

ARM & ASR / EU Joint Workshop

Summary Report

Hilton Washington DC/Rockville

February 22, 2013

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BER / CESD



U.S. DEPARTMENT OF
ENERGY

Office
of Science

Office of Biological
and Environmental Research

Workshop

Goals of Workshop

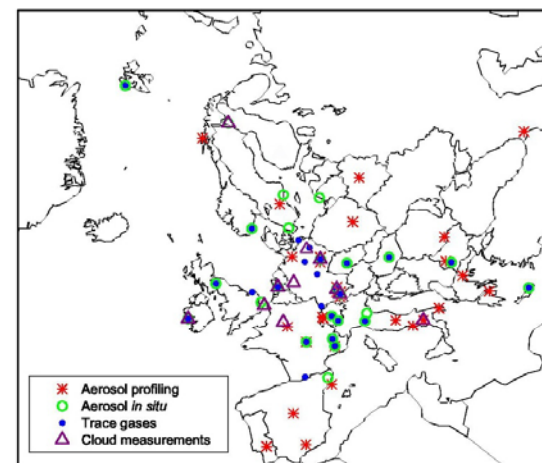
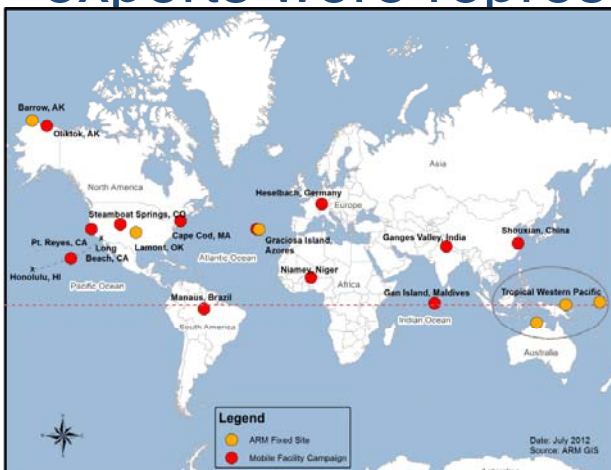
- Identify outstanding climate change science challenges of common interest to US and the EU
- Develop joint observational strategies and data sharing to address common challenges
- Explore a set of actions to enhance collaborations via funding instruments and common infrastructures

Scientific scope:

- Process studies: clouds, aerosols, and precipitation
- Observational strategies: ground- and aerial-based observations.

Participants

- November 6–8, 2012 in Renaissance Hotel, Washington, DC
- 36 noted scientists were invited – 18 US and 18 European
- 8 Countries represented: Finland, France, Germany, Ireland, Italy, the Netherlands, United Kingdom, United States
- Observational, process research, and modeling experts were represented



Meeting Agenda

- Day 1:
 - develop a catalog of S&T questions that drive both EU and US priorities. The discussion guidelines were to address the critical scientific uncertainties that benefit from collaborations between the European and U.S. climate scientists
 - ***The science questions were the basis of discussion for the next two days.***
- Day 2
 - discuss observation strategies to address each of the identified science questions of common bilateral interest.
- Day 3
 - determine the best strategies for coordination among the ARM and European programs.
 - Opportunities for collaboration between EU and DOE centers and scientists identified and explored.

Scientific Questions – common to EU and DOE - derived from working groups

1. What is the distribution of aerosol properties for the Atmospheric Model Intercomparison Project (AMIP) period (i.e., since 1979)?
2. What is the coupling among microphysics, aerosols, and cloud dynamics as a function of scale and regime (e.g., vertical velocity or stability)?
3. How are precipitation, water vapor and cloudiness coupled, and what roles does organization play in this coupling?
4. How do clouds and precipitation couple with surface properties?
5. What is the response of clouds to warming?
6. What is the response of the probability density function (PDF) of precipitation to warming?

Observational Strategies – Guidance to workshop discussions

- The discussion guidelines to address the geophysical variables needed, including accuracy and resolution (vertical, spatial, temporal) needs.
- The breakout groups to address the type of correlated data sets (synergy) needed to address the scientific questions.
- The participants to discuss the best mix of laboratory, campaign mode, and long-term data sets.

Key Workshop Recommendations

1. Establish a bilateral steering committee
 - Develop collaboration mechanisms and instruments
 - Oversee parallel bilateral working groups
 - Develop and execute strategies of common interest
2. Establish a set of six working groups (WGs) to coordinate among the key DOE and EU ground-based remote sensing centers
 - Radar calibration
 - Microwave radiometry
 - Retrievals including instrument simulators
 - Integrated Data Portal
 - Initialization Data Sets
 - Operational use of Large Eddy Simulations at supersites and during field campaigns
3. Coordinate participation in major field campaigns
 - GOAmazon FY14-15
 - Atlantic Observations FY14-15
 - Arctic Sea Ice Study FY16
 - Southern Ocean Observations tbd

Subsequent actions: post-workshop

1. Steering Committee established, meeting once each month to ensure progress, and coordinate bilateral team meetings, develop strategies, and execute plans
 - Wanda Ferrell, BER
 - Susanne Crewell, University of Cologne
 - Ashley Williamson, BER
 - Gelsomina Pappalardo, Institute of Methodologies for Environmental Research - Italian National Research Council
 - Björn Stevens, Max-Planck-Institut für Meteorologie
- First action
 - Establish the six working groups, each with mission to explore actionable collaborations to be taken to Steering Committee for decision (and execution).

WG Radar calibration Current Activities and Plans

Goal:

Combine radar experts from the ARM and European observatories to initiate common traceable methods for cloud radar calibration.

Co-Chairs:

Nitin Bharadwaj
Herman Russchenberg



WG Microwave Radiometers

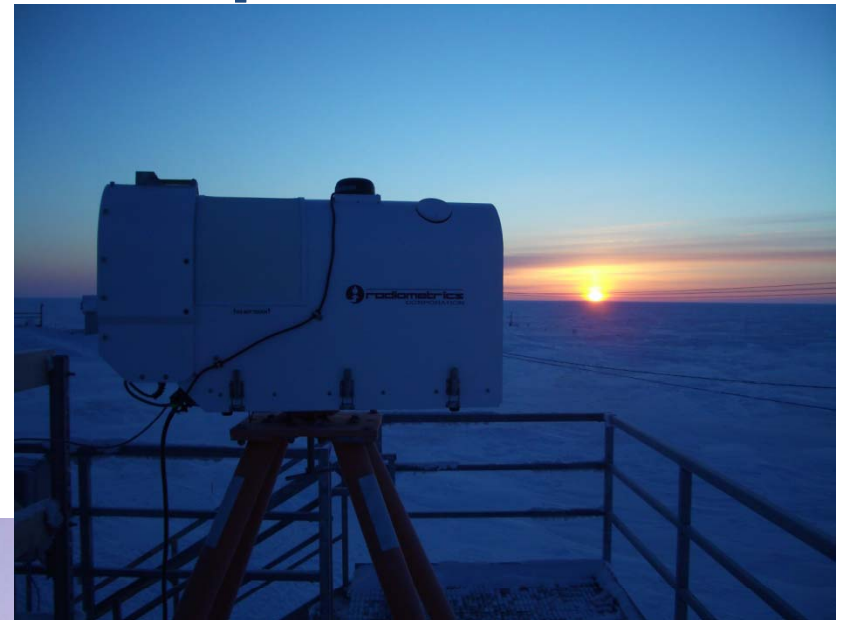
Current activities and plans

Microwave radiometers –
Comprising radiometer experts from and the European MWRnet, develop a set of collaboration mechanisms that leads to a common procedure on the data flow of operational microwave radiometer measurements.

Co-chairs:

Nico Cimini

Maria Cadeddu



WG Retrievals

Current Activities and Plans

Retrievals – Combining data retrieval experts of ARM and the Cloudenet, EG-CLIMET, and HD(CP)2 communities, develop mechanisms to enhance collaboration on the retrieval of the cloudy, thermodynamic atmospheric state through ground-based remote sensing. This will also address instrument simulators, which should be developed and used to exploit the full potential of the ground-based remote sensing measurements (lidar, cloud radar, radiometer).

First step is an U.S./EU workshop scheduled for mid-May in Cologne

Co-chairs:

Jennifer Comstock
Ulrich Löhnert



WG Large Eddy Simulation Current Activities and Plans

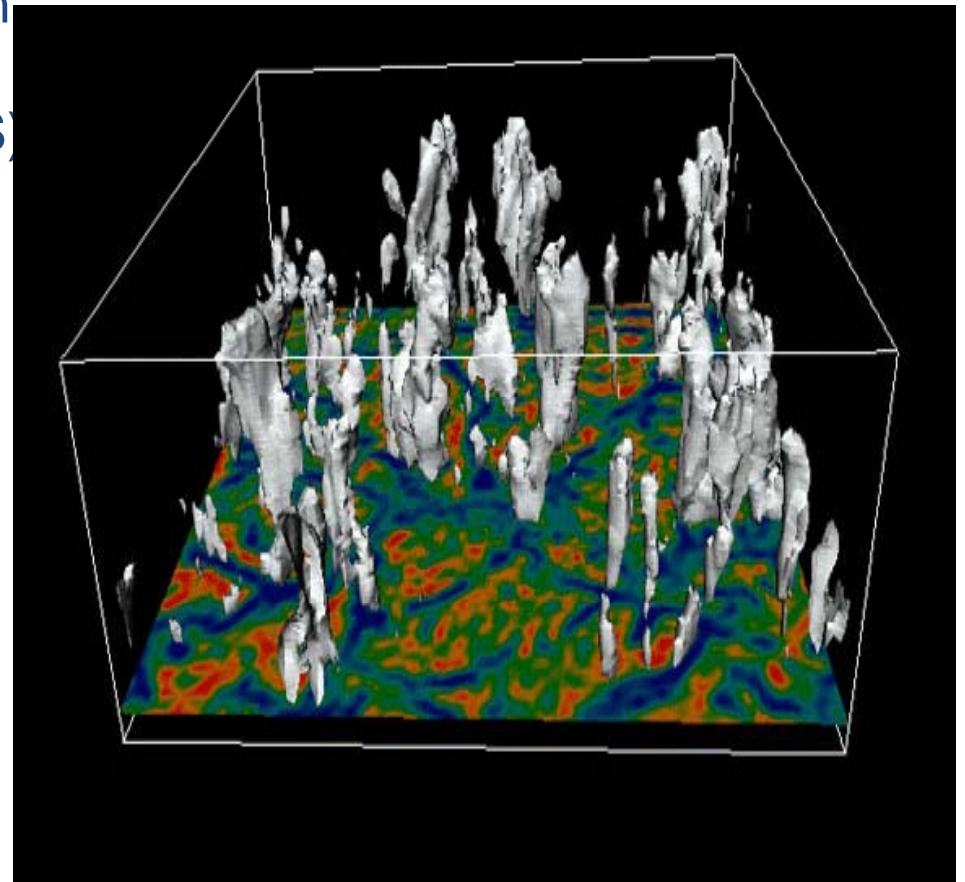
Large Eddy Simulations :

Combining ARM/ASR and European expertise, evaluate the operational use of Large Eddy Simulations (LES) at supersites and during field experiments. Experiences from the Cabauw site will serve as a prototype whose procedures should be transferred to the SGP site (RACORO campaign) and later to others

Co-chairs:

Felix Ament

Graham Feingold



WG Integrated data portal

Current Activities and Plans

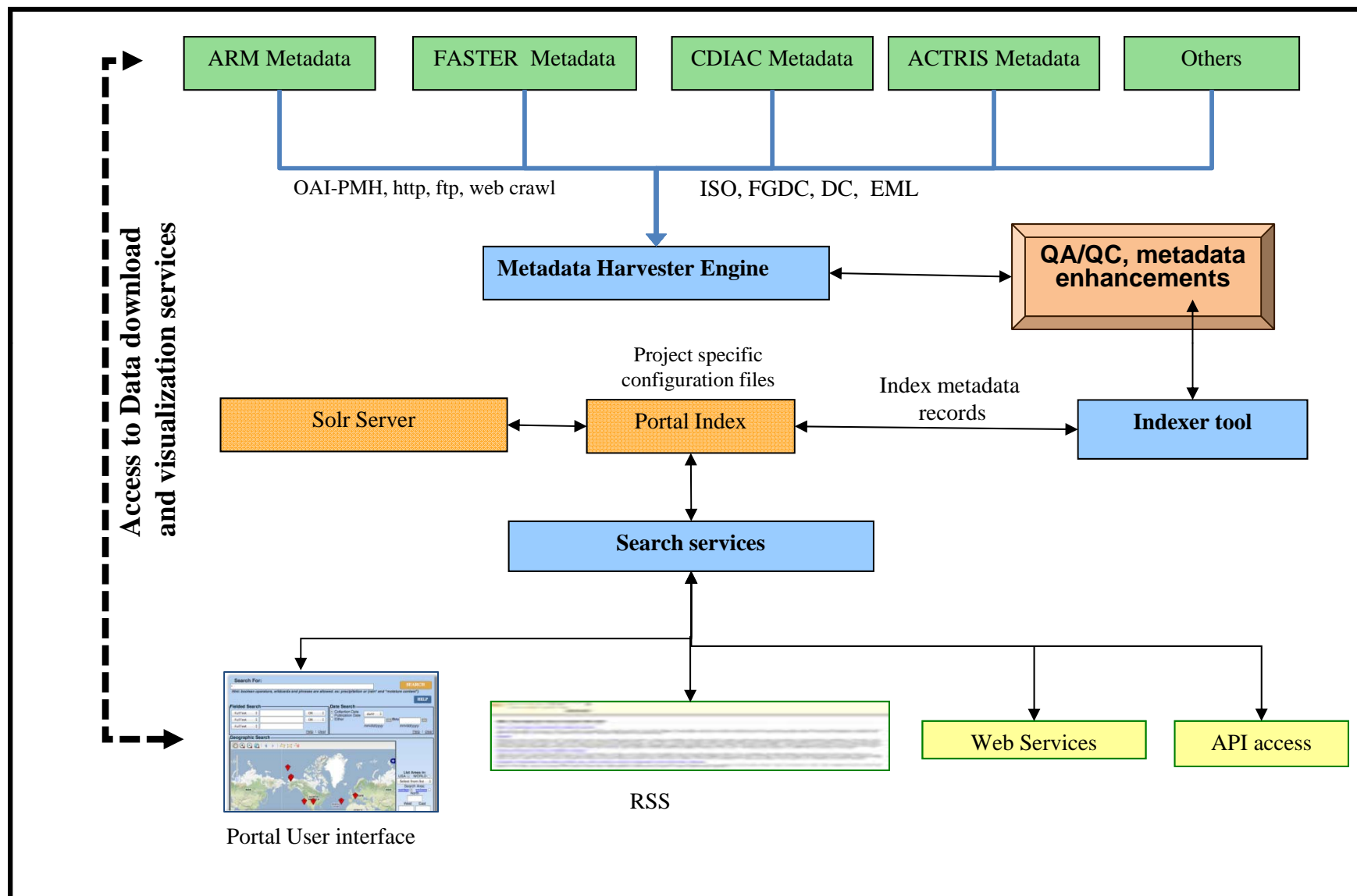
Integrated Data Portal - : Combining experts involved in both ARM and EU facility data informatics, develop the architecture, standards, and framework for an integrated portal and document the metadata, products, and related information. Focus products toward scientific utility. Identify tasks and form working groups as necessary to define scope.

This activity will furthermore serve to contribute to broader BER goals to advance a next generation data informatics capacity in support of the climate, environmental, and biological sciences

Co-Chairs:

Jimmy Voyles
Ewan O'Connor

Portal Architecture



Portal Search Functionalities

Search For:

SEARCH

Hint: boolean operators, wildcards and phrases are allowed. ex: precipitation or (rain and "moisture content")*

HELP

Fielded Search

FullText	<input type="text"/>	OR	<input type="text"/>
FullText	<input type="text"/>	OR	<input type="text"/>
FullText	<input type="text"/>		

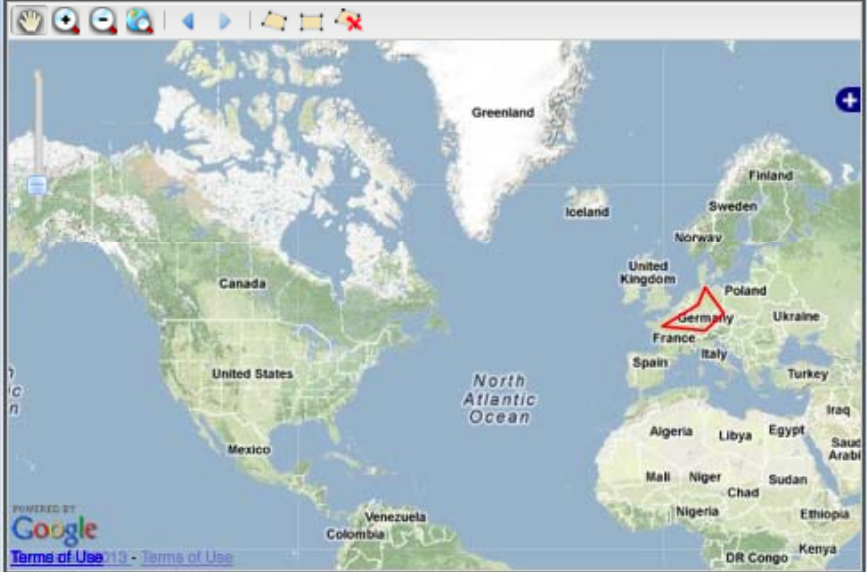
[Help](#) | [Clear](#)

Date Search

during thru
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[Help](#) | [Clear](#)

Geographic Search



Include Global datasets

List Areas in: USA WORLD

Select from list

Search Area: overlaps encloses

North
53.9560
West East
-0.3515 14.7656
South
47.2792

[Help](#) | [Clear](#)

Data Type

All
Model Data
Observational Data

Data Providers

All
Atmospheric Radiation Measurement (ARM)
Carbon Dioxide Information Analysis Center (CDIAC)
Earth System Grid Federation (ESGF)
Next-Generation Ecosystem Experiments Data (NGEE)

- Multiple search options
- Flexible spatial search
- Build complex search criteria

WG Initialization Data Sets Current Activities and Plans

Initialization Data Sets - Combining researchers from both the global climate modeling (GCM) and large eddy simulation (LES) communities, determine which specific data sets from ARM and European facilities can be used to improve initialization (scale and temporal) and evaluation of process and prediction models.



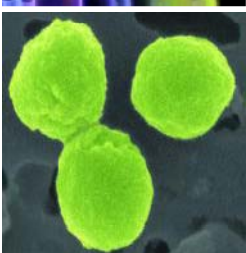
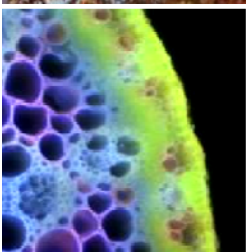
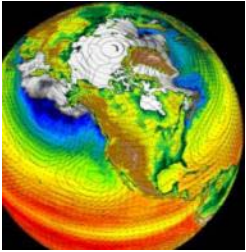
Co-chairs:

Martial Haeffelin
Shaocheng Xie

WG workshops

Current Activities and Plans

Workshops will be convened by PIs to discuss how to proceed on each campaign.



Systems science to meet DOE mission needs in bioenergy, climate and the environment.

<http://science.energy.gov/ber>

Thank you!



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