Improved Search, Discovery, and Accessibility of Field Campaign Data

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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.

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.

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 Semun, 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).

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.

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.