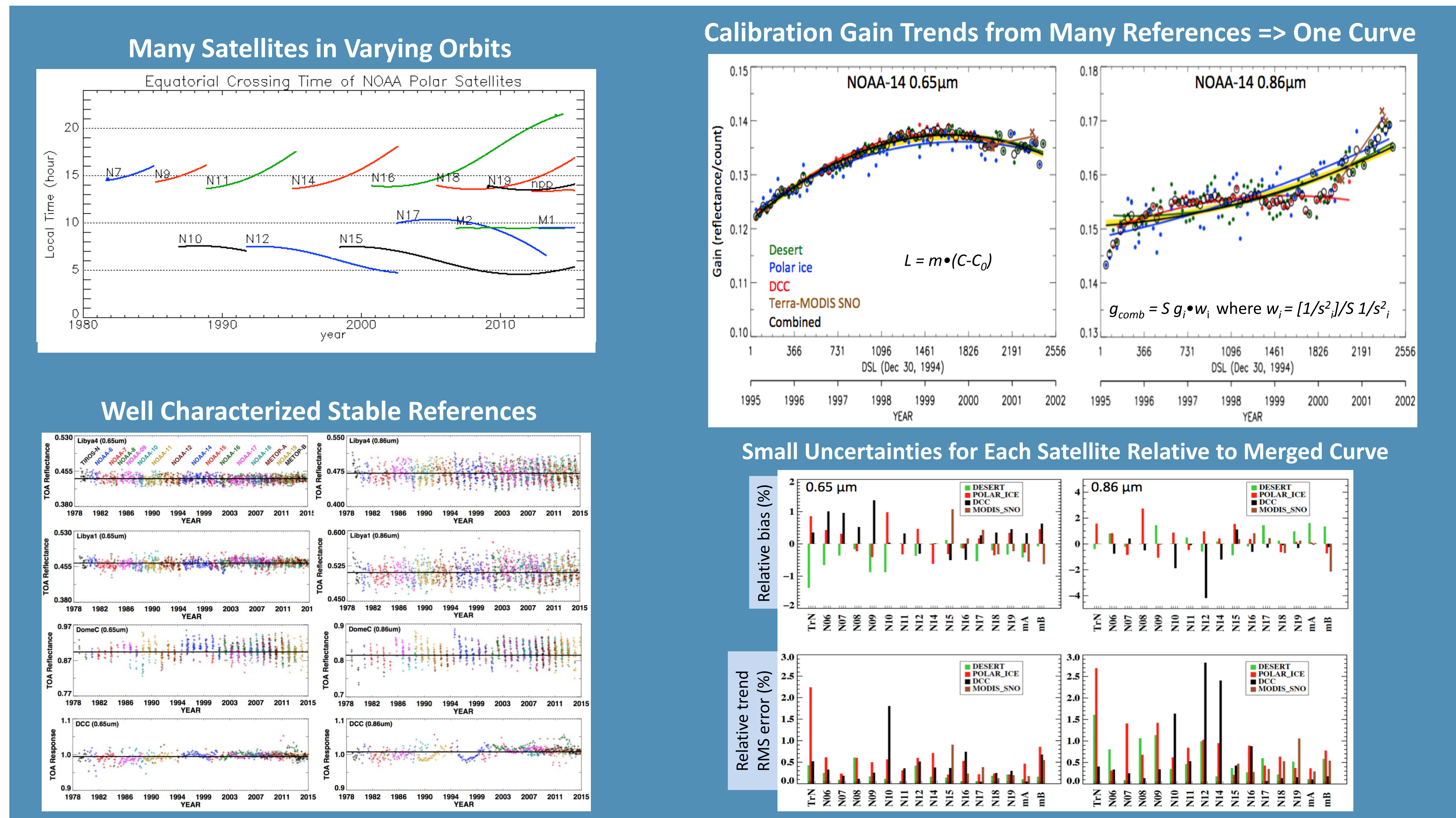


AVHRR Solar Channel Calibration Fundamental CDR Using Multiple Methods

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CDR Images



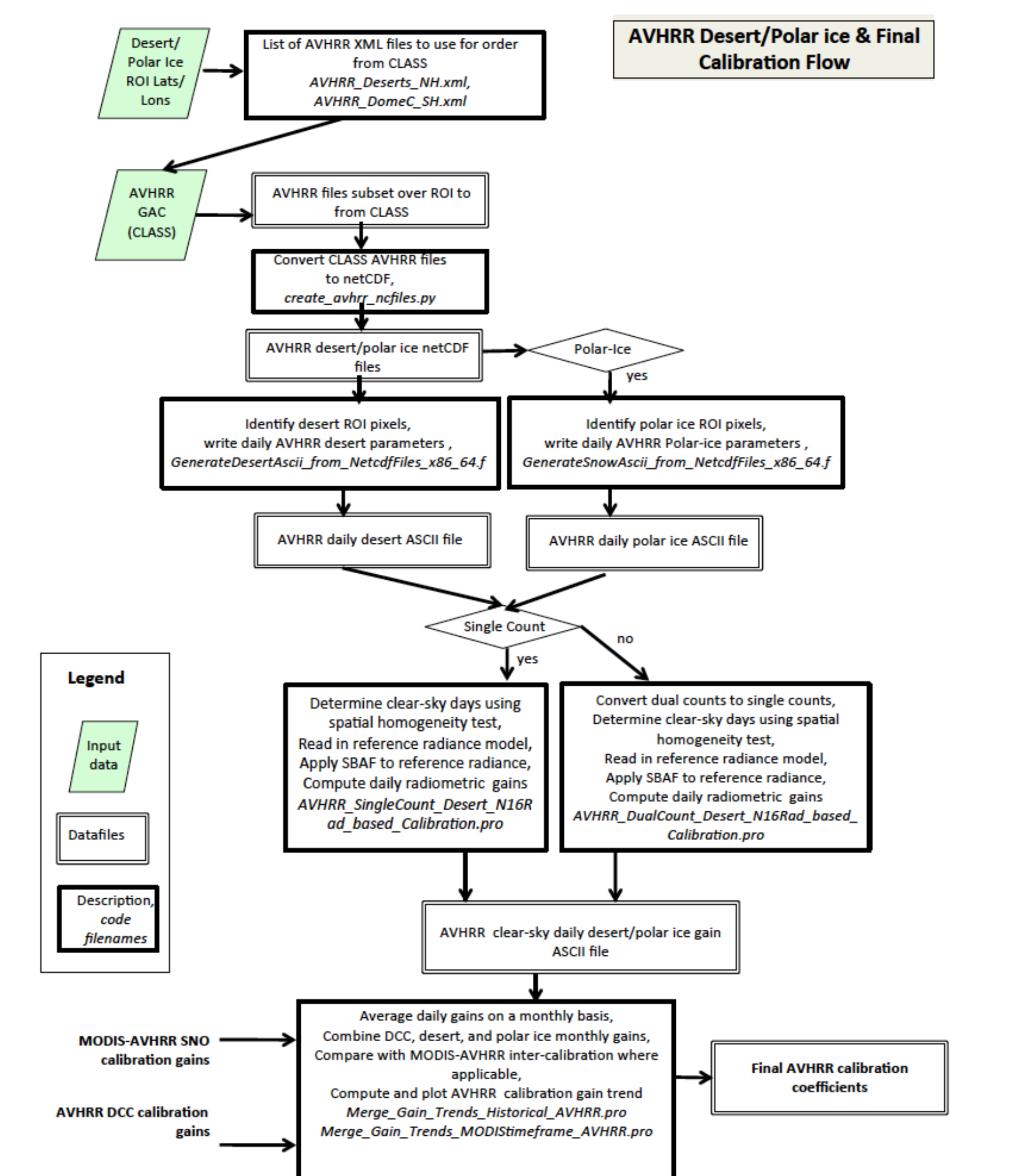
CDR Description

Calibration FCDR Specifications

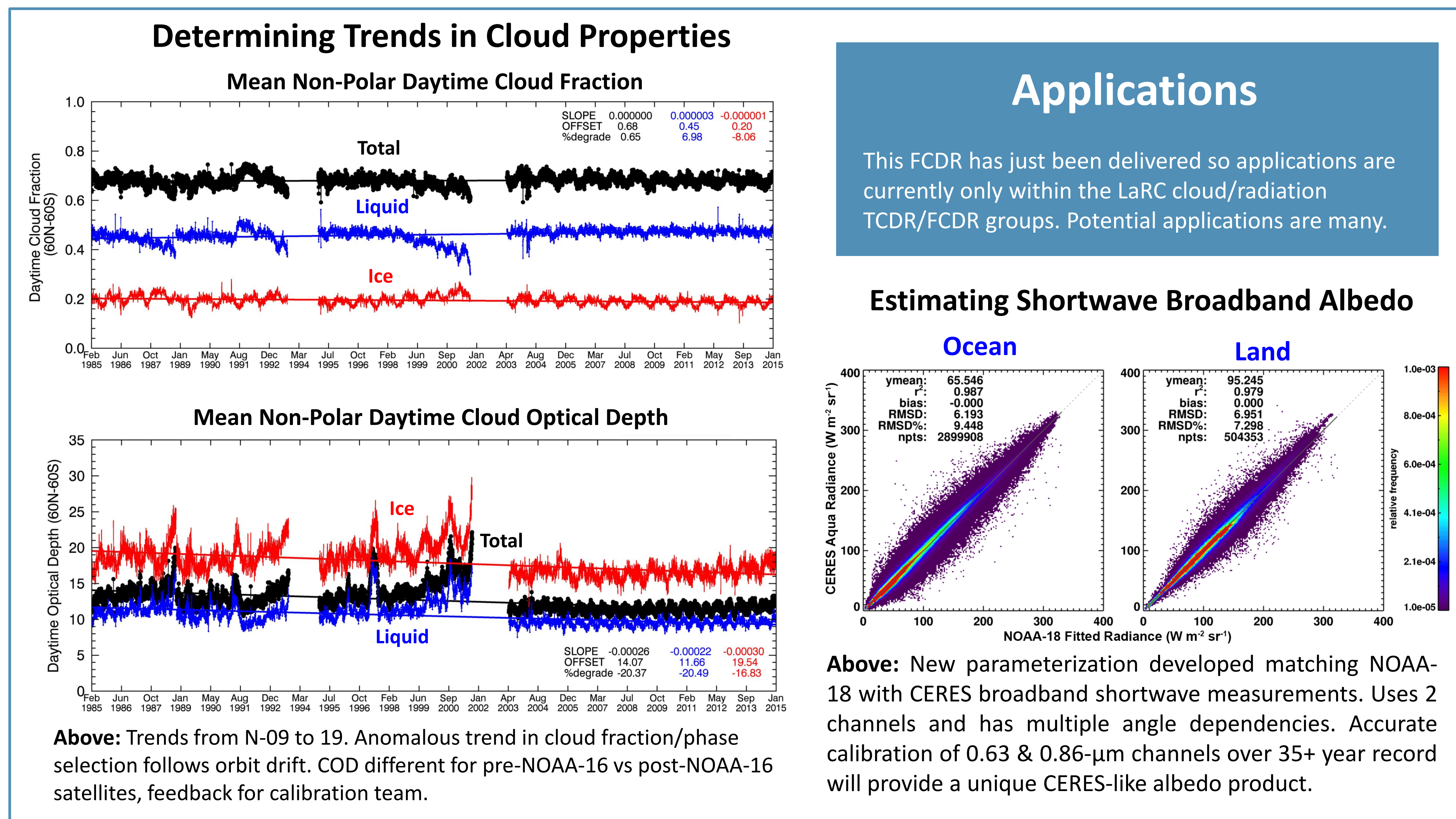
- Gains produced monthly using 5 methods
 - Desert, Polar snow invariant targets (IT)
 - Deep convective clouds (DCC)
 - Simultaneous Nadir Overpass (SNO) w/ Aqua MODIS
 - Merged DCC & IT results
- Monthly mean gains, g , 1978-2012
- Polynomial fits to monthly means, $fn(dsl)$
 - $m = m_0 + m_1 \cdot dsl + m_2 \cdot dsl^2$

Inputs to Calibration FCDR

- Re-navigated Advanced Very High Resolution Radiometer (AVHRR) 0.63, 0.86, and 1.6-µm brightness counts, C
- Observational geometric conditions, date
- Invariant site reflectance models, SBAFs
- DCC BRDF models
- Spectral solar constant, launch date, C_0



Example of CDR Applications



Future Improvements and Anticipated Applications

Development & Improvements

- Perform AVHRR AM/PM SNO calibration to validate merged calibration between AM/PM satellites
- Test sensor and band specific polynomial fits with varying number of orders to more accurately describe the calibration drift not captured in simple quadratic fit
- Improve strategy of combining Greenland summit (NH) and Dome-C (SH) observations
- Increase DCC calibration accuracy by ensuring a stable cross-sensor 205 K BT using AVHRR AM/PM SNOs
- Improve DCC BRDF accuracy for SZA greater than 60° by using selective viewing angles
- Use 0.86-µm DCC BRDFs: need for band specific DCC BRDFs demonstrated by PARASOL data
- Monitor cross-sensor global mean optical depth retrievals: allows all Earth observed reflected radiances to be evaluated as a whole
- Determine & correct source of cloud optical depth difference between AVHRR/2 and 3 sensors

Potential Applications

- Calibration Needed for Any Daytime Parameter**
- Aerosol Optical Thickness & Type
 - Surface Albedo
 - Radiation Budget
 - Solar Energy
 - Vegetation Index
 - Ocean Properties / Wind Speed (sunglint area)
 - Snowpack
 - Flood Monitoring
 - Land Use/Cover Type (i.e. burn areas)
 - Calibration Transfer to Other Satellites

