



U.S. DEPARTMENT OF
ENERGY

Office of
Science

Atmospheric Radiation Measurement (ARM) User Facility

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2023 ARM-ASR Joint User Facility & PI Meeting

ARM User Facility

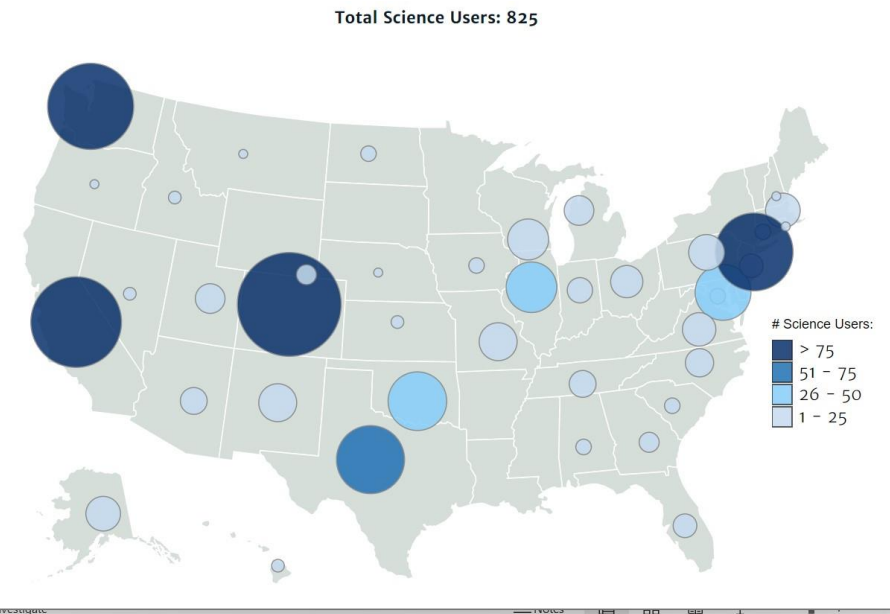
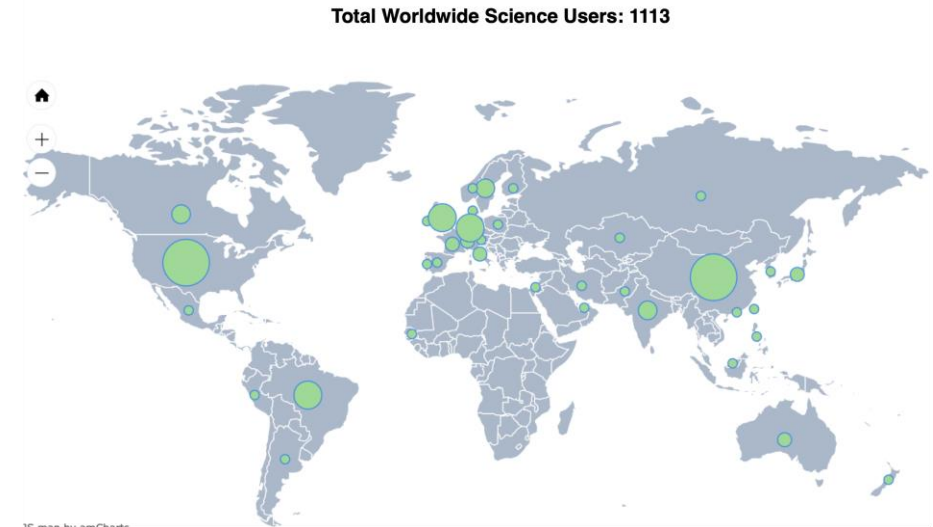
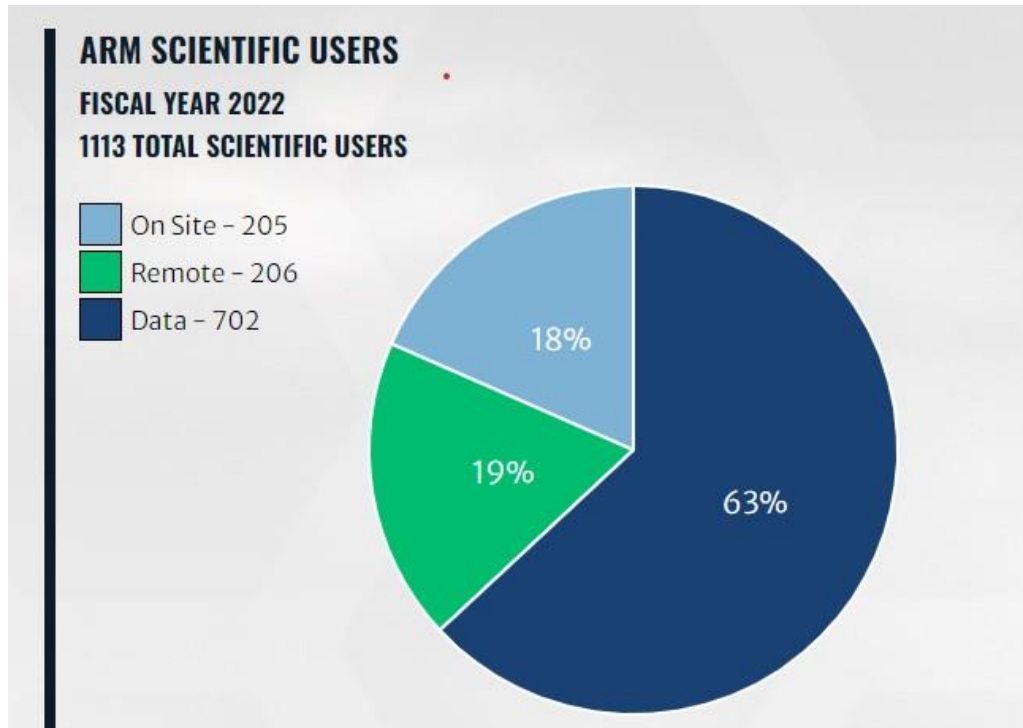
MISSION: The Atmospheric Radiation Measurement (ARM) user facility, a DOE Office of Science user facility managed by the Office of Biological and Environmental Research, provides the climate research community with strategically located atmospheric observatories to improve the understanding and representation in earth system models of clouds and aerosols and their interactions with the Earth's surface.

VISION: To provide the research community with the best array of field observations and supporting state-of-the-art data analytics to significantly improve the representation of challenging atmospheric processes in earth system models



ARM – User Facility Statistics

► FY22 User Facility Statistics



Acknowledging ARM

- ▶ It is important to acknowledge ARM facility in your papers to show the research coming out of the facility
 - ▶ <https://arm.gov/working-with-arm/acknowledging-arm>
- ▶ ARM data is not possible without the work of many people – to acknowledge their efforts:
 - ▶ Cite the data – use DOIs for datasets
 - ▶ Cite instrument handbooks or relevant papers on the instruments/data streams
 - ▶ If ARM staff (mentors, translators, site operations, data center) are contributing significantly to your research, include them as a co-author

Science Communication

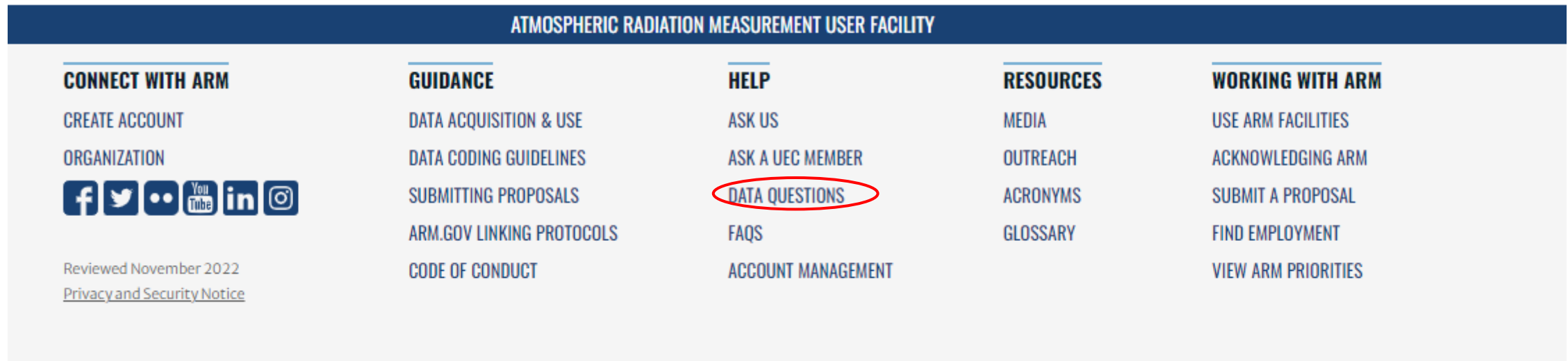
- ▶ Communicating the results of DOE-funded science is very important to DOE Office of Science leadership
- ▶ Please submit research highlights on your work!
- ▶ New collaboration between SC and the Kavli foundation to develop the Science Public Engagement Partnership
<https://scipep.org/about/>
- ▶ At this meeting – Wednesday lunchtime session:
 - ▶ Communicating Climate Science to a Broader Audience: Getting Beyond the Journal Article and In Front of the Public

BER Unified Data Subcommittee


- ▶ BER Advisory Committee (BERAC) charged by Office of Science to recommend a strategy for the next generation data management and analysis within a unified framework across BER
- ▶ Subcommittee recently held a 2-day workshop that included several ARM users/ASR scientists
- ▶ Can submit comments to the Federal Register Notice Request for Information
 - ▶ Email to: BERACRFI@science.doe.gov with the subject line "BER unified data".

BER Unified Data Subcommittee (2)

- ▶ Can always ask questions or provide input to ARM on data concerns or challenges:



The screenshot shows the navigation menu for the Atmospheric Radiation Measurement User Facility. The menu is organized into five columns: CONNECT WITH ARM, GUIDANCE, HELP, RESOURCES, and WORKING WITH ARM. The 'DATA QUESTIONS' link under the HELP column is circled in red.

ATMOSPHERIC RADIATION MEASUREMENT USER FACILITY				
CONNECT WITH ARM	GUIDANCE	HELP	RESOURCES	WORKING WITH ARM
CREATE ACCOUNT	DATA ACQUISITION & USE	ASK US	MEDIA	USE ARM FACILITIES
ORGANIZATION	DATA CODING GUIDELINES	ASK A UEC MEMBER	OUTREACH	ACKNOWLEDGING ARM
	SUBMITTING PROPOSALS	DATA QUESTIONS	ACRONYMS	SUBMIT A PROPOSAL
Reviewed November 2022	ARM.GOV LINKING PROTOCOLS	FAQS	GLOSSARY	FIND EMPLOYMENT
Privacy and Security Notice	CODE OF CONDUCT	ACCOUNT MANAGEMENT		VIEW ARM PRIORITIES

- ▶ Or visit the ARM data booth in the lobby for help with ARM data

ARM Capability Updates

- ▶ New instrumentation/capabilities in process or planned:
 - ▶ New lidar and aerosol capabilities for NSA
 - ▶ New mobile C-band radar for ARM Mobile Facility
 - ▶ Exploring potential water vapor & aerosol extinction lidars
- ▶ Challenger 850 – ARM research aircraft
 - ▶ Project had to revise plans & schedule based on FAA ruling of “significant” modifications
 - ▶ DOE/BER approved project revised baseline cost/schedule in May
 - ▶ First science flights expected FY25; user-proposed science missions FY26



ARM Capability Updates (2)

- ▶ **AMF3 – Bankhead National Forest**
 - ▶ Updated requirements/regulations plus supply chain issues have led to some cost increases and delays in site operations
 - ▶ Expected start date for central facility delayed to Nov 2023
 - ▶ Still expect to be able to support guest instruments and operation of supplemental sites in May 2024
 - ▶ Breakout session – Wed at 2 pm
- ▶ **LASSO – LES modeling**
 - ▶ CACTI data released
 - ▶ Workshop recently held on plans for ENA simulations
 - ▶ Breakout session – Mon at 2 pm
 - ▶ Upcoming workshop on future plans – likely early Nov



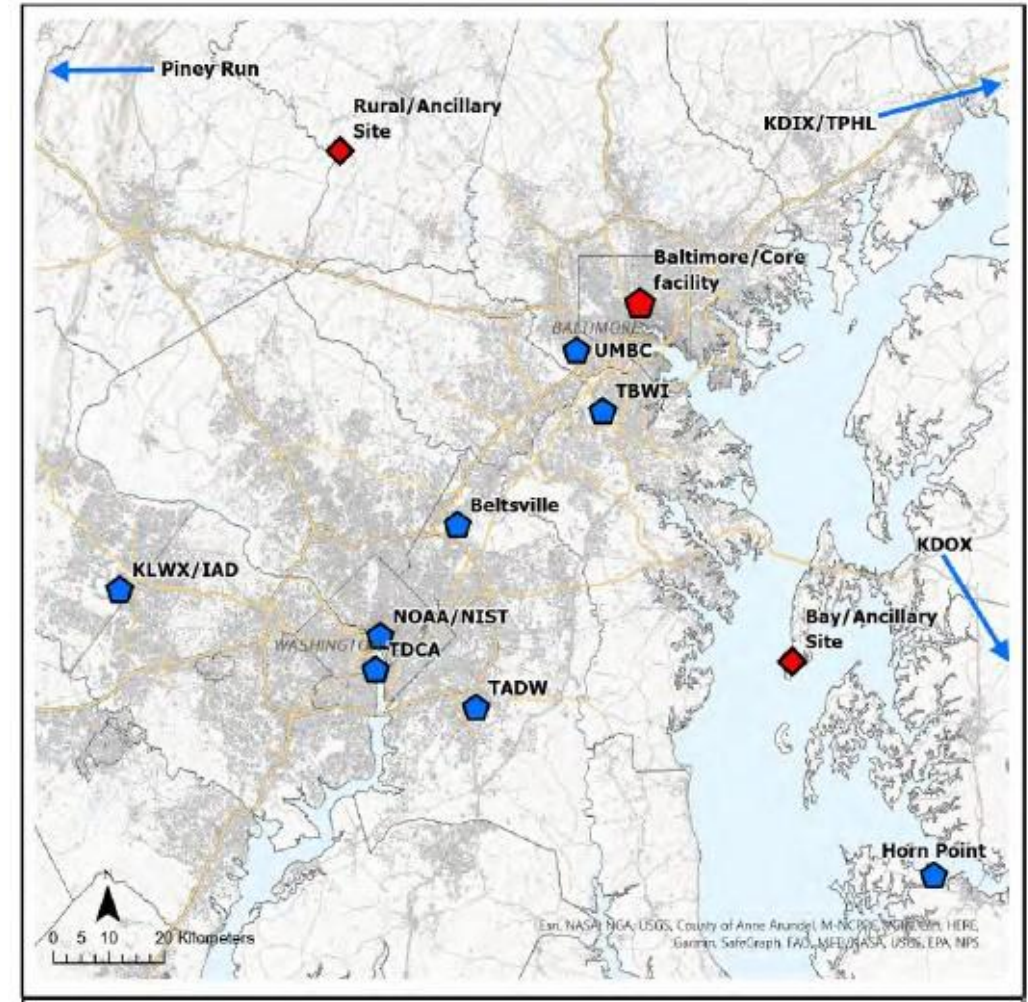
Field campaign updates – Mobile Facilities

- ▶ **EPCAPE (PI: Lynn Russell, UCSD)**
 - ▶ Feb 2023 – Feb 2024
 - ▶ Deployment of AMF at Scripps Pier & supplemental site at Mt Soledad to study aerosol and cloud interactions
 - ▶ Breakout session – Tues at 4:15 pm
- ▶ **CAPE-K (PI, Jay Mace, Utah)**
 - ▶ April 15, 2024 – Sep 15, 2025
 - ▶ Deployment of the AMF at the Kennaook/Cape Grim Baseline Air Pollution Station in Tasmania, Australia to study the seasonal cycle of Southern Ocean cloud & precipitation properties
 - ▶ Collaboration with Australian agencies - BOM/CSIRO
 - ▶ Breakout session - Mon at 2:00 pm



New ARM Mobile Facility Campaign

- ▶ CoURAGE - Coast-Urban-Rural Gradient Atmospheric Experiment
 - ▶ PI: Ken Davis, Penn State University
 - ▶ Dates TBD; likely Fall 2024 – Fall 2025
 - ▶ Baltimore, MD + 2 ancillary sites (rural, bay) Study urban-coastal-rural interactions and their impacts on atmospheric boundary layer, atmospheric composition, clouds & radiation, and precipitation
 - ▶ Collaborations: Baltimore Social-Environmental Collaborative (BSEC) Urban IFL project; Howard University Beltsville site; Morgan State University



New Tethered Balloon System Campaigns

- ▶ **Characterization of Organosulfates and Organonitrates in Vertically-Resolved Aerosols over the Southern Great Plains**
 - ▶ Haofei Zhang, UC Riverside
 - ▶ Selected under FICUS - joint call with EMSL user facility for analysis of ARM TBS samples with EMSL instrumentation
- ▶ **Vertical column dual-comb spectroscopy on a TBS**
 - ▶ PI: Peter Schwindt, Sandia National Laboratories
 - ▶ Selected under ARM TBS call
- ▶ **TBS missions in support of CoURAGE**
 - ▶ Tentatively approved for FY25 - #of missions/details TBD



Upcoming ARM Facility Solicitations – Tentative Timelines

- ▶ ARM Mobile Facility
 - ▶ Call expected to be released ~Dec with pre-apps due ~Feb for campaigns starting in 2026
- ▶ Tethered balloon system
 - ▶ Annual ARM TBS & joint ARM/EMSL calls ~Dec for 2025 campaigns
- ▶ Arctic Shark flights
 - ▶ Planning call for FY24 flights at SGP
- ▶ Proposals for small campaigns & use of ARM high performance computing capabilities can be submitted year-round



ARM Updates - FY24 Budget

- ▶ FY24 President's budget requested \$1.5M less for ARM operations
- ▶ FY24 Congressional appropriations:
 - ▶ Senate appropriations bill proposes 2% increase for BER/EESSD; no specific numbers for ARM, but expresses support for SC user facilities
 - ▶ House appropriations bill proposes cutting BER/EESSD by 12%
 - ▶ Final FY24 appropriations unknown; likely to be in a continuing resolution to start year
- ▶ ARM has had unexpected increases in costs for the replacement aircraft and AMF3 site development, as well as increases in costs due to inflation & supply chain issues
- ▶ In order to balance these increased costs while still developing new capabilities to advance science, ARM is following guidance from past review committees to assess and reduce some lower-impact and/or higher maintenance capabilities