ARM

CLIMATE RESEARCH FACILITY

ARM Updates: Organization, Activities and Plans

Jim Mather
ARM Technical Director

ARM/ASR Joint User Facility PI Meeting
Vienna, VA
March 17, 2015

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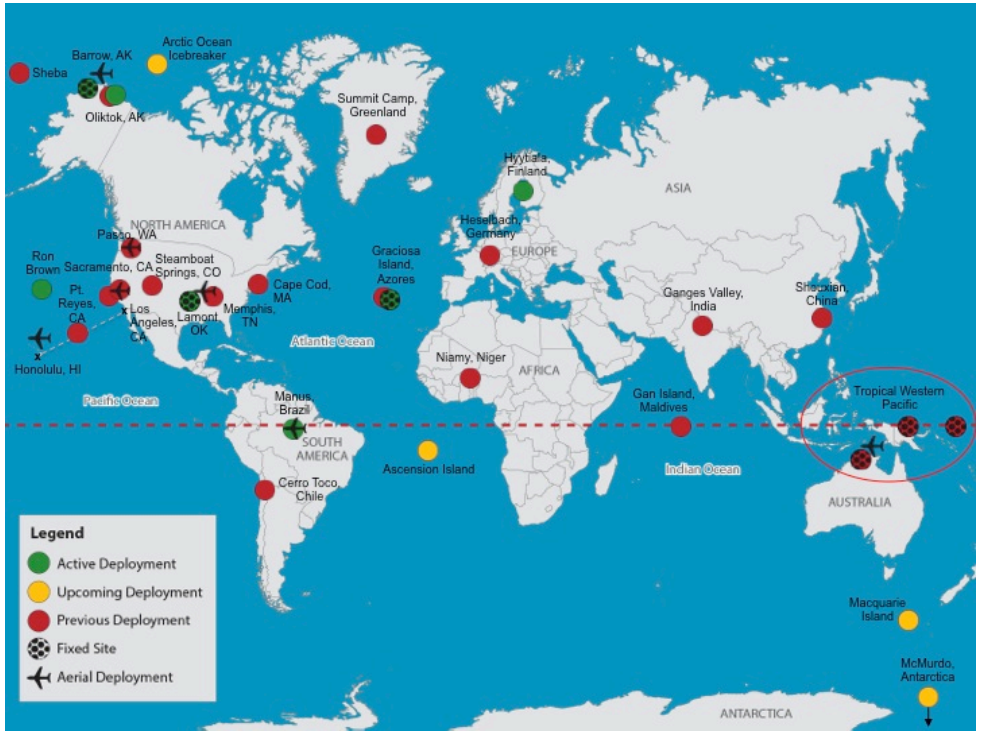
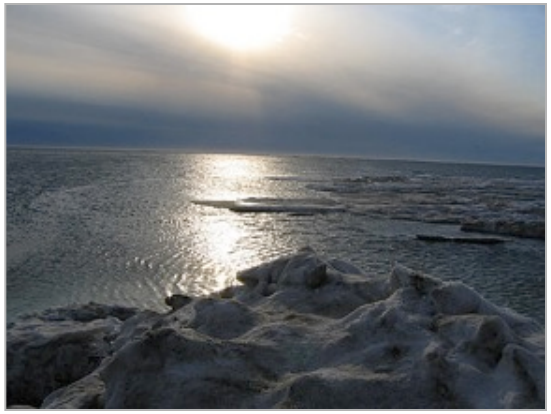
Providing measurements to support climate research and model development

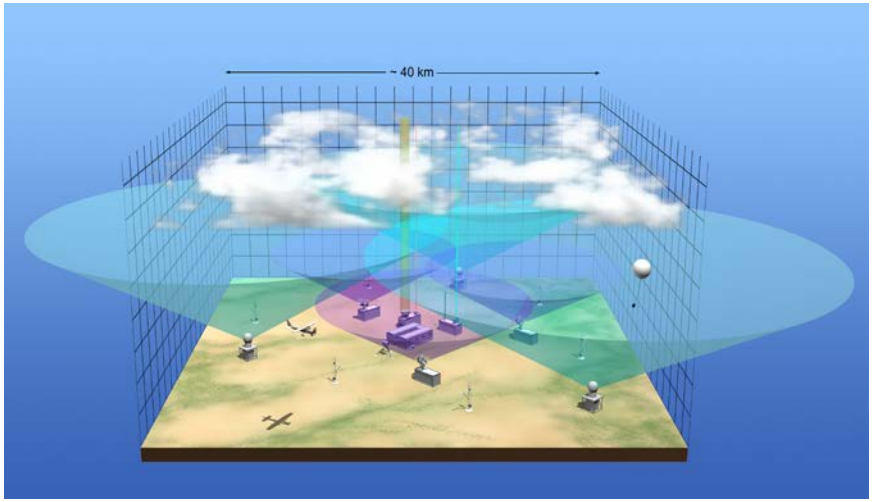
The ARM mission is to provide the climate research community with strategically located in situ and remote sensing observatories designed to improve the understanding and representation, in climate and earth system models, of clouds and aerosols as well as their interactions and coupling with the Earth's surface.





Strengthening the link to models

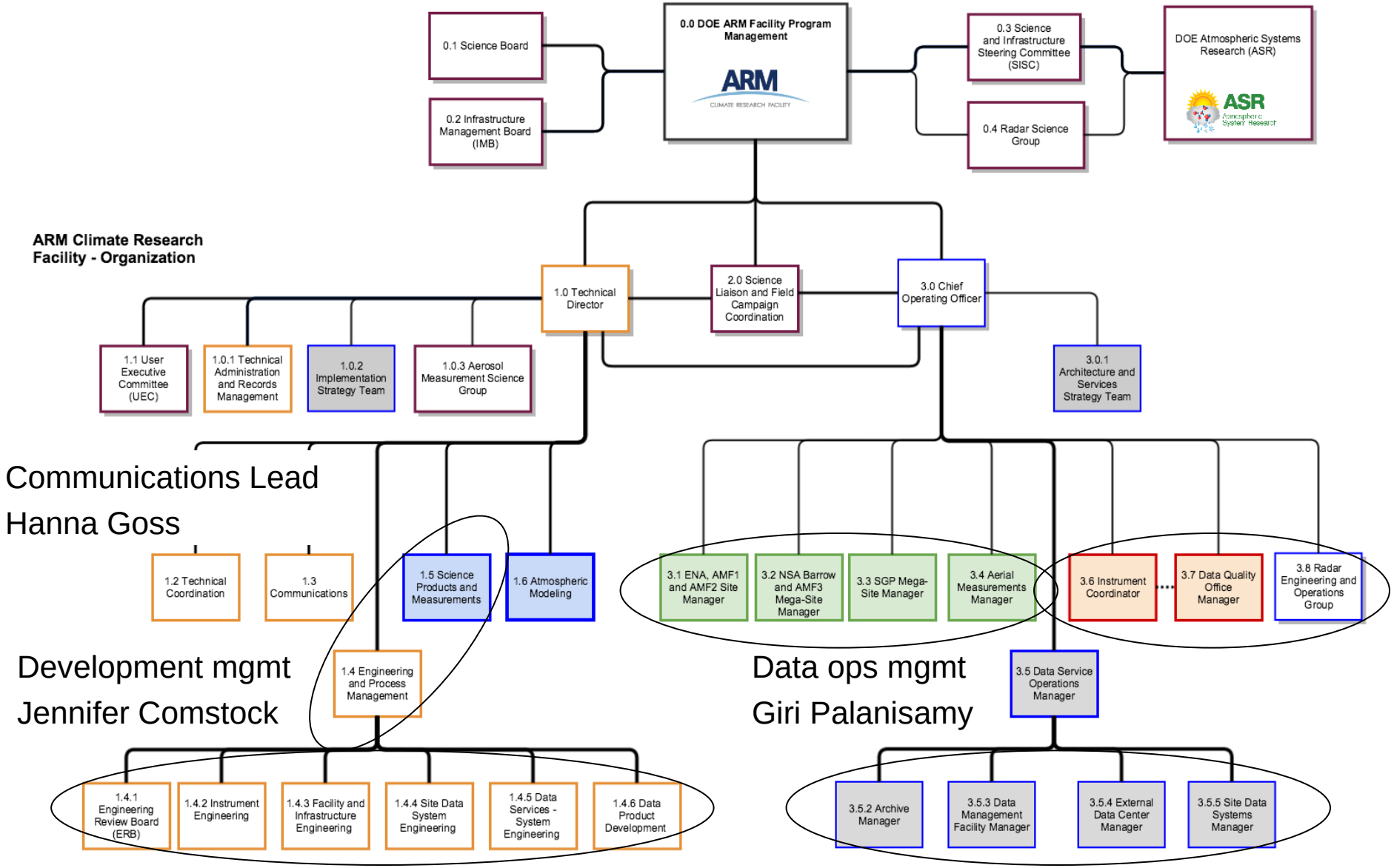
ARM is undergoing a reconfiguration to better integrate observations and high-resolution modeling with the continued goal of improving climate models. The reconfiguration has three main facets:



- Optimization of the ARM measurement facilities at two megasites to better support high-resolution modeling
- Development of a routine modeling strategy for process studies and to provide a link to Global-scale models
- Development of a data processing strategy to bridge measurements and models

While continuing to provide observations from the mobile facilities, aerial platforms, and the new long-term site on Graciosa Island in the Azores.

Refining the ARM organization to improve support and enable change



New Roles

Giri Palanisamy

Jennifer Comstock

Hanna Goss

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The Southern Great Plains Megasite

For the SGP, science questions raised through the May 2014 high-resolution modeling workshop included:

- What are the relative impacts of large-scale forcing, local forcing, and aerosol on shallow continental cloud properties?
- What is the role of coupling between the land surface and atmosphere for planetary boundary layer structure and cloud properties?
- How well do models represent the vertical distribution of aerosols and how is this impacted by model resolution?
- Do models capture the wet removal of aerosols correctly?
- What are the relationships among components of cloud systems (microphysics, radiation, dynamics)?
- Why do GCMs fail to predict the correct diurnal cycle of convection at the SGP?

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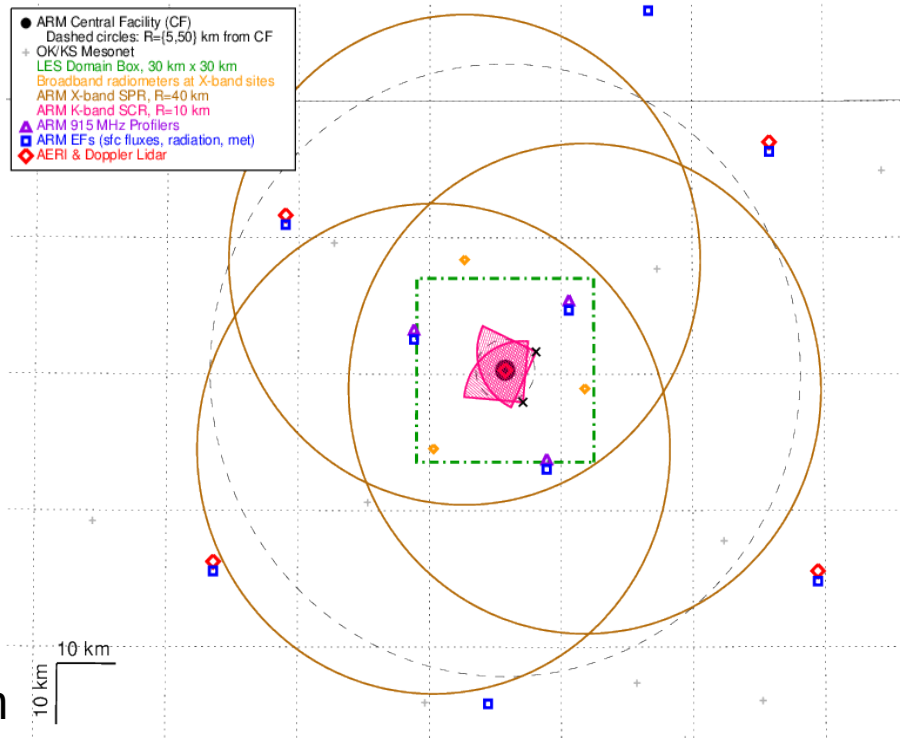
SGP Measurement Enhancements

Activities currently planned or in discussion for the SGP include:

- Requirements document for four boundary layer profiling sites to include an AERI, microwave radiometer, and Doppler lidar co-located with surface flux sites
- Plans to evaluate real-time profile processing to support operational data assimilation
- Aerosol Observing System and Raman upgrades
- Deployment plans for returning radars from the tropics
- Proposal to evaluate 3-wavelength lidar retrieval at the central facility
- Improvements to the soil moisture network



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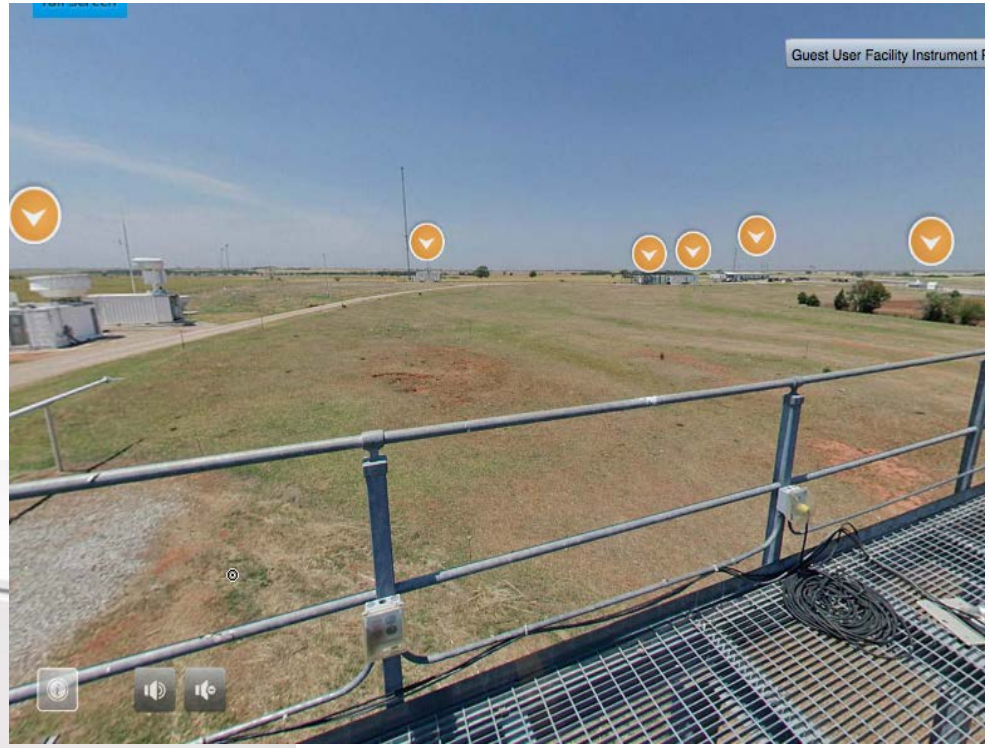
SGP Virtual Tour

An interactive virtual tour of the SGP facility is now available at:

http://www.arm.gov/sites/sgp

Virtual tours for Barrow, Oliktok, and Graciosa are coming in late 2015.



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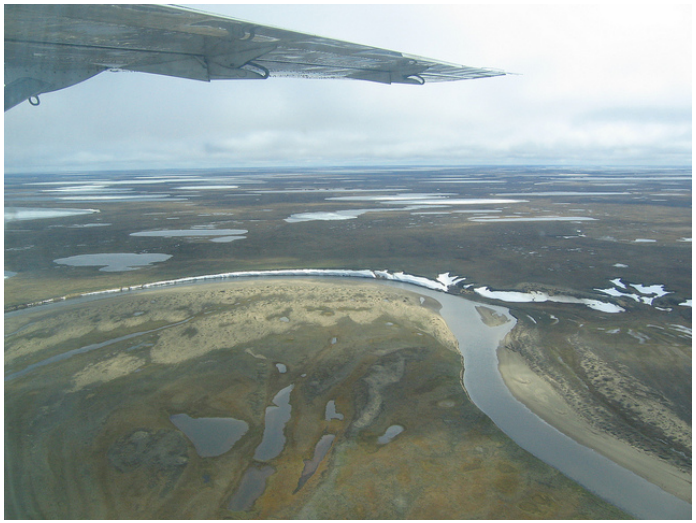
The North Slope of Alaska Megasite

Science issues highlighted at the NSA workshop were organized around the themes of clouds, aerosols, vertical structure and long-range transport. Specific questions included:

- How do clouds interact with and respond to varying and heterogeneous terrestrial/ocean/sea-ice conditions?
- What processes control the life-cycle of mixed-phase, single and multi-layer cloud/aerosol systems?
- How is variability in long-range and short-range transport of heat, water vapor and aerosols manifested in the vertical structure of the atmosphere?
- What are the characteristics, sources, sinks, and distribution of ice and liquid nucleating aerosols?



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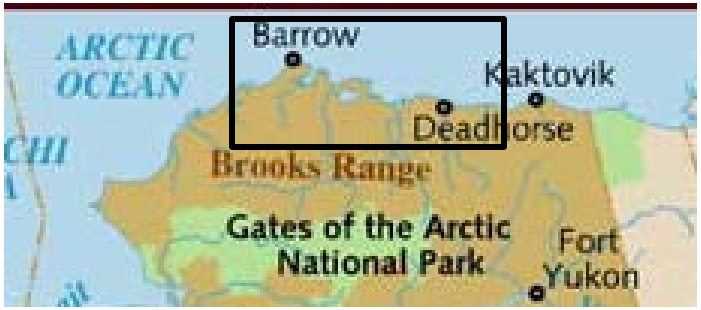
NSA measurement enhancements



The near term development emphasis for the NSA megasite is on aerial measurements:

- UAS flights through the ERASMUS campaign
- Tethered balloon tests led by the NSA team
- G1 flights through the ACME V campaign

Other measurements suggested by the NSA workshop included:

- Move the Barrow HSRL to Oliktok to support multi-wavelength aerosol retrievals
- Inventory of North Slope emission sources
- Add a snowflake camera at Barrow
- Inland observations (possibly Atqasuk)

Decadal Vision

A long-term vision document has been developed to capture the current plans for the megasites, modeling, and related activities. This document sets out to:

- Describe the goal of better integrating models with ARM observations and the current strategy for achieving this
- Summarize the outcome of the SGP and NSA workshops
- Emphasize the continued commitment to the AMFs
- Begin a discussion regarding the future of aerial measurements
- Begin a discussion regarding data efforts needed to better support complex observations and integrated observation-model analysis

http://www.arm.gov/publications/programdocs/doe-sc-arm-14-029.pdf?id=36

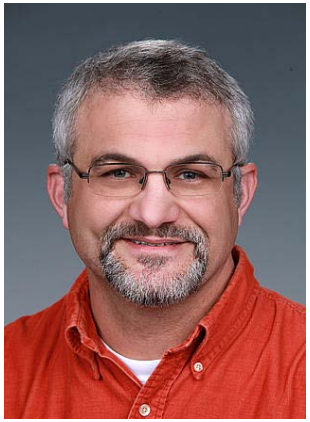
User Executive Committee

User facilities are expected to have a User Executive Committee whose purpose is to facilitate communications between the facility and the user community and represent the interests of the user community.

An ARM User Executive Committee was formed in January of this year. This group is in the process of identifying issues that ARM should be addressing and mechanisms to engage with the user community.

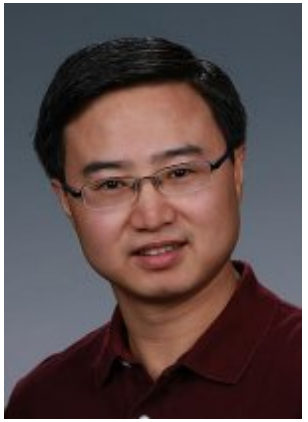
UEC Members

Dave Turner



Larry Berg

Gannet Hallar



Hailong Wang

Pavlos Kollias

Ernie Lewis

Andrew Gettelman

Matt Shupe

Rob Wood

Chuck Long

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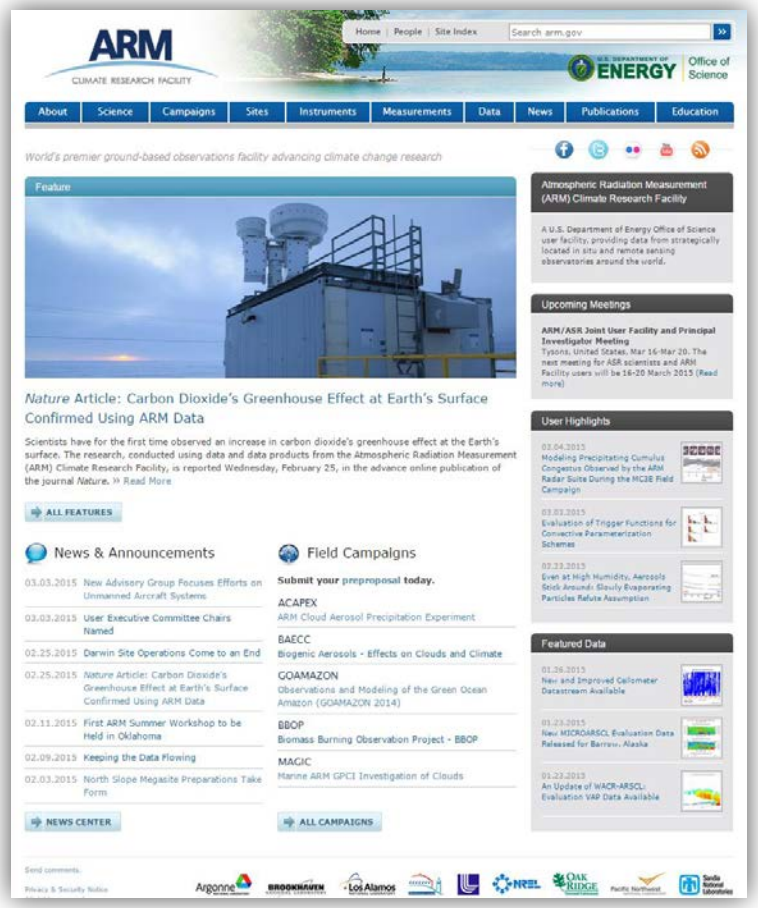
www.arm.gov

The ARM web site provides:

- Description of sites, instruments, data
- Upcoming campaigns
- Science highlights
- ARM News (subscribe to RSS feed)
- Wiki pages
- Links to social media (#armasrmtg)
- Provide Feedback
- Contacts

The next generation facility requires a next generation web site.



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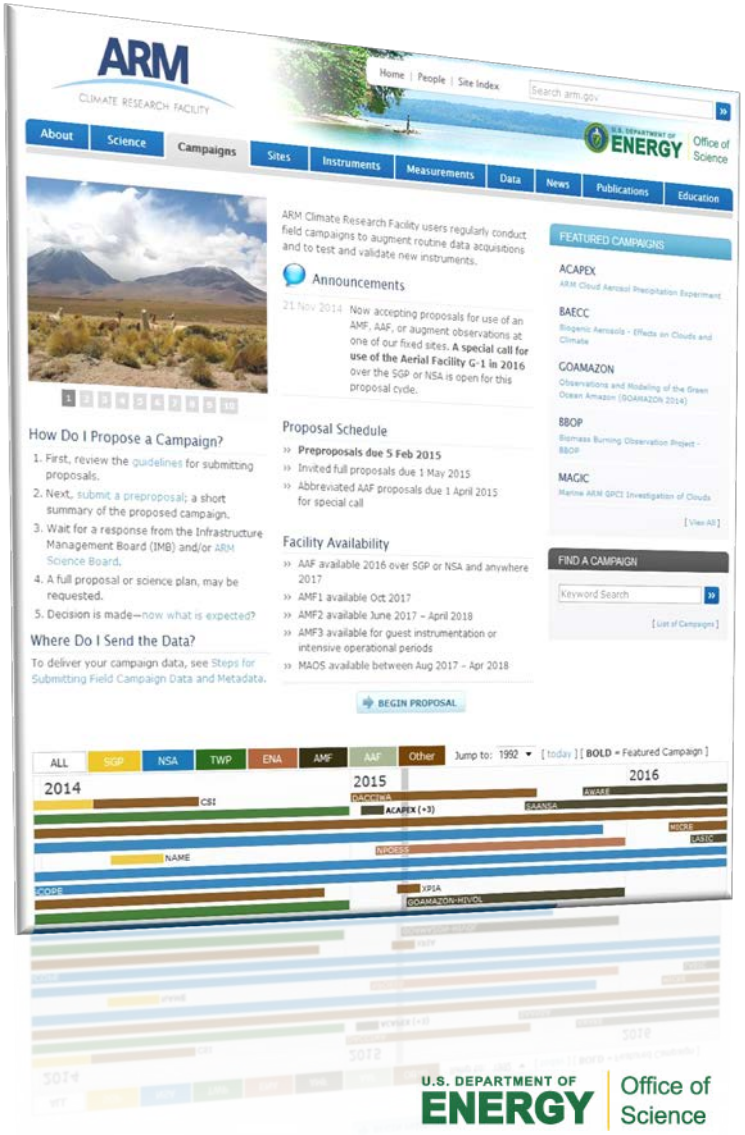
A major website redesign will:

- Revamp content for accuracy and clarity.
- Ensure smooth and easy navigation.
- Increase the accessibility of ARM capabilities.



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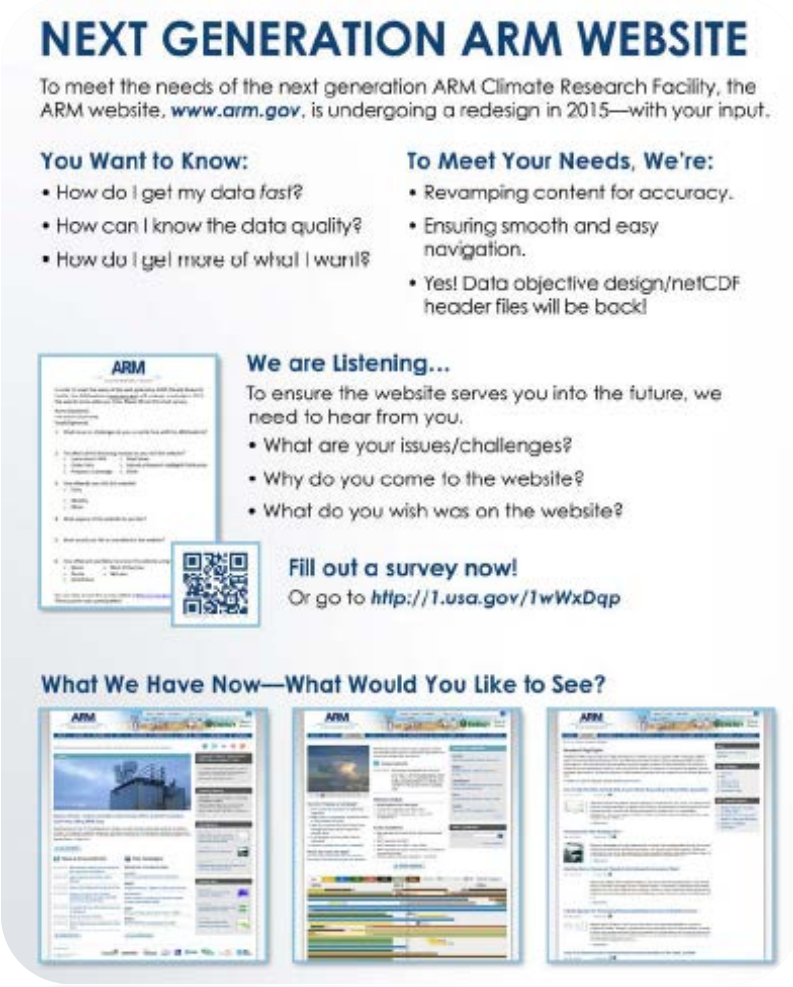
We need your input:

- What are your issues/challenges?
- Why do you come to the website?
- What do you wish was on the website?



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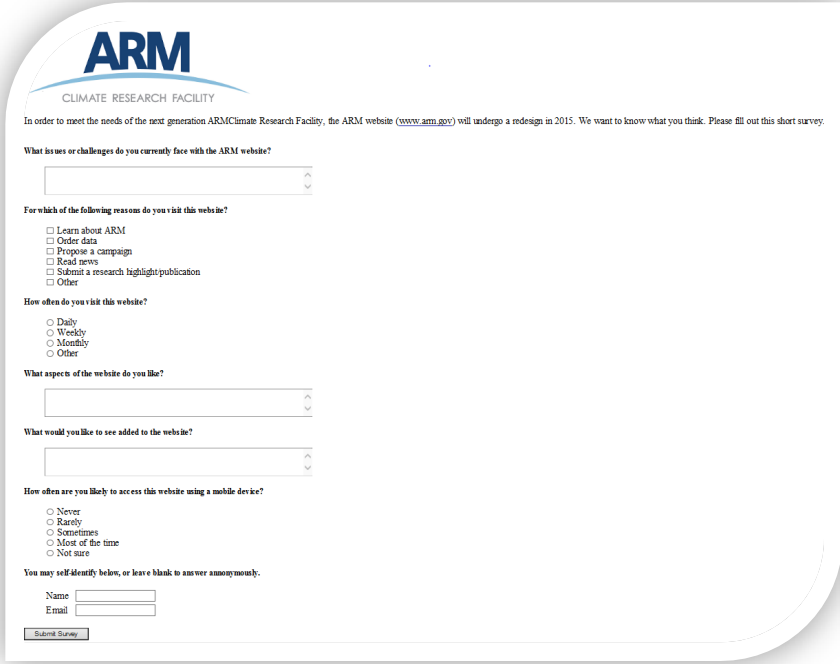
Fill out an easy 6 question survey

- http://1.usa.gov/1wWxDqp

Or get a hard copy from:

- A member of the Website Team
- At the Poster
- During Lunchtime Tutorials



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In order to meet the needs of the next generation ARMClimate Research Facility, the ARM website (www.arm.gov) will undergo a redesign in 2015. We want to know what you think. Please fill out this short survey.

What issues or challenges do you currently face with the ARM website?

For which of the following reasons do you visit this website?

- ☐ Learn about ARM
- ☐ Order data
- ☐ Propose a campaign
- ☐ Read news
- ☐ Submit a research highlight/publication
- ☐ Other

How often do you visit this website?

- ○ Daily
- ○ Weekly
- ○ Monthly
- ○ Other

What aspects of the website do you like?

What would you like to see added to the website?

How often are you likely to access this website using a mobile device?

- ○ Never
- ○ Rarely
- ○ Sometimes
- ○ Most of the time
- ○ Not sure

You may self-identify below, or leave blank to answer annonymously.

Name
Email

Submit Survey

A Few ARM-Oriented Sessions

Next generation/Data

- Next Generation Data Analysis Tools (Wed 1:30-3:30)
- Assessing and communicating measurement uncertainties and data quality (Thurs 10:30-12:30)

Measurements

- Varied set of sessions last night
- Vertical Velocity (Wed 1:30-3:30)
- Land-Atmosphere-Cloud Interactions (Thurs 8:00-10:00)
- Precipitation Measurements (Thurs 10:30-12:30)
- Radar simulators (Thurs 1:30-3:30)