

The Societal Value of Mesoscale Data: Examples from Oklahoma

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The Oklahoma Mesonet is a weather and climate network covering the State of Oklahoma (181,186 square kilometers). The concept for this network was developed following the disastrous Tulsa flood of May 1984. At about the same time, similar ideas were blossoming in Stillwater for an agricultural network. As a result, scientists from Oklahoma State University joined with their colleagues at the University of Oklahoma to develop plans for the statewide network (1986-1991). After securing almost \$3 million to launch the network in January of 1991, the network was commissioned as fully operational in March 1994.

Since that time, over 4 billion observations have been archived — >99% of which were available within minutes of each 5-minute observation time. Today, the network consists of 120 Mesonet sites, spaced on average about 30 km between sites. The network is composed of 3300 sensors and 250 linked computers that provide about 700,000 observations each day. Each site has two-way communications and is solar powered. Because the data are *reliably available*, ~63,000 products and files are made available to users each day.

This reliability is built around a state-of-the-art calibration lab, field technicians, automated quality control procedures, QA meteorologists, network operators, and data users — each of whom provide checks and balances to ensure that the archived data and products are of a *research quality*. These check and balances — from a team dedicated to producing quality data — permit the maintenance dispatch system to prioritize maintenance actions & allocate resources in a cost-effective manner. As a result, we believe the Oklahoma Mesonet is a model for its adherence to high standards and high efficiency of operations.

However, the unique features of the Oklahoma Mesonet lie in its application to many societal issues. These issues span the spectrum from K-12 and university education to life-saving decisions based upon real-time information, to saving property during wildfires, providing data to help solve murders, scheduling the use of irrigation water, and planning for burn conditions days in advance.

The Oklahoma Mesonet owes its very existence to the effectiveness of its major outreach programs: Earthstorm and its 5000 K-12 teachers and students; OK-First and its 450 trained emergency managers, OK-FIRE and its 125 trained fire officials, and untold farmers, ranchers and urban dwellers who use Mesonet data as if it were a public utility.

From a university perspective, the Mesonet has been a resounding success: 292 peer-reviewed manuscripts have been published, 99 M.S. and Ph. D. students have graduated, and perhaps \$50 million in competitive research grants have come to Oklahoma as a result. The Mesonet is a testimony to two phrases: "build it and they will come," but "support them and train them and they will stay."

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