2012 ARM Sites and GRUAN Effort Updates

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ARM Site Updates FY 2012

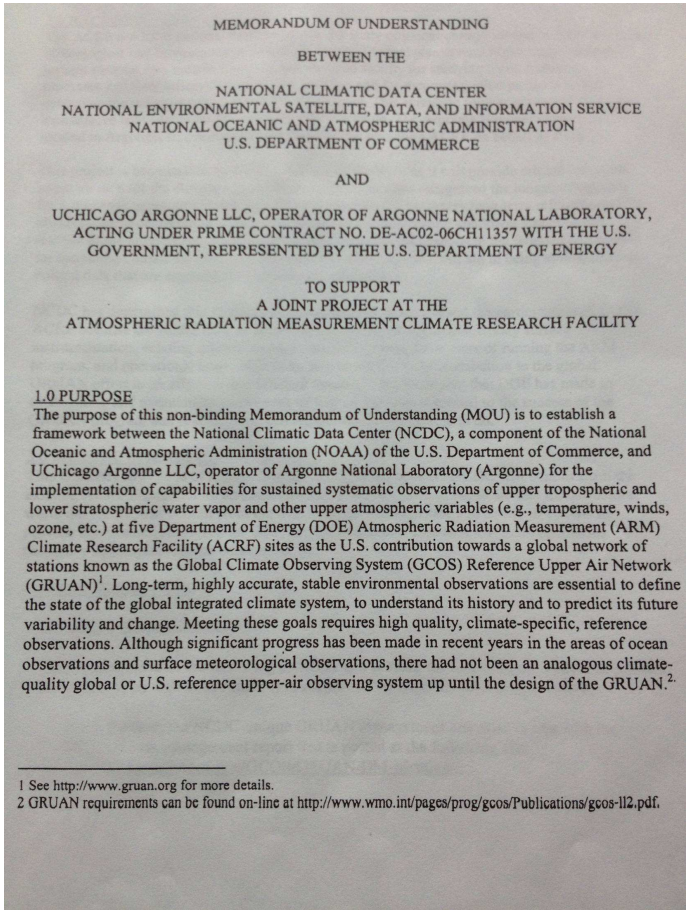
ARM Climate Research Facility (http://www.arm.gov/):

- Installation of all instrumentation at all fixed sites procured with $60M USD from the American Recovery and Reinvestment Act of 2009. ARM purchased and deployed new and upgraded instrumentation, equipment, and infrastructure to improve the atmospheric data sets used in regional and global climate models. Too numerous to list here, they can be found at: http://www.arm.gov/about/recovery-act/instruments

- Funding to install two additional fixed sites that are anticipated operational by the end of 2013. These two sites are located at Oliktok, Alaska, and the Azores in the Atlantic. The Azores might be a good candidate for GRAUN, but I suspect another Artic site (Oliktok) is not needed. (http://www.arm.gov/news/features/post/16355)

- Scientists identified the need for data from these regions to evaluate and improve computer simulations of climate at the global scale, as well as simulations for these climate-sensitive regions. Report on the ARM Climate Research Facility Expansion Workshop (2007): Report on the ARM Climate Research Facility Expansion Workshop. (http://www.arm.gov/publications/programdocs/doe-sc-arm-0707.pdf?id=28)

ARM and GRUAN Connection



MEMORANDUM OF UNDERSTANDING

BETWEEN THE

NATIONAL CLIMATIC DATA CENTER
NATIONAL ENVIRONMENTAL SATELLITE, DATA, AND INFORMATION SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE

AND

UCHICAGO ARGONNE LLC, OPERATOR OF ARGONNE NATIONAL LABORATORY,
ACTING UNDER PRIME CONTRACT NO. DE-AC02-06CH11357 WITH THE U.S.
GOVERNMENT, REPRESENTED BY THE U.S. DEPARTMENT OF ENERGY

TO SUPPORT
A JOINT PROJECT AT THE
ATMOSPHERIC RADIATION MEASUREMENT CLIMATE RESEARCH FACILITY

1.0 PURPOSE

The purpose of this non-binding Memorandum of Understanding (MOU) is to establish a framework between the National Climatic Data Center (NCDC), a component of the National Oceanic and Atmospheric Administration (NOAA) of the U.S. Department of Commerce, and UChicago Argonne LLC, operator of Argonne National Laboratory (Argonne) for the implementation of capabilities for sustained systematic observations of upper tropospheric and lower stratospheric water vapor and other upper atmospheric variables (e.g., temperature, winds, ozone, etc.) at five Department of Energy (DOE) Atmospheric Radiation Measurement (ARM) Climate Research Facility (ACRF) sites as the U.S. contribution towards a global network of stations known as the Global Climate Observing System (GCOS) Reference Upper Air Network (GRUAN)[1]. Long-term, highly accurate, stable environmental observations are essential to define the state of the global integrated climate system, to understand its history and to predict its future variability and change. Meeting these goals requires high quality, climate-specific, reference observations. Although significant progress has been made in recent years in the areas of ocean observations and surface meteorological observations, there had not been an analogous climate-quality global or U.S. reference upper-air observing system up until the design of the GRUAN.[2]

1 See http://www.gruan.org for more details.
2 GRUAN requirements can be found on-line at http://www.wmo.int/pages/prog/gcos/Publications/gcos-112.pdf.

November 22, 2010: Argonne/NOAA MOU

Provides Vaisala RS-92 raw sonde data and the associated metadata to the GRUAN Lead Center for processing with a single GRUAN algorithm that assesses uncertainty and puts an uncertainty error for every data point in each file. The GRUAN processed data is distributed through the National Center for Climatic Data (NCDC).

December 21, 2011: The ARM raw radiosonde data and related metadata have been provided to the GRAUN Lead Center per the MOU. ARM has provided the acknowledgement for the readme file and its approval to use the data to the Lead Center.

March 2012 (?): The GRUAN processed ARM data will be made available to the community through the National Climatic Data Center per the MOU.

ARM Instrument Uncertainty: A High Priority

November 28, 2011: ARM Engineering Change Order (#894) was initiated to:

- To have an easily accessible link to an instrument uncertainty table;
- To provide a more simple*, high-level expression of each instrument measurement uncertainty;
- To the complete description of each instrument measurement uncertainty table extracted from the instrument handbooks.

*The simplest expression for measurement uncertainty for an instrument. This could be the Vendor's claim, a Mentor's professional opinion, in a perfect setting operating under ideal conditions, an ideal or goal, etc. The purpose of requesting the simplest expression for measurement uncertainty is convey to a user that knows nothing about instrumentation a *ball-park *uncertainty of how well a measurement can be made by an instrument (or a product of measurements from different instruments or instrument systems).

ARM- GRAUN Current Issues (2012)

- Although NOAA has funds to initiate CFH launches at the ARM Southern Great Plains Site for at least one year, there has been a hold on procurements and implementing Cryogenic Frostpoint Hygrometer (CFH) launches. (Howard Diamond can address those issues.)
- Resolving potential issues with CFH flights at the ARM Darwin Site, which is co-located at Australian Bureau of Meteorology (BoM) Darwin Site. ARM collects the raw BoM radiosonde (Vaisala RS-92) data for distribution. Agreements would have to be worked out with specific contracts to have the BoM launch the CFH at Darwin.
- ARM has provided the GRUAN Lead Center with raw radiosonde data for all its sites. ARM has approved the release of the GRUAN processed ARM radiosonde data.
- ARM is responding to specific metadata issues about the elevations of reference instrumentation (radiosonde ground reference checks).

ARM and GRUAN Outcomes

- Have a global standard (reference traceable) for (radiosonde) measurements that allows processed data from all other networks to be evaluated and intercompared and therefore utilized. (More usable data!)
- Allows uncertainties of instrument measurements and observations to more transparent. (Provides opportunities to do better!)
- Possibly change the "image" of uncertainty: uncertainty should not be viewed as "ignorance", but more as "confidence". (Policymakers that rely on model forecasts have a better understanding of the information!)