Four-Radar Testbed Installed to Forewarn of Hazardous Weather Events
Highlight ID: 13230

The Engineering Research Center (ERC) for Collaborative Adaptive Sensing of the Atmosphere (CASA), which is based at the University of Massachusetts, installed a four-radar distributed collaborative adaptive sensing (DCAS) system testbed in the tornado-prone locations of Cyril, Lawton, Rush Springs, and Chickasha, Oklahoma. The testbed, the Center's first end-to-end system deployment, is part of CASA's vision of a lower-atmospheric observing system for detecting, predicting, warning, and responding to hazardous weather. It essentially integrates all of this ERC's research activities to date.

The testbed will gather storm data from multiple radars, perform an objective atmospheric analysis of the information in real-time, and dynamically retarget system resources in response to changing weather and multiple end-user preferences and needs.

CASA staff collaborated on the system's design, testing, and use with partners such as Raytheon, the University of Science & Arts of Oklahoma, the National Oceanic and Atmospheric Administration, Chickasha city officials, and a local news station meteorologist.

Primary Strategic Outcome Goal:

- Research Infrastructure: Build the nation's research capability through critical investments in advanced instrumentation, facilities, cyberinfrastructure and experimental tools.

Secondary Strategic Outcome Goals:

- Discovery: Foster research that will advance the frontiers of knowledge, emphasizing areas of greatest opportunity and potential benefit and establishing the nation as a global leader in fundamental and transformational science and engineering.

How does this highlight address the strategic outcome goal(s) as described in the NSF Strategic Plan 2006-2011?:
This ERC is inventing and building the first radar system that can clearly "see" low-level atmospheric phenomena such as tornadoes, using collaborative and adaptive sensing across a network of radars. This highlight reflects the Center's first complete deployment of such a system, although as a prototype or testbed for research purposes. It is thus an advanced facility for this transformational, multidisciplinary research. Partnership with government agencies at all levels, industry, other universities, and the media are an integral part of the system development.

Does this highlight represent transformative research?
Yes

This is the first time that a collaborative, adaptive network approach to radar has been attempted. The potential payoffs in terms of timely and accurate warnings regarding low-level weather phenomena are great.

ENG/EEC 2007

Program Officer: Lynn Preston

NSF Award Numbers:

0313747
Award Title: Center for Collaborative Adaptive Sensing of the Atmosphere (CASA)

PI Name: David McLaughlin

Institution Name: University of Massachusetts Amherst

PE Code: 1480

The tornado that struck in Norman and Moore, Oklahoma, on May 8, 2003.

Permission Granted
Credit: CASA ERC

Tornadoes often cause catastrophic damage along a lengthy storm track.

Permission Granted
Credit: CASA ERC

NSF Contract Numbers:

NSF Investments: Climate Change, Cyber-enabled Discovery and Innovation (CDI), Dynamics of Earth's Water System, Homeland Security, Networking and Information Technology Research Development (NITRD), Sensor Research

Related Center or Large Facility: Engineering Research Center for Collaborative Adaptive Sensing of the Atmosphere

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