A Summary of Recent ARM Metadata Activities: New and Adjusted Workflows, Primary Measurement Types, Databases

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Abstract

The ARM Metadata Team has worked on several key components of metadata management in order to enhance data discovery, web site visits, and data tool usage for the diverse community of ARM users. This presentation describes a number of significant activities that were completed since last year's ARM/ASR Joint User Facility PI Meeting. The impact of these accomplishments will be discussed, as well.

Changes Made to Primary Measurement Types (PMT)

Newly Created PMTs

Carbon Monoxide (CO) Concentration (coconc):
"The amount of carbon monoxide per unit of volume."

Sulfur Dioxide (SO2) Concentration (so2conc):
"The amount of sulfur dioxide per unit of volume."

Hydrometeor Concentration (hydrometconc):
" The number of hydrometeors present in a given volume of air"

We now have multiple PMTs to represent specific gas concentrations**: methaneconc, co2conc, ozoneconc, coconc**, and **so2conc.**

PMT **nitrogen** requires reevaluation to determine whether it is too broadly defined for ARM purposes.

We have PMTs for size distribution and concentration for cloud particles and aerosols. Now, size distribution and concentration PMTs exist for hydrometeors.

Changed Usage of Some PMTs

Incorrect PMT assignments were changed:

hydrometfallvel and **verticalvel** were replaced by **radardoppler** as PMT for mean_doppler_velocity variables,

cldpartsizedistr was replaced by **radardoppler** as PMT for spectral_width variable.

Changes from more general PMTs to specific PMTs were made:

ozone was replaced be either **ozoneconc** or **ozonecolumn**,

backscatter was replaced by **aerosolbackscatter** when appropriate,

tracegasconc is being replaced by specific gas concentrations when appropriate.

The Metadata Team consults with the appropriate science groups – including Aerosol Measurement Science and Radar Science – for questions regarding certain PMTs. This input helps refine the ARM metadata and enhances data discoverability.

Changes Made to Instrument Classes (IC)

Newly Created ICs

ICs used exclusively in Field Campaigns:

Cavity Ring-Down Extinction Spectrometer (crds)
IR Absorption Spectrometer (irspec)
X-Band Guest Radar (xband-guest)
Chemical Ionization Mass Spectrometer (cims)
Thermal Desorption Chemical Ionization Mass Spectrometer (tdcims)

ICs used for ARM Production Instruments:

Weighing Bucket Precipitation Gauges (wb)
Tricolor Absorption Photometer (tap)
Sulfur Dioxide Monitor (so2)
Nitrogen Oxides Monitor (nox)
Carbon Monoxide Analyzer (co-analyzer)

ICs used for ARM VAPs (Evaluation and Production):

Cloud Type Classification (cldtype)
SACR Advance Quasi-Vertical Profile (sacradvqvp)
SACR Advance Velocity Azimuth Display (sacradvvad)
Fair-Weather Shallow Cu ID (shallowcumulus)

Changed Usage of Some ICs

Reevaluated the instrument classes that may be overly broad for ARM's needs:

Trace gas concentrations (**tracegas**) is not specific enough for current AOS instruments. So, a decision was made to create gas-specific ICs to associate with AOS and AAF instruments.

Particle imager (**partimg**) is a general IC that is too broad. It was assigned to datasets where more specific instrument class are appropriate (e.g**. hvps** and **fcdp**).

Broaden instrument classes that were to specific:

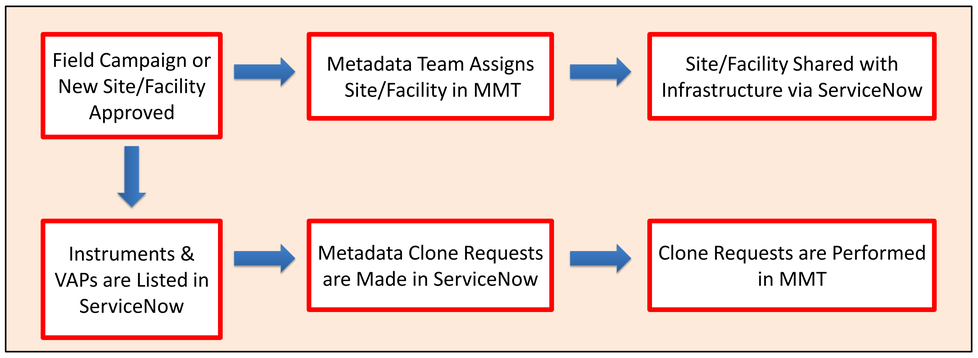
IC rain is described as rain gauge which implies liquid precipitation. The new **wb** IC describes the measuring mechanism (i.e. weighing bucket). The pluvio2 and geonor are both weighing buckets.

Increase use of container IC:

We began looking more closely at ICs that contain other instruments. Other than the AOS, possible containers are towers, tethered balloons, and sondes.

Changes in Metadata Workflow and Metadata Tools

Metadata Assignments using MMT Clone Tool and ServiceNow



Recent use of this workflow were for MARCUS, and AOS at SGP E13.

Record of clone activity is in both Clone Tool and ServiceNow.

This workflow emerged as clone requests were made. We ensure correct metadata is in place before clone is performed.

Communicating to the metadata team – via ServiceNow -- the instruments being deployed is a crucial step in this process.

Changes to Metadata Workflow and MMT

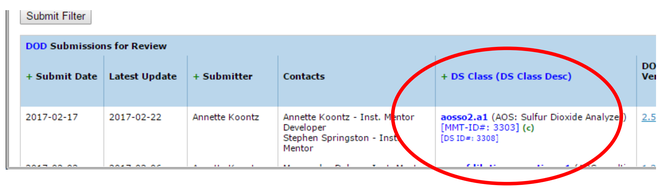
Evaluation Products

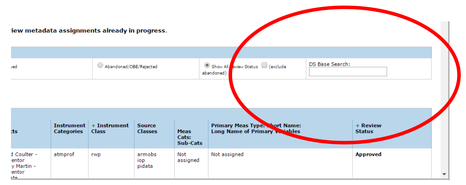
New workflows and data structures are needed to improve the processes associated with evaluation products. These processes include switching between evaluation status and baseline status.

Need to be cognizant of (1) Evaluation processes (e.g., how do evaluation products become baseline products), (2) Metadata structures (e.g., where to include evaluation product description?), (3) Structure of ARM web pages (e.g., what are the implications of using instrument classes to build the web pages?)

MMT Updates

The Metadata Management Tool (MMT) was modified to (1) link a DOD to its associated Datastream Object, and (2) provide additional search capabilities.





Migration of Database Management Systems

The ARM External Data Center (XDC) located at Brookhaven National Lab completed the migration of their database management system (DBMS) from SYBASE to PostGres. There are many positive implications of this task:

- The XDC is now on the same DBMS as the Archive
- Tools are in development to improve metadata updates made in MMT to the ARM-INT databases
- The goal is to update the metadata tables at both the Archive and the XDC in near-real time
- Updates to the ARM web pages would not be limited by reproducing metadata tables between the XDC and Archive.