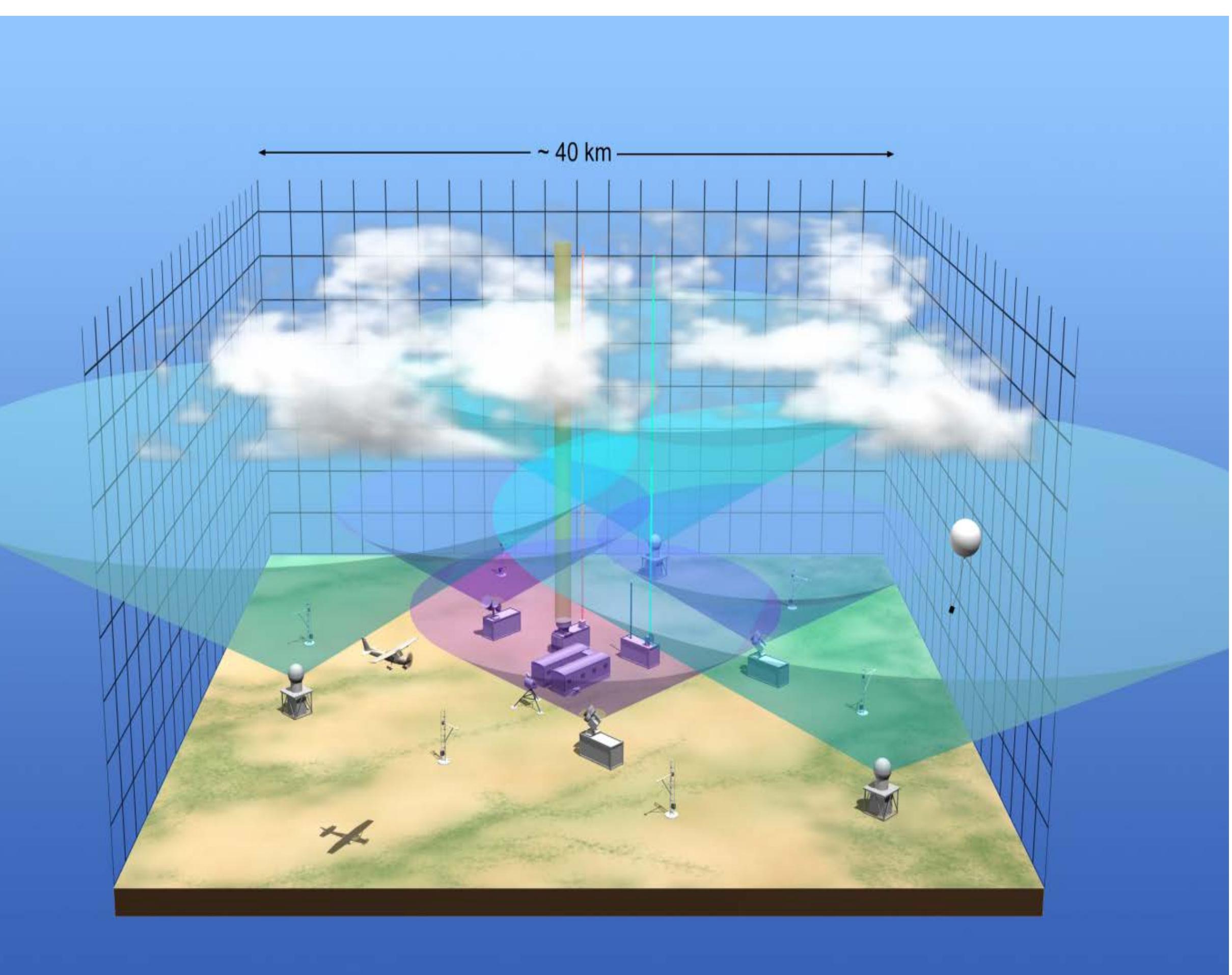


DEPARTMENT OF ENERGY ARM FACILITIES ON THE NORTH SLOPE OF ALASKA AND PLANS FOR A NORTH SLOPE "MEGA-SITE"

Mark Ivey¹, Hans Verlinde², Jim Mather³
 Sandia National Laboratory¹, Pennsylvania State University², Pacific Northwest National Lab³

Combining Observation Data with High-Resolution Models



- Concentrate instruments into fewer locales to provide dense, "mega-site" grids at the ARM Oklahoma and Alaska sites
- Decommission TWP sites to support expansion of mega-sites and conserve resources
- Run high-resolution models (LES and/or Cloud Resolving Models) and Single Column Models over mega-sites on a routine basis
- Use integrated data products to constrain model simulations

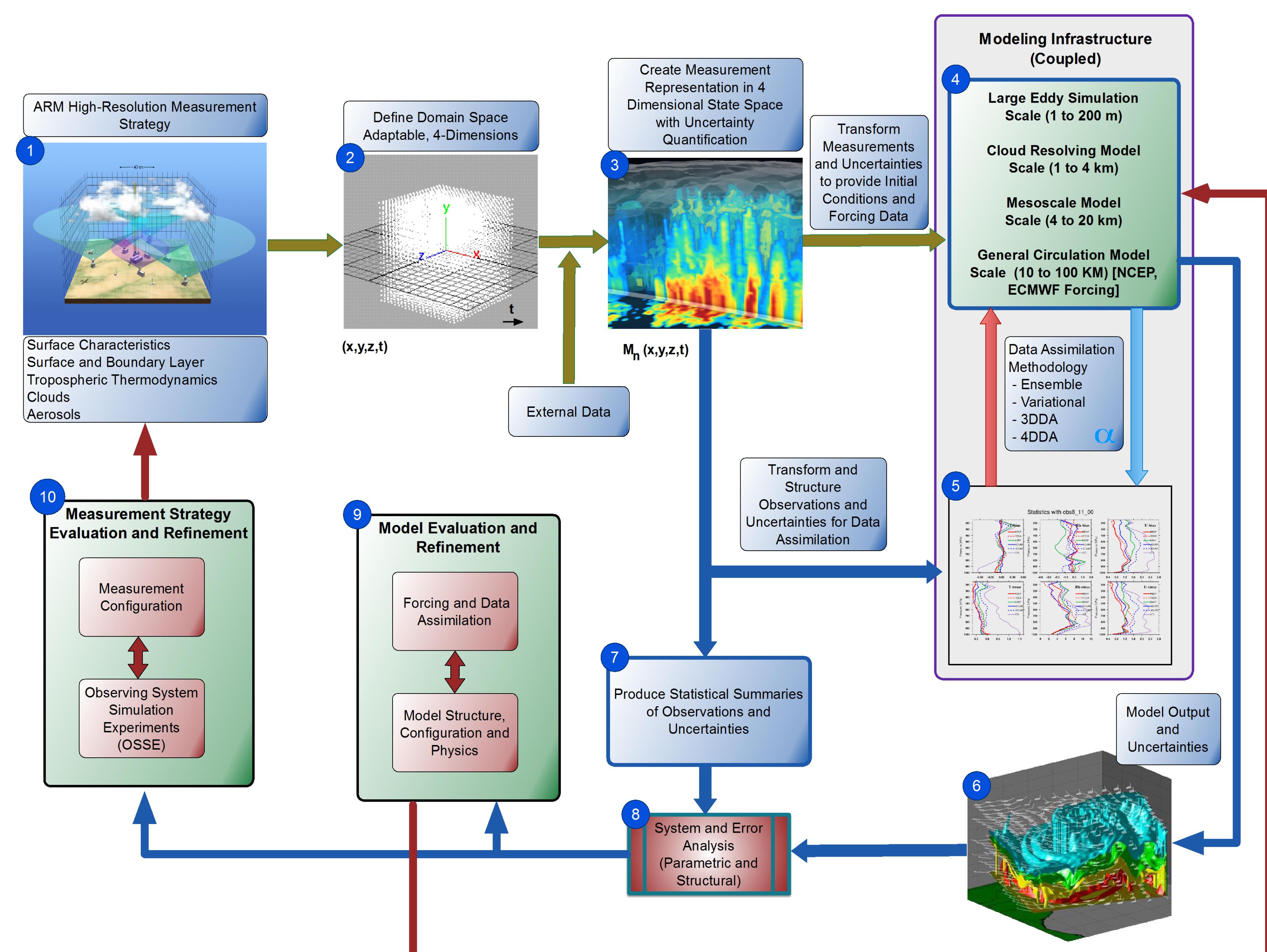
Routine Modeling, Integrated Data Products and the ARM Computing Infrastructure

In addition to changes in ARM observations, the facility reconfiguration will include routine model simulations. These simulations will serve two communities:

- Non-modelers who would benefit by working with model output
- Modeling community who will benefit from having a consistent library of forcing data sets and data analysis tools

Models under discussion range from LES and Cloud Resolving Models to Single Column Models and GCM (e.g. using a refined grid over the mega-sites). At the recent SGP-focused workshop, WRF and SAM were put forward as two likely candidates for high-resolution modeling.

Other points of discussion include domain size, resolution, methods of forcing, and output requirements (how much to save)



Jimmy Voyles & Jim Mather
June 2014

Two U.S. Mega-Sites: Oklahoma and Alaska

ARM is preparing to develop two mega-sites. The first at the current Southern Great Plains site and the second along the North Slope of Alaska.



The NSA Mega-Site:

- Include the Barrow and Oliktok sites
- Make use of Unmanned Aircraft Systems and tethered balloons
- Make use of manned aircraft to link the two primary facilities

Vision for ARM NSA Mega-Site Aerial Components



- Barrow, Oliktok
- AMF → Ship → Islands
- Tethered Balloons
- Mini Aerial Vehicles
- Manned Routine Flights
- Unmanned Routine Flights



Phase I (2013) Facilities and Instruments at Oliktok



- In mid-September, 2013, a field team led by Sandia National Laboratories finished installing an initial collection of instruments at Oliktok Point, Alaska, for a new Department of Energy climate observation station.
- This portable observatory is planned to operate for up to five years at its remote outpost near the U.S. Air Force's Long Range Radar Site at Oliktok. It is ARM's third mobile facility (AMF3) and will be the first one designed to operate for so long at a single location. It will complement data collected since 1997 by ARM's long-term site in Barrow.

Instruments



Phase II (2014) Facilities and Instruments at Oliktok



Instruments

