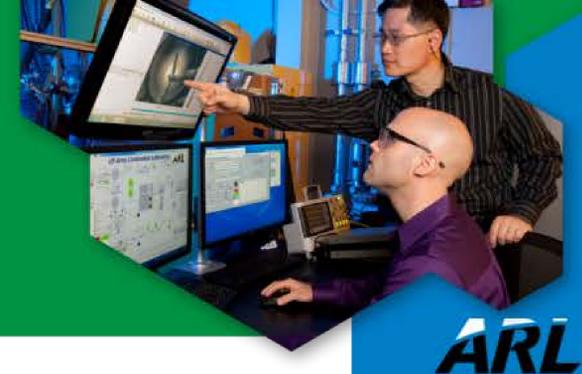


# Meteorological Sensor Array

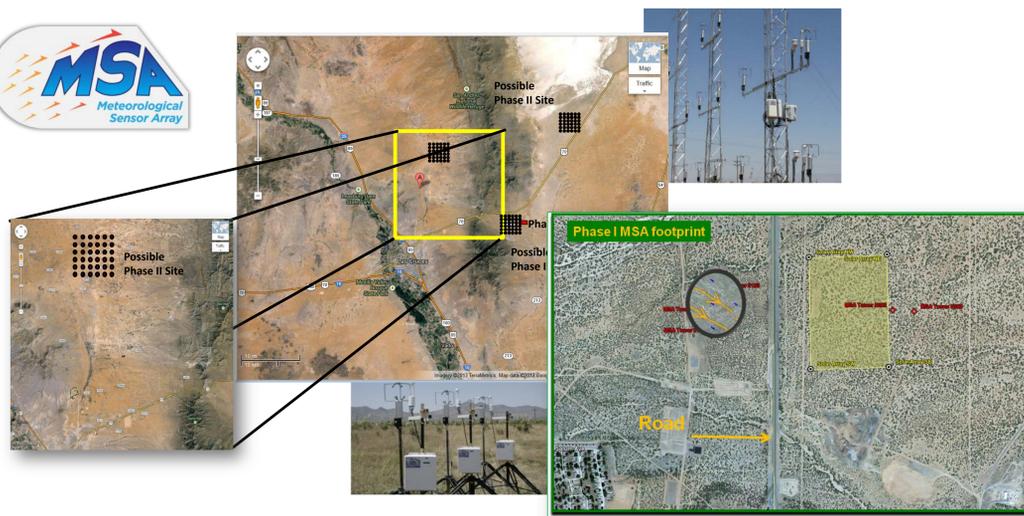


**S&T Campaign: Information Sciences**  
Sensing, Effecting

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## Research Objective

- Develop an agile, innovative, reliable, sustained, and world-class finely-spaced grid of near-surface met sensors that will be used for assessment of boundary layer atmospheric models and sensing methods.
- The MSA will be a persistent, customizable meso/microscale community wide data source.



## ARL Facilities and Capabilities Available to Support Collaborative Research

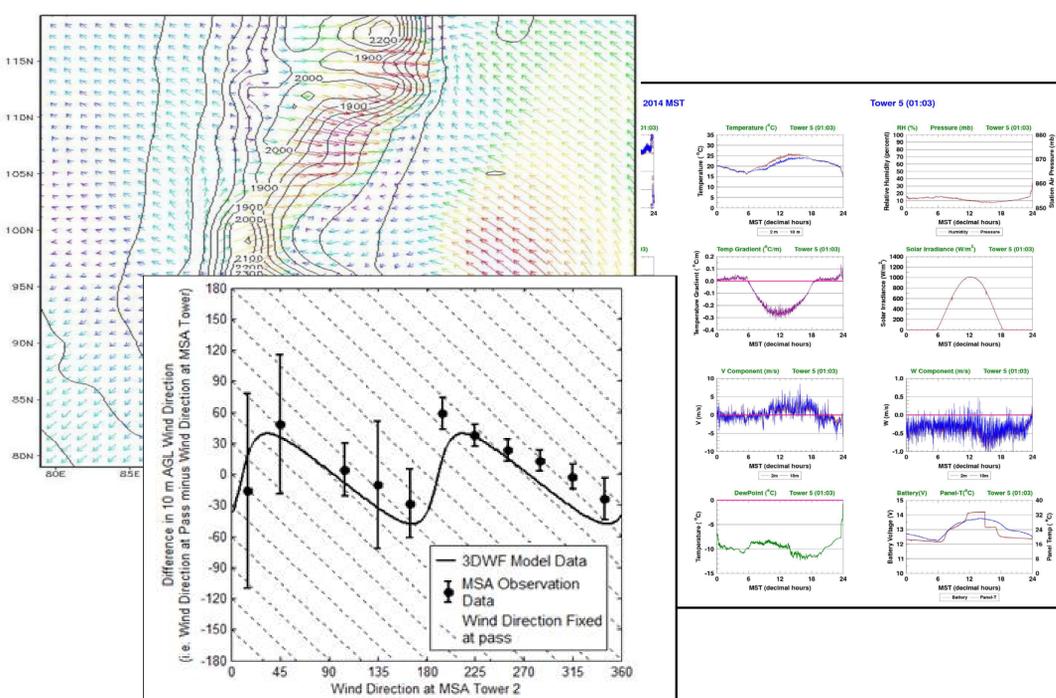
- ARL will provide an asset that will directly support modelers at microscale and meso-gamma resolutions.
- ARL and the WSMR community will provide a long-term resource for the modeling community
- Collaborations with ARL Computational, Informational and Network Science Divisions.
- ARL /CISD expertise in Sub-Meso and Microscale modeling
- ARL/CISD expertise in array operations
- ARL WSMR expertise in novel Sub-Meso/Microscale modeling assessment techniques
- References:
  - Vaucher et al., "Meteorological Sensor Array (MSA), Volume1: Phase I ("Proof of Concept") ARL-TR-7058, Sep 2014
  - Harrison, S and Vaucher GT Meteorological Sensor Array (MSA)-Phase I, Volume 2 (Data Management Tool: "Proof of Concept"); ARL-TR-7133, Oct 2014.
  - Vaucher and Edmonds, 2015; "Meteorological Sensor Array (MSA) Observation and High Resolution Model Validation, Submitted, 19<sup>th</sup> Conference on Integrated Observing and Assimilation Systems for Atmosphere, Oceans, and Land Surface, Phoenix, AZ

## Challenges

- Need high resolution ( $\leq 1\text{km}$ ) gridded observations to conduct high resolution atmospheric model assessment.
- High resolution modeling skill assessment requires traditional and non-traditional methods.
- Infrastructure and maintenance costs have limited previous dense array measurement projects to short duration, limited span, and lower density.

## Complementary Expertise/ Facilities/ Capabilities Sought in Collaboration

- Collaborating with Air Force Weather Agency and NCAR for GIS and other object oriented assessment techniques to use with MSA
- Collaborating with MATERHORN field campaign organizations for management, calibration, instrumentation and analysis of array data
- Academic Collaborators; Notre Dame, Navy Post Graduate School, Air Force Institute of Technology, New Mexico State University and University of Oklahoma
- Other Collaborators; National Center of Atmospheric Research (NCAR), National Renewable Energy Lab (NREL), Department of Energy (DOE) and National Oceanic and Atmospheric Agency (NOAA)
- Seeking Collaboration with U.S. Department of Agriculture (USDA) for use of Jornada Experimental Range (allows use of UAV's and current/future range infrastructure)



Innovative techniques required to assess sub-meso and microscale Meteorological Models