



Working Group On Calibration and Validation Minutes of the 36th CEOS WGCV Plenary

Hosted by:

AOE, CAS: Key Lab of Quantitative Remote Sensing Information Technology, and
Key Lab of Computational Optical Imaging Technology

in collaboration with:

SECM, CAS: Key Lab of Microsatellites

USTC, CAS: Key Lab of Electromagnetic Space Information

SITP, CAS: State Key Lab of Infrared Physics, and
Key Lab of Space Active Opto-Electronics Technology



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Executive Summary

The 36th Working Group for Calibration and Validation (WGCV) plenary meeting was hosted by the Academy of Opto-Electronics, Chinese Academy of Sciences (CAS) in Shanghai, China from May 13 to 17, 2013 in collaboration with SECM, USTC and SITP of CAS. There were more than 55 participants representing 25 agencies/institutions internationally. Some participants joined the meeting virtually. In addition to usual plenary proceedings such as subgroup reports, agency/country reports, work plan, GEO actions etc., there were a number of Special Interest Presentations. As a follow up from SIT-28 meeting, one of the main objectives of this plenary was to engage with CEOS Virtual Constellations (VCs) and their activities that could lead to substantive collaboration between WGCV and VCs. Some VCs (SST, AC, LSI and PC) and CEO made presentations (virtually or in person) and potential collaboration was discussed. In fact the Infrared and Visible Optical Sensors (IVOS) subgroup of WGCV is already working jointly with VC-SST proposing a campaign for post-launch calibration and validation of instrumentation used for brightness temperature measurements. The campaign should also be useful to both WG Climate and VC-AC.

There was a Quality Assurance Framework for Earth Observation (QA4EO) side meeting during WGCV-36, and short- and long-term approaches were discussed. In the short term (months), the focus is on addressing specific examples with QA4EO, e.g., flooding and ozone. In the longer term (1-2 years), the approach is to extend these examples to showcases. The Terrain Mapping (TM) subgroup of WGCV proposed to produce a GEO showcase on tsunamis; it is presently under consideration by the CEOS Secretariat. At WGCV-36 there was also a call for nominations for the 2014-2016 Vice Chair, to become Chair in 2016-2018.

The 37th WGCV plenary meeting will be hosted by ESA/ESRIN in Frascati, Italy from February 17-21, 2014.

DAY 1- MONDAY – MAY 13, 2013

Chair's Welcome

WGCV Chair, Dr. Satish Srivastava, welcomed participants to the 36th Working Group on Calibration and Validation Plenary (WGCV-36) in Shanghai, China. Host and sponsor organizations, represented by: Prof. Li (AOE, CAS), Prof. Liao (NRSCC), Prof. Wang (Shanghai branch, CAS) and Prof. Yin (SECM), and everyone involved in the organization of WGCV-36, were thanked for their efforts in hosting the meeting that attracted over 55 delegates representing 25 agencies/institutions from around the World to discuss calibration and validation issues. Delegates were also thanked for their efforts in travelling to participate in WGCV-36.

Roll Call

Participants were asked to introduce themselves via a roll call. The complete list of registered attendees for WGCV-36 may be found in Appendix 1.

Adoption of Agenda

The WGCV-Chair presented the Agenda to WGCV-36 participants for adoption.

Minor changes were accepted to have TMSG Chair (J.P. Muller) move his discussion on the Geo-ministerial showcases from the QA4EO session to a later timeslot, likely on Thursday, May 16th, depending on time availability. ACSG Chair also expressed desire to have time allotted for a discussion on the structure of QA4EO during the QA4EO session on Tuesday May 14th.

Agenda, including minor changes, was adopted unanimously by the plenary. A copy of the agenda may be found in Appendix 2.

Host and Welcome Address

AOE-CAS (Prof. C.R. Li): Welcomed all participants on behalf of AOE-CAS. Stressed the importance of EO information in all aspects of society and the critical role of calibration and validation in the development and operation of sensors for providing accurate and enriched data as a primary information resource. Very pleased to host WGCV-36 to share information with, and learn from, the International community on EO calibration and validation issues.

NRSCC (Prof. X.H. Liao): Offered his congratulations to local hosts and CEOS organizers on the organization of WGCV-36 in Shanghai. NRSCC currently involves 49 associated departments in China involved in the EO science and technology area. As a member of CEOS, NRSCC is involved in many aspects and many working groups to promote data, infrastructure and knowledge sharing. Also involved in GEO and GEOSS activities as a member organization. Wishes everyone good discussions and output from the plenary meeting.

CAS, Shanghai Branch (Prof. J.Y. Wang): Offered a warm welcome to participants on behalf of CAS, Shanghai Branch. Considers EO imaging as one of the most important technologies from the last century for observing planet Earth. Shanghai branch of CAS includes 14 research institutes involved in many related fields of sensor development and Earth observation. Thanked the hosting organizations to have invited CAS to attend the WGCV-36 and wished all participants a successful plenary.

WGCV-Chair's Report (S. Srivastava)

The WGCV Chair presented his report (A copy of the WGCV Chair's Report is available on the WGCV-36 webpage [[PDF](#)]).

Discussion on SIT-28 meeting outcome:

- **B. Bojkov (ESA/ACSG Chair):** Expressed concerns about the somewhat negative feedback received on WGCV from the last SIT-28 meeting in Washington D.C.
- **S. Srivastava (CSA/WGCV Chair):** Feedback from SIT-28 was that progress of WGCV is not significant and that the working group has to re-organize and re-invent itself and pay careful attention to including Virtual Constellations in its activities.
- **N. Fox (NPL/IVOS Chair):** Also noticed some negative feedback on the various e-mail threads following the SIT-28 meeting. Thinks that WGCV activities are not sufficiently visible to the Virtual Constellations in GEO and that WGCV needs to be conscious of better communicating the message to VCs of its role in fundamental core cal/val activities and available infrastructure for cal/val and work in partnership with them. As well, believes that the VCs need to channel some of their resources and efforts into WGCV in order to help support some of the cal/val activities that they require, within the framework on WGCV infrastructure that exists. Also, some agencies are finding it easier to provide support to VCs versus core activities of the working groups and thinks that it is WGCV's job to better promote itself to the agencies.
- **B. Bojkov (ESA/ACSG Chair):** WGCV is a technical forum that deals with background activities such as fundamental measurements, producing cal/val site protocols, dealing with issues of long-term data preservation, etc. which are not those of the VCs which tend to be more targeted and 'attractive' in gaining support for their activities. It is therefore critical that the message to the SIT has to be targeted to promote the role of WGCV as a provider of fundamental core cal/val activities and infrastructure that VCs should involve in their activities.
- **S. Srivastava (CSA/WGCV Chair):** Agrees to make that message clearer to SIT.

Review of Action Items from WGCV-35 (E. Arsenault)

The actions items of WGCV-35 were reviewed by participants of the WGCV-36 plenary. The status summary/close-out of each action item is provided in Appendix 3 with comments and/or justification provided where necessary.

Host Agency Presentation of Research Activities

Introduction to Academy of Opto-Electronics (AOE), CAS (C. R. Li)

- A copy of Prof. Li's presentation is available on the WGCV-36 webpage [[PDF](#)].

Introduction Shanghai Engineering Center for Microsatellites (SECM), CAS (Z. S Yin)

- A copy of Prof. Yin's presentation is available on the WGCV-36 webpage [[PDF](#)].

Subgroup Reports #1

Microwave Subgroup Report – MSSG (X. Dong)

- A copy of the MSSG Chair's Report is available on the WGCV-36 webpage [[PDF](#)].

Questions/Comments:

- o On the MSSG Chair's proposal to suggest Dr. Richard Dudley (NPL, UK) as vice-chair for MSSG subgroup: It was recommended by WGCV plenary to have a representative from an agency that is either developing or supporting a microwave satellite sensor in the role of chair or vice-chair. MSSG was still encouraged to include NPL actively in the work of the subgroup (i.e. workshops, etc.).

Infrared, Visible and Optical Sensors – IVOS (N. Fox)

- A copy of the IVOS Chair's Report is available on the WGCV-36 webpage [[PDF](#)].
- Questions/Comments:
 - o **A. von Barga (DLR/WGCV Vice-Chair)** : Will have a topic in Tuesday May 14th presentation on 'Future Ideas on WGCV' on what is required to have a more co-ordinated approach as to the work of the subgroups to avoid overlaps in effort and to have a more cohesive response to various requests being presented to WGCV and their subgroups.
 - o **B. Bojkov (ESA/ACSG Chair)**: Why are land products included in IVOS when it should likely be handled by the LPV group?
 - o **M. Román (NASA/LPV Vice-Chair)**: [Response to B. Bojkov] LPV acknowledges that there is a gap in terms of expertise on reflectance cal/val and is encouraged that IVOS can fill-in the gap in this area. As long as there is always direct coordination between LPV and IVOS, there is not really an issue.

Land Product Validation – LPV (M. Roman on behalf of G. Schaeppman-Strub)

- A copy of the LPV Chair's Report is available on the WGCV-36 webpage [[PDF](#)].
- Questions/Comments:
 - o **J.-P. Muller (UCL/TMSG-Chair)** raised the issue of terrain that is not usually considered into the modelling of LPV products which has been raised in previous WGCV plenaries. When can TMSG get involved with the LPV subgroup to collaborate in including terrain products in more LPV applications?
 - o **M. Román (NASA/LPV Vice-Chair)** [Response to J.-P. Muller] If the individual sub-group leads see it as appropriate, an overview section that describes the issue of terrain correction in land products (e.g. albedo) can be added into their best practices documents. AGU special session was also brought-up and it was said to be a very successful event. LPV plans to follow that format again based on the positive outcome if other such opportunities come up.

Agency/Country Reports #1

National Space Science Center, CAS - NSSC (X. Dong)

- A copy of the NSSC report is available on the WGCV-36 webpage [[PDF](#)].

National Remote Sensing Centre of China – NRSCC (H.Y. Yue)

- A copy of the NRSCC report is available on the WGCV-36 webpage [[PDF](#)].

CSIRO (M. Thankappan [for T.Malthus])

- A copy of the CSIRO report is available on the WGCV-36 webpage [[PDF](#)].

Geoscience Australia / Australia Report (M. Thankappan)

- A copy of the Geoscience Australia agency report is available on the WGCV-36 webpage [[PDF](#)].
- A copy of the Australia country report is available on the WGCV-36 webpage [[PDF](#)].

Meeting was adjourned for the day at 17:10.

DAY 2 - TUESDAY – MAY 14, 2013

Special Interest Presentations/discussions #1

Overview of CEOS and GEO priorities for 2013 (K. Sawyer - remote presentation)

- A copy of the CEOS and GEO priorities for 2013 presentation is available on the WGCV-36 webpage [[PDF](#)].

WGCV's Role in the CEOS Self-Study Implementation Initiative (K. Sawyer - remote presentation)

- A copy of the CEOS Self-Study Implementation presentation is available on the WGCV-36 webpage [[PDF](#)].
- Questions/Comments:
 - o **B. Bojkov (ESA/ACSG Chair):** Asked about the differences between virtual constellations and working groups in terms of representation at the CEOS level. Are they treated equally in terms of addressing the recommendations made to CEOS? The reporting structure mechanism within CEOS is hierarchical with an annual approval process. Within WGCV, the sub group work plans get rolled-up into the broader working group WGCV work plan which then gets presented to CEOS for approval at the plenary. The VCs on the other hand have a much more simple structure which allows them to present much more focused work plans to CEOS.
 - o **K. Sawyer (CEOS-CEO):** The WGs report at the CEOS plenary level while the VCs only report to the Strategic Implementation Team (SIT). In terms of structure, it is every WG's decision to determine the complexity of its own internal structure. For example, some WGs do not have any subgroups.
 - o **S. Srivastava (CSA/WGCV Chair):** Does the WGCV work plan need approval at SIT? What is the procedure on that?
 - o **K. Sawyer (CEOS-CEO):** The process of approving work plans at the SIT level is not currently active; it is simply a recommendation at this point.
 - o **G. Stensaas(USGS):** During last plenary meeting, WGCV had many recommendations that were compiled from the WGCV-35 plenary meeting from the six subgroups. There was not enough time to address them at the CEOS plenary. Is there a requirement to make all of the recommendations from the WGCV group report, available to CEOS for revision prior to the annual CEOS plenary?
 - o **K. Sawyer (CEOS-CEO):** Yes, from here to November, there will be guidance from CEOS on how the information needs to be summarized so that it can be presented well ahead of time to the CEOS principles so that they come prepared and ready to make decisions on WGCV recommendations at the CEOS plenary.

Future Ideas on WGCV and Discussion (A. von Bargaen, All - Part 1)

- A copy of the Future Ideas on WGCV – Part 1 presentation is available on the WGCV-36 webpage [[PDF](#)].
- Questions/Comments:
 - o **G. Stensaas(USGS)**: Comment: Feels that WGCV has established itself as the point of contact on cal/val issues for CEOS and was one of the first working groups created in the early days of CEOS. In recent years, multiple VCs have been established along with numerous CEOS task and efforts that overlap WGCV cal/val issues. In this context, the communication process also has to come from the other groups as well, not just from WGCV. All CEOS working groups have significant needs for calibration of their sensors and for validation of their products. Without good cal/val processes, some of these projects would not be as useful or credible.
 - o **A. von Bargaen (DLR/WGCV Vice-Chair)**: The problem is that there is a growing number of VCs which are very motivated and focused. This has to be seen as a positive. The roles between VCs and WGCV within CEOS have to be clarified to avoid duplication of efforts and avoid divergent messages or conclusions.
 - o **B. Bojkov (ESA/ACSG Chair)**: The message that WGCV should be the entry point for all cal/val issues is valid but there are some exceptions. There are certain groups (i.e. for greenhouse gases) that are much focused and address, not just retrievals, but also cal/val aspects and there is no point in duplicating this activity within the subgroup.

Subgroup Reports #2

Synthetic Aperture Radar Subgroup Report – SAR (M. Zink)

- A copy of the SAR Chair’s Report is available on the WGCV-36 webpage [[PDF](#)].
- Questions/Comments:
 - o **J.-P. Muller (UCL/TMSG-Chair)**: Commented on the great work by SAR subgroup on their new website. Asked WGCV if any support is available for web site development support. Alessandro Burini from the CEOS cal/val portal mentioned that help could be provided to the TMSG subgroup for such a thing.
 - o **B. Bojkov (ESA/ACSG Chair)**: It would be worthwhile to have WGCV workgroup discuss the development of common templates among the various subgroup and the CEOS cal/val portal team would be happy to help in that matter.
 - o **M. Román (NASA/LPV Vice-Chair)**: At the agency level, there’s an interest in maintaining the websites of the various subgroups. NASA for example is supporting the LPV website, with direct input from the LPV chair and vice-chair, and would be open to following any standard template or format that WGCV would recommend.

Atmospheric Composition Subgroup Report – ACSG (B. Bojkov)

- A copy of the ACSG Chair's Report is available on the WGCV-36 webpage [[PDF](#)].
- Questions/Comments:
 - o **B. Bojkov (ESA/ACSG Chair):** Asked the question whether or not the ACSG group should be dissolved based on the level of maturity/end-of-life of many of its missions where cal/val is not really required anymore.
 - o **S. Srivastava (CSA/WGCV Chair):** Creation or deletion of a subgroup level is at the workgroup level; therefore it is in WGCV's mandate to take that decision.
 - o **P. Henry (CNES):** Believes that, if the ACSG would to be dissolved, the information on activities normally conveyed via the ACSG subgroup would have to be reported via another means at the WGCV such as through a special interest report.
 - o **B. Bojkov (ESA/ACSG Chair):** As suggested by WGCV Chair, took a personal action to reflect more on this and have discussion with his members on this possible scenario. (Note: action not to be recorded as a WGCV plenary action)

Special Interest Presentations /discussions #2

Updated CEOS Cal/Val Portal and discussion (A. Burini)

- A copy of the CEOS Cal/Val presentation is available on the WGCV-36 webpage [[PDF](#)].
- Questions/Comments:
 - o **M. Román (NASA/LPV Vice-Chair):** Question about A. Burini's report on the 6S tool being no longer available via Eric Vermotte's website. The 6S tool is still available working according to LPV chair (see: <http://6s.ltdri.org/>, RUN 6S section). Both LPV chair and A. Burini to discuss offline and contact E. Vermotte on this issue.
 - o **Other participant:** Development or endorsement should be user-driven and not imposed by WGCV. Statistics on user access to tools should be considered to determine which tools to focus on for improvement.
 - o **J.-P. Muller (UCL/TMSG-Chair):** There is a need for an effort to make data set interoperable between sensors/data products. How do you see CEOS cal/val portal evolving to expand to include other satellite products, such as Mercury or Fluxnet?
 - o **M. Román (NASA/LPV Vice-Chair):** Thinks that the WGCV approach for the CEOS cal/val portal should allow some flexibility in leveraging other mission specific tools developed by national agencies, but making sure that they meet or exceed a common agreed-upon WGCV standard. WGCV needs to reach a consensus; on what it needs and use the resources that it has to achieve this. Exercise should be international collaboration, not just one agency representation. Perhaps, there is a requirement that needs to be formulated to WGISS on this topic?

- **P. Henry (CNES):** Has issues with the term “users”. Must be careful to not open up the tools to the general public, should be limited to the cal/val community who understand how to use the tools appropriately.
- **A. Burini (ESA):** Users are tracked by their I.P. address. About 70% cal/val portal are from the cal/val community from the national space agencies and approx. 30% from academia. Site is controlled by user name and password where access to subfolders can be restricted if required.
- **P. Henry (CNES):** Comment on subsetting of data: WGCV has to define the methods and the procedures that are used to subset the data in order to avoid the introduction of bias due to inconsistent methodologies applied.
- **P. Henry (CNES):** Does CEOS cal/val have in mind a mechanism to keep the information on the source of the original data provider to allow them to be cited and/or credited for their efforts?
- **A. Burini (ESA):** On the metadata, there is a specific field to capture the information on the data originator.
- **M. Román (NASA/LPV Vice-Chair):** Comment: LPV is exploring the development of a DOI approach for validation data sets in order to keep a persistent trace on the origins of the files.
- **S. Srivastava (CSA/WGCV Chair):** Thanked ESA for their good work on the CEOS cal/val portal and supports its continuation on behalf of WGCV.

Subgroup Reports #3

Terrain Mapping Sub Group – TMSG (J.P. Muller)

- A copy of the TMSG Chair’s Report is available on the WGCV-36 webpage [[PDF](#)].
- Questions/Comments:
 - **P. Henry (CNES):** A good description was given during this TMSG presentation on the usefulness of a DEM product. Quite surprised that none of the agencies has come for guidance to WGCV or TMSG group, regarding the accuracy of DEMs for correcting products that will be delivered to users from sensors/missions that they are developing. For example, do you have any idea of the accuracy of the DEM that will be used in the processing of Sentinel-2?
 - **J.-P. Muller (UCL/TMSG-Chair):** The issue was brought up to ESA and the Sentinel-2 leads and no response was received. Surprising and disappointing that this is not a concern. At NASA, the issue was acknowledged with a DEM science working group set up, specifically for EOS, but unfortunately the data sets that they use (i.e. GTOPO30) are not the most accurate.
 - **H. Reuter (ISRIC):** Other issue is that certain agencies have internal DEM data sets that are not distributed outside of their agency.
 - **J.-P. Muller (UCL/TMSG-Chair):** Several proposals have been made over the years to have data shared but unable to attract the space agencies’ support to achieve this.
 - **B. Bojkov (ESA/ACSG Chair):** Could it be an issue of not addressing the correct people at the space agencies to raise this issue?

- **M. Zink (DLR/SAR Chair):** Clarification on the DLR announcement of opportunity: 1st element is Intermediate DEM which is the DEM derived from the 1st coverage, 2nd is access to the interferometric pairs - CoSSC (Co-registered Single-look Slant-range Complex data used to generate the DEM) PI will get limited amount of data

Agency/Country Reports #2

NASA (M. Román)

- A copy of the NASA agency report is available on the WGCV-36 webpage [[PDF](#)].

German Aerospace Center (DLR) (A. von Bargaen/M. Zink)

- A copy of the DLR agency report is available on the WGCV-36 webpage [[PDF](#)].
- Questions/Comments
 - **J.-P. Muller (UCL/TMSG-Chair):** Question asked about imaging over deserts. Noticed that many areas imaged over Saudi Arabia have high error levels, obviously due to the penetration issue. Is there a plan to re-image these areas?
 - **M. Zink (DLR/SAR Chair):** Plan to focus on these areas after bulk of current work on Antarctica is completed. Plan to modify the look direction, reacquire imagery over deserts, at lower incidence angles to increase the SNR to fill these voids.
 - **J.-P. Muller (UCL/TMSG-Chair):** Is the frequency stability of the LiDARs and the FWHM narrow enough to make these measurements inside frown half-lines?
 - **A. von Bargaen (DLR/WGCV Vice-Chair):** The laser would have to be tuned. Not so easy to do. Can consult DLR specialist to answer this question.
 - **S. Srivastava (CSA/WGCV Chair):** What kind of uncertainty do you see in the measurements over Greenland because of the penetration into the ice?
 - **M. Zink (DLR/SAR Chair):** Two issues: 1) penetration in the ice, and 2) melting of the ice which modifies the topography. Difference up to 10m can be observed.

National Oceanic and Atmospheric Administration (NOAA) (X. Shao/C. Cao)

- A copy of the NOAA agency report is available on the WGCV-36 webpage [[PDF](#)].

QA4EO: A Quality Assurance Framework for Earth Observation

Update on GEO Actions (S.Srivastava – WGCV Chair)

- WGCV Chair reviewed GEO Actions assigned to WGCV with updates.
- The new GEO Actions proposed by WGCV are summarised in the WGCV Chair's Report available on the WGCV-36 webpage [[PDF](#)].

Review of Action Items for QA4EO WGCV-35 – Deferred from Day 1- (S.Srivastava – WGCV Chair)

- See Appendix 3 for decisions/close out of action items WGCV35-3, 35-13, 35-28, and 35-31.

Background presentation on QA4EO (N. Fox)

- A copy of the QA4EO Background presentation is available on the WGCV-36 webpage [[PDF](#)].

Discussion (All)

- **A. von Bargaen (DLR/WGCV Vice-Chair):** User community is unclear on the purpose of QA4EO. If we want to proceed forward, we have to find a purpose for QA4EO that will benefit the user community. WGCV should sort out questions to be answered for QA4EO before moving forward.
- **M. Román (NASA/LPV Vice-Chair)** – The primary focus should be the interaction with our users. One example is with MODIS Land products QA tutorial series (see: https://lpdaac.usgs.gov/sites/default/files/public/modis/docs/MODIS_LP_QA_Tutorial-1.pdf). A review of current papers showed that 70% of users were not using the QA data correctly. We would serve the community well if we were thinking on how to be proactive with the user in promoting the proper use of QA information.
- **B. Bojkov (ESA/ACSG Chair)** – Still thinks that QA4EO is good but believes that our delivery of our message has not been well executed and as a result, many users have abandoned on the idea of QA4EO. Doesn't think that WGCV needs a heavy structure (i.e.: implementation board or an executive panel) for QA4EO, but rather it simply needs to keep the documents updated and perhaps a curator of the web pages and have a few examples but nothing more.
- **N. Fox (NPL/IVOS Chair)** – Emphasized that QA4EO is not about the guidelines but rather about the principles. The reason that QA4EO was created was to provide a framework for traceability and uncertainty that was consistent and that was simple for people to recognize. QA4EO was meant to be a vehicle to encourage that process.
- **A. von Bargaen (DLR/WGCV Vice-Chair)** – Suggests avoiding promoting QA4EO as an abstract concept which is not always well understood by the community. Start rather with concrete examples of what QA4EO can serve.

- **B. Bojkov (ESA/ACSG Chair)** – QA4EO has a message problem – five year cycle on trying to formulate a message – not really any examples to show at this point. QA4EO should start demonstrating products.
- **S. Srivastava (CSA/WGCV Chair)** - Should we have QA4EO? If we have QA4EO, then how do we go about it?
- **N. Fox (NPL/IVOS Chair)**- QA4EO is a principle – any implementation team is only really there to help guide the process. Should be a small grouping of people focusing a few existing case studies.
- **S. Srivastava (CSA/WGCV Chair)** - General discussion today seems to go in the direction of continuing with QA4EO and that focus should be put on some case studies, not necessarily all. WGCV should have some mechanism to communicate progress on these case studies, should it be the role of general secretariat for QA4EO to do this? These are questions we must answer.
- **B. Bojkov (ESA/ACSG Chair)** – Proposes that WGCV regroup and get its act together and show concrete examples before pursuing in the current path.

-
QA4EO – Splinter Meeting

- From the QA4EO discussion, A von Barga proposed a QA4EO splinter meeting with a few key WGCV members to discuss and propose a way forward for QA4EO.
- It was decided to have the splinter meeting at the WGCV-36 (end of day 2) to be attended by B. Bojkov (ESA), M. Román (NASA), J.-P. Muller (UCL), N. Fox (NPL), A von Barga (DLR), and L. Fonesca (INPE).

Meeting was adjourned for the day at 17:30.

DAY 3 - WEDNESDAY – MAY 15, 2013

Agency/Country Reports #3

USGS (G. Stensaas)

- A copy of the USGS agency report is available on the WGCV-36 webpage [[PDF](#)].
- Questions/Comments:
 - o **J.-P. Muller (UCL/TMSG-Chair):** Is Landsat-8 in a similar orbit as Terra orbit or is it completely different?
 - o **G. Stensaas (USGS):** It is the same orbit as Landsat-5; Landsat-8 is an 8 day repeat cycle.
 - o **J.-P. Muller (UCL/TMSG-Chair):** Regarding the Level 2 Landsat-8 surface reflectance retrievals, are there any existing accuracy assessments available?
 - o **G. Stensaas(USGS):** The Landsat-8 reflectance products have been compared with VIIRS products and reflectance products appear to be a near perfect match. Can provide link to Landsat-8 website and some example products.

Special Interest Presentations /discussions #3: Interactions between WGCV and CEOS Virtual Constellations

Sea Surface Temperature Virtual Constellation (SST-VC) (G.Corlett)

- A copy of the SST-VC presentation is available on the WGCV-36 webpage [[PDF](#)].
- Questions/Comments:
 - o **B. Bojkov (ESA/ACSG Chair):** The level of uncertainty (i.e. 0.1 Kelvin) for some of the products demonstrated in your presentation is exceptionally low. Is this required? For example, does the weather forecasting require uncertainty numbers this low since many of their products are generally aggregated into 100 km grid cells before inputting it into their simulations?
 - o **G. Corlett (SST-VC):** The reason why such low levels of uncertainty are targeted is because we are trying to look for very small trends in the data. Satellites provide very stable platforms that make it possible to measure with such low uncertainty levels since they observe in an environment free of factors such as wind, water, dust, etc.

Atmospheric Composition Constellation - ACC-9 Report (B. Bojkov)

- A copy of the ACC presentation is available on the WGCV-36 webpage [[PDF](#)].
- Questions/Comments:

- **B. Bojkov (ESA/ACSG Chair):** In large projects with many stakeholders, factors such as budget shortfalls from one stakeholder can often compromise certain components of prelaunch. CEOS could be quite useful in prelaunch if they could provide the minimum requirements. Topics such as polarization and stray light are difficult issues that are not always well addressed at prelaunch.

Land Surface Imaging Virtual Constellation - (J. Dalge remote presentation)

- A copy of the LSI presentation is available on the WGCV-36 webpage [[PDF](#)].
- Questions/Comments:
 - **S. Srivastava (CSA/WGCV Chair):** Good to see the bullet in your presentation on interactions with other WGs, especially your need for data quality and calibration issues. WGCV is there to assist you and we expect that any of your calibration needs should be directed to us to avoid any confusion.
 - **G. Stensaas(USGS):** Question on first two bullets and the terms of reference: distribution services for LSI portal and distribution of terrestrial ECVs: those two functions seem to be directly related to WGISS functions of implementing quick availability and dissemination of information from all of the CEOS agency archives.
 - **J. Dalge (LSI-VC):** LSI understands the well defined roles of WGISS. LSI asked at the last SIT meeting for a WGISS representative to help define the most appropriate set of contents for an updated LSI terms of reference which was accepted by Satoko.

Precipitation Constellation (S. Neeck – not presented due to remote connection issues)

- A copy of the Precipitation Constellation presentation is available on the WGCV-36 webpage [[PDF](#)].

Agency/Country Reports #4

Canadian Space Agency CSA (S. Srivastava)

- A copy of the CSA agency report is available on the WGCV-36 webpage [[PDF](#)].
- Questions/Comments:
 - **J.-P. Muller (UCL/TMSG-Chair)** – Under SOAR program would it possible to consider acquiring terrain data or is it only Level 1b data? This could be useful to cover gaps in TerraSAR-X DEM coverage.
 - **S. Srivastava (CSA/WGCV Chair)** – CSA does not have any plans to do high level products. At this stage, only level-1 product is provided. If such a product is required, request can be made but will be considered on a case by case basis.

- **M. Román (NASA/LPV Vice-Chair)** – Are there any plans to release or develop product for deriving 3D canopy structure/biomass maps with RADARSAT?
- **S. Srivastava (CSA/WGCV Chair)** – [Response to M. Román] It is planned to contribute RADARSAT-2 data to initiatives such as GFOI. No blanket agreement to provide data. For individual projects, the vehicle for this is SOAR for doing R&D.
- **Y. Zhou (CAS/AOE)** – For the next generation of RADARSAT (RCM), what will be the revisit time of each satellite?
- **S. Srivastava (CSA/WGCV Chair)** - Revisit time will be 12 days for each satellite but only 4 days for any of the three satellites in the constellation to revisit the same site. – One very important application will be change detection which will have data available every four days.
- **G. Stensaas (USGS)** – What will be the data policy on the RADARSAT data for the new RCM mission?
- **S. Srivastava (CSA/WGCV Chair)** – The CSA data policy on RCM RADARSAT data is not approved yet, but the intent is to make data available publicly, except for areas where there is commercial or national security sensitivity.

European Space Agency – ESA (B. Bojkov)

- A copy of the ESA agency report is available on the WGCV-36 webpage [[PDF](#)].
- Questions/Comments:
 - **J.-P. Muller (UCL/TMSG-Chair)**– Question about ESA support for ground networks. There is a rather large gap in land surface spectral bi-directional reflectance measurements. At the current system in place, opportunity as well and a challenge at the current time. Would ESA be willing to support such a network and help address this gap?

Action WGCV36-1: LPV to address the specification of the requirements for a worldwide network of land surface spectral directional measurements for validation of spaceborne retrievals.

- **G. Stensaas (USGS)** – Question on Miami Ocean Color campaign and Landnet best practices study. We’ve been talking about these initiatives within WGCV for a while now with a few actions from the last plenaries to this effect. Have we made any progress in attempting to fund these initiatives?
- **B. Bojkov (ESA/ACSG Chair)**– ESA responded to the Landnet requirement on two fronts, expecting only one to get funded and both got funded. It was directly based on the requirement that came out of IVOS and WGCV and ESA was very much supportive of this. Currently planning two sites, one in Europe and one in South America based on IVOS recommendations. The onus is also other agencies to help fund these initiatives.
- **N. Fox (NPL/IVOS Chair)** - IVOS meeting in Frascati in March, got agreement from ESA to support Landnet but also CNES and NASA would support the initiative as a partnership. There is now agreement to have a

prototype autonomous network for Landnet. Also from the current WGCV plenary, there appears to be support from our Chinese colleagues at AOE to support and join this initiative. Therefore, four agencies are now contributing to the effort to move this process forward.

- **M. Román (NASA/LPV Vice-Chair)**–From the WGCV perspective, there was always an effort to support underrepresented measurements and as an example, the variable of snow/water equivalent is one of the most important one to understand snow dynamics. How do we go about making the case for increased measurements giving that there are not that many satellite measurements that can help in this perspective but that new missions may come out of it?
- **B. Bojkov (ESA/ACSG Chair)**– [Response to M. Román] Not sure if it is the mandate of WGCV of recommending new missions.
- **A. von Barga (DLR/WGCV Vice-Chair)** – [Response to Bojkov and Román] Our mandate is to prepare statements which may lead to recommendations in products that may be needed. This may also lead to ideas for new missions. However, in the end it is the agencies that support and develop missions. But WGCV is in the position to identify gaps in products and cal/val needs. In that sense, we focus more on our core business.

ROSCOSMOS (P. Denisov)

- A copy of the ROSCOSMOS agency report is available on the WGCV-36 webpage [[PDF](#)].
- Questions/Comments:
 - **S. Srivastava (CSA/WGCV Chair)** – What is the frequency of your SAR mission?
 - **P. Denisov (ROSCOSMOS)** - X-band

CNES (P. Henry)

- A copy of the CNES agency report is available on the WGCV-36 webpage [[PDF](#)].

Special Interest Presentations /discussions #4

China Carbon Satellite (Z.S. Yin)

- A copy of the China Carbon Satellite presentation is available on the WGCV-36 webpage [[PDF](#)].
- Questions/Comments:
 - o **B. Bojkov (ESA/ACSG Chair)**- From the eight stations that you showed on your map – are those TCON grade or TCON-traceable instruments?
 - o **Z.S. Yin (SECM)/C.R. Li (CAS/AOE)**: TCON – six are planned to be traceable but not sure which one yet.

Special Interest Presentations /discussions #5

Status of MODIS (Terra/Aqua) and VIIRS (S-NPP) On-Orbit Cal. (X. [Jack] Xiong)

- A copy of the MODIS and VIIRS presentation is available on the WGCV-36 webpage [[PDF](#)].
- Questions/Comments:
 - o **C.R. Li (CAS/AOE)**- Is the solar diffuser stability monitor (SDSM), another instrument to monitor the degradation of the solar diffuser?
 - o **X. Xiong (NASA)**- Yes, the solar diffuser is a passive device that can change over time and the SDMS is used to monitor it (i.e by using the sun as a reference)

Agency/Country Reports #5

JRC, EC (J.-L. Widlowski)

- A copy of the JRC, EC report is available on the WGCV-36 webpage [[PDF](#)].
- Questions/Comments
 - o **J.-P. Muller (UCL/TMSG-Chair)**: How do you know when your simulation is at a level where you have captured every measurement that you need in order to have an adequate representation of real conditions from your model?
 - o **J.-L. Widlowski (JRC/EC)** - Not easy to answer. We always use the best models that we currently have with the objective of continuously improving on them.
 - o **M. Román (NASA/LPV Vice-Chair)**: There are also certain variables that do not require extensive simulation and are adequate for what you are trying to study and where extensive effort is not required in order to get a stable adequate approximation.
 - o **J.-L. Widlowski (JRC/EC)** The tolerance level of uncertainty that is acceptable (i.e 20% uncertainty) is what governs the level of effort to develop a simulation model. As the requirements are becoming more stringent, better tools, more measurements, are required to reduce the uncertainty.

Norwegian Space Center (E. Herland)

- A copy of the NSC report is available on the WGCV-36 webpage [[PDF](#)].
- Questions/Comments
 - o **J.-P. Muller (UCL/TMSG-Chair)**– Question on sea ice. Would it be possible for the CEOS facilities to monitor directional reflectance of just broad band albedo of sea ice? There are no current operational measurements to do that, given the sensitivity of the Arctic region to the albedo effect, particularly to sea ice, in terms of positive and negative feedbacks for ice thinning. Are there any plans to do any measurements, in Svalbard?
 - o **E. Herland (NSC)** – Thinks that there are already initiatives to do this. For this specific one, perhaps the Norwegians, NERSC. Will be happy to provide more information by e-mail if required.

Special Interest Presentations /discussions #6

Discussion on promoting technical committee on remote sensing technology in ISO (Y.Y. Jia)

- A copy of the presentation is available on the WGCV-36 webpage [[PDF](#)].
- Questions/Comments
 - o **J.-P. Muller (UCL/TMSG-Chair)**– What are the specific advantages that you see in getting ISO certification? There is a lot of overhead in establishing the standard and maintaining the standards afterwards.
 - o **C.R. Li (CAS/AOE)** – In all of our internal activities, we will have internal standards, sales standards, organization standards, etc., to bring the remote sensing satellite from science/design to market. From our application department, we need standards to evaluate the sensors to determine their quality. Standards are required to be able to collaborate. In ISO there is only one working group on imagery. Remote sensing is not only about visual aspect and geomatics, it must also deal with radiometry, beam qualities. Should have a standard in ISO as a guideline for the remote sensing community.
 - o **A. von Bargaen (DLR/WGCV Vice-Chair)**: Very fruitful idea to have standards but we have to be careful not to duplicate efforts.
 - o **N. Fox (NPL/IVOS Chair)**– Applauds the ISO initiative but offers some words of caution. In trying to standardize methods to do a calibration and of standards that are use to do a calibration, the sector is not mature enough for that process. If you oblige people to use a single method or standard at this stage of development, you will stifle the market. If you require a transparent quality metric indicator for the community, which is uncertainty, and you need to make it visible as how you get there – then this

is considered documentation. All that you require is traceability to international agreed-upon standards, which are defined as the International System of Units (S.I.). The S.I. is the standard for radiance, reflectance, irradiance, etc. It does need to be translated to specific activities that are related to Earth Observation but there are many methods to achieve that process and there are published and they are best practices. It would be wrong to say that there is only one best practice, they are several. It is the use of multiple methods that we still need to do in this sector. We support ISO fully, but if you go down that route, it is too early in the process. The requirements are moving so fast along with the changing technology and methods for measurements are evolving quickly. What we are doing in CEOS, is to establish internationally agreed infrastructure (test sites) which can be use to verify interoperability of those measurements in the post-launch domain. That is the approach that we should be moving towards but not ISO at this stage.

- **H. Reuter (ISRIC):** – Thinks that ISO can be adapted to be flexible to contain all of the concepts that need to be transported. Everything does not need to be fully defined. If you need to transport uncertainty for remote sensing, you need to have the concept there and how you fill that is for you to define that. Another way to define ISO is that it contains empty containers like an empty container for uncertainty that you fill your methods. Glad to see that our Chinese colleagues are moving forward with ISO, because later on, if we are talking about geoharvesting then, we need ISO standardisation so that machines/systems can talk to each other.
- **S. Srivastava (CSA/WGCV Chair)** - Thinks that what our Chinese colleagues are trying to do is what QA4EO is trying to do. For example, when a directorate of CSA wanted to go for ISO9002 certification in their operations, they were told that no changes are required in how things are done, all that is required is the procedure with documentation. The standard is not locking into a certain procedure on how we do calibration. The standard is to document what you are trying to do and not to change your way of doing. From that point of view, supports this initiative.
- **C.R. Li (CAS/AOE)** –Feels that remote sensing needs an ISO standard. If industry wants to use the technology, standards must be in place. If we don't start this process, someone else will do it for us. Also, we are going at a very slow pace in developing the standard. We will consider your comments as we move forward in the development of our standard.
- **X. Xiong (NASA)**– Agrees that ISO is important. It's a process how you get there. There are also certain standards. For some things, you don't want an ISO methodology because there are not mature enough in there development but for industry, if you are trying to commercialize something, if you are not ISO certified, it can be very difficult to sell a product. Standardization is one way of doing business.

Special Interest Presentations /discussions #7

Video presentation and Introduction of the UAV-base Remote Sensing Payload Comprehensive Validation System (C.R. Li)

- A copy of the presentation is available on the WGCV-36 webpage [[PDF](#)].
- Questions/Comments
 - o **C.R. Li (CAS/AOE) – Additional comments:** CAS/AOE wishes to foster international collaboration and invites WGCV members and the scientific community to collaborate with CAS/AOE and make use of the UAV – based Remote Sensing Payload Comprehensive System. As shown in the presentation, the comprehensive system includes 2 UAV platforms that are relatively inexpensive to operate and can be used for cal/val of remote sensing products. The system is also supported by easily accessible cal/val sites in northern (600km from Beijing) and southern China that have different climatic, land cover and topographic features. Both sites include many different types of targets for optical, and SAR calibration and validation.
 - o **S. Srivastava (CSA/WGCV Chair)** – Congratulates CAS/AOE on behalf of WGCV on their achievements with the UAV-based Remote Sensing Payload Comprehensive Validation System, and thinks that it will most certainly benefit the cal/val user community.

Status and Development Plan of Baotou Comprehensive Cal&Val site (L.L. Ma)

- A copy of the presentation is available on the WGCV-36 webpage [[PDF](#)].
- Questions/Comments
 - o **M. Román (NASA/LPV Vice-Chair)**- Very impressed by the rigor and the effort that went into developing this site. Think bigger in your ability to impact the science. This is not only an ideal Landnet site but also an ideal ecological site (e.g., <http://www.neoninc.org/science/domains>). That full cycle, from the calibration to the global biophysical parameters is very unique and should be considered.
 - o **L.L. Ma (CAS/AOE)** – We are also concerned about the maintenance of this site for long term and are always trying to find better methods to manage it. Looking forward to learn from Landnet on managing such a site.
 - o **N. Fox (NPL/IVOS Chair)** – We applaud your efforts and the potential contribution that you can make to the bigger CEOS community.

Meeting was adjourned for the day at 16:55.

DAY 4 - THURSDAY – MAY 16, 2013

Results of QA4EO splinter group meeting (A. von Bargaen)

- Results of the splinter group meeting held on Tuesday May 14 were presented by A. von Bargaen.
- A copy of the QA4EO Splinter presentation is available on the WGCV-36 webpage [[PDF](#)].

Discussion and Decisions (all)

- Step 1: Short-term examples addressing “stakeholders” is to be completed by SIT Technical Workshop in September 2013.
- QA4EO monthly telecons are still to occur but with smaller group rather than the current large QA4EO group. This smaller group is to be composed of the six people from the splinter meeting group, which includes:
 - B. Bojkov (ESA),
 - M. Román (NASA),
 - J.-P. Muller (UCL),
 - N. Fox (NPL),
 - A von Bargaen (DLR),
 - L. Fonesca (INPE)
- and also:
 - WGCV subgroups represented by their chairs or vice-chairs, or both, and;
 - WGCV chair and vice-chair
- The way forward for QA4EO, resulting from this splinter meeting will be reported by the WGCV chair at the next SIT telecon, next Thursday, May 23rd as an answer to the CEOS-SIT 28 action item.

Agency/Country Reports #6

UKSA Agency Report (J.P. Muller)

- A copy of the UKSA agency report is available on the WGCV-36 webpage [[PDF](#)].
- Questions/Comments
 - **B. Bojkov (ESA/ACSG Chair)**– Question on CEMS – CEMS is currently seen as a program accessible to UK organizations only. When it was created, CEMS was sold as a cooperative system that would allow international organizations to participate, has that not been established yet?
 - **J.-P. Muller (UCL/TMSG-Chair)**– All of the data sets that are being processed under CEMS will be transferred to the British Atmospheric Data Centre (BADC). The BADC at the moment is not set up for non-UK access. CEMS is British at the current time but its intention is eventually to be international in scope.

- **X. Xiong (NASA)** – Question about the CEMS Instrument Calibration Facility – is that a UK service in general or is it mission specific?
- **N. Fox (NPL/IVOS Chair)**– It is not mission specific – It is more a coordination of UK activities to have all of the UK calibration activities, pre flight, post launch and try to be seen as UK capability and facility, as a virtual network, not necessarily in one location, to provide a service to any mission born within the European context. It is a UK general service but to be offered to Europe as well, to provide a coordinated support to support European industry in delivering calibration and services.

GEO ministerial showcases (J.-P. Muller)

- J.-P. Muller presented a letter sent by the GEO Ministerial Taskforce to all PoCs involved in GEO activities, which arrived on Wed. May 8. A ministerial working group being set up to select videos which are 3 mins in length to be presented in the ministers' program which will take place in Jan 2014 in Geneva, Switzerland.
- Proposing for WGCV to have a showcase, which focuses on the issue of the impact of quality indicators, traceability, and interoperability with regards to improving the forecasting of tsunami land falls?
- Plan is to not just demonstrate the data but also demonstrate how the data impacts tsunami predictive models.
- QA4EO showcase proposes a partnership between UCL, DLR and JRC in Ispra.
- The area chosen will be either Sri Lanka or Australia. The choice currently is leaning towards Sri Lanka because of the impact on a larger population.
- GEO Ministerial Taskforce is asking for the script to be completed by the end of September.
- **Questions/Comments**
 - **S. Srivastava (CSA/WGCV Chair)** – J.P. Muller's showcase video proposal was sent to K. Sawyer following the CEOS-SEC telcon of May 8th for consideration by the CEOS Systems Engineering Office (SEO).
 - K. Sawyer accepted to review the proposal and present it to CEOS-SEO for approval on May 15th.
 - If approved by CEOS, the final showcase video presentation will have to be cleared by CEOS before it goes to GEO.
- **Discussion and Decisions**
 - WGCV supports J.P. Muller to go ahead and produce the Geo ministerial showcase, provided that it is supported by CEOS-SEO.

Review of WGCV Work Plan (E. Arsenault)

- The WGCV five-year work plan 2011-2016 version 5.4 was reviewed. Minor editorial changes were identified (i.e. authorship, WGCV organizational structure to reflect new chairmanship, etc.) and will be updated for version 5.5 for review at WGCV-37.
- WGCV membership: The WGCV membership list in Annex A was determined to be outdated and requires a major revision, both in content and in format, which the WGCV secretariat has agreed to undertake (see Actions WGCV-36-2, 3, and 4)

WGCV-36-2: WGCV Secretariat to ask all CEOS agencies to nominate or confirm a representative for WGCV and update membership list.

WGCV-36-3: WGCV Secretariat to include NRSCC as a member organization of WGCV with Prof. Li as a representative.

WGCV-36-4: WGCV Chair and Secretariat to propose a new tabular structure for describing WGCV membership in WGCV work plan to include reference to role of representative (e.g. member, associate member, etc.)

WGCV-36-5: WGCV Secretariat to make a draft update to the WGCV work plan based on relevant discussions held at WGCV-36

Review of Joint WGCV-35 and WGISS-34 Joint Action Items (S. Srivastava)

- A review of open action items from the Joint WGCV-35 and WGISS-34 meeting held in Hyderabad, India.
- All action items were closed and responses given where appropriate. These responses are to be communicated to WGISS Chair (Satoko Miura) by WGCV Chair.
- Please see Appendix 4 for summary of WGCV responses.

Introduction of Shanghai Institute of Technical Physics (N. Dai)

- An overview of the Shanghai Institute of Technical Physics was given to WGCV members by Prof. N. Dai.
- The presentation was followed by a tour of the SITP facilities including the research achievement exhibition hall and the State Key Laboratory of Infrared Physics.

Special Interest Presentations /discussions #8

Presentation 1: Calibration for Multi-Channel Scanning Radiometer on FY-2 and Imaging Radiometer on FY-4 (F.C. Chen)

- Presentation was given on FengYun-2 (FY-2f) /Multi Channel Scanning Radiometry Satellite (MCSR)

- Some issues are being experienced with the onboard calibration of the sensor with sunlight. Would like to receive input from WGCV members.
- Questions/Comments
 - **N. Fox (NPL/IVOS Chair)**– Can comment on getting from lab radiance to that type of system. You can use a laboratory source that is calibrated which can be monochromatic in nature such as a laser/LED and will be bright enough in radiance to mimic sunlight. This would allow monitoring of the system but it will not be an absolute calibration.
 - **P. Henry (CNES)** – For further discussion of onboard calibration, a good forum for exchange would be GSICS. There is also Chinese representation at GSICS such as CMA.

Presentation 2: Spectral Calibration of Hyperspectral Imagers (Y. Hu)

- Presentation was given on a Hyperspectral Imager manufactured by SITP with an overview of the calibration procedures.

Presentation 3: The Introduction of the Optical Payload in Chang'e Project (R. Shu)

- Presentation was given of CE-1 2 and 3 laser altimeters built in the context of moon exploration.
- Overview of CE laser altimeter test and calibration was given.
- Example of moon DEM created from CE laser was shown.
- CE-3(infrared imaging spectrometer) is both a laser rangefinder sensor and laser 3d imager to be launched in 2013.

Meeting was adjourned for the day at 16:00.

DAY 5 - FRIDAY – MAY 17, 2013

Special Interest Presentations /discussions #9

Report from the Working Group on Climate (A. von Bargaen)

- A copy of the Working Group on Climate Report presentation is available on the WGCV-36 webpage [[PDF](#)].
- **Questions/Comments**
 - **B. Bojkov (ESA/ACSG Chair)** - Will you keep us informed on the development of the maturity matrix? Understanding is that it will be adjusted to be more a product focused matrix versus a software based one.
 - **A. von Bargaen (DLR/WGCV Vice-Chair)** – Yes, I will keep WGCV informed. At first instance, the maturity matrix can be excellent for self-assessment to see where you are in the development of a product. The original maturity matrix was developed for operational processes with a strong emphasis towards the system engineering aspects. Further development of the matrix with an extension for the scientific assessment is under discussion in the Working Group on Climate.

Other Business

Future Ideas for WGCV (Part II) (A von Bargaen, All)

- A copy of the Future Ideas on WGCV – Part 2 presentation is available on the WGCV-36 webpage [[PDF](#)].
- **Discussion/Comments**
 - Inclusion of UAV in WGCV**
 - Comment was raised regarding WGCV's focus which is strictly towards EO platforms at the moment and not towards UAVs.
 - General consensus of the plenary was that while they are not specifically included, they are not by any means excluded and could be presented as part of a special interest presentation at a future plenary or can be part of any of the subgroup activities.
 - Idea of shortening length of WGCV plenary and add days extra days for workshop**
 - Idea is to shorten the WGCV plenary to 2-3 days to carry WGCV required business and add extra days for a workshop open to wider audience.
 - Great idea but two day workshops have been tried before and the difficulty is with logistics of travel – severe logistical issues for justifying 1-2 day travel to come to the meeting. Many agencies may have difficulty to justify attending both meetings.
 - From past experiences, joint meetings with other working groups can be discouraged, but the formula of having the plenary with an attached workshop is attractive.

- Audience might be too big if a workshop is attached to the WGCV plenary. If it is open to many people, mostly it will be people from the host country attending the workshop.
- Not necessary to have a workshop at every plenary. Workshops could be held at every second or third plenary.
- Many have had mixed experiences with tagged on workshops. However, there are many cross-cutting activities during plenary and the WGCV plenary does not always focus on this or take advantage of this. Example of potential workshops could be level 1 processing or terrain mapping issues.
- CEOS has 40 or 50 agencies and many are not represented at WGCV. WGCV should have a goal of having more agencies participating. A more straightforward agenda would likely attract more participants.

Comment on Plenary Format

- Round-table presentations/discussions of products required by subgroups would build momentum in getting these done collectively.
- Should have a way to report on cross-cutting activities of subgroups. Would like to see topical teams within WGCV spanning several subgroups.
- Subgroup activities get often overlooked in WGCV reporting at CEOS plenary.
- Also, more time required for subgroup report but less time for agency report.
- Comments were raised as to the requirements in setting up the new WGCV format which in most cases implies paid positions. Very difficult to justify funding for this within the sponsor agency.

Discussion on interaction with GSICS for WGCV

- Having feedback from GSICS at WGCV would be beneficial. There are many parallel activities between GSICS and CEOS WGCV subgroups and information from GSICS activities should be shared with WGCV.
- GSICS are more practical in their approach to calibration and could complement CEOS WGCV.

Concluding remarks on Future Ideas Discussion

- More time should be spent thinking and developing these ideas.
- Can be revisited at WGCV-37.
- First step could be to develop reporting templates for WGCV plenary.

WGCV-36-6: WGCV Vice-Chair to develop reporting templates for agency and subgroup reports to be presented at WGCV-37 for discussion.

Subgroup Recommendations

Discussion on TMSG recommending a DEM

- **B. Bojkov (ESA/ACSG Chair)**– Because of the many DEM products currently available, thinks that a recommendation of a standard DEM or a product issued from a best practice approach would be useful to the space agencies for use in the design/operations of their missions.
- **J.-P. Muller (UCL/TMSG-Chair)** – In the past, have recommended the GTOPO30 (1 km res.) to space agencies in their operations. We could make a similar recommendation to space agencies that GMTED2010 (several res. 250-500m-1km.) replace the GTOPO30. At a higher resolution, we could also make a recommendation that the 3 arcseconds SRTM v.3 data set could be used for specific applications involving specific kinds of resolution. With regard to moving on to the next stage with creating a DEM at 30m, that is a bit more ambiguous. There is an ASTER data set but that is not a consistent enough data set for that purpose. There is a data set being created from Tandem-X by DLR that will be a substitute to the SRTM v.3 by 2015, but with regards to a 30 m resolution, it is not clear at the moment if that will be created. Happy to make specific recommendations on the basis of scientific evidence that is being gathered for acceptance or rejection by WGCV and hope that space agencies would take notice.
- **B. Bojkov (ESA/ACSG Chair)** – Thinks that it would be good to address this. Perhaps some recommendations to be made at WGCV-37?
- **J.-P. Muller (UCL/TMSG-Chair)**– Yes and another way of addressing the requirement for a 30m resolution would be to create a virtual constellation on this topic.

Review of IVOS recommendations

- A copy of IVOS recommendations is available on the WGCV-36 webpage [[PDF](#)].
- **JRC Request**
 - o JRC request to CEOS WGCV for letter to SIT on promoting participation of agencies in ECV (land products) ‘retrieval algorithms’ intercomparison exercise.
 - JRC will establish data set/protocol etc but needs to know that agencies will participate. Propose a letter to CEOS SIT advising of proposal and to endorse a letter calling for participation and subsequently ask agencies to encourage/support participation of those in their area of influence

WGCV Decision:

- A letter of support is not the proper mechanism for this particular recommendation/request but WGCV-Chair has no issue in presenting this to SIT for information purposes at the next SIT workshop upon reception of draft proposal from J.L. Widlowski.

- **Establish pilot project to prototype LandNET.**
 - o Awareness to SIT / Recommendation of support from WGCV to do a pilot for developing international harmonisation infrastructure

WGCV Decision:

- WGCV supports this, and WGCV-Chair has no issue in presenting this to SIT for support upon reception of draft wording from P. Henry.

- **Other recommendations**

- o The review of the remainder of the IVOS subgroup recommendations presentation was continued but the process was made difficult without the presence of the IVOS Chair. There was some confusion about the content of the IVOS recommendations presentation in determining if the recommendations were strictly for informational purposes to WGCV, or if IVOS was requesting support from WGCV or support from SIT on these. Also, recommendation 5 required some clarification on the part of the SST-VC chair. As a result, the following two actions were formulated:

WGCV-36-7: IVOS Chair to reword IVOS recommendations to precisely indicate whether the recommendation is for: a) information to WGCV, b) support from WGCV, or c) support from SIT. If support is required from SIT, then a case must be presented to justify this request.

WGCV-36-8: SST-VC (G.Corlett) to reword Recommendation 5 from IVOS recommendations to precisely indicate whether the recommendation is for: a) information to WGCV, b) support from WGCV, or c) support from SIT. If support is required from SIT, then a case must be presented to justify this request.

Note: IVOS, jointly with SST-VC, may prepare a proposal for a calibration campaign to be presented at the SIT Technical Workshop in September 2013, to seek support from CEOS agencies.

Action Items from WGCV-36

The plenary reviewed the list of action items raised at WGCV-36. The summary of action items from WGCV-36 is presented in Appendix 5.

Also, Action35-28 from WGCV 35 with regards to “working with WG on Climate to find out the exact components and support that WG Climate is looking for from WGCV” was reformulated to be clearer and was resubmitted as Action WGCV36-9:

WGCV-36-9: WG on Climate is searching for support in assessment of the FCDR and ECVs. WGCV is willing to support the assessment based on their ToR and expertise.

Two clarifications have to be carried out in cooperation with WGC and SIT/plenary:

- (1) In principle, WGCV should be the only responsible body (or body first to be asked) in CEOS for CAL/VAL related issues of satellite products, i.e. sensor calibration and higher level (e.g. 2/3) product validations;

(2) If for higher level product (2/3) evaluation/assessment/validation will be carried out by other (CEOS or others) bodies, this should be first coordinated with WGCV to allow cooperation.

Nominations for WGCV Vice-Chair 2014-16 (E.Arsenault)

A review of the guidelines for nominating candidates for the WGCV Vice Chair was presented. Please consult the WGCV Work Plan 2011-2016 for more details. Nominations are requested for presentation at WGCV-37 and elections will occur at WGCV-38.

Location and Place of WGCV-37 plenary

The hosting of the next WGCV-37 has been generously been offered by ESA (thanks to Bojan Bojkov). It will be held February 17-21, 2014 at ESRIN in Frascati, Italy. Further details will be provided later and posted to WGCV website as well. Requests to host WGCV-38 are also welcomed.

Closing Remarks

WGCV Chair thanked the host organizations for the wonderful hospitality which was seconded by the vice chair.

Plenary adjourned at 13:20.

Appendix 1: Attendee List

(In blue are those who participated via GoToMeeting webconferencing.)

Title	First	Last	Organization	Country
Prof.	Chuanrong	Li	AOE,CAS	China
Dr.	Zhaoyan	Liu	AOE,CAS	China
Dr.	Lingling	Ma	AOE,CAS	China
Mrs.	Lingli	Tang	AOE,CAS	China
Dr.	Yongsheng	Zhou	AOE,CAS	China
Ms.	Lin	Yao	AOE,CAS	China
Dr.	Leila	Fonseca	INPE	Brazil
Dr.	Julio	Dalge	INPE	Brazil
Dr.	Satish	Srivastava	CSA	Canada
Mr.	Eric	Arsenault	CSA	Canada
Ms.	Kerry	Sawyer	CEOS and NOAA/NESDIS	USA
Mr.	Patrice	Henry	CNES	France
Mr.	Gregory	Stensaas	Department of Interior, USGS, EROS	USA
Dr.	Albrecht	von Bargaen	DLR	Germany
Dr.	Manfred	Zink	DLR	Germany
Dr.	Jean-Luc	Widlowski	European Commission, JRC	Italy
Dr.	Bojan	Bojkov	ESA	Italy
Dr.	Alessandro	Burini	ESA	Italy
Miss	Françoise	Labonté	FLC, under contract from ESA	Canada
Dr.	Fuqin	Li	Geoscience Australia	Australia
Mr.	Medhavy	Thankappan	Geoscience Australia	Australia
Dr.	Guoqing	Zhou	Guilin University of Technology	China
Dr.	Hannes Isaak	Reuter	ISRIC World Soil Information	The Netherlands
Prof.	Hongliang	Fang	LREIS, CAS	China
Mr.	Chongya	Jiang	LREIS, CAS	China
Miss	Wenjuan	Li	LREIS, CAS	China
Miss	Shanshan	Wei	LREIS, CAS	China
Dr.	Miguel	Román	NASA, GSFC	USA
Dr.	Xiaoxiong	Xiong	NASA, GSFC	USA
Mr.	Steven	Neeck	NASA, Headquarters	USA
Dr.	Nigel	Fox	NPL	UK
Mr.	Niall	Origo	NPL	UK
Dr.	Xiaohan	Liao	NRSCC	China
Dr.	Huanyin	Yue	NRSCC	China
Dr.	Jinlong	Fan	NSMC, CMA	China
Dr.	Jian	Liu	NSMC, CMA	China
Mr.	Su Wai	Ng	ANGKASA	Malaysia
Mrs.	Soo Mee	Wong	ANGKASA	Malaysia
Prof.	Xiaolong	Dong	NSSC, CAS	China
Prof.	Heguang	Liu	NSSC, CAS	China
Dr.	Changyong	Cao	NOAA/NESDIS/STAR	USA
Dr.	Xi	Shao	NOAA/UMD	USA
Dr.	Einar-Arne	Herland	Norwegian Space Centre	Norway

Mr.	Pavel	Denisov	ROSCOSMOS	Russia
Dr.	Wen	Chen	SECM	China
Prof.	Jianyu	Wang	Shanghai Branch, CAS	China
Dr.	Xiaobo	Jiang	SECM	China
Dr.	Zengshan	Yin	SECM	China
Dr.	Jinpei	Yu	SECM	China
Ms.	Biru	Liu	SECM	China
Mr.	Chuanpeng	Li	SECM	China
Ms.	Pang	Ying	SECM	China
Dr.	Xiaoxian	Huang	SITP, CAS	China
Dr.	Fuchun	Chen	SITP, CAS	China
Dr.	Yanhua	Ma	SITP, CAS	China
Dr.	Jue	Xu	SITP, CAS	China
Prof.	Rong	Shu	SITP, CAS	China
Dr.	Kuifeng	Luan	SITP, CAS	China
Dr.	Xiangtuan	Xia	SITP, CAS	China
Dr.	Ning	Dai	SITP, CAS	China
Ms.	Xiangbo	Wang	SITP, CAS	China
Ms.	Yuhan	Zhang	SITP, CAS	China
Dr.	Xiaoli	Shi	SITP, CAS	China
Dr.	Yong	Hu	SITP, CAS	China
Prof.	Jan-Peter	Muller	UCL Mullard Space Science Lab.	UK
Dr.	Gary	Corlett	University of Leicester/GHRSST	UK
Dr.	Bin	Liu	Univ. of Science and Tech. of China	China
Prof.	Dongjin	Wang	Univ. of Science and Tech. of China	China
Prof.	Nenghai	Yu	Univ. of Science and Tech. of China	China
Dr.	Gabriela	Schaepman	University of Zurich	Switzerland

Appendix 2: WGCV-36 Agenda (modifications made during the plenary in blue)

Monday 13 May 2013

Meetings will be held in the Jasmine Room, Okura Garden Hotel Shanghai, 58 Maoming Road (S.), Shanghai, China

8:30 Registration and Coffee

9:15 Introduction and adoption of agenda S. Srivastava, WGCV-Chair

Host and Welcome Address

9:30 Academy of Opto-Electronics (AOE), CAS C. R. Li, Vice President
9:40 National Remote Sensing Center of China (NRSCC) X. H. Liao, Director General
9:50 Chinese Academy of Sciences (CAS), Shanghai Branch J. Y. Wang, Vice President

10:00 – 10:30 WGCV-36 group photo session and Coffee / Health Break

10:30 Chairs' report (WGCV-Chair) S. Srivastava
11:00 Action Items (WGCV-Secretariat) E. Arsenault

Host Agency Presentation of Research Activities

11:30 Academy of Opto-Electronics (AOE), CAS C. R. Li
11:45 Shanghai Engineering Center for Microsatellites (SECM),
CAS Z. S Yin

12:00 – 13:00 Lunch

Subgroup reports #1

13:00 Microwave Subgroup Report X. Dong
13:30 Infrared & Visible Optical Sensors Subgroup Report N. Fox
14:00 **Terrain Mapping Subgroup Report (moved to Thu)** **J.-P. Muller**
14:30 Land Product Validation Subgroup Report M. Román

15:00 – 15:30 Coffee/Health Break

Country/Agency Reports #1

15:30 National Remote Sensing Center of China (NRSCC) H.Y. Yue
15:45 National Space Science Center, CAS X. Dong
16:00 **CSIRO** M. Thankappan (for T.Malthus)
16:15 Geoscience Australia / Australia Report M. Thankappan
16:00 **NASA (moved to Tue)** **M. Román**

17:00- Adjourn for the day

Evening

18:00: **Welcome Banquet hosted by AOE, CAS.** (Location: Okura Garden Hotel)

Tuesday 14 May 2013

Meetings will be held in the Jasmine Room, Okura Garden Hotel Shanghai, 58 Maoming Road (S.), Shanghai, China

8:30 Coffee

Special Interest Presentations /discussions #1

9:00	Overview of CEOS and GEO priorities for 2013	K. Sawyer (remote presentation)
9:15	WGCV's Role in the CEOS Self-Study Implementation Initiative	K. Sawyer (remote presentation)
9:30	Future Ideas on WGCV and Discussion (Part 1)	A. von Bargaen, All

10:00 – 10:30 Coffee / Health Break

Subgroup reports #2

10:30	SAR Subgroup Report	M. Zink
11:00	Atmospheric Composition Subgroup Report	B. Bojkov

Special Interest Presentations /discussions #2

11:15	Updated CEOS Cal/Val Portal and discussion (35-45 mins)	A. Burini
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12:00 – 13:00 Lunch

Subgroup reports #1 b

13:00	Terrain Mapping Subgroup Report	J.P Muller
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Country/Agency Reports #2

13:30	NASA	M. Roman
13:45	German Aerospace Center (DLR)	A. von Bargaen
14:00	National Oceanic and Atmospheric Administration (NOAA)	X. Shao/C. Cao

QA4EO: A Quality Assurance Framework for Earth Observation

(with remote participation by QA4EO Secretariat)

14:15 – 15:00 Discussion (All)

- QA4EO Status Update for GEO Tasks Component IN-02-C1 (S. Srivastava)
- Review of Outstanding WGCV-35 actions on QA4EO (S. Srivastava)
- Background presentation on QA4EO (N. Fox)
- Discussion/Way Forward (All)

15:00 – 15:15 Coffee/Health Break

15:15- 17:00 Discussion (..continued)

17:00 - Adjourn for the day

Evening – Proposed Social Activity: Acrobatics Show

Wednesday 15 May 2013

Meetings will be held in the Jasmine Room, Okura Garden Hotel Shanghai, 58 Maoming Road (S.),
Shanghai, China

8:30 Coffee

Country/Agency Reports #3

8:45 USGS

G. Stensaas (remote
presentation)

Special Interest Presentations /discussion #3:

Interactions between WGCV and CEOS Virtual Constellations

9:00 Introductory remarks

S. Srivastava

9:10 CEOS Precipitation Constellation

S. Neeck (remote
presentation)

9:30 Land Surface Imaging Virtual Constellation (LSI-
VC)

J. Dalge (remote presentation)

9:40 Sea Surface Temperature Virtual Constellation
(SST - VC)

G. Corlett

10:00 Atmospheric Composition Constellation (ACC)

B. Bojkov

Special Interest Presentation (moved from Tue. QA4EO session)

10:15 Geo ministerial showcases (moved to Thu)

J.P. Muller

10:30 - 11:00 Coffee / Health Break

Country/Agency Reports #4

11:00 CSA

S. Srivastava

11:15 Roscosmos

P. Denisov

11:30 ESA

B. Bojkov

11:45 CNES

P. Henry

12:00 - 13:00 Lunch

Special Interest Presentations /discussion #4:

13:00 China Carbon Satellite

Z. S Yin

Special Interest Presentations /discussion #5:

13:30 Status of MODIS (Terra/Aqua) and VIIRS (S-NPP)
On-Orbit Calibration

X. Xiong

Country/Agency Reports #5

14:00 JRC, EC

J.-L. Widlowski

14:15 Norwegian Space Center

E. Herland

14:30 UKSA, UK

J.P. Muller

Special Interest Presentations /discussion #6:

15:15 Discussion on promoting technical committee on remote
sensing technology in ISO.

Y.Y. Jia

Special Interest Presentations /discussion #7:

16:15 Video presentation and Introduction of the UAV-based
Remote Sensing Payload Comprehensive Validation
System

C.R. Li

16:35 Status and Development Plan of Baotou Comprehensive
Cal&Val site

L.L. Ma

16:50 - Adjourn for the day (*Evening - Free*)

Thursday 16 May 2013

Meeting will be held at Shanghai Institute of Technical Physics (SITP), Chinese Academy of Sciences

8:30 *Travel to SITP (transportation provided)*

9:00 - 9:15 Arrival & Coffee

9:15	UKSA Agency Report	J.P. Muller
9:30	Geo ministerial showcases	J.P. Muller
9:45	WGCV Work Plan	S. Srivastava, E. Arsenault
10:00	WGCV-35 and WGISS-34 Joint Action Items and CEOS-GEO	All

10:30 – 10:45 *Coffee / Health Break*

10:45	Subgroup Recommendations – Part 1	All
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12:00 – 13:00 *Lunch hosted by SITP*

13:00	Visit of SITP's research achievement exhibition hall	SITP
13:20	Visit State Key Laboratory of Infrared Physics	SITP

14:15 – 14:40 *Photo session and Coffee/Health Break*

14:40	General introduction of SITP	N. Dai
14:55	Special topic: Progress of China space optoelectronics remote sensing technology, and Discussion	SITP, All

16:00 - *Adjourn for the day - Return transportation provided to Okura Garden Hotel*

Evening – Proposed Social Activity: *Boat tour on Huangpu River hosted by SECM*

Friday 17 May 2013

*Meetings will be held in the Jasmine Room, Okura Garden Hotel Shanghai, 58 Maoming Road (S.),
Shanghai, China*

8:30 *Coffee*

Special Interest Presentations /discussion #8:

9:00 Report from the Working Group on Climate A. von Bargaen

Other Business

9:20 Subgroup Recommendations – Part 2 All

10:00 Nominations for WGCV Vice-Chair 2014-16 E.Arsenault

10:15 – 10:30 Coffee / Health Break

10:30 Future Ideas for WGCV (Part II) A. von Bargaen

10:45 Concluding Business / Discussion S. Srivastava

11:30 Action Items from WGCV-36 (WGCV-Secretariat) E. Arsenault

11:45 Dates and place for WGCV-37 and future WGCV meetings S. Srivastava

12:00 Adjourn the WGCV-36 meeting

12:00 – 13:00 Lunch

Afternoon – City Tour (ZhuJiaJiao) – Optional

Evening - Dinner in ZhuJiaJiao hosted by AOE - Optional

Appendix 3: Action Items from WGCV-35 (Hyderabad, India)

WGCV35 Action Items	Assigned to:	Due Date	Status
WGCV35-1: WGCV to define our terms of reference as to who (when dialing in via WebEx) and what constitutes adequate participation to make them eligible to vote.	WGCV	by WGCV-36	Closed. Virtual participation does not constitute participation in WGCV plenary for voting purpose.
WGCV35-2: The Plenary needs to have a discussion and vote on responding to GSCICS's request to us. Follow interaction and define those (per A. von Barga).	WGCV	by WGCV-36	Closed. WGCV should be represented at executive panel of GSICS.
WGCV35-3: Have discussion on QA4EO chair and co-chair role, and the management role for this task. The role for a volunteer agency should be fine for secretariat, but not for leadership role. Define WGCV's leadership role with respect to QA4EO implementation, and what the sharing process is for the co-chair.	WGCV-QA4EO	by WGCV-36	Closed. PoC will be the WGCV Vice-Chair until upcoming SIT workshop. Decision will be taken afterwards on who will be PoC within WGCV.
WGCV35-4: ESA to check on thematic sampling from the Ozone Mapping and Profiler Suite (OMPS). Others to provide sites for subsets.	ESA (B. Bojkov)	by WGCV-36	Closed. 1) Information on thematic sampling from OMPS has been provided by ESA (link). 2) The link to the SNPP OMPS Total Column station overpass subsets (note this is the NASA research product, suitable for research applications) is http://avdc.gsfc.nasa.gov/pub/data/satellite/Suomi_NPP/OVP/TC_EDR_TO3/ Please note that NOAA will release a similar station overpass in the coming months once their data is no longer "provisional".

<p>WGCV35-5: Have group discussion (Stensaas, Bojkov, Chander, von Bargaen) to getting SCIAMACHY data over CEOS recommended test sites.</p>	<p>G. Stensaas, B. Bojkov, G. Chander, A. von Bargaen</p>	<p>by WGCV-36</p>	<p>Leave Open (A. Burini to follow-up by WGCV-37)</p>
<p>WGCV35-6: For LPV to cross-coordinate with the WG on Climate. They have invited LPV to come to these meetings. There is a lot of cross-coordination happening and it would be nice to see more from the WG on Climate.</p>	<p>LPV (Lead J. Nightingale and G. Schaepman-Strub)</p>	<p>by WGCV-36</p>	<p>Closed. Contact is still WGCV Chair or Vice-Chair</p>
<p>WGCV35-7: Dong to address links between IVOS and MSSG test sites. What are the current and future sites being reviewed by microwave and are they related to IVOS sites?</p>	<p>MSSG-X.Dong</p>	<p>by WGCV-36</p>	<p>Closed. (MSSG to use some of these sites)</p>
<p>WGCV35-8: Update and discuss the showcase for AC.</p>	<p>WGCV</p>	<p>by WGCV-36</p>	<p>Closed. Reference to 'QA4EO Splinter Meeting/Way Forward' presentation of May 16 by WGCV Vice-Chair.</p>
<p>WGCV35-9: The appropriate people should be looking at these items as they come out. Maybe WGCV can be defining what those fields are. Recommendation or suggestion to think about a discussion in this area.</p>	<p>WGCV Personnel</p>	<p>by WGCV-36</p>	<p>Closed. Reference to 'QA4EO Splinter Meeting/Way Forward' presentation of May 16 by WGCV Vice-Chair.</p>
<p>WGCV35-10: To get more knowledge on how to get the right parameter, take information from test sites and share with the Team. From a test site perspective, WGCV has the action.</p>	<p>WGCV</p>	<p>by WGCV-36</p>	<p>Closed. It is ongoing work.</p>

<p>WGCV35-11: With regard to test sites, cal/val portals, constellations, etc. find out what is out there and re-define from there.</p>	<p>WGCV</p>	<p>by WGCV-36</p>	<p>Closed. Address cal/val Portal in WGCV-36 discussions.</p>
<p>WGCV35-12: For WGCV to contact CEOS DCEO (Sawyer) to find out how to start populating things on this calendar site (done per Gregory Stensaas). Sawyer suggested that WGCV develop its own calendar.</p>	<p>WGCV Chair</p>	<p>by WGCV-36</p>	<p>Done as of Oct 2, 2012 (G. Stensaas)</p>
<p>WGCV35-13 WGCV to come up with a recommendation and feed-back to WGISS regarding DEMqis and QAlbedo.</p>	<p>WGCV</p>	<p>WGCV36</p>	<p>Closed. Will be delivered as short documentary case studies with WGISS by Q4 2013 (J.P. Muller).</p>
<p>WGCV35-14: Document all the quality related activities, send out an e-mail to WGCV and WGISS and provide QA related activities to a POC, and create a list of information. (Stensaas will do for WGCV and Miura for WGISS). Fox will provide the group with the e-mail POC for the QA4EO group. Fox and Stensaas will work on an e-mail that would work for both groups.</p>	<p>G. Stensaas, S.Miura, N.Fox</p>	<p>12-Dec-12</p>	<p>Closed. Has been communicated.</p>
<p>WGCV35-15: WGCV teams should also suggest ideas of quality data/metadata fields for the key sensors and products. WGCV to work on common definitions of quality. Work together with WGISS on this and present to CEOS.</p>	<p>WGCV/ WGISS</p>	<p>by WGCV-36</p>	<p>Closed. Ask WGISS to do a survey of quality metadata currently used in EO.</p>

<p>WGCV35-16: WGCV and WGISS chairs to send emails to document all quality-related activities regarding WGCV35-15, and data access to CEOS Test sites and tools</p>	<p>WGCV/ WGISS</p>	<p>by WGCV-36</p>	<p>Closed. Refer to WGCV35-15.</p>
<p>WGCV35-17: Killough will take an action to talk to Tom Stone, and get requirements, and report back to the group regarding lunar calibration.</p>	<p>B. Killough, NASA</p>	<p>by WGCV-36</p>	<p>Closed. Response (by e-mail from B.Killough, May 8th, 2013): Brian Killough (NASA, CEOS SEO) and Tom Stone (USGS) have communicated several times and discussed requirements for lunar calibration of spacecraft. These requirements will be used to develop a new feature to the COVE tool, called the "Lunar Observation Forecaster"</p>
<p>WGCV35-18: Killough will contact ESA (Alessandro) to see what lists they have to provide.</p>	<p>B. Killough, NASA</p>	<p>by WGCV-36</p>	<p>Closed. Response (by e-mail from B.Killough, May 1st, 2013): A list of eight Landnet sites and six Pseudo-Invariant (PIC) sites was received and added to the COVE tool. These cal-val sites are available as selectable "regions" within COVE and can be used for calculating potential overpasses for any of the 126 missions in the COVE database.</p>
<p>WGCV35-19: For WGCV to discuss lunar calibration modeling and components and address future requirements to get that.</p>	<p>WGCV</p>	<p>by WGCV-36</p>	<p>Closed. IVOS activity, being discussed in that subgroup.</p>

<p>WGCV35-20: To let the National Institute for Space Research (INPE), through Leila Fonseca, know that the information they have does not include proper (correct) names as related to header names for data collection sets. Faundeen will also take it back to his LSI group to resolve other names that need to be corrected.</p>	<p>INPE (L.Fonseca), and John Faundeen of WGISS</p>	<p>by WGCV-36</p>	<p>Closed. Response (by e-mail from John Faundeen, May 1st, 2013): ISRO, INPE and NASA (as the IDN maintainer) all discussed this point and agreed to label IDN collections that overlap with other CEOS member data holdings to preface the collection name with the agency identified. An example would be INPE LISS3 or INPE Landsat MSS.</p>
<p>WGCV35-21: WGCV to provide feedback to John on WGCV test sites on CWIC by using Libya 4 as an example.</p>	<p>WGCV</p>	<p>by WGCV-36</p>	<p>Closed. Feedback provided to J. Faundeen. Access to CWIC is limited until it is updated to access other sensors.</p>
<p>WGCV35-22: Processes and efforts regarding cal/val portal and test sites to be deciphered, documented, and provided in an e-mail. Additionally, a regular reminder on this action should take place at least by every WGCV (every 8 months) or less.</p>	<p>WGCV</p>	<p>WGCV36 and ongoing</p>	<p>Closed. It is ongoing work.</p>
<p>WGCV35-23: All WGCV members look at portal and suggest changes/fixes to ESA. ESA has asked for this on a regular basis so we should provide our best effort.</p>	<p>WGCV</p>	<p>by WGCV-36</p>	<p>Closed. Cal/Val portal will solicit feedback from WGCV on a regular basis.</p>
<p>WGCV35-24: Fox and Chander to provide documentation associated with requirements for radiometric gain sites for linkage and Recommendation to WGCV</p>	<p>N.Fox Fox/G. Chander</p>	<p>by WGCV-36</p>	<p>Closed. IVOS to provide info to WGCV chair. See WGCV36-7 action.</p>

WGCV35-25 a) SAR to work with ISRO to help bring access to ISRO in situ information forward and available to CEOS.

SAR/M. Zink by WGCV-36

Closed. Response from S. Kumar by e-mail : ISRO is in touch with AGOS - Australian Geophysical Observing System- (Focal point: Dr. Medhavy Thankappan) and initial exchange of information has been completed to begin the joint calibration of ISRO's SAR mission - RISAT1 over AGOS site.

Response from M. Zink by e-mail : It is planned to collect information on SAR cal sites (both point and distributed targets) on our new web site:
<http://sarcv.ceos.org/>
For the moment the best summary available is a presentation by Stephan Cote (CSA) presented at our 2011 SAR subgroup Workshop:
<http://sarcv.ceos.org/documents/doc/14/>

WGCV35-25: b) provide ISRO information of CEOS ground and ocean sites and relevant information of other comparing sensors acquired over the CEOS CV sites.

S. Kumar (ISRO)

Closed. On CEOS ground sites: A good progress has been made so far. ISRO has been in touch with USGS and GSFC (Focal Points: Chander and Jack Xiong) for exchange of satellites (ISRO-Resourcesats) data, sensor characteristics details and information regarding the IVOS ground calibration sites. Further course of action has been drawn to continue the joint effort. We look forward to participate any joint ground campaign over CV sites, if proposed by CEOS, in near future.

On CEOS ocean sites: Similar progress has not been made so far in ocean sites. ISRO looks forward to receiving more details on these sites and in particular, the most preferred site from the past experiences of campaign ocean color sensor calibration exercises. In addition, dynamic nature of the ocean sites' stability may demand JOINT CAMPAIGN MODES OF MULTIPLE OCEAN SENSORS SYNCHRONOUSLY ACQUIRING ON GIVEN CV SITE(s) - for sharing relevant sea truth/atmospheric information exchange and also comparing sensors characteristics. We need to have focal points from WGCV for this plan of activities.

WGCV35-26: Continue to work to establish this CEOS/WGCV/Australia (AUS) partnership. The last two briefings we saw from AUS had much in them. Everyone was encouraged to provide feedback to the chair/vice chair on potential work we can do within the subgroups.

WGCV and AUS partners

by WGCV-36

Closed. Some input has been provided.

WGCV35-27: ROSCOSOMOS to work w/IVOS. IVOS has put out a request for such.

ROSCOSMOS leads

by WGCV-36

Closed. All agencies invited to participate in IVOS.

<p>WGCV35-28 WGCV to work with WG on Climate: 1) To find out the exact components and support WG Climate is looking for from WGCV.;2) To discuss the maturity matrix process of QA4EO as a guideline or maybe a showcase.</p>	<p>WGCV</p>	<p>by WGCV-36</p>	<p>Closed. Status: #1 (Closed) – A new action item is formulated (see WGCV36-6). #2 (Closed) – Answer is no.</p>
<p>WGCV35-29: Srivastava to look at SAR report and make Recommendations.;MSSG: support membership as well as agency support.; TMSG: Vice Chair Reuter will talk with Chair Muller to determine a Recommendation for TMSG;</p>	<p>S. Srivastava</p>	<p>by CEOS Plenary</p>	<p>Closed per discussion at WGCV-36.</p>
<p>WGCV35-30 ACSG: Stensaas and Srivastava will check the slides by Bojan and share any Recommendations with the group.</p>	<p>G. Stensaas and S. Srivastava</p>	<p>by CEOS Plenary</p>	<p>Closed per discussion at WGCV-36.</p>
<p>WGCV35-31: LPV, IVOS, and TMSG to work with chair and vice chair to determine the fitness of QAlbedo as a showcase or recommended effort that needs to happen within CEOS.</p>	<p>Leads J. Nightingale/G. Schaepman-Strub, N. Fox, and J-P. Muller</p>	<p>by WGCV-36</p>	<p>Closed. No longer relevant</p>

Appendix 4: WGCV Responses to WGIS Action Items (in blue)



1. **WGCV teams should also suggest ideas of quality data metadata fields for the key sensors and products.**
 - **WGIS to look at quality metadata for WGIS 35, starting from collection level (led by Tech Expo IG).**
 - *Tech Expo IG is preparing questionnaire and will distribute it to WGIS members.*
 - **Common definitions on quality is needed. WGCV will work on this.**
- **CLOSED –with following response from WGCV to WGIS chair:**
Following consultation with WGCV members, and due to the complexity and heterogeneity of EO data at Level 1, 2, and 3, a generic activity such as described in Joint Action 1 cannot be achieved. However, WGCV encourages users to refer to the principles of QA4EO to provide quality information with their datasets.
- **Work together based on above results and prepare a example(s). Show and appeal to CEOS members !**
 - *Not started yet*



2. **Metadata requirements for quality, need to tap each WGCV working group for sensor information. Have WGIS find out what is available. Get NASA ESIP feed back on this and others.**
 - **WGCV & WGIS chairs will send e-mail WGIS/WGCV members to document all the quality related activities.**
 - *Not yet (but regarding WGIS, Action 1 will take care of this one also).*
 - **Nigel will provide QA4EO**
 - *CLOSED – Combine with Action 1.*



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Shanghai, China
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Action 3



3. Data access of CEOS Test Site information starting with:

- a. CEOS IVOS sites (also test first one prior to meeting for Libya 4 site)
- b. LPV sites
- c. SAR
- d. DEM and others. Recommend starting with some key examples. SG support needed.
 - WGCV will provide necessary information to WGISS/CWIC.
 - CEOS WGISS Integrated Catalog (CWIC) will support for this.

➤ *Completed (Data access to all the test sites became available in Oct. 2012.)*



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Action 4



4. Quality indicators: get WGCV SG support and ideas and ideas from WGISS.

- Will follow No.1

➤ *Will follow No.1*



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Action 5



5. How does **quality assurance information on ECV products get populated and stored and what are the documentation components needed**

- WGCV will contact to Climate WG to obtain quality assurance requirements.
 - *Closed with response from Action #1 by WGCV*
- WGISS/DSIG will contribute to this, especially regarding long term data preservation.
 - *Not yet, waiting for the above requirements*
- Input to GEO WP Component IN-02-C1
 - *Not yet, depending on the above two actions.*



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Action 6



6. Identifying key partners and how they benefit the working group and they benefit from WG

- WGISS use Wish List from VCs. WGISS, working with WGCV , to contact to each VCs on their needs (detailed/specific needs).
 - *Contacted each VC, but feed back was not so good. WGISS closed this action and will wait for the outcome of “CEOS Portal Study” led by CNES (the SIT vice chair team).*



7. Updates and **develop new showcases**

- **QAbedo: new proposal from WGCV**
 - WGCV will discuss existing showcases and Qalbedo tomorrow (SEP-27) and give more feed back to WGISS.

Status: Closed – reference to ‘QA4EO Splinter Meeting/ Way Forward’ presentation of May 16 by WGCV Vice-Chair.



8. DEM Quality Information System (DEMqis)

- **DEMqis WPS functions (newly proposed)**
 - New web services could be developed by different space agencies irrespective of whether they produce or store/distribute DEMs...
- **On-going WGISS-WGCV joint efforts**
 - Sponsorship needed
 - WGISS will discuss if WGISS agree to participate this efforts tomorrow (SEP-27).

➤ **Waiting for sponsorship**

Appendix 5: New action items from WGCV-36 (Shanghai, China)

WGCV36 Action Items	Assigned to:	Due Date	Status
WGCV-36-1: LPV to address the specification of the requirements for a worldwide network of land surface spectral directional measurements for validation of spaceborne retrievals.	LPV (G. Schaepman)	WGCV 37	Open
WGCV-36-2: WGCV Secretariat to ask all CEOS agencies to nominate or confirm a representative for WGCV and update membership list.	WGCV Secretariat	WGCV 37	Open
WGCV-36-3: WGCV Secretariat to include NRSCC as a member organization of WGCV with Prof. Li as a representative.	WGCV Secretariat	WGCV 37	Open
WGCV-36-4: WGCV Chair and Secretariat to propose a new tabular structure for describing WGCV membership in WGCV work plan to include reference to role of representative (e.g. member, associate member, etc.)	WGCV Chair, vice-chair and Secretariat	WGCV 37	Open
WGCV-36-5: WGCV Secretariat to make a draft update to the WGCV work plan based on relevant discussions held at WGCV-36.	WGCV Secretariat	WGCV 37	Open
WGCV-36-6: WGCV Vice-Chair to develop reporting templates for agency and subgroup reports to be presented at WGCV-37 for discussion.	WGCV Vice-chair	WGCV 37	Open

WGCV-36-7: IVOS Chair to reword IVOS recommendations to precisely indicate whether the recommendation is for:
a) information to WGCV,
b) support from WGCV, or
c) support from SIT

IVOS Chair

WGCV 37

Open

If support is required from SIT, then a case must be presented to justify this request.

WGCV-36-8: SST-VC to reword Recommendation 5 from IVOS recommendations to precisely indicate whether the recommendation is for:
a) information to WGCV,
b) support from WGCV, or
c) support from SIT

SST-VC (G. Corlett)

WGCV 37

Open

If support is required from SIT, then a case must be presented to justify this request.

WGCV-36-9: WG on Climate is searching for support in assessment of the FCDR and ECVs. WGCV is willing to support the assessment based on their ToR and expertise.

WGCV Chair and Vice-Chair

WGCV 37

Open

Two clarifications have to be carried out in cooperation with WGCV and SIT/plenary:

- (1) In principle, WGCV should be the only responsible body (or body first to be asked) in CEOS for CAL/VAL related issues of satellite products, i.e. sensor calibration and higher level (e.g. 2/3) product validations;
- (2) If for higher level product (2/3) evaluation/assessment/validation will be carried out by other (CEOS or others) bodies, this should be first coordinated with WGCV to allow cooperation.

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