U.S. DEPARTMENT OF ENERGY | Office of Science

DOE/SC-ARM-12-021

Atmospheric Radiation Measurement Climate Research Facility Operations Quarterly Report

July 1–September 30, 2012

ARM

CLIMATE RESEARCH FACILITY

DISCLAIMER

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1.0 Data Availability

1.1 Description

Individual datastreams from instrumentation at the Atmospheric Radiation Measurement (ARM) Climate Research Facility fixed and mobile research sites are collected and routed to the Data Management Facility (DMF) for processing in near-real-time. Instrument and processed data are then delivered approximately daily to the ARM Data Archive, where they are made freely available to the research community. For each instrument, we calculate the ratio of the actual number of processed data records received daily at the Data 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, 92 days or 2208 hours for this quarter
- Estimated maximum operation or uptime goal (OPSMAX)
- Variance (VARIANCE), which is equal to [1 – (ACTUAL/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 **2907.6** hours (0.95 x ACTUAL)
- North Slope Alaska (NSA) locale is **1987.2** hours (0.90 x ACTUAL)
- Tropical Western Pacific (TWP) locale is **1876.8** hours (0.85 x ACTUAL).

The SGP site has a spatial dimension of 150 km x 150 km including the Central Facility, 5 extended facilities, 8 new surface characterization facilities, 4 radar facilities, and 3 profiler facilities sited within the domain. The NSA locale has the Barrow site. The TWP locale has the Manus, Nauru, and Darwin sites.

The first ARM Mobile Facility (AMF1) is now deployed at Cape Cod, Massachusetts, to support the Two-Column Aerosol Campaign (TCAP). The TCAP campaign began on July 1, 2012.

The second AMF (AMF2) is now onboard the cargo ship Horizon in support of the Marine ARM GPCI Investigation of Clouds (MAGIC) field campaign. The MAGIC field campaign began on October 1, 2012.

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.

1.2 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	1987.2	2009.28	-0.0111	90.00%	91.00%
SGP	2097.6	2053.44	0.0211	95.00%	93.00%
TWP	1876.8	1898.88	-0.0118	85.00%	86.00%
Site Average	**1987.2**	**1987.2**	**0.0000**	**90.00%**	**90.00%**
AMF1 Cape Cod, MA	N/A	N/A	N/A	N/A	77.00%
AMF2 Horizon- CA, HI	N/A	N/A	N/A	N/A	N/A

2.0 Scientific Users

2.1 Description

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. 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. 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. 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.

2.2 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.

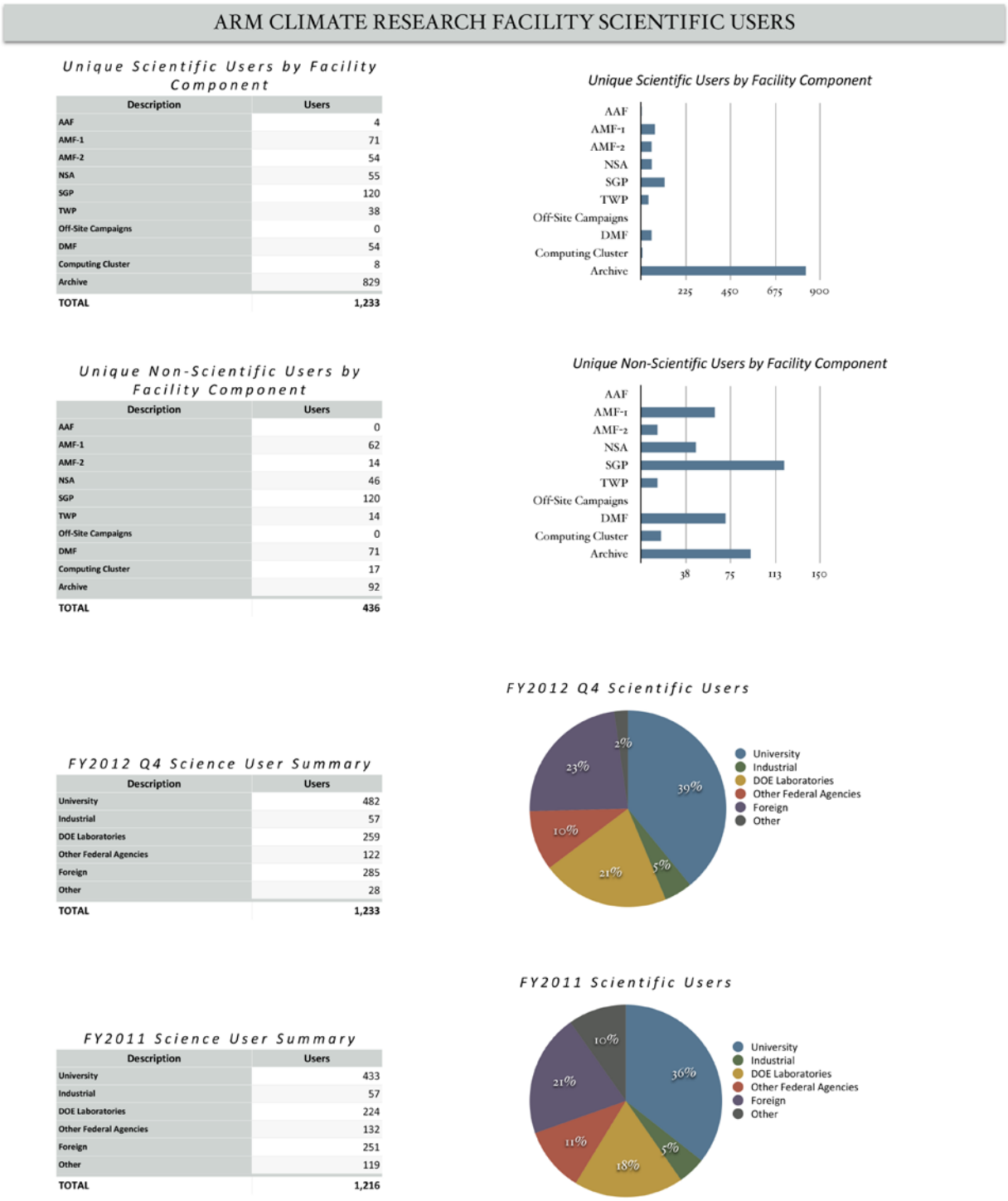

Figure 1. Summary of ARM scientific users.

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	92	92	92	92	92
Days Worked Without a Recordable Accident	92	92	92	92	92
Days Worked Without a Property Damage Incident	92	92	92	92	92
Days Worked Without a Reportable Loss to Vehicles	92	92	92	92	92
*"Injury-free" is defined as days without a recordable lost-time incident or property damage incident.					

Table 3 reports consecutive days since the last recordable lost-time incident or property damage incident:

- for the fixed sites for the period beginning October 1, 1998
- for AMF1 for the period beginning January 1, 2004
- for AMF2 for the period July 1, 2010 to the end of this reporting quarter, September 30, 2012.

Table 3. Consecutive days since the last recordable lost-time incident or property damage incident .

ES&H Category	NSA	SGP	TWP	AMF1	AMF2
Days Worked Without a Lost-Time Incident	5111	1878	5111	3194	823
Days Worked Without a Recordable Accident	5111	1878	5111	3194	823
Days Worked without a Property Damage Incident	5111	5111	5111	3194	823
Days Worked without a Reportable Loss to Vehicles	5111	5111	5111	3194	823

SGP has had four lost workday cases and one recordable medical case to date:

- FY1998: 2 lost days restricted work for lower back sprain

- FY1999: 14 lost days for fracture of wrist (slipped and fell on ice after hail storm)
- FY2000: 162 lost days and 130 restricted days due to an alleged injury from a congenital defect to back.

SGP FY2006: Recordable medical treatment cases: (1) A technician sustained a tick bite in April 2006, was seen by a physician, and was treated with an antibiotic. There was no lost time from this incident.

SGP FY2007–2008: 45 lost days and 10 restricted days due to an alleged back injury. A technician alleged that he injured his back when he stepped in a hole at a remote field site. An additional 125 lost days have been added for FY2008 for a total of 180 days lost. Said technician continues to be off work pending disposition by Workman's Compensation. No change as of March 31, 2010. Note: The SGP site is under new management; thus, this incident has been closed out effective July 1, 2010.

4.0 Publications

As an additional measure of performance, this quarterly report includes the number of publications that are based on ARM data, with emphasis on this year's contribution but also summarizing historical data, collection of which began in 1990. The publication categories are (1) abstracts or presentations at conferences, (2) technical reports, (3) books, (4) book chapters, (5) journal articles, and (6) papers in conference proceedings.

Table 4 shows the number of publications by category for 1990 through September 2011, the number of publications for FY2012, and the total of publications for 1990 through September 2012. Publications numbers may vary from year to year as items are added retroactively to the database. Therefore, the most current report reflects the most accurate tally of publications.

Table 4. Number of publications that use ARM data.

Category	1990 to September 2011	FY 2012	1990 to September 2012
Abstracts or Presentations	2781	242	3023
Technical Reports	359	26	385
Books	13	1	14
Book Chapters	65	1	66
Journal Articles	2707	123	2830
Conference Papers	2007	3	2010

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