ARM Data Quality Office

K. Kehoe, A. Theisen, J. Monroe, J. King, R. Peppler
E. Wong, M. Schneider, N. Myers, J. Quinn, T. Kloss, E. Green, A. Duling, R. Bunker, J. Anthony

ARM Data Quality Process

Instrument Deployment and Maintenance

- **Mentors work with site to install and calibrate instrument. Document all actions in logs.**
- **Site personnel perform daily rounds checking instrument function in the field and on instrument computer display. Document all actions in logs.**
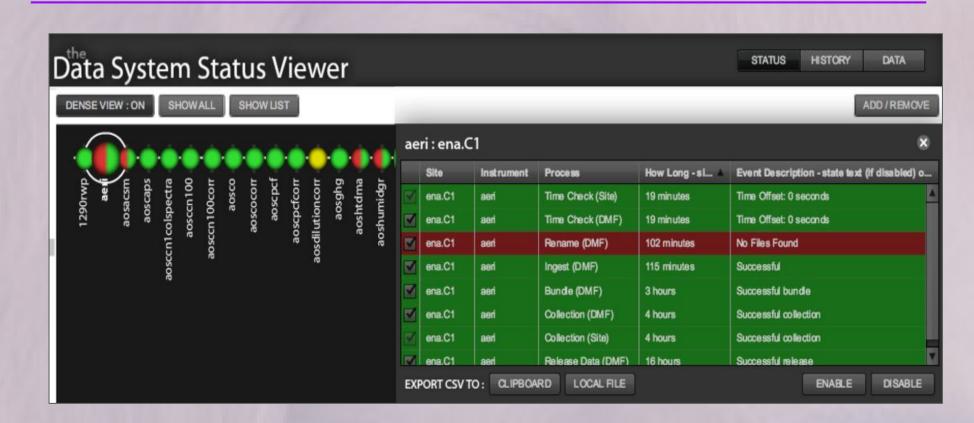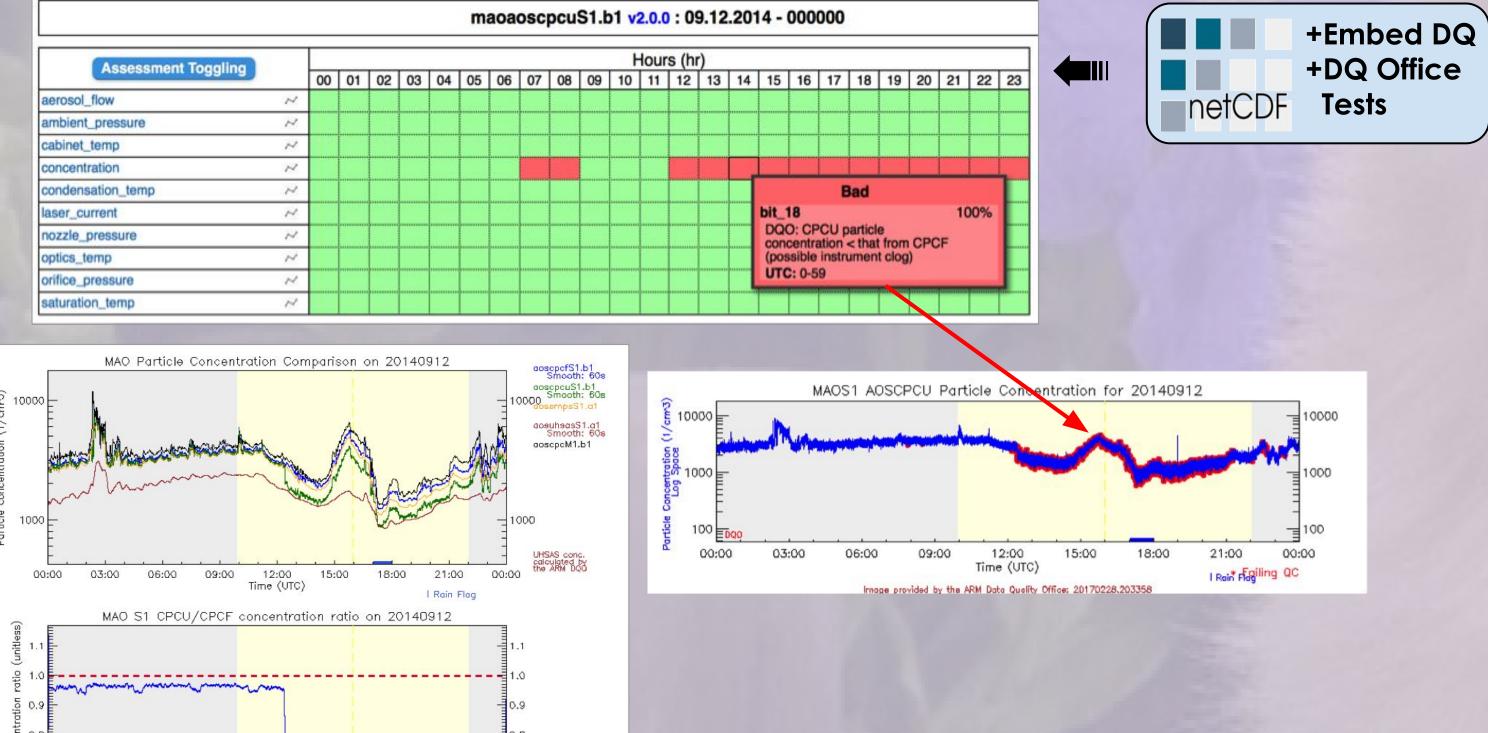- ⇒ **Mentors or site personnel enter Data Quality Problem Report at any point in this process when needed.**

Data Processing

Data Management Facility processes raw data into community standard files and higher order Value Added Products (VAP).

- Apply calibration
- Add embedded quality control fields including advanced quality control to Value Added Products
- Monitor data flow
- ⇒ **Operators enter Data Quality Problem Report at any point in this process when needed.**

Data Inspection

- DQ Office metrics summarize embedded quality control and additional DQ Office tests
- The DQ Office metrics tables are designed for web-browsing speeds using hourly quality flag summaries and pre-generated plots
- DQ Analysts review data daily to weekly creating weekly Data Quality Assessment reports
- Analysts and other ARM personnel use interactive web-tools to zoom into a problem when needed
- Fully automated processing, and e-mail alerts
- On-site processing for remote deployments - transfer smaller sized metrics and plots files only
- ⇒ **DQ Analysts enter Data Quality Problem Report at any point in this process when needed.**

Data Quality Problem Report
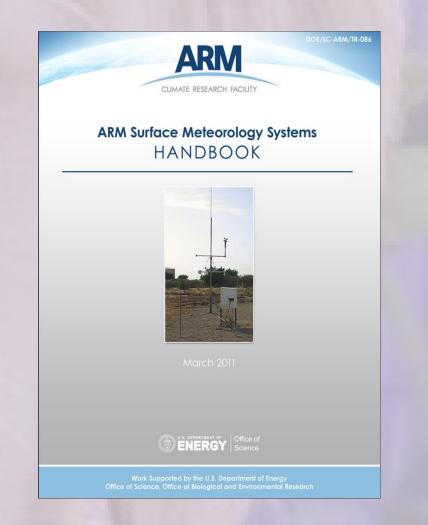

Data Quality Office in the Numbers: 2016

- **Total Plots and Metrics Created or Modified**
  - **Plots: 7,076,620**
  - **Metrics: 533,995**
- **996 Data Quality Reports submitted (versus 222 submitted in 2011)**
- **DQ Analysts submitted 8,378 Data Quality Assessments (versus 2,799 in 2011)**
- **Submitted 482 Data Quality Problem Reports**
  - **342 have currently resulted in Data Quality Reports**

Data User Resources

Instrument Handbooks Provide Summary and Detail

- Instrument Handbooks and Value Added Product technical reports provide information including operation, maintenance, data descriptions and data quality.

- Example excerpt from AERIPROF VAP:

"Below is a description of quality control checks for both the input data for the AERIPROF retrieval algorithm and the retrieved AERI profiles.
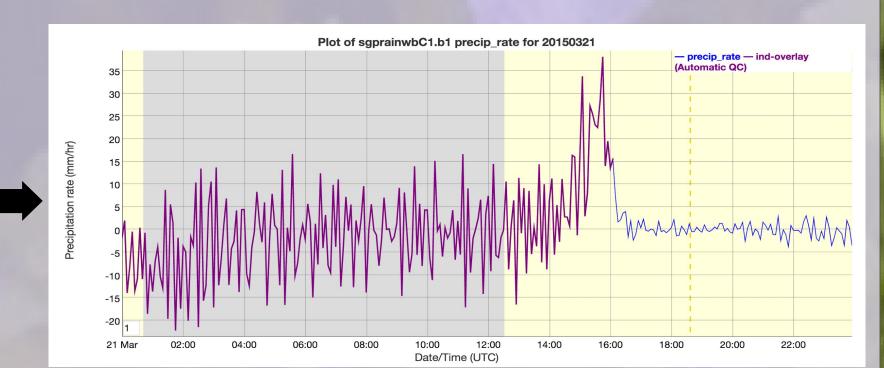
Input File Quality Control for Lidar data:
 0: Lidar data OK
 1: Fog/condensation on lidar window
 2: No data within AERI specified time period
 3: No valid data found within LIDAR file"

Embedded Quality Control Fields Mask Incorrect or Suspect Data: User's Option
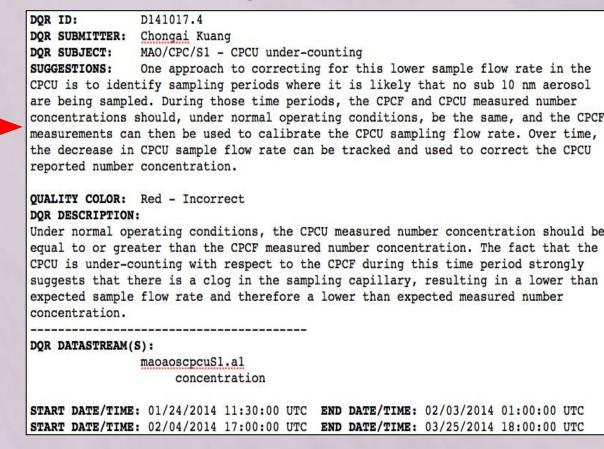
Data users copy-paste code into their code to enable filtering incorrect or suspect data using embedded quality control.

Data Quality Reports Mask Incorrect or Suspect Data: User's Option

Option 2:
- Users copy-paste code into their code to filter data with Data Quality Report web-service.
- Web-service does most of the work for user's code.

Option 1:
- Mask data within data file using Data Quality Reports. User selectable options in Data Discovery Tool.
- Repeatable if outcome is not what user needs.