

15th CEOS Plenary Minutes

Kyoto, 6th-7th November 2001

Final V.1.0

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1. Welcome addresses and logistics information

Yoji Furuhashi (NASDA) as Co-Chairman welcomed the participants to the 15th CEOS Plenary and expressed his wish for a productive meeting. Tomiji Sugawa (MEXT) as Co-Chairman made an opening address welcoming participants to Japan and highlighting some of the key issues to be resolved at the meeting.

Yoji Furuhashi invited all participants to an IGOS Open Session meeting, which was scheduled for the afternoon of Wednesday, 7 November.

Masami Onoda (NASDA) reported on all key logistics information for the week of meetings.

2. Review and adoption of the Agenda

Yoji Furuhashi advised that there was just one late change to the agenda (Item 9 moving to Tuesday afternoon, 6 November) and the agenda was adopted without further comment.

3. Record of the 14th Plenary

The final minutes of the 14th CEOS Plenary were adopted without comment. Chu Ishida (NASDA) confirmed that all actions from the 14th CEOS Plenary were considered to be completed or to have been resolved in discussions in planning for the 15th Plenary agenda. John Trinder (ISPRS) gave an update on Action 14/05 (on the development of an International Industry Forum). He noted that there was effectively only one major commercial satellite in operation since there had been a number of launch failures during the last year. As a consequence, there had been no real progress on this action. This 14th Plenary action was considered complete and John Trinder would keep CEOS informed of any future developments.

4. Report of the Chairman

Yoji Furuhashi (NASDA) gave a presentation on the activities of MEXT/NASDA during 2001 in their role as Chair Agency for CEOS, and he provided an overview of some of the key events and activities of this period, including:

- The CEOS Review Team activity;
- Visibility efforts;
- The technical and practical progress of the Working Groups.

Paul Mason (GCOS) commented on the issue of CEOS and IGOS efforts to raise their profile within the UNFCCC Secretariat and Technical Committees. He noted that GCOS had significant experience and links within these fora and would be an effective route for representation of CEOS and IGOS in UNFCCC.

5. Membership Issues

Tomiji Sugawa (MEXT) confirmed that the CEOS Chair had received two applications for admission to CEOS membership during the last 12 months:

- Korean Aerospace Research Institute (KARI) of the Republic of Korea: for Member of CEOS;
- The Geo Informatics and Space Technology Department Agency of Thailand (GISTDA): for Associate of CEOS.

He noted that these applications had been reviewed by the Chair and the secretariat, who considered that both agencies satisfactorily met the relevant criteria for admission to CEOS. The application letters had been distributed to CEOS Principals with the recommendation that CEOS admit KARI and GISTDA and allow their participation in the 15th CEOS Plenary meeting.

The representatives of KARI and GISTDA, who had been invited to attend the start of the CEOS Plenary as observers, were asked to leave the room for the duration of the discussion about their applications. The main points of this discussion were as follows:

- Ghassem Asrar (NASA) suggested that the likely contributions of KARI and GISTDA to CEOS objectives in the next few years be clarified;
- Chu Ishida (NASDA) confirmed that such information had already been supplied to support the KARI and GISTDA applications, as follows:
 - KARI had already launched its first satellite (KOMPSAT – featuring ocean colour and high resolution imaging sensors) in 1999 and had undertaken to provide data from this and future planned satellites on a non-discriminatory basis, in accordance with CEOS membership requirements;
 - GISTDA was a newly formed agency bringing together elements of the National Research Council of Thailand, which had been receiving Landsat, JERS-1 etc., and organizations involved in GIS development and applications; GISTDA would serve as the focus of activity in Thailand for receiving EO satellite data and for their distribution to user communities;
- Based on such information – the CEOS Chair recommended KARI and GISTDA for admission to CEOS;
- NASA, EUMETSAT, CNES, ISRO, and CSA all expressed their support for admission of KARI and GISTDA to CEOS;
- ESCAP also expressed support and encouraged KARI and GISTDA to further clarify their data policies in support of CEOS objectives.

Tomiji Sugawa (MEXT) confirmed the decision of the 15th CEOS Plenary:

CEOS agreed to admit the Korean Aerospace Research Institute (KARI) as a Member of CEOS, and the Geo-informatics and Space Technology Department of Thailand (GISTDA) as an Associate of CEOS, with immediate effect.

The Chairman invited the representatives from KARI and GISTDA to rejoin the meeting and welcomed them in their new capacities as member (KARI) and associate (GISTDA) to participate in the remainder of the meeting.

On behalf of KARI, Zeen-Chul Kim thanked the CEOS agencies and NASDA, which had supported them throughout the application process. He encouraged participants to refer to the KOMPSAT brochure for more information on KARI Earth observation activities.

On behalf of GISTDA, Vibulsresth Suvit thanked the CEOS agencies for accepting GISTDA as an Associate of CEOS.

Tomiji Sugawa (MEXT) confirmed that enquiries for CEOS membership or associate status had been received from UNESCO (for associate) and from the Malaysian Centre for Remote Sensing (MACRES) (for member or associate) and that the incoming Chair should investigate and develop these applications during the next year.

Action 15-1: CEOS Chairman to work with UNESCO (United Nations Educational, Scientific and Cultural Organization) and MACRES (Malaysian Centre for Remote Sensing) with regard to their interest in applying for CEOS membership or associate status and to report to the 16th Plenary.

6. CEOS Review Team Report

6.1 Recommendations by the CEOS Review Team

Chu Ishida (NASDA) reviewed the summary and purpose of the CEOS Review Team topic, as presented in the covering annotations distributed to participants. He reminded the meeting that at the 14th Plenary meeting, the Chairman of SIT had presented views on SIT's future, including a recommendation to conduct a review of the progress made in the IGOS Partnership process over the past several years, and of its implications in terms of CEOS structure and activities.

In response to this proposal, the Plenary meeting had adopted the following Action:

Action 14/29: CEOS Chair to appoint a group to conduct a review of CEOS structure and activities, especially of its participation in the IGOS Partnership over the past years, analysing the success and shortcomings of said structure and activities and aiming at improving their effectiveness, and make suitable recommendations to the 15th CEOS Plenary.

A CEOS Review Team was established and charged with addressing these issues and making recommendations to the 15th CEOS Plenary.

These recommendations had been presented in the CEOS Review Team Report, which had been distributed to 15th Plenary participants. Chu Ishida noted that there were a number of options also presented to the Plenary, based on recent comments received from CEOS Principals.

To facilitate the discussion, Chu Ishida presented a draft set of decisions for the meeting to consider and revise as necessary. The highlights of the discussion that followed were:

- Stephen Briggs (ESA) suggested that the key point for SIT was that it should become a standing group, as opposed to ad-hoc; and that the name SIT be retained;
- Brent Smith (NOAA) confirmed that NOAA had suggested alternative terms of reference (ToRs) for the SIT, but that in the course of the previous day's discussion in the CEOS Secretariat, NOAA had agreed to adoption of the ToRs in the CEOS Review Team Report – for the sake of reaching a consensus; this was on the condition that an extra clause be added confirming that these ToRs are provisional and that they would be reviewed as part of the mandate of the CEOS Review Team for 2002 – with further discussion at the 16th Plenary;
- Virendra Jha (CSA) suggested that SIT, in any future form, should continue in a way that limits membership to those agencies willing to make commitments for implementation;
- Don Hinsman (WMO) noted that he was delighted to see the inclusion of "*...achieve greater synergy between the research satellite and operational satellite communities in building upon proven research instrumentation to develop future generation operational monitoring capabilities*" within the proposed ToRs of SIT; he also noted the difficulty of this task and the need for SIT to involve the relevant user communities;

- Ghassem Asrar (NASA) suggested that this issue raised questions regarding the roles, responsibilities, and composition of SIT, and how SIT could capture the interest of the necessary partners at the early stages of new Themes, in order to ensure the best composition for Theme teams and a realistic and pro-active implementation strategy.

Yoji Furuhashi noted that there was a good consensus amongst participants on the basic decisions regarding this issue and outlined these decisions as follows:

CEOS decided:

1. **To endorse the CEOS Review Team Report recommendations**
2. **To extend the mandate of the CEOS Review Team under ESA Chairmanship of CEOS to address the full range of activities and structures within CEOS, including the CEOS Working Groups, and to develop a new CEOS Strategic Plan**
3. **To replace ad-hoc SIT with a standing working group – retaining the Strategic Implementation Team (SIT) name**
4. **If IGOS-P decided on a co-chairmanship including a co-chair from CEOS, the CEOS Chairman would be the IGOS Co-Chairman. The CEOS formal representation to IGOS-P would be the CEOS Chairman and the SIT Chairman. The past and incoming CEOS Chairmen and the SIT vice-Chairman would also attend IGOS-P meetings.**
5. **The SIT terms of reference contained in the CRT Review are approved for one year and the continuation of the CRT Review will, inter alia, re-appraise these ToRs. Any modifications are to be submitted for the consideration of CEOS Plenary 16.**
6. **The duration of the post of the new Strategic Implementation Team Chairman is two years - with the possibility of extension.**

The terms of reference for SIT from the CEOS Review Team Report are contained in annex A.

Action 15-2: CEOS Chairman to lead the CEOS Review Team for a further year in order to develop a new CEOS Strategic Plan. The Strategy will address the full range of activities and structure within CEOS, including the CEOS Working Groups. The Chairman shall report the results to the 16th CEOS Plenary.

6.2 IGOS-P structure and management

Yoji Furuhashi (NASDA) reminded the meeting that WMO and IOC had both presented proposals to the IGOS Partnership on IGOS-P structure and management issues. These proposals would be discussed at the coming IGOS-P-8 meeting in Kyoto. He noted that since the IGOS Partnership is important to CEOS, CEOS should contribute actively to this discussion at the Partners meeting. With this in mind, a draft statement of the position of CEOS members had been prepared – for the Plenary to consider, revise, and take forward to the IGOS-P-8 meeting. In addition, draft CEOS proposals were presented, suggesting revisions to the WMO recommendations to be discussed in the IGOS-P-8 meeting.

There was a brief discussion of this draft statement, including:

- The need to make it consistent with the Plenary decisions regarding the future of SIT;
- The agreement to delete the 4th recommendation of WMO from the CEOS position – since it was generally agreed that the use of partner categories might complicate rather than simplify matters for IGOS-P.

The draft materials incorporating these changes were adopted by the meeting as the CEOS position for IGOS-P-8:

1. CEOS has no objection to IGOS-P holding one annual meeting instead of two, and for this meeting to be thus detached from the annual cycle of CEOS Plenaries. CEOS would support that the IGOS-P Chairman or Chairmen should be able to convene extraordinary meetings if these are judged necessary for the efficient conduct of IGOS-P business.
2. CEOS accepts the principle of joint chairmanship for IGOS-P, with one Chairman nominated by CEOS and one by consensus among other Partners. This arrangement could come into effect immediately after IGOS-P8.
3. If 2 above is accepted, CEOS proposes to nominate as its IGOS-P Co-Chairman the CEOS Chairman. Each CEOS Chairman would serve as IGOS-P Co-Chairman for a one-year period. The other IGOS-P Co-Chairman could still serve for a two-year period. The CEOS one-year terms would be from CEOS Plenary to CEOS Plenary. The Chairman of the CEOS Strategic Implementation Team will also be an official representative of CEOS to IGOS-P meetings and will be the focal point for working issues related to CEOS input to IGOS themes.
4. CEOS does not support the notion of employing paid full-time staff for the IGOS-P Secretariat, and prefers to encourage each Partner to make its own arrangements for IGOS-P Secretariat support, consistent with the "best efforts" principle. Each IGOS-P Co-Chairman should nominate aide(s) (for the duration of his chairmanship) to serve with the other IGOS-P Secretariat members.
5. CEOS is not convinced of the utility of formally grouping IGOS Partners (as first suggested in the WMO proposal to IGOS Partners), since all Partners, irrespective of group, should have the same rights and obligations.
6. CEOS would support a system whereby new IGOS Partners need first to be proposed by two existing Partners, and then accepted by consensus of all the Partners. Candidates must be able to demonstrate that mutual benefit would result from their admission.
7. In the particular case of GOS/GAW, CEOS would welcome its immediate entry as a Partner.

The CEOS proposal for revised recommendations (from the original WMO recommendations) to be adopted by IGOS-P is as follows (changes from the original WMO text are underlined):

Recommendation #1 – The principal objectives of the strategy should be to address how well user requirements are being met by the existing mix of observations, including those of the global observing systems, and how they could be met in the future through better integration and optimisation of remote-sensing (especially Space-based) and *in situ* systems.

Recommendation #2 - The strategy should serve as guidance to those responsible for defining and implementing individual observing systems. The implementation of the strategy, i.e. the establishment and maintenance of the components of an integrated global observing system, must remain with those governments and organizations with commitments as expressed, for example, within the governing councils of the observing systems' sponsors.

Recommendation #3 - The "theme" approach should be a step-wise internal process based on perceived priorities towards the development of an integrated global observing strategy.

Recommendation #4 – proposed to be deleted.

7. Working Group Recommendations

7.1. WGISS

On behalf of the WGISS Chair (Peter Churchill, EC), Terry Fisher (CCRS) gave a presentation reporting on WGISS efforts since the last Plenary, including:

- An update on the WGISS Test Environment, and on the GOF C Test Facility in particular;
- Proposals for two new Test Facilities in support of the IGOS Water Cycle and Ocean theme activities;
- WGISS is investigating a role in GRID / e-science initiatives, which will develop basic middleware services for seamless distributed computing and data management;
- WGISS is undertaking various outreach activities, including a relationship with the Open GIS Consortium (OGC);
- Following a meeting between the WGISS Chair and WGCV, there has been an approach to WGISS from WGCV for support in ISS aspects – in order to aid international collaboration in calibration and validation; but a ‘champion’ agency needs to be identified;
- It is proposed that Terry Fisher should take over from Peter Churchill as WGISS Chair, pending approval by the 15th CEOS Plenary;
- John Faundeen (USGS) is proposed as the new WGISS Vice-Chair;
- The next WGISS meetings will be:
 - WGISS-13: 12th-15th February 2002, Tokyo;
 - WGISS-14: 23rd-27th September 2002, Honolulu;
 - WGISS Subgroups: week of 15th April 2002, Frascati.

John Townshend and Terry Fisher gave a short demonstration of the WGISS Test Facility for GOF C, highlighting how the various WGISS tools – such as the CEOS IDN - could be put to use for data discovery, searching, access, and inter-use in important and practical applications, such as the example of fire detection and mapping in South-East Asia.

Yoji Furuhashi thanked Terry Fisher and John Townshend for the presentation and demonstration. He noted the impressive progress that had been achieved during the last year. Ghassem Asrar (NASA) and Paul Mason (GCOS) both expressed their appreciation for the demonstration and expressed the hope that the work could be applied further in order to fully realize the benefits of the effort invested so far. John Townshend confirmed that GOF C would be extending and applying the progress achieved so far for a further year. He added that enabling ‘data for the masses’ to be provided through such projects would be an invaluable future role for CEOS and its Working Groups.

David Carson (WCRP) and Shinichi Sobue (NASDA) clarified that the Water Cycle Theme Team was already in discussion with WGISS to investigate how best to apply the WGISS Test Environment to support their objectives. WGISS will work with the Water Cycle Theme Team and the Ocean Theme Team to identify how best to proceed and will encourage participation of relevant experts in these activities to help WGISS understand the requirements.

The following actions were confirmed:

- Action 15-3: Interested CEOS agencies to contact the WGISS Chair to identify interest in championing the collaboration between WGISS and WGCV (by the end of January 2002).**

Action 15-4: Interested CEOS agencies to contact the WGISS Chair to identify their interest in providing participants and/or additional resources to support WGISS Test Facility collaborative projects (by the end of January 2002).

Yoji Furuhashi noted with special thanks the contribution of Peter Churchill, who had served as the WGISS Chairman for the past two years and who had played a key role in the numerous accomplishments of WGISS during that time - including CIP (Catalogue Interoperability Protocol), GOIN (Global Observation Information Network) transition, and the WGISS Test Facility initiatives.

Chu Ishida confirmed the decision of the 15th Plenary with regards to the WGISS report:

Noting that CEOS Plenary 2000 directed WGISS to pursue the Test Facility collaboration with interested parties, and noting the successful collaboration between WGISS and GOFC: CEOS directed WGISS to continue to pursue such work with interested parties and to report back to Plenary 2002.

**CEOS approved Terry Fisher as the new WGISS chair.
CEOS approved John Faundeen of USGS as the new WGISS vice-chair.**

CEOS endorsed:

- the WGISS initiatives with respect to Grid / e-science;
- the proposed joint effort between WGISS and WGCV.

The full WGISS report is available on the WGISS WWW site: <http://wgiss.ceos.org>

7.2. WGCV

Yves-Louis Desnos (ESA), Chairman of the CEOS Working Group on Calibration and Validation, delivered the WGCV report to the Plenary, focusing on the following highlights:

- Availability of the new WGCV WWW site: <http://www.wgcvceos.org>;
- The development of a new 3 year work plan for WGCV, covering 2000-2002;
- The proposed formation of a joint ISPRS/WGCV taskforce to address geometric and radiometric standards; Details of the Second Infrared Radiometer Calibration and Inter-comparison campaign; A joint WGCV/WGISS activity to provide web-based access and value-added formatting/geo-registration of EO remote sensing (and other) data over a set of "Core" Validation sites in support of global land product inter-comparison activities; A CEOS SAR workshop held at EORC/NASDA, Tokyo on 2-5 April 2001 and jointly organised by NASDA and ESA (a CD-ROM of the proceedings is available).

In the light of the WGCV report and subsequent discussion, the 15th CEOS Plenary decided as follows:

1. CEOS endorsed: appointment of new Chairs for four subgroups of WGCV: Infrared and Visible Optical Sensors subgroup (M Rast, ESA), Microwave Sensors subgroup (M Martin Neira, ESA), Synthetic Aperture Radar subgroup (M Shimada, NASDA) and Terrain Mapping subgroup (J Peter Muller, UCL); appointment of new WGCV Secretariat for three-year period; the Work Plan 2000 –2002 (Issue 2.5) decided by WGCV.

2. CEOS endorsed the establishment of a new subgroup of WGCV on atmospheric chemistry with the following mission and objectives:

(a) Mission:

To ensure high quality, traceable calibration of atmospheric chemistry data from Earth Observation satellites and the validation of higher level products.

(b) Objectives:

- To promote international collaboration and technical exchange of data relating to calibration/validation of atmospheric sensors and to thus assist in the improved atmospheric chemistry application of satellite data.
- To include all instrumentation (ground-based, airborne, balloon-based and satellite) that supports the calibration/validation of atmospheric sensors, and to encourage traceability of the calibration of these sensors.
- To identify a global network of validation sites and to encourage continuous observation and inter-comparison of data from these sites.
- To ensure the validation of Level 2 and higher level products.
- To encourage the further development of data assimilation facilities to be used for validation.

(c) Chair:

CEOS endorsed the proposed appointment for chair of the Atmospheric Chemistry Subgroup: Ernest Hilsenrath NASA GSFC

3. CEOS encouraged close collaboration between WGCV and CEOS working groups, especially with WGISS for data sharing for calibration and validation activities.

4. CEOS endorsed the joint WGCV/WGISS proposal for "CEOS Land Product Validation Core Sites" and invites WGISS to consider it for adoption.

5. CEOS encouraged WGCV to promote and enhance alliances with:

- (1) other organisations, particularly by working more closely with ISPRS;
- (2) Science Projects such as CEOP and GOFD;
- (3) IGOS Theme Teams including TCO; for greater efficiency and elimination of any duplication of work, and to come to Plenary with specific proposals for implementation or action.

6. CEOS approved the formation of a joint ISPRS/WGCV taskforce to address geometric and radiometric standards.

7. Recognising the unique capability of SAR interferometry for the monitoring of small-scale surface deformation, and the need for long-term consistent data sets to deliver its full benefit, CEOS encouraged members to address, from the design phase onwards, the interoperability of SAR systems for relevant applications.

8. Recognising the importance of measurements from Space of both terrestrial and oceanic carbon fluxes, in support of Kyoto Protocol monitoring, CEOS stressed the need for accurate calibration of relevant instrumentation (e.g. ALOS PALSAR over land and ENVISAT MERIS over ocean) and the importance of appropriate product validation to achieve such measurements. The full WGCV report is available on the WGCV WWW site: <http://www.wgcvceos.org>

7.3. Ad-hoc DMSG

Helen Wood (NOAA), Chairperson of the CEOS Ad-Hoc Disaster Management Support Group, delivered the DMSG report to the Plenary, focusing on the following highlights:

- Availability of the DMSG WWW site: <http://disaster.ceos.org> and its features for various disaster applications;
- Results of study of spatial and temporal requirements for various disaster applications;
- The International Charter on Space and Major Disasters; Co-operation between DMSG and the United Nations Office of Outer Space Affairs (UNOOSA), including plans for joint regional workshops on the use of Space technology in disaster management; Support to the development of an IGOS Geohazards Theme.

In the light of the DMSG report and subsequent discussion, the 15th CEOS Plenary decided as follows:

1. **CEOS extended its approval of the ad hoc Disaster Management Support Group (DMSG) for a final year.**
2. **CEOS accepted NOAA's offer to provide the chair for 2002, with continued support from the current vice chairs (EC/Research and CNES). CEOS directed DMSG to present to CEOS Plenary 2002 a final report with specific recommendations for the way forward in this area. CEOS decided to co-sponsor (with the UN Office of Outer Space Affairs) two regional workshops (in Africa and in the Asia-Pacific region) on the use of Earth observing satellites for disaster support.**
5. **CEOS members and WGs are encouraged to support these workshops through participation of technical experts and funding.**
6. **CEOS agencies are encouraged to respond to the recommendations of the DMSG 2001 Report "The Use of Earth Observing Satellites for Hazard Support: Assessments & Scenarios" and to provide inputs to the DMSG Chair.**

Action 15-5 DMSG to present CEOS Plenary 2002 with a final report, including a set of recommendations for the way forward in this area.

Action 15-6 Interested CEOS agencies to consider and respond to the DMSG Chair, by 15th February 2002, on the relevant recommendations contained in the 2001 DMSG report.

7.4. Ad-hoc WG-Edu group

Mukund Rao (ISRO), Chairman of the CEOS Ad-Hoc Working Group for Education and Training (WG-Edu) delivered the WG report to the Plenary, focusing on the following highlights:

- Details of the new proposed 'CEOS Strategy for EO Education and Training', and a three-year action plan for its implementation by the WG-Edu;
- Consideration of the various needs which exist, especially in developing countries, for EO education and training, and of the resources which CEOS agencies might already have available for this purpose;
- The concept of a CEOS co-ordination mechanism to provide a 'clearing house' for relevant materials and activities;
- The idea of closely working with the six UN EO training centres;
- Development of a resource library;
- The possibility of an EO Education and Training summit on the occasion of the 16th CEOS Plenary in Frascati.

Mukund Rao acknowledged the contribution of Leslie Charles of NASA in helping to finalise the WG-Edu strategy and plan documents: In the light of the WG-Edu report and subsequent discussion, the 15th CEOS Plenary decided as follows:

The Fifteenth Plenary of the Committee on Earth Observation Satellites:

Noting the rapidly changing trends of Earth observation technology and the increasingly varied applications of Earth observation;

Recognising that these changing trends create the imperative for capability-building and capacity enhancement amongst all users of Earth observation technology, especially in developing countries;

Recognising the efforts of many Space agencies in support of Earth observation education and training, both at the national and international levels, and also their efforts in developing a substantial amount of training materials and teaching aids;

Recognising that there are various domestic, regional and international institutions already undertaking Earth observation education and training and that these institutions have enabled the wider outreach of Earth observation technology and applications around the world;

Noting the UN efforts to establish the UN Regional Centres for Space Science and Technology Education, the initiation of operational education and research programmes by these Centres, and the UNISPACE-III recommendations regarding Earth observations and education;

Realising that Earth observation applications have considerable societal outreach and that education and training efforts can be greatly assisted by government support and resources;

Emphasising that the success of the CEOS strategy for Earth observation education and training will depend directly on the active and sustained participation of CEOS Members and Associates;

THEREFORE:

ADOPTED the CEOS Strategy for Earth Observation Education and Training as proposed by the ad hoc Working Group on Earth Observation Education and Training (WGEdu) in its document entitled "CEOS Strategy for Earth Observation Training and Education, with special emphasis on the Developing World;"

ADOPTED the three-year action plan for implementing the strategy as detailed in the document entitled "CEOS Strategy for Earth Observation Training and Education;"

TASKED the ad hoc WG-Edu to initiate the implementation of the three-year action plan;

EXTENDED the term of the WG-Edu for three years to carry out this mandate;

INVITED CEOS Members and Associates to nominate active representatives to the ad hoc WG-Edu;

TASKED the ad hoc WG-Edu to report to the 16th Plenary detailing the milestones achieved on the action plan to date.

The following actions were also agreed:

Action 15-7: Ad hoc WG-Edu to report to the 16th Plenary detailing the milestones achieved on the action plan to date.

Action 15-8: Interested CEOS agencies to nominate Ad Hoc WG-Edu representatives to Mukund Rao by 31st December 2001.

Stephen Briggs (ESA) suggested consideration of an 'Education and Training Summit' with ISRO as part of planning the 16th CEOS Plenary that ESA will host.

8. IGOS Themes

8.1. SIT Report

Jean-Louis Fellous (CNES) updated the meeting on significant events of the Strategic Implementation Team (SIT), informing the Plenary of the outcome of the 9th SIT meeting held in Paris in May 2001 as well as the conclusions of the breakfast meeting which had been held earlier that day before commencement of the CEOS Plenary. He reported that the IGOS Themes of Ocean and Carbon were both progressing. He noted that the Terrestrial Carbon component (TCO) of the Carbon theme had provided SIT with an extensive table of satellite data requirements. It was agreed that CEOS would see how this set of requirements folds into the overall strategy as it develops in the IGCO Theme Report in preparation, particularly in terms of priorities for related science and applications and integrated products, and then CEOS will respond to it.

Jean-Louis Fellous also updated the meeting on the progress on development of proposals for new IGOS Themes – relating to the Water Cycle, Coral Reefs, and Geological/Geophysical Hazards. The CEOS decision on these new themes was agreed as follows:

CEOS decided, in IGOS-P-8:

To recommend its endorsement of the Global Water Cycle theme.

To encourage the promoters of the Coral Reef theme to work at developing a broader Coastal Regions (or Coastal Ecosystems) Theme, adjacent to the Ocean Theme, with an initial focus on Coral Reefs as the first element.

Jean-Louis Fellous confirmed that he would be leaving CNES after the CEOS Plenary and would therefore be stepping down as the CNES Contact and the SIT Chairman. He expressed the wish for the future success of SIT and the need to ensure that future IGOS Themes are suitably broad, not too numerous, and include involvement of social scientists. He also confirmed that CNES was pleased to continue to lead the production of the IGOS Bulletin, but that a new Chair for the Editorial Board needed to be appointed.

The following decision, proposed by the Chairmen, was agreed:

CEOS offers sincere thanks to Jean-Louis Fellous of CNES, the retiring Chairman of SIT, and appoints Tillmann Mohr (EUMETSAT) as Chairman of the re-constituted SIT for a period of two years. The question of Vice-Chairman of SIT will be addressed at the 16th CEOS Plenary.

Tillmann Mohr expressed his willingness to serve as the new Chair of SIT.

9. Other Reports

9.1. CEOS Database

Don Hinsman (WMO) updated the meeting on the status of the CEOS Database. He summarized the inputs, which had been received during 2001 – and noted that he had also recently received updates from NRSCC and Roshydromet, which would be incorporated in the 2002 CD-ROM edition. He urged agencies to keep their points of contact up to date to allow WMO to keep in touch with requests for inputs and updates.

Don Hinsman noted that the database now features details on 179 different missions of CEOS members, including information on some 328 different instruments. He also noted that a new version of the Database Manual (version 1.3) had been developed, and distributed to CEOS agencies in May 2001. Don Hinsman gave special thanks to EUMETSAT for mastering the CD-ROMs.

The following action was agreed:

Action 15-09: Agencies to ensure that their designated focal point is correct for the 2002 update of the CEOS Database and to provide database updates to Don Hinsman by 31st August 2002, based on the CD-ROM prepared by WMO.

9.2. SFCG

Chu Ishida (NASDA) reminded the Plenary, that at the last meeting, on behalf of SFCG rapporteur Korehiro Maeda, he had reported on the outcomes of WRC2000 and provided a proposed CEOS Resolution as a position for the CPM-2002 and WRC-2003 meetings; and that Plenary had deferred adoption of the Resolution to the 15th CEOS Plenary.

Nobuhiro Kawajiri (NASDA) gave a presentation outlining the preparations for the CPM-2002 and WRC-2003, and stressed the importance of CEOS agencies adopting a common position in order to secure the proper operation of future remote sensing instruments and their supporting communications systems.

The following decisions were agreed:

CEOS appointed Edoardo Marelli of ESA as the new rapporteur of CEOS regarding the activities of the Space Frequency Coordination Group (SFCG) until the end of ESA's Chairmanship of CEOS.

CEOS adopted the following resolution as an essential preparation for CPM-2002 and WRC-2003:

Resolution on the contribution of CEOS to CPM-02 and WRC-2003

The 15th Plenary of CEOS (Kyoto, Japan, 6-7 November 2001)

Noting

the revised report of the CEOS ad hoc coordination group on spectrum management based upon results of WRC-2000 and discussion in CEOS, and recognizing the importance of passive and active sensors for Earth observation;

Decides to:

propose and support the following items in appropriate meetings for CPM-02 and WRC-2003 on:
- Allocation of 6MHz for Space-borne SAR using 420-470 MHz (1.38 of Res.800 (WRC-2000));

- Expansion of 5250-5460 MHz to 5250-5570 MHz for Space-borne SAR and altimeter (1.5 of Res.800 (WRC-2000));
- Exclusion of footnote S5.551A for Space-borne precipitation radar using 35.5-35.6 GHz (1.12 of Res.800 (WRC-2000) and Res.730 (WRC-2000)) ;
- Sharing conditions included in Radio Regulations for Space-borne passive sensors using 36-37 GHz (1.12 of Res.800 (WRC-2000));
- Appropriate limit for out-of-band emission of active services to protect EESS (passive) (1.8.2 of Res.800 (WRC-2000));

propose and support agenda items for WRC-2005/2006 in appropriate meeting for CPM-02 and WRC-2003 on:

- Primary allocation of Space-borne passive sensors using 4.2-4.4 GHz (2.7 of Res.801 (WRC-2000));
- Revision of S5.332 and S5.335A for Space-borne SAR using 1215-1300 MHz to promote the status of the SAR with the understanding that wind profilers will not be adversely impacted (2.13 of Res.801 (WRC-2000));
- Table allocation for Space-borne and Earth-based passive sensors above 275 GHz (2.3 of Res.801 (WRC-2000));
- Allocation of Earth-based passive sensors above 200 GHz.
- Possible modification of S5.482 to protect Space-borne sensor in 10.6-10.68 GHz.

Don Hinsman (WMO) confirmed that WMO was very supportive of all the proposed CEOS recommendations and welcomed the appointment of Edoardo Marelli as the new SFCG rapporteur.

Yoji Furuhashi (Chairman) acknowledged the contribution of Korehiro Maeda of NASDA over many years as rapporteur in co-ordinating proposals of CEOS for SFCG regarding the WRC.

10. Relevant Initiatives

10.1. World Summit on Sustainable Development 2002

Stephen Briggs (ESA) noted that the World Summit on Sustainable Development (WSSD 2002) would be held in Johannesburg, South Africa in 2002, - probably in August/September - and that this represented an excellent opportunity for CEOS to demonstrate how far Earth observation and its benefits have developed since the UNCED conference in Rio de Janeiro in 1992. Since WSSD 2002 falls within ESA's term of CEOS Chairmanship and IGOS Co-Chairmanship, ESA will focus on this opportunity as a priority activity during 2002.

He suggested that CEOS should consider how best to collaborate with its partners in IGOS-P that already have existing links into the key environmental convention secretariats (such as GCOS and its work with UNFCCC).

Naomasa Murakoshi (NASDA) presented a proposal from NASDA on a way forward for CEOS to prepare for WSSD 2002, including the establishment of a small drafting group to develop texts for the meeting and the preparatory meetings (PrepCom II: 28th January – 8th February; PrepCom III: 25th

March – 5th April). He suggested that CEOS members, in preparing for WSSD 2002, need to heed the lessons of past efforts to promote Earth observation benefits in such fora, such as at Rio+5 and CSD-9.

Stephen Briggs suggested that the drafting group would focus on the preparation of background material and on consultation with stakeholders.

A number of members expressed support for the initiative and provided comments on the proposals for WSSD. A common theme of these comments was that CEOS must recognise the needs and interests of the WSSD Conference and its participants. The key themes of the event will be alleviation of poverty and sustainable development. CEOS must consider how - as part of its future strategy - to position itself to serve these needs and to inspire the interest of the developing countries involved in WSSD and events like it. Initiatives to improve EO data availability, and its application to key sustainable indicators were suggested as some of the possible themes for CEOS to consider. USGS, NRSCC, CSIR, and Roshydromet all expressed support for the planned efforts and offered contributions of information on their national EO application programmes, if required.

Stephen Briggs thanked Plenary participants for their strong support and confirmed that ESA would take note of the many ideas and comments that had been received.

The following decisions were agreed:

CEOS decided:

To establish a small drafting group, under the leadership of the CEOS Chairman, focused on preparations for the World Summit on Sustainable Development 2002.

That, with a view to assisting national delegations at PrepCom II for the World Summit (New York, 28 January - 8 February 2002), this group will prepare a short explanatory paper on the progress in remote-sensing and its applications that has been achieved in the implementation of Agenda 21 and the Programme for the Further Implementation of Agenda 21.

The group should also prepare short draft texts to be offered to national delegations for decision at PrepCom III (New York, 25 March - 5 April 2002).

10.2. UNISPACE III follow-up

Sergio Camacho (UNOOSA) reminded the meeting that he had reported to the 14th CEOS Plenary on UNOOSA activities following UNISPACE III. His presentation to the 15th Plenary summarised the latest status of UNOOSA efforts to follow up UNISPACE III recommendations, including:

- Establishment of COPUOS action teams in 2001 to address specific UNISPACE recommendations;
- Prioritisation of the UNISPACE recommendations by the Scientific and Technical Subcommittee;
- Agreement that permanent observers to COPUOS were invited to participate in action teams; The first meeting had been held (October 2001) of an action team to implement an integrated, global system to manage natural disaster mitigation, relief and prevention efforts; The considerable opportunities for participation of CEOS and IGOS-P representatives in the process.

A decision on this issue was agreed as follows:

CEOS

agreed that CEOS participation in UNISPACE III follow-up actions is extremely important;

decided to seek observer status for CEOS in COPUOS in order to be better informed about future developments.

11. CEOS Planning

11.1. Next Plenaries

The future CEOS Chair agencies reported on the status of planning of CEOS Plenary meetings, summarised as:

Agency (Year)	Venue	Dates and information
ESA (2002)	ESA ESRIN, Frascati, Italy	* 19 th – 21 st November 2002 * 1.5 days Plenary meeting * Possible Open Session on Education and Training * Other events under consideration
NOAA (2003)	Washington DC area, USA	November 2003
China	TBD, China	TBD
TBD	TBD	The Chairman indicated that proposals would be invited from potential hosts

12. Updates on Significant Events by Members and Associates

NOAA, NASA, ESA, EC, CSA, SNSB, ISRO, ISPRS, NASDA, and China presented brief reports on major events since last Plenary. Written reports were also provided in advance by CSIRO, DLR and NASDA.

13. Other Business

13.1 Transition of Consolidated Report

Leslie Charles (NASA) noted that NASA had produced a CEOS Consolidated Report every year since 1991 as a summary record of the year's CEOS activities, mostly for internal CEOS reference. With the emergence of the CEOS Newsletter and widespread use of the Internet as an information source, NASA had proposed to the 14th Plenary that the contents of the Consolidated Report move to the CEOS website (CII), which will provide an ongoing and current record of all CEOS activities.

Leslie Charles noted that NASA had designed the new look for the CEOS website, and that NASDA, with the CII task team of WGISS, had arranged for it to be hosted on a NASDA server in Japan. The site had been reviewed by the CEOS Secretariat and uploaded in time for use as the document repository for the 15th Plenary. She added that NASA would also consider the production of a CEOS annual report as a brief executive type document, featuring just the main accomplishments of the CEOS year.

CEOS noted the significant achievement of NASA and NASDA in establishing the new CII and encouraged all members to provide feedback.

Action 15-10: CEOS agencies and Working Groups to provide any updates and/or suggestions for the new CII website to Leslie Charles of NASA

13.2 ESA proposal for the CEOS Handbook

Josef Aschbacher outlined ESA's plans to develop an updated edition of the CEOS Handbook during 2002 and to use the opportunity of WSSD 2002 for its distribution. He noted that the main objectives and scope of the document were similar to the previous editions, and that:

- Its aim would be to highlight the role of Earth observation in support of global governance and the increasing use of Space technology as a vital element in the development of operational information services; The target readership was decision makers within the Space and policy making communities;
- The document would be structured in two parts: Part 1 - Global environmental issues and the role for Earth observations; Part 2: Earth observation satellite capabilities and plans; The Handbook would be completed by June/July 2002 in time for distribution to relevant WSSD participants;
- The Handbook will be available in printed, CD-ROM, and on-line versions.

It was agreed that the Handbook should be sensitive to the needs of the themes and participants of WSSD 2002 but that, in order to ensure a longer shelf life, it would need to be more multi-purpose in nature.

Action 15-11: CEOS Chairman to establish a small drafting group focused on the issues relating to preparation of CEOS inputs including the CEOS Handbook to the World Summit on Sustainable Development (Johannesburg, Sept 2002) and its preparatory meetings

Action 15-12: CEOS agencies to note and provide comments on the ESA proposal for the CEOS Handbook

Action 15-13: CEOS agencies to support future requests from ESA's CEOS Handbook team for assistance on information, text, and imagery for the Handbook

14. Review of Action Items

Yoji Furuhashi presented a draft list of the action items from the 15th CEOS Plenary meeting. He confirmed that the list would be refined to take account of last minute comments in the meeting and would be posted on the CEOS website to allow participants to comment. The actions would then be finalised. Similarly, a draft list of decisions, as a summary record of the key conclusions of the meeting, would be prepared and posted on the website.

The lists of actions and decisions are repeated here as annexes B and C respectively.

15. Chair handover to ESA

Tomiji Sugawa (MEXT), as Co-Chairman, reviewed the achievements of CEOS during the last year and officially handed over the CEOS Chairmanship to Stephen Briggs (ESA). Stephen Briggs said that ESA was delighted to accept the Chairmanship at this challenging time for CEOS and that he looked forward to contributing to the conclusion of the CEOS Review Team efforts and to strengthening the CEOS

relationship with IGOS-P. On behalf of all CEOS members, he thanked MEXT and NASDA for their excellent efforts during 2001.

16. Adjourn

Tomiji Sugawa (MEXT) and Yoji Furuhashi (NASDA), as Co-Chairmen, thanked all participants of the 15th CEOS Plenary meeting for their productive participation and wished them a safe journey home. They looked forward to meeting everyone again at the 16th Plenary in Frascati, Italy.

A Extract from the CEOS Review Team Report

The Terms of Reference of SIT

The CEOS Strategic Implementation Team will:

- (a) For each IGOS P approved Theme, seek commitments to cover the needs of the Theme, and monitor the realisation of the commitments (this will constitute the major part of the SIT work);*
- (b) When a Theme has reached Implementation stage, ensure that there is an appropriate Space component representative in each Theme's Implementation Team. This representative will report regularly to the Chairman of the SIT, and will look to him for support in carrying out CEOS commitments;*
- (c) Act as a focal point for all IGOS-P related matters of interest to CEOS. The Chairman will keep the CEOS Chairman regularly informed and briefed, particularly in connection with IGOS-P meetings, where the CEOS Chairman and the Chairman of SIT will be the formal CEOS representatives;*
- (d) Report to CEOS Plenary on IGOS-P matters requiring discussion or decision by CEOS Plenary, and arrange for appropriate action to be taken.*
- (e) Develop, implement and review strategies for outreach and education on IGOS-P issues relating to CEOS;*
- (f) Work to achieve greater synergy between the research satellite and operational satellite communities in building upon proven research instrumentation to develop future generation operational monitoring capabilities.*

Participation is open to all CEOS Members who have made, or intend in the near future to make, a contribution to an IGOS-P Theme or other IGOS-P activity. The Chairman may invite observers as appropriate.

Representatives to SIT should be mandated by the organisation they represent to make commitments at or shortly after meetings, in order to facilitate the implementation process.

The SIT Chairman will be elected by the CEOS Plenary for a two-year term, (possibly open to extension). The SIT Chairman will be a senior Space agency official, from a different agency than the CEOS Chairman. The SIT Chairman will also serve as the CEOS Vice-Chairman for IGOS-P Affairs and be a member of the CEOS Secretariat.

The Chairman will arrange meetings of SIT as needed to strategically address Space agency commitments to IGOS Themes - once those Themes reach a mature stage of development, and to address implementation of such commitments. The Chairman will convene the meetings at a time and place which will facilitate the participation of as many interested and active representatives as possible. In each case the Chairman will provide an agenda in good time prior to the meeting, so that representatives may elect to limit their participation to meetings where they have a direct interest. In addition, the Chairman will, as needed, pursue inter-sessional contacts with SIT Member Principals and work together with the CEOS Chairman and CEOS Secretariat to keep all CEOS agencies informed of IGOS-P activities and issues during the period between CEOS Plenaries.

The Chairman will ensure that Plenary is adequately consulted and informed, but will rigorously avoid repetition of lengthy presentations already made in SIT and/or IGOS-P.

The SIT will be supported by the CEOS Secretariat.

B 15th CEOS Plenary action items

No.	Description
15-01	CEOS Chairman to work with UNESCO (United Nations Educational, Scientific and Cultural Organization) and MACRES (Malaysian Centre for Remote Sensing) with regard to their interest in applying for CEOS membership or associate status and to report to the 16 th Plenary.
15-02	CEOS Chairman to lead the CEOS Review Team for a further year in order to develop a new CEOS Strategic Plan. The Strategy will address the full range of activities and structure within CEOS, including the CEOS Working Groups. The Chairman shall report the results to the 16 th CEOS Plenary.
15-03	Interested CEOS agencies to contact the WGISS Chair to identify interest in championing the collaboration between WGISS and WGCV (by end Jan 02)
15-04	Interested CEOS agencies to contact the WGISS Chair to identify their interest in providing participants and/or additional resources to support WGISS Test Facility collaborative projects (by end Jan 02).
15-05	DMSG to present CEOS Plenary 2002 with a final report including a set of recommendations for the way forward in this area.
15-06	Interested CEOS agencies to consider and respond to the DMSG Chair, by 15 th February 2002, to the relevant recommendations contained in the 2001 DMSG report.
15-07	Ad hoc WGEdu to report to the 16 th Plenary detailing the milestones achieved on the action plan to date
15-08	Interested CEOS agencies to nominate active Ad Hoc WGEdu representatives to Mukund Rao by 31 st December 2001
15-09	Agencies to ensure that their designated focal point is correct for the 2002 update of the CEOS Database and to provide database updates to Dr Don Hinsman by 31 st August 2002, using a CD ROM to be provided by WMO
15-10	CEOS agencies and Working Groups to provide any updates and/or suggestions for the new CII WWW site to Leslie Charles of NASA
15-11	CEOS Chairman to establish a small drafting group focused on the issues relating to preparation of CEOS inputs including the CEOS Handbook to the World Summit on Sustainable Development (Johannesburg, Sept 2002) and its preparatory meetings
15-12	CEOS agencies to note and provide comments on the ESA proposal for the CEOS Handbook
15-13	CEOS agencies to support future requests from ESA's CEOS Handbook team for assistance on information, text, and imagery for the Handbook

C 15th CEOS Plenary decisions

No.	Description
15-01	<p>Membership</p> <p>CEOS agreed to admit the Korean Aerospace Research Institute (KARI) as a Member of CEOS, and the Geo-informatics and Space Technology Department of Thailand (GISTDA) as an Associate of CEOS, with immediate effect.</p>
15-02	<p>CEOS Review Team</p> <p>CEOS decided</p> <ol style="list-style-type: none"> 1. To endorse the CEOS Review Team Report recommendations. 2. To extend the mandate of the CEOS Review Team under ESA Chairmanship of CEOS to address the full range of activities and structures within CEOS, including the CEOS Working Groups, and to develop a new CEOS Strategic Plan. 3. To replace ad-hoc SIT with a standing working group – retaining the Strategic Implementation Team (SIT) name (subject to the final conclusions of 5. below). 4. If IGOS-P decides on a co-chairmanship including a co-chair from CEOS, the CEOS Chairman will be the IGOS Co-Chairman. The CEOS formal representation to IGOS-P will be the CEOS Chairman and the SIT Chairman. The past and incoming CEOS Chairman and the SIT vice-Chairman would also attend IGOS-P meetings. 5. The SIT terms of reference contained in the CRT Review are approved for one year and the continuation of the CRT Review will, inter alia, re-appraise these ToRs. Any modifications to be submitted for the consideration of CEOS Plenary 16. 6. The duration of the post of the new Strategic Implementation Team Chairman is two years - with the possibility of extension.
15-03	<p>IGOS-P Structure and Management</p> <p>CEOS Plenary Members decided the following position to take to the IGOS-P-8 meeting:</p> <ol style="list-style-type: none"> 1. CEOS has no objection to IGOS-P holding one annual meeting instead of two, and for this meeting to be thus detached from the annual cycle of CEOS Plenaries. CEOS would support that the IGOS-P Chairman or Chairmen should be able to convene extraordinary meetings if these are judged necessary for the efficient conduct of IGOS-P business. 2. CEOS accepts the principle of joint chairmanship for IGOS-P, with one Chairman nominated by CEOS (the CEOS Chairman) and one by consensus among other Partners. This arrangement could come into effect immediately after IGOS-P8. 3. If 2 above is accepted, CEOS proposes to nominate as its IGOS-P Co-Chairman the CEOS Chairman. Each CEOS Chairman would serve as IGOS-P Co-Chairman for a one-year period. The other IGOS-P Co-Chairman could still serve for a two-year period. The CEOS one-year terms would be from CEOS Plenary to CEOS Plenary. The Chairman of the CEOS Strategic Implementation Team will also be an official representative of CEOS to IGOS-P meetings and will be the focal point for working issues related to CEOS input to IGOS themes. 4. CEOS does not support the notion of employing paid full-time staff for the IGOS-P Secretariat, and prefers to encourage each Partner to make its own arrangements for IGOS-P Secretariat support, consistent with the "best efforts" principle. Each IGOS-P Co-Chairman should nominate aide(s) (for the duration of his chairmanship) to serve with the other IGOS-P Secretariat members. 5. CEOS is not convinced of the utility of formally grouping IGOS Partners (as first suggested in the WMO proposal to IGOS Partners), since all Partners, irrespective of group, should have the same rights and obligations.

	<p>6. CEOS would support a system whereby new IGOS Partners need first to be proposed by two existing Partners, and then accepted by consensus of all the Partners. Candidates must be able to demonstrate that mutual benefit would result from their admission.</p> <p>7. In the particular case of GOS/GAW, CEOS would welcome its immediate entry as a Partner.</p>
15-04	<p>IGOS-P structure and management (cont'd)</p> <p><i>CEOS proposed that the recommendations proposed by WMO be adopted by IGOS-P to incorporate the following revisions:</i></p> <p>Recommendation #1 – The principal objectives of the strategy should be to address how well user requirements are being met by the existing mix of <u>observations, including those of the global observing systems</u>, and how they could be met in the future through better integration and optimization of remote-sensing (especially Space-based) and <i>in situ</i> systems.</p> <p>Recommendation #2 - The strategy should serve as guidance to those responsible for defining and implementing individual observing systems. The implementation of the strategy, i.e. the establishment and maintenance of the components of an integrated global observing system, must remain with those governments and organizations with commitments as expressed, <u>for example</u>, within the governing councils of the observing systems' sponsors.</p> <p>Recommendation #3 - The "theme" approach should be a step-wise internal process based on perceived priorities towards the development of an integrated global observing strategy.</p> <p>Recommendation #4 – CEOS proposes that this recommendation should not be pursued.</p>
15-05	<p>WGISS</p> <p>Noting that CEOS Plenary 2000 directed WGISS to pursue the Test Facility collaboration with interested parties, and noting the successful collaboration between WGISS and GOFC, CEOS directed WGISS to continue to pursue such work with interested parties and to report back to Plenary 2002.</p> <p>CEOS approved:</p> <ul style="list-style-type: none"> - Terry Fisher of CCRS as the new WGISS Chair - John Faundeen of USGS as the new WGISS vice-Chair <p>CEOS endorsed:</p> <ul style="list-style-type: none"> - the WGISS initiatives with respect to Grid / e-science. - the proposed joint effort between WGISS and WGCV
15-06	<p>WGCV</p> <p>1. CEOS endorsed:</p> <p>appointment of new Chairs for four subgroups of WGCV: Infrared and Visible Optical Sensors subgroup (M Rast, ESA), Microwave Sensors subgroup (M Martin Neira, ESA), Synthetic Aperture Radar subgroup (M Shimada, NASDA) and Terrain Mapping subgroup (J Peter Muller, UCL); appointment of new WGCV Secretariat for three-year period; the Work Plan 2000 –2002 (Issue 2.5) decided by WGCV.</p> <p>2. CEOS endorsed the establishment of a new subgroup of WGCV on atmospheric chemistry with the following mission and objectives:</p> <p>(a) Mission: To ensure high quality, traceable calibration of atmospheric chemistry data from Earth Observation satellites and the validation of higher level products.</p> <p>(b) Objectives: To promote international collaboration and technical exchange of data relating to calibration/validation of</p>

	<p>atmospheric sensors and to thus assist in the improved atmospheric chemistry application of satellite data.</p> <p>To include all instrumentation (ground-based, airborne, balloon-based and satellite) that supports the calibration/validation of atmospheric sensors, and to encourage traceability of the calibration of these sensors.</p> <p>To identify a global network of validation sites and to encourage continuous observation and inter-comparison of data from these sites.</p> <p>To ensure the validation of Level 2 and higher level products.</p> <p>To encourage the further development of data assimilation facilities to be used for validation.</p> <p>(c) <i>Chair:</i> CEOS endorses the proposed appointment for chair of the Atmospheric Chemistry Subgroup: Dr Ernest Hilsenrath NASA GSFC.</p> <p>3. CEOS encouraged close collaboration between WGCV and CEOS working groups, especially with WGISS for data sharing for calibration and validation activities.</p> <p>4. CEOS endorsed the joint WGCV/WGISS proposal for "CEOS Land Product Validation Core Sites" and invites WGISS to consider it for adoption.</p> <p>5. CEOS encouraged WGCV to promote and enhance alliances with:</p> <ul style="list-style-type: none">(1) other organisations, particularly by working more closely with ISPRS;(2) Science Projects such as CEOP and GOFIC;(3) IGOS Theme Teams including TCO; <p>for greater efficiency and elimination of any duplication of work, and to come to Plenary with specific proposals for implementation or action.</p> <p>6. CEOS approves the formation of a joint ISPRS/WGCV taskforce to address geometric and radiometric standards.</p> <p>7. Recognising the unique capability of SAR interferometry for the monitoring of small-scale surface deformation, and the need for long-term consistent data sets to deliver its full benefit, CEOS encouraged members to address, from the design phase onwards, the interoperability of SAR systems for relevant applications.</p> <p>8. Recognising the importance of measurements from Space of both terrestrial and oceanic carbon fluxes, in support of Kyoto Protocol monitoring, CEOS stresses the need for accurate calibration of relevant instrumentation (e.g. ALOS PALSAR over land and ENVISAT MERIS over ocean) and the importance of appropriate product validation to achieve such measurements.</p>
15-07	<p>DMSG</p> <p>1. CEOS extended its approval of the ad hoc Disaster Management Support Group (DMSG) for a final year</p> <p>2. CEOS accepted NOAA's offer to provide the chair for 2002, with continued support from the current vice chairs -- (EC/Research and CNES).</p> <p>3. CEOS directed DMSG to present to CEOS Plenary 2002 a final report with specific recommendations for the way forward in this area</p> <p>4. CEOS decided to co-sponsor (with the UN Office of Outer Space Affairs) regional workshops on the use of Earth observing satellites for disaster support.</p> <p>5. CEOS members and WGs are encouraged to support these workshops through participation of technical experts and funding.</p> <p>6. CEOS agencies are encouraged to respond to the recommendations of the DMSG 2001 Report "The Use of Earth Observing Satellites for Hazard Support: Assessments & Scenarios" and to provide inputs to the DMSG Chair.</p>

15-08	<p>WG-EDU</p> <p>CEOS adopted:</p> <p>- the following resolution on Earth observation education and training:</p> <p>The Fifteenth Plenary of the Committee on Earth Observation Satellites:</p> <p><u>Noting</u> the rapidly changing trends of Earth observation technology and the increasingly varied applications of Earth observation;</p> <p><u>Recognising</u> that these changing trends create the imperative for capability-building and capacity enhancement amongst all users of Earth observation technology, especially in developing countries;</p> <p><u>Recognising</u> the efforts of many Space agencies in support of Earth observation education and training, both at the national and international levels, and also their efforts in developing a substantial amount of training materials and teaching aids;</p> <p><u>Recognising</u> that there are various domestic, regional and international institutions already undertaking Earth observation education and training and that these institutions have enabled the wider outreach of Earth observation technology and applications around the world;</p> <p><u>Noting</u> the UN efforts to establish the UN Regional Centres for Space Science and Technology Education, the initiation of operational education and research programmes by these Centres, and the UNISPACE-III recommendations regarding Earth observations and education;</p> <p><u>Realising</u> that Earth observation applications have considerable societal outreach and that education and training efforts can be greatly assisted by government support and resources;</p> <p><u>Emphasizing</u> that the success of the CEOS strategy for Earth observation education and training will depend directly on the active and sustained participation of CEOS Members and Associates;</p> <p>THEREFORE:</p> <p>ADOPTED the CEOS Strategy for Earth Observation Education and Training as proposed by the ad hoc Working Group on Earth Observation Education and Training (WG-Edu) in its document entitled "CEOS Strategy for Earth Observation Training and Education, with special emphasis on the Developing World;"</p> <p>ADOPTED the three-year action plan for implementing the strategy as detailed in the document entitled "CEOS Strategy for Earth Observation Training and Education;"</p> <p>TASKED the ad hoc WG-Edu to initiate the implementation of the three-year action plan;</p> <p>EXTENDED the term of the WG-Edu for three years to carry out this mandate;</p> <p>INVITED CEOS Members and Associates to nominate active representatives to the ad hoc WG-Edu;</p> <p>TASKED the ad hoc WG-Edu to report to the 16th Plenary detailing the milestones achieved on the action plan to date.</p>
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15-09	<p>SIT</p> <p>CEOS decided, in IGOS-P-8:</p> <p>To recommend its endorsement of the Global Water Cycle theme.</p> <p>To encourage the promoters of the Coral Reef theme to work at developing a broader Coastal Regions (or Coastal Ecosystems) Theme, adjacent to the Ocean Theme, with an initial focus on Coral Reefs as the first element</p> <p>CEOS offers sincere thanks to Jean-Louis Fellous of CNES, the retiring Chairman of SIT, and appoints Tillmann Mohr (EUMETSAT) as Chairman of the re-constituted SIT. The question of Vice-Chairman of SIT will be addressed at the 16th CEOS Plenary.</p>
15-10	<p>SFCG</p> <p>CEOS appointed Edoardo Marelli of ESA as the new rapporteur of CEOS regarding the activities of the Space Frequency Coordination Group (SFCG) until the end of ESA's Chairmanship of CEOS.</p> <p>CEOS adopted the following resolution as an essential preparation for CPM-2002 and WRC-2003:</p> <p style="text-align: center;">Draft Resolution on the contribution of CEOS to CPM-02 and WRC-2003</p> <p>The 15th Plenary of CEOS (Kyoto, Japan, 6-7 November 2001)</p> <p>Noting</p> <p>the revised report of the CEOS ad hoc coordination group on spectrum management based upon results of WRC-2000 and discussion in CEOS, and recognizing the importance of passive and active sensors for Earth observation;</p> <p>Decides to:</p> <p>propose and support the following items in appropriate meetings for CPM-02 and WRC-2003 on:</p> <ul style="list-style-type: none"> - Allocation of 6MHz for Space-borne SAR using 420-470 MHz (1.38 of Res.800 (WRC-2000)); - Expansion of 5250-5460 MHz to 5250-5570 MHz for Space-borne SAR and altimeter (1.5 of Res.800 (WRC-2000)); - Exclusion of footnote S5.551A for Space-borne precipitation radar using 35.5-35.6 GHz (1.12 of Res.800 (WRC-2000) and Res.730 (WRC-2000)) ; - Sharing conditions included in Radio Regulations for Space-borne passive sensors using 36-37 GHz (1.12 of Res.800 (WRC-2000)); - Appropriate limit for out-of-band emission of active services to protect EESS (passive) (1.8.2 of Res.800 (WRC-2000)); <p>propose and support agenda items for WRC-2005/2006 in appropriate meeting for CPM-02 and WRC-2003 on:</p> <ul style="list-style-type: none"> - Primary allocation of Space-borne passive sensors using 4.2-4.4 GHz (2.7 of Res.801 (WRC-2000)); - Revision of S5.332 and S5.335A for Space-borne SAR using 1215-1300 MHz to promote the status of the SAR with the understanding that wind profilers will not be adversely impacted (2.13 of Res.801 (WRC-2000)); - Table allocation for Space-borne and Earth-based passive sensors above 275 GHz (2.3 of Res.801 (WRC-2000)); - Allocation of Earth-based passive sensors above 200 GHz. - Possible modification of S5.482 to protect Space-borne sensor in 10.6-10.68 GHz.

15-11	World Summit on Sustainable Development 2002 CEOS decided: to establish a small drafting group, under the leadership of the CEOS Chairman, focused on preparations for the World Summit on Sustainable Development 2002. That, with a view to assisting national delegations at PrepCom II for the World Summit (New York, 28 January - 8 February 2002), this group will prepare a short explanatory paper on the progress in remote-sensing and its applications that has been achieved in the implementation of Agenda 21 and the Programme for the Further Implementation of Agenda 21. The group should also prepare short draft texts to be offered to national delegations for decision at PrepCom III (New York, 25 March - 5 April 2002).
15-12	UNISPACE III follow-up CEOS agreed that CEOS participation in UNISPACE III follow-up actions is extremely important; decided to seek observer status for CEOS in COPUOS in order to be better informed about future developments.
15-13	Next Plenaries 2002: ESA, Frascati, 19-21 November 2003: NOAA: Washington DC, November 2004: China 2005: European region, host TBA
15-14	Transition of consolidated report CEOS noted the significant achievement of NASDA and NASA in establishing the new CII and encouraged all members to provide feedback.
15-15	CEOS Handbook CEOS encouraged all members to provide comments to ESA on their outline proposal for a 2002 Handbook and to support future requests for text and imagery for the document

Results of the 15th Plenary of the Committee on Earth Observation Satellites (CEOS) and the 8th Meeting of the Integrated Global Observing Strategy (IGOS) Partners held in Kyoto, Japan, November 6-8: NOAA was represented at the 15th CEOS Plenary, November 6-7, in Kyoto, Japan, by NESDIS Assistant Administrator Gregory W. Withee (CEOS Principal), Office of Satellite Data Processing and Distribution Director Helen Wood (Chair of the CEOS Disaster Management Support Group) and by NESDIS International and Interagency Affairs Chief Brent Smith (CEOS Point-of-Contact and member of the CEOS and IGOS Secretariats). Withee, and Smith also participated as observers at the 8th meeting of the IGOS Partners on November 8. The CEOS Plenary and IGOS Partners meetings were chaired by Yoji Furuhashi, Executive Director of the National Space Development Agency of Japan (NASDA). Chairmanship of CEOS and Co-Chairmanship of IGOS passed at these meetings to the European Space Agency (ESA). **Mr. Withee will become Chairman of CEOS and Co-Chairman of IGOS next November when NOAA succeeds ESA in leading these organizations.** The IGOS Partnership consists of CEOS (representing the space agencies), WMO, UNEP, FAO, IOC, UNESCO, ICSU, IGBP, WCRP, IGFA, and the three global observing systems, GCOS, GOOS and GTOS. NOAA participants in Kyoto held side meetings with senior representatives of EUMETSAT, NASDA and the Japan Meteorological Agency (JMA) as well as a meeting among the partners in the Jason-2 satellite altimetry mission (NOAA, NASA, EUMETSAT and the French space agency, CNES).

Highlights of the CEOS and IGOS meetings and various side meetings of relevance to NOAA are as follows:

- **CEOS replaced its ad-hoc Strategic Implementation Team (SIT) with a standing working group, retaining the SIT name.** EUMETSAT Director-General Tillmann Mohr succeeds Jean-Louis Fellous of CNES as SIT Chair. The next SIT meeting will be February 21-22, 2002, in Darmstadt, Germany. SIT will continue to focus its efforts on securing space agency commitments for IGOS themes. **At a breakfast meeting in Kyoto, SIT endorsed development of an IGOS Global Water Cycle Theme and encouraged the promoters of an IGOS Coral Reef Theme to work at developing a broader Coastal Ecosystems Theme with an initial focus on Coral Reefs as the first element.** SIT Terms of Reference, as proposed by a CEOS Review Team, were approved for one year, subject to reappraisal at next year's Plenary.
- **The CEOS Chairman was asked to lead the CEOS Review Team for a further year in order to address the full range of activities and structure within CEOS, including the CEOS Working Groups, and to develop a new CEOS Strategic Plan.**
- **CEOS extended its approval of the ad hoc Disaster Management Support Group (DMSG) for a final year, accepting NOAA's offer to provide the Chair (Helen Wood) for 2002.** DMSG is directed to provide a final report to the 2002 Plenary with specific recommendations for the way forward in the disaster management area. CEOS agreed to co-sponsor (with the United Nations Office of Outer Space Affairs) regional workshops on the use of Earth observing satellites for disaster support with CEOS members and working groups encouraged to support these workshops through

participation of technical experts and funding. CEOS Members were tasked to consider and respond, by February 15, 2002, to the recommendations contained in the 2001 DMSG report.

- The CEOS Working Group on Systems and Services (WGISS) received high compliments for a demonstration at the Plenary of its Test Facility collaboration with the Global Observation Forest Cover (GOFC) project, with Professor John Townshend of the University of Maryland leading the demonstration together with incoming WGISS Chair Terry Fisher of the Canada Centre for Remote Sensing. WGISS was directed to pursue further Test Facility collaboration with interested parties. The Plenary further endorsed WGISS initiatives with respect to Grid/e-science, proposed joint collaboration between WGISS and the CEOS Working Group on Calibration/Validation, and the selection of John Faundeen of USGS as the new WGISS Vice-Chair.
- The CEOS Working Group on Calibration/Validation (WGCV) presented its Work Plan 2000-2002 which was endorsed by the Plenary. The Plenary further endorsed the establishment of a new atmospheric chemistry subgroup of WGCV to be led by Dr. Ernest Hilsenrath of NASA Goddard Space Flight Center, the appointment of new Chairs for four WGCV subgroups, and a WGCV/WGISS proposal for "CEOS Land Product Validation Core Sites."
- The Plenary adopted the CEOS Strategy for Earth Observation Education and Training as proposed by the ad hoc Working Group on Earth Observation Education and Training (WGEdu) and the WGEdu three-year action plan for implementing the strategy.
- The Plenary decided to establish a small drafting group under the leadership of the new ESA Chairman of CEOS to focus CEOS preparations for the upcoming Johannesburg World Summit on Sustainable Development (WSSD). This group will prepare a short explanatory paper on the progress in remote sensing and its applications that has been achieved with respect to Agenda 21 of the 1992 Rio Earth Summit. **The CEOS Chairman was apprised of the roles of Linda Moodie and her staff members in their involvement with the development of USG preparations for WSSD with the expectation that CEOS could call on their expertise.**
- The Korean Aerospace Research Institute (KARI) was admitted as a CEOS Member. The Geo-informatics and Space Technology Department of Thailand (GISTDA) was admitted as a CEOS Associate.
- NASDA turned over the CEOS Chairmanship to ESA, to be followed in November 2002 by NOAA, and in November 2003 by the National Remote Sensing Center of China. The 2002 Plenary will be held November 19-21, in Frascati, Italy.
- The IGOS Partners in their meeting adopted structural changes with the result that IGOS will in future meet only once per year (normally in the May/June time frame back-to-back with the annual meeting of the Sponsors Group of the Global Observing Systems). A Co-

Chairmanship system goes into immediate effect whereby the Partnership will have two Co-Chairs, one of whom is the CEOS Chair. Each Co-Chair post will be for a one-year duration (with the CEOS Co-Chair typically changing in November and the other Co-Chair changing in June—and hence providing a valuable overlap). Current Co-Chairs are the ESA Chairman of CEOS (Stephen Briggs acting for the yet unnamed Director of ESA Earth and Environmental Monitoring) and UNESCO (Walter Erdelen). **Greg Withee is thus in line as future CEOS Chair to also become IGOS Co-Chair in November 2002.**

- The IGOS Partners further agreed to maintain an active Secretariat in support of IGOS activities, resourced on a “best efforts” and “no exchange of funds” basis by Partners. Brent Smith is currently a CEOS member of the IGOS Secretariat. The Partners further adopted “information needs of the international conventions” as a permanent feature of IGOS meeting agendas.
- The Global Observing System/Global Atmosphere Watch of WMO was accepted as a new IGOS Partner.
- With respect to IGOS themes, the IGOS Partners in Kyoto approved the development of a Global Water Cycle Theme on a priority basis, encouraged the Geological Geophysical Hazards Theme Team to proceed with development of their theme proposal, **and approved a Coral Reef Sub-Theme as the first component of an expected IGOS Coastal Theme. With regard to this latter action, the Partners encouraged UNEP, IOC-UNESCO and CEOS (NOAA) and other interested parties to develop a short scoping paper on a broader IGOS Coastal Theme (reporting this to the IGOS-P-9 meeting next May) with the aim of developing a full Coastal Theme proposal for IGOS-P-10 in 2003. In side discussions in advance of this decision, Greg Withee was actively involved in signaling NOAA’s strong interest in a co-leadership role in development of this broader Coastal Theme, and NOAA will need to work with the other designated lead Partners in development of a scoping paper in the next few months. Al Strong of NESDIS is the designated co-lead with Arthur Dahl of UNEP of the coral reef activity which has been endorsed for further development as an IGOS Sub-Theme.**
- The Partners failed to endorse proposed Terms of Reference for an IGOS Visibility Group but did task the IGOS Co-Chairs to develop Terms of Reference for future consideration and to establish an ad-hoc IGOS Visibility Group to define and prepare IGOS activities and materials for the September 2002 World Summit on Sustainable Development and its preparatory process, both actions in full consultation with IGOS Partners. With respect to information needs of international conventions, the IGOS Partners agreed to support the Global Climate Observing System (GCOS) in developing the integrated approach to global climate observations and in its preparation of the second report on adequacy of observations for the 9th Conference of the Parties of the Framework Climate Convention.

- The next IGOS Partners meeting will be hosted by UNESCO in Paris, France, on May 31, 2002. NOAA as future CEOS Chair will have a co-lead role in organizing and potentially hosting the Spring 2003 IGOS Partners meeting.
- In a Kyoto side meeting with EUMETSAT Director-General Tillmann Mohr and EUMETSAT staff, Greg Withee and Brent Smith discussed the status of METOP-1 compatibility tests of NOAA instruments as well as planning for the planned December 3 meetings in Darmstadt, Germany, of the NOAA/EUMETSAT High-Level Working Group and annual bilateral.
- In a side meeting with NASDA Executive Director Yoji Furuhashi and NASDA staff, Greg Withee, Helen Wood and Brent Smith discussed NOAA's proposed way forward in working with the University of Alaska/Fairbanks to provide a North American node for reception (and thereby NOAA and USG access) of the planned Japanese Advanced Land Observing System (ALOS) satellite, NASDA plans to officially reschedule the launch of ADEOS-2 to November 2002, and plans for having the next meeting of the NOAA/NASDA Earth Observation Joint Working Group in early 2002 in Tokyo.
- In a side discussion with JMA Deputy Director-General Shuichi Teramae and JMA Climate and Marine Department Director Koichi Nagasaka (who traveled to Kyoto from Tokyo for the meeting), Greg Withee, Helen Wood and Brent Smith discussed JMA interest in exploring the potential of NOAA backup support for its ailing GMS-5 geostationary spacecraft to fill an anticipated gap prior to its delayed MTSAT-1R mission, contingent on USG consultations/approval, Japanese government approval of an urgent JMA budget supplemental, and formal negotiation of terms for such support.
- On November 8 in Kyoto, Greg Withee and NASA Associate Administrator Ghassem Asrar exchanged a NASA/NOAA letter of intent with a French space agency (CNES)/EUMETSAT letter of intent provided by EUMETSAT Director-General Tillmann Mohr and CNES Director of Earth Observation Jean-Louis Fellous. This exchange of letters signaled readiness by the four agencies to proceed with development of a Jason-2 satellite altimetry mission with a key element of this cooperation the intended involvement of operational agencies in collaborating with research agencies in the development and transition of operation of Jason-2 and potential follow-on altimetry missions. Jason-1, developed by NASA and CNES, is slated to be launched next month, on December 7 from Vandenberg Air Force Base. An announcement of the intended Jason-2 cooperation was then made by the four Parties to the IGOS Partners at their meeting later on November 8 as a tangible result of the IGOS process and specifically the IGOS Ocean Theme which had identified continuity of ocean altimetry as a priority area.