U.S. DEPARTMENT OF ENERGY

DOE/SC-ARM-11-008

Atmospheric Radiation Measurement Program Climate Research Facility Operations Quarterly Report

January 1–March 31, 2011

ARM

CLIMATE RESEARCH FACILITY

DISCLAIMER

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Contents

Tables

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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 users. 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); the estimated maximum operation or uptime goal (OPSMAX), which accounts for planned downtime; and the VARIANCE [1 – (ACTUAL/OPSMAX)], which accounts for unplanned downtime. The OPSMAX time for the second quarter of FY2011 for the Southern Great Plains (SGP) site is 2052 hours (0.95 × 2160 hours this quarter). The OPSMAX for the North Slope Alaska (NSA) locale is 1944 hours (0.90 × 2160) and for the Tropical Western Pacific (TWP) locale is 1836 hours (0.85 × 2160). The first ARM Mobile Facility (AMF1) deployment in Graciosa Island, the Azores, Portugal, completed its mission last quarter and is currently in transit to its next deployment location. Therefore, there are no data statistics to report this quarter. The second ARM Mobile Facility (AMF2) began its inaugural deployment last quarter to Steamboat Springs, Colorado. Therefore, the OPSMAX time for the AMF2 is 2052 hours (.95 × 2160 hours) for this quarter. 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 Data 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 Data Archive represents the average percentage of the time (24 hours per day, 90 days or 2160 hours for this quarter) 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 period January 1–March 31, 2011, 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. This second quarter comprises a total of 2160 possible hours for the fixed sites and the AMF2. The average of the fixed sites met our goal this quarter. The AMF1 has essentially completed its mission and is transit for its next deployment to India. The AMF2 did not meet its goal for this second quarter, but no data were lost or missing, except for a small time

period of surface flux data that were lost because of a failed sensor. There were two instruments that did not have ingests at the time of this report, so only raw data were available. When the ingests are completed, all processed data will be available to users at the Data Archive.

Table 1. Operational Statistics for the Fixed ARM Sites and Mobile Facilities for the Period January 1–March 31, 2011.

	Hours Of Operation			Data Availability	
Site	Opsmax	Actual	Variance	Goal	Actual
NSA	1944.00	1900.80	+0.0222	0.90	0.88
SGP	2052.00	2052.00	+0.0000	0.95	0.95
TWP	1836.00	1879.20	-0.0235	0.85	0.87
Site Average	1944.00	1944.00	-0.0000	0.90	0.90
AMF1 Azores, PT	N/A	N/A	N/A	N/A	N/A
AMF2 Colorado, USA	2052.00	1900.80	+0.0741	0.95	0.88

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 and Atqasuk sites. Beginning in October 2010, the Atqasuk site initiated a process to close down the site, so there are fewer datastreams this reporting period. 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 4 extended facilities will remain, but there will be up to 12 new surface characterization facilities, 4 radar facilities, and 3 profiler facilities sited in the smaller domain. 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. It is anticipated that the new instrumentation at all the fixed sites will be in place by the end of FY2011. Last quarter, the AMF1 completed its 20-month deployment in Graciosa Island, Azores, Portugal. The AMF1 is currently in transit to India this quarter, and the new ARRA observational capabilities will be added to the AMF1 during setup in India. The second ARM Mobile Facility (AMF2) started operations last quarter in Steamboat Springs, Colorado, in support of the Storm Peak Lab Cloud Property Validation Experiment (STORMVEX). The data from the first field deployment of AMF2 will be used to validate ARM-developed algorithms that convert the remote sensing measurements to cloud properties for liquid and mixed-phase clouds. New ARRA observational capabilities were added to AMF2 in Colorado as they become available this quarter and are described elsewhere (http://www.arm.gov/about/recovery-act).

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 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 facilities that have passed through the formal data quality review process are stored at and distributed through the Data Archive. The Data 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 Data 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 for the period April 1, 2010–March 31, 2011. 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. Table 2 shows the summary of cumulative scientific and non-scientific users for the period April 1, 2010–March 31, 2011. While the number of ARM unique users was 1513 in total, 1112 were characterized as unique scientific users. 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: http://www.arm.gov/campaigns/table. The large increase in users this period is mostly attributed to the AMF2 STORMVEX field campaign and data being pulled form the Data Archive for the preparation of reports and presentations at the Atmospheric System Research Science Team Meeting that took place this second quarter.

Table 2. Summary of ARM Scientific Users for the Period April 1, 2010–March 31, 2011.

ARM Facility Component	Unique Scientific Users	Unique Non-Scientific Users
AMF1 (Azores)	17	15
AMF2 (Colorado)	146	43
NSA	32	44
SGP	80	152
TWP	28	27
Off-Site Campaigns	0	0
DMF	43	60
Data Archive	766	60
Total	1112	401

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 3 reports the consecutive days since the last recordable or reportable injury or incident causing damage to property, equipment, or vehicles for the period January 1–March 31, 2011. There were no recordable lost workday cases or reportable injury or incidents causing damage to property, equipment, or vehicles reported for the second quarter of FY2011.

Table 3. Consecutive Days of Injury-Free Operation,* January 1–March 31, 2011.

ES&H Category	NSA	SGP	TWP	AMF1	AMF2
Days Worked without a Lost-Time Incident	90	90	90	90	90
Days Worked without a Recordable Accident	90	90	90	90	90
Days Worked without a Property Damage Incident	90	90	90	90	90
Days Worked without a Reportable Loss to Vehicles	90	90	90	90	90
*"Injury-free" is defined as days without a recordable lost-time incident or property damage incident.					

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