

**COMMITTEE ON EARTH OBSERVATION SATELLITES
WORKING GROUP ON CALIBRATION AND VALIDATION**

**MINUTES OF THE 20TH MEETING
WGCV-20**

12 – 14 February 2003

Hosted by:

**CSIRO Marine Research,
CSIRO Earth Observation Centre &
Antarctic Cooperative Research Centre**

at

**CSIRO Marine Laboratories,
Hobart,
Australia**

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Acronyms

AATSR	Advanced Along Track Scanning Radiometer
AVHRR	Advanced Very High Resolution Radiometer
BNSC	British National Space Centre
Cal/Val	Calibration / Validation
CCRS	Canada Centre for Remote Sensing
CEOP	Coordinated Enhanced Observing Period
CEOS	Committee on Earth Observation Satellites
CHRIS/PROBA	Compact High-Resolution Imaging Spectrometer / Project for On-Board Autonomy
COSPAR	Committee on Space Research
CRT	CEOS Review Team
DEM	Digital Elevation Model
Envisat	Environmental Satellite
EOS	Earth Observing Satellite
ERS	Earth Resources Satellite
ESA	European Space Agency
ESRIN	European Space Research Institute
ESSAC	Earth Systems Science Advisory Committee
ESTEC	European Space Research and Technology Centre
GHz	Gigahertz
GIFTSS	Government Information From The Space Sector
GOFC	Global Observation of Forest Cover
GOME	Global Ozone Monitoring Experiment
IGOS	Integrated Global Observing Strategy
ISPRS	International Society for Photogrammetry and Remote Sensing
ISSMAP	<i>In situ</i> Sensor Measurement Assimilation Programme
IVOS	Infrared and Visible Optical Sensors
JERS	Japanese Earth Resources Satellite
LPV	Land Product Validation
MERIS	Medium Resolution Imaging Spectrometer
MHz	Megahertz
MODIS	Moderate-Resolution Imaging Spectrometer
NASA	National Aeronautics and Space Administration, USA
NASDA	National Space Development Agency, Japan
NIST	National Institute of Standards and Technology, USA
NOAA	National Oceanic and Atmospheric Administration
NPL	National Physical Laboratory
NPOESS	National Polar-orbiting Operational Environmental Satellite System
NPP	NPOESS Preparatory Project
RV	Research Vessel
RADARSAT	Radar Satellite
SAR	Synthetic Aperture Radar
SIT	Strategic Implementation Team
SPOT	Système Probatoire pour l'Observation de la Terre
SRTM	Shuttle Radar Topography Mission
TIFRI	Technology Innovations for Radiometer Instruments
TM	Terrain Mapping
USGS	United States Geological Survey
WGCV	Working Group on Calibration and Validation
WGEdu	Working Group on Training and Education
WGISS	Working Group on Information Systems and Services
WMO	World Meteorological Organisation
WTF	WGCV / WGISS Test Facility

1 Welcome from the official WGCV-20 hosts (Tony Haymet, Chief of CSIRO Marine Research)

Haymet welcomed the WGCV-20 participants to Hobart and to the CSIRO Marine Laboratories. CEOS and the work of the WGCV is especially important to Australia and Haymet and his colleagues are keen to play their part in the calibration and validation of satellites and their sensors.

Desnos thanked CSIRO for hosting the WGCV's 20th plenary meeting, and particularly Dr Ian Barton for all his efforts in preparing for the meeting.

The agenda (Annex A) was unanimously approved.

2 WGCV chair's report

2.1 Chair's Report & Action Items from 16th CEOS Plenary (*Yves-Louis Desnos*)

Desnos gave a brief introduction to the WGCV, detailing its history and background, as a reminder of the role of the working group. A report on the group's achievements was made. Outreach since the last plenary meeting had included an update of the brochure and the creation of two large information panels relating to the WGCV and its work. The panels are also available in digital form, which would allow them to easily be emailed to anyone who would desire this type of display at their meeting. A further update of the WGCV website is also planned.

Desnos outlined the priority actions, resulting from the CEOS review, that relate to the WGCV. A recommendation had been made to CEOS plenary that CEOS needs to support attendance and contribute to working group activities. **Hilsenrath** asked for details on exactly how this would be done. He suggested that the CEOS members should report back at the next CEOS plenary on actions undertaken on such plenary-approved recommendations. **Barton** explained that agency representatives leave CEOS plenary with a list of action items and these are reviewed at the next plenary meeting. **Keyte** agreed that it is important for agencies to provide representatives to attend working group meetings. However, he identified that it is more difficult for them to contribute effectively without clear definitions. An agency cannot decide how its budget should be allocated across the various subgroup activities if those activities are not clearly identified. It would strengthen the argument if the contributions asked for are clear. **Rast** added that there are a lot of responsibilities placed upon the subgroup members. There is a high-level of responsibility on the subgroup itself to move forward and achieve the goals it sets itself. As this is best-effort work, the steps made towards achieving the goals may be small. **Keyte** added that in some cases the work is already part of on-going programmes, the harder task is to start a new activity.

The WGCV/ISPRS taskforce kicked-off in November 2002. **Hilsenrath** asked if the group has representatives from the standard agencies. **Desnos** confirmed that there were representatives from the standard agencies. **Desnos** went on to outline the various activities of the subgroups, the details of which were discussed later in the subgroup sessions.

2.2 Update from the WGCV Secretariat (*Marie-Claire Robinson*)

Desnos informed the meeting that the WGCV website is to be updated (*Action WGCV20-1*). The ESA graphics bureau has been working on a new look to the website. **Morisette** suggested that it would be good if the subgroup websites had the same look as the main WGCV website. Also, where there are links to the subgroup websites, the link is seamless and opens within the main WGCV site.

Development of the new website will require substantial collaborative work with the subgroup chairs, the ESA graphics bureau and the Secretariat to have it operational by the middle of 2003. **Barton** suggested that there could be a password-protected link to the new site from the old. This would allow members to check on progress and provide comments. **Hilsenrath** requested a “what’s new” section on the front page of the website.

2.3 Update on CEOS/IGOS (*Yves-Louis Desnos*)

Desnos provided the meeting with an update from CEOS-16 plenary on IGOS and the WGEdu. A general report from CEOS-16 was also given, including details on NOAA’s plans for its chairmanship (November 2002 – November 2003).

2.4 Review of Action Items from WGCV-19

WGCV17-10	SAR subgroup to request WGISS to provide task team for POL-INSAR data formatting	Open – to be discussed at the next SAR subgroup meeting in Canada in June 2003
WGCV18-9	[Datla /] Privette to provide the secretariat with the [NIST /] NASA lists of definitions relating to standards	Closed – superseded by the activities of the WGCV / ISPRS taskforce
WGCV18-13	Subgroup chairs to provide the secretariat with contributions to the next cal/val newsletter (issue 10)	Open – no contributions received
WGCV19-1	WGCV Members to provide to Secretariat cal/val case studies for inclusion on the website	Open – no contributions received
WGCV19-2	Secretariat to arrange for a live ozone hole demonstration at CEOS plenary 16 through coordination with Burrows	Closed – demonstration successful
WGCV19-3	Rast to check on the status of the website at NASA giving access to the Cal/Val dossier (http://sps0.gsfc.nasa.gov/calval/)	Closed – no access to dossier gained
WGCV19-4	Secretariat to prepare a single presentation representing the WGCV and the activities of the subgroups, host it on the WGCV website and liaise with the WGEdu	Closed – basic presentation formulated and available for download from WGCV website
WGCV19-5	Martin-Neira / Hilsenrath to identify existing education material and channel this to WGEdu through secretariat	Open – not received
WGCV19-6	WGCV / WGISS Test Facility Group to provide a first draft of the project plan to the WGCV chair	Closed – first draft provided
WGCV19-7	WGCV Chair to distribute the first draft of the test facility project plan to the WGCV members	Closed – first draft distributed at WGCV-20
WGCV19-8	WGCV members to provide comments on the first draft of the test facility	Open – first draft distributed & comments invited based on this draft
WGCV19-9	WGCV Chair to report on the outcome of WGCV-19 at the WGISS subgroup meeting on 5 May 2002	Closed – report to WGISS made

WGCV19-10	WGCV chair to ensure co-ordination with WGISS and report back to WGCV plenary 20	Closed – report made at WGCV-20
WGCV19-11	Johnson to provide Secretariat with copies of documentation relating to standards that can then be posted on the WGCV website	Closed – links to documentation provided and placed on WGCV website
WGCV19-12	WGCV members to comment on the existing work plan (v2.6)	Closed – no comments received. Work Plan updated into v2.7 and distributed for comment
WGCV19-13	Dowman to provide an ISPRS/WGCV taskforce contribution to the work plan	Closed – contribution received & incorporated into v3.0 of the WGCV Work Plan under Activity 5
WGCV19-14	WGCV members to comment on updated work plan (to be v2.7)	Closed – comments received and changes made accordingly in v3.0
WGCV19-15	Subgroup chairs to confirm with the secretariat details of their group's meeting plans	Closed – meeting details included in CEOS newsletter, published on WGCV website and presented at CEOS plenary

2.5 Nomination / election of new chair's for the WGCV and for the LPV subgroup

Jeffrey Morisette had been put forward by the LPV subgroup to take over from the retiring chair, Jeffrey Privette. This proposal was unanimously approved by the WGCV.

The chairmanship of Yves-Louis Desnos is due to expire at the end of 2003. A candidate is thus sought to chair the WGCV for the period November 2003 – November 2006. CEOS has been asked for nominations but no response so far has been forthcoming. The procedure for nomination of a new chair is clearly defined in the CEOS protocols and dictates that the WGCV nominate a chair. **Keyte** identified a major concern for many is namely the funding of the work of the chair. **Weinreb** asked for an idea of the time taken up for the chair to effectively undertake their duties. **Desnos** estimated that 20% of his time is taken up by chairing the WGCV, but he has secretarial support, which helps. **Barton** suggested that CEOS plenary could write letters to specific agencies asking for their nominations. It would also be a way of getting agencies back into the fold. This would at least be a fall-back plan if no nominations are forthcoming from within the WGCV. There are major resourcing issues for the nominee's organisation to consider, so it is important to approach agencies that will have something to gain from chairing a group and can also afford it. The CEOS chair (NOAA) could write a letter, or WGCV write a letter and the CEOS chair sign it. **Desnos** stressed the need to resolve the issue quickly, so that the transition period between chairs is effective. The new chair should attend the next WGCV plenary, and it would be beneficial if the chair were to rotate between the different agencies. **Barton** added that there is also a need to look at the other subgroup chairs and their agency representation. **Morisette** expressed the desire to see the nominated candidate coming from the ranks of the WGCV and not from outside. He volunteered to ask Jeffrey Privette, the former chair of the LPV subgroup and an active member of the WGCV. **Morgan** nominated Ian Barton. **Barton** declined the offer of nomination. The WGCV members were asked to go back to their organisations / agencies to seek a candidate to take over the position of chair (**Action 20-2**). It would be better to have a candidate from within the ranks of the WGCV, and approved by the WGCV. The new chair

should attend the next WGCV and CEOS plenaries to ensure an effective hand-over. If no candidate has been put forward by then, NOAA as CEOS chair would be asked to send a letter out to all agencies canvassing for their nominations.

3 WGCV Work Plan

Version 3.0 of the WGCV Work Plan will be updated (*Action WGCV20-3*). **Desnos** suggested that the priority actions from the CRT be included in the introduction of the WGCV work plan. These priorities are defined in the CEOS 5-year plan, which is due to be revised in 3 years time. It was decided that these priority actions should be included in the introduction of the WGCV work plan. **Morisette** added that some small background on IGOS, IGBP etc. would also justify why these priority actions have been identified for the WGCV. **Desnos** added that it is important to ensure the traceability of the cal/val activities to the IGOS themes. It was proposed to alter the plan to ensure traceability at a subgroup level. It was also agreed that there should be a few focused activities that support the IGOS themes. **Keyte** stressed, however, that it is important to make it clear that we are not just focused on the IGOS themes. **Desnos** explained that many of these actions are already within the work plan, it is just important to highlight those specific areas where there are gaps.

Specific changes to the plan include:

- Page 1, Bullet 4: 'Be such that the Members and Associates will support the action' is not a concrete statement and it may not be strong enough. **Desnos** asked the members to think about this and report back at WGCV-21 (*Action WGCV20-4*).
- Page 5: Pre-launch information. This came about after some satellite-providers in the past were keeping information to themselves. **Weinreb** asked if it would be possible to enhance this part of the work plan. Links could be made from the WGCV website to NOAA, and more work could be undertaken to obtain further links to other calibration information sources.
- **Rast** agreed to provide an update of the IVOS mission, objectives and action plan, and this would be discussed at the next WGCV plenary. The opportunity to do this is also open to all subgroup chairs. **Morisette** identified slight changes to the mission, and to the action plan, and agreed to do this by the next plenary (*Action WGCV20-5*).

4 Reports from Subgroups

4.1 Atmospheric Chemistry (*Ernest Hilsenrath*)

Both the Atmospheric Chemistry and the IVOS subgroups expressed the desire to have a EUMETSAT representative within their subgroups. At present, there is also no representative within the WGCV (*Action WGCV20-6*).

Morgan identified an Australian atmospheric chemistry data centre, which was unknown to Hilsenrath. **Morgan** offered to help establish links between **Hilsenrath** and this centre. This offer was taken up, and they agreed to establish a link.

Hilsenrath explained that two recommendations had been made by the Atmospheric Chemistry subgroup to CEOS plenary. CEOS plenary appeared to have approved these, but it was unclear to him what the next stage was. It appeared to be a double-headed arrow with no-one taking responsibility for the implementation of the recommendations. CEOS plenary had actioned **Desnos** to take the recommendations to the IGOS themes. A meeting of the IGOS-P atmospheric chemistry theme (IGACO) was held in January 2003, but IGOS do not have any resources. It would, therefore, be

necessary to discuss it further with IGOS and then to go back to CEOS plenary with the proposal. **Barton** added that IGOS is higher level and is a partnership between the large 'user' agencies, not 'space' agencies. **Desnos** added that the recommendations should therefore be discussed at IGOS first before taking them back to CEOS plenary (*Action WGCV20-7*).

Vik asked if **Hilsenrath** and his community were aware of a KNMI project, the GOA project, that addresses total ozone and profiles of GOME, with comparisons with ozone sondes for some. This information would be freely available. **Hilsenrath** agreed to talk to NILU on this subject.

4.2 Infrared and Visible Optical Sensors (*Michael Rast*)

The IVOS membership needs to be improved to ensure the continuity of the work of the subgroup. **Rast** agreed to provide **Hilsenrath** with the reference for the Thuillier spectrum.

Recommendation 1, put forward at WGCV19, had been discussed further within the subgroup, and it had been decided that it still stands.

Recommendation 1: Instrument teams should put exo-atmospheric irradiances band-integrated, on www, as tailored to their needs/instruments (single spectrum recommended) and re-sampled / defined by them. In this context IVOS encourages the use of G. Thuillier's solar reference spectrum (as submitted to Solar Physics 2002) at highest possible spectral resolution. The source spectrum should be made available on WGCV website, possibly with pointers to different space-borne instrument (re-sampled) spectra.

The Thuillier reference spectrum is currently the best available, and Recommendation 1 should be reworded and split up to make it clearer.

Recommendation 2 had been worked on, but will not be put forward to the WGCV again.

Recommendation 2: For post-launch calibration of visible and near-infrared sensors it is recommended to implement a global instrumented and automated network of test-sites:

- *Capture radiometric, spectral, spatial, geometric, and temporal characteristics of each test site.*
- *Use standard in situ measurement protocols for data acquisition by common traceably calibrated instruments and central/identical data processing (transfer radiometers, e.g. 2nd Internat. IR inter-comparison.....).*
- *Emphasize autonomous in situ sensors and wireless telecommunication.*

Recommendation 3 would need someone to take the initiative, to lead discussion and formulation. **Fox** and **Rast** agreed to meet to discuss this further.

Recommendation 3: Define key factors for Calibration and Validation to be documented in Protocols => A coordinating Group/office in view of up-coming (2002) sensors is needed, (specifically for ocean colour). Important work already carried out has to be recognised, e.g. SIMBIOS / SeaWIFS protocols.

Concerning Recommendation 4, the subgroup had actioned **Rast** to discuss it with NIST reference standards.

Recommendation 4: Recommends the in-depth study of the behaviour of onboard diffuser reflection standards and their stability in the space environment (hard radiation).

Hilsenrath added that diffusers that use not just Spectralon are flown and it is important to consider all diffusers, including those to be flown on future missions. **Rast** explained that Recommendation 4 is not exclusively related to Spectralon, it is just easier to access information relating to diffusers that use Spectralon.

Rast informed WGCV-20 that a 2-day meeting will be held immediately before the next WGCV plenary, to try and integrate activities between different sensors and their data. A dedicated aerosol subgroup was suggested as a useful addition to the WGCV, however, **Rast** thought that this would not be a good idea as there would then be too many subgroups to be effective.

4.3 Microwave Sensors (*Yves-Louis Desnos*)

Apologies for absence had been received from **Martin-Neira**. **Desnos** presented the Microwave Sensors subgroup report on his behalf.

The NIST standards terminology document is available at:

<http://www.boulder.nist.gov/div813/stdterms/Links.htm>

This link will also be made available from the WGCV website. The Microwave subgroup had put forward several recommendations:

Recommendation 1: The Microwave Sensors Subgroup of the CEOS Calibration and Validation Working Group recommends that all future missions carrying a microwave radiometer are designed to allow the view of the cold sky of its primary reflector at least twice in the whole mission taking into account its value against its cost. A survey of ground sites where the sky is observed at different microwave frequencies of interest in Earth remote sensing should be done (useful at lower frequencies).

Recommendation 2: The Microwave Sensors Subgroup of the CEOS Calibration and Validation Working Group recommends that an analysis of available microwave radiometer records over different potential cal / val areas of the World is performed, in particular Dome-C in Antarctica (for radiometers in its view), deserts, tropical rain forest and the oceans. Presently flying should continue gathering data on these areas of interest to continue the research on their suitability as cal/val sites for long-term applications. Study on stable areas on the Earth surface suitable for radiometer inter-calibration purposes should be pursued.

Concerning Recommendation 1, **Weinreb** wondered if there would be a risk to other instruments if the attitude of a satellite itself is changed. **Keyte** added that it is important to specify the exact nature of the problem that this recommendation puts forward as a solution. Once the problem is made clearer, it may be that other alternatives are available to overcome the problem. **Desnos** agreed that the wording of the recommendation should be amended to include not just the cost, but also the risk to the mission. As it stands, Recommendation 1 does not provide enough information, and it is necessary to understand why it is being put forward, as this solution is not necessarily practical. Concerning Recommendation 2, the word “sensors” should be included after “Presently flying”, and the second section requires re-wording. **Martin-Neira** was asked to re-word the recommendations and return with them to WGCV-21 (*Action WGCV20-8*).

4.4 Land Product Validation (*Jeffrey Morisette*)

Morisette explained that he had previously served as deputy chair of the LPV subgroup, and he would like to find a new deputy chair to support him as the new subgroup chair. The subgroup’s mission statement has changed and the subgroup’s goals have also changed slightly. These changes were approved by the WGCV and will be reflected in v3.1 of the WGCV work plan. **Running** asked for clarification of the role this organisation has in relation to GTOS. It is important to ensure that this group’s activities do not replicate anything GTOS does, and that this group delivers remote sensing products to the international community. **Morisette**, as the chair of the LPV, should coordinate with the chair of GTOS to make sure that each of their group’s work is compatible and not redundant. The goals should therefore be amended slightly. **Morisette** explained that his subgroup does not hold its

own meetings, instead they hold workshops. It is thus maybe worth considering having a meeting to bring people together. The main players would then decide the mission and goals of the subgroup. **Rast** added that intercomparison should be included within the goals; this is important for continuity.

Morisette explained that there has not been a commitment to provide processed, subsetting data to the LPV for the WGCV / WGISS core site work. For example, SPOT data had been made available through Goddard, but not from SPOT itself. **Rast** identified that there is currently no MERIS data available on the LAI intercomparison website for the core sites, but that ESA would be willing to provide this if possible. **Rast** offered to check offline to see if MERIS data is available for the core sites (*Action WGCV20-9*). **Desnos** asked where one could find the results of work done on LAI intercomparison and he asked **Morisette** to provide the link to any the websites / publications to make them available via the WGCV website. Fire / burn scar links were also requested (*Action WGCV20-10*).

Keyte made the point that attendance at the different workshops should be addressed. It is important to make ensure that the whole community is aware of these workshops so that they can attend if appropriate. **Morisette** agreed to communicate more with the Secretariat to make sure that the LPV meetings / workshops are broadcast to all of the WGCV members (*Action WGCV20-11*). It was also agreed that all subgroup chairs should liaise with the various IGOS activities that relate to their subgroup's activities and report back at the next WGCV plenary (*Action WGCV20-12*).

4.5 Terrain Mapping (*Gordon Keyte*)

Apologies for absence had been received from **Muller**. **Keyte** presented the Terrain Mapping subgroup report on his behalf.

Muller was asked to provide a copy of the best-practice dossier for the website (*Action WGCV20-13*). No subgroup meeting had been held in the last year, but one is planned for April / July 2003. Work had been undertaken to assess the quality of SRTM data, and several comparisons of errors had been done. **Muller** was asked to let the Secretariat know the exact date and location of next subgroup meeting (*Action WGCV20-11*). **Muller** was asked to provide a text document that would explain the work of the Terrain Mapping subgroup, presented on his behalf at the last minute by **Keyte** at WGCV-20 (*Action WGCV20-14*).

4.6 SAR (*Masanobu Shimada & Gordon Keyte*)

Shimada detailed the activities and interests of the SAR subgroup. He explained that Action WGCV17-10 relating to Pol INSAR data formatting would be reported on at WGCV-21 as this is still under discussion.

Keyte outlined the presentations and activities undertaken at the SAR subgroup workshop in 2002. He identified some recommendations resulting from discussions held the workshop.

5 The WGISS / WGCV Test Facility Prototype (*Jeffrey Morisette*)

Keyte identified that one of the SAR subgroup recommendations is to have sites and data available over the specific WGISS / WGCV core test sites. He asked about the availability of the data and how it is acquired. For ASAR, there had been discussions on the possibility of having data collected over sites and in different modes. **Rast** explained that for ESA data, one has to write a category 1 proposal to request the acquisition of the data required. Once approved, it would be possible to access all data

from Envisat, and also data from ERS-2 instruments, in one proposal (*Action WGCV20-15*). **Morisette** asked if these proposals would just give you access to the data, or could some collaborative work be undertaken to process data and make it available. This is more than an access to data issue and subsets are required. CEOS members have to do more than simply provide access to the data. **Dwyer** identified that data access is maybe the first thing to focus on though, even though there are more issues to address.

Dwyer explained that the requirements have to be very specific and they are only now clearly understood. The next part of the work is to set very explicit milestones for when certain types of functionality are desired. It is important to iteratively check the steps being made along the way. It has taken a while to get to the current stage, and there are no show-stoppers as yet, but then again, nothing is critical at the moment. The infrastructure is in place and is being developed. It would be preferable for phase 1 to be completed soon as there are valuable lessons that will have been learnt and need to be carried over to phase 2.

Desnos expressed the desire to have a demonstration of the WTF at the next CEOS plenary (*Action WGCV20-16*). It would be desirable to show examples for at least one or two test sites to prove the feasibility of the task. If this could be achieved it would bring more credibility to recommendations for further activities put before CEOS plenary. **Rast** identified that Phase 1 is concerned with the provision of access to data only. It is still unclear what will happen after Phase 1. There is no-one at present readily identified to undertake intercomparison work on the data, and this is the ultimate goal. **Running** suggested that the key thing to get the momentum going is the provision of subsetting datasets in an easily accessible way. The users are the people who are interested in seeing how their landscape is being viewed from the satellite and so they are very motivated. They will then feed back and provide their data for further validation. **Desnos** added that there is no point in putting the data only on the web. It is also necessary to identify the benefits in using these datasets. This would also justify and prove the facility. Some other data could be included from other CEOS members for e.g., one site only, to prove the value of it. **Morisette** suggested the production of a chart of vegetation parameter vs. year. This would give a view of continuity over time for the datasets that are so far available, and would give the facility more credence. **Keyte** added that this should be made more open and accessible to more users. **Desnos** explained that the overall objective of this is to make it open to all. At least by the time of the proposed demonstration at CEOS plenary it should be open.

6 Joint WGCV / ISPRS Taskforce (*Nigel Fox*)

Hilsenrath asked about the scope of the taskforce. **Fox** explained that it is necessarily unclear as the taskforce itself is not 100% clear on whether it should be defining protocols to compare sensors, or comparing data products. The original scope was much more focused on terminology and this has now changed somewhat. **Desnos** identified that NASA is committed in its support of the taskforce chair. **Hilsenrath** added that Jim Butler (NASA) should be included in the taskforce. However, **Rast** had received word from Jim Butler that he was too busy to be involved in IVOS, and thus he probably would not be able to be involved in the taskforce. **Datla** explained that Butler works closely with NIST, and thus he would probably be involved in the taskforce through either himself or Carol Johnson. **Desnos** suggested that details of the taskforce should be distributed to get people to contribute to the core participation of the taskforce. **Weinreb** identified that there should be a NOAA person involved and he offered to try and find someone (*Action WGCV20-17*). **Hilsenrath** wondered if NPPOES should also be involved. NPPOES is a shared responsibility between the government and industry and it may be beneficial for the system contractor to be involved in this. **Hilsenrath** agreed to see if the NGST (system contractor) would be willing to be involved (*Action WGCV20-18*). **Fox** explained that the taskforce is not comprised of CEOS members / affiliates and CEOS needs to

formally ask the taskforce to do the work. **Desnos** therefore asked **Fox** to be the WGCV's representative on the taskforce. **Fox** agreed to this proposal.

The taskforce action items within the WGCV work plan were edited at the meeting. The revised actions will be sent to Bruce Davis (the taskforce chair), but firstly will be distributed within the WGCV for consolidation and approval (*Action WGCV20-19 & Action WGCV20-20 & Action WGCV20-21*). The actions can then be approved at the next WGCV plenary. The names of the contributors to the taskforce from the WGCV will also be sent to the taskforce chair. There is a potential overlap between this taskforce and the work of the other members of the WGCV. This is an issue that should be revisited at the next WGCV plenary. The presence of **Bruce Davis** and **Ian Dowman** at the next WGCV plenary was thus seen as beneficial (*Action WGCV20-22*). The WGCV expressed the need to know the background to the taskforce. The minutes from the Terrain Mapping subgroup meeting in 2000 in Gaithersburg were thus requested from **Muller** to provide some background to the WGCV members (*Action WGCV20-23*).

7 The ESA / Envisat Cal/Val Database (*Aasmund Fahre Vik*)

Hilsenrath asked **Vik** if NILU had any recommendation concerning the interchange of data in HDF 4 and 5, as Envisat data uses a different version from that used by NASA. There had been an internal action to see if there is a converter between the two, and **Vik** agreed to look into this. **Morissette** asked if it would be possible to access NILU's Envisat cal / val database. **Desnos** explained that it is only accessible to ESA PIs who perform validation of the Envisat products. **Vik** explained that the data contained in the database is varied. One specific problem that had been encountered was that terms for one group of scientists were very different to those used by others. **Rast** added that measurement procedures are also different and this was a huge obstacle that had to be overcome in this project.

8 Network-enables Connectivity – The Key to Future Space and Aerospace Development (*Garth Morgan*)

Morgan provided informative hand-out material, supplemental to his presentation. **Barton** explained that CEOS is already very active in this type of work, and there is a strong push for protective bandwidths. Requirements and requests from the CEOS members are taken into account, and allocations for bandwidths is firmly and definitely on the CEOS agenda.

9 Country / Agency reports

9.1 Australia (*Ian Barton*)

Barton provided the Australia country report. He explained that a second SeaWiFS HPLC analysis round robin experiment is planned. **Barton** would like this to have a CEOS seal of approval on it and to make sure that organisations / agencies who do not already know about it are involved. **Rast** offered to report on the interest the IOCCG has in this and he agreed to talk with Barton about this. **Desnos** asked if this is not a missed opportunity for cooperation. **Barton** explained that if a NASA representative was in attendance across all the various activities, then this may not have happened. **Rast** agreed to talk to Chuck Trees, the IOGGC program manager.

9.2 China (*Xiaoxian Huang / He-guang Liu*)

Huang provided the SITP agency report, and **Liu** the CSSAR report. **Hilsenrath** asked if the data are available to the whole scientific community. **Huang** explained that the satellite has only been active for half a year and that there are no plans to make the data available although it is possible to obtain the data on request. **Liu** explained that there is a data centre in the institute and **Huang** agreed to order data for **Hilsenrath** and provide it to him, along with a description of the format.

Liu explained that he is the contact for the next meeting, WGCV-20, which will be hosted by CSSAR in Beijing, China. There will be the opportunity to hold subgroup meetings earlier in the week if desired. **Rast** took up the offer for an IVOS meeting to be held earlier in the week, but there was no other clear indication from any other subgroup.

9.3 ESA (*Michael Rast*)

Rast presented the ESA agency report, provided to the WGCV by **Evert Attema**. **Rast** directed the WGCV members to the Envisat website (envisat.esa.int), which provides information on Envisat and its data. Other hyperlinks are included in the country report so members are invited to visit these and the report for further information. **Keyte** raised the point that it is important to go into more detail on the plans for collaboration between the different agencies; this would be of great interest to those present at the WGCV meetings. A request for such a presentation was put forward for WGCV-21.

Desnos showed examples of data products from Envisat. **Shimada** asked which polarisation had been found to be more effective in oil spill detection. **Desnos** explained that the VV had been used although this is still a priority research area.

9.4 NASA (*Ernest Hilsenrath*)

Hilsenrath reported on the NASA activities.

9.5 NASDA (*Masanobu Shimada*)

Shimada provided the NASDA agency report. **Desnos** asked about the availability of data to scientists in Europe. **Shimada** explained that observation scenarios for each observation mode are being undertaken. Polarimetry is part of this and the priorities for data distribution will be established after this work. Specific research requests can be sent to NASDA. It is also possible to order data through e.g., ESA, who would send the European requests on behalf of European scientists. **Keyte** added that this question of ability to obtain data should be discussed in more detail within the SAR subgroup.

9.6 NOAA (*Michael Weinreb*)

Weinreb discussed NPOESS and NPP, and further discussions were to be held offline due to time constraints.

9.7 NIST (*Raju Datla*)

Datla detailed NIST's activities.

9.8 Norway (*Aasmund Fahre Vik*)

Vik detailed Norway's activities. **Desnos** clarified that, concerning the ASAR Wave mode, the processor was installed at the end of November 2002. Validation using an offline processor has started. There is a new algorithmic chain and a new product, and the initial results are good so far. In June 2003 there should be more results related to the validated products.

9.9 NPL (*Nigel Fox*)

Fox provided the NPL report. He explained that the aim of TRUTHS is to provide a standard reference for a set of reference sites. This could then be transferred to other satellites.

9.10 UK (*Gordon Keyte*)

Keyte detailed the activities of the UK.

9.11 USGS (*John Dwyer*)

Dwyer presented the USGS report. **Weinreb** identified that some of the work being undertaken at the USGS seemed familiar. He cited work already undertaken in calibrating the moon. **Dwyer** was not aware of this and did not know the details of this work.

10 Newsletter

The idea of the WGCV newsletter is that it is a nine-monthly / annual publication. **Desnos** presented the expected input to the next issue of the WGCV newsletter (issue 10). A reminder for newsletter input would be sent out in the middle of March to remind members that inputs need to be with the Secretariat by 31 March 2003 (*Action WGCV18-13*). A draft would then be ready by 15 April 2003 (*Action WGCV20-24*). Publication and availability, via the web, of issue 10 of the WGCV Newsletter would be by May 2003 (*Action WGCV20-25*).

11 Actions

WGCV17-10	SAR subgroup to request WGISS to provide task team for POL-INSAR data formatting	Jun 2003
WGCV18-13	Subgroup chairs to provide the secretariat with contributions to the next cal/val newsletter (issue 10)	31 Mar 2003
WGCV19-1	WGCV Members to provide to Secretariat cal/val case studies for inclusion on the website	1 Apr 2003
WGCV19-5	Martin-Neira / Hilsenrath to identify existing education material and channel this to WGEdu through secretariat	1 Apr 2003
WGCV19-8	WGCV members to provide comments on the first draft of the test facility	1 Apr 2003
WGCV20-1	Secretariat to update the WGCV website in collaboration with the ESA Graphics Bureau	30 Jun 2003
WGCV20-2	WGCV members to propose a replacement for Desnos as WGCV chair	14 Mar 2003
WGCV20-3	Secretariat to update the Work Plan v 3.0 (into v 3.1) and distribute to WGCV members for approval	31 Mar 2003
WGCV20-4	WGCV members to comment on Bullet 4, Page 1 of the WGCV Work Plan v3.0 ('Be such that the Members and Associates will support the action')	15 Oct 2003 (WGCV-21)
WGCV20-5	Subgroup chairs to update the subgroup mission, objectives and / or action plan in v3.0 of the WGCV Work Plan as appropriate	15 Oct 2003 (WGCV-21)
WGCV20-6	Desnos to contact the EUMETSAT CEOS secretariat representative (David Williams) to request that EUMETSAT be actively represented within the WGCV	1 Apr 2003
WGCV20-7	Hilsenrath to include the issue of the two ground-station project proposals in discussions with the Atmospheric Chemistry IGOS theme and report back at WGCV-21	15 Oct 2003 (WGCV-21)
WGCV20-8	Martin-Neira to re-work the Microwave Sensors subgroup recommendations and report back to WGCV-21	15 Oct 2003 (WGCV-21)
WGCV20-9	Rast to check if MERIS data is available for the WGCV / WGISS test facility core sites and liaise with Morisette / Dwyer	1 Apr 2003
WGCV20-10	Morisette to provide the Secretariat with the links to reports / websites / publications that relate to the LAI intercomparison & the Fire / burn scar work	1 Apr 2003
WGCV20-11	Subgroup chairs to actively communicate with the Secretariat to ensure that all meetings / workshops are publicised throughout the WGCV membership	Ongoing
WGCV20-12	Subgroup chairs to liaise with the relevant IGOS themes and report back at WGCV-21	15 Oct 2003 (WGCV-21)
WGCV20-13	Muller to provide the Secretariat with a copy of, or a link to, the best practise dossier for the WGCV website	14 Mar 2003

WGCV20-14	Muller to provide to the Secretariat with a text document, as a supplement to the presentation made at WGCV-20 on his behalf by Gordon Keyte, to explain the activities of the Terrain Mapping subgroup	14 Mar 2003
WGCV20-15	Morisette / Dwyer to prepare a proposal to ESA to access data over the WTF core test sites included in Phase 1	14 Mar 2003
WGCV20-16	Morisette / Dwyer to arrange for a WGCV / WGISS Test facility demonstration at the CEOS-17	17 Nov 2003
WGCV20-17	Weinreb to propose a NOAA representative for the joint ISPRS / WGCV taskforce	28 Apr 2003
WGCV20-18	Hilsenrath to ask the NGST (system contractor for NPPOES) to be represented on the joint ISPRS / WGCV taskforce	28 Apr 2003
WGCV20-19	Dowman to confirm the updated Action plan for the joint ISPRS taskforce in the WGCV work plan and to send any comments to the Secretariat	31 Mar 2003
WGCV20-20	Secretariat to forward the draft version of the Action plan related to the ISPRS taskforce to Bruce Davis (taskforce chair) for approval	28 Apr 2003
WGCV20-21	Datla to follow up on the Action plan for the joint ISPRS taskforce, encourage the participation of the Taskforce chair to WGCV-21, and to report back to the WGCV	15 Oct 2003 (WGCV-21)
WGCV20-22	Secretariat to invite the joint ISPRS / WGCV taskforce chair, Bruce Davis, and Ian Dowman to WGCV-21	15 Oct 2003 (WGCV-21)
WGCV20-23	Muller to provide the Secretariat with the minutes from the Terrain Mapping subgroup held in 2000 in Gaithersburg, which should give the background to the joint ISPRS taskforce. Secretariat to distribute these to the WGCV members.	14 Mar 2003
WGCV20-24	Secretariat to produce a draft cal/val Newsletter (issue 10) for approval	15 Apr 2003
WGCV20-25	Secretariat to produce issue 10 of the cal/val Newsletter and post it on the WGCV website	12 May 2003
WGCV20-26	Rast / Hilsenrath to refine a recommendation submitted by IVOS on instrument convolution and reference solar spectrum and report back at WGCV-21	15 Oct 2003 (WGCV-21)

12 Recommendations

The recommendations put forward by the Microwave sensor subgroup are to be reworked (**Action WGCV20-8**). The IVOS recommendation on instrument convolution and the reference solar spectrum is to be reworked (**WGCV20-26**). A further IVOS recommendation would be discussed at the next IVOS meeting and presented at the next WGCV plenary. Both subgroups agreed to report back to WGCV-21. **Keyte** asked about the SAR recommendations that have already been made. **Desnos** explained that concrete proposals, with cost requests should be drafted. This would then be presented at WGCV plenary and then CEOS plenary. **Barton** agreed to send **Shimada / Keyte** the details of the way IVOS obtained funding and support for the Miami intercomparison as an example of the way to achieve this.

13 Date and Place of next meeting

The next meeting (WGCV-21) will be held from 15 – 17 October 2003 in Beijing, People's Republic of China. The length of the meeting will be extended from the usual 2½ days to a full 3 days, with the meeting ending at 17:00 on Friday 17 October 2003. Confirmation of attendance would be expected by 1 September 2003.

It was provisionally suggested that WGCV-22 could jointly hosted by NOAA / NASA / IPO from 22 – 24 June 2004 in Washington, USA.

Annex A: Agenda

Wednesday 12 February 2002

9:00 Registration

10:00 Welcome from the official WGCV-20 hosts (*Tony Haymet, Chief of CSIRO Marine Research*)

10:10 Approval of the Agenda

10:15 WGCV Chair's report

10:15 Chair's report and action items from 16th CEOS Plenary (*Yves-Louis Desnos*)

11:00 Update from WGCV Secretariat (*Marie-Claire Robinson*)

11:10 Update on CEOS / IGOS (*Yves-Louis Desnos*)

11:30 Action items from WGCV-19 (*Marie-Claire Robinson*)

11:50 Nomination / election of new chair's for the WGCV and for the LPV subgroup

12:00 Lunch

13:00 Review of WGCV Work Plan issue 3.0

14:00 Reports from Subgroups

14:00 Atmospheric Chemistry (*Ernest Hilsenrath*)

15:00 Coffee

15:30 Reports from Subgroups (continued)

15:30 Infrared and Visible Optical Sensors (*Michael Rast*)

16:30 Microwave Sensors (*Yves-Louis Desnos*)

Thursday 13 February 2003

08:30 Reports from Subgroups (continued)

08:30 Land Product Validation (*Jeffrey Morisette*)

09:30 Terrain Mapping (*Gordon Keyte*)

10:00 SAR Calibration (*Masanobu Shimada / Gordon Keyte*)

11:00 Coffee

11:30 The WGISS / WGCV Test Facility Prototype (*Jeffrey Morisette*)

12:30 Joint WGCV / ISPRS Task Force (*Nigel Fox*)

13:30 The ESA / Envisat Cal/Val database (*Aasmund Fahre Vik, NILU*)

14:00 Lunch

14:30 Special session on remote sensing in Antarctic research and visit to the Antarctic Adventure Centre, Salamanca Place.

19:00 Dinner at the Blue Skies Restaurant, located on Hobart's waterfront.

Friday 14 February 2003

08:30 Network-enabled Connectivity – The Key to Future Space and Aerospace Development
(*Garth Morgan, University of South Australia*)

9:00 Country and agency reports

09:30 Australia

09:45 China

10:00 ESA

10:15 NASA

10:30 Coffee

10:45 Country and agency reports continued

10:45 NASDA

11:00 NOAA

11:15 NIST

11:30 Norway

11:45 NPL

12:00 UK

12:15 USGS

12:30 Newsletter

- Content
- Deadlines for submission and production

12:45 Review of action items

13:05 Recommendations and reporting to Plenary

13:25 Date and place of next meeting

13:30 Lunch

Annex B: Participants

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