

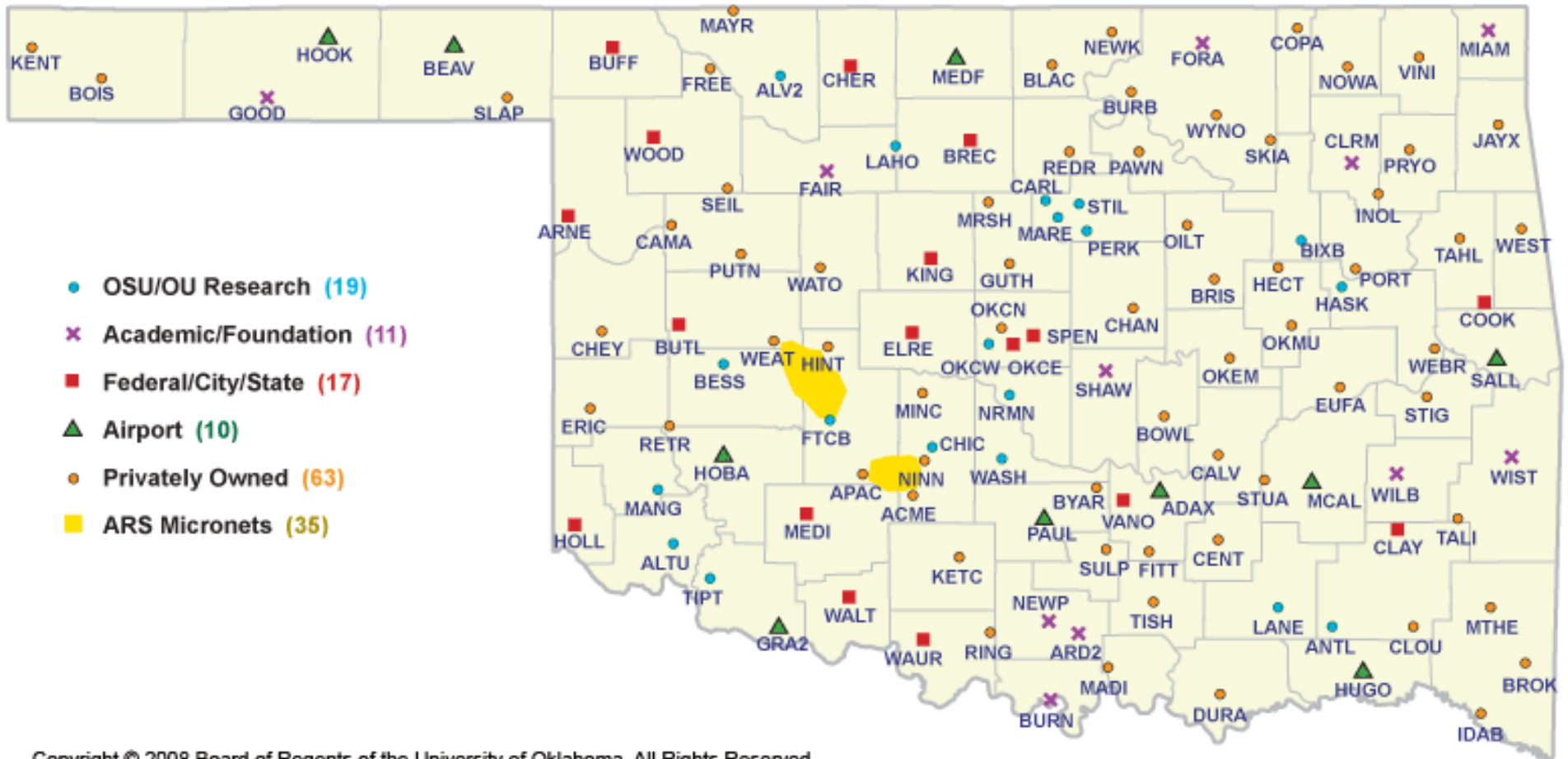
The Oklahoma Mesonet

- ▶ Weather and climate network of **120 sites** covering 181,186 km²
- ▶ Commissioned in 1994
- ▶ Joint project between the **Oklahoma State University** and the **University of Oklahoma**.
- ▶ Extensive quality assurance is applied to the collected observations (real-time and archived \leftrightarrow automated and manual)
- ▶ Over 4 billion observations archived
- ▶ Operational funding supplied by the State of Oklahoma – Research funded mainly by grant awards
- ▶ Over 330 peer-reviewed publications, over 80 M.S. theses, and over 30 Ph.D. dissertations have used Oklahoma Mesonet data.

Jeff Basara, Director of Research, Oklahoma Climatological Survey, University of Oklahoma

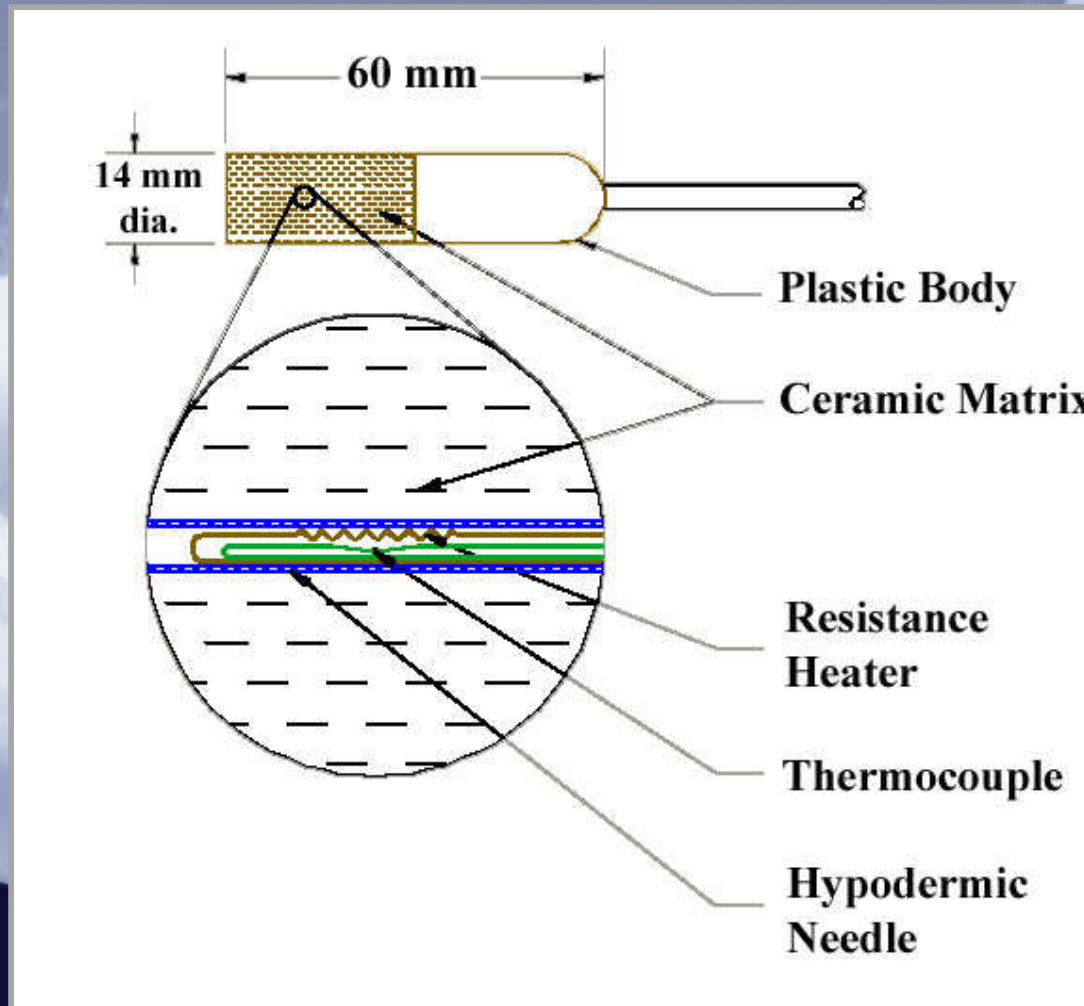
- Contact Point and Lead Scientist for SMAP Cal/Val related activities involving the Oklahoma Mesonet

The Oklahoma Mesonet



McPherson, R. A., C. Fiebrich, K. C. Crawford, R. L. Elliott, J. R. Kilby, D. L. Grimsley, J. E. Martinez, J. B. Basara, B. G. Illston, D. A. Morris, K. A. Kloesel, S. J. Stadler, A. D. Melvin, A.J. Sutherland, and H. Shrivastava, 2007: Statewide monitoring of the mesoscale environment: A technical update on the Oklahoma Mesonet. *J. Atmos. Oceanic Tech.*, **24**, 301–321.

Soil Moisture Instrumentation



- ▶ Campbell Scientific 229-L Sensor
- ▶ Heat Dissipation Sensor
- ▶ Raw measurement is a change in temperature (ΔT) following the introduction of a heat pulse
- ▶ Provides relative measures of soil “wetness”
- ▶ With soil texture information, soil water content is empirically estimated
- ▶ Does not work well in sand

Illston, B.G., J.B. Basara, D.K. Fischer, R.L. Elliott, C. Fiebrich, K.C. Crawford, K. Humes, and E. Hunt, 2008: Mesoscale Monitoring of Soil Moisture Across a Statewide Network. *J. of Atmos. and Oceanic Tech*, 25, 167-182.

Oklahoma Mesonet Soil Moisture

- ▶ **Core Measurement** of the Oklahoma Mesonet at 5, 25, and 60 cm – i.e. fully supported both now and into the future.
- ▶ Current technology does not measure **Water Content** directly – empirical relationships exist and are being revisited/improved by colleagues at Oklahoma State University.
- ▶ Over **13 years** of data collected thus far – data available in near real time or via archived datasets.
- ▶ Coincident metadata available (soil texture, vegetation, etc.) – additional metadata collection is currently underway.
- ▶ Developing a project, which if funded, will conduct long-term evaluations of current instrumentation at multiple locations with other soil moisture technology to determine **(a)** standardized conversions between various sensors in various soil types and **(b)** evaluate whether the Oklahoma Mesonet should transition to a different technology.



Questions?