

# Data Quality Office Inspection Tools and Techniques



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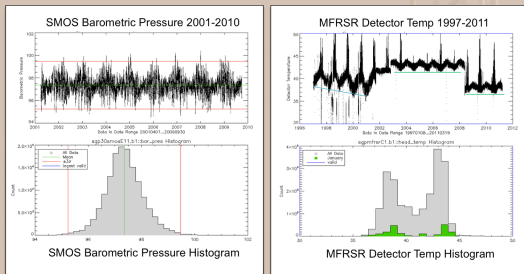


## Overview

The ARM Climate Research Facility Data Quality (DQ) Office develops and utilizes a wide range of tools and analysis methods to support the needs of the Atmospheric System Research Program. Now in our eleventh year, the DQ Office is expanding these inspection tools and techniques used to ensure users receive the highest possible level of research-quality data.

## ARM\*STAR

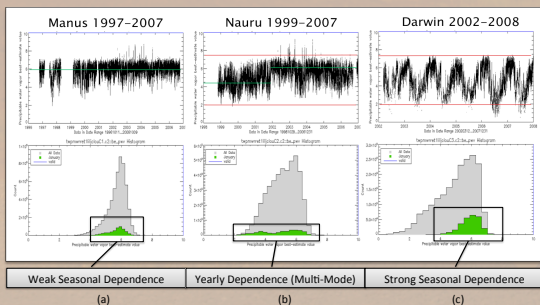
- Characterize data using long term plots, statistics and histograms
- Review instrument measurements, Value Added Products (VAPs) and engineering data in order to identify trends, detect problems, and improve limits



ARM\*STAR output for (a) SMOS barometric pressure from 2001-2010 and (b) MFRSR detector temperature from 1997-2011.

## Value Added Products

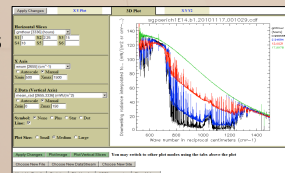
- Characterize data and improve DQ limits for VAPs



MWRRET c2-Level review of TWP data for Manus (a), Nauru (b), and Darwin (c) showing long-term data trends and seasonal dependencies.

## NCVweb

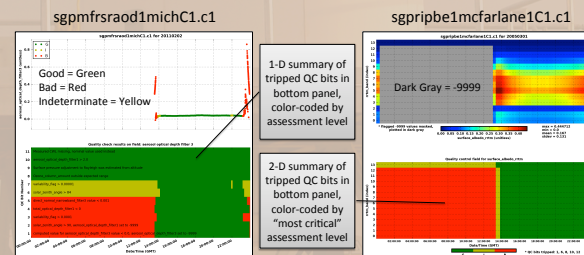
- Inspect files for problems
- Interactive plotting
- Simple statistics
- View file metadata
- Extract data
- Convert values to ASCII



NCVweb displaying SGP AERI E14 on 2011117 at 1 GMT no cloud, 2 GMT (thin cloud), 15 GMT (thick cloud), and 18 GMT (rain-hatch closed)

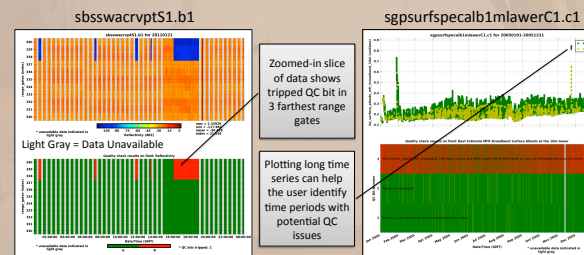
## DQ Inspector

- New Python-based generic plotting tool for ARM-standard netCDF files
- Plots data with summary results from 1-D and 2-D bit-packed QC variables



Aerosol optical depth filter 3 on Feb 2, 2011. Surface albedo rrtm band on Mar 1, 2005.

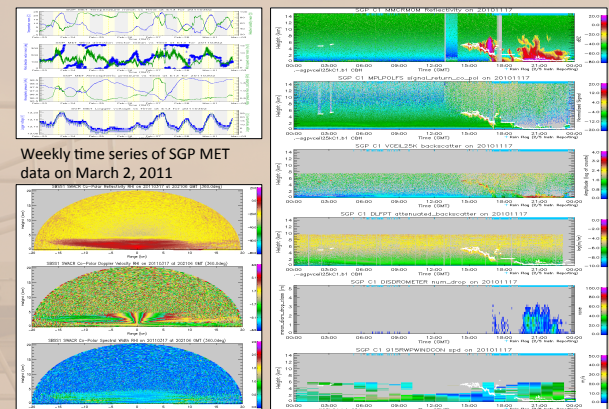
- Provides many options, such as scaling in the horizontal and/or vertical direction and/or plotting multiple days at once
- Useful for troubleshooting during the development of ingest and VAPs



Last 11 range gates of Reflectivity on Jan 21, 2011. 10m MFR Best-estimate surface albedo on Jan 1-Dec 31, 2005.

## IDL Generic Plotting Functions

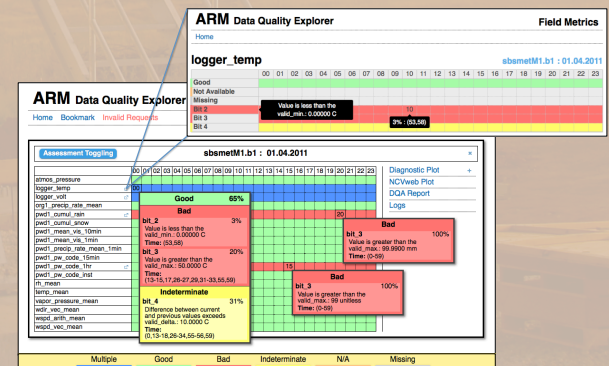
- A suite of generic plotting tools have been created to increase the efficiency in the way we produce plots for analysis
- These tools range in functionality from plotting time-series data to plots of radar data and comparison plots of 2-D data



Range Height Indicator (RHI) for SGP profile comparison plot of MMR, MPLPOLFS, VCEIL, DL, Disdrometer, and RWP with VCEIL cloud base heights overlaid in white.

## DQ Explorer

- Future replacement of DQ Hands with enhanced functionality



DQ-Explorer SBS Met metrics (bottom) and bit-expansion table (top).