



Committee on Earth Observation Satellites  
Working Group on Calibration and Validation

# **WGCV actions**

## **March 2010**

**Pascal Lecomte (ESA)  
CEOS WGCV chair**

**Marie-Claire Greening (Greening Consulting)  
CEOS WGCV & QA4EO Secretariat**



# GEO actions

## CL-06-01a\_15: Correction coefficients to intercalibrate historical geostationary infrared imager to AIRS and IASI

Jason Microwave radiometer measurements will be inter-compared with those from similar channels of AMSU on NOAA and MetOP satellites at the simultaneous nadir overpasses to assess their stability and consistency.

The study will be expanded to other microwave radiometers with similar channels.

1. Assess the calibration stability of the Jason 2 Advanced Microwave Radiometer (AMR) by using simultaneous nadir observations (SNO) from AMSU.  
September 2010: present preliminary results at NOAA for Jason 2/AMR
2. Expand the experiment to other Microwave Radiometer for intercalibration  
November 2010: preliminary results for Jason 1/TMR, and possibly other radiometers with similar channels
3. Investigate the possibility for a Reference for MR Calibration.  
October 2010: preliminary results of ocean site selection for monitoring Jason microwave radiometer stability.  
December 2010: review progress in the development of a national microwave blackbody standard at NIST.

**Responsible:** Changyong Cao (NOAA)

**Due:** 01-Nov-10

## CL-06-01a\_15: Update

- JASON 2/AMR time series stability study using AMSU.
- The calibration stability of the Jason 2 Advanced Microwave Radiometer (AMR) is being assessed by using simultaneous nadir observations (SNO) from AMSU.
- The AMR calibration stability directly affects the water vapour path delay correction in the Jason 2 altimeter measurements which are used to monitor sea level rise with high precision.

## **CL-09-03b\_6: Forest Carbon Tracking**

Support the generation of the document that will contain Interoperability Methods for Satellite Data for Forest Carbon Tracking

- February 2010: First draft
- March 2010: Face-to-face working meeting

**Responsible:** Frank Martin Seifert (ESA)

**WGCV contact:** ???

**Due:** 31-Dec-10

## CL-09-03b\_6: Update

Country Guidance Document on options for satellite data processing workflows for deriving the products as specified in #2 (above), including the potential for interoperability between the various satellite sensors being used for GEO FCT.



## **DA-09-01a\_6: Ground-based Cal/Val Campaign**

**Plan and execute an international cross-comparison of ground Cal/Val support techniques and instrumentation for both IR emitted radiance (SST) (spring 09) and VIS/SWIR reflected radiance (Land) (summer 10).**

1. August 2008: Email request to CEOS agencies for financial support for comparison infrastructure
2. September 2008: CEOS SIT to remind agencies to respond
3. October 2008: (If funding available) send formal invitation to participate in IR radiance comparison
4. December 2008: Circulate formal comparison protocol
5. April/May 2009: Carry out comparison in Miami for IR over ocean
6. May 2009: Initiate call for Land surface reflectance comparison
7. August 2010: Carry out CEOS comparison of Land surface reflectance (will be carried out in Turkey - rehearsal in Aug 2009)

**Responsible:** Nigel Fox

**Due:** 30-Aug-10

## DA-09-01a\_6: Update

- IR Radiance comparison highly successful. 9 participants + NPL and NIST. 30 radiometers (13 viewing the ocean). First results show generally good agreement with some surprises!
- Pilot comparison of land surface reflectance took place in August in Turkey, organised by NPL with DLR, CNES, ONERA and TU taking part and INPE and CSIR as observers
- Simultaneous Aircraft and satellite measurements were made by various agencies (including a coordinated activity by GSICS) following a formal invitation to participate. Agencies are requested to submit any results asap .
- Results for all the comparisons are now being processed with the invitation for participation in a full CEOS comparison to be sent out shortly it is hoped that agencies will support participation of key ground teams and provide satellite/aircraft imagery.



## DA-09-01a\_6: Further comments

- Following the success of these first comparisons IVOS is now initiating plans for a similar effort to support OC sensors, particularly for type 2 waters and to support the Ocean Color virtual constellation.
- Plan is to have a European Pilot to establish protocols etc in 2010 and followed by perhaps 3 coordinated CEOS comparisons following similar protocols but in different regions e.g. Europe, Americas and Asia (Korea) to enable ALL research groups to cross-calibrate field instruments and obtain traceability.
- CEOS members are asked to consider how to resource these comparisons.

## DA-09-01a\_8: Develop Cal/Val Portal and post-launch Test Sites

- Nov 10: IVOS workshop to discuss and plan future comparisons at JRC.
- 2010/2011: Enhance the Cal/Val portal to support campaigns and WGCV test sites by:
  1. Build a prototype database for Landnet use (an equivalent of Mermaid for Land).
  2. Initiate an activity to automatise a process for intercalibration of medium resolution sensor.

Note. These two activities include a link between the Landnet (instrumented for high resolution sensors) and the Invariant not instrumented sites (for the medium resolution sensors).

**Responsible:** Gyanesh Chander (USGS) & Philippe Goryl (ESA)

**Due:** 31-Dec-11

## DA-09-01a\_8: Update

- The online catalog provides easy public Web site access to this vital information for the global community  
[http://calval.cr.usgs.gov/sites\\_catalog\\_map.php](http://calval.cr.usgs.gov/sites_catalog_map.php)
- Land sites for radiometric gain and stability are well established and agencies have been requested to regularly observe them. Similarly sites for Ocean colour and Water temp (IR) have been endorsed. QA4EO Procedures have been established to aid their characterisation, description and CEOS registration.
- Work is now in progress to expand the catalogue to sites for other applications and other sensor domains and also to allow storage of associated satellite imagery by USGS. Agencies are requested to regularly observe these sites and to provide data to the database.
- CNES are working towards making available easy access to the SADE database of pseudo-invariant sites for cal/val purposes for CEOS members
- ESA are nearing completion of a revamped Cal/val portal which will have a new look and also increased functionality including wikki based input and edit capability



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## **DA-09-01a\_11: CEOS Reference Test Site Data Collaboration and Comparison**

**including the development of the CEOS Visualisation Environment (COVE) Tool to display Satellite sensor coverage areas and for the identification of coincident scene locations in support of calibration and validation.**

- Jun 09: Work with WGCV Subgroup leads to initiate dialogue with instrument owners relating to the collection of calibration data over CEOS-endorsed sites.
- Aug 09: Ensure collaboration and coordination for the evaluation of the data and the development of the results over comparative sites as a prototype for an operational EO calibration network.
- Nov 09: Peer-review the results and post them on the Cal/Val portal.
- March 10: Present COVE prototype version-1 to WGCV
- May 10: Present information via CEOS/GEO venues.
- May 10: Publish significant results.
- Sept 10: Present COVE prototype version-2 to WGCV
- Nov 10: Complete COVE final version.

**Responsible:** Nigel Fox (NPL), Gyanesh Chander (USGS),  
Philippe Goryl (ESA) & Changyong Cao (NOAA)

**Due:** 01-Nov-10

## DA-09-01a\_11: Update

- Request for agencies to acquire data over the CEOS Land based reference standard test sites during Aug/Sep 2009 and 2010 to coincide with the Ground comparison campaign in Turkey (task –6) was carried out and a number of agencies formally responded (see task 6) This task continues into 2010 and will also expand to include simultaneous ground measurements on other test sites as well.
- This activity is seen as the basis for a prototype “operational Cal/val service” for land imagers and particularly in support of the LSI VC. Plans to further the implementation of this activity are in discussion by a number of CEOS agencies through IVOS.
- Some discussions have been proposed that this could be incorporated in a next phase development of the COVE tool under development by NASA for CEOS.
- To aid this process going forward and to facilitate more efficient contact with key sensor operational personnel. CEOS WGCV is seeking to establish a database of key sensor characteristics with an associated POC for each sensor so that comparisons can be more efficiently organised by targeted emails rather than the use of current email lists. Agencies are requested to provide a POC for each sensor that they operate. The POCs will only be maintained for use by CEOS WGCV and not for public access.

## DA-09-01a\_12: DOME-C Multi-sensor Experiment

**Use Dome-C as prototype and developing continued and on-going methodology to tie into the Cal/Val portal enhancement as a reference for Landnet sites**

1. September 2010: Investigate within the SAR subgroup if Dome C site has a potential for radiometric calibration of SAR.
2. March 2011: Use Dome-C as prototype and developing continued and on-going methodology to tie into the cal val portal enhancement as a reference for Landnet sites.
3. March 2011: Evaluate prospect of BRDF at the Italian base in Antarctica as a test.
4. March 2012: Establish detailed surface BRDF data of DOME-C to provide improved corrections for satellite view and illumination geometries.

**Responsible:** Nigel Fox (NPL), Changyong Cao (NOAA) & Satish Srivastava (CSA)

**Due:** 31-Mar-12



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## **DA-09-01a\_12: Update**

No update – new task

## DA-09-01a\_13: The Quality Assurance Framework for Earth Observation (QA4EO)

will be implemented for GEOSS. QA4EO was initially conceptualised for the space community and this will now be expanded to ensure QA4EO's application to all EO disciplines within all SBA communities. The broadening of the scope for QA4EO necessitates a more generic approach and a wider remit to its applicability. A wider focusing task team with representation from all SBA communities will work towards an appropriate implementation and action plan to achieve a solid QA4EO approach for all members to GEOSS.

- Mar 10: Publish QA4EO version 4.0
- Jul 10: Redefine the task team, Formulate an implementation plan, Formulate an action plan
- Sep 10: Organise a community workshop

**Responsible:** Pascal Lecomte (ESA) & Gregory Stensaas (USGS)

**Due:** 01-Nov-10



## **DA-09-01a\_13: Update**

No update – new task

## DA-09-01b\_2: Data, Metadata & Product Harmonisation

Establish a WGISS project to focus its contributions to the subject task and to generate those contributions. The focus in 2010 will be the development of a community catalog for satellite data, the CEOS WGISS Integrated Catalog (CWIC). The associated CWIC information model will serve as input from CEOS as the GEO community refines the GEOSS information model.

1. March 2010 - Form CEOS WGISS Integrated Catalog (CWIC) Design Team and hold kick-off meeting.
2. June 2010 - Publish CWIC Preliminary Design and its contribution to the GCI.
3. October 2010 - Complete CWIC Detailed Design with Version 1 of the CWIC Information Model.
4. December 2010 - Test/demonstrate CWIC initial capability.

**Responsible:** Kenneth McDonald (NOAA)

**WGCV contact:** ???

**Due:** 31-Dec-10

## DA-09-01b\_2: Update

- On schedule. Deliverables are being prepared as originally foreseen.
- NASA (IDN team) is preparing a letter to the POC of AR-09-01 task to explore the ways the IDN can be integrated into GEOSS.
- WGISS will hold a workshop on Nov. 11 & 12, 2009

## **DI-09-03b\_2: Implementation of a Fire Warning System at Global Level**

**Develop global fire warning system (geostationary and polar orbiting satellites)**

- Dec 2009 Draft plan for the inclusion of satellite-based fuel load and fuel condition data into the global early warning system. Work with GEO task leads and GOFC-GOLD to create data inventory and define specifications and requirements.
- Jul 2010 After review and comment period, deliver completed plan for fuel data provision.

**Responsible:** Ivan Csiszar (NOAA)

**WGCV contact:** LPV subgroup (???)

**Due:** 30-Jul-10

## DI-09-03b\_2: Update

- The early warning system for fires requires multi-source information on fire weather, fuel availability and fuel condition. The GOFC-GOLD Fire Implementation Team has identified the potential for space assets to provide useful information on fuel amount and fuel condition. Data provision and product generation can be facilitated via CEOS coordination mechanisms.
- This task is in its initial phase. Work on collecting information on fuel load and fuel condition data has started. A draft inventory of space-based assets and plan for the inclusion of such information in the global early warning system for fire will be prepared by the end of 2009.

## DI-09-03b\_2: Further comments

- This task is the follow-on to DI-06-13. Recent work has demonstrated a number of geostationary and polar satellite systems can be used effectively to detect emerging fire hotspots in near-real time. As these systems become operational, there is a need to increase the effectiveness of the system by extending the warning to more generic mitigation activities and including parameters measurable from polar orbiting satellites such as vegetation condition and moisture. The task will review existing warning systems. CEOS members can assess the extent to which satellite data is used in these systems and suggest improvements.

## **EN-07-01\_6: Solar Energy Resource Knowledge Management**

**Improve, validate, and disseminate solar resource information from space and ground-based sensors**

- Best Practices Handbook developed: 9/2010

**Responsible:** Paul Stackhouse (NASA)

**WGCV contact:** ???

**Due:** 30-Sep-10

## **EN-07-01\_6: Update**

No update – task still being defined





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# CEOS actions



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## **CEOS 23-11**

**Agencies interested in providing the  
next WGCV Chair term should  
forward nominations to WGCV Chair**

**Due by WGCV-31**



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## **CEOS 23-13**

**WGCV Chair to work with GEO FCT  
Co-Leads to identify the supporting  
role for WGCV in the calibration and  
validation aspects of the FCT  
initiative**

**Due by April 2010**



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# WGCV-30 actions

## WGCV29-6

CRESDA (Xiaolong Dong) potentially providing sample high spectral resolution data HJ-1 A, over select sites: Dome C, Dunhuang and Libyan desert.

Status: Closed – Dong has confirmed that the data of the hyperspectral imager of HJ-1A satellite, together with data from other payloads of HJ-1 series satellites, can be provided to Cal/Val portal and post-launch test sites, based on the availability of the data. The PoC for this is Dr. Feng Zhang, who is the director of administration office of the National Environment Satellite Application Center, which is the data center for HJ series satellites.

Due: WGCV-31

## **WGCV29-9**

WGCV, WGISS and LSI – put together a study to achieve: coordinated quality index for land cover products.

Status: Open – Baret to be asked for an update

Due: WGCV-31

## WGCV30-1

WGCV Subgroups to follow the QA4EO reference standard and the associated IVOS procedure to provide information related to the CEOS World Wide Test Sites. The IVOS procedure should be used, changed or updated as needed to meet subgroup requirements. Cal/Val and test site information should be provided (via the WGCV secretariat) for incorporation into the World Wide Test Site Page.

Responsible: Subgroup chairs

Status: Open

Due: 1 September 2009

## **WGCV30-2**

Remind CEOS chair of accepted CEOS plenary recommendations regarding ASTER GDEM data access & redistribution and request their action.

Responsible: WGCV Chair

Status: Closed

Due: 1 July 2009



## WGCV30-3

Report on why MERIS fAPAR was not used over the BELMANIP2 sites for work done within GEO task DA-09-01b\_1. WGCV Secretariat to ask Baret (task lead).

Responsible: WGCV Secretariat / Baret

Status: Open

Due: 1 July 2009

## **WGCV30-4**

Subgroups to consider their specific requirements for data formats (including metadata) and consider proposing a standard format or standard set of processes where appropriate.

Responsible: Subgroup chairs

Status: Open

Due: WGCV-31

## WGCV30-5

Stensaas to work (with WGISS) to draft a short summary on the exact nature and background to the request made in action WGCV30-4 for presentation to the subgroup members to assist their response.

Responsible: Stensaas

Status: Open

Due: 01 September 2009

## WGCV30-6

Discuss with AR-09-01c (GEOSS Best Practices Registry) leads to identify exactly how their catalogue works and to discuss establishing links to QA4EO best practice and Cal/Val related documentation.

Responsible: Lecomte / Stensaas

Status: Open

Due: SIT-24

## WGCV30-7

Compile a statement of WGCV capability and abilities that the constellation communities may use to identify areas where the WGCV could effectively contribute. This should include POCs for each capability or at least each instrument covered by the subgroup.

Responsible: Stensaas / Subgroup Chairs /  
WGCV Secretariat

Status: Open

Due: SIT-24

## WGCV30-8

Enhance the proposed QA4EO Governance Structure to ensure inclusion of all relevant parties from both within CEOS and also from the wider GEO community.

Responsible: Lecomte / Stensaas /  
QA4EO Secretariat

Status: Open

Due: GEO VI

## **WGCV30-9**

Draft a proposition for an implementation strategy for QA4EO for presentation to GEO at GEO-VI

Responsible: Lecomte / Stensaas / Ungar /  
QA4EO Secretariat

Status: Open

Due: 1 July 2009

## WGCV30-10

Define a list of IVOS instruments and encourage (write a letter to) all agencies to participate in a prototype global intercomparison experiment (Tuz Golu campaign – August 2009) to include all IVOS test sites. Pass this information to the SEO.

Responsible: Fox / Lecomte

Status: Closed

Due: 13 July 2009



## WGCV30-11

WGCV representatives to ensure that their WGCV plenary report includes particular reference to any current CEOS or GEO task issues. For example, the agency / country report may include details on progress towards the goal of making DEM data available for the GEO Global DEM (in response to GEO task DA-09-03d) and/or a report on progress in implementation of QA4EO (in response to GEO task DA-09-01a).

Responsible: All WGCV plenary participants

Status: Open

Due: WGCV-31