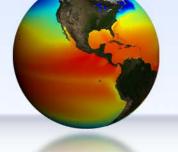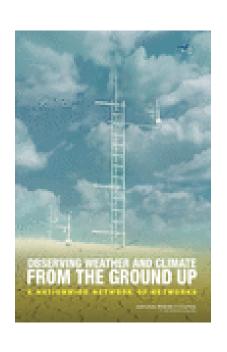# The National Mesonet Program

Dr. Curtis H. Marshall
NWS/Office of Science and Technology
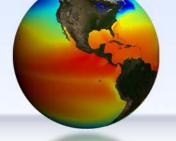
FPAW Surface Observations Panel
August 8, 2012

Background

- National Academy of Sciences (2008) released *Observing Weather and Climate From the Ground Up: A Nationwide Network of Networks*

- An overarching vision for an integrated, flexible, adaptive, and multi-purpose mesoscale meteorological observation network

- Provides specific steps to help develop a network that meets multiple national needs in a cost-effective manner.

- Focus on mesoscale observational requirements over the United States and adjacent coastal zones

- Emphasis on characterizing the planetary boundary layer (defined as extending from approximately 2 meters below the surface to 2-3 kilometers above)
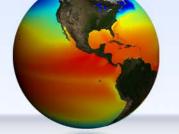
Background

- NAS Report:

  - *"The committee envisions a distributed adaptive Network of Networks (NoN) serving multiple environmental applications near the Earth's surface. Jointly provided and used by government, industry, and the public, such observations are essential to enable the vital services and facilities associated with health, safety, and the economic well being of our nation."*

  - The breadth of the enterprise extends well beyond the combined mission space of the federal agencies

  - Challenge: preserving and enhancing the diversity of investment while introducing an appropriate degree of centralization

  - A centralized authority should be identified to provide or to enable "essential core services" for the network of networks

  - The centralized authority should require metadata of every component in an integrated, multi-use observing system.
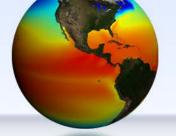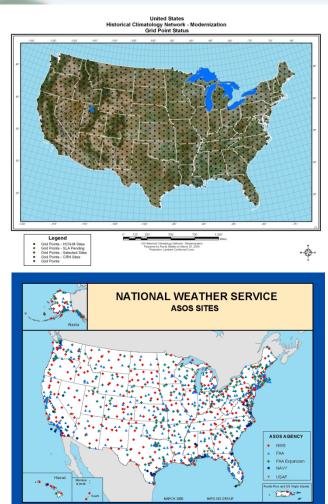
NWS Approach

- Develop robust network of networks—leverage what we have FIRST

    - NAS report: *Increased coordination among <u>existing surface networks</u> would provide a significant step forward and serve to achieve improved quality checking, more complete metadata, increased access to observations, and broader usage of data serving multiple locally driven needs*

    - Accelerate the integration of data from federal agencies, academic, local and state mesonets

- Expand Existing Surface Network

    - Close most glaring surface gaps

    - Severe weather belts, coastal, mountain, soil conditions

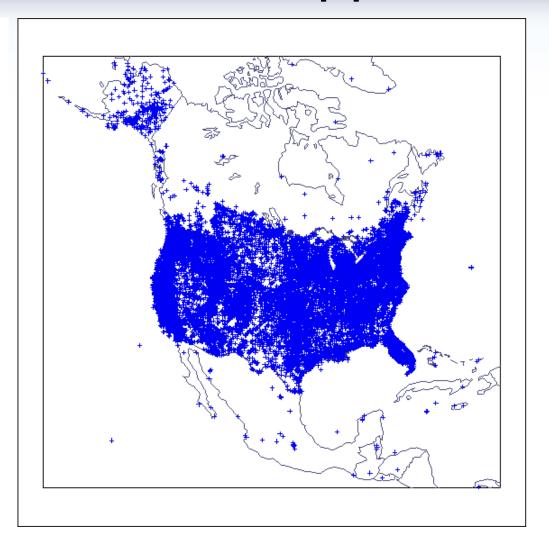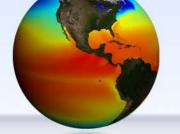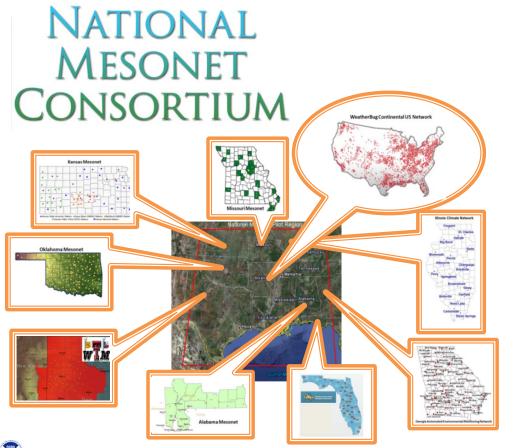   - Collect and assess data from mobile platforms

NWS Approach

NOAA Surface Observing Systems (~900)

Non-NOAA Surface Observing Stations (~20000)

Congressional Support

Since release of From the Ground Up, Congress has provided "add on" support each year to support NWS's National Mesonet Program

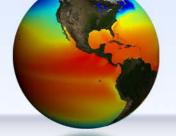**Global Science & Technology**

WeatherFlow

University of Utah (MesoWest)

Coastal Carolina University

North Carolina State University

Rutgers University (NJ Mesonet)
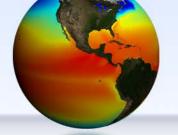
University of Delaware (DEOS)

Data Utilization/Development

- NOAA Development Team:

  - NWS NCEP (Data Assimilation/NWP)
  - NWS MDL (Statistical Forecasting)
  - OAR ERSL (Mesoscale Analysis)
  - Funded with earmark "leftovers"

- Purpose: Integrate enhanced metadata into the operational application environment

- NWS goal is to execute very high resolution mesoscale models on very fast high performance computing platforms for forecasting short-term, high-impact weather

- Meeting this goal will require the types of "hyperlocal" observations provided by a National Mesonet

- NCEP: RTMA
- MDL: MOS for 9K+ mesonet sites
- ESLR: MADIS development

The Future