

16th CEOS Plenary Minutes

Frascati, 20th-21st November 2002

V1.0

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1. Welcome address and logistics information

The Chairman, José Achache (ESA), welcomed the participants to ESA ESRIN and to the 16th CEOS Plenary. He noted the large number of registrations as a sign of the strong interest in CEOS activities and plans.

Josef Aschbacher (ESA) reported on all key logistics information for the week of meetings.

2. Review and adoption of the Agenda

The agenda was adopted with the following minor revisions:

- the report by the SFCG was moved to the afternoon of the first day;
- NASDA was invited to make a presentation on the 3rd World Water Forum (in 2003) under item 8 on IGOS-P and SIT;
- NRSCC – as the CEOS Chair for 2004 - was invited to make a presentation on the Chinese space programme, under item 13 (CEOS Planning).

The Chairman advised that item 12 (Updates on significant events) should be limited to presentations on new items of interest to Plenary which require some action or decision. He noted that the standard country/agency reports were available via the Plenary WWW site and that participants should refer to those for full details.

3. Record of the 15th Plenary

The Chairman thanked NASDA/MEXT for providing the final minutes of the 15th CEOS Plenary and confirmed that all previous comments had been reflected by NASDA in the document.

The Chairman confirmed that all actions from the 15th CEOS Plenary were considered to be completed or expected to be resolved during the 16th CEOS Plenary. The following points were added:

- Don Hinsman (WMO) confirmed that 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 Dr Don Hinsman by 31st August 2002, using a CD ROM to be provided by WMO*) had been completed. He noted that all information in the CEOS Database was now up to date and was fully consistent with the new CEOS Handbook; a CD-ROM of the latest Database would be distributed to CEOS Agencies shortly;
- Leslie Kay (NASA) advised that NASA had received several inputs in response to action 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*). The CEOS WWW site receives considerable traffic of users wishing to obtain more information and is providing an excellent outreach function for CEOS. Leslie thanked NASDA for their role in hosting and updating the site.

The final minutes of the 15th CEOS Plenary were adopted without further comment.

4. Report of the Chairman

José Achache (ESA), as Chairman, gave a presentation on the activities of ESA during 2002 in their role as Chair Agency for CEOS, and provided an overview of some of the key events and activities of this period, including:

- strategy planning in the CEOS Review Team activity, including the development of a new 5 Year Plan to guide CEOS efforts;
- WSSD 2002 – where ESA, well supported by other CEOS members, led significant CEOS involvement in the preparatory process (the PrepCom meetings) throughout 2002 and the World Summit; CEOS participation was particularly rewarding, resulting in:
 - delivery of a CEOS statement by the Chairman in the WSSD Plenary;
 - 12 specific references to Earth observation in the Johannesburg Plan of Implementation;
 - 2 Type II Partnerships being launched (IGOS-P and CEOS EO Education and Training);
 - a CEOS stand and side events;
 - the CEOS WSSD Follow-up programme, the subject of the seminar arranged the day before the CEOS Plenary;
- active outreach and promotion of CEOS (and IGOS-P), including several new publications (including the Earth Observation Handbook (online at <http://www.eohandbook.com>) and the WSSD brochure (online at <http://www.esa.int/wssd/ceos>);
- significant technical and practical progress within the CEOS Working Groups and CEOS Secretariat;
- support to UNESCO in their application for Associate status.

The Chairman observed that it had been a very busy year for CEOS and he hoped that all participants would agree that it would be remembered as one of very significant achievement. He recalled that he had been appointed to the role of CEOS Chairman only in early 2002 – and he recognised the efforts of Stephen Briggs and Josef Aschbacher of ESA who had been responsible for the planning and implementation of the ESA efforts for CEOS throughout the year.

5. Membership Issues

The Chairman confirmed that he had received an application from the United Nations Educational, Scientific and Cultural Organization (UNESCO) to be accepted as an Associate of CEOS. He noted that the application had been reviewed by the Chair and the Secretariat, who considered that UNESCO satisfactorily met the relevant criteria for admission to CEOS as an Associate. The application letter had been distributed to CEOS Principals with the recommendation that CEOS admit UNESCO and allow their participation in the 16th CEOS Plenary meeting.

Walter Erdelen (UNESCO) outlined some of UNESCO's activities which he hoped could be of benefit to CEOS activities in the coming years, including:

- use of UNESCO networks and high level contacts to assist the developing and developed countries to co-operate on Earth observation issues;
- the transfer of knowledge and technology to help the developing world utilise Earth observation data;
- the new Space Hydrology International Partnership (involving UNESCO and ESA);

- UNESCO efforts to develop a space education programme (with ISPRS, IAF, COSPAR, and space agency partners) - with the aim of including space issues into the secondary education curriculum (UNESCO is interested in collaboration with CEOS WGEdu on the relevant issues).

The representatives of UNESCO, 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 application. The main points of this discussion were as follows:

- Yoji Furuhashi (NASDA) confirmed the support of NASDA/MEXT for UNESCO's application;
- Virendra Jha (CSA) added his support to UNESCO's application and suggested that WGEdu efforts should be harmonised with relevant UNESCO efforts.

The Chairman confirmed the unanimous decision of the 15th CEOS Plenary:

CEOS agreed to admit the United Nations Educational, Scientific and Cultural Organization (UNESCO) as an Associate of CEOS, with immediate effect.

The Chairman invited the representatives from UNESCO to rejoin the meeting and welcomed them - in their new capacity as Associate - to participate in the remainder of the meeting. On behalf of UNESCO, Walter Erdelen thanked the CEOS Plenary and ESA staff who had supported UNESCO throughout the application process, and looked forward to a fruitful cooperation.

In response to a query from the Chairman, Yoji Furuhashi (NASDA) confirmed that no further communication had been received from MACRES concerning their membership application and that the matter could be considered closed until further notice.

6. CEOS Review Team Report

6.1 Chairman's recommendations

Stephen Briggs (ESA), as Chairman of the CEOS Review Team 2 (CRT-2), reviewed the background to the CRT-2 effort, as presented in the meeting papers distributed to participants. He noted that the CEOS Review Team – which had first operated under NASDA Chairmanship during 2001 – had focused primarily on the relationship between CEOS and IGOS-P. The mandate of the Team had been extended a further year – under ESA – to address a wider range of issues and to report to the 16th Plenary. He noted that the Team had been very active during 2002 via a series of meetings and telecons, and had, as tasked, developed a draft report on its findings for distribution in advance of the Plenary.

The CRT-2 report focuses on 3 main recommendations:

- an extension in scope and permanence of the terms of reference of the SIT;
- proposals for priority areas for CEOS attention over the next 5 years:
 - positioning of CEOS in the international context;
 - mission coherence: cooperation in the development and management of remote sensing and associated data management programmes;
 - continued and strengthened involvement in the IGOS Partnership;
 - links with developing countries;
 - links with the commercial sector;
 - education and training;
 - calibration and validation;
 - information systems and services;

- disaster management support;
- full attendance at CEOS Plenary by all CEOS Principals and their attention to Plenary issues.

The main comments in the resulting discussion were as follows:

- Paula Freedman (BNSC) expressed the appreciation of BNSC for an excellent job by the CRT-2; she questioned on what basis the document would be updated in future and to what extent it might include measurable targets so that CEOS could monitor progress against the plan;
- Ghassem Asrar (NASA) suggested that it was not completely clear whether the document was intended to be for internal use only or also for external distribution – and whether it was for strategic or operational use;
- Don Hinsman (WMO) questioned whether the 5 Year Plan was intended to encompass the efforts of CEOS Associates as well as Members, and suggested that CEOS should recognise the important role of the Associates in helping CEOS to identify which missions and instruments should transition from research to operational status;
- Daniel Vidal-Madjar (CNES): highlighted the ongoing need for better links between Plenary targets and Working Group activities and the need for an improved interface;
- Christian Paternmann (EC) suggested that progress against the 5 Year Plan needs to be placed on the annual Plenary agenda with a systematic report on each of the elements, and more discussion on the implementation and monitoring of progress;
- Tillmann Mohr (EUMETAT) expressed his support for the 5 Year Plan but also noted that CEOS needs to identify the actions required to reflect the CRT-2 recommendations in the work of the CEOS Plenary; he repeated the call of the EC for steps to ensure that progress is monitored and noted that it was up to future Chairs to apply the paper in the actual business of CEOS.

In response, Stephen Briggs made a number of clarifications regarding the CRT-2 output:

- the CEOS Plan developed by CRT-2 is intended to be a working document for guidance, identifying priorities and the ways in which the elements of CEOS might work together to achieve them; it falls to the Chairman of CEOS to set the goals for each specific year and to introduce the mechanisms required for implementation; the CRT-2 document is not an implementation plan;
- the audience for the Plan is primarily ‘internal’ although additional background information on CEOS was included in case the document is distributed more widely;
- the term ‘CEOS agencies’ is not intended to be exclusive and refers to both Members and Associates of CEOS, without discrimination;
- CRT-2 recognised that there needs to be a stronger link between the CEOS Chairman and the Working Group Chairs, both at the start of the Chair’s year in office and in advance of the Plenary meeting in order to identify the optimal contribution from each of the WGs to the overall CEOS objectives;

6.2 Way ahead

Ghassem Asrar (NASA) thanked Stephen Briggs for the clarifications and acknowledged the thanks due to the CRT-2 members for such a great achievement. He proposed that the 16th Plenary adopt the document and repeated the comments of others that the incoming CEOS Chairs should recognise the need for their efforts to be guided by this new plan.

Greg Withee (NOAA) added his support for approval of the document, noting that the traditional CEOS annual cycle of Chairmanship – and in particular the way in which the incoming Chair announces his priorities and plans for the year at the end of the Plenary meeting without any opportunity for feedback or comment from Plenary – was an obstacle to continuity in the objectives of Chair agencies. He confirmed that NOAA would endeavour to explain its plans in suitable detail during the 16th Plenary and would invite CEOS Agencies to provide early feedback. To overcome this obstacle, Greg Withee proposed that:

- CEOS reinforce the concept of the ‘past, present, and future’ troika of Chairmen, as suggested by Prof. Achache, to ensure continuity in CEOS objectives and plan implementation;
- CEOS Plenary feature (as a standing item) more discussion on the plans of the incoming Chairman, and on progress of the preceding year against the targets set out in the 5 Year Plan.

The Chairman confirmed the decision of the Plenary with regards to the CEOS Review Team:

- 1) CEOS ENDORSES the goals set out in the 5 Year Plan.**
- 2) CEOS NOTES the importance of the active participation of Principals in CEOS Plenary meetings.**
- 3) CEOS ADOPTS as permanent the current Terms of Reference of SIT, amended to include the following additional remit:**

‘Since the SIT mechanism has proved to be effective in interfacing with IGOS-P, it could also be exploited in neighboring fields, for example in encouraging the transition from research programmes to operational systems, and in the coordination of mission planning. The chairman of CEOS should make use of the SIT to pursue such non-IGOS-P activities as appropriate’

- 4) CEOS AGREES to review and update the 5 Year Plan every 3 years.**

The following actions were confirmed:

- Action 16-01: CEOS Chair to reflect the priorities identified in the new 5 Year Plan in the activities planned for 2003**
- Action 16-02: CEOS Chair to reinforce the concept of the ‘past, present, and future’ troika of Chairmen to ensure continuity in CEOS objectives and plan implementation**
- Action 16-03: CEOS Chair to write to Principals to reaffirm the importance of their active participation at CEOS Plenary meetings**
- Action 16-04: CEOS Chair to investigate, with Working Group Chairs, mechanisms for closer involvement of the Working Groups in implementation of the CEOS 5 Year Plan – in connection with their respective work plans**

7. IGOS-P and SIT

7.1 IGOS-P Co-Chair’s Report

José Achache (ESA) – as the IGOS-P Co-Chair for 2002 – summarised the highlights of the last year for the IGOS Partnership:

IGOS-P-9: The 9th meeting of the IGOS Partners was held in Paris on the 31st May, 2002, hosted by UNESCO and co-Chaired by UNESCO (Walter Erdelen) and ESA (José Achache). Around 45 representatives from Partner organisations and from the Theme teams attended the event.

Implementation task force: Partners agreed to establish a Task Force (led by Don Hinsman of WMO) to develop a consensus on the role of the IGOS Partnership in the implementation of IGOS-P Themes – including a detailed proposal for monitoring the implementation process after a Theme Report has been approved. The Task Force will report to the Co-Chairmen and Partners by end December 2002.

IGOS Process Paper: An updated version of the IGOS Process Paper was adopted at IGOS-P-9.

IGOS Secretariat: IGOS-P agreed to maintain the current membership of the Secretariat, on the basis that:

- 'membership' is for an IGOS Partner, rather than a named individual;
- new members can be accepted by consensus of all other members of the Secretariat;
- members may suggest to be removed on their own initiative after informing the Secretariat;
- the updated list of the Secretariat to be presented annually to the IGOS-P Plenary.

IGOS Themes:

Integrated Global Carbon Observations (IGCO) Theme: The team plans to produce a draft report in November 02. The IGCO team has been reminded to take account of the review and adoption process by IGOS-P – including consideration by CEOS SIT.

Integrated Global Water Cycle Observations (IGWCO) Theme: A Report Writing Team and Report Advisory Group have been established. The first draft of the IGWCO Theme report is planned for April 2003 – with completion in September 2003.

Coral Reefs Sub-Theme/Potential Coastal Theme: Partners agreed that this would best be addressed within an IGOS Coastal Theme; given the status of key players (such as GOOS) it was agreed that the decision on the Coastal Theme and its scope and composition be revisited at IGOS-P-10 and that in the meantime the Coral Reefs Sub-Theme should proceed as proposed.

Geo-hazards Theme: This new theme covers the need for information on earthquakes, ground instability, and volcanoes – all driven by geological processes. The requirements address ongoing hazard management (mapping, monitoring, mitigation, and prediction) and the results are expected to contribute to risk assessment, response, and rehabilitation. A Theme report will be submitted by May 2003.

New themes and the overall number of themes: Partners agreed that efforts in 2002-3 should concentrate on implementing already approved themes; and that whilst new theme proposals may be considered, they must all be subject to a strict application of the existing acceptance criteria as outlined in the IGOS Process Paper.

Other issues:

WSSD 2002: IGOS-P was registered as a Type II Partnership of WSSD 2002 (a voluntary partnership aimed at implementing Type I (political) outcomes of the WSSD 2002).

Visibility Group: IGOS Partners confirmed their support for the work of the ad-hoc IGOS Visibility Group and encouraged their continued efforts towards WSSD 2002 and its outcomes. The mandate of the ad-hoc IGOS Visibility Group was extended until the 10th IGOS Partners meeting.

José Achache (ESA) confirmed that the 10th IGOS Partners meeting will be hosted by ICSU and held at UNESCO HQ, Paris on 5th June 2003. NOAA will take over IGOS-P Co-Chairmanship from ESA at the end of the 16th CEOS Plenary. FAO will take over IGOS-P Co-Chairmanship from UNESCO at IGOS-P-10.

Walter Erdelen (UNESCO) – as IGOS-P Co-Chair – confirmed that the report of José Achache was a good reflection of the activities of IGOS-P during 2002. He noted that the preparation for the WSSD event was an excellent demonstration of the benefits of active collaboration by the IGOS-P Co-chairs in order to raise visibility of IGOS-P. Walter Erdelen thanked ESA for the excellent support during its CEOS Chairmanship (and IGOS-P Co-chairmanship) and welcomed Greg Withee of NOAA as the incoming IGOS Co-Chair, looking forward to an effective cooperation on the key issues, including addressing the output of the Implementation Task Force.

Plenary participants provided a number of comments and inputs on IGOS-P issues, including the following:

- Don Hinsman (WMO), as Chairman of the IGOS-P Implementation Task Force, provided Plenary with an informal status report on the Task Force: he noted that the group had been meeting diligently (with thanks to active participation from GOOS, GTOS and EUMETSAT), had reviewed the IGOS implementation process, and was developing strong recommendations that should help the IGOS process work more effectively; the Task Force recommendations will recognise that, while there is a well established process on the ‘space side’ via SIT for the formulation of formal commitments to IGOS Themes, there is no such process on the ‘in-situ’ side; the Task Force will recommend the participation of representatives from the Observing Systems who are in a position to make a formal commitment – backed up by requests to the relevant Governing Bodies in order that the required support is forthcoming from the relevant Member States; the full Task Force report will be delivered within the next few weeks;
- Chu Ishida (NASDA), on behalf of Prof Koike of CEOP, reported that the Observation Phase of CEOP had recently started in October 2002 and that 33 ground measurement sites were participating, as well as space agencies and the major NWP centres; NASDA will actively progress the WGISS Test Facility for CEOP during 2003 and invites and encourages participation of all interested CEOS agencies;
- Greg Withee (NOAA), as the incoming IGOS-P Co-Chair, noted that NOAA had held early discussions with UNESCO and was committed to active leadership of IGOS-P during 2003, with the primary goal of achieving more progress on the IGOS Themes; NOAA continues to take a role in progressing the proposed Coastal Theme and a meeting will be held in early 2003 to define the way ahead – in association with GOOS and GTOS Partners;
- Gilles Sommeria (WCRP), advised the Plenary that the Water Cycle Theme is very much on track with 3 workshops planned for 2003: in January (hosted by NASA in USA), in March (hosted by ESA in Europe), and in March (hosted by NASDA in Japan); WCRP is very pleased with the advances in CEOP and appreciates the contribution of NASDA and NASA on this project; it is hoped that Envisat data from ESA will also contribute to CEOP in due course;
- Colin Summerhayes (GOOS) confirmed that the Ocean Theme will undertake a rolling review of progress during 2003 and that IGOS-P might adopt the planned approach as a model for the way in which other Themes are evaluated periodically; he also noted that GOOS is now prepared to join in the Coastal Theme discussions announced by Greg Withee;
- Jeff Tschirley (FAO/GTOS) noted that the Coastal Terrestrial group of GTOS had met recently and would convene again in March 2003 – with a view to preparing for participation in the Coastal Theme, as and when IGOS Partners are ready to proceed; he also noted that the terrestrial carbon input to the IGCO Theme had been submitted and that the TCO team was ready to support progress on the IGCO Theme when appropriate.

7.2 SIT Report

Tillmann Mohr (EUMETSAT), Chairman of the CEOS Strategic Implementation Team (SIT), gave a presentation to report on SIT activities and achievements during 2002. The main points were as follows:

- the 10th SIT meeting (Pasadena, 18th–19th April 2002) developed 6 proposals for the IGOS-P-9 meeting; 3 of these were translated into actions from the IGOS-P meeting:

Action 9.3: IGOS Partners to apply the Process Paper more rigorously, and the IGOS Secretariat to inform the current and future theme leaders of this position.

Action 9.4: Each IGOS Partner to identify the most appropriate mechanism to inform their senior staff and, as appropriate, to report to the IGOS-P 10 on what has been done in this respect.

Action 9.5: Each Partner to identify how it could potentially contribute to the funding and resources needed to develop specific IGOS themes in which it intends to be involved, and to report to IGOS-P 10.

- the remaining actions were referred to the IGOS Implementation Task Force (reported in section 7.1 here);
- Dr. Yoji Furuhashi of NASDA kindly agreed, as of 15th May 2002, to serve as Vice-Chairman of SIT;
- with regards to the Themes, SIT concludes that the overall CEOS agency response to the Ocean Theme is good - with requirements on ocean topography, surface vector winds, sea surface temperature, ocean colour, and sea ice generally being well met; from a space perspective the Ocean Theme has worked, but SIT is concerned about the status of the full implementation under GOOS as agreed by IGOS-P;
- SIT is very concerned at the lack of Theme reports from other themes – some of which are considerably delayed in relation to the timetable laid out in the IGOS Process paper; the IGOS-P Secretariat has informed Theme teams that SIT is prepared to convene meetings to review draft Theme reports in time to facilitate their review at IGOS-P 10; however, to date, only the Terrestrial Carbon Observation (TCO) team has made contact with SIT;
- the SIT report conclusions include:
 - IGOS-P Themes need better partner involvement;
 - without this IGOS remains space dominated;
 - there is a need to recall that IGOS and the themes have been established as a way to give non-space entities a more equal role;
 - there is a need for all partners to work their delegations for support in both **defining** and **implementing** themes;
 - assessing value in both short and long term remains important;
 - IGOS-P may need to modify the IGOS Process Paper for value assessment by setting goals that are both important and measurable.

Tillmann Mohr concluded the SIT report by referring participants to the final section of the SIT paper submitted to Plenary:

“The activities since the meeting of IGOS-P 9 on 31 May 2002, have not been at the rhythm of the previous years. It had been hoped that several Theme teams would have found it useful to discuss progress with SIT, and to inform SIT of developments in the definition of their space observation needs. This has regrettably not been the case, and it is concluded that current Theme teams have not found the same dynamics that characterised the Ocean Theme.

If Plenary shares this impression, it is suggested that it should be conveyed by the Chairman of CEOS to the other IGOS Partners, with a view to injecting more vigour and, if one may say so, a little more discipline, into the conduct of the IGOS-P themes and their implementation.”

The Chairman invited comments on the report from SIT:

- Colin Summerhayes (IOC) noted that there was no detailed specification within the IGOS Process paper providing guidance on reporting to the IGOS Theme teams, and that this might be rectified in future in order to establish a common understanding of the obligations;
- Don Hinsman (WMO) recalled one of the proposals made by SIT to IGOS-P-9 (“...that each Partner should consider how best to bring the potential of IGOS-P to the personal attention of their most senior office-holders and their national delegations...”) and advised Plenary that WMO had taken this very seriously, making a presentation to the Executive Council. The Council had recognised the value of IGOS and made a commitment to the continued support of WMO; Don Hinsman noted that a further presentation on IGOS-P is likely to be made to the upcoming May 2003 WMO Congress.

The Chairman confirmed the decision of the Plenary with regards to the SIT Report:

CEOS Plenary notes the report of the SIT Chairman, and encourages the incoming CEOS Chairman to convey to the IGOS Partnership the SIT concern at the lack of progress reported by the Themes, and to make the suggestion that there is a need to inject more vigour and discipline into the conduct of the Themes and their implementation.

7.3 World Water Forum

Yoji Furuhashi (NASDA) made a short presentation advising the Plenary on plans for the 3rd World Water Forum on March 16th – 23rd 2003 in Japan (Kyoto, Shiga, and Osaka). NASDA and NASA are planning a session in Osaka under the Forum Theme ‘Water and Information’ on March 18th or 19th. The session is expected to last about 2 hours. Details of the Forum are available at: <http://www.worldwaterforum.org>. NASDA has made an application for 2 booths at the event and CEOS agencies are invited to participate.

A Symposium will also be held on 13th – 14th March 2003 at Awaji Yumebutai International Conference Centre, on the topic of ‘Space Platforms for Water and Climate Observations’, and will include a workshop on AMSR (which will be launched on ADEOS-II on December 14th 2002). All CEOS agencies are invited to attend the symposium. (Venue information at <http://www.yumebutai.org>).

Yoji Furuhashi also notified the meeting about Japan’s attempts to rise to the challenge of expanding national support in line with Theme team requirements. He advised that MEXT had initiated an inter-ministerial meeting on IGOS related matters – attended by 6 different ministries and 4 observer agencies. For the Ocean Theme, 5 agencies responsible for implementation had been identified. The same process is being pursued for the Water Cycle Theme, and will be applied as other Themes mature.

8. WSSD

8.1 WSSD 2002

Josef Aschbacher (ESA) advised that, as one of the major themes for its Chairmanship of CEOS during 2002, ESA had co-ordinated the involvement of CEOS in the World Summit on Sustainable Development. He noted that efforts had focused on the insertion of space-related language into the negotiated texts of the Summit, complemented by some communication activities for and at the Summit. WSSD 2002 in Johannesburg (26th August – 4th September) brought together more than forty thousand participants, including 104 heads of State and Government, national delegates and leaders from non-governmental organizations (NGOs), businesses and other major groups to focus the world's attention and direct action toward meeting difficult challenges, including improving people's lives and conserving our natural resources in a world that is growing in population, with ever-increasing demands for food, water, shelter, sanitation, energy, health services and economic security. Josef Aschbacher summarised the main CEOS achievements in relation to the event:

- **Participation in the political process – 12 references in the WSSD Plan of Implementation:** ESA had obtained accreditation at the WSSD as an intergovernmental organisation, which allowed full participation in the Summit and all preparatory meetings as an observer. CEOS coordinated and prepared a number of official statements, which were delivered at PrepCom meetings in New York (Jan/Feb and Mar/Apr 2002) and Bali (May/Jun 2002), and the Summit itself. The excellent support from national delegations of some CEOS members, particularly NASDA and NOAA, led to the inclusion of specific references to satellite/Earth observation/remote sensing in twelve paragraphs or sub-paragraphs of the 54-page *WSSD Plan of Implementation*, which was one of the two documents adopted by Heads of State.
- **Communication activities – The CEOS exhibition stand at Ubuntu Village:** CEOS arranged an exhibition stand in Ubuntu Village, which served as a focal point for all CEOS members to inform visitors and delegates about how space can support sustainable development. The exhibition booth was used, and staffed, by a number of space agencies, notably ESA, NASDA, NOAA, DLR, CNES, and others. The stand followed an integrated design approach based on the CEOS WSSD brochure “Sustainable Development – The Space Contribution / From Rio to Johannesburg”. The information material displayed and distributed included various CEOS publications (WSSD brochure and fact sheets, Handbook, Newsletter, Annual Report), complemented by publications of other CEOS members (NASA/NOAA GISD flyers, NASDA brochures, etc.).
- **Communication activities – Publications:** CEOS prepared a number of targeted WSSD publications, such as: CEOS WSSD Brochure “Sustainable Development – The Space Contribution / From Rio to Johannesburg”, 18 pages; CEOS WSSD Fact Sheets “Sustainable Development – The Space Contribution / From Rio to Johannesburg”, folder plus 30 pages; CEOS “Earth Observation Handbook” in hardcopy and CD ROM, 180 pages; in addition, a number of other CEOS publications were displayed and distributed.

Josef Aschbacher noted that CEOS had also been involved in a number of events in the context of the WSSD, including: CEOS/IGOS Side Events at PrepCom III and IV (26 March and 6 June 2002); Co-Chairmanship, organisation and presentation of an IGOS/ICSU Session at the Science Forum in Johannesburg (30 Aug); and two presentations at Japanese Side Events (30 Aug and 2 Sep), among others.

8.2 WSSD follow-up

Josef Aschbacher (ESA) referred participants to the ‘Proposal for a CEOS Follow-up Programme to WSSD 2002’ distributed in advance of Plenary and noted that this had been prepared by a small team from within the Secretariat (Roy Gibson, Linda Moodie, Naomasa Murakoshi, Josef Aschbacher) - in

anticipation of the interest in WSSD issues amongst participants at the 16th Plenary. Josef noted that the proposal used the WSSD Plan of Implementation as a starting point and identified five areas where Earth/satellite observation is mentioned and where it may seem appropriate for CEOS to take action

- Area 1 - Education, training and capacity building
- Area 2 - Water resources management
- Area 3 – Disaster management and conflicts
- Area 4 – Climate change
- Area 5 – Global mapping, land use monitoring, GIS

A modular approach is proposed to allow flexibility in both agency contributions to, and CEOS management of, the Programme. Based on initial consultations, two of the five areas were identified as having ‘champions’ willing to establish and lead a ‘Module’ within the proposed Programme:

- Module 1: Education, training and capacity building (led by NOAA);
- Module 2: Water resources management (led by ESA and NASDA).

Josef Aschbacher proposed that CEOS establish an Ad-hoc WSSD Follow-up Team in order to further develop and refine the ideas within the outline proposal presented to 16th CEOS Plenary and to identify the next steps towards implementation. The following timetable is proposed:

- 20-21 Nov 02: discussion and approval of concept by CEOS Plenary; establishment of Ad-hoc WSSD Follow-up Team; initial identification of participation in Modules;
- Jan 03: consolidation of Programme;
- Q2 03: first review – led by CEOS Chair;
- Sep 03: workshop/s in developing country/ies;
- Nov 03/04/05: yearly reviews by CEOS Plenary;
- Nov 05: decision on revision/continuation by CEOS Plenary.

It was stressed that the Follow-up Programme was designed in a modular way, allowing agencies to join the Programme as and when they feel fit. The step-wise implementation shall add flexibility and allow for an evolution of the Programme. The main benefit of participating in the Programme will be to take advantage from the increased visibility and an established common platform when approaching third (non-space) partners such as the World Bank. In addition, better international coordination of EO activities on issues related to sustainable development is an obvious general benefit to CEOS and its Members and Associates.

There followed an extended discussion of the way forward for CEOS in initiating the proposed WSSD Follow-up Programme. The main highlights and conclusions were as follows:

- Kuniyuki Kageyama (MEXT) made a short presentation and stressed the importance of cooperation between CEOS agencies and the international research community for joint observation and research. He also emphasised the need to strengthen the data distribution networks of developing countries (particularly through the efforts by WGISS), and suggested that the coming CSD sessions represented an opportunity for the international community to recognise and appreciate the efforts of space agencies in these domains;

- Naomasa Murakoshi (NASDA) suggested several recommendations for Plenary consideration in relation to WSSD follow-up:
 - For the implementation of the CEOS WSSD Follow-up Programme, CEOS should improve contact with the international research community;
 - CEOS should facilitate data access by developing countries through the activities of CEOS Working Groups and the cooperation of CEOS Members;
 - The CEOS Chair should apply for accreditation of CEOS to the CSD process as a “science and technology organisation” in preparation for future sessions of CSD;
- Many participants (including Arthur Dahl (UNEP), Colin Summerhayes (IOC), Christian Patermann (EC), and Ghassem Asrar (NASA)) made calls for the new initiative to first take stock of the many initiatives ongoing within CEOS agencies and their partners which are of relevance to Earth observation and sustainable development issues (it was noted that ICSU, for example, was planning a major thrust on Education and Training issues in response to WSSD 2002 outcomes); it was suggested that a synthesis of existing work would be a valuable foundation for the way forward; Ghassem Asrar (NASA) suggested that CEOS should consider new activities by looking at an expansion of working successes – since it requires considerable resources to start up new applications and adoptability requires maturity in the technology and services;
- John Trinder (ISPRS) noted that it would be vital to coordinate the WSSD Follow-up programme with the efforts already being undertaken by CEOS WGEdu;
- support was expressed by a number of delegates for the proposal that CEOS seek proper accreditation within the CSD process;
- Tillmann Mohr (EUMETSAT) suggested that CEOS should do more to promote past successes in this field and could prepare a short brochure of past achievements as part of its submission to CSD;
- Colin Summerhayes (IOC) suggested that the space agency Charter on Major Natural Disasters might be adopted as a model for a similar charter on ‘development assistance’;
- Arthur Dahl (UNEP) emphasised that CEOS’ success would be measured by CSD in terms of working-level practical results – rather than strategy papers or workshops.

In response to the discussion points, the Chairman put forward a number of clarifications and recommendations for consideration:

- the newly-established WSSD Type-II partnership on EO Education and training (CEOS WGEdu) is envisaged as the primary vehicle for implementation of module 1 – with all necessary care being taken to harmonise with existing initiatives;
- selection of further modules should be based on availability of ‘champion’ agencies ready to make commitments for their implementation;
- the proposed Ad-hoc WSSD Follow-up Team would have a number of responsibilities:
 - to coordinate the new projects on a practical level (there are several expressions of interest in the 2 initial Modules);
 - to attract new partners if necessary - such as the World Bank (the Chairman explained that this is why the World Bank had been invited to the WSSD Follow-up session the day before); the Chairman confirmed that he had also initiated exploratory discussions with the African Development Bank;
 - to review existing capabilities – and perhaps develop the ‘promotional’ document suggested by several participants during the discussion (eg featuring details of PUMA, RANET, the Disaster Charter and others).

A number of participants expressed their support for the establishment of the Programme and the Ad-

hoc Team and indicated their willingness to commit to particular Modules or to share details of their existing initiatives:

- Greg Withee (NOAA) confirmed that the topic of Education, Training, and Capacity building would be one of the priorities for NOAA's Chairmanship of CEOS during 2003; NOAA agreed that an Ad-hoc Team would be valuable and NOAA would be prepared to chair the Team;
- Tillmann Mohr (EUMETSAT) advised that EUMETSAT was ready to support modules 1 & 2 and could contribute their considerable experience in these areas – including experience derived from PUMA;
- Sergio Camacho (UNOOSA) said that UNOOSA would be ready to join CEOS efforts and could bring capacity building experience to the process;
- USGS and CCRS indicated their support for the establishment of the Ad-hoc Team and confirmed that they may be interested in joint leadership of a 3rd Module (Global mapping, land use monitoring, and GIS);
- Daniel Vidal-Madjar (CNES) advised that CNES would soon establish a 'task force' on WSSD actions – with the main purpose of coordinating national programmes for R&D during 2003, in relation to a French initiative aimed at the G-8 meeting being hosted by France in June 2003; France will define the agenda for this meeting and has proposed an initiative for R&D on sustainable development issues; CNES will be working with the French Ministry of Research on the space contribution, and would be prepared to work with CEOS to promote CEOS interests in this domain.

With the agreement of the participants, the Chairman recorded the decision and actions of the Plenary with regard to the issue of the CEOS WSSD Follow-up Programme:

- 1) CEOS SUPPORTS the establishment of a CEOS WSSD Follow-up Programme;**
- 2) CEOS NOTES the unanimous request for the establishment of an Ad-hoc WSSD Follow-up Team and accepts the offer of NOAA to serve as Team Leader;**
- 3) CEOS NOTES the interest of CEOS agencies in the areas of: Education, training and capacity building; Water resources management; Global mapping, land use monitoring, and GIS; and charges the Team Leader to: explore these areas as the initial Modules for the Programme; and to consolidate the offers of Members and Associates into concrete proposals for activities in these areas – in line with the proposed time schedule.**

Action 16-05: CEOS Chair to apply for accreditation of CEOS to the CSD process as a 'science and technology organisation'

Action 16-06: CEOS Members and Associates prepared to make active contributions to CEOS WSSD Follow-up modules to nominate representatives for the Ad-hoc WSSD Follow-up Team by 15th December 2002

Action 16-07: CEOS Members and Associates to provide details of their initiatives relevant to CEOS WSSD Follow-up modules to NOAA, as the Leader of the Ad-hoc WSSD Follow-up Team, by 15th January 2003

9. Working Group Recommendations

9.1 WGISS

Terry Fisher (CCRS), Chair of the CEOS Working Group on Information Systems and Services (WGISS), gave a presentation reporting on WGISS efforts since the last Plenary, including:

- CEOS IDN – as a valuable international gateway to numerous and diverse data holdings (over 11,000 datasets including all major EO datasets); the IDN is heavily utilised with more than 30,000 user sessions/month at the various IDN nodes;
- WGISS outreach – including details of the GISD demonstration at the WSSD meeting; a GISD portal is operational at <http://wgiss.ceos.org/gisd/> and a CD-ROM of the demo has been distributed to Plenary participants;
- the WGISS Test Facility (WTF) and its spin-off's to related to the work with the Global Observation of Forest Cover (GOF) activity;
- Proposals for two new Test Facilities: one in support of the IGOS Water Cycle Theme (CEOP) on which NASDA and NASA will start work by Jan 2003, and another to develop a web-based interface for access to information on a global network of core cal/val sites (in association with WGCV); a further WTF project on 'Oceans' is still under consideration – currently focused on a pilot activity looking at oil slicks;
- WGISS sponsored a 2-day GRID Workshop at ESRIN in April 2002, and has identified 4 application projects for further development (in the period to Oct 03): USGS Data Delivery; NOAA Operational Model Archive and Distribution System (NOMADS); ESA Data Integration and Web Portal; NASA GSFC Advanced Data Grid;
- WGISS undertook a survey of members on the value of WGISS activities; the survey indicated:
 - a high degree of satisfaction with WGISS activities;
 - the need to better advertise activities;
 - the need for better linkage with Plenary priorities;
 - the need for better linkage with other CEOS WGs;
 - the need for a revised meeting structure to reduce travel costs.

Terry Fisher noted that WGISS used the survey results to adjust the priorities for its 2002 activities. The WSSD demonstration was initiated to address the linkage with the Plenary priorities and the advertising of WGISS capabilities. The development of the Core Sites WTF with WGCV and the transfer of the CD-ROM project to the WGEdu addressed the closer ties to the other CEOS WGs. Finally WGISS adjusted its organisation and meeting to streamline its structure and reduce travel costs.

Terry Fisher advised that WGISS had recently adopted a new structure based on two subgroups: a "Technology and Services Subgroup" (chair Wyn Cudlip of BNSC/Qinetiq and vice-chair Paul Kopp) and a "Projects and Applications Subgroup" (chair Ivan Petiteville of ESA and vice-chair Osamu Ochiai, NASDA). The WGISS chair recognised the excellent work of outgoing Subgroup (SG) chairs and vice-chairs: Access SG chair Ken McDonald (NASA) and vice-chair Paul Kopp (CNES); Network SG Chair Shin-ich Sobue (NASDA) and vice-chair Jeff Smith (NASA) and the Data SG chair Wyn Cudlip (BNSC/Qinetiq). A copy of the final report of the Network SG was submitted with WGISS Plenary documents.

He noted the highlights for WGISS in 2003:

- WGISS-15 and joint Sub-Group meetings will be hosted by CNES in May 2003 in Toulouse, France;

- WGISS-16 and joint Sub-Group meetings will be held in Thailand co-hosted by GISTDA and NASDA;
- The GRID Pilot Projects will be progressed;
- The first phase of WTF CEOP and WTF Core Sites (WGCV) will be progressed;
- Collaboration with the WGEdu on the CEOS CD-ROM project.

A number of participants expressed their appreciation for the valuable work being undertaken by WGISS, particularly in relation to WSSD and their support for the IGOS Themes. The following points were raised in response to the WGISS report:

- Naomasa Murakoshi (NASDA) expressed appreciation, on behalf of MEXT, for WGISS efforts at WSSD 2002, and noted the references in the Summit text, which refer to use of information systems which facilitate access to information; he noted that the 3rd World Water Forum would have ‘Water and Information’ as one of the themes and NASDA is planning a side event related to information systems for water management and water cycle; Naomasa Murakoshi noted that NASDA is committed to the development of the WGISS Test Facility in support of the Water Cycle;
- Ghassem Asrar (NASA) questioned the scope for greater involvement of WGISS in the IGOS Themes; Terry Fisher noted that discussion for a WTF on Oceans (in support of the Ocean Theme) were underway, but that WGISS was resource-limited; Ghassem Asrar suggested that the IGOS Themes offer an opportunity to tap into existing networks of users and it would be valuable for CEOS Working Groups to align themselves with the Themes for long term impact;
- Colin Summerhayes (IOC) called for closer links to IGOS Themes;
- Li Deren (NRSCC) expressed the hope that WGISS might be able to assist in some way in establishing a pilot project in support of Chinese environmental issues;
- Yoji Furuhashi (NASDA) called for the Plenary to discuss in more detail the linkage between the new WGISS 5 Year Plan and the new CEOS 5 Year Plan;
- Daniel Vidal-Madjar (CNES) explained that CNES continues to establish thematic data centres and would like to propose a presentation on these centres at the next WGISS meeting to be held in Toulouse in May 2003;
- Jeff Tschirley (FAO & GTOS) suggested that WGISS might wish to explore collaboration with GTOS via TEMS (Terrestrial Ecosystem Monitoring Sites). TEMS encompasses numerous in-situ observation sites and 60 different networks; one issue identified for TEMS is the need for better access to space-related data; the programme includes a module on ‘carbon’ and another on ‘coastal’ observations; Jeff suggested that WGISS might explore how to support information system aspects of the datasets relating to carbon and coastal issues.

José Achache confirmed the decision of the 16th Plenary with regards to the WGISS report.

CEOS Plenary ENDORSES:

- **the WGISS focus on Test Facilities, in particular the WTF Core Sites (WGCV) and WTF Coordinated Enhanced Observing Period for 2003;**
- **the WGISS Plan for GRID Pilot Projects.**
- **WGISS reorganisation to a two subgroup structure (“Technology and Services Subgroup” and “Projects and Applications Subgroup”) – as defined in the revised WGISS 5 Year Plan submitted to Plenary.**

Action 16-08: CEOS Members and Associates to send the WGISS Chair any nominations for the next WGISS Vice Chair by 31st March 2003

Action 16-09: CEOS Working Group chairs to investigate closer links between Working Groups and the IGOS Themes and to report to the 17th CEOS Plenary

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

9.2 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:

- the 19th WGCV plenary meeting was held in Ottawa, Canada, hosted by CCRS, and included discussions on: Canadian cal /val activities, Envisat's early results, NPOESS and NPP;
- phase 1 of the joint WGCV / WGISS activity on CEOS core test sites for land parameter validation has started - involving the survey of five globally distributed sites from October 2002 – October 2003;
- the WGCV/ISPRS taskforce on radiometric and geometric standards kick-off meeting was held on 11th November 2002 in Denver, Colorado, USA;
- the re-establishment of the IVOS (Infrared Visible Optical Sensors) Subgroup membership and their new focus on addressing reference spectra for data processing;
- the involvement of the SAR Subgroup in Envisat's ASAR cal / val campaign, and the preparation of documentation detailing requirements and techniques necessary for effective calibration of polarimetric interferometric systems;
- Members of CEOS are encouraged to ensure that calibration processes for SAR are traceable to the primary standards;
- the preparation of documentation, by the LPV (Land Product Validation) Subgroup, concerning the validation of Albedo measurements;
- the focus of the Microwave Sensors (MWS) Subgroup on general terminologies for microwave radiometry and issues of calibration for Aperture Synthesis Radiometers;
- establishment, and first meeting, of the sixth subgroup of the WGCV, the Atmospheric Chemistry subgroup; the focus of the Atmospheric Chemistry subgroup is on ensuring sustained support for ground networks, used for product validation, both throughout the lifetime of a particular mission, and also between missions; Members of CEOS are encouraged to commit to sustained financial support of existing network stations and to locate stations in under-sampled regions of the globe in order to complement the space observing systems for climate change;
- the focused, dedicated effort of the Terrain Mapping (TM) Subgroup towards SRTM/C-SAR validation and evaluation;
- representation of WGCV and its subgroups at a variety of workshops and meetings;
- preparation of a stand at CEOS Plenary 2002 and a WGCV brochure update;
- a new version of the WGCV 5 Year Plan.

The 20th WGCV plenary will be held in Hobart, Australia, from 12th – 14th February 2003, and will be hosted by CSIRO Marine Research, the CSIRO Earth Observation Centre, and the Antarctic

Cooperative Research Centre. The 21st WGCV plenary will be held in Beijing, China, from 15th – 18th October 2003.

Yves-Louis Desnos explained two specific requests for assistance to CEOS Members in support of the work of the Atmospheric Chemistry Subgroup. He encouraged Members of CEOS to consider support:

- establishment of two ozone calibration centres, one in South America and the other one in Africa to maintain the quality of column ozone data from 17 developing countries (at an estimated cost of around €300k per station);
- establishment of five new ozone-sonde stations within a five-year programme in developing countries (selected from Africa, continental Asia, Central and South America, and island nations) to improve the geographic distribution of high quality monitoring stations.

Don Hinsman (WMO) congratulated the work of WGCV and noted their close collaboration with the staff within the Global Atmosphere Watch responsible for cal/val for atmospheric chemistry parameters. He suggested that written requirements from CEOS would help the funding for the proposed projects to be secured - by identifying the value of the proposed in-situ stations for the work of the space agencies.

Tillmann Mohr (EUMETSAT/SIT Chair) recognised the importance of the proposal and noted that this was an issue to be addressed as an integral part of the IGOS Atmospheric Chemistry Theme. He urged WGCV to take the issue forward with the Theme and noted that this would foster the stronger links between CEOS WGs and IGOS Themes which the 16th Plenary had asked for.

The Chairman supported the suggestion of Tillmann Mohr and summarised the decision of the 16th Plenary with regards to the WGCV Report:

1) CEOS NOTES the need for sustained support for ground networks to complement space observing systems for climate change, and further notes that:

- **ground networks are complementary and necessary components for surveying the Earth's atmosphere and detecting global climate change;**
- **ground networks provide observations that cannot be made from space and correlative data for space missions to validate their observations;**
- **observations of climate change due to changing composition of the atmosphere demand accuracy and continuity that are at the brink of our capabilities.**

2) CEOS RECOMMENDS that:

- **ground network station operators and interested space agencies commit to sustained financial support of existing network stations and should locate stations in under-sampled regions of the globe;**
- **ground network stations should commit to established guidelines for data accuracy (eg those of WMO, or of ESA-Envisat) and timely archival.**

3) CEOS ENCOURAGES agencies to ensure calibration processes for SAR are traceable to the primary standards.

4) CEOS ENCOURAGES agencies to support their representatives to attend and make effective contributions to Working Group activities.

Action 16-10: CEOS Members and Associates to send the WGCV Chair any nominations for the next WGCV Chair by 31st January 2003

The Chairman recalled the agreement on Action 16-09 (*CEOS Working Group chairs to investigate closer links between Working Groups and the IGOS Themes and to report to the 17th CEOS Plenary*)

and urged the WGCV Chair to include the issue of the ground station proposals in their discussions with the Atmospheric Chemistry Theme.

The full WGCV report is available on the WGCV WWW site: <http://www.wgcvceos.org>

9.3 Ad-hoc DMSG

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

- a history of DMSG activities and achievements since its establishment in 1997 – including examples of the outputs and reports produced;
- an overview of the findings of the DMSG in key areas;
- a summary of DMSG recommendations in relation to ‘responsiveness’ and ‘data integration’.

In light of the DMSG report and subsequent discussion, the 16th CEOS Plenary decided as follows:

- 1) CEOS ACCEPTS the DMSG final report;**
- 2) CEOS COMMENDS the work of DMSG participants, and records particular appreciation for the efforts of Helen Wood in Chairing DMSG since its inception;**
- 3) CEOS ENDORSES the recommendations contained in the DMSG final report, namely to:**
 - **Integrate current DMSG activities into: International Charter: Space and Major Disasters; UN COPUOS and OOSA Workshops; IGOS Geohazards Theme;**
 - **Continue opportunities to build technical capacity;**
 - **Transition the DMSG website information to the CEOS website;**
 - **Integrate specific hazards requirements into the CEOS/WMO requirements database;**
 - **Facilitate opportunities for member agencies to integrate and adopt DMSG recommendations.**

Action 16-11: DMSG Chair to work with NASDA/NASA to migrate DMSG WWW site to CEOS WWW site

Action 16-12: DMSG Chair to work with Don Hinsman to integrate DMSG hazards requirements into the CEOS/WMO requirements database

Many participants added their congratulations to the DMSG for the conclusion of their activities and expressed warm thanks to Helen Wood for her energetic leadership of the Group. Don Hinsman (WMO) noted that the next long term plan of WMO would include a new programme on natural disasters and their mitigation and hoped that WMO could exploit the considerable experience and knowledge developed through the DMSG activity. He expressed the hope, echoed by other participants, that CEOS would not lose the body of knowledge that had been amassed, and that it would in some way be preserved for future use.

Helen Wood hoped that the valuable knowledge acquired throughout the last 5 years would live on within the team members and within the extensive documentation produced by the Group – which will be available via the WWW site of CEOS.

9.4 Ad-hoc WG-Edu group

The Chairman noted that the Chairman of CEOS Ad-Hoc Working Group for Education and Training (WG-Edu), Mukund Rao (ISRO), was unable to attend the Plenary, and was – due to pressures from other commitments – proposing to step down as Chairman. The CEOS Chairman had received a proposal that Sergio Camacho (UNOOSA) be appointed by the 16th Plenary as the new Chairman of WGEdu, and that he be supported by Christine Hutton (CCRS) and Maurizio Fea (ESA) serving as Vice-Chairs.

The Chairman invited Sergio Camacho to deliver the WGEdu report on behalf of Mukund Rao. The highlights of the WGEdu report were:

- a recap of the purpose of the WGEdu, namely: to establish an effective coordination and partnership mechanism among CEOS agencies and institutions offering education and training around the world; and to facilitate activities that substantially enhance international education and training in Earth observation techniques, data analysis, interpretation, use and application;
- the WGEdu strategy and action plan was reviewed and revised during 2002;
- the main other activities of the Working Group during 2002 included:
 - an assessment of EO data and materials need of the UN Training Centres – with a view to identifying mechanisms for CEOS agencies to respond and commit “resources” to the Centres; a survey and initial analysis has been completed;
 - design and initial development of the EO education and training resources discovery tool;
 - design of an internet-based certificate course on EO/GIS (in collaboration with ISPRS and under ISRO sponsorship);
 - finalisation of the core curriculum review document for UN Centres (with UNOOSA);
 - establishment of a WSSD Type II Partnership initiative for capacity building in EO (as discussed earlier in the meeting);
 - initiated drafting of a set of principles for data provision to facilitate EO training and education – with a view to adoption of a set of CEOS principles for EO data provision for education and training;
 - initiated discussions with WGISS and CNES and WGEdu taking on responsibility for the CEOS CD-ROM activity.

A number of issues were raised in response to the WGEdu report:

- Robert Missotten (UNESCO) suggested that there might be scope for coordination of WGEdu efforts with those of UNESCO, which has a network of schools worldwide ready to test CEOS outputs, and which could provide links to national education ministries;
- Colin Summerhayes (IOC) noted that IOC would be interested in joining the WGEdu and hoped that the Group would (as per action 16-09), strengthen its links to the IGOS Themes as appropriate;
- Tillmann Mohr (EUMETSAT) expressed the hope that the WGEdu would be a success and that the Group might focus in future years on a smaller number of activities in order to be able to conclude the proposed outputs.

In light of the WGEdu report and subsequent discussion, the 16th CEOS Plenary decided as follows:

1) CEOS NOTES the progress achieved by WGEdu in:

- **supporting the UN Training Centres;**
- **developing the EO education and training discovery initiative;**
- **drafting principles for EO data provision by CEOS agencies;**

- steps for formalising data principles;
 - formation of the WSSD Type II Partnership;
 - developing the internet based EO/GIS training module;
 - developing a core curriculum for the UN Training Centres.
- 2) **CEOS TASKS** the WGEdu to further these 7 activities as per the WG action plan and to report to the 17th Plenary.
 - 3) **CEOS APPOINTS** Sergio Camacho (UNOOSA) as Chair of WGEdu, and Christine Hutton (CCRS) and Maurizio Fea (ESA) as Vice-Chairs.
 - 4) **CEOS COMMENDS** the work of WGEdu members and expresses particular thanks to the outgoing Chair, Mukund Rao.
 - 5) **CEOS ENCOURAGES** all Members and Associates to consider providing a representative to WGEdu.

10. Other relevant activities

10.1 Space Policy Summit

Roy Gibson (EUMETSAT) referred participants to the paper distributed in advance of Plenary, regarding the deliberations of the Space Policy Summit, which took place from 11th–13th October 2002 in Houston, Texas, in conjunction with the World Space Congress. The Summit brought together world space leaders to discuss space exploration, space commerce, and space applications and the participants identified key policies and initiatives aimed at bringing the benefits of space activities to humanity through international cooperation. They also discussed obstacles that inhibit taking full advantage of the benefits of space and explored ways to eliminate or move beyond these challenges.

The Summit was the culmination of more than a year's work by international space policy experts who identified the key policy areas that helped shape the agenda. The Summit was hosted by the James A. Baker III Institute for Public Policy at Rice University, and organised by the American Institute of Aeronautics and Astronautics.

Roy Gibson suggested that CEOS agencies might be particularly interested in the Space Applications (Protectors) section, (chaired by Roy) and recommended that those interested should seek out the background paper, which will be published in future. He noted that the Summit had provided very useful exposure for CEOS and IGOS-P, and had allowed them to reach a new audience, as well as the heads of many partner agencies. He indicated the specific willingness of several data provider agencies to make data targeted to specific needs (eg IGOS Themes like Water Cycle) available at little or no cost to developing countries.

10.2 UNFCCC

Naomasa Murakoshi (NASDA) made a short presentation on the events of UNFCCC COP-8 (and SBSTA-17) held in New Delhi on 23rd – 29th October 2002. He noted that:

- the UNFCCC Secretariat had arranged a special event on research and systematic observations with the participation of IEA, IGBP, IGFA, IHDP, IPCC and WCRP;
- the SBSTA had 'noted the importance of an integrated international effort on research and systematic observations';

- the SBSTA had decided to regularly consider issues related to research on climate change at its future sessions in order to inform parties about on-going and planned activities of international research programmes, and to provide a forum for consideration of research needs and priorities and ways and means for addressing them;
- the SBSTA had encouraged the GCOS Steering Committee to explore a proposal for a voluntary GCOS fund to support high priority needs relating to global observing systems for climate.

Linda Moodie (NOAA) noted that it was a significant achievement to have ‘systematic observations and research’ back onto the regular COP agenda. She stressed the need for practical actions by CEOS agencies, particularly in working with the international research programs that might continue to be involved in COP discussions and with their national delegations to the COP, so that they can confirm the value of satellite observations in meeting the needs of the Convention. She proposed the following action, which was agreed by Plenary:

Action 16-13: CEOS Members and Associates, as appropriate, to strengthen their ties to international organisations with relevant research activities, and their national delegations to the UNFCCC in order to demonstrate better the value of satellite observations in meeting the needs of the research community and the Convention

Yoji Furuhashi confirmed the significance of this action for MEXT/NASDA.

The Chairman thanked Linda Moodie and Naomasa Murakoshi for their continuous participation in the UNFCCC process on behalf of CEOS.

10.3 Second Adequacy Report

Paul Mason (GCOS) updated the CEOS Plenary on the progress to date on the preparation by the GCOS secretariat of a second report on the adequacy of Global Climate Observing Systems for the UNFCCC. This Second Adequacy Report will be a succinct scientific report on the state of the global observing systems for climate. Its goals are to:

- determine what progress has been made in defining and implementing climate observing networks and systems since the first Adequacy Report prepared for COP-4;
- determine the degree to which current networks and systems meet with scientific requirements and conform with associated observing principles; and
- assess how well these current systems, together with planned improvements, meet the needs of the Convention.

The 2nd Adequacy report will be based on the National Reports prepared by the Parties and submitted to the UNFCCC Conference of Parties. It will draw upon a balanced range of scientific experts to develop the specific analyses, and take into account relevant COP decisions on capacity building, technology transfer and adaptation.

The 2nd Adequacy Report is being prepared under the overall direction of the GCOS Steering Committee (GCOS-SC), acting through its Chairman and the chairmen of its Science Panels. The 3rd draft of the Report will be available within two weeks of CEOS Plenary and the timetable for conclusion of the draft is as follows:

- **Jan 2003 – Mar 2003** – Open review of the 4th draft (via the GCOS homepage), available also to SBSTA parties and via international presentations - to develop a consensus on the conclusions;

- **April 2003** - Finalisation by GCOS SC.
- **June 2003** - Report available to SBSTA 18.

Paul Mason noted that this was a significant undertaking for GCOS and one that had been demanded in a very short timescale. He reviewed the outline structure of the draft report and indicated some of the draft conclusions of relevance to Earth observation, noting that there had been some debate (split 50/50 amongst authors) as to whether satellite observations should be described as being an 'essential' part of the global climate observing systems. It was noted that the report would likely call for a strategy for new satellites and analysis centres that will provide homogeneous data and products to all parties on key areas.

A number of CEOS members expressed concern over whether there had been adequate expertise on Earth satellite observations included within the report generation process and therefore whether there was suitable representation of Earth observation issues in the report. The Chairman queried whether CEOS would have the opportunity to provide coordinated review comments on the report to assist GCOS with the Earth observation system aspects – in advance of public review. Paul Mason noted that GCOS would appreciate such an offer but that the CEOS comments (on the 3rd draft) would have to be returned within a 2-week period if they were to be reflected in the 4th draft – to be made available via the GCOS WWW site on 1st January 2003. The Chairman undertook to arrange this and urged the incoming CEOS Chairman to take steps to continue CEOS involvement in reviewing the 2nd Adequacy Report during the first half of 2003. He recognised that all Members saw this as an issue of vital importance.

Action 16-14: GCOS to send 3rd draft of Second Adequacy Report to CEOS Chair for comment by 1st December 2002

Action 16-15: CEOS Chair to set up a team to review the Second Adequacy Report (providing initial comments within 2 weeks of receipt of the 3rd draft)

10.4 COPUOS/UNISPACE III

Sergio Camacho (UNOOSA) gave a short presentation on the status of the follow up actions in the implementation of UNISPACE III recommendations, including the following main points:

- UNISPACE III had seen the adoption of: "The Space Millennium: Vienna Declaration on Space and Human Development" - the nucleus of a strategy to address global and regional problems through the use of space science & technology (33 recommendations);
- the UN General Assembly had endorsed the Vienna Declaration and called upon all concerned to implement the recommendations of UNISPACE III;
- the UNISPACE III recommendations are the focus of the work of COPUOS for 2000-2004, via the action teams (of which there are 11) addressing specific recommendations;
- there is no action team on 'developing and implementing the Integrated Global Observing Strategy (IGOS)' as COPUOS and its Scientific and Technical Subcommittee (STSC) recognised that the work of the IGOS-P addresses the recommendation; on behalf of STSC, UNOOSA has invited IGOS-P to make a presentation to the STSC in February 2003 and a reply is sought soon;

- in June 2002, COPUOS recommended that CEOS be granted permanent observer status with COPUOS and its two Subcommittees; the Plenary of the UN General Assembly will adopt a resolution in December 2002 to that effect;
- further practical cooperation between UNOOSA and CEOS has been realised through the workshops during 2002 on the use of space technology in disaster management, co-sponsored by ESA/CNES and ECA and ESCAP;
- COPUOS envisages further opportunities and synergies for CEOS involvement.

Action 16-16: CEOS Chairman to request the IGOS-P Co-Chairs to present IGOS-P to UN COPUOS STC (Feb 2003)

10.5 Space Frequency Coordination Group (SFCG)

Edoardo Marelli (ESA) reported on the efforts of the Space Frequency Coordination Group, including the following key points:

- planning for WRC-03, which will take place in Geneva in June 2003 and for which CEOS has already generated a resolution; most of the items of interest to SFCG and CEOS are on a path to a satisfactory solution - but two items are still heavily debated and would benefit from political pressure by the CEOS delegates:
 - protection and extension of the C-band allocation to active sensors (SAR, altimeters, scatterometers);
 - new allocation in P-band to active sensors (SAR);
- CEOS delegates are asked to inform their administrations about the importance of keeping the 24GHz band clean (under threat from UltraWide band devices – eg those being developed by car manufacturers), making also reference to the ITU regulations that forbid any intentional emission in this band and to the results of the CEPT compatibility studies;
- in identifying future needs for Earth observation frequency bands, SFCG has relied to date on its own members; although some user representatives are also participating in SFCG (eg WMO, ITWG), it is felt that CEOS would be better placed to provide a more comprehensive picture of the future user requirements.

A number of discussion points were raised in response to the SFCG report:

- Don Hinsman (WMO) urged CEOS Members to recognise the significance of the threat to the passive sensing band and noted that it was vital for a number of instruments – including AMSU, AMSR, MWR, and many other planned sensors, including many employed for meteorology; Don suggested that Plenary agree an action item to strongly lobby against the threat to this band and the envisaged corruption to passive sensor measurements resulting from UWB devices; a number of members expressed their support for Don Hinsman's proposal;
- Ghassem Asrar (NASA) also suggested that some sort of co-ordinated effort by CEOS should be planned, emphasising the importance of the user organisations in making a compelling case for preservation of the relevant spectrum; he stressed the importance of making appeals in writing to the relevant authorities; Sergio Camacho (UNOOSA) offered to put this issue on the agenda of the UN inter-agency meeting in January in order to get a UN system response.

In light of the SFCG report and the subsequent discussion, the 16th CEOS Plenary decided on the following actions:

- Action 16-17: Edoardo Marelli, in consultation with the CEOS Chair, to co-ordinate the lobbying by CEOS Members and Associates for:**
- the protection of active sensors in C-Band (WRC-03 AI 1.5);
 - a new allocation for active sensors in P-Band (WRC-03 AI 1.38);
 - the protection of the 24GHz band
- Action 16-18: CEOS Members and Associates to provide inputs to Edoardo Marelli by May 2003 in support of generation of a document by SFCG (by August 2003) indicating priorities anticipated in the mid to long-term for frequency bands required for passive and active sensing**
- Action 16-19: UNOOSA to discuss frequency protection at the next Inter-Agency Meeting (Jan 2003) and provide CEOS with a consolidated UN system recommendation concerning frequency protection.**

The Chairman envisaged that Action 16-17 might involve the generation of a letter for all supporting agencies to send under their letterhead to their relevant national authorities.

11. Updates on Significant Events by Members and Associates

CSA, ISPRS, NASDA, CSIRO, WCRP, and BNSC presented brief reports on major events since last Plenary. Written reports were also provided in advance by CSIRO, DLR, NASA, NASDA, NOAA, NSC, and Roshydromet.

12. CEOS Planning

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

Agency (Year)	Venue	Dates and information
NOAA (2003)	Broadmoor Hotel, Colorado Springs, CO	18 th – 20 th November 2003
China (2004)	TBD, China	TBD
Europe (agency TBC) (2005)	TBD	TBD

Paula Freedman (BNSC) noted that BNSC were considering making an offer to CEOS to serve as the Chair agency after China. Chairmanship of CEOS (and IGOS-P) fits well with the sustainable development agenda being pursued in the UK. BNSC will consult with the UK Space Council and the Minister for Science and advise the CEOS Chairman of the conclusion early in 2003.

Li Deren (NRSCC) gave an overview of the space programme in China. He noted that Dr Xu Guanhua (Minister of MOST) will Chair CEOS and IGOS-P and is assembling a good team to ensure the best results.

13. Other Business

No topics were proposed.

14. Review of Action Items

The Chairman presented a draft list of the action items from the 16th 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. The list of actions is repeated here as annex A.

15. Chair handover to NOAA

José Achache (ESA), as Chairman, reviewed the achievements of CEOS during the last year and officially handed over the CEOS Chairmanship to Greg Withee (NOAA). Greg Withee noted the many plans worldwide for space ventures during the next decade and stressed his belief that coordination will be essential for these projects to be effectively applied for the benefit of mankind. He suggested that CEOS has a tremendous opportunity in this regard. Greg explained NOAA's planned priorities for CEOS Chairmanship during 2003:

- **strengthening of IGOS-P:** this is seen as a big challenge, with the need to get more senior level attention of the partners to get their members states doing the work; the Themes need considerable progress too; NOAA hopes to help progress the Themes during 2003 and welcomes suggestions in order to get the Partnership to operate more effectively;

- **promoting improved satellite data utilisation:** including via several events: the CEOS/NASDA workshop near Osaka in Japan on 13th–14th March 2003; the World Water Forum in March; an IUGG-CEOS discussion on global satellite data utilisation supporting environmental research, planned for Sapporo, Japan in early July 2003; CEOS agencies are strongly encouraged to contact the Chair if they foresee opportunities for involvement of CEOS within their planned domestic events;
- **WSSD follow-on activities:** the Chair will coordinate the implementation of the WSSD Follow-up Programme and intends to undertake activities within the WSSD Type II Partnership established on Education and Training;
- **international satellite coordination mechanisms:** the Chair will look at the various mechanisms which exist (CEOS, WMO Consultative Meeting on Satellite Matters, CGMS) and consider whether there is scope for better harmonisation among them in future.

Greg Withee, as the new CEOS Chairman, expressed warm thanks to José Achache for his effective Chairmanship of CEOS throughout 2002. On behalf of all CEOS members, he thanked ESA for its excellent efforts.

16. Adjourn

José Achache thanked all participants of the 16th CEOS Plenary meeting, and hoped that they had found the event both enjoyable and productive. He thanked the staff of ESA for their support and arrangements and wished all participants a safe journey home.

A 16th CEOS Plenary action items

No.	
16-01	CEOS Chair to reflect the priorities identified in the new 5 Year Plan in the activities planned for 2003
16-02	CEOS Chair to reinforce the concept of the 'past, present, and future' troika of Chairmen to ensure continuity in CEOS objectives and plan implementation
16-03	CEOS Chair to write to Principals to reaffirm the importance of their active participation at CEOS Plenary meetings
16-04	CEOS Chair to investigate, with Working Group Chairs, mechanisms for closer involvement of the Working Groups in implementation of the CEOS 5 Year Plan – in connection with their respective work plans
16-05	CEOS Chair to apply for accreditation of CEOS to the CSD process as a 'science and technology organisation'
16-06	CEOS Members and Associates prepared to make active contributions to CEOS WSSD Follow-up modules to nominate representatives for the Ad-hoc WSSD Follow-up Team by 15 th December 2002
16-07	CEOS Members and Associates to provide details of their initiatives relevant to CEOS WSSD Follow-up modules to NOAA, as the Leader of the Ad-hoc WSSD Follow-up Team, by 15 th January 2003
16-08	CEOS Members and Associates to send the WGISS Chair any nominations for the next WGISS Vice Chair by 31 st March 2003
16-09	CEOS Working Group chairs to investigate closer links between Working Groups and the IGOS Themes and to report to the 17 th CEOS Plenary
16-10	CEOS Members and Associates to send the WGCV Chair any nominations for the next WGCV Chair by 31 st January 2003
16-11	DMSG Chair to work with NASDA/NASA to migrate DMSG WWW site to CEOS WWW site
16-12	CEOS Members and Associates, as appropriate, to strengthen their ties to international organisations with relevant research activities, and their national delegations to the UNFCCC in order to demonstrate better the value of satellite observations in meeting the needs of the research community and the Convention
16-13	DMSG Chair to work with Don Hinsman to integrate DMSG hazards requirements into the CEOS/WMO requirements database
16-14	GCOS to send 3 rd draft of Second Adequacy Report to CEOS Chair for comment by 1 st December 2002
16-15	CEOS Chair to set up a team to review the Second Adequacy Report (providing initial comments within 2 weeks of receipt of the 3 rd draft)
16-16	CEOS Chairman to request the IGOS-P Co-Chairs to present IGOS-P to UN COPUOS STC (Feb 2003)
16-17	Edoardo Marelli, in consultation with the CEOS Chair, to co-ordinate the lobbying by CEOS Members and Associates for: <ul style="list-style-type: none"> - the protection of active sensors in C-Band (WRC-03 AI 1.5); - a new allocation for active sensors in P-Band (WRC-03 AI 1.38); - the protection of the 24GHz band
16-18	CEOS Members and Associates to provide inputs to Edoardo Marelli by May 2003 in support of generation of a document by SFCG (by August 2003) indicating priorities anticipated in the mid to long-term for frequency bands required for passive and active sensing
16-19	UNOOSA to discuss frequency protection at the next Inter-Agency Meeting (Jan 2003) and provide CEOS with a consolidated UN system recommendation concerning frequency protection

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