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## **ARM Climate Research Facility Quarterly Value-Added Product Report**

C Sivaraman

October 2014



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# **ARM Climate Research Facility Quarterly Value-Added Product Report**

**Fourth Quarter:  
July 1 to September 30, 2014**

C Sivaraman

October 2014

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## Abstract

The purpose of this report is to provide a concise status update for Value-Added Products (VAPs) implemented by the Atmospheric Radiation Measurement (ARM) Climate Research Facility. The report is divided into the following sections: (1) new VAPs for which development has begun; (2) progress on existing VAPs; (3) future VAPs that have been recently approved; (4) other work that leads to a VAP; (5) top requested VAPs from the ARM Data Archive; and (6) a summary of VAP and data releases to production and evaluation;. New information is highlighted in **blue text**. New information about processed data by the developer is highlighted in **red text**. The upcoming milestones and dates are highlighted in **green**.

## Acknowledgements

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## **1.0 New Value-Added Products (VAPs)**

This section describes new activities that have begun in the last quarter after being approved by the ARM Infrastructure and Science Team.

### **1.1 Areal Averaged Spectral Surface Albedo**

Translator: Laura Riihimaki, Pacific Northwest National Laboratory

Developer: Krista Gaustad, Pacific Northwest National Laboratory

Engineering Change Order-01094 was approved to implement an algorithm developed to calculate the white-sky areal average albedo from only an upward-looking MFRSR during overcast conditions.

### **1.2 ARM Best Estimate 2-Dimensional Grid (ARMBE2DGRID)**

Translator: Shaocheng Xie, Lawrence Livermore National Laboratory

Developer: Qi Tang, Lawrence Livermore National Laboratory

Engineering Change Order-01080 was approved to merge various datastreams together and interpolate them onto a common 2D grid with a uniform temporal resolution of a one-hour interval, the same as that used in current ARMBE data sets.

### **1.3 ARM Best Estimate 2-Dimensional Station-Based (ARMBE2DSTNS)**

Translator: Shaocheng Xie, Lawrence Livermore National Laboratory

Developer: Qi Tang, Lawrence Livermore National Laboratory

Engineering Change Order-01080 was approved to develop an hourly station-based surface data set that contains the same variables as in ARMBE2DGRID.

### **1.4 Clutter Removal in Radar Wind Profiler (RWP) Doppler Spectra (RWPCLUT)**

Translator: Scott Collis, Argonne National Laboratory

Developer: Jonathan Helums, Argonne National Laboratory

Engineering Change Order-01091 was approved to identify non-atmospheric returns in the Doppler spectra data from the radar wind profiler for improved estimation of moments and winds.

## 2.0 Existing VAPs

This section describes the status of each VAP and the ongoing activities that were approved to improve the performance of, or maintain, existing VAPs. The information is extracted primarily from the monthly updates provided by the development team in the Engineering Change Orders (ECOs).

### 2.1 ARM Cloud Retrieval Ensemble Data Set (ACRED)

Translator: Shaocheng Xie, Lawrence Livermore National Laboratory

Developer: Chuanfeng Zhao and Renata McCoy, Lawrence Livermore National Laboratory

Status: In Development

Tier: Evaluation

Engineering Work Order-13590 has been approved to address the uncertainty in cloud retrievals and provide three different retrievals at the five ARM fixed research sites.

[Finished the analysis for the ice cloud case on March 9, 2000.](#)

[Next Milestone: Provide MICROBASE data with error bars for a selected intensive operational period \(IOP\), Spring Cloud IOP in 2000, for evaluation and discussion by August 30, 2014.](#)

### 2.2 Atmospherically Emitted Radiance Interferometer Noise Filter (AERINF)

Translator: Laura Riihimaki, Pacific Northwest National Laboratory

Developer: Tim Shippert, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

There are no open ECOs for this VAP.

### 2.3 AERI Profiles of Water Vapor and Temperature (AERIPROF)

Translator: Laura Riihimaki, Pacific Northwest National Laboratory

Developer: Tim Shippert, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

## **2.4 Aerosol Best Estimate (AEROSOLBE)**

Translator: Connor Flynn, Pacific Northwest National Laboratory

Developer: Annette Koontz, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

There are no open ECOs for this VAP.

## **2.5 Aerosol Intensive Properties (AIP)**

Translator: Connor Flynn, Pacific Northwest National Laboratory

Developer: Annette Koontz, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

## **2.6 Aerosol Modeling Testbed (AMT)**

Translator: Jerome Fast, Pacific Northwest National Laboratory

Developer: Chen Song and Manish Shrivastava, Pacific Northwest National Laboratory

Status: Operational

Tier: Evaluation

Engineering Work Order-13683 has been approved to move data from the Brookhaven National Laboratory Aerosol Life Cycle IOP field campaign to the testbed.

[No progress has been made last quarter.](#)

[Next Milestone: The bundling of the processed final testbed has been pushed back.](#)

## **2.7 Aerosol Optical Depth (AOD) Derived from Either Multi-Filter Rotating Shadowband Radiometer (MFRSR) or Normal Incidence Multi-Filter Radiometer (NIMFR)**

Translator: Connor Flynn, Pacific Northwest National Laboratory

Developer: Connor Flynn, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

The Engineering Work Order 14994 has been opened to move the AOD VAP to the ARM Data Integrator (ADI).

The VAP has been ported and released. Reprocessing of historical data has begun.

## **2.8 Aerosol Observing System Cloud Condensation Nuclei Average (AOSCCNAVG)**

Translator: Connor Flynn, Pacific Northwest National Laboratory

Developer: Yan Shi, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

There are no open ECOs for this VAP.

## **2.9 Aerosol Observing System Correction (AOSCORR)**

Translator: Connor Flynn, Pacific Northwest National Laboratory

Developer: Annette Koontz, Pacific Northwest National Laboratory

Status: On Hold

Tier: Evaluation

Engineering Work Order-00934 was approved to apply instrument corrections and calibrations to handle the Brookhaven National Laboratory (BNL) Aerosol Observing System (AOS) datastream.

The original plan has been put on hold due to the discrepancies with the National Oceanic and Atmospheric Administration (NOAA) AOS data and BNL AOS data. A teleconference was held with key stakeholders in April 2014, and this task has been put on hold until the ingest work is completed.

## **2.10 ARM Best Estimate Atmospheric Measurements (ARMBEATM)**

Translator: Shaocheng Xie, Lawrence Livermore National Laboratory

Developer: Renata McCoy, Lawrence Livermore National Laboratory

Status: Operational

Tier: Production

Engineering Change Order-14547 has been approved to make corrections to produce ARMBE.

Development of ARMBEATM for the ARM Mobile Facility (AMF) China deployment is on hold until land data development has been completed.

## **2.11 ARM Best Estimate Cloud Radiation Measurements (ARMBECLDRAD)**

Translator: Shaocheng Xie, Lawrence Livermore National Laboratory

Developer: Renata McCoy, Lawrence Livermore National Laboratory

Status: Operational

Tier: Production

Development of ARMBECLDRAD for the AMF China deployment is on hold until land data set development has been completed

## **2.12 Active Remote Sensing of Clouds (ARSCL)**

Translator: Mike Jensen, Brookhaven National Laboratory

Developer: Karen Jones, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

## **2.13 Best Estimate Fluxes from Energy Balance Bowen Ratio (EBBR) Measurements and Bulk Aerodynamics Calculations (BAEBBR)**

Translator: Shaocheng Xie, Lawrence Livermore National Laboratory

Developer: Krista Gaustad, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

There are no open ECOs for this VAP.

## 2.14 Broadband Heating Rate Profile (BBHRP)

Translator: Laura Riihimaki, Pacific Northwest National Laboratory

Developer: Tim Shippert, Pacific Northwest National Laboratory

Status: In Development

Tier: Evaluation

Engineering Change Order-00219 has been extended to test the scalability of BBHRP.

[Waiting on modelers to get ready for test runs.](#)

## 2.15 Best Estimate Surface Radiative Flux (BEFLUX)

Translator: Laura Riihimaki, Pacific Northwest National Laboratory

Developer: Yan Shi, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

There are no open ECOs for this VAP.

## 2.16 Cloud Concentration Nuclei Profile (CCNPROF)

Translator: Laura Riihimaki, Pacific Northwest National Laboratory

Developer: Chitra Sivaraman, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

Engineering Work Order-16147 was approved to adapt the existing CCNPROF VAP to run with the new AOSCCN input that scans the supersaturation in the instruments in 10-minute steps with six supersaturation values each hour.

[Significant progress has been made to adapt to this change.](#)

[Next Milestone: Release the VAP to production by December 31, 2014.](#)

## 2.17 Cloud Classification (CLDCLASS)

Translator: Laura Riihimaki, Pacific Northwest National Laboratory

Developer: Chaomei Lo, Pacific Northwest National Laboratory

Status: No Development

Tier: Evaluation

There are no open ECOs for this VAP.

## **2.18 Corrected Moments in Antenna Coordinates (CMAC)**

Translator: Scott Collis, Argonne National Laboratory

Developer: Scott Collis, Argonne National Laboratory

Status: In Development

Tier: Evaluation

## **2.19 Corrected Moments in Antenna Coordinates Version 2.0 (CMAC2)**

Translator: Scott Collis, Argonne National Laboratory

Developer: Jonathan Helums, Argonne National Laboratory

Status: In Development

Engineering Change Order-01077 was approved to establish a pre-processing echo identification; improve upon linear-phase processing, allowing for larger areas of differential phase on backscatter previously not considered; and correction of correlation coefficient for low signal-to-noise.

[Significant progress has been made in de-aliasing, fuzzy logic, and liquid-phase processing.](#)

## **2.20 Convective Vertical Velocity VAP (CONVV)**

Translator: Scott Collis, Argonne National Laboratory

Developer: Kirk North, McGill University

Status: In Development

Tier: Evaluation

## **2.21 Doppler Lidar Profile VAP (DLPROF)**

Translator: Laura Riihimaki, Pacific Northwest National Laboratory

Developer: Chitra Sivaraman, Pacific Northwest National Laboratory

Status: Operational

Tier: Evaluation

Engineering Work Order-01035 and -01036 have been approved to create two VAPs—the vertical profiles of horizontal wind speed and direction using the velocity-azimuth-display (VAD) algorithm from the Doppler lidar data—and the cloud and vertical velocity statistics (WSTAT) from the Doppler lidar data.

Next Milestone: Evaluate user feedback by June 2015.

## **2.22 G-Band Vapor Radiometer Precipitable Water Vapor (GVRPWW)**

Translator: Connor Flynn, Pacific Northwest National Laboratory

Developer: Annette Koontz, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

There are no open ECOs for this VAP.

## **2.23 Interpolated SONDE (INTERPSONDE)**

Translator: Mike Jensen, Brookhaven National Laboratory

Developer: David Troyan, Brookhaven National Laboratory

Status: Operational

Tier: Production

The Engineering Change Order-14216 is being tracked to ensure that the beginning and end discontinuities in this VAP have been addressed.

There were several issues with reprocessing historical data. Working on resolving these issues.

Next Milestone: Run VAP on production and send data to the ARM Data Archive and ensure that the test passes.

## **2.24 Ka-Band Zenith-Pointing Radar Active Remote Sensing of Clouds (KAZRARSCL)**

Translator: Mike Jensen, Brookhaven National Laboratory

Developer: Karen Johnson, Brookhaven National Laboratory

Status: In Development

Tier: Evaluation

Engineering Change Order-00899 was approved to initiate and coordinate the development of an ARSCL-like VAP to enhance the scientific value of data collected by the Ka-band ARM zenith radar (KAZR), the follow-on to the now-retired millimeter-wavelength cloud radar.

The insect detection algorithm has been successfully matched with the ARM Data Integer version and evaluation data set. Additional test data was provided to users.

Next Milestone: Release of the VAP to production has been moved to December 31, 2014.

## **2.25 Langley Regression (LANGLEY)**

Translator: Connor Flynn, Pacific Northwest National Laboratory

Developer: Annette Koontz, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

There are no open ECOs for this VAP.

## **2.26 Microwave Radiometer-Scaled SONDE Profiles (LSSONDE)**

Translator: Connor Flynn, Pacific Northwest National Laboratory

Developer: Annette Koontz, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

There are no open ECOs for this VAP.

## **2.27 Merged Sounding (MERGESONDE)**

Translator: Mike Jensen, Brookhaven National Laboratory

Developer: David Troyan, Brookhaven National Laboratory

Status: Operational

Tier: Production

Engineering Change Order-00889 was approved to move the data to production.

Historical reprocessing continues. Issues with differences in processed data are being resolved.

Next Milestone: Compare production runs to development runs and release data to production.

## **2.28 MFRSR Column Intensive Properties (MFRSRCIP)**

Translator: Connor Flynn, Pacific Northwest National Laboratory

Developer: Annette Koontz, Pacific Northwest National Laboratory

Status: In Development

Tier: Evaluation

Engineering Change Order-00823 has been approved to develop a VAP to retrieve aerosol column intensive properties from the MFRSR, including single-scattering albedo, asymmetry parameter, and bi-modal log-normal size distributions.

Significant progress has been made to make this VAP operational. The data object design (DOD) has been approved.

Next Milestone: Release of the VAP to run at the Data Management Facility (DMF) has been pushed back to December 31, 2014.

## **2.29 Cloud Optical Depth from MFRSR (MFRSRCLDOD)**

Translator: Laura Riihimaki, Pacific Northwest National Laboratory

Developer: Yan Shi, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

Engineering Change Order-00287 has been approved to update the VAP to run with the Microwave Radiometer Retrievals VAP (MWRRET) to input, run, and evaluate data from the AMF Azores deployment, then release the product.

Minor issues were found while running AMF data, but they were resolved.

## **2.30 Micro-ARSCL (MICROARSCL)**

Translator: Mike Jensen, Brookhaven National Laboratory

Developer: Ed Luke, Brookhaven National Laboratory

Status: In Development

Tier: Evaluation

Engineering Change Order-00847 has been approved to solve the spectral imaging problem and moving MICROARSCL to the ARM computer cluster at Oak Ridge National Laboratory.

No progress has been made to the development of this VAP.

Next Milestone: Release the VAP to production by March 30, 2015.

### **2.31 Continuous Baseline Microphysical Retrieval (MICROBASE)**

Translator: Mike Jensen, Brookhaven National Laboratory

Developer: Meng Wang, Brookhaven National Laboratory

Status: On Hold

### **2.32 Mapped Moments to Cartesian Grid (MMCG)**

Translator: Scott Collis, Argonne National Laboratory

Developer: Scott Collis, Argonne National Laboratory

Status: Operational

Tier: Evaluation

### **2.33 Micropulse Lidar Cloud Optical Depth (MPLCOD)**

Translator: Laura Riihimaki, Pacific Northwest National Laboratory

Developer: Chaomei Lo, Pacific Northwest National Laboratory

Status: No Development

Tier: Evaluation

There are no open ECOs for this VAP.

### **2.34 Micropulse Lidar Polarized Average (MPLAVG)**

Translator: Connor Flynn, Pacific Northwest National Laboratory

Developer: Annette Koontz, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

There are no open ECOs for this VAP.

### **2.35 MPL Cloud Mask (MPLCMASK)**

Translator: Laura Riihimaki, Pacific Northwest National Laboratory

Developer: Chitra Sivaraman, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

[Engineering Work Order-14994 has been closed and all historical data has been processed.](#)

### **2.36 Microwave Radiometer Retrievals (MWRRET)**

Translator: Laura Riihimaki, Pacific Northwest National Laboratory

Developer: Krista Gaustad, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

Engineering Change Order-00526 has been approved to transition the product from evaluation to production, release the product, and process historical data.

[Niamey, Niger \(NIM\), and Black Forest, Germany \(FKB\), runs are complete and the data has been archived.](#)

### **2.37 Microwave Radiometer Retrieval Version 2 (MWRRET2)**

Translator: Laura Riihimaki, Pacific Northwest National Laboratory

Developer: Krista Gaustad, Pacific Northwest National Laboratory

Status: In Development

Tier: Evaluation

Engineering Change Order-00985 has been approved to update the current retrieval algorithm to be more flexible, so it can work with any set of n microwave frequencies to retrieve precipitable water vapor (PWV) and liquid water path (LWP).

No progress made during the last quarter. Waiting on guidance to move forward on the development of the VAP.

Next Milestone: Process Southern Great Plains (SGP), Tropical Western Pacific, and Gan Airport, Gan Island, Maldives (GAN) data with the latest code by December 31, 2014.

## 2.38 Marine ARM GPCI Investigation of Clouds Navigation (NAVBE)

Translator: Mike Jensen, Brookhaven National Laboratory

Developer: Tami Toto, Brookhaven National Laboratory

Engineering Change Order-01071 was approved to create the Marine ARM GPCI<sup>1</sup> Investigation of Clouds (MAGIC) Navigation Best Estimate (MAGNAVBE) VAP to consolidate many different sources of instruments on the ship that collected Global Positioning System (GPS) and Inertial Navigation System (INS) measurements during the MAGIC campaign. This consolidation will result in a single, continuous datastream (rather than approximately a dozen different datastreams).

Issues with missing data gaps are being resolved

Next Milestone: Release data to the evaluation area

## 2.39 Droplet Number Concentration (NDROP)

Translator: Laura Riihimaki, Pacific Northwest National Laboratory

Developer: Chitra Sivaraman, Pacific Northwest National Laboratory

Status: Operational

Tier: Evaluation

Engineering Change Order-00955 has been approved to initiate and coordinate the development of a VAP to implement a method for determining droplet number concentration.

Historical data has been processed and released to the archive.

## 2.40 Organic Aerosol Component Analysis (OACOMP)

Translator: Jerome Fast, Pacific Northwest National Laboratory

Developer: Tim Shippert, Pacific Northwest National Laboratory

Status: In Development

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<sup>1</sup> GPCI = GCSS Pacific Cross-section Intercomparison, a working group of GCSS  
GCSS = GEWEX Cloud Systems Study  
GEWEX = Global Energy and Water Cycle Experiment, a core project of the World Climate Research Programme.

Tier: Evaluation

Engineering Change Order-00838 has been approved to develop a VAP to estimate organic aerosol components from Aerosol Mass Spectrometers (AMS) and Aerosol Chemical and Speciation Monitors (ACSM) to be deployed at ARM's sites and as part of the Mobile Aerosol Observing System (MAOS).

The VAP is ready to be released to production. The input data has been identified as bad data. Hence, the VAP is on hold.

Next Milestone: Waiting for input data issues to be resolved.

## 2.41 Planetary Boundary Layer Height (PBLHT)

Translator: Laura Riihimaki, Pacific Northwest National Laboratory

Developer: Chitra Sivaraman, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

Engineering Change Order-00893 has been approved to initiate and coordinate the development of a VAP to implement methods for Planetary Boundary Height (PBL) height detection using radiosondes, ceilometer, and micropulse lidar.

The steps to develop the MPL algorithm have been outlined.

Next Milestone: Release the PBL VAP to evaluation using the MPL method by June 30, 2015.

## 2.42 Quality Checked Eddy Correlation (QCECOR)

Translator: Shaocheng Xie, Lawrence Livermore National Laboratory

Developer: Yunyan Zhang, Argonne National Laboratory

Status: Operational

Tier: Production

## 2.43 Data Quality Assessment for ARM Radiation Data (QCRAD)

Translator: Laura Riihimaki, Pacific Northwest National Laboratory

Developer: Yan Shi, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

There are no open ECOs for this VAP.

Engineering Change Order-15035 has been approved to run the second level (c2) of the VAP.

Next Milestone: [Waiting on broadband radiometer station \(BRS\) data to be reprocessed to complete this task.](#)

## 2.44 Quantitative Precipitation Estimate (QPE)

Translator: Scott Collis, Argonne National Laboratory

Developer: Scott Collis, Argonne National Laboratory

Status: On Hold

Tier: Evaluation

Engineering Work Order-00936 was approved to produce the QPE VAP for the Manus C-band scanning ARM precipitation radar for ARM MJO Investigation Experiment (AMIE) campaign data.

Next Milestone: [To integrate the VAP code with ADI.](#)

## 2.45 Radiation Flux VAP (RADFLUX)

Translator: Laura Riihimaki, Pacific Northwest National Laboratory

Developer: Krista Gaustad, Pacific Northwest National Laboratory

Engineering Change Order-00675 has been approved to develop the VAP. This VAP will use surface broadband radiation measurements to detect periods of clear skies and produce continuous clear-sky estimates. To run the c2 level of the VAP.

[The coefficient analysis has been evaluated for SGP C1. The VAP has been updated to run with QCRADBRSLONG.](#)

Next Milestone: [Waiting on minor issues to be resolved.](#)

## 2.46 Radiatively Important Parameters Best Estimate (RIPBE)

Translator: Laura Riihimaki, Pacific Northwest National Laboratory

Developer: Tim Shippert, Pacific Northwest National Laboratory

Status: Operational

Tier: Evaluation

## **2.47 Raman Lidar Profiles—Aerosol Scattering Ratio (RLPROFASR)**

Translator: Connor Flynn, Pacific Northwest National Laboratory

Developer: Chitra Sivaraman, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

There are no open ECOs for this VAP.

## **2.48 Raman Lidar Profiles—Best Estimate (RLPROFBE)**

Translator: Connor Flynn, Pacific Northwest National Laboratory

Developer: Chitra Sivaraman, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

There are no open ECOs for this VAP.

## **2.49 Raman Lidar Profiles—Depolarization Ratio (RLPROFDEP)**

Translator: Connor Flynn, Pacific Northwest National Laboratory

Developer: Chitra Sivaraman, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

## **2.50 Raman Lidar Profiles—Extinction (RLPROFEXT)**

Translator: Connor Flynn, Pacific Northwest National Laboratory

Developer: Chitra Sivaraman, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

There are no open ECOs for this VAP.

## **2.51 Raman Lidar Profiles—MERGE (RLPROFMERGE)**

Translator: Connor Flynn, Pacific Northwest National Laboratory

Developer: Chitra Sivaraman, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

There are no open ECOs for this VAP.

## **2.52 Raman Lidar Profiles—Mixing Ratio (RLPROFMR)**

Translator: Connor Flynn, Pacific Northwest National Laboratory

Developer: Chitra Sivaraman, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

There are no open ECOs for this VAP.

## **2.53 Raman Lidar Profiles—Temperature (RLPROFTEMP)**

Translator: Connor Flynn, Pacific Northwest National Laboratory

Developer: Chitra Sivaraman, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

There are no open ECOs for this VAP.

## **2.54 Scanning ARM Cloud Radar Correction VAP (SACRCORR)**

Translator: Michael Jensen, Brookhaven National Laboratory

Developer: Karen Johnson, Brookhaven National Laboratory

Engineering Work Order-01038 has been approved to develop a SACR corrections VAP to enhance the scientific value of data collected by the Ka-, W- and X-band Scanning ARM Cloud Radars.

[No progress has been made since receiving the code from McGill University.](#)

## **2.55 Shortwave Array Spectroradiometer Hemispheric Aerosol Optical Depth (SASHE AOD)**

Translator: Connor Flynn, Pacific Northwest National Laboratory

Developer: Brian Ermold, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

Engineering Work Order-16154 has been approved to add scattering light correction.

[The scattering light correction code was implemented and the VAP has been released.](#)

## **2.56 Shortwave Array Spectroradiometer Hemispheric Column Intensive Properties (SASHECIP)**

Translator: Connor Flynn, Pacific Northwest National Laboratory

Developer: Annette Koontz, Pacific Northwest National Laboratory

Status: In Development

Tier: Evaluation

Engineering Change Order-01014 has been approved to develop a VAP to retrieve aerosol column intensive properties from the shortwave array spectrometer hemispheric column, including single-scattering albedo, asymmetry parameter, and bi-modal log-normal size distributions. The proposal is to extend this MFRSRCIP product to use measurements from the SASHE, including wavelengths in the near-infrared, which will improve the retrieval sensitivity to coarse-mode particles.

[No progress has been made to this VAP. It is on hold until MFRSRCIP is completed.](#)

## **2.57 Shortwave Array Spectroradiometer Hemispheric Langley (SASHE LANGLEY)**

Translator: Connor Flynn, Pacific Northwest National Laboratory

Developer: Brian Ermold, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

## **2.58 SGP Area Surface Cloud and Shortwave (SW) Radiation Grid (SFCCLDGRID)**

Translator: Laura Riihimaki, Pacific Northwest National Laboratory

Developer: Krista Gaustad, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

## **2.59 SONDE Adjust (SONDEADJUST)**

Translator: Mike Jensen, Brookhaven National Laboratory

Developer: David Troyan, Brookhaven National Laboratory

Status: Operational

Tier: Production

[The historical data has been reprocessed and is under review.](#)

[Next Milestone: Reprocess all historical data for all sites and send to the ARM Data Archive.](#)

## **2.60 Sea-Surface Temperature (SST)**

Translator: Laura Riihimaki, Pacific Northwest National Laboratory

Developer: Yan Shi, Pacific Northwest National Laboratory

Status: In Development

Tier: Evaluation

Engineering Change Order-00970 has been approved to develop and derive SST from the infrared thermometer measurements for the MAGIC deployment.

[Next Milestone: Waiting on Atmospheric Sounder Spectrometer for Infrared Spectral \(ASSIST\) data to continue development.](#)

## **2.61 Ship Correction (SHIPCOR)**

Translator: Mike Jensen, Brookhaven National Laboratory

Developer: David Troyan, Brookhaven National Laboratory

Status: Operational

Tier: Evaluation

## **2.62 Ship Motion Correction for Ceil, HSRL, and MPL**

Translator: Mike Jensen, Brookhaven National Laboratory

Developer: David Troyan, Brookhaven National Laboratory

Status: In Development

Engineering Change Order-00996 was approved to create a VAP that will post-process data from the unstabilized Vaisala ceilometer, high spectral resolution lidar, and micropulse lidar (VCEIL, HSRL, MPL) for ship deployments

[No progress has been made on the development of this VAP.](#)

## **2.63 Surface Spectral Albedo (SURFSPECALB)**

Translator: Laura Riihimaki, Pacific Northwest National Laboratory

Developer: Krista Gaustad, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

There are no open ECOs for this VAP.

## **2.64 Shortwave Flux Analysis (SWFLUXANAL)**

Translator: Laura Riihimaki, Pacific Northwest National Laboratory

Developer: Krista Gaustad, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

There are no open ECOs for this VAP.

## **2.65 Tower Water Vapor Mixing Ratio (TWRMR)**

Translator: Laura Riihimaki, Pacific Northwest National Laboratory

Developer: Krista Gaustad, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

There are no open ECOs for this VAP.

## **2.66 UHF ARM Profiling Radar Actively Remotely Sensed Atmospheric Layers (UAPARSAL)**

Translator: Scott Collis, Argonne National Laboratory

Developer: Edwin Campos, Argonne National Laboratory

Status: Operational

Tier: Principal Investigator (PI) Data Product

## **2.67 Variational Analysis (VARANAL)**

Translator: Shaocheng Xie, Lawrence Livermore National Laboratory

Developer: Renata McCoy, Lawrence Livermore National Laboratory

Status: Operational

Tier: Evaluation

Engineering Work Order-14198 has been approved to develop continuous large-scale forcing data.

[AMIE GAN data has been released to production.](#)

## **2.68 Vertical Velocity in Stratiform Rain (VVSR)**

Translator: Mike Jensen, Brookhaven National Laboratory

Developer: Karen Johnson, Brookhaven National Laboratory

Status: Operational

Tier: Evaluation

Engineering Change Order-00865 was approved to initiate and coordinate the development of the VAP to generate profiles of vertical air motion during large-scale stratiform liquid precipitation. It will include information on the horizontal and vertical shear of the velocity.

[Next Milestone: No new milestone has been set.](#)

## 2.69 W-Band ARM Cloud Radar Active Remote Sensing of Clouds (WACRARSCL)

Translator: Mike Jensen, Brookhaven National Laboratory

Developer: David Troyan, Brookhaven National Laboratory

Status: Operational

Tier: Production.

### 3.0 Future VAPs

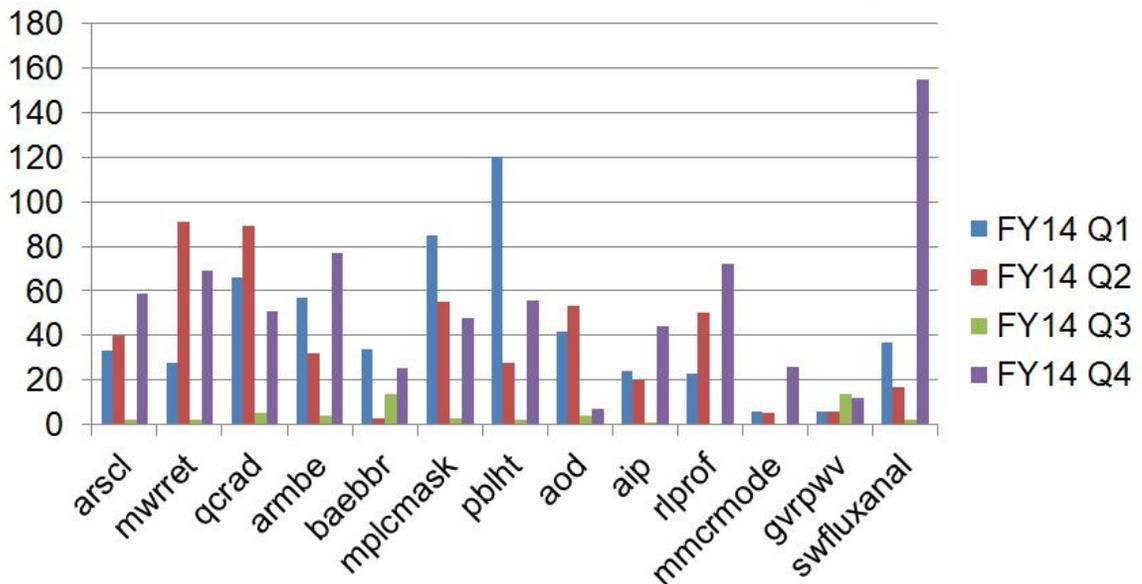
This section describes new activities that may begin in the next quarter.

Implementation plans are being written for VAPs related to the Surface Cloud Grid.

### 4.0 VAP Metrics

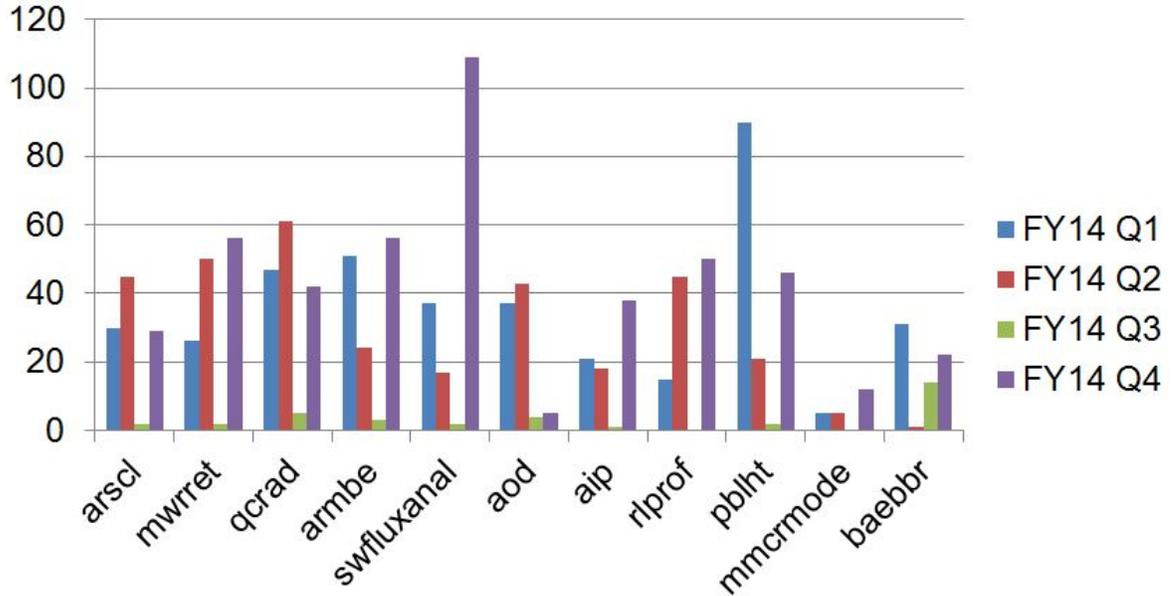
This section lists the top five VAPs that were requested by users from the ARM Data Archive during the third quarter.

#### Downloaded ARM Data Files – Production Data/ Unique Requests



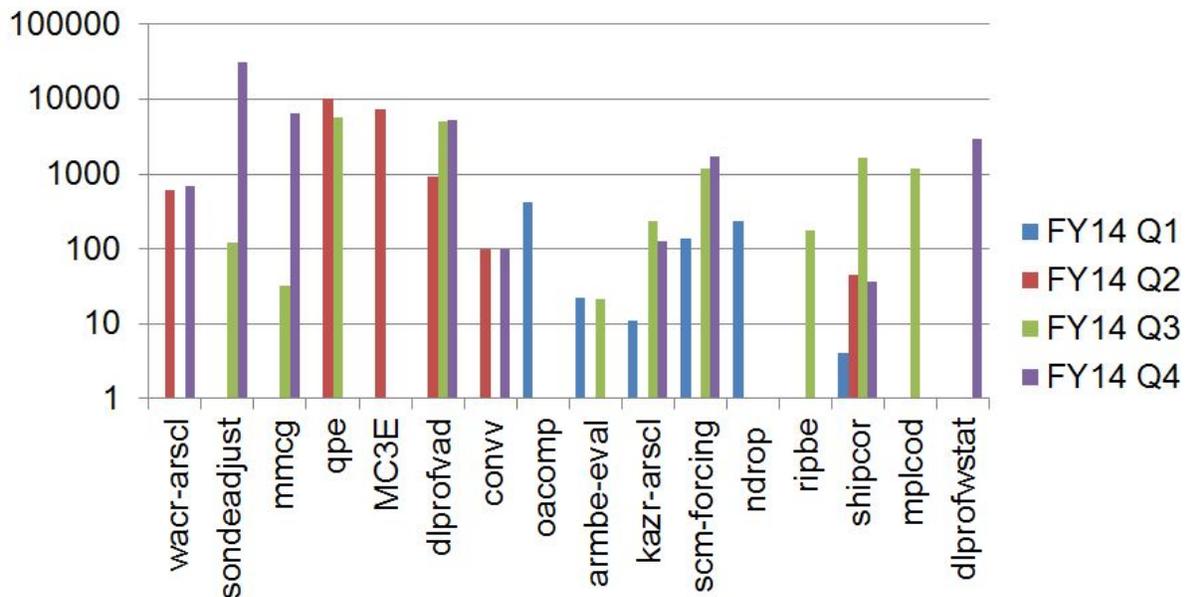
**Figure 1.** This chart shows the top VAPs requested by users from the ARM Data Archive during the last four quarters ordered by number of unique requests.

### Downloaded ARM Data Files – Production Data/ Unique Users

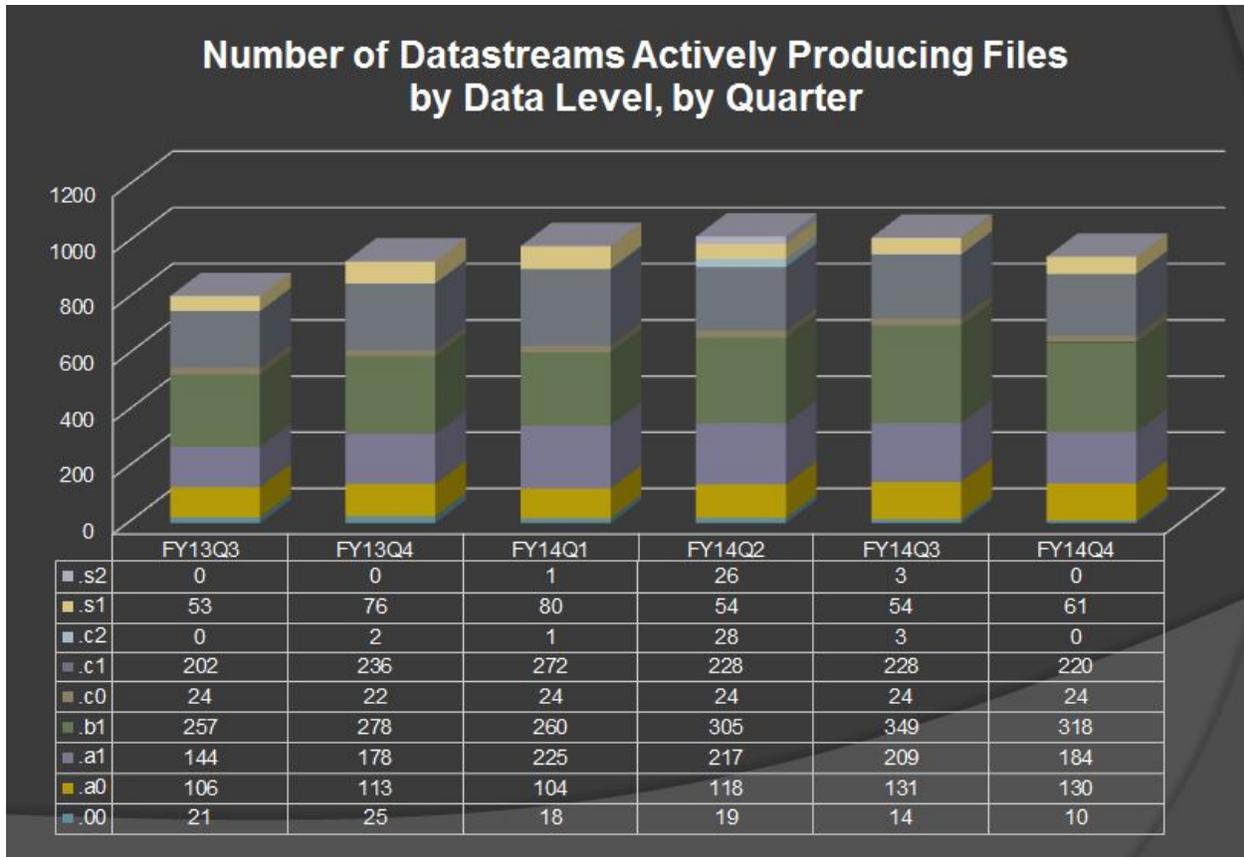


**Figure 2.** This chart shows the top VAPs that were requested by users from the ARM Data Archive during the last four quarters ordered by unique users.

### Downloaded ARM Data Files – Evaluation Data



**Figure 3.** The chart shows the top VAPs downloaded from the evaluation area for the last four quarters.



**Figure 4.** The chart shows the number of datastreams stored in the ARM Data Archive for the last six quarters.

## 5.0 Summary

This section describes the summary of VAP and data releases to production and evaluation.

### 5.1 Products Released to Production

This section includes VAPs that are released to production for automated operations by the ARM DMF.

**Table 1.** VAPs released to production.

VAP	Action
SASHE AOD	Released to production after implementing stray light correction.
AOD	Released to production after porting to ADI.

## 5.2 Data Released to Evaluation

This section includes VAPs that are being released to the evaluation area for user feedback for the first time.

**Table 2.** Data released to evaluation.

VAP	Action
ARM2DGRID	Two months of data released to evaluation.
ARM2DSTNS	Two months of data released to evaluation.
VARANAL	AMIE GAN data released to evaluation.

## 5.3 Data Released to the ARM Data Archive

This section includes data that are being released to the ARM Data Archive by the developer through a manual process.

**Table 3.** Data released to the ARM Data Archive.

VAP	Action
MWRRET	NIM and FKB data processed and sent to the ARM Data Archive.
MFRSRCLDOD	Data from all sites released to the ARM Data Archive.
NDROP	All historical data for SGP C1, SGP E13 and Graciosa Island, Azores, Portugal (GRW), have been released to the ARM Data Archive.

## 5.4 Significant Development

This section provides a summary of significant improvements.

**Table 4.** Significant developments.

VAP	Action
ARMBE2DGRID	Pre-processing 2011 data for the 2D surface data sets.
ACRED	Finished the analysis for the ice cloud case on March 9, 2000.
CCNPROF	The VAP has been ported to new version of ADI

<b>VAP</b>	<b>Action</b>
	along with the implementation of the new super saturation scan.
CMAC2	Significant progress has been made to de-aliasing and fuzzy logic.
NAVBE	Issues with data gaps are being resolved.
KAZRARSCL	Insect detection methodology has been completed and test data has been provided to beta users.
MFRSRCIP	The VAP is ready to be released to production.
PBLMPL	The outline for the code development has been completed.
RADFLUX	Development for SGP is complete. The VAP has been developed to use QCRADBRS data.



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