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Atmospheric Radiation Measurement Climate Research Facility Operations Quarterly Report

January 1–March 31, 2012



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**Atmospheric Radiation Measurement
Climate Research Facility
Operations Quarterly Report**

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1.0 Data Availability

Description. Individual raw datastreams from instrumentation at the Atmospheric Radiation Measurement (ARM) Climate Research Facility fixed and mobile sites are collected and sent to the Data Management Facility (DMF) at Pacific Northwest National Laboratory (PNNL) for processing in near real-time. Raw and processed data are then sent approximately daily to the ARM Data Archive, where they are made available to the research community. For each instrument, we calculate the ratio of the actual number of processed data records received daily at the Archive to the expected number of data records. The results are tabulated by (1) individual datastream, site, and month for the current year and (2) site and fiscal year (FY) dating back to 1998.

The U.S. Department of Energy (DOE) requires national user facilities to report time-based operating data. The requirements concern the:

- Actual hours of operation (ACTUAL) – 24 hours per day, 91 days or 2184 hours for this quarter
- Estimated maximum operation or uptime goal (OPSMAX)
- Variance (VARIANCE), which is equal to $[1 - (\text{ACTUAL}/\text{OPSMAX})]$.
- The OPSMAX and VARIANCE numbers account for unplanned downtime.

For this reporting period the OPSMAX times for the fixed ARM research sites were:

- Southern Great Plains (SGP) site is **2074.8** hours (0.95 x ACTUAL)
- North Slope Alaska (NSA) locale is **1965.6** hours (0.90 x ACTUAL)
- Tropical Western Pacific (TWP) locale is **1856.4** hours (0.85 x ACTUAL).

The first ARM Mobile Facility (AMF1) deployment is operational in the Ganges Valley, India. However, due to operational data review constraints, data statistics are not reported.

The second AMF (AMF2) facility has just completed the ARM Madden-Julian Oscillation (AMIE) field campaign on Gan Island, Maldives, and is currently being packed up for relocation to the United States in preparation for the Marine ARM GPCI Investigation of Clouds (MAGIC) field campaign.

The differences in OPSMAX performance reflect the complexity of local logistics and the frequency of extreme weather events. It is impractical to measure OPSMAX for each instrument or datastream. Data availability reported here refers to the average of the individual, continuous datastreams that have been received by the Archive. Therefore, data availability is directly related to individual instrument uptime expressed in hours. Data not at the Archive are caused by downtime (scheduled or unplanned) of the individual instruments. Missing data due to scheduled downtime are not included in the metrics. Thus, the

average percentage of data in the Archive represents the average percentage of the time the instruments were operating this quarter.

Summary. Table 1 shows the accumulated maximum operation time (planned uptime), actual hours of operation, and variance (unplanned downtime) for the fixed sites. Because the AMFs operate episodically, the AMF statistics are reported separately and not included in the aggregate average with the fixed sites. The average of the fixed sites met our goal this quarter.

Table 1. Operational statistics for the fixed ARM sites and mobile facilities for this reporting period.

Site	Hours Of Operation			Data Availability	
	OPSMAX	Actual	Variance	Goal	Actual
NSA	1965.6	2118.48	-0.0778	90.00%	97.00%
SGP	2074.8	2096.64	-0.0105	95.00%	96.00%
TWP	1856.4	2009.28	-0.0824	85.00%	92.00%
Site Average	1965.6	2074.8	-0.0556	90.00%	95.00%
AMF1 Nainital, India	N/A	N/A	N/A	N/A	N/A
AMF2 Gan Island, Maldives	2074.8	2074.8	0	95.00%	95.00%

2.0 Scientific Users

Description. The Site Access Request System is a web-based database used to track visitors to the fixed and mobile sites, all of which have facilities that can be visited. The NSA locale has the Barrow site. The SGP site has historically had a Central Facility, 23 extended facilities, 4 boundary facilities, and 3 intermediate facilities. Beginning in October 2009, the SGP began a transition to a smaller footprint (150 km x 150 km) by rearranging the original and new instrumentation made available through the American Recovery and Reinvestment Act (ARRA). The Central Facility and 5 extended facilities will remain, with 8 new surface characterization facilities, 4 radar facilities, and 3 profiler facilities sited in the smaller domain. We are planning to add 2 new extended facilities over the next 12–24 months that will be Ameriflux-quality eddy correlation flux measurement (ECOR) sites. This new configuration will provide observations at scales more appropriate to current and future climate models. The transition to the smaller footprint is ongoing through this quarter. The TWP locale has the Manus, Nauru, and Darwin sites. These sites will also have expanded measurement capabilities with the addition of new instrumentation made available through ARRA funds. AMF1 is operational in India this quarter, but data delivery from the site is governed by a review process limited by Indian collaborators. AMF2 was operational on Gan Island, Maldives, earlier this quarter; however, it is now being packed up for shipment to the United States in preparation for the MAGIC field campaign.

Users can participate in field experiments at the sites and mobile facilities, or they can participate remotely. Therefore, there are a variety of mechanisms provided to users to access site information. Users

who have immediate (real-time) needs for data access can request a research account on the local site data systems. This access is particularly useful to users for quick decisions in executing time-dependent activities associated with field campaigns at the fixed site and mobile facility locations. The eight computers for the research accounts are located at the Barrow site; the SGP Central Facility; the TWP Manus, Nauru, and Darwin sites; the AMFs; and the DMF at PNNL. However, users are warned that data provided at the time of collection are not fully screened for quality, and therefore, are not considered to be official ARM data. Hence, these accounts are considered to be part of the facility activities associated with field campaign activities, and users are tracked. Fully screened and approved ARM data are officially requested through the ARM Data Archive.

In addition, users that visit sites can connect their computer or instrument to an ARM site data system network, which requires an on-site device account. Remote (off-site) users can also have remote access to any ARM instrument or computer system at any ARM site, which requires an off-site device account. These accounts are also managed and tracked.

Official ARM data collected through the routine operations and scientific field experiments at the fixed sites and mobile facility that have passed through the formal data quality review process are stored at and distributed through the Archive. The Archive receives fully quality assured data within 24–48 hours of the collection and processing of data that takes place at the DMF. These data are available to the public free of charge.

DOE requires national user facilities to report facility use by total visitor days—broken down by institution type, gender, race, citizenship, visitor role, visit purpose, and facility—for actual visitors and for active user research computer and Archive accounts. This information is maintained but not presented in this report. Visitor role and visit purpose information are used to identify scientific users. Based on the user self-provided information about their role and visit purpose, the following types of users categorized as scientific users are: Principal and Co-Principal Investigators, Post Doctorates, Graduate Students, Undergraduate Students, Infrastructure Instrument Mentors, and Infrastructure Chief and Site Scientists. Although there are other categories that can be identified, they are considered non-scientific. They are reported here for completeness.

This quarterly report provides the cumulative numbers of scientific user accounts by site. Only scientific users are officially counted, and they are determined by the sum of unique scientific users for each of the ARM Facility components. As before, all user accounts are established for a period of up to one year and must be renewed. To report users, we count the number of active users for the previous 12 months during the last month of the quarterly reporting period.

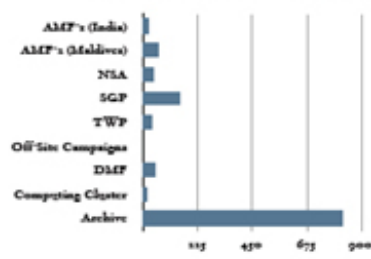
Summary. Figure 1 shows the summary of cumulative scientific and non-scientific users for the previous 12 months and the summary of scientific users' affiliation. In addition to the AMFs and fixed site campaigns, ARM supports field campaigns that are not located with any of the fixed sites (i.e., off-site campaigns). For a complete listing of all field campaigns, please refer to the ARM website at: <http://www.arm.gov/campaigns/table>.

ARM CLIMATE RESEARCH FACILITY SCIENTIFIC USERS

Unique Scientific Users by Facility Component

Description	Users
AMF-1 (India)	22
AMF-2 (Maldives)	65
NSA	40
SGP	133
TWP	38
Off-Site Campaigns	0
DMP	50
Computing Cluster	17
Archive	823
TOTAL	1,208

Unique Scientific Users by Facility Component



Unique Non-Scientific Users by Facility Component

Description	Users
AMF-1 (India)	10
AMF-2 (Maldives)	12
NSA	45
SGP	127
TWP	20
Off-Site Campaigns	0
DMP	70
Computing Cluster	22
Archive	84
TOTAL	390

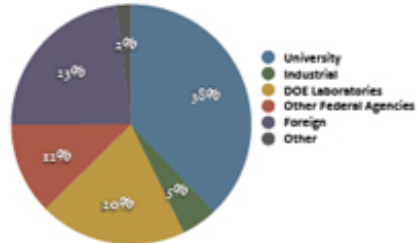
Unique Non-Scientific Users by Facility Component



FY2012 Q2 Science User Summary

Description	Users
University	438
Industrial	38
DOE Laboratories	240
Other Federal Agencies	149
Foreign	278
Other	25
TOTAL	1,208

FY2012 Q2 Scientific Users



Science User Summary

Description	Users
University	433
Industrial	37
DOE Laboratories	224
Other Federal Agencies	132
Foreign	251
Other	119
TOTAL	1,216

Scientific Users

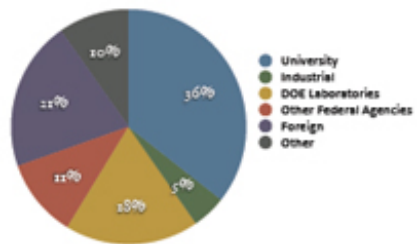


Figure 1. Summary of ARM scientific users.

3.0 Safety

For reporting purposes, the three ARM sites and the two AMFs operate 24 hours per day, 7 days per week, and 52 weeks per year. Time is reported in days instead of hours. If any lost work time is incurred by any employee, it is counted as a workday loss. Table 2 reports the consecutive days since the last recordable or reportable injury or incident causing damage to property, equipment, or vehicles for this reporting period. There were no recordable lost workday cases or reportable injury or incidents causing damage to property, equipment, or vehicles reported.

Table 2. Consecutive days of injury-free * operation, for this reporting period.

ES&H Category	NSA	SGP	TWP	AMF1	AMF2
Days Worked without a Lost-Time Incident	91	91	91	91	91
Days Worked without a Recordable Accident	91	91	91	91	91
Days Worked without a Property Damage Incident	91	91	91	91	91
Days Worked without a Reportable Loss to Vehicles	91	91	91	91	91
*“Injury-free” is defined as days without a recordable lost-time incident or property damage incident.					



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