surface, fine-scale, rapidly updating weather radar developed by researchers at the Center for Collaborative Adaptive Sensing of the Atmosphere (CASA) at UMass Amherst, Colorado State University and the University of Oklahoma.

Three radars are already in place in Midlothian, the University of Texas at Arlington, and the University of North Texas in Denton. The Addison unit will become operational a few days after installation to provide data to forecasters and emergency planners for the upcoming severe weather season.

CASA, funded by the National Science Foundation (NSF), was launched in 2003 to address problems of national significance, such as the need for faster tornado warning times. The new CASA Doppler radar system will help DFW-area National Weather Service forecasters and emergency managers in several ways.

For example, the overlapping network of four radar units, which will eventually grow to eight, can look for storms closer to the ground where tornados actually form. They report data every minute instead of every five, as the national system in use does now. Also, CASA networked radars offer much finer resolution and provide significantly improved data on rainfall amounts, wind shear and tornado signatures within a storm.

The CASA model is an entirely new way to support advances in severe weather warning and emergency preparedness, says Brenda Philips, CASA's co-director. "We're pioneering a public-private partnership where the local communities share in the cost of installing and operating the radar network. We're working closely with the North Central Texas Council of Governments in Dallas-Fort Worth, but our goal is to roll out this community-based approach to cities and towns across the nation."

Installation of a fifth CASA radar is expected in March in Fort Worth. The unit being installed on Feb. 11 in Addison was funded by the University of Oklahoma and built by Enterprise Electronics Corporation of Alabama.

CASA networks use radars the size of a microwave oven with 36-inch dish compared to the current, 50-year-old generation of larger radars mounted atop 150-foot towers. CASA's smaller, nimbler X-band radar units are deployed on rooftops and cell towers and are most effective when networked in groups of three or four, Philips says.

Having detected a storm, the radar network conducts "smart" scans focused on areas of greatest concern to give a precise storm location. This provides data five to 10 times more detailed than current radar systems, and at near-ground level. By contrast, current Doppler radars are so widely spaced and mounted so high they can't "see" ground conditions in certain areas.

CASA's many advantages were amply demonstrated over four years recently in rural Oklahoma, where the radars were tested in many severe storm conditions. Philips and colleagues are now working with the emergency management community, other university researchers and private industry in the Dallas area to define CASA's benefits on their terms.

She adds, "We think the volatile weather in the Dallas-Fort Worth area and the fact that 6.5 million people could benefit from earlier, more precise storm warning makes it the perfect urban site for CASA's next phase."

Addison Mayor Todd Meier says, "The CASA system serves as a model for the entire country, providing quicker awareness of incoming severe weather. That is why we are so proud that Addison and the North Texas Council of Governments have partnered together with CASA partners to install this incredibly robust CASA weather radar system right here in our community. This new CASA radar system will quickly be able to detect severe weather, which will aid in alerting our citizens faster so they have more time to seek shelter. CASA will improve the way scientists detect and understand severe weather and how we respond to severe weather, which in turn will help save lives."

V. Chandrasekar, a CASA deputy director at Colorado State University, points out that "with the CASA network we will also be able to expand our use of rainfall data to predict flooding. It's like having a rain gauge every 800 feet. With more accurate, specific information, you can predict which neighborhoods to warn."

CASA was developed with support from the Engineering Research Center program and the Partnerships for Innovation program at NSF, the National Weather Service Office of Science and Technology and at UMass Amherst by the Jerome M. Paros Fund for Measurement and Environmental Sciences Research. Its developers hope to see the system deployed over the next decade in cities and towns across the country.

Provided by University of Massachusetts Amherst