

Report of WG II Satellite Data and Products

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(Rapporteurs)**

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(Co-Chairs)**

Highlights

- 60 participants – largest ever!!
- Agency reports on GSICS and SCOPE CM & Nowcasting.
- In-depth discussions on intercomparing and improving products on:
 - Volcanic ash, Atmospheric motion vectors, Clouds
- Ocean community is looking for guidance from CGMS: data formats and real-time access
- GPM Constellation and precipitation sampling matters
- Update on radio-occultation from IROWG
 - Concern on decline of RO constellation; Access to existing RO data
- Update on ESA and NASA programmes and validation activities
- Very encouraging cal/val results from CNSA on HY-2A instruments
- Importance of orbital parameters for optimizing observing system for ocean colour
- Suggestion for new CGMS agenda item on supporting ISWGs and VLab

HLPP Areas addressed by WG II

- Data Dissemination, Direct Read-out Services and Contribution to the WIS
- Enhance the Quality of Satellite-derived Data and Products
- Advancing the architecture for climate monitoring from space
- (Coordination of observing systems – ocean colour)

HLPP Tasks addressed by WG II

Data dissemination:

- Increase access to, and use of, data from R&D and pre-operational missions (2.3)
- Investigate the feasibility of introducing a coordinated dissemination service for information in support of the Ocean User Community (2.5)
- Further enhance the Regional ATOVS Retransmission Services (RARS) initiatives through their extension to advanced sounders for at least half of the globe (2.10)

Enhance quality:

- 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 (3.1)
- Establish commonality in the derivation of satellite products for global users where appropriate (e.g., through sharing of prototype algorithms) (3.2)
- Foster the continuous improvement of products through validation and inter-comparison through international working groups and SCOPE-type mechanisms (3.3)
- Harmonise the metadata (e.g. quality descriptors) and format of products to be exchanged (3.4)
- 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. (3.6)

HLPP Tasks addressed by WG II

Climate Architecture:

- 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 (5.3)

Further enhance the Regional ATOVS Retransmission Services (RARS) initiatives through their extension to advanced sounders for at least half of the globe (HLPP 2.10)

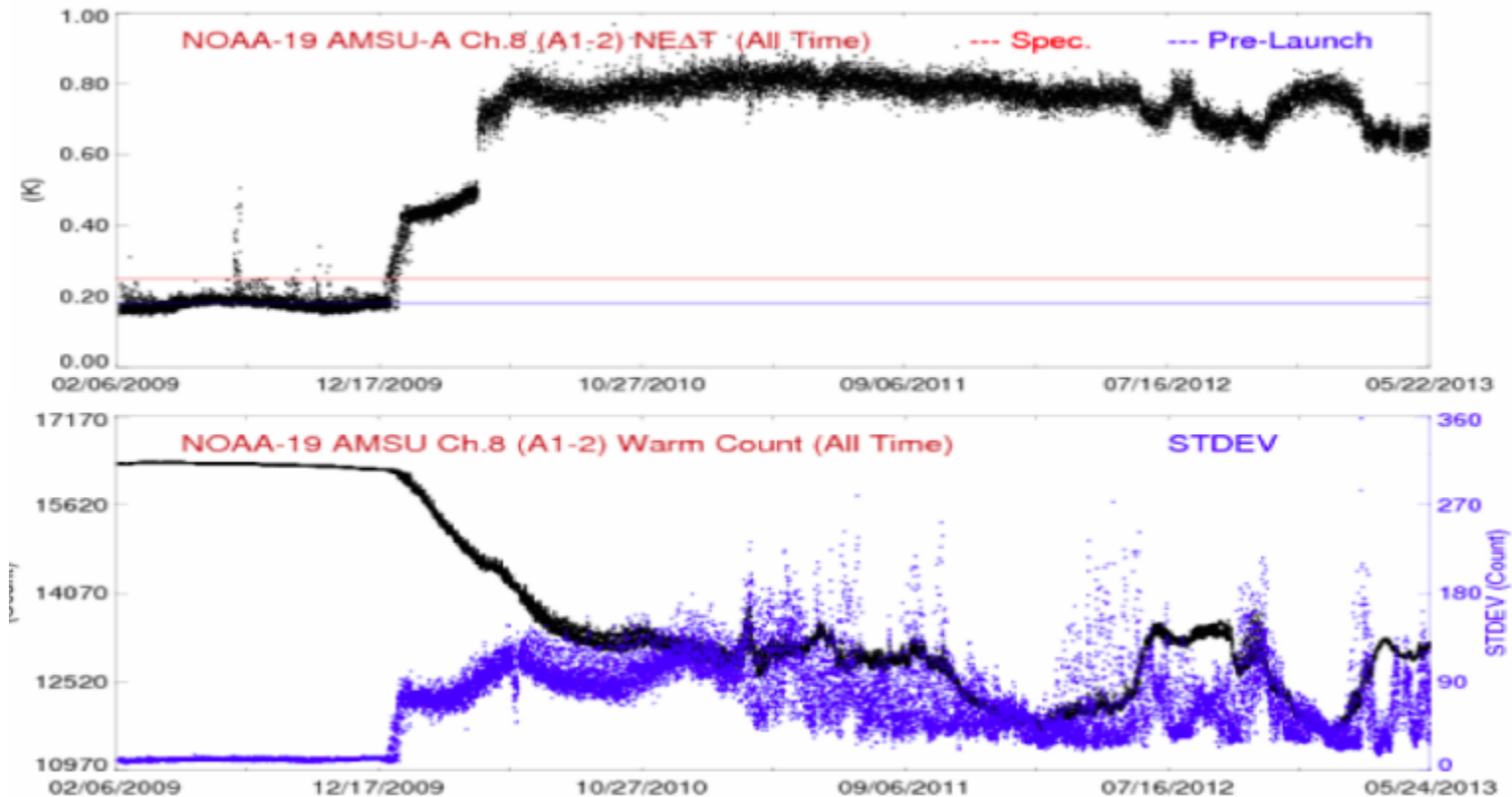
- *Highlights: NOAA WP-17 discussed new NOAA initiative for new Direct Broadcast sites over US and Pacific with plans to acquire NPP/JPSS, METOP, FY-3, METEOR-M*
- *Action 41.xx: CGMS agencies with direct broadcast to provide access to software for converting satellite data packets to calibrated sensor observations (level 1b), and complete related information on the WMO website (http://www.wmo.int/pages/prog/sat/accessandtools_en.php) .*
–Deadline: 1 Nov 2013 to identify Point of Contact.
- *Recommendation 41.XX: NOAA to coordinate its new direct readout initiative which focuses on advanced sounder data from POES, METOP, FY3, METEOR-M, Aqua/Terra with the WMO RARS program.*

Increase access to, and use of, data from R&D and pre-operational missions (HLPP 2.3)

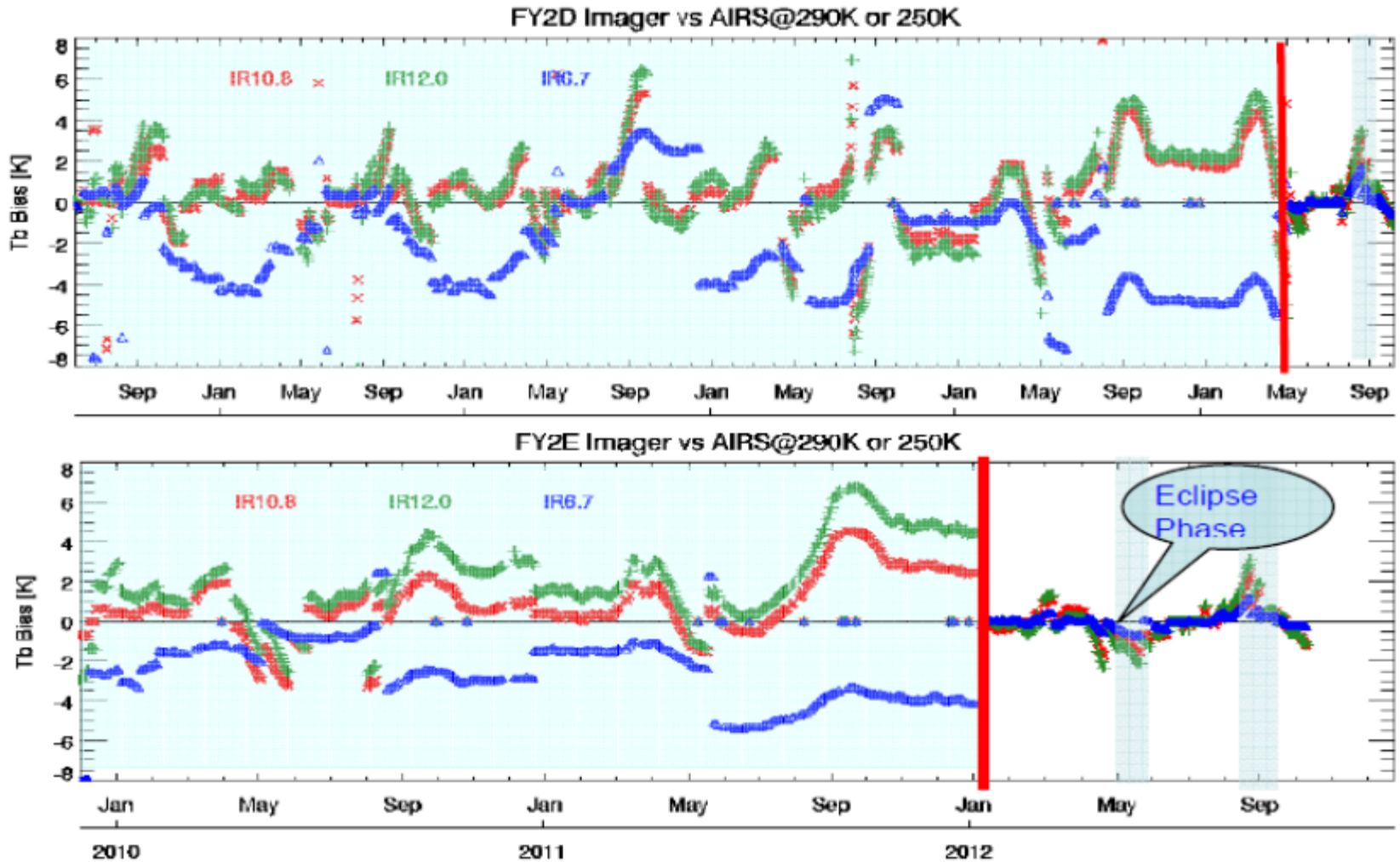
- *Highlights: Discussion of three hour sampling requirement for precipitation and GPM; CNSA paper demonstrating excellent validation results from HY-2A scatterometer and altimeter*
- *Action 41.XX: IPWG to collect the details of data access arrangements for all GPM constellation contributions, and to document these on the IPWG website. Deadline: CGMS-42 .*
- *Action 41.xx: CNSA is requested to provide a summary paper on how to access HY-2A data for CGMS-42.*

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.



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



CMA successfully applying GSICS mechanism to FY-2E Imager

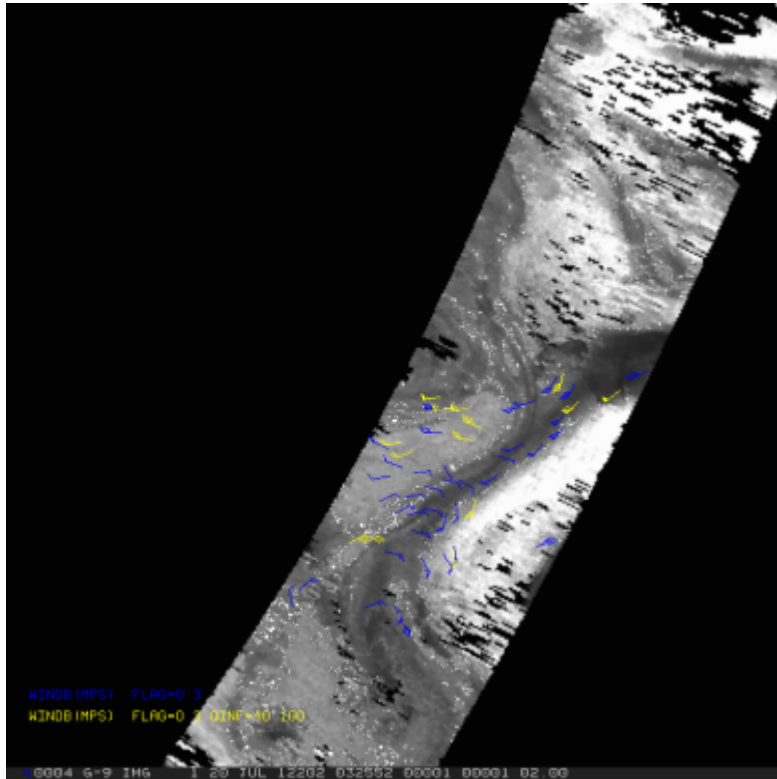
Foster the continuous improvement of products through validation and inter-comparison through international working groups and SCOPE-type mechanisms (HLPP 3.3)

- *Highlights: SCOPE-Nowcasting to focus on volcanic ash, dust, clouds, precipitation and convective initiation; SCOPE-Nowcasting focal points nominated; Excellent support of second AMV inter-comparison project; JMA offers a volcanic ash algorithms testbed; Overview of Cloud Retrieval Evaluation (CRE) working group with anticipation of becoming a CGMS Science Working Group at CGMS-42.*
- *Recommendation 41.XX:* Invite all CGMS members to consider participation in approved SCOPE-CM phase 2 projects.
- *Action 41.XX:* KMA to provide paper on their contribution to SCOPE-CM to the next CGMS session.
- *Action 41.xx:* Co-Chairs of IWWG to provide a summary paper and lessons learnt to CGMS-42 from the second AMV derivation inter-comparison project.

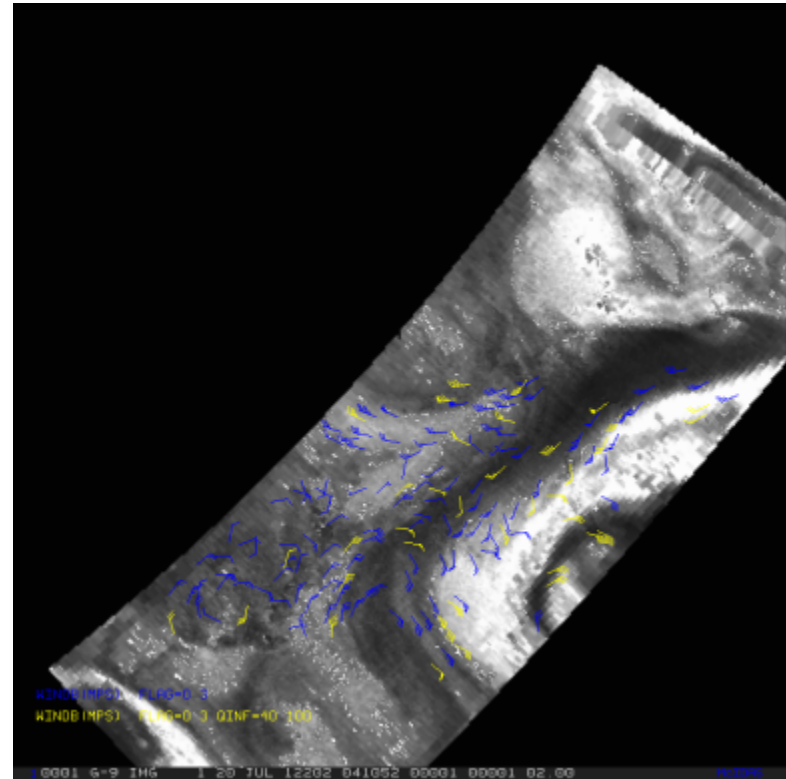
Foster the continuous improvement of products through validation and inter-comparison through international working groups and SCOPE-type mechanisms (HLPP 3.3)

- *Action 41.xx*: IWWG co-chairs to i) organize a dedicated session at IWW12 on research, operational applications and benefits of high resolution AMVs and ii) to provide a corresponding report to the next CGMS meeting.
- *Recommendation 41.xx*: The IWWG-12 is requested to discuss progress on spatially enhanced AMV products using combinations of data from polar orbiting satellites (including sounders).
- *Recommendation 41.xx*: NASA is requested to provide a summary paper to CGMS-42 on Cloud-Motion Winds from MISR. The paper should include the potential of the product for NRT application in NWP and also describe efforts to provide the product for re-analyses.

AIRS and ATMS H₂O Retrieved Winds at 400hPa



AIRS 20 July 2012 0505 UTC



ATMS 20 July 2012 0551 UTC

Specific humidity retrievals.
All winds (blue); Quality controlled winds (yellow)



Consecutive Water Vapor Soundings Provide Altitude Resolved Atmospheric Motion Vectors

Foster the continuous improvement of products through validation and inter-comparison through international working groups and SCOPE-type mechanisms (HLPP 3.3)

- *Action 41.xx*: JMA to establish an environment to implement multiple algorithms to retrieve quantitative ash cloud parameters from operational satellites. This will serve as a test bed for the intercomparison of retrievals on an operational basis in the framework of SCOPE-Nowcasting. JMA is invited to perform an intercomparison based on historical data and report on this to CGMS-42.
- *Action 41.xx*: Co-chairs of CRE WG are invited to draft the terms of reference for a CGMS Working Group on operational cloud parameter retrievals, jointly with the nominated points of contact from CGMS agencies. Due date CGMS-42.

Foster the continuous improvement of products through validation and inter-comparison through international working groups and SCOPE-type mechanisms (3.3)

Proposed objectives of Group:

- to **exchange knowledge** on parameter retrieval algorithms;
- to **contribute to the assessment and to the validation** of both level-2 **cloud parameter retrievals** and their associated **error estimates**;
- to **foster commonality** for operational cloud parameter retrievals among the different CGMS satellite operators;
- to support and **stimulate training** of the operational and scientific community;
- to **enhance communication** in this field and develop international partnerships

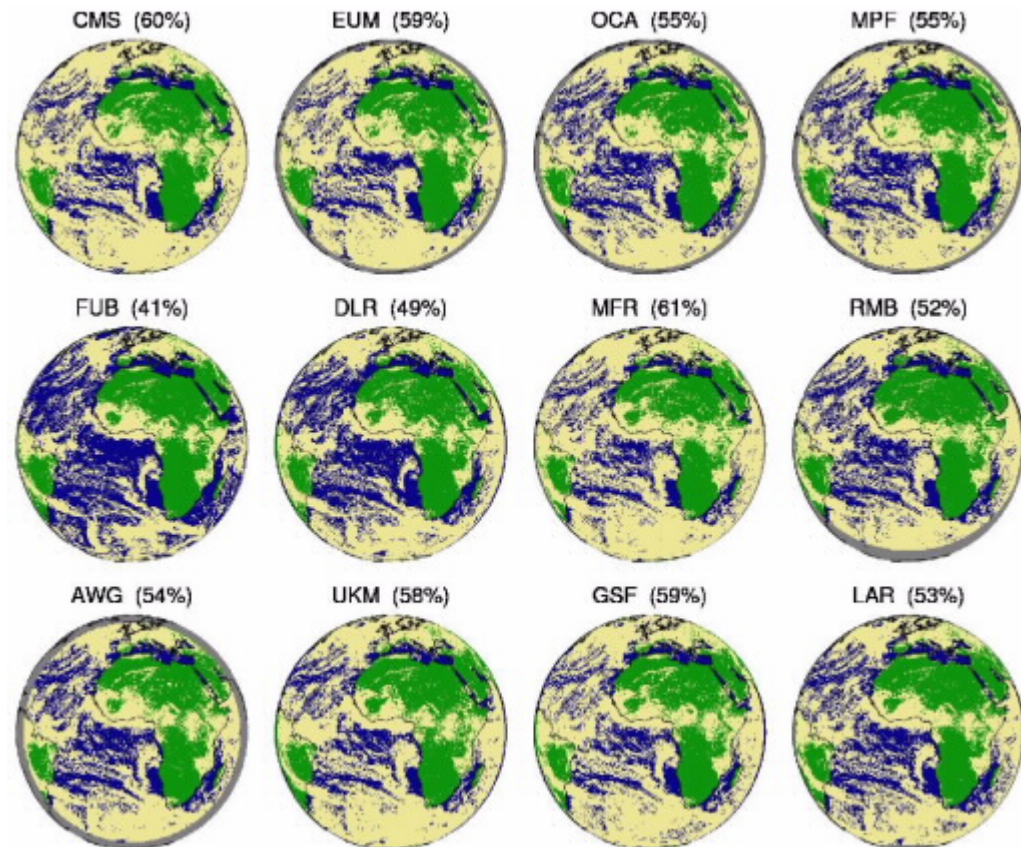


Fig. : Cloud masks of 11 MSG algorithms (13 June 2008, 12 hr UTC)

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 (HLPP 5.3)

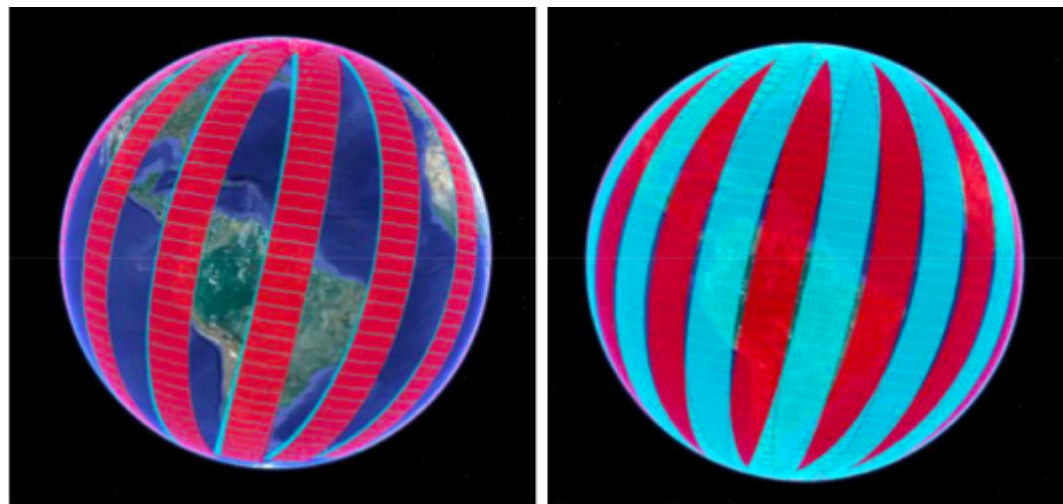
- *Highlight- University of Wisconsin /CIMSS –funding reprocessing of GOES winds from 1995 to present in time for ECMWF next reanalysis*
- *Action 41.XX:* NOAA to ensure that CIMSS/SSEC AMV reprocessing activity should be embedded into SCOPE-CM AMV project by a communication to the SCOPE-CM Secretariat.
- *Recommendation 41.XX:* NOAA is invited to consider sustained support to future reprocessing work on GOES and polar AMVs for the benefit of future reanalyses
- *Recommendation 41.XX:* The International Wind Working Group (IWWG) to support SCOPE-CM toward the possible development of a unified algorithm for consistent reprocessing AMVs from geostationary meteorological satellites.
 - *Supportive of HLPP 3.4 - Establish commonality in the derivation of satellite products for global users where appropriate (e.g., through sharing of prototype algorithms)*

Harmonise the metadata (e.g. quality descriptors) and format of products to be exchanged (HLPP 3.4)

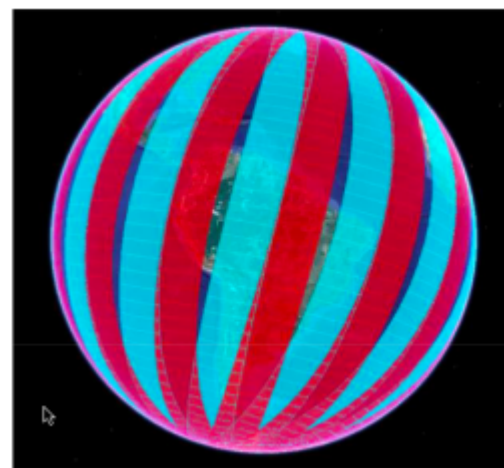
- *Highlights: Overview of GHRSSST and report from the first International Ocean Colour Science (IOCS) meeting*
- *Recommendation 41.XX*: CGMS agencies to assess the GHRSSST data specification for applying to SST data, and to report to CGMS-42.
- *Recommendation 41.xx*: CGMS agencies to support the ocean colour community by adopting netCDF4/CF for representing ocean colour data; and further support data analysis tools (such as SeaDAS, BEAM and ODESA), and optimize the dissemination of ocean colour datasets for research and operational applications.

Other Highlights

- NASA paper on improved constellation planning: With minor adjustments to the planned orbit of GCOM-C1 (4 km altitude, <0.1 deg inclination, 2 min LST), the constellation can maximize the daily coverage potential and remove the oscillations in relative spacing between adjacent swaths that create periods of poor coverage.
- *Action 41.xx*: NASA is invited to pursue the analyses of optimising the orbits of GCOM-C1 and Sentinel-3A, including trade-offs to be made for different scenarios. Due date CGMS-42



Coverage of GCOM-C and ESA Sentinel 3A over 3 month range



Improved coverage maintained with different orbital parameters

Other Highlights

- A NASA paper reported on uncertainty in the Terrestrial Geodetic Reference Frames (1 mm; 0.1mm/yr) which impacts the accuracy of e.g. sea level trends highlighted the importance of sustaining support infrastructure that is critical to satellite operations but not directly under control of CGMS operators.
- Examples are:
GCOS Reference Upper-Air Network, Global Atmosphere Watch, Global Geodetic Observing System, Marine buoy and Tide Gauge networks.

Other Highlights

- *Action 41.XX*: ROSCOSMOS/ROSHYDROMET to verify information on its Meteor-M missions in WMO OSCAR database. Deadline: 1 Sep 2013
- <http://www.wmo.int/oscar>



Suggested new CGMS agenda item

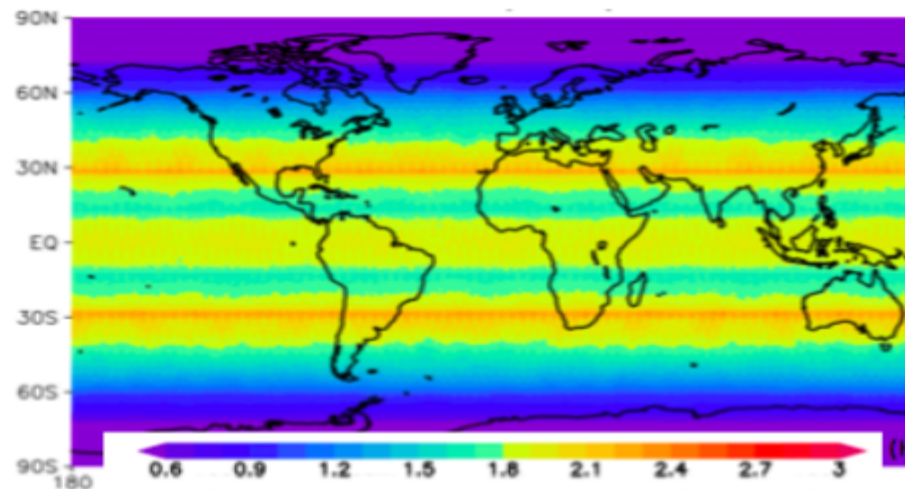
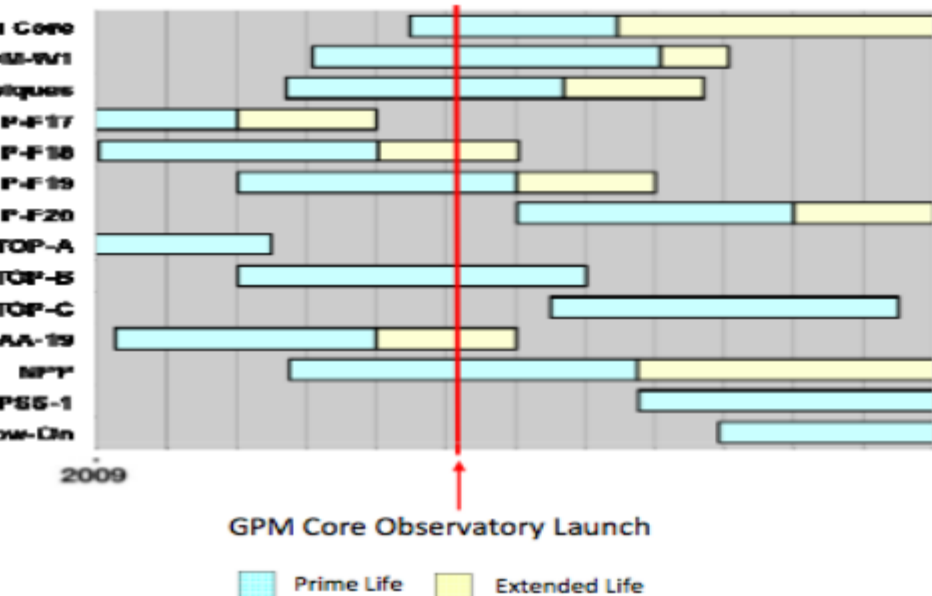
- There is a regular need to support activities of the WMO/CGMS Int'l Science Working Groups (ITWG, IWWG, IPWG, IROWG) – meetings held every 18-24 months (*HLPP 3.3, 5.5*)
- There is a regular need to provide shared support to the VLab technical support officer (*HLPP 4.2*)
- Suggestion: Add agenda item “Support to CGMS International Science Working Groups and VLab Technical Support” to CGMS Plenary sessions

Open WG II-related Actions

- Global GNSS-RO Constellation: Carry out impact studies; mitigate potential gaps; improve data access; in collaboration with WMO, CEOS and IROWG (40.06, 40.23)
- Satellite-based precipitation estimates at 3-hourly intervals: NASA jointly with IPWG to investigate the impact of a potentially degraded global observing system for precipitation over the next decade (40.31)

Overview

Baseline Constellation Schedule



Average Time Interval Between Observations for GPM Constellation Satellites (2015)

- > More than 50% of observations are less than 1 hour apart at all latitudes
- > Percent observations less than 3 hrs apart:
 - 80% in the tropics
 - 70% in the midlatitudes
 - 90+% in polar regions

Appreciation

- Volker Gartner for his many years of dedicated service to CGMS as IPWG rapporteur
- Toshi Kurino for his excellent contribution as co-chair and dinner host.
- To all 60 plus participants from 13 CGMS members in WG II