ARM Climate Research Facility Quarterly Value-Added Product Report

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ARM
CLIMATE RESEARCH FACILITY

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**Second Quarter:
January 1–March 30, 2011**

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Abstract

The purpose of this report is to provide a concise status update for value-added products (VAP) implemented by the Atmospheric Radiation Measurement Climate Research Facility. The report is divided into the following sections: (1) new VAPs for which development has begun, (2) progress on existing VAPs, and (3) future VAPs that have been recently approved. New information is highlighted in **blue text**. New information about processed data by the developer is highlighted in **red text.**

Acknowledgements

This report is developed largely from the information submitted by the developers and task leads to the Extraview reporting system (http://ewo.arm.gov). Special thanks to our VAP development team for providing timely and complete updates to the Engineering Change Orders and Engineering Work Orders, and to Dana Dupont and Rolanda Jundt, who make sure that this information is posted accurately on the ARM website.

Contents

1.0 New 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 Cloud Concentration Nuclei (CCN)

Translator: Sally McFarlane, Pacific Northwest National Laboratory

Developer: Chitra Sivaraman, Pacific Northwest National Laboratory

Engineering Change Order-00813 (ECO) has been approved to begin implementation of the Ghan CCN Retrieval algorithm, develop a version of the code, provide one month of data for review, and add quality checks.

The first version of the code has been developed under the Integrated Software Development Environment (ISDE), and one month of data has been produced and reviewed.

1.2 Radar VAPs

Translator: Scott Collis, Argonne National Laboratory

Developer: Scott Collis, Argonne National Laboratory

Engineering Change Order-00796 was approved to initiate and coordinate the development of the VAP generation procedures associated with data produced by the Recovery Act-funded precipitation radars.

A gridding technique has been picked, and results were provided at the Atmospheric System Research (ASR) Science Team meeting. The first gridded data sets of radar moments were made available. Significant progress has been made to show real-time displays of data at the Southern Great Plains (SGP) site.

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 abstracted primarily from the monthly updates provided by the development team to the ECOs.

2.1 Atmospherically Emitted Radiance Interferometer Noise Filter (AERINF)

Translator: Sally McFarlane, Pacific Northwest National Laboratory

Developer: Chaomei Lo, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

Engineering Change Order-00449 has been approved to run AERINF at the ARM Mobile Facility (AMF) sites and adapt to the new Recovery Act-funded AERIs.

Preliminary runs were made with Black Forest data, but no progress has been made due to higher ingest priorities.

2.2   AERI Profiles of Water Vapor and Temperature (AERIPROF)

Translator: Sally McFarlane, Pacific Northwest National Laboratory

Developer: Tim Shippert, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

There are no ECOs for this VAP.

2.3   Aerosol Best Estimate (AEROSOLBE)

Translator: Connor Flynn, Pacific Northwest National Laboratory

Developer: Annette Koontz, Pacific Northwest National Laboratory

Status: Development

Tier: Evaluation

Engineering Change Order-00360 was approved to update the VAP to add logic to capture red and blue wavelength quantities, to update the quality check fields, and to use the latest Aerosol Intensive Properties (AIP) data. The VAP is estimated to be released by June 1, 2011.

Updates to the quality check fields are in progress, and the expected new finish date is June 1, 2011, due to other high-priority ingest tasks.

2.4   Aerosol Intensive Properties (AIP)

Translator: Connor Flynn, Pacific Northwest National Laboratory

Developer: Annette Koontz, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

Engineering Change Order-00363 was approved to update the VAP with various changes. Please see the ECO for details.

This task is 100% complete. The product has been released to the Data Management Facility (DMF).

2.5 Aerosol Optical Depth Derived From Either MFRSR or NIMFR (AOD)

Translator: Connor Flynn, Pacific Northwest National Laboratory

Developer: Connor Flynn, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

Engineering Change Order-00089 was approved to run the AOD VAP at the AMF sites.

The work was scheduled to start, but no progress has been made due to conflicting priorities.

2.6 Active Remote Sensing of Clouds (ARSCL)

Translator: Mike Jensen, Brookhaven National Laboratory

Developer: Karen Jones, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

Engineering Change Order-00086 has been approved to catch up on processing of ARSCL data.

The new MPL Cloud Mask (MPLCMASK) VAP data have been used to improve processing time of ARSCL. Progress has been made to process data from Manus.

2.7 Best-Estimate Fluxes from 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.

2.8   Broadband Heating Rate Profile (BBHRP)

Translator: Sally McFarlane, Pacific Northwest National Laboratory

Developer: Tim Shippert, Pacific Northwest National Laboratory

Status: In development

Tier: Evaluation

Engineering Change Order-00219 has been approved to make updates to the BBHRP/Radiatively Important Parameters Best Estimate (RIPBE) interface, run the alpha version, analyze data, prepare a technical report, and deliver data to the evaluation area.

An alpha version of RIPBE/BBHRP interface has been developed, and three months of output have been produced.

2.9   Best-Estimate Surface Radiative Flux (BEFLUX)

Translator: Sally McFarlane, Pacific Northwest National Laboratory

Developer: Yan Shi, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

There are no open ECOs for this VAP.

2.10 Cloud Classification (CLDCLASS)

Translator: Sally McFarlane, Pacific Northwest National Laboratory

Developer: Chaomei Lo, Pacific Northwest National Laboratory

Status: No Development

Tier: Evaluation

There are no open ECOs for this VAP.

2.11 Climate Modeling Best Estimate (CMBE)

Translator: Shaocheng Xie, Lawrence Livermore National Laboratory

Developer: Renata McCoy, Lawrence Livermore National Laboratory

Status: Operational

Tier: Evaluation

Engineering Change Order-00620 has been approved to make updates to run SGP data; add data from the North Slope of Alaska (NSA) and Tropical Western Pacific (TWP) sites, and publish CMBE to the Earth System Grid (ESG).

Atmospheric profiles, surface meteorological quantities, and statistical summaries have been created for NSA and TWP; the data at SGP have been reprocessed due to Microwave Radiometer Retrievals (MWRRET) revisions. A sample CMBE data set has been published to ESG.

2.12 G-Band Vapor Radiometer Precipitable Water Vapor (GVRPWV)

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.

2.13 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.

2.14 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.

2.15 Merged Sounding (MERGESONDE)

Translator: Mike Jensen, Brookhaven National Laboratory

Developer: David Troyan, Brookhaven National Laboratory

Status: In Development

Tier: Evaluation

Engineering Change Order-00092 has been approved to add quality check fields, release the first version of the code to the DMF, and provide version 2 of the data to evaluation.

Data from MERGESONDE have been processed for all sites through 2010 and placed in evaluation. The VAP is getting ready to be released to the DMF.

2.16 Cloud Optical Depth from MFRSR (MFRSRCLDOD)

Translator: Sally McFarlane, 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 MWRRET as input, run and evaluate data at Azores, and release the product.

The VAP has been released to production, and this ECO is 100% complete.

2.17 Continuous Baseline Microphysical Retrieval (MICROBASE)

Translator: Mike Jensen, Brookhaven National Laboratory

Developer: Maureen Dunn, Brookhaven National Laboratory

Status: Operational

Tier: Production

Engineering Change Order-00804 has been approved to update the VAP with quality checks and release to production.

The VAP has been released to production, and this ECO is 100% complete.

2.18 MICRO-ARSCL (MICROARSCL)

Translator: Mike Jensen, Brookhaven National Laboratory

Developer: Ed Luke, Brookhaven National Laboratory

Status: In Development

Tier: Evaluation

An ECO needs to be opened to solve the spectral imaging problem and porting MICROARSCL to the ARM computer cluster at Oak Ridge National Laboratory.

Some progress has been made to solve the spectral image problem.

2.19 Micropulse Lidar Cloud Optical Depth (MPLCOD)

Translator: Sally McFarlane, Pacific Northwest National Laboratory

Developer: Chaomei Lo, Pacific Northwest National Laboratory

Status: No development

Tier: Evaluation

There are no open ECOs for this VAP.

2.20 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.

2.21 MPL Cloud Mask (MPLCMASK)

Translator: Sally McFarlane, Pacific Northwest National Laboratory

Developer: Chitra Sivaraman, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

Engineering Change Order-00778 is 90% complete. The VAP has been released to production, and processing of historical data has begun.

2.22 Microwave Radiometer Retrievals (MWRRET)

Translator: Sally McFarlane, 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.

This ECO is 100% complete. The VAP has been released to production, and historical data have been processed.

2.23 Data Quality Assessment for ARM Radiation Data (QCRAD)

Translator: Sally McFarlane, Pacific Northwest National Laboratory

Developer: Yan Shi, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

Engineering Change Order-00247 has been approved to run the VAP with Azores data, fix quality check problems, and analyze data.

This ECO is 100% complete. The data for the Azores have been processed and sent to the ARM Data Archive. Progress has been made to add quality check fields and analyze the data.

2.24 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.

The data from 2005–2008 have been reprocessed.

2.25 Raman Lidar Profiles—Best Estimate (RLPROFBE)

Translator: Connor Flynn, Pacific Northwest National Laboratory

Developer: Chitra Sivaraman, Pacific Northwest National Laboratory

Status: Development

Tier: Production

Engineering Change Order-00106 has been approved to update the RLPROFBE VAP to input the new release of all its input data, add quality checks, and release the VAP.

The addition of quality control (QC) variables has been completed.

2.26 Raman Lidar Profiles—Depolarization Ratio (RLPROFDEP)

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.

The data from 2005–2008 have been reprocessed.

2.27 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.

The data from 2005–2008 have been reprocessed.

2.28 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.

Updates were made to this VAP to run with data from the TWP Darwin site for the new Raman lidar, and the product has been released to production.

2.29 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.

The data from 2005–2008 have been reprocessed.

2.30 Radiatively Important Parameters Best Estimate (RIPBE)

Translator: Sally McFarlane, Pacific Northwest National Laboratory

Developer: Tim Shippert, Pacific Northwest National Laboratory

Status: Development

Tier: Evaluation

The ECO-00767 has been approved to fix bugs and enhance the product based on feedback from beta users. The RIPBE/BBHRP interface is 95% completed and data are now available for SGP from March 2005–February 2006 at the evaluation area.

2.31 SGP Area Surface Cloud and SW Radiation Grid (SFCCLDGRID)

Translator: Sally McFarlane, Pacific Northwest National Laboratory

Developer: Krista Gaustad, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

There are no open ECOs for this VAP.

2.32 Surface Spectral Albedo (SURFSPECALB)

Translator: Sally McFarlane, Pacific Northwest National Laboratory

Developer: Krista Gaustad, Pacific Northwest National Laboratory

Status: In Development

Tier: Evaluation

Engineering Change Order-00525 has been approved to review data, address quality check review, automate a test script, and prepare a technical report.

The technical report and the automation of the test script have been completed. Progress has been made to address quality check review.

2.33 SONDE Adjust (SONDEADJUST)

Translator: Mike Jensen, Brookhaven National Laboratory

Developer: David Troyan, Brookhaven National Laboratory

Status: In Development

Tier: Evaluation

Engineering Change Order-00824 has been approved to correct the documented biases in radiosonde humidity measurements.

Progress has been made to correct the biases, and data have been sent to evaluation.

2.34 Shortwave Flux Analysis (SWFLUXANAL)

Translator: Sally McFarlane, Pacific Northwest National Laboratory

Developer: Krista Gaustad, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

There are no open ECOs for this VAP.

2.35 Tower Water-Vapor Mixing Ratio (TWRMR)

Translator: Sally McFarlane, Pacific Northwest National Laboratory

Developer: Krista Gaustad, Pacific Northwest National Laboratory

Status: Operational

Tier: Production

There are no open ECOs for this VAP.

2.36 Variational Analysis (VARANAL)

Translator: Shaocheng Xie, Lawrence Livermore National Laboratory

Developer: Renata McCoy, Lawrence Livermore National Laboratory

Status: In Development

Tier: Evaluation

Engineering Change Request-0096 (ECR-0096) has been approved to develop continuous large-scale forcing data.

Continuous large-scale forcing has been developed for SGP for the years 2001–2009.

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

Translator: Mike Jensen, Brookhaven National Laboratory

Developer: David Troyan, Brookhaven National Laboratory

Engineering Change Request-00826 has been approved to run WACRARSCL at all AMF deployments.

This ECO is 100% complete. All past AMF deployment data have been reprocessed.

3.0 Future VAPs

This section describes new activities that have been approved in the last quarter by the ARM Science and Infrastructure and Science Steering Committee. Work on these activities will begin in the next quarter.

3.1 Organic Aerosol Component Analysis

Translator: Jerome Fast, Pacific Northwest National Laboratory

Developer: Tim Shippert, Pacific Northwest National Laboratory

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). For details of the implementation plan, please visit the wiki page at https://wiki.arm.gov/bin/view/Engineering/VAPWhitePapers.

3.2 MFRSR Column Intensive Properties

Translator: Connor Flynn, Pacific Northwest National Laboratory

Developer: Annette Koontz, Pacific Northwest National Laboratory

Engineering Change Order-00823 has been approved to develop a VAP to retrieve aerosol column intensive properties from the multifilter rotating shadowband radiometer (MFRSR) including single scattering albedo, asymmetry parameter, and bi-modal log-normal size distributions. For details of the implementation plan, please visit the wiki page at https://wiki.arm.gov/bin/view/Engineering/VAPWhitePapers.

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