

# Chairman's Report

EP-14

# GSICS Practices

- Calibration of satellite instruments is monitored and assessed by comparing them with community references, using common methodologies, following international standards and community best practices, and, ultimately, tying these to SI-traceable standards.
- Calibration corrections are generated for both Near-Real-Time use and retrospective analyses, with specified uncertainties, through well-documented, peer-reviewed procedures, based on various techniques to ensure consistent and robust results, which are applicable over a broad range of observing conditions.
- These inter-calibration products are delivered to users through free and open access, adopting community data standards.
- Developed recommendations for monitoring calibration parameters

# Outcome

- GSICS promotes greater understanding of instrument absolute calibration by analyzing the root causes of biases, supports instrument global interoperability, and enables better accuracy and global consistency of Level 2 environmental, climate and weather forecasting products.
- GSICS is a key contribution to the Implementation Plan for the Global Observing System for Climate in support of the UNFCCC (GCOS-IP), and to ensuring the interoperability of satellite data within the WMO Integrated Global Observing System (WIGOS) and the Global Earth Observation System of Systems (GEOSS) of the Group on Earth Observations (GEO).
- Accurate and consistent calibration is a prerequisite to evaluate decadal trends of climate variables. Feedback from NWP centres shows that intercalibration and subsequent bias analysis and correction are also of great benefit to NWP.

# New Drivers

- CGMS High Level Priority Plan
  - Coordination of observing systems and protection of assets
  - Data Dissemination, direct read out services and contribution to the WIS Products development
  - Enhance the quality of satellite-derived data and Products
  - Outreach and training activities
  - Cross-cutting issues and new challenges

## Enhance the quality of satellite-derived data and Products

- Establish within GSICS a fully consistent calibration of relevant satellite instruments across operational CGMS agencies, recognising the importance of collaboration between operational and research CGMS agencies;
- Establish commonality in the derivation of satellite products for global users where appropriate (e.g., through sharing of prototype algorithms);
- Foster the continuous improvement of products through validation and inter-comparison through international working groups and SCOPE-type mechanisms;
- Harmonise the metadata (e.g. quality descriptors) and format of products to be exchanged;
- Develop, and start implementing, methods to describe the error characteristics of satellite data and products;
- Strengthen interaction with users in selected thematic areas by establishing a close relation with them as beta-testers and foster optimum use of satellite data.

# CROSS CUTTING ISSUES AND NEW CHALLENGES

- Advancing the architecture for climate monitoring from space
  - Extend the use of the Global Space-based Inter-Calibration System (GSICS) and the Sustained Co-Ordinated Processing of Environmental satellite data for Climate Monitoring (SCOPE-CM) frameworks;
  - Analyse long term data sets for specific climate relevant phenomena to demonstrate their impact on climate applications;
  - Establish priorities of multi decadal ECV products (including ECVs addressed by the International Science Working Groups) and contribute to creation of key FCDR that provide the basis for many ECVs;

# GSICS Contributions to climate is rooted in our Mission

- To provide sustained calibration and validation of satellite observations
- To intercalibrate critical components of the global observing system to climate quality benchmark observations and/or reference sites
- To provide corrected observations and/or correction algorithms to the user community for current and historical data

# GSICS to support climate needs to:

- Provide access to instrument quality information for the life of each sensor
- Provide calibration event monitoring log
- Produce intercalibrated sensor data records
- Provide error uncertainty analysis including full error budget
- Contribute to the ECV inventory which now calls for FCDRs to be included



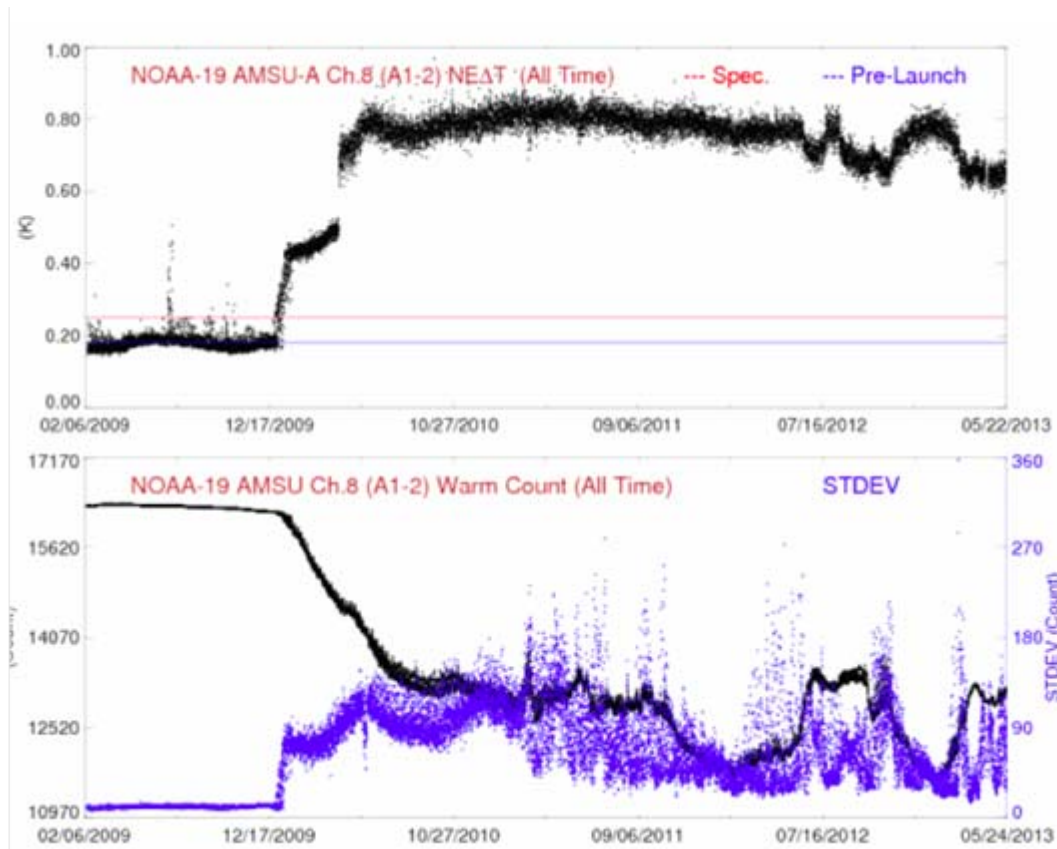
# Next Step

- Update the GSICS Implementation Plan to Support the Generation of FCDRs
  - Supported GSICS Research Working Group

# Approach

- Map GSICS intercalibration activities to SCOPE-CM projects
- FCDRs by the instrument operators
- Polar Satellites (for records longer than 10 years)
  - AVHRR FCDR
  - MODIS FCDR
  - MSU-AMSU-ATMS FCDR
  - Hyperspectral IR FCDR (IASI, CrIS, AIRS)
  - SSMI/SSMIS FCDR
  - SBUV-2, OMO
  - CERES
- Each satellite operator takes responsibility for their satellites using common practices when possible through GSICS collaboration via GRWG.
- Geostationary FCDRs are tied to the Polar Satellites
  - Geo IRs are tied to IASI and AIRS
  - Geo Visible are tied to MODIS/DCC ....

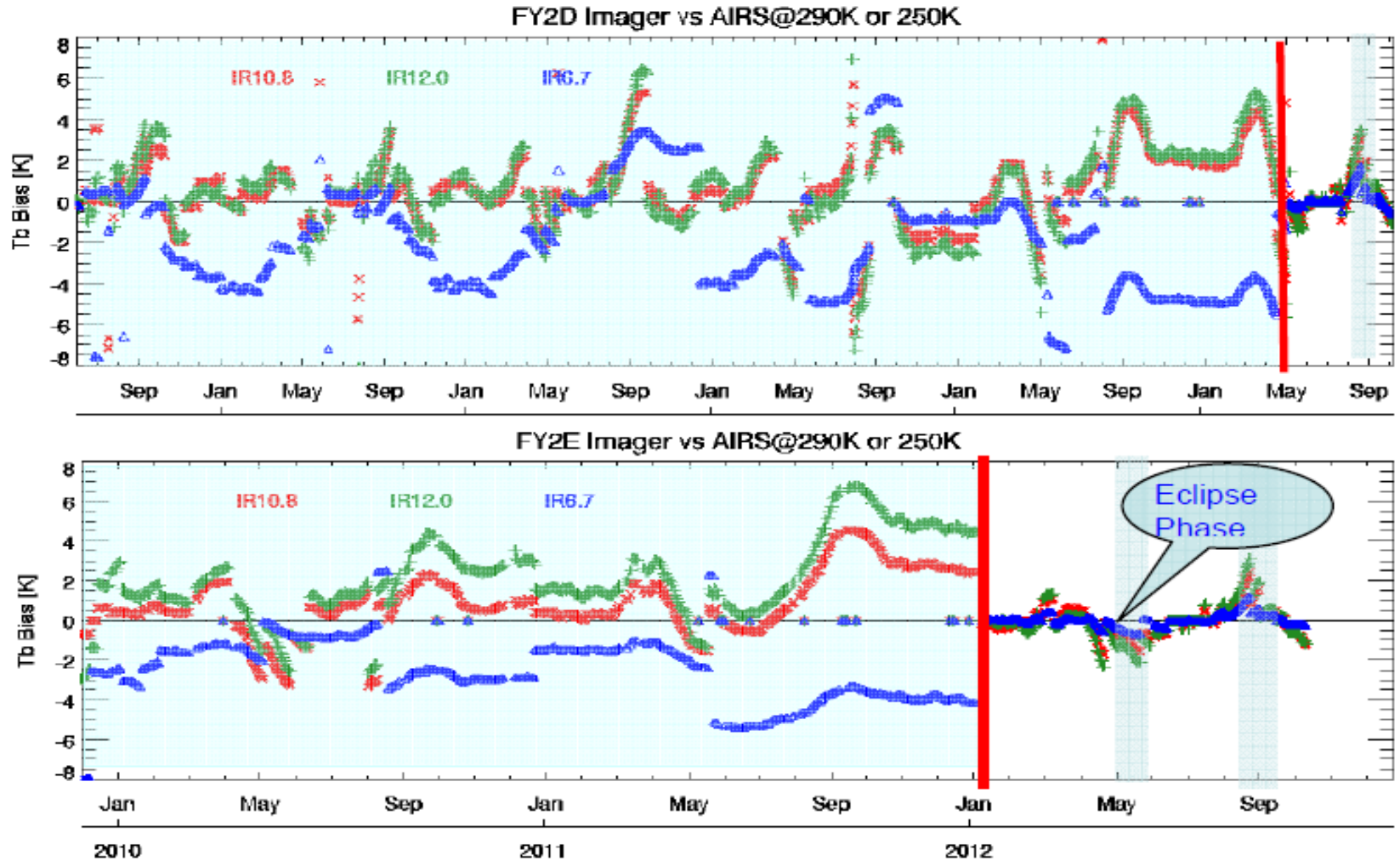
For each individual sensor data record we should provide:



Easy access to critical instrument calibration information is essential for constructing climate data records

Need to preserve the information as data, not just plots, and provide access and provide entry in ECV inventory

# Example of the benefit



CMA successfully applying GSICS mechanism to FY-2E Imager

Establish within GSICS a fully consistent calibration of relevant satellite instruments across operational CGMS agencies, recognising the importance of collaboration between operational and research CGMS agencies (HLPP 3.1)

- *Highlights: Excellent reports on calibration activities including updates on GSICS activities, Suomi NPP cal/val, ESA programmes, NASA/NOAA airborne campaigns, and Russian ground-based validation*
- *Action 41.xx:* GSICS to take on calibration event monitoring activities following the recent work on calibration event monitoring. Such information should be included in the next update of the WMO OSCAR database.
- *Action 41.XX:* CGMS agencies to provide working papers on current and future capabilities for calibration monitoring and event logs – CGMS-42.
- *Recommendation 41.XX:* CNSA to participate in GSICS in recognition of their framework to map sensor performance to application requirements.