

Improved Search, Discovery, and Accessibility of Field Campaign Data

Alice Cialella¹, Kathy Lazar¹, Anne Sasha Glanville², Richard Wagener¹, Richard Cederwall³, and John Bell³

¹Brookhaven National Laboratory, Upton, NY 11973

²University of Kansas, Lawrence, KS 66045

³Oak Ridge, National Laboratory, Oak Ridge, TN 37831

1. Problem

Atmospheric Radiation Measurement (ARM) Climate Research Facility (ACRF) data collected during field campaigns (FC) throughout the year must be assigned metadata (namely instrument classes and primary measurements) before they can be “discovered” by a user through the ARM website. As of June 2010 a **significant portion of the FCs did not have metadata** assignments. The current project addressed this deficiency.

Site	TOP Name	Start Date	PI Name	Data Source Name	Are we expecting data?	dataLink	Instrument Categories	Instrument Class	Source Class	Measurement Categories	Primary Measurement Types
OSC	2008 VAMOS Ocean-Cloud-Atmos-Land Study (VOCALS) (OPF-0611,Proj#-625)	2008-10-14	Senum (PI#18-400)	Cloud Aerosol Precip Spectrometer	Yes	Yes	aerosol aerosol cloud	cloudaerosol	top	cloudaerosol	cloudaerosol

Figure 2. Senum’s metadata as shown through the ARM FC metadata tool (www.db.arm.gov/cgi-bin/IOP2/checkPIInst.pl).

3. Results

Field campaign metadata assignments increased 25% by the end of this project.

A dataset from the 2008 VAMOS Ocean-Cloud-Atmos-Land Study (VOCALS) field campaign illustrates one of the completed datasets. Using a Cloud and Aerosol Spectrometer (CAPS) instrument, the PI, Gunnar Senum, collected several types of data, one of which was cloud particle number concentration (Figure 2). Figure 3 shows a photograph of the instrument attached to the aircraft. Figure 4 illustrates a sample of data collected by the CAPS.

Following approval and implementation of the metadata into the FC database, a researcher can now **easily identify and download** a measurement, such as cloud particle number concentration data, through the ARM website (Figure 5).



Figure 3. Photograph of the CAPS instrument fixed to the DOE G1 aircraft.

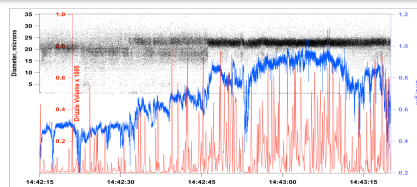


Figure 4. Changes in cloud droplet distribution with increasing drizzle and liquid water content.

4. Summary

A backlog of unassigned FC metadata had accumulated due to lack of personnel resources. This affected the efficiency by which scientific researchers could identify and access ARM field campaign data. At the conclusion of this project, an additional quarter of the unassigned field campaign data became accessible to the research community via the ARM website. In addition a more efficient method for syncing ARM databases was developed.

For example, **assignment of metadata** to the VOCALS field campaign allows researchers outside of the experiment to **locate and utilize data** related to cloud microphysics by campaign, instrument or measurement. Assigning metadata increases the efficiency and accessibility of ARM data to the scientific community, who then present at conferences and publish in peer-reviewed journals.

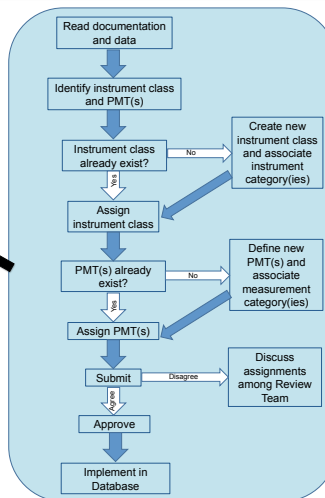


Figure 1. Flow chart of the metadata assignment methodology.

2. Process

The metadata assignments are made in the ARM Field Campaign Database using an existing database tool. The **flow chart in Figure 1** illustrates the process.

If an instrument class describing the data does not exist, a new class is created and instrument categories associated with it. Similarly, new primary measurement types (PMT) are defined and associated with measurement. Several new classes were created to accommodate recent and upcoming aerosol and cloud physics measurements.

The ARM metadata review team discuss the assignments, via a database tool, and once in agreement, the metadata are implemented in the database.

Figure 5. Downloading data via the measurement tab on the ARM Web page (www.arm.gov).

5. Future Work

ARM has recently begun to archive datasets from the former DOE Aerosol Science Program (ASP). This project’s metadata assignments, generated with forethought to the backlog of ASP data, will allow these and other new cloud and aerosol data to be assigned more efficiently.

Plans are being drawn to implement the streamlined syncing process and review system for regularly collected ARM data streams.