

continuous operation versus intensive operation periods

Gannet Hallar

Tim Onasch

Continuous operation versus intensive operation periods

Aerosol Measurement Science Group
Gannet Hallar and Tim Onasch

Discussion of goals and options
-and-
Request for feedback and input

US Department of Energy Climate Science

- **ASR** – aerosol processes (i.e., process-level evolution)
 - e.g., changes in chemistry, mixing state, size distributions, CCN and IN activity, etc.
- **ARM** – aerosol properties (i.e., long-term observations)
 - User Facilities in support of **ASR** science
 - AMF (AOS) – super-sites, aerosol properties
 - AAF – airborne, aerosol properties and processes
- How can ARM long-term measurements be optimized to better support ASR process studies?
 - What aerosol and atmospheric properties are necessary to evaluate aerosol processes?
 - What sampling strategies best enable the study of aerosol processes?

Current ARM Sampling Strategies

- Core measurements operating all the time (Super sites)
 - Annual Facility Call Campaigns (> \$300k)
 - Small Campaigns (< \$300k)
- } Principal Investigator (PI)
science driven
- Should ARM consider new sampling strategies?
 - **AMSG** concept under consideration
 - ARM structured to improve measurement and data quality
 - Encourage Guest measurements/instrumentation

Goals for new ARM Sampling Strategy

- Improve understanding of aerosol processes using ARM facilities
- Increase involvement from ASR funded scientists and new external scientific communities
- Improve ARM measurement and data quality
- Provide ARM instrument mentors with structured down-time for maintenance and calibrations
- Test new measurement technologies (e.g., SBIR)
- Increase ARM data *use and confidence*

Structured Intensive Observational Periods (IOPs)

- Located at super-site locations
 - Help focus/support Small Campaigns associated with Annual Facility Call Campaigns
- Science topic driven
- Increase spatial (i.e., vertical) and temporal (i.e., 4D) measurements
 - Include AAF facilities including **tethered balloons and UAV**
- Increase direct modeling efforts
- Direct participation and focus from ARM mentors
 - Concentrate complex measurement techniques during IOPs rather than as core long-term measurements
 - Planned down time for instrument upgrades and calibrations (i.e., between IOP's)
- ASR Principal Investigator (PI) proposals accepted/encouraged for participation in IOPs
- Seasonally aware
 - Ensure representative yearly sampling for long term trends

IOP Aerosol Sampling Plan

Core Measurements

S	M	T	W	T	F	S
			1	2	3	4
5				9	10	11
12	13	14				18
19	20	21	22	23		
26	27	28	29	30		

Continuous 24/7 – Year Round

Core Measurements:
Focus on long-term trends (IPCC)
e.g., Aerosol Concentration,
Full Aerosol Size Distribution,
Aerosol Optical Properties,
CCNC, ACSM, etc.

With a focus on
aerosol *in situ*
initially

Intensive Observational Periods

Times selected (with input from modelers and AMSG) to strategically sample different sources and environmental phenomenon. Mentors required to have instruments calibrated and at optimum allowable performance. Vertical profiling is targeted.

ARM measurements focused on atmospheric processes:
e.g., fRH, HTDMA, Scanning CCNC, etc.

Guest Instruments or Mini IOPs

Annual or Bi-Annual
Mechanism for outside PIs to propose to small field campaign that will allow instrumentation to complement existing

PI measurements focused on Process Questions, Closure Studies & Instrument Comparison
e.g., CIMS, CFDC, etc.

Feedback and Input

- Enter and vote on input via padlet
- Find us at this meeting
- Email us



<https://padlet.com/gannethallar/wmpgl1zeuyyf3ssp>