Working Group on Calibration and Validation

Minutes of the
37th CEOS WGCV Plenary

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Executive Summary

The 37th Working Group on Calibration and Validation (WGCV) plenary meeting was hosted by the European Space Agency (ESA) at ESRIN in Frascati, Italy from Feb 17th to 20th, 2014. There were more than 36 delegates representing 24 agencies and institutions internationally. Some participants joined the meeting virtually via webconferencing.

Along with the WGCV Chair's report and subgroup reports for LPV, IVOS, ACSG, SAR, MSSG, and TMSG; fifteen agencies reported on the status of current missions, future missions as well as on current and planned calibration and validation activities.

Furthermore, focused discussions were held on existing and potential interactions between VCs and WGCV with presentations by SST-VC, AC-VC, and LSI-VC along with discussion on Cal/Val needs from the VC perspective. Also, potential interactions between WGCV and WMO were explored with GSICS representatives who were invited to talk on topics of inter-calibration.

At the CEOS level, Diane Wickeland of NASA presented an update on the CEOS Carbon Task Force Report which contains many items as recommendation or action requiring the attention of WGCV. Also, the CEOS CEO, Kerry Sawyer, gave an overview introduction to CEOS, reviewed the outcomes of the 27th CEOS plenary, and presented a draft of the CEOS 2014-16 work plan in its new form. A discussion was also held on the CEOS communication protocol. Additionally, the CEOS WGISS chair, Richard Moreno, was invited to come to speak on his working group's activities. All outstanding joint action items from past plenaries between WGCV and WGISS were discussed. The actions were closed with some follow-up work captured in a new action.

At the GEO level, Osamu Ochiai from the GEO Secretariat provided an update on GEO activities along with priorities for 2014 and discussions were held on possible areas of collaboration with CEOS.

As a first experience for WGCV, special sessions were held to discuss topics of interest to many subgroups and agencies (cross-cutting themes) in order to identify potential linkages/collaborations on specific themes. These sessions proved to be successful and will likely be repeated in the future. Topics discussed included maturity matrices, the Sentinel-2 radiometric uncertainty tool, snow retrieval, cloud masking, solar irradiance reference spectrum, global DEMs and QA4EO among other topics in the context of Cal/Val.

Candidacy presentations for the WGCV 2014-2016 Vice Chair position were made by NASA candidate, Kurtis Thome; and NRSCC candidate Prof. C.R. Li. WGCV will select the future Vice-Chair at the WGCV-38 plenary and will recommend to CEOS for confirmation at the CEOS-28 plenary.

The USA will be hosting the 38th WGCV plenary meeting in September or October of 2014. The dates, venue location and co-hosts will be determined by April 2014.

Monday Feb 17 – 2014 - Day 1

Host Welcome and Welcome Address

Chair's Welcome

WGCV Chair, Dr. Satish Srivastava, welcomed participants to the 37th Working Group on Calibration and Validation Plenary (WGCV-37) at ESRIN/ESA, Frascati, Italy. He also thanked Bojan Bojkov for his support in organizing the plenary and was grateful to ESRIN/ESA for accepting to host the meeting in their facility.

Roll Call

Participants were asked to introduce themselves via a roll call. The complete list of registered attendees for WGCV-37 may be found in Appendix 1.

Adoption of Agenda

The WGCV-Chair presented the Agenda to WGCV-37 participants for adoption.

The agenda was adopted with the addition of a presentation by Jan Peter Muller on the Q4ECV initiative which was tentatively scheduled for Tuesday Feb 18 at 13:15. Appendix 4 of this document has a copy of the agenda presented to the plenary.

Host Welcome and Introduction to ESA Earth Observation

Dr. Henri Laur, Head of the Earth Observation Missions Management Office at ESA, welcomed the participants.

A copy of Dr. Laur's presentation is available on the WGCV-37 meeting webpage [PDF]
The host presentation included a description of changes occurring at ESA where the focus is shifting from the older generation of satellites (ERS, Envisat, etc.) to the new era of Sentinel type satellites within the Copernicus Programme such as Sentinel-1A which will be launched in March 2014. Dr. Laur described the Copernicus Sentinel Missions as being one of three main activity sectors of ESA alongside meteorological missions (in partnership with EUMETSAT), and Earth Explorer Missions. Support is also provided by ESA to third-party missions and small-mission satellites (e.g. proba-1 and proba-v).

There are also changes to come at ESA in terms in data availability with more data from Sentinel missions becoming available and accessible to a wider audience. Changes can also be observed in the programmatic and the financial environment with the European Commission now providing budget for operations of Sentinels, and more innovation initiatives being supported by ESA (e.g. ESA EO Envelope Programme) together with ESA member states. A third area of change is with information and communication technology in terms of enabling new data flow architecture and collaboration schemes.

Dr. Laur expressed the necessity to maintain a high level of expertise for Cal\Val activities and for product algorithm evolution. Much has been built and developed over the past 20 years in Europe in terms of expertise with many EO sensors. There is also a vibrant, mature and competitive European EO R&D community, along with strong institutional support for product algorithm development, and increased IT processing capabilities.

Dr. Laur concluded by thanking the organizing committee for their hard work and wished a good WGCV plenary to all.

Question/Comments:

A comment was made by Satish Srivastava from CSA applauding ESA and their open data policy approach to Sentinel mission data. CSA is now in the process of looking at the data policy for the next generation of RADARSAT Constellation Mission satellites and learning from what has been implemented from various existing missions of foreign agencies. Some information on the RCM data policy will be presented during the CSA agency report at this WGCV-37 plenary. Dr. Laur added that while much importance is being put on the data being more easily accessible in high volumes, the quality of it will matter just as much.

ESA Agency Report (Bojan Bojkov)

Bojan Bojkov presented the ESA agency report which included updates on the ESA Earth Observation programme, a review of recent ESA Cal/Val activities, and an introduction to the Cal/Val Infrastructure Working Group – CVI.

A copy of the ESA report is available on the WGCV-37 webpage [PDF].

Questions/Comments:

G. Stensaas (USGS) Praised the initiative of ESA and its member states for establishing the Cal/Val infrastructure (CVI) working group. Asked if the CVI, or that type of infrastructure, could be established across the various CEOS agencies via the WGCV.

B. Bojkov (ESA) [Response to G. Stensaas] The CVI is not just an ESA (and its member states) initiative. While CVI is not formerly tied to CEOS or WGCV, it is very much complimentary to their activities. Within CEOS, working groups can only bring recommendations to SIT which are in fact non-binding. What CVI allows is a forum to exchange ideas and bring more flexibility in arranging funding or cooperation among its members.

S. Srivastava (CSA) [Response to G. Stensaas, and B. Bojkov] ESA's point of view is very correct. From the experience gained as WGCV Chair, the approach should be that an initial arrangement should be made at the agency level before asking for support/endorsement at the CEOS plenary level.

O. Ochiai (GEO) – CVI is a very nice model. GEO is attempting to work in the same sense with its in situ committee. However GEO is a much more dispersed network of agencies and partners. How could the GEO in situ committee get involved with CVI?

B. Bojkov (ESA) [Response to O. Ochiai] The focus with CVI is more on the tailored infrastructure that supports/measures sensor performance. The GEO in situ network is a very large heterogeneous community. To understand how to integrate and coordinate the measurement protocols and measurement data from such a large network is very complex. What CVI is trying to accomplish is more on a smaller scale by coordinating the measurement infrastructure to address key questions about specific sensors. However, CVI would be willing to work with GEO on this issue, at least on the lessons learned.

K. Thome (NASA) Provided some clarification about the funding for MOBY. It is currently funded by NOAA and not by NASA.

WGCV Chair's Report (S. Srivastava)

The WGCV Chair presented his report. An overview of meetings that he attended was given, including meeting highlights and resulting actions with reports on their status. Meetings attended included the SEC and SIT telecons; the SIT Technical Workshop in California; and the 27th CEOS plenary in Montreal.

Among many WGCV topics reported by the WGCV Chair at the CEOS-27 plenary, one important activity is the work by the Infrared and Visible Optical Sensors (IVOS) subgroup of WGCV in collaboration with the SST-VC to propose 2 projects to CEOS. The first project is a cal/val sensor comparison campaign in support of SST and LST measurements from space. The second is an operational validation project involving a network of high performance drifting ocean buoys for continuous monitoring of ocean temperatures in addition to ship borne radiometers analogous to test sites such as Aeronet and the new RADCALNET. Initial phases of the first project relating to comparisons of radiometers including blackbodies were endorsed by CEOS at the Plenary. For the remaining unfunded phases of the first and second projects, CEOS approved the WGCV request to proceed with detailed planning to be presented at SIT-29.

The Chair also reported on current CEOS level initiatives of interest to WGCV. These include the release of new ToRs for the CEOS Virtual Constellations (VC); the introduction of CEOS process papers on WGs VCs and new initiatives; the development of a CEOS Document Configuration Management System and the new 3-year Rolling CEOS Work Plan.

A copy of the WGCV Chair's Report is available on the WGCV-37 webpage [PDF].

Questions/Comments:

N. Fox (UKSA/NPL) RE: SIT group telecon with all VCs and WGs held on June 20, 2013 (slide 4) – What was the response from SIT and VCs about the position of WGCV being the reference on any calibration/validation requirements for CEOS?

S. Srivastava (WGCV Chair, CSA) [Response to N. Fox] Response from SIT Chair was positive but stated that WGCV has to demonstrate that it is the reference for all cal/val requirements in

CEOS. Few VCs on the other hand, stated that they have their own calibration activities and experts to do that work. WGCV stated that there should be cooperation in cal/val activities to avoid duplication of work. - The discussion on this topic was deferred to the WGCV and VC Interactions session on Wed. Feb 19.

WGCV Business

Review of Action Items from WGCV-36

The action items of WGCV-36 were reviewed by E. Arsenault (WGCV Secretariat) together with participants of the WGCV-37 plenary. The status summary/close-out of each action item is provided in Appendix 3 with comments and/or justification provided where necessary.

Review of GEO Action Items

A summary of the action status report as entered in CEOS-GEO Action Tracking System (Oct 2013) was presented. The summary presentation is available from the WGCV-37 webpage [PDF].

Discussions on deliverables for Year 2014, 2015 were deferred to the Wednesday session on CEOS-GEO Interactions, "Review of GEO tasks related to WGCV".

CEOS Plenary Action Items

The status of actions items assigned to WGCV at CEOS-26 in Bangalore (India) and at CEOS-27 in Montreal (Canada) was reviewed. The summary presentation is available from the WGCV-37 webpage [PDF].

Review of Minutes from WGCV-36

The minutes of the previous WGCV-36 meeting held in Shanghai, China in May 2013 were reviewed and accepted as produced. The official copy of these minutes is available on the CEOS WGCV website [PDF].

Vice Chair Election Process and Presentation from Candidates

An overview of the WGCV vice-chair election process, as described in the WGCV Work Plan, was given by the WGCV Chair. A copy of the overview presentation is available on the WGCV-37 webpage [PDF]. The WGCV Chair then proceeded to present the two candidates put forward for the position of WGCV Vice-Chair after confirming with the plenary that there were no additional agency nominations of candidates.

The first candidate, Prof. Chuanrong Li, was nominated by the National Remote Sensing Center of China NRSCC while the second candidate, Dr. Kurt Thome, was nominated by the National Aeronautics and Space Administration (NASA)

Both candidates made presentations on their background and their vision/objectives for WGCV as future Vice-Chair. Copies of the NRSCC and NASA candidate presentations are available from the WGCV-37 webpage: Prof. Chuanrong Li [PDF], and; Dr. Kurt Thome [PDF].

The selection of the next WGCV Vice-Chair will occur at the WGCV-38 plenary in September or October, 2014. The nomination will then be submitted to CEOS for confirmation at the CEOS-28 plenary in Oct/Nov 2014. It should be mentioned that the term of the current WGCV Chair will end in Oct/Nov 2014. The current WGCV Vice-Chair will then automatically become Chair.

Discussion on the Next WGCV Plenary Meeting

Greg Stensaas has received support from USGS management to host the **WGCV-38** in the USA and is currently in discussions with other US agencies to help co-host the meeting. The venue location will be confirmed at a later date along with meeting dates.

The plenary discussed potential dates for the meeting based on WGCV members' availability and other meetings occurring in the fall of 2014. It was decided to have Greg Stensaas poll the WGCV members on their availability. Because of the long delay for travel visa applications for some participants, it was suggested to determine the date of the meeting as early as possible.

WGCV-37-1: Greg Stensaas (USGS) to poll (via doodle poll) WGCV Chair, Vice-Chair and Subgroup Chairs to determine optimal dates for WGCV-38 plenary meeting in USA, and confirm plenary dates by March 1st, 2014.

Albrecht von Bargen on behalf of DLR offered to host **WGCV-39** to be held in May 2015. The meeting will be in Berlin, Germany during the week of May 4-8th (likely, on Wed 6th onwards), prior to 36th International Symposium on Remote Sensing of Environment hosted by DLR which starts the following week on Monday, May 11th. Also, there will likely be a session on Cal/Val during the ISRSE36 conference. However, participants wishing to attend ISRSE36 will have to pay fees to attend. More information on ISRSE36 can be found at www.isrse36.org.

The meeting for day 1 was adjourned at 18:15.

Tuesday Feb 18 – 2014 - Day 2

Subgroup Reports (I)

Land Product Validation – LPV (G. Schaepman-Strub) - Remote Presentation

A copy of the LPV Chair's Report is available on the WGCV-37 webpage [PDF].

Questions/Comments:

J.-P. Muller (UCL): On slide 10 and the 'Validation Stage 2010' table on the highest CEOS validation stage reached for satellite-derived land products relevant to the LPV sub-group; is there an updated table for 2014? Mostly interested in Albedo variable/products.

G. Schaepman-Strub (LPV Chair) [Response to J.-P. Muller] This table was first published in a 2010 proceedings paper for which Joanne Nightingale was the lead author. Updated numbers were received from participants at the January 2014 LPV subgroup meeting which will be verified and used to update the original 2010 version of this table.

S. Kumar (ISRO) RE: slide 14 on Global Validation Supersite: ISRO knows of some sites identified from GFOI project, for biomass and deforestation studies. Are these of interest to CEOS/LPV as supersites?

G. Schaepman-Strub (LPV Chair) [Response to S. Kumar] LPV would welcome an e-mail from ISRO describing what sites that they have knowledge of and how they can contribute. In general, sites are more desirable if they are very well characterized and if long-term measurements can be assured.

G. Stensaas (USGS) Should CEOS member agencies be more involved into LPV subgroup meetings to determine if they can provide more agency support in terms of some of the validation processes? For example, with Landsat -8, USGS is preparing to create many of the ECV products as described in the LPV report presentation and is currently looking at validation processes – there might be some support and funding that could be provide through John Dwyer of USGS.

G. Schaepman-Strub (LPV Chair) [Response to G. Stensaas] – Carol (Mladinich) from USGS is currently participating in LPV telecons and these are generally open to agencies. However, for the last LPV subgroup meeting, it was decided to have a closed meeting to have more focussed discussions but LPV might consider opening meetings to agencies if that could be beneficial in providing some future funding.

G. Stensaas (USGS) Did LPV ever consider the National Ecological Observatory Network (NEON) sites for their validation activities?

G. Schaepman-Strub (LPV Chair) [Response to G. Stensaas] Yes, LPV is already in contact with the National Ecological Observatory Network and collaborating on some initiatives for LAI validation.

Personal Action on G. Stensaas (not to be recorded as WGCV action) To send information to G. Schaepman on USGS Landsat-8 ECV validation processes work and initiatives and on NEON work as well.

Microwave Subgroup Report – MSSG (X. Dong)

A copy of the MSSG Chair's Report is available on the WGCV-37 webpage [PDF].

Proposals and recommendations were provided to WGCV plenary on slides 23 and 24. These are for information purposes only, no action is required.

Questions/Comments:

T. Hewison (EUMETSAT/GSCICS): Pleased to hear about the subgroup's intention to focus on standardization and best practices. Within GSICS, the microwave subgroup was recently reformed and, with regards to microwave sounders, GSICS has been focussing on developing inter-calibration techniques in collaboration with the GPM X-Cal group. Linkages between GSICS, GPM X-Cal and MSSR are likely feasible and GSICS would like to explore these further in the 'CEOS WGCV-WMO Interaction' session on Thursday at WGCV-37.

G. Stensaas (USGS) On the topic of difficulty with data sharing (slide 14 – Cross-calibration of scatterometry – Requirements and Difficulties). From a CEOS/WGCV perspective, what could be done to help the MSSR subgroup get support from the agencies to facilitate data sharing?

X. Dong (NSSC, MSSG Chair) [Response to G. Stensaas] The main issue is with the scatterometer data where it is generally more difficult in getting data for some specific sensors. However, collaboration is easier with European colleagues as the data policy on the products from their sensors is more flexible for scatterometer data. Workaround strategies can be implemented but it is not an ideal scenario. At the next MSSR subgroup meeting in June, discussions will be held to find sites where a good stack of data from multiple sensors can easily be made available and shared.

S.Srivastava (CSA, WGCV Chair) [Response to X.Dong and G. Stensaas] The issue of data sharing can usually be resolved directly with the agency providing the data. WGCV can always elevate this issue to CEOS plenary for discussion and awareness among the various agencies if deemed necessary.

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

A copy of the IVOS Chair's Report is available on the WGCV-37 webpage [PDF].

Questions/Comments:

T. Malthus (CSIRO) Australia would be interested in hosting the fourth ESA/CNES RADCALNET site. Possibilities include Lake Lefroy or Lake Frome.

N. Fox (IVOS Chair) [Response to T. Malthus] The RADCALNET team would certainly be interested in that offer. The next would be to discuss with the ESA/CNES team who is managing that project to make sure that the site meets the correct criteria for selection.

T. Hewison (EUMETSAT/GSCICS): The understanding is that if, after 2 years, the RADCALNET program is successful, it will be extended to additional sites. Could this possibly include larger sites such as Libya 4 that could be used for calibration of not such high spatial resolution instruments such as those of geostationary satellites?

N. Fox (IVOS Chair) [Response to T. Hewison] It is quite difficult to put new instruments at Libya-4. With RADCALNET, while the objective is to expand and create additional (smaller) instrumented sites, there is also on-going work within IVOS to find solutions to link the instrumented sites with the bigger test sites in order to be able to do harmonization activities.

K. Thome (NASA) [Additional comment to T. Hewison] The Railroad Valley site operated by the University of Arizona may be of interest as it is large enough that is can be used as a calibration site for geostationary or large spatial resolution instruments.

J.-P. Muller (UCL) With the RADCALNET sites, the assumption is that these are all bright sites. Will there be systematic spectral BRDF measurements made from towers?

N. Fox (IVOS Chair) [Response to J.-P. Muller] At one of the sites, there is a bright and dark target of approximately 50 m^2. All of the RADCALNET sites will be characterized for their spectral BRDF as part of the comparison exercise. On the La Crau site and on the new ESA/CNES site, there will be a tower with some BRDF fixed range of angles measurements. The Chinese site might do this in the future but it is not currently set up as such.

K. Thome (NASA) BRDF measurements were done in the past on the Railroad Valley site but they are not carried out anymore. The Railroad Valley site is stable and near lambertian and it is such that repeated BRDF measurements are not required.

J.-P. Muller (UCL) [Comment to N. Fox] A concern with RADCALNET is that there is not a dark site (over forest) for BRDF spectral measurements.

N. Fox (IVOS Chair) [Response to J.-P. Muller] RADCALNET sites are set up with targets to calibrate instruments for radiometric gain and therefore at the moment, they are made-up of bright targets.

K. Thome (NASA) [Comment to J.-P. Muller] RADCALNET is a network of prototype sites and as such the focus should remain on getting the sites well characterized and have core instrumentation and measurement protocols in place before expanding to other types of measurements, etc.

J.-P. Muller (UCL) Does the La Crau (France) site include water that could be used as a dark target?

P. Henry (CNES) [Response to J.-P. Muller] No, it does not include water. It is very difficult to have multiple target types over a calibration site because they are usually dedicated to one type of measurement and they can't necessarily be used for the complete characterization of your sensor.

J.-P. Muller (UCL) With tower measurements taken at various times during the day over the La Crau and ESA/CNES sites, it does give the variation of the time of day which could constitute a BRDF measurement. An issue that arose with Dome-C was that the site was thought to be lambertian but in fact it was not quite as such, which is why temporal BRDF measurements should be done to have some basic understanding of that aspect of the site.

P. Henry (CNES) [Response to J.-P. Muller] It will be temporal over La Crau and measurements will be done six times a day but with some approximation, so it is more a fit of a BRDF model than direct BRDF measurements.

Atmospheric Composition Subgroup – ACSG (B. Bojkov)

A copy of the ACSG Chair's Report is available on the WGCV-37 webpage [PDF].

Questions/Comments:

C. Zeher (ESA) Where can the results of the subgroup activities, or minutes of ACSG meetings be found?

A. von Bargen (DLR)/B. Bojkov (ESA) [Response to C. Zeher] Within WGCV, there is ongoing work to migrate the subgroup webpages to the cal\val portal which should allow information to be updated and flow better to the public.

M. De Maziere (BIRA) Question directed to either B. Bojkov or C. Zeher - would like to know more about the ESA SEOM activity.

C. Zeher (ESA) [Response to M. De Maziere] This ESA Scientific Exploitation of Operational Missions (SEOM) activity is based on the outcome of an Atmospheric Science conference where cross-section requirements of the users of the AC and GHG communities were compiled. Understanding the differences in ozone measurements from UV and infrared instruments is one activity field and the other one is in preparation of sentinel 5 precursor mission to improve the reference spectra in the SWIR range.

J.-P. Muller (UCL) With regards to the spectral measurements made from the RADCALNET sites; do any of the sites have instruments measuring in the UV?

B. Bojkov (ESA) [Comment to N. Fox and J.-P. Muller] UV instrumentation should be considered on RADCALNET sites. Ideally the sites would have UV instrumentation and in parallel RADCALNET could benefit from the AERONET-Cimel network. Examples of UV instruments: Pandora spectrometer developed by NASA (i.e. similar to AERONET) and the mini spectrometers supported by ESA which go from 280 to 950 nm (1nm resolution up to 600nm and 2nm FWHM resolution beyond).

N. Fox (IVOS Chair) [Response to J.-P. Muller and B. Bojkov] All that was done in RADCALNET was to take a minimum set of requirements in order to meet the Cal/Val needs of the sensors that were initially targeted by the project for calibration. Although the calibration of UV sensors was not initially targeted, RADCALNET will be encouraging adding UV instrumentation in the future.

Terrain Mapping Subgroup - TMSG (J.-P. Muller)

A copy of the TMSG Chair's Report is available on the WGCV-37 webpage [PDF].

Questions/Comments:

WGCV Participant (ESA) What is the data policy on the TanDEM-X 90m DEM product for use by public, agencies, commercial entities, etc.?

J.-P. Muller (UCL) [Response to WGCV participant] Although not official, the current understanding is that the TanDEM-X 90m data would be released in a similar manner as to the SRTM-90m data, with few restrictions on data accessibility.

A. von Bargen (DLR) [Response to J.-P Muller and WGCV participant] At the current time, proposals may be submitted trough the TanDEM-X Science portal to access TanDEM-X data.

TMSG Recommendations

TMSG presented its recommendations to the WGCV plenary (see last slide of the TMSG presentation - slide 42).

Although these recommendations were initially targeted for acceptance by WGCV and presentation to CEOS for endorsement, a discussion ensued on the process to bring recommendations up to the CEOS level.

The WGCV Chair and Vice-Chair reminded subgroups that they must have backing from the agencies before making a recommendation for endorsement to CEOS. Therefore, the plenary encourages TMSG to attempt to get support from agencies and then reformulate its recommendations if it wishes to bring them up to a higher level of CEOS.

This was perceived to be a change in CEOS and WGCV policy by some participants but the plenary agreed that getting prior backing from agencies should be respected if this is the expected protocol from SIT and CEOS.

Agency Reports (I)

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

A copy of the NSCC report is available on the WGCV-37 webpage [PDF].

Questions/Comments:

B. Bojkov (ESA) On NSSC's altimetry work, how is tropospheric correction handled? Is the microwave data used for this purpose?

X. Dong (NSSC) [Response to B. Bojkov] The microwave data is not used for this but rather the correction is based on vapour data and models.

National Remote Sensing Centre of China - NRSCC (C.R. Li)

A copy of the NRSCC report is available on the WGCV-37 webpage [PDF].

Questions/Comments:

B. Bojkov (ESA) With respect to the Cal/Val of TANSAT FTIR instruments, do you have any plans to work with NDACC subgroup on FTIRs and participate in inter-comparison activities, best practices, common reference spectra, etc.? Recommends having discussions with M. De Maziere who is the NDACC chair.

C.R. Li (NRSCC) [Response to B. Bojkov] There is no dedicated plan at the moment but would be glad to discuss further with NDACC in the future.

G. Stensaas (USGS) Is there information available on the NRSCC test sites that WGCV could include in its catalogue of test sites?

C.R. Li (NRSCC) [Response to G. Stensaas] Not fully, but currently working at preparing a package of information.

Canadian Space Agency - CSA (S. Srivastava)

A copy of the CSA report is available on the WGCV-37 webpage [PDF].

Questions/Comments:

J.-C. Lambert (BelSPO-BIRA-IASB) What is the current status of the Polar Communication and Weather (PCW) mission?

S. Srivastava (CSA) [Response to J.-C. Lambert] A Request for Information (RFI) was issued globally for interest in PCW and several requests have been received and these are currently being reviewed by Government of Canada departments.

B. Bojkov (ESA) How will the open data policy work for RCM as this is public/private partnership in sorts?

S. Srivastava (CSA) [Response to B.Bojkov] The RCM mission and data will be owned by the Government of Canada unlike the current RADARSAT-2 mission which is owned and operated by MDA. Therefore, the Government of Canada will have the right to distribute RCM data but

within the access control regulations governed by the Canadian Remote Space Systems Act (RSSA). The RCM data policy is still in development.

B. Bojkov (ESA) ESA was asked to comment on SCISAT performance as part of a peer-review for continuation of its operations. Is this review for operations beyond 2015?

S. Srivastava (CSA) [Response to B.Bojkov] The current peer-review of the SCISAT mission is for operations beyond the CSA approved end-of-funding date of March 31st, 2015. The review should be positive in the end.

S. Kumar (ISRO) Is CSA currently doing RADARSAT-2 radiometric calibration?

S. Srivastava (CSA) [Response to S. Kumar] MDA does radiometric calibration of RADARSAT-2. However, CSA also routinely performs image quality and calibration checks using a forested site in Cameroun and CSA transponders as part of image quality assurance for Government of Canada users.

National Oceanic and Atmospheric Administration – NOAA (F. Padula)

A copy of the NOAA report is available on the WGCV-37 webpage [PDF].

Questions/Comments:

J.-P. Muller (UCL) Is there radiometric calibration being performed on the day/night band on VIIRS? Many applications which relate to socio-economic retrievals require very well calibrated high gain data in order to achieve the results wanted.

X (Jack) Xiong (NASA) [Response to J.P Muller] VIIRS is calibrated using the on-board solar diffuser.

Centre national d'études spatiales - CNES (P. Henry)

A copy of the CNES report is available on the WGCV-37 webpage [PDF].

No questions/comments due to lack of time.

National Aeronautics and Space Administration – NASA (K. Thome)

A copy of the NASA report is available on the WGCV-37 webpage [PDF].

Questions/Comments:

J.-P. Muller (UCL) The OCO-2 mission will require very accurate calibration. What is planned for calibration of this mission?

K. Thome (NASA) [Response to J.P Muller] The OCO-2 calibration will rely on the group at JPL involving Carol Bruegge and will certainly follow the same rigor as with OCO-1. It is suggested talking to C. Bruegge of JPL on that topic.

Cross-cutting themes (I)

Introduction: Bojan Bojkov (ESA) introduced the cross-cutting session and provided some background as to its existence in the WGCV-37 plenary and the rationale behind it.

The idea of having a cross-cutting session was initially discussed at WGCV-36 in Shanghai with the rationale of stimulating discussion amongst plenary participants from various agencies and subgroups. The objective is to exchange or "cross-pollinate" ideas and identify potential linkages/collaborations on specific themes.

Several guest speakers have also been invited to this session with the expectation that they can bring information on specific Cal/Val initiatives that they are involved with and from which WGCV can benefit. This session is a first experience for WGCV and therefore it will be used to evaluate the concept.

Reference Solar Irradiance Spectrum (N. Fox, NPL)

A copy of the presentation is available on the WGCV-37 webpage [PDF].

Questions/Comments:

J.-P. Muller (UCL) The variability shown in your presentation between the solar min and max may represent the extreme range but is it not the case, particularly in the UV, that the variations are even larger? Is it not more important to have missions that support continuous monitoring of the solar spectrum? Why are you are not moving towards a dynamic spectrum that is being produced from a satellite, that continuously monitors the solar spectrum, and will enable you to take any instantaneous orbital data and produce the correct spectra?

N. Fox (NPL) [Response to J.P Muller] The solar spectrum is currently being measured from the SIM instrument on the SORCE platform which is measuring solar spectral irradiance down to 200nm. For the area that IVOS is concerned with (above 400nm), the spectrum is not changing significantly and therefore there is less of a need to do continuous monitoring of the spectrum. From an atmospheric chemistry domain, it is clearly important, but doing something dynamic is of high risk because the uncertainties in those absolute measurements are really quite high (i.e.: 4 to 5% in absolute values in the visible).

K. Thome (NASA) [General comment to plenary] At the climate level, if the goal is to measure radiance in the visible to do climate quality measurements, then the solar irradiance variability on a monthly scale must be taken into account as it does dominate the error budget.

K. Thome (NASA) [General comment to plenary] An important thing to consider from a cross-cutting perspective, especially for the LPV, atmospheric, or calibration communities, is that systems are calibrated (i.e vicarious calibration) using the correct solar curve which puts them

on a specific solar scale. If the user community then uses a different solar scale to generate their products, this will introduce bias. Therefore, it is very important that the land, atmospheric and calibration communities use a standard scale and cross-cutting is key here.

M. De Maziere (BIRA) In the discussion on using a dynamic spectrum, the SIM instruments from the SORCE platform was mentioned but also remember that there is the SOLSPEC instrument on the ISS that can be used for this purpose. With regards to the reference spectrum shown in the presentation based on Thuillier (2004), there might be an updated reference spectra based on ISS-SOLSPEC measurements.

N. Fox (NPL) [Response to M. De Maziere] Although there might have been other more recent work based on ISS-SOLSPEC measurements, in the spectral range >400nm, the proper reference is still Thuillier (2004).

T. Hewison (EUMETSAT/GSCICS) Strongly supports the concept of defining best practices for performing spectral convolution as discussed in the presentation. Could a best practice be developed to convert from one reference spectrum to another?

N. Fox (IVOS Chair) [Response to T. Hewison] From the best practice developed for the spectral convolution as shown in the presentation, in principle this becomes straightforward to convert from one to another because you are simply changing the input data allowing to go from one to the other.

B. Bojkov (ESA) From the discussion today on this topic of Reference Solar Irradiance Spectrum, it is clear that there has to be cross-cutting activities. This topic is not just important for satellites but also for ground measurements. It would be good to organize a follow-up telecon to continue collaborative work in this activity area.

WGCV-37-2 IVOS Chair to setup a doodle poll regarding availability of participants for a follow-up telecon to the October 2013 WebEX session with user community on the development of best practices for use of External Solar Irradiance Spectrum.

Personal Action on B. Bojkov (not to be recorded as WGCV action) To consult the ACSG subgroup to determine the wavelength range and resolution requirements in the UV spectral range with regards to the External solar irradiance spectrum. B. Bojkov to also consult the LPV Chair (G. Schaepman) to understand their requirements in the UV spectrum, if any.

Cloud masking (R. Hollman, DWD)

A copy of the presentation is available on the WGCV-37 webpage [PDF].

Questions/Comments:

J.-P. Muller (UCL) In the presentation (slide 13), twelve different versions of a global cloud mask generated from various algorithms are shown. Which of these versions would be the correct one to use as a climate record input to a data set like the one of ISCCP (International Satellite Cloud Climatology Project)?

R. Hollman (DWD) [Response to J.P Muller] These are not associated with ISCCP at all. The objective of the exercise was to apply various algorithms with the same satellite input data taken at a specific point in time and comparing the output results. ISCCP uses averaged measurements from various satellite sensors and the application is based on a two channel approach [VIS (day) and IR radiance measurements].

J.-P. Muller (UCL) Every sensor produces a different cloud mask and every algorithm produces a different cloud mask from the same sensor input data. What does that mean for ISCCP in terms of its value as a credible climate data record?

R. Hollman (DWD) [Response to J.P Muller] If the common characteristics of the sensors are exploited, then a long term climate data record can start to be built from that. ISCCP, while not perfect, is using a two channel approach applied to common measurements from multiple GEOs as well as LEOs, hence creating the ability to produce a long term data set of cloud cover integrated from multiple sources.

B. Bojkov (ESA) For certain types of sensors, could a common or similar approach be used for detecting the presence of a physical cloud? An example would be if one wants to do an initial filtering of pixels and label the image pixels as 'cloud' or 'no cloud'. It would be useful for other fields as well to have a recommended approach for detecting the presence of physical clouds.

R. Hollman (DWD) [Response to B. Bojkov] By using a lowest common denominator approach and focussing on the spectral channels common to many sensors, then it becomes easier to fine-tune a universal algorithm to produce more homogeneous and consistent cloud cover products. I would certainly be interested in working on this topic and other cloud detection issues with the different WGCV subgroups.

Personal Action on B. Bojkov (not to be recorded as WGCV action) To talk with R. Hollman of DWD and with T. Hewison of EUMETSAT to further discuss cloud masking cross-cutting activities.

NORS Project – Network of Remote Sensing Ground-Based Observations for the GMES Atmospheric Service (M. De Maziere, BIRA)

A copy of the presentation is available on the WGCV-37 webpage [PDF].

Questions/Comments:

J.-P. Muller (UCL) Have you done an inter-comparison of all the instruments in the NORS network at the same place and time to make sure that they are compatible?

M. De Maziere (BIRA) [Response to J.P Muller] Efforts of this sort were done in the past with the FTIR instruments but it is logistically difficult and costly to achieve. The preferred approach currently used by NORS is to use calibration cells. For example, all of the FTIR instruments are equipped with similar calibration cells to control the alignment and calibration of the instrument

and this assures some consistency in measurement across the entire network. Also, standardized processing algorithms are used at all of the sites.

J.-P. Muller (UCL) Do you have in-situ measurements that allow you to back-calibrate your FTIR and microwave measurements?

M. De Maziere (BIRA) [Response to J.P Muller] NORS is trying to implement in-situ measurements for the future. For example, with the TCCON network, which attempts to make very precise measurements of the greenhouse gases, the approach would be to do an overflight on a regular basis with an aircraft equipped with in-situ sensors that are calibrated to NIST standards to validate the TCCON instruments.

J.-C. Lambert (BelSPO-BIRA-IASB) [Comment to J.P Muller] In the UV/VIS community, there are also inter-comparison campaigns organized in the framework of CEOS with ESA funding to inter-compare the new instrumentation similar to what is done via NORS and the FTIR and microwave instruments.

Discussion on NORS and WGCV

A discussion ensued, led by B. Bojkov (ESA), on the need for a good characterization of the atmosphere for many of the WGCV activities and those of the Cal/val or CEOS community as a whole (i.e. for RADCALNET, AERONET, CEOS supersites, target sites, etc.)

WGCV could benefit from harmonizing its activities with the NORS infrastructure, procedures and tools which is quite extensive. For example, NORS could provide complementary atmospheric characterization information to RADCALNET sites.

B. Bojkov (ESA) suggested formulating a recommendation for consideration by the CEOS plenary to encourage NORS to continue to develop its infrastructure, tools and procedures to make available to WGCV and the community as a whole. The WGCV-Chair suggested to B. Bojkov (ESA, ACSG Chair) to further develop and formulate a recommendation and present it to the WGCV plenary at the next WGCV-38 meeting in Sept-Oct 2014 where a decision can be made to bring it up to the CEOS level.

Personal Action on B. Bojkov (not to be recorded as WGCV action) To further develop and formulate a recommendation on involving the NORS network into WGCV activities. The recommendation will be discussed at the next WGCV-38 meeting in Sept-Oct 2014 by the WGCV plenary for approval and recommendation to CEOS plenary level.

The Vice Chair thanked the guest speakers to conclude the cross-cutting session themes session (I).

Cross-cutting themes (II)

CORE CLIMAX – Maturity Matrix and ECV data records (Y. Zeng, U. of Twente)

A copy of the presentation is available on the WGCV-37 webpage [PDF].

Application of a Maturity Matrix to Satellite Data Records (R. Hollman, DWD)

A copy of the presentation is available on the WGCV-37 webpage [PDF].

Questions/Comments and Discussion:

G. Stensaas (USGS) Has been following the maturity matrix work since its introduction with the WG on Climate and USGS is starting to use it for the future Landsat-8 products. There are some known difficulties in the areas of metadata and uncertainty characterization where these are often not fully defined across the different systems, sensors or products. What is WGCV's role in helping to fill-in these maturity matrix components and support some of these areas?

R. Hollman (DWD) [Response to G. Stensaas and plenary] This question is more for the WGCV plenary. However, there is a recent case based on a discussion held at a January 2014 workshop on applying the maturity matrix to the Global Precipitation Climatology Centre (GPCC) data set where not all of the maturity matrix components could be rated for this data set. Much discussion was on whether or not to try and rate every component of the maturity matrix but most importantly it was clear that a cover sheet should be included to either describe why some components could not be rated or state if partial information was used to rate them.

G. Stensaas (USGS) [Comment to plenary] WGCV has an important role to play in the development of maturity matrices along with WGISS, especially with regards to metadata and developing the supporting cal/val/uncertainty documentation that are required by some of the components. Therefore, a CEOS wide effort would be needed to move this process forward.

A. von Bargen (DLR) [Comment to plenary] Before developing a cross-cutting project on maturity matrices across CEOS, WGCV needs to look at the work of the CORE-CLIMAX group where they are already looking into maturity matrices approaches including extensions to the original Maturity Matrix [Bates and Barkstrom (2006)], called the System Maturity Matrix (SMM) and the Application Performance Matrix (APM). They are also looking at Uncertainty.
What is the interest for WGCV in maturity matrices? What can WGCV learn from the CORE-CLIMAX study? Is a simple number based rating sufficient to meet WGCV's requirement and those of the user, or is a different approach warranted? Also, does WGCV need an approach for quality or for uncertainty?

R. Hollman (DWD) [Comment to plenary] Would not see WGCV's role as completing the matrix but act more as an independent reviewer of existing maturity matrices.

B. Bojkov (ESA) [Comment to plenary] A few years ago during a QA4EO meeting, there was much discussion on a scoring system with no real resolution. Is the maturity matrix the answer? WGCV has to come to some form of decision. We saw in the LPV subgroup report that they are using a validation stage scoring system for land product which is another way of looking at evaluating product maturity but likely on a much more simple level than a maturity matrix.

G. Stensaas (USGS) [Comment to plenary] From a Cal/Val perspective, there can be issues if the overall score from the maturity matrix is the same for similar product types over a validation site even though the individual components within the matrix are scored very differently for these.

How do we make sense of a single maturity score averaged from several component sub-scores?

N. Fox (NPL) [Comment to plenary] Thinks that it is risky for WGCV to try and go down the route of selecting one approach over the other. WGCV is not at that level of maturity. However, WGCV can contribute by providing a consistent way of producing evidence and making sure that the answer can be justified / backed for users to make their own judgement on the maturity level of a product.

P. Henry (CNES) [Comment to plenary] Believes that WGCV should set its focus on describing/rating cal/val processes and methods and not so much on rating products as far as the maturity matrix approach is concerned. At WGCV level, what is important is that the methods that are being applied are at a mature stage.

G. Stensaas (USGS) [Comment to plenary] From a working group perspective, there is some cal/val related maturity matrix work that WGCV can support and there has been collaboration with the WG on Climate on this in the past. Also, agencies are developing maturity matrices for their products (i.e. USGS for LST, TOA and Surface Reflectance products, etc.) and the WGCV should be guiding them in that process on cal/val related issues.

A. von Bargen (DLR) [Comment to plenary] Also believes that WGCV should focus on describing the maturity of cal/val methods as opposed to describing the maturity of the products. WG Climate is concerned uniquely with climate data record products and they have a well-defined application for using the maturity matrices for rating their products. On the other hand, WGCV is more concerned with processes and methodologies.

B. Bojkov (ESA) [Comment to plenary] There needs to be a basic scale or standard to be able to rate the maturity of methods or products across WGCV and all subgroups. With the multitude of best practices, procedures agreed upon by subgroups, inevitably the end-user will want to compare products/methods that best fit their requirements. Something like a maturity matrix can help the user to quickly determine the level of documentation available and differences in information for various methods or products to evaluate their fitness for purpose or use.

N. Fox (NPL) [Comment to plenary] Believes that having such a maturity system can help in self-declaring the level of maturity of processes in a consistent way and it can help in driving the process of documentation. This will inevitably drive the development of Cal/Val in general.

S. Srivastava (CSA, WGCV-Chair) [Comment to plenary] Based on the conversation during this session, believes that a recommendation should be drafted for WGCV to investigate the use of a standard self-assessment process for all of its subgroups to allow a consistent evaluation of the maturity of its methods and products.

Suggested WGCV Recommendation:
WGCV should investigate the use of a standard rating and/or reporting system for evaluating the maturity of its cal/val methods and processes.

T. Hewison (EUMETSAT/GSCICS) [Comment to plenary] Within GSICS there is process in place which is based on product acceptance. GSICS is looking at integrating this into a system such as a maturity matrix but it has not decided on a way forward yet.

WGCV-37-3: WGCV to follow-up with GSICS (Tim Hewison) to learn from their experience with implementing maturity matrix type systems within their activities.

Global DEM (J.-P. Muller, UCL)

A copy of the presentation is available on the WGCV-37 webpage [PDF].

Questions/Comments:

B. Bojkov (ESA) There is a need for more information or guidance on the use of DEMs with regards to which DEM source to use in light of specific purposes or needs. For example, ESA uses its own modified versions of existing DEMs for each of its mission as there is not really any agreed-upon standard DEM product or DEM selection guidelines available. Is there a way that WGCV could propose a plan or strategy to provide this information to the community?

J.-P. Muller (UCL) One of the issues to quantitatively evaluate the limitation of existing DEMs is that most subgroups have avoided topography and set up their test sites over flat sites and therefore there is no ground based source data to properly assess the DEMs aside from doing simulations. However, we now know what is required to do a proper assessment of the DEMs; it is just that the resources are not available to do it.

WGCV participant (ESA) [Question to G. Stensaas] What DEM is Landsat-8 using?

G. Stensaas (USGS) [Response to WGCV participant] The Landsat-8 mission is currently using the 30m SRTM.

Subgroup Reports (I) - Addendum

LPV Addendum (M. Roman, NASA)

A response was provided with regards to the action item 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”.

The response from LPV was accepted by the plenary and the action WGCV-36-1 was closed. Some recommendations related to this action item were also provided by LPV. The response and recommendations can be consulted here: [PDF].

The meeting for day 2 was adjourned at 18:30.

Wednesday Feb 19 – 2014 - Day 3

Cross-cutting themes (III)

QA4EO Secretariat Report (N. Origo, NPL)

A copy of the presentation is available on the WGCV-37 webpage [PDF].

Questions/Comments:

G. Stensaas (USGS) Would like to make use of the poster(s) mentioned in the QA4EO presentation for and upcoming ASPRS conference. Is it available from the QA4EO website?

N. Origo (NPL) [Response to G. Stensaas] Yes, the poster(s) can be downloaded from the resource page of the QA4EO [link].

Y. Zeng (U. of Twente) Asked for clarification on the classification system used to describe the Case Studies and the meaning of the level 1, 2 and 3.

N. Origo (NPL) [Response to Y. Zeng] The higher the level, the more detail is supplied for the Case Study. For example a level 1 Case Study should deliver a concise, relatively technically simplistic summary while a level 3 should aid users interested in the implementation of QA4EO in a particular field.

J.-C. Lambert (BelSPO-BIRA-IASB) In the context of various EU projects for the Atmospheric Service, feedback from potential users with regards to QA4EO, the principles are much appreciated but they feel overwhelmed about the documentation. They would propose using graphical flowchart to help guide the user quickly within the QA4EO principles.

N. Origo (NPL) [Response to J.-C. Lambert] The Case Studies are a first step in that direction but the suggestion is appreciated and QA4EO can consider looking into simplifying the presentation of the material.

QA4EO Show Cases presented at SIT Technical Workshop (A. von Bargen, WGCV Vice-Chair)

The presentation shown at the SIT Technical Workshop in Sept 2013 outlining the strategy adopted at WGCV-36 on the way forward for QA4EO along with an example of a show case was presented. A copy of the presentation is available on the WGCV-37 webpage [PDF].

No questions or comments.

QA4EO SAR (M. Zink, DLR, WGCV SAR Subgroup Chair)

A copy of the presentation is available on the WGCV-37 webpage [PDF].

Questions/Comments:

S. Srivastava (CSA, WGCV-Chair) [Comment to M. Zink] One of the recommendations that came out of the cross-cutting themes (II) session was how can WGCV use approaches similar to maturity matrices to document its calibration work. There is much to do to standardize the process for all subgroups and encourages the SAR subgroup to continue their efforts initiated with QA4EO SAR.

Sentinel-2 Radiometric Uncertainty Tool (N. Fox, NPL)

A copy of the presentation is available on the WGCV-37 webpage [PDF].

Questions/Comments:

B. Bojkov (ESA) [Comment to plenary] The RUT tool in itself is just one small part of the entire process to determine the radiometric uncertainty at the pixel level. What is important is the input that goes into the tool. For the input data, the information must be collected in a systematic approach, distilled, mistakes identified and documented before implementing. There will still be a lot of open questions after completion of this tool, and space agencies should learn from this exercise as it is a long iterative process to improve the output from tools of this nature.

SnowPEX (B. Bojkov, ESA)

A copy of the presentation is available on the WGCV-37 webpage [PDF to come from B. Bojkov].

Questions/Comments:

J.-P. Muller (UCL) Each of these individual snow retrieval algorithms will likely use different cloud mask sources. How much of the difficulty associated with the cloud detection, particularly over forest, will impact on the result of the snow retrievals? Is there a way to quantify this impact?

B. Bojkov (ESA) [Response to J.-P. Muller] In the past project, a lot of effort was put on the cloud detection because it was the biggest contributor to the error budget, not just over forested areas but over all areas in general, especially in mountainous areas. Suspects that much focus will be put on this topic in the 1st or 2nd workshop meetings. Although the comparison of snow retrievals from various satellites will be one important aspect of the work, much focus will also be put on the reference in-situ data as some of these data sets are difficult to synthesize.

X. Dong (NSSC, MSSG Chair) You mainly focussed on snow extent in your presentation. Is this activity also part of snow water equivalent work?

B. Bojkov (ESA) [Response to X. Dong] Yes it is part of the snow equivalent work and using passive microwave remote sensing. Invites Prof. Dong to join into the comparison to include the Chinese products in this work along with others if any are interested.

QA4ECV (J.-P. Muller, UCL) – Presented on Wednesday Feb 19.

A copy of the presentation is available on the WGCV-37 webpage [PDF].

No questions or comments.

Round- table discussion

The WGCV Chair and Vice-Chair opened the round table discussion by asking the plenary to determine what the objective of the QA4EO secretariat was for the future. Excellent work has been done over the last few years with the QA4EO secretariat thanks to NPL who is hosting the secretariat office.

It was confirmed by Nigel Fox of NPL that the QA4EO secretariat can continue to be hosted at NPL past the initial UKSA funding which will be nearing 2 years soon. At the moment, QA4EO is a collection/promotion of quality assurance activities and this task is relative easy to manage in that mode. At the end of the day, QA4EO is a principle with some promotion of the concepts. It could be expanded to include the maturity matrix work for Cal/Val which could fall under the umbrella of QA4EO.

The WGCV Vice-Chair suggested that the CEOS Cal/Val portal could be a good host of the QA4EO site instead of having separate hosted sites which require more effort for maintaining the supporting infrastructure and site content.

The plenary agrees that the QA4EO principles must continue to be supported and there is evidence that it is starting to practically being applied and recognized after eight years of existence throughout the community. O. Ochiai of GEO also encourages continuing with QA4EO and encourages WGCV to find ways to connect with the user community but also to make its initiatives more visible to GEOSS audience.

The plenary was in general agreement that WGCV should target the message of QA4EO not necessarily at the stakeholder level but more at the scientific working level for the good of the scientific advancement of Cal/Val in general.

WGCV Chair suggested that the subgroups should have a QA4EO session as a regular agenda item of their general meetings to discuss on-going initiatives within their own subgroups. The outcome of their discussions could be summarized and presented at the WGCV plenary level as part of their subgroup report where they could present success cases and issues for general discussion with the other WGCV subgroups.

The WGCV Vice-Chair suggested formulating an action item for WGCV subgroups to identify one specific topic for implementation in QA4EO. The plenary was in agreement but it was also suggested that agencies, if they wish, could follow suite and inventory their activities where QA4EO principles are or could be applied.

WGCV-37-4: All subgroups to formulate/identify 1 specific topic/example to implement in QA4EO for the next WGCV plenary.

Voluntary action: *for agencies to inventory activities where QA4EO principles are or could be applied.*

Subgroup Reports (II)

Synthetic Aperture Radar – SAR (M. Zink)

A copy of the presentation is available on the WGCV-37 webpage [PDF].

Three SAR subgroup recommendations were presented to the plenary for future consideration by the CEOS plenary for endorsement. These can be consulted on slides 10, 11, and 12 of the SAR subgroup presentation.

Questions/Comments:

S. Srivastava (WGCV Chair, CSA) Regarding the third SAR subgroup recommendation on protection Earth Observation (EO) frequency bands: this should be raised at the CEOS plenary level because it is a real danger for the SAR mission.

K. Sawyer (CEOS-CEO) [Response to S. Srivastava and plenary] At the CEOS plenary level in 2009 in Thailand, it was decided that it was more an agency issue and not a CEOS issue. CEOS can highlight the issue and ask the agencies, on behalf of their countries, to make pleas for the protection of the frequency bands.

O. Ochiai (GEO) [Response to S. Srivastava and plenary] At the last GEO Summit, the EC requested the support of the protection on the C-Band to GEO. GEO will attempt to assemble all of the issues and send it back to its member states to raise awareness of this issue.

M. Thankappan (GA) On the proposed new measurement quantity ERCS, is this still a proposal or has it been published?

M. Zink (DLR) [Response to M. Thankappan] ERCS is still a proposal at this stage.

Agency Reports (II)

European Organisation for the Exploitation of Meteorological Satellites, EUMETSAT (T. Hewison)

A copy of the presentation is available on the WGCV-37 webpage [PDF].

Questions/Comments:

J.-P. Muller (UCL**)** Are there known stereo imaging applications using the Meteosat Second Generation (MSG) satellite?

T. Hewison (EUMETSAT/GSCICS) EUMETSAT has previously attempted to create stereo imagery but they were not used for quantitative analysis. Does agree that there could be some interesting stereo imaging applications but that would likely be developed by EUMETSAT's satellite application facilities.

WGCV and Virtual Constellations Interactions

The WGCV Vice-Chair introduced the WGCV and Virtual Constellation Interactions session which was first done at WGCV-36 and proved to be a good discussion forum for both WGCV and the VCs. The objective is to give the floor to Virtual Constellations to let WGCV know what their Cal/Val needs are.

Presentations were done by representatives of three virtual constellations: Atmospheric Composition Constellation (ACC); Sea Surface Constellation (SST), and; Land Surface Imaging (LSI).

Atmospheric Composition Constellation -ACC (C. Zehner, ESA)

A copy of the presentation is available on the WGCV-37 webpage [PDF].

Sea Surface Constellation – SST (G. Corlett, U. of Leicester)

A copy of the presentation is available on the WGCV-37 webpage [PDF].

Land Surface Imaging (LSI) Virtual Constellation (G. Stensaas, USGS)

A copy of the presentation is available on the WGCV-37 webpage [PDF].

Questions/Comments:

A. von Bargen (DLR) Is it correct that the LSI virtual constellation is currently undergoing a re-structuring and that its activities are on hold?

K. Sawyer (CEOS-CEO) [Response to A. von Bargen]There will be a proposal made by CEOS at the upcoming SIT-29 meeting to pause the LSI virtual constellation until an agency comes forward and is willing to lead the constellation. The hope is that an agency can be found prior to SIT-29 to support this very important group within CEOS.

A. von Bargen (DLR) With regards to the mission statement of LSI, it is a very general statement which is unusual for a virtual constellation which generally has a more specific mission statements.

G. Stensaas (USGS) [Response to A. von Bargen] This is likely because LSI is more focussed on a broad variety of land products as opposed to other constellations which are more sensor specific or product specific.

Discussion

A discussion ensued on how the interactions between WGCV and VCs should be defined. The WGCV-Chair reminded the plenary that the prime purpose of bringing the VCs into WGCV was to support the Cal/Val aspects of the VC and a good example is the work that has been done since WGCV-36 with the SST-VC via WGCV-IVOS.

Nigel Fox (NPL) suggested that the Terms of Reference for the Virtual Constellations could include an explicit statement to say that the first point of contact on Cal/Val related issues should be with the CEOS WGCV where the working group can either directly assist the VC or guide them in the right direction. Kerry Sawyer stated that the ToRs of the virtual constellations were now finalized (except for LSI) as of Dec 20, 2013, therefore it will not be possible to change the wording at this time. The WGCV Vice-Chair suggested that WGCV should offer its support to virtual constellation on Cal/Val related issues.

Reference was made to the International Ocean Colour Coordinating Group (IOCCG) which contributes to the CEOS Ocean Colour Radiometry-VC (OCR-VC). A meeting of the IOCCG was attended by Nigel Fox (IVOS Chair) where he reported that a new strategy was established resulting in the creation of new working groups and task groups to do various activities, including radiometric calibration. There was some concern that there was duplication of existing calibration activities already on-going within IVOS making it difficult for agencies to determine where to put their efforts for supporting or representing their interest in terms of calibration related issues as this impacts resource allocation on their side. It was mentioned the reason behind IOCCG establishing a specific working group on radiometric calibration was that they felt there was no group currently addressing their specific needs. However, IOCCG accepted to report to WGCV and interact with IVOS on their calibration work.

Gary Corlet (U. of Leiceister) mentioned that the Surface Sea Temperature Virtual (SST) has written a memorandum on the creation of long term data records done primarily by Chris Merchant (U. of Reading) who is the SST representative to WG on Climate. The document contains much on Cal/Val and Gary asked if it should be reviewed by WGCV? The response from the plenary was that the main interface on this document is with the WG on Climate and it is up to them to request assistance to WGCV on Cal/Val issues if they require it. The WGCV Vice-Chair also mentioned that this should be of interest to the WGCV-Microwave Sensors Subgroup but Prof Dong (MSSG Chair) mentioned that the link between the subgroup and WG Climate is not strong, however there are strong links with the Ocean Surface Wind Vector (OSWV-VC) and Ocean Surface Topography Virtual Constellation (OST-VC).

Kerry Sawyer (CEOS CEO) mentioned that under NASA's SIT Chairmanship, there was a tag up telecon meeting held with the Precipitation Constellation (PC-VC), and there was much confusion and discussion about who was doing the Cal/Val work for them. Tim Hewison (EUMETSAT) mentioned the GSICS involvement with the GPM cross-calibration group who are coordinating inter-calibration efforts of microwave imagers in support of GPM for precipitation. GSICS will try to coordinate with PC-VC on these issues.

The session concluded by the plenary agreeing that WGCV cannot support all cal/val needs for every CEOS entity. Given the resources, WGCV has specific activity fields where it can contribute to the VCs, but these are not all compiled centrally. The WGCV Vice-Chair suggested that the subgroups should list of their existing interactions between WGCV and VCs by the next WGCV-38 meeting.

WGCV-37-5: Subgroup Chairs to identify areas where WGCV can contribute to cal/val activities of Virtual Constellations, and other WGs.

CEOS – GEO Interactions Session

GEO Update and Priorities for 2014 (O. Ochiai, GEO)

A copy of the presentation is available on the WGCV-37 webpage [PDF].

Questions/Comments:

K. Sawyer (CEOS-CEO) On the topic of engaging the in-situ community into QA4EO, is it the space community's responsibility to engage the in-situ community or is this GEO's role? CEOS would like to see GEO take on the task of engaging the in-situ community.

O. Ochiai (GEO) [Response to K. Sawyer] GEO Secretariat understands that it must engage the in-situ community but at the same time, CEOS as a GEO contributor should also work towards this. The roles of both GEO and CEOS in this area are not that distinct.

J.-P. Muller (UCL) On the data policy issue, the science community within big national and international organizations have a tendency to be very protective of their EO or in-situ data. What efforts is GEO doing to help open up the access to this data?

O. Ochiai (GEO) [Response to J.-P. Muller] There are various ways that this could be approached within GEO but the key is that there must be a societal benefit or value for an open data policy. Through user committees within GEO, a strategy needs to be established to determine what the societal benefits of an open data policy are.

J.-P. Muller (UCL) Would have liked to have seen a discussion on cloud computing in the GEO overview. Should GEO be exploiting the cloud computing capabilities currently out there within its activities?

O. Ochiai (GEO) [Response to J.-P. Muller] GEO has already engaged in these discussions in several groups of GEO but it was not presented for this particular overview presentation.

S. Srivastava (WGCV Chair, CSA) Asked if the 'GEOSS Data Quality Guidelines' document was available and if WGCV was given the opportunity to comment on it?

K. Sawyer (CEOS-CEO) [Response to S. Srivastava] Yes, the document was made available from the GEO website as of June 19, 2013. CEOS was made aware of the document before its release and the data quality subgroup of WGISS was involved in the review of this document. The

statements related to Cal/Val are very generic and WGCV is already doing what is described in the document.

S. Srivastava (WGCV Chair, CSA) On the GEOSS Data Management Principles Task force, you mentioned that WGCV (QA4EO) should be invited to participate in this task force. Could you elaborate on this task force?

O. Ochiai (GEO) [Response to S. Srivastava] The request for the creation of this task force initially came from the GEO Infrastructure Implementation Board. It is still at the discussion stage. If it goes forward, CEOS will be advised and the CEOS-CEO can bring it to WGCV and the QA4EO Secretariat at that time if assistance is required.

Review of GEO Tasks related to WGCV

The WGCV-Chair suggested reviewing the CEOS WGCV-GEO action items (IN-02-C1_3 and IN-02-C1_5) to report on status but also to determine the deliverables for 2014. The action items and their status were briefly reviewed [PDF].

After discussion with the plenary and with Kerry Sawyer (CEOS-GEO), it was suggested by Kerry to table the discussion for the time being on defining the deliverables for these actions until the CEOS 3-year work plan is finalized and endorsed at SIT-29 (i.e. April 2014). The plenary agreed and the session was closed.

CEOS-Internal Collaboration

Carbon Task Force Update (D. Wickland, NASA) – Remote presentation

A copy of the presentation is available on the WGCV-37 webpage [PDF].

Discussion

Questions or comments could not be raised to Diane Wickland by the WGCV plenary due to technical issues with the audio of the webconferencing system.

However, a discussion ensued among the plenary participants on how WGCV should respond to the 'CEOS Strategy for Carbon Observations from Space' document.

There was much concern about the large amount of action items related to calibration and validation. The very short amount of time given to WGCV to review the document, prior to the upcoming SIT-29 meeting being held in April 2014, was also of concern as the document was targeted for endorsement by CEOS at SIT-29.

The WGCV Chair suggested that a telecon be set up to discuss the content of this report with all of the WGCV executive and WGCV subgroup chairs and come up with a strategy for response to CEOS.

WGCV-37-6: WGCV to review the CEOS Carbon Task Force Report and have a telecon meeting by mid-March 2014 to discuss a strategy to respond to action items outlined in the report, in preparation for the SIT-29 meeting.

The meeting for day 3 was adjourned at 16:30 to allow a side meeting of the WGCV executive on administrative issues.

Thursday Feb 20 – 2014 - Day 4

Agency Reports (III)

CSIRO (T. Malthus)

A copy of the CSIRO report is available on the WGCV-37 webpage [PDF].

Questions/Comments:

F. Padula (NOAA) Asked if the ship mounted spectroradiometer data mentioned in the presentation was available.

T. Malthus (CSIRO) [Response to F. Padula] Yes, it is available on the IMOS Bio-optical database but can contact CSIRO to get it as well.

Geoscience Australia - GA (M. Thankappan)

A copy of the Geoscience Australia report is available on the WGCV-37 webpage [PDF].

No questions were asked.

ISRO (S. Kumar)

A copy of the ISRO report is available on the WGCV-37 webpage [PDF].

Questions/Comments:

A. von Bargen (DLR) [Comment to S. Kumar] Pleased to see many Cal/Val related activities for which ISRO is doing. Encouraged ISRO to join the various subgroups of WGCV, likely SAR or IVOS based on field of activities presented today.

J.-P. Muller (UCL) Interested in knowing what plans that ISRO has for validation of DEMs. For example on the Indian National DEM made from Cartosat data, would like to have ISRO involved in TMSG in setting up a test site to do validation.

S. Kumar [Response to J.P. Muller] Certainly willing to start collaborating in this area. There might be issues with data policy that would have to be looked at.

J.-P. Muller (UCL) Invited ISRO to join an upcoming WGCV TMSG meeting at the ISPRS symposium in Shanghai in mid-May.

BelSpo/BIRA (J.-C. Lambert)

A copy of the BelSpo/BIRA report is available on the WGCV-37 webpage [PDF].

Questions/Comments:
A. von Bargen (DLR) Asked about the status of Proba-v launched by BelSPO recently, and also other missions.

J.-C. Lambert (BelSPO-BIRA-IASB) [Response to A. von Bargen] Can provide more information on these by putting in touch with the correct persons at BelSPO. At the next plenary, there should be more information presented on Proba-v and also more information on the oceanographic validation because Belgium has much infrastructure in the North Sea and there is a lot of activity in this area.

B. Bojkov (ESA) [Comment to J.-C. Lambert] It would also be interesting for future meetings that BelSPO-BIRA-IASB presents 1 or 2 slides on the Liege calibration laboratory which does very nice work in the calibration field.

UKSA/NPL (N. Fox)

A copy of the UKSA/NPL report is available on the WGCV-37 webpage [PDF].

No questions were asked.

Norwegian Space Center - NSC (V. Lonar-Barth)

A copy of the NSC report is available on the WGCV-37 webpage [PDF].

Questions/Comments:

J.-P. Muller (UCL) What instruments were used for the lunar photometry for obtaining AOD? This is interesting for producing continuous products of surface albedo, especially over northern areas, because one of the big problems is to determine the variation of the AOD over these areas.

V. Lonar-Barth (NSC) Can provide more information offline to J.-P. Muller offline if desired on this.

USGS (G. Stensaas)

A copy of the USGS report is available on the WGCV-37 webpage [PDF].

Questions/Comments:

P. Henry (CNES) What is the quality of the registration of the thermal band and visible band because different sensors are used for these? Also, what types of products are distributed?

G. Stensaas (USGS) Registration between the thermal and visible bands is very good and has been verified using a network of ground control points. The products distributed are Level 1b orthorectified to 30 m SRTM DEM.

B. Bojkov (ESA) Asked about the land product validation system and if the tool developed for this is open source.

G. Stensaas (USGS) Can send the PoC information to Bojan for this project for more information.

DLR report (M. Zink and A. von Bargen)

A copy of the DLR report is available on the WGCV-37 webpage [PDF].

Questions/Comments:

S. Srivastava (WGCV Chair, CSA) You showed an interesting concept of the Staring Spotlight Mode – a gain in radiometric resolution was reported but was there any gain in spatial resolution?

M. Zink (DLR) [Comment to S. Srivastava] Yes, in fact spatial resolution was traded to improve radiometric resolution in a multi-looking process.

CEOS WGCV – WMO Interaction

Global Space Inter-Calibration System (GSICS) and interactions with WGCV (T. Hewison and J. Lafeuille)

Jerome Lafeuille of WMO (Secretariat of GSICS Executive Panel) introduced GSICS and sees many linkages with WGCV. However, he encouraged GSICS and WGCV to be careful to be complementary and supportive of each other's activities and avoid duplication of effort as much as possible.

He introduced Tim Hewison of EUMETSAT who is the Chair of the GSICS Research Working Group. Tim proceeded to present a more detailed introduction to GSICS along with potential interaction areas with WGCV. A copy of the presentation is available from the WGCV-37 webpage [PDF].

Questions/Comments:

S. Srivastava (WGCV Chair, CSA) GSICS does calibration and generates products, not just a governing body, but do the GSICS member agencies also do their own calibration work?

T. Hewison (EUMETSAT/GSCICS) [Response to S. Srivastava] Each member organization of GSICS is responsible for their own satellites. Ultimately, for the inter-calibration products that are

applicable to their satellites, they are responsible for either generating or recommending other suitable products for their users. If your agency is working for GSICS or GCMS, this requires a strong commitment to join the group. GSICS is not there to provide funding.

Discussion

Representation of WGCV at GSICS meetings was discussed. It was mentioned that there is agency representation but not necessarily WGCV representation. WGCV has formerly been invited to GSICS meetings in the past and WGCV should consider attending according to Greg Stensaas. Jerome Lafeuille mentioned that the GSICS Executive Panel adopted the principle to invite WGCV and to send an invitation to the Chairman of WGCV who can decide to go or send a WGCV representative in his place. GSICS will continue to do this.

A discussion ensued on potential interactions between GSICS and WGCV (see slide 32 of GSICS presentation).

On the 'Best practice guidelines' (i.e. traceability, calibration and uncertainty) topic, Greg Stensaas and Nigel Fox mentioned that WGCV is actively working in this area and they see no issue at addressing this topic in association with GSICS through existing initiatives such as QA4EO.

With regard to the 'Glossary of calibration terminology' topic, Nigel Fox (NPL) commented that from experience, many do not like to go into work related to building glossaries of terminology. From a pure calibration point of view, there is accepted standard terminology that is not always used but that should be strongly encouraged. Document published by NIST should be consulted since it had quite an extensive number of terms defined for a multitude of sensors. Some of terminology is also sitting in QA4EO guidelines but they are more generic at a very high level.

On the topic of the 'Specific interactions with WGCV subgroups: IVOS, MWSG, ACC', it was agreed that there is a need for WGCV subgroup Chairs to identify and prioritize specific activity areas for interaction with GSICS and for the WGCV Chair, Vice-Chair, and Subgroup Chairs to have a discussion on how to coordinate the WGCV participation in GSICS meetings. In the meantime, it was decided that if a WGCV subgroup chair or representative is attending a GSICS meeting, they should inform Chair or Vice-chair of attendance and let them know of important decisions.

WGCV-37-7: WGCV subgroup Chairs to identify and prioritize specific activity areas for interaction with GSICS.

WGCV-37-8: WGCV Chair, Vice-Chair, and Subgroup Chairs to have a discussion on how to coordinate the WGCV participation in GSICS meetings.

The WGCV Chair and Vice-Chair concluded the session by thanking Jerome and Tim for accepting to present GSICS to the WGCV and for their participation in the discussion on potential interactions with the working group.

CEOS and WGCV Core Business

CEOS – Introduction (K. Sawyer, CEOS-CEO)

Kerry Sawyer (CEOS-CEO) gave an overview presentation to WGCV on CEOS regarding its mission, objectives and the overall organizational structure. She discussed the 2013 CEOS plenary outcomes and presented the CEOS priorities for 2014. An overview of new CEOS strategic documents was also provided along with a first look at the draft CEOS 2014-16 Work Plan. Finally, an overview of CEOS communication protocol was given. A copy of the presentation is available from the WGCV-37 webpage [PDF].

CEOS 3-year Work Plan

On the CEOS 3-year work plan, WGCV is tasked with reviewing the draft Work Plan and populating, with detailed text, section 3.5 and more importantly, the table on deliverables.

The CEO office's objective is to have a draft of the work plan ready by the end of February and to have a final version published by end of March. The plenary agreed to have subgroup chairs review the document and provide their input to WGCV Chair/Vice Chair for review before WGCV returns the final document revisions to the CEOS CEO Office by the end of March.

WGCV-37-9: WGCV Chair to send CEOS 3-year work plan draft to subgroup chairs, for them to review and return their comments by March 10 for discussion at WGCV telecon to be held mid to late March, 2014

CEOS Communication Protocol

On the CEOS Communication Protocol, Kerry re-iterated that working groups report to the CEOS chair. When structures under the CEOS Chair are involved in high level communication, this should be reported up to the CEOS chair level and seek approval where required.

WGCV Membership Review

The WGCV Secretariat presented its work on the membership review done based on the WGCV-36-4 action to propose a new tabular structure for describing WGCV membership in the WGCV work plan to include some reference to role of the representative (e.g. member, associate member, etc.)

After discussion at the WGCV Administration meeting held after day 3 of WGCV-37 and after discussion with the plenary, WGCV formalized the definition of WGCV membership to be:
"WGCV membership consists of representatives from a) CEOS member agencies, b) CEOS associate agencies, and c) a person (not representing a CEOS member or associate agency) nominated to be Chair of a subgroup and whose nomination has been confirmed by WGCV to be classified as 'Expert' for the sake of membership."

With regards to participation in a WGCV plenary meeting: 1) the participation is open to WGCV members (CEOS members, associates, or nominated experts), and; 2) persons invited by WGCV for a particular plenary to present/discuss: specific projects, WGCV interactions, cross-cutting themes, etc.

Registration requests received by the WGCV Secretariat from persons not belonging to the above two categories will be referred to WGCV Chair or Vice-Chair for consideration before acceptance for registration.

The updated membership list was reviewed and some actions were derived from this exercise:

WGCV-37-10: MWSG Chair (X. Dong) to request NRSCC to confirm that he may act as a NRSCC WGCV member.

WGCV-37-11: Implement edits recommended by WGCV plenary to the membership list and publish revised list to WGCV web site.

WGCV work plan review

The changes to the WGCV work plan that were recommended at WGCV-36 were implemented and presented for approval to the plenary (ref. action WGCV-36-5). Edits were accepted with a minor change in section 4.5 'Participating Delegations' to leave out following text "including agencies nominating vice-chair candidates". A new action was formulated for the WGCV Secretariat to implement the edits and publish to the WGCV web site.

WGCV-37-12: Implement edits to WGCV Work Plan (2011-2016) that were presented and agreed upon at WGCV-37 and publish as version 5.5. to WGCV website.

WGCV/WGISS Interactions (R. Monero, WGISS Chair, CNES)

The CEOS WGISS chair, Richard Moreno, presented his working group's activities and areas of interactions with WGCV. A copy of the presentation is available from the WGCV-37 webpage [PDF].

Outstanding joint action items from past plenaries between WGCV and WGISS were discussed and a response was provided for each of them. The summary is provided below:

> Joint actions items WGCV\WGISS
>
> Joint action 1: WGCV discussed this item at the last WGCV-36 meeting and already provided a response which was forwarded to Satako Miura by the WGCV Chair. The WGCV response: *"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."*

Joint action 2: B. Bojkov and G. Stensaas are aware of both the GEO Data Documentation and Quality (DDQ) and the NASA Earth Science Data Systems Working Group (ESDSWG). Effort is going on there with many of the WGISS people as well. Decision was made to leave the action open and in progress by both working groups.

Joint action 3: G. Stensaas reported that item 3a has been completed. A. Burini will implement a connection between CWIC and CEOS data portal (OpenSearch format).

WGCV-37-13: A. Burini will implement a connection between CWIC and CEOS cal\val data portal (OpenSearch format).

Joint action 4: Answered in Joint action 1.

Joint action 5: This action was closed at WGCV-36 as per the WGCV response in Joint action 1.

Join action 6: Already closed by WGISS.

Joint action 7: Closed at WGCV-36. QA4Albedo is not going forward based on outcome on the QA4EO Splinter Meeting / Way Forward presentation from WGCV-36 [PDF].

Joint actions 9 to 12: At WGCV level, the action item of accessibility and availability of data (i.e. data policy) is not feasible.

The possibility of future joint meetings between WGISS and WGCV was discussed. The WGCV Vice-Chair commented on a discussion that the WGCV plenary had at its WGCV-36 meeting where set regular joint meetings (i.e. every 2 years) were discouraged to favour less frequent, more focussed, joint meetings when they are required. This does not necessarily limit the interaction between the two groups. It could also be that the Chair or Vice Chair of either working group attends the other's meeting, such as is the case with the presence of WGISS at WGCV-37. Another possibility could be to use the SIT meetings as opportunities for the chairs of the two working groups to meet and have targeted discussions (i.e. 30-45 mins meeting) and determine if a general joint meeting is required.

B. Bojkov referred to the WGISS surveys and their inventory of information collected from various organizations on the data that they provide. In the context of NetCDF (i.e. used by the ECV user community) it would interesting to assess the level of variability in the community in terms of quality/uncertainty flagging. How is it reported, how different is the terminology? Afterwards, this would allow focusing of efforts to harmonize quality information and reporting. R. Moreno proposed to look into this matter.

WGCV Future Plenary (A. von Bargen, WGCV Vice-Chair)

The WGCV Vice-Chair revisited his ideas on the transforming the format of WGCV plenary meetings that was presented at WGCV-36 [PDF].

The action item WGCV-36-6 - to develop reporting templates for agency and subgroup reports was left open and A. von Bargen will distribute sample templates to Subgroup Chairs and Agencies by **May 31st,**

2014 for review. The objective is to receive comments on the template and have some agencies and subgroups test it for the next plenary meeting.

Final Review of Action Items and Recommendations

The final review of the remaining WGCV-36 action items were closed or updated. Also, the new WGCV-37 action items were reviewed and accepted. These action items can be consulted in Appendix 2 (new actions) and Appendix 3 (past actions).

Because of lack of time, it was decided not to review the recommendations suggested by the subgroup at WGCV-37 but rather to document these in the minutes. These recommendations will be discussed at the WGCV-38 plenary and decisions will be made at that time for any follow-on actions on these.

Adjournment of WGCV-37

The WGCV Chair thanked the organizers of the WGCV-37 meeting and proceeded to close the meeting.

The meeting for day 4 was adjourned and the WGCV-37 plenary was closed at 18:30.

Appendix 1: Attendees

(In blue are those who participated via WebEx webconferencing)

Participant	Agency/ Organization	Country
Mr. Eric Arsenault	Canadian Space Agency	CANADA
Dr. Bojan Bojkov	European Space Agency	Italy
Dr. Alessandro Burini	European Space Agency	ITALY
Dr. Gary Corlett	SST-VC/GHRSST/University of Leicester	United Kingdom
Dr. MARTINE DE MAZIERE	BELGIAN INSTITUTE FOR SPACE AERONOMY	BELGIUM
Prof. Xiaolong Dong	National Space Science Center, Chinese Academy of Sciences	China
Dr. Nigel Fox	National Physical Laboratory	UK
Dr. Bilgehan Gür	TNO - (Dutch Organization for Applied Scientific Research)	The Netherlands
Mr. Patrice Henry	CNES	France
Dr. Tim Hewison	EUMETSAT	Germany
Dr. Rainer Hollmann	Deutscher Wetterdienst	Germany
Mr. Jérôme Lafeuille	World Meteorological Organization	Switzerland
Dr. Jean-Christopher Lambert	BelSPO / Belgian Institute for Space Aeronomy (BIRA-IASB)	Belgium
Prof. Chuanrong Li	Academy of Opto-electronics,CAS	China
Prof. Heguang Liu	National Space Science Center, Chinese Academy of Sciences	China
Ms. Vigdis Lonar Barth	Norwegian Space Centre	Norway
Mr. Tim Malthus	CSIRO	Australia
Mr. Richard Moreno	CNES	France
Prof. Jan-Peter Muller	UCL Mullard Space Science Laboratory	UK
Mr. Osamu Ochiai	GEO Secretariat	Switzerland
Mr. Niall Origo	QA4EO Secretariat	UK
Mr. Francis Padula	NOAA	USA
Dr. Miguel Roman	NASA Goddard Space Flight	USA
Ms. Kerry Ann Sawyer	NOAA/NESDIS	USA
Dr. Gabriela Schaepman	University of Zurich	Switzerland
Dr. A. SENTHIL KUMAR	National Remote Sensing Center / I S R O	India
Dr. Satish Srivastava	Canadian Space Agency	Canada
Mr. Gregory Stensaas	USGS EROS	USA
Prof. Lingli Tang	Academy of Opto-electronics,CAS	China
Mr. Medhavy Thankappan	Geoscience Australia	Australia
Mr. Kurtis Thome	NASA/Goddard Space Flight Center	United States
Dr. Albrecht von Bargen	DLR	Germany
Prof. Zhenzhan Wang	National Space Science Center, Chinese Academy of Sciences	China
Ms. Diane Wickland	NASA	USA
Mr. Xiaoxiong Xiong	NASA / Goddard Space Flight Center	USA
Mr. Claus Zehner	ESA/ESRIN	Italy
Mr. Yijian Zeng	ITC Faculty, University of Twente	Netherlands
Dr. Manfred Zink	DLR	Germany

Appendix 2: New action items from WGCV-37 (Frascati, Italy)

WGCV37 Action Items	Assigned to:	Due Date	Status
WGCV-37-1: Greg Stensaas (USGS) to poll (via doodle poll) WGCV Chair, Vice-Chair and Subgroup Chairs to determine optimal dates for WGCV-38 plenary meeting in USA, and confirm plenary dates by March 1st, 2014.	Greg Stensaas (USGS)	March 1st, 2014	**To be closed.** Greg conducted doodle poll and WGCV-38 plenary date was fixed.
WGCV-37-2: IVOS Chair to setup a doodle poll regarding availability of participants for a follow-up telecon to the October 2013 WebEX session with user community on the development of best practices for use of External Solar Irradiance Spectrum.	IVOS chair (N.Fox)	March 1st, 2014	**Open**
WGCV-37-3: WGCV to follow-up with GSICS (Tim Hewison) to learn from their experience with implementing maturity matrix type systems within their activities.	Greg Stensaas (USGS)	WGCV-38	**Open**
WGCV-37-4: All subgroups to formulate/identify 1 specific topic/example to implement in QA4EO for the next WGCV plenary. ***Voluntary action:*** *for agencies to inventory activities where QA4EO principles are or could be applied.*	Subgroup Chairs	WGCV-38	**Open**
WGCV-37-5: Subgroup Chairs to identify areas where WGCV can contribute to cal/val activities of Virtual Constellations, and other WGs.	Subgroup Chairs	~~WGCV-38~~ Updated, now due Friday Aug 29 in preparation for SIT VC day.	**Open**
WGCV-37-6: WGCV to review the CEOS Carbon Task Force Report and have a telecon meeting by mid-March 2014 to discuss a strategy to respond to action items outlined in the report, in preparation for the SIT-29 meeting.	WGCV Chair, Vice-Chair and Subgroup Chairs	March 14, 2014	**To be closed.** Telecon was done and a strategy was agreed.

WGCV-37-7: WGCV subgroup Chairs to identify and prioritize specific activity areas for interaction with GSICS.	WGCV Subgroup Chairs	WGCV-38	**Open**
WGCV-37-8: WGCV Chair, Vice-Chair, and Subgroup Chairs to have a discussion on how to coordinate the WGCV participation in GSICS meetings.	WGCV Chair, Vice-Chair, and Subgroup Chairs	WGCV-38	**Open**
WGCV-37-9: WGCV Chair to send CEOS 3-year work plan draft to subgroup chairs, for them to review and return their comments by March 10 for discussion at WGCV telecon to be held mid to late March, 2014	WGCV Chair	March 10, 2014	**To be Closed.** WGCV input to CEOS 3-year work plan was discussed at the telecon and then provided to CEO. CEO and SEO felt the number of tasks was very large. On the instructions of SIT-29, WGCV task list was condensed by merging and keeping it at high level.
WGCV-37-10: MWSG Chair (X. Dong) to request NRSCC to confirm that he may act as a NRSCC WGCV member.	MWSG Chair	WGCV-38	**Open**
WGCV-37-11: Implement edits recommended by WGCV plenary to the membership list and publish revised list to WGCV web site.	WGCV Secretariat	June 30	**Open**
WGCV-37-12: Implement edits to WGCV Work Plan (2011-2016) that were presented and agreed upon at WGCV-37 and publish as version 5.5. to WGCV website. Note: Section 4.5 'Participating Delegations' – leave out following text "including agencies nominating vice-chair candidates"	WGCV Secretariat	June 30	**Open**
WGCV-37-13: A. Burini will implement a connection between CWIC and CEOS cal\val data portal (OpenSearch format).	A. Burini	WGCV-38	**Open**

Appendix 3: Past action items from WGCV-36 (Shanghai, China) and WGCV-35 (Hyderabad, India)

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	**CLOSED** - Miguel Román presented, on behalf of LPV, a report on this action in *Subgroup Session (I) Addendum* session at WGCV-37.
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	**CLOSED** – Proposal at WGCV-37 to rewrite into WGCV Work Plan as a Secretariat on-going responsibility.
WGCV-36-3: WGCV Secretariat to include NRSCC as a member organization of WGCV with Prof. Li as a representative.	WGCV Secretariat	WGCV 37	**CLOSED**
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	**CLOSED**
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	**CLOSED**
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	**Leave Open** (A. von Bargen to distribute sample templates to Subgroup Chairs and Agencies by **May 31st, 2014 for review.** Objective is to receive comments on the template and have some agencies and subgroups test it for the next plenary)

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.	IVOS Chair	WGCV 37	**CLOSED**
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 If support is required from SIT, then a case must be presented to justify this request.	SST-VC (G. Corlett)	WGCV 37	**CLOSED**
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 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.	WGCV Chair and Vice-Chair	WGCV 37	**Leave Open** WGCV Vice-Chair, as PoC to WG Climate, will discuss at upcoming telecon/meeting

WGCV35 Action Items	Assigned to:	Due Date	Status
WGCV35-5: Have group discussion (Stensaas, Bojkov, Chander, von Bargen) to getting SCIAMACHY data over CEOS recommended test sites	Re-assigned to A. Burini/B. Bojkov at WGCV-36	WGCV-37	**CLOSED – now deferred to IVOS** Reported by A. Burini by e-mail (Feb 10, 2014): • Identification of data source and repository for Level 1B (DONE) • Design of an overpassing tool (IDL) for the selection of orbit (DONE) • Calibration of SCIAMACHY data via SCIAL1 tool (ESA official tool) to obtain L1C data (DONE) • Design of subsetting tool (Spectra, Geo info + export in HDF5) of L1C (PENDING) • Integration of Processing Chain in GRID environment (Pending) • Delivery of data (Pending)

Appendix 4: Agenda

37th CEOS Working Group on Calibration and Validation Plenary (WGCV-37)

- Agenda -

Hosted by:
European Space Agency (ESA)

ESA/ESRIN, Frascati, Italy, Feb 17-20, 2014
Rev. 13

Monday 17 Feb 2014		
12:30 to 14:30 Registration and Lunch		
Host and Welcome Address		
14:30 (15 mins)	Introduction, Logistics and Adoption of Agenda	**S. Srivastava (WGCV Chair)**
14:45 (20 mins)	Host Welcome & Introduction to ESA EO	**H. Laur / ESA**
15:05 (25 mins)	ESA Agency Report	**B. Bojkov**

WGCV Business		
15:30 (30 mins)	Chair's Report	**S. Srivastava (WGCV Chair)**
16:00 - 16: 30 Coffee/Health Break		
16:30 (40 mins)	WGCV/CEOS Plenary/GEO Action Items	**E. Arsenault (WGCV Secretariat), & All**
17:10 (5 mins)	Minutes of WGCV #36	**S. Srivastava**
17:15 (10 mins)	Vice Chair Election Process	**S. Srivastava**
17:25 (15 mins)	Presentation by Candidate #1	**C.R. Li (NRSCC)**
17:40 (15 mins)	Presentation by Candidate #2	**K. Thome (NASA)**
17:55 (15 mins)	Next meeting	**All**
18:30 Adjourn for day		
18:30 - 19:30 ***Ice Breaker*** *(sponsored by DLR e.V.)*		

Tuesday 18 Feb 2014		
08:30-9:00 Arrival		
Subgroup Reports (I)		
09:00 (5 mins)	Recap of previous day	**S. Srivastava**
09:05 (25 mins)	Land Product Validation Subgroup	**G. Schaepman-Strub (remotely)**
09:30 (20 mins)	Microwave Subgroup	**X. Dong**
09:50 (15 mins)	Infrared & Vis. Opt. Sensors Subgroup	**N. Fox**
10:05 (15 mins)	Atmospheric Composition Subgroup	**B. Bojkov**
10:20 (20 mins)	Terrain Mapping Subgroup	**J.-P. Muller**
10:40	Session Conclusions	**All**
11:00 - 11:30 Coffee/Health Break		
Agency Reports (I)		
11:30 (15 mins)	NSSC	**X. Dong**
11:45 (15 mins)	NRSCC	**C.R. Li**
12:00 (15 mins)	NSC	**V. Lonar Barth**
12:15 (15 mins)	CSA	**S. Srivastava**
12:30 (15 mins)	NOAA	**F. Padula**
12:45 (15 mins)	CNES	**P. Henry**
13:00 (15 mins)	NASA	**K. Thome**
13:15 (10 mins)	QA4ECV	**J.P. Muller / N. Fox**
13:30 to 14:30 Lunch		
Cross-cutting themes (I)		
14:30 (10 mins)	Introduction	**B. Bojkov**
14:40 (15 mins)	External Solar Flux	**N. Fox**
14:55 (10 mins)	Discussion / Need in Subgroup Work	**All**
15:05 (15 mins)	Cloud Masking	**R. Hollmann (DWD)**
15:20 (10 mins)	Discussion / Need in Subgroup Work	**All**
15:30 (15 mins)	NORS	**M. De Maiziere**
15:45 (10 mins)	Discussion / Need in Subgroup Work	**All**
15:55 (5 mins)	Conclusions	**All**
16:00 - 16: 30 Coffee/Health Break		

Cross-cutting themes (II)		
16:30 (15 mins)	CORE-CLIMAX Maturity Matrix and ECV data records	Y. Zeng
16:45 (15 mins)	Application of Maturity Matrix Approach	R. Hollmann (DWD)
17:00 (30 mins)	Round-Table Maturity Matrix Approach	All
17:30 (15 mins)	DEM	J.-P. Muller
17:45 (10 mins)	Discussion / Need in Subgroup Work	All
17:55 (10 mins)	Session Conclusions	All
Subgroup session (I) Addendum		
18:05 (10 mins)	LPV addendum	M. Román (remotely)
18:30 Adjourn for day		

Wednesday 19 Feb 2014		
08:30-9:00 Arrival		
Cross-cutting themes (III)		
09:00 (10 mins)	Recap of previous day	S. Srivastava
09:10 (10 mins)	Session Introduction	A. von Bargen
09:20 (15 mins)	QA4EO Secretariat Report	N. Origo
09:35 (10 mins)	SIT Show case	A. von Bargen
09:45 (10 mins)	QA4EO SAR Implementation	M. Zink
09:55 (10 mins)	Rad. Uncertainty Tool (RUT)	X. Gorono / N. Fox
10:05 (10 mins)	SnowPEX	B. Bojkov
10:15 (35 mins)	Round Table	All
10:50 (10 mins)	Session Conclusions	All
11:00 - 11:30 Coffee/Health Break		
Subgroup session (II)		
11:30 (15 mins)	SAR Subgroup	M.Zink
11:45 (5 mins)	Conclusions	

Agency Reports (II)		
11:50 (20 mins)	EUMETSAT	T. Hewison
WGCV and Virtual Constellations		
12:10 (5 mins)	Introduction	
12:15 (20 mins)	Cal/Val needs from VC perspective	G. Corlett, G. Stensass, C. Zehner (SST, LSI, ACC)
12:35 (45 mins)	Round table Interaction with Virtual Constellation	All
13:20 (10 mins)	Session Conclusions	All
13:30 to 14:30 Lunch		
CEOS - GEO Interaction		
14:30 (5 mins)	Introduction	
14:35 (20 mins)	GEO perspective	GEO Officer
14:55 (20 mins)	Review of GEO tasks related to WGCV	All

15:15 (20 mins)	Round Table	All
CEOS-Internal Collaboration		
15:35 (20 mins)	Carbon Task Force Update	Diane Wickland (remotely)
15:55 (20 mins)	Round Table	All
16:15 - 16:30 Coffee/Health Break		
16:30 Adjourn plenary for day		
WGCV Administration Meeting		
16:30 (2 hrs)	WGCV Administration Meeting (outside of WGCV-37 plenary)	WGCV Executive and Subgroup Chairs (only)
18:30 Adjourn WGCV Admin Meeting		
20:00 - ***Hosted Dinner*** *(sponsored by ESA)*		

Thursday 20 Feb 2014		
08:30-9:00 Arrival		
Agency Reports (III)		
09:00 (10 mins)	Recap of previous day	**S. Srivastava**
09:10 (25 mins)	Geoscience Australia / CSIRO	**M. Thankappan / T. Malthus (joint pres., remotely)**
09:35 (20 mins)	ISRO	**S. Kumar (remotely)**
09:55 (15 mins)	BIRA-IASB	**J.-C. Lambert**
10:10 (15 mins)	DLR	**A. von Bargen**
10:25 (15 mins)	UKSA	**N. Fox / J.P Muller**
10:40 (15 mins)	USGS	**G. Stensaas**
11:00 - 11:30 Coffee/Health Break		
CEOS WGCV - WMO Interaction		
11:30 (30 mins)	CGMS / GSICS	**J. Lafeuille**
12:00 (60 mins)	Round Table Discussion	**All**
CEOS and WGCV Core Business		
13:00 (15 mins)	CEOS Introduction	**K. Sawyer**
13:15 (15 mins)	CEOS Comm. Protocol + Discussion	**K. Sawyer, All**
13:30 to 14:30 Lunch		
14:30 (10 mins)	CEOS-WGCV 3 year Plan (*)	**S. Srivastava**
14:40 (30 mins)	Round Table Discussion (*)	**All**
15:10 (20 mins)	CEOS-WGCV Workplan Review (*)	**All**
15:30 (15 mins)	Membership Review (*)	**All**
15:45 (15 mins)	WGCV Web Presence (*)	**A. Burini & All**
16:00 - 16: 30 Coffee/Health Break		
16:30 (15 mins)	WGISS/WGCV Interactions	**R. Moreno**
16:45 (30 mins)	Round Table Discussion including Joint Action Items (*)	**All**
17:15 (15 mins)	WGCV Future Plenary Organisation (*)	**A. von Bargen**
17:30 (30 mins)	Round Table Discussion (*)	**All**
18:00 (30 mins)	Summary of Action Items and Subgroup Recommendations	**All**
18:30 Close WGCV-37		

*Items to be discussed during WGCV Adminstration meeting (not all but there is some need)

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