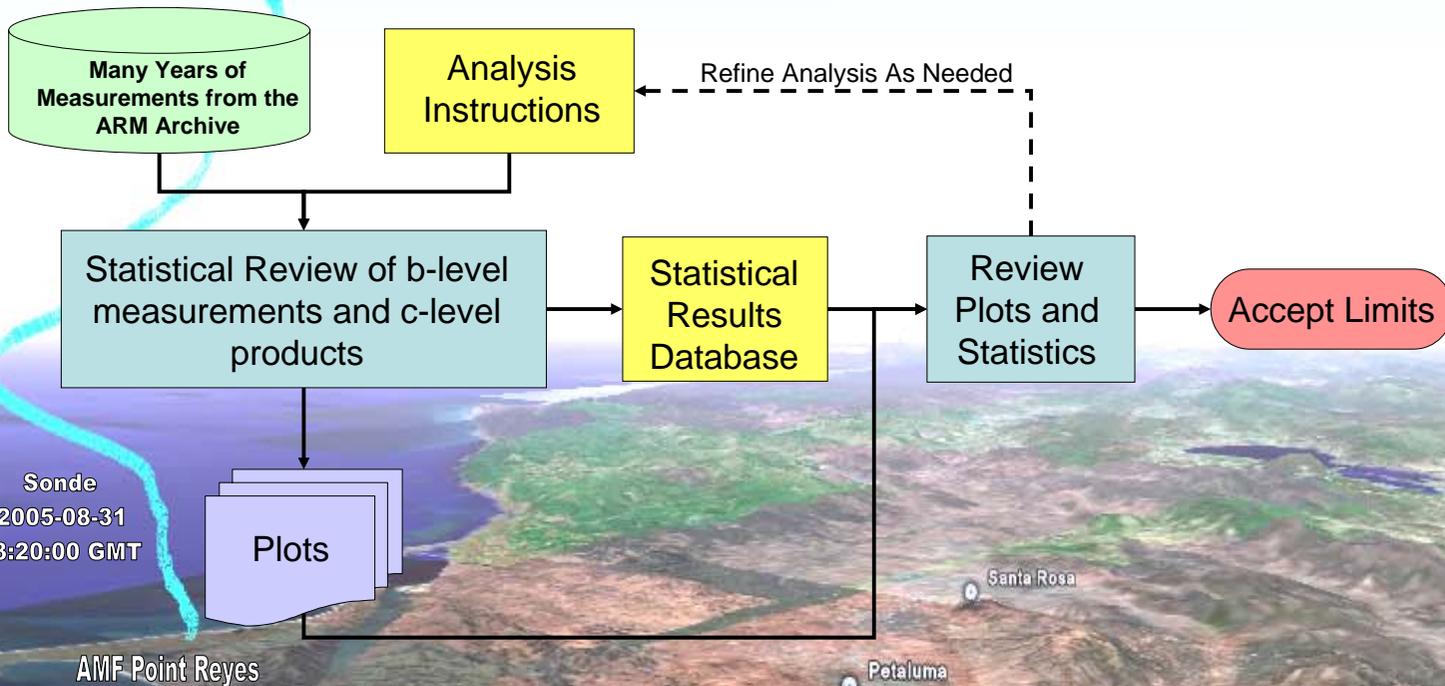# Using Historical ARM Measurements to Systematically Improve QC Limits

Sean Moore — ATK Mission Research, Santa Barbara, California.   Supported by DOE Grant DE-FG02-04ER63864   http://arm.atk.com/
Kenneth Kehoe, Randy Peppler, Karen Sonntag — ARM Data Quality Office, The University of Oklahoma, Norman, Oklahoma   http://dq.arm.gov/

Objectives

- **Set Quality Control (QC) limits for data streams without any valid data ranges defined.**

- **Suggest better QC limits for b-level and c-level products based on the historical record.**

- **Determine which measurements might benefit from imposing monthly and site specific varying limits.**

- **Provide ACRF with new tools for visualizing measurements.**

Many Years of Measurements from the ARM Archive

Analysis Instructions

Refine Analysis As Needed

Statistical Review of b-level measurements and c-level products

Statistical Results Database

Review Plots and Statistics

Accept Limits

Sonde
2005-08-31
23:20:00 GMT

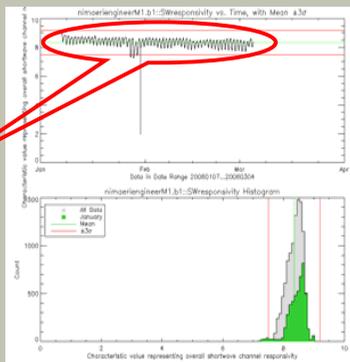Plots

AMF Point Reyes

Santa Rosa

Petaluma

Example: Define New Limits

Niamey is a new location for ARM Mobile Facility.

No limits defined in AERI NetCDF files.

Quickly assess typical behavior using plots.

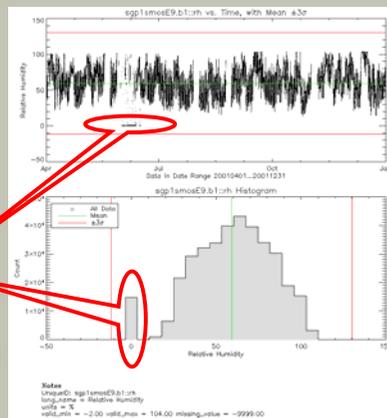Plots and statistics help to identify reasonable data range.

Example: Improve Existing Limits

SMOS b-level NetCDF files define valid relative humidity range as -2 to 104 %.

Frequency distribution plot helps to identify problems.
Spike at 0%

Analysis suggests existing range could be tighter to catch more problems.

Example: Define Monthly Limits

No limits defined in NetCDF files for BEFLUX VAP.

Assess typical behavior with long time-series and spot outliers.

Frequency distribution shows monthly data range is distinct from overall range.

January

Analysis suggests monthly varying limits may be more appropriate for this data.