

December 27, 1995

**Final Minutes of the  
Committee on Earth Observation Satellites  
Ninth Plenary Meeting  
11-13 October 1995  
Saint-Hubert, Canada**

**1. INTRODUCTION**

The ninth Plenary meeting of the Committee on Earth Observation Satellites (CEOS) was held at Saint-Hubert, Canada on 11-13 October 1995. The meeting was hosted by the Canadian Space Agency, the 1995 CEOS Chair. The following organizations attended:

- o Members
  - Agenzia Spaziale Italiana (ASI)
  - British National Space Centre (BNSC)
  - Canadian Space Agency (CSA)
  - Centre National d'Etudes Spatiales (CNES)
  - Commonwealth Scientific and Industrial Research Organisation (CSIRO)
  - Deutsche Agentur für Raumfahrtangelegenheiten (DARA)
  - European Commission (EC)
  - European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT)
  - European Space Agency (ESA)
  - Indian Space Research Organization (ISRO)
  - Instituto Nacional de Pesquisas Espaciais (INPE)
  - National Aeronautics and Space Administration (NASA)
  - National Oceanic and Atmospheric Administration (NOAA)
  - National Remote Sensing Center of China (NRSCC)
  - Russian Federal Service for Hydrometeorology and Environment Monitoring (ROSHYDROMET)
  - Science and Technology Agency of Japan (STA)
  - Swedish National Space Board (SNSB)
- o Observers
  - Canada Centre for Remote Sensing (CCRS)
  - Federal Office for Scientific, Technical and Cultural Affairs - Belgium (OSTC)
  - Norwegian Space Centre (NSC)
- o Affiliates
  - Global Climate Observing System (GCOS)
  - Global Ocean Observing System (GOOS)
  - Intergovernmental Oceanographic Commission (IOC)
  - International Geosphere-Biosphere Programme (IGBP)
  - World Climate Research Programme (WCRP)
  - World Meteorological Organization (WMO)

The Atmospheric Environment Service of Environment Canada attended as part of the Canadian delegation. The National Environmental Research Council (NERC) and the Department of Environment (UK-DOE) attended as part of the British delegation. The Commission of Science, Technology and Industry for National Defence, P.R. China, attended as part of the Chinese delegation. The National Space Development Agency of Japan (NASDA), the Japanese Meteorological Agency (JMA), the Japanese Embassy in Ottawa, and the Ministry of International Trade and Industry (MITI) attended as part of the Japanese delegation. The Intergovernmental Group of Funding Agencies for Global Change Research (IGFA) and the Space Frequency Coordination Group (SFCG) attended at the invitation of the CEOS Chair. From Canada, the Department of Fisheries and Oceans (DFO) and Department of Foreign Affairs and International Trade (DFAIT) attended as special observers.

The Belgium Embassy attended on behalf of OSTC. Regrets were received from UNOOSA, UNEP, NSAU, CAST and RSA.

A list of Plenary action items (Doc. 9-0), list of participants (Doc. 9-1), and an annotated agenda (Doc. 9-2), are provided.

## **2. OPENING REMARKS**

On behalf of the Canadian Space Agency and the Canadian government, Dr. Lindberg welcomed all participants. He introduced the CSA delegates and those from other Canadian organizations. All the participants introduced themselves. Dr. Lindberg introduced Mr. Mac Evans, President of CSA.

Mr. Evans commented that he had attended the first meeting of CEOS hosted by Canada, and acted as Chairman. He noted the considerable growth of the committee that had occurred since then and said that it was an indication of the importance of its role in Earth observation in helping to meet the needs of all the world. He welcomed the delegates to Montreal and to the CSA facility.

Mr. Evans recalled the founding principles of CEOS when it was formed as the committee of agencies who had or were planning to have Earth observation satellites. He noted that at the time of this meeting, Canada is on the verge of launching its first Earth observation satellite, Radarsat-1, which is now on the launch pad and waiting for design adjustments to the launcher - the expected launch date is November 4. Radarsat-1 is the key programmatic element of Canada's Space Program this year. He noted that many organizations in Canada participate in Earth observation and welcomed the representatives from CCRS, AES, and the Department of Fisheries and Oceans.

Mr. Evans said that the creation of CEOS in 1984 had forecasted the needs of the nations of the world and that it gives him great pleasure to see the importance that the nations of the world attribute to this activity. CEOS is a clear recognition of the multi-disciplinary nature of Earth observation and the activities of CEOS are fundamental to Earth observation as we go into the next century. He emphasized that Earth observation is a priority area of the Canadian Space Program and that the CSA will continue to support the actions and initiatives of CEOS and its working groups.

### **3. ADOPTION OF THE AGENDA**

Dr. Lindberg reviewed the agenda which had been circulated to and reviewed by the delegates prior to the meeting; some changes had been requested and incorporated. The agenda was adopted as revised.

### **4. RECORD OF THE 8TH CEOS PLENARY**

Dr. Liebig of DARA presented highlights of the eighth CEOS Plenary. He reviewed the joint resolution on CEOS achievements and noted the granting of membership to the EC and affiliation status to UNOOSA. He noted CEOS Activities in Support of Developing Countries and the Strategic Plan that had been accepted - seven action items had resulted from this discussion. The Plenary had endorsed the Data Policy Resolution on Principles of Satellite Data Provision in Support of Operational Environmental Use for the Public Benefit, which had been prepared in an Ad Hoc Data Policy meeting. In-discussions on Working Groups, the Plenary had endorsed the long term implementation plans of WGD and WGCV, the Ad Hoc WGN was converted to an Interim WGINS and directed to review the terms of reference of the different working groups of CEOS and submit a proposal to the 9th Plenary.

The Plenary accepted the results of the User Requirements Workshop held at Bonn. Finally, the Future CEOS Strategy was reviewed and agreed to, and an Implementation Plan for the goals in the Analysis and Planning paragraph was accepted; a Task Force was formed to begin this work. The minutes of the 8th CEOS Plenary were adopted.

### **5. MEMBERSHIP ISSUES**

Dr. Lindberg reported that he had received no formal application or request to join CEOS as a Member, an Affiliate or an Observer. However, he noted that applications may be stimulated from within as well as received from outside, and encouraged the membership to consider whether an organization should be represented in CEOS and if so, to present a proposal.

Dr. Lindberg noted that Mr. Taylor of IFCG had been invited to observe the meeting and give a presentation for possible future involvement in CEOS. Similarly Mr. Brown of IGFA had been invited as special observer to give a presentation on IGFA activities.

### **6. CEOS SECRETARIAT REPORT**

Ms. Manak of CSA presented a report of Secretariat activities during 1995. She noted that the Secretariat had met 9 times; 3 of those via telecon. Activities included participation in coordinating the User Requirements Workshop where the Task Force report on Planning and Analysis was reviewed; the organization of 3 CEOS Open Fora; update and distribution of the 1995 Consolidated Report; publishing of the CEOS Newsletter which, in addition to a mailing list of over 2000, is now also available on the World Wide Web; involvement with re-alignment of the Working Groups and examination of their terms of reference; and completion of the CEOS Yearbook. Action Items from the last Plenary were monitored throughout the year and all are either closed already or are on the Agenda for this Plenary meeting.

## **7. REPORT OF THE CEOS TASK FORCE ON PLANNING AND ANALYSIS**

### **7.a. Introduction**

At its 8th Plenary Meeting in 1994, CEOS set up a Task Force on Planning and Analysis. The objective of this Task Force was to assess how far the current and planned space missions of the CEOS members were likely to satisfy the requirements of the users, with the eventual goal of identifying potential gaps or overlaps in the planned program.

Dr. Lindberg reviewed the outcomes of the 1995 CEOS User Requirements Workshop (Doc. 9-3), which reviewed the draft Report of the Task Force. He noted that the workshop participants recognized that there are data users not represented by CEOS Affiliates who could be addressed in the CEOS requirements assessment process (e.g., users of ozone, trace gases, and solid Earth monitoring data). In addition, the participants recalled that the 1994 User Requirements Workshop tried to address regional users but was unable to reach consensus on how to do that within the CEOS context.

Dr. Lindberg noted that, to make progress in this area, the participants recommended that the Plenary consider the following strategies:

- 1) continue efforts to find new international or global groups with which CEOS can interact;
- 2) encourage Affiliates who have not yet vigorously participated in developing the Affiliates' requirements (Dossier Volume C) to do so;
- 3) encourage Members to prepare "national dossiers" containing requirements of non-Affiliate organizations with whom they interact. These requirements could be included in a new CEOS Dossier or in the Dossier Volume C; and
- 4) continue or expand dialogue with non-global user groups (e.g., at the regional or local level) through activities such as the CEOS Open Fora.

Dr. Lindberg also announced that Dr. Rasool will no longer be able to serve as co-chair of the Task Force. He asked the Plenary to consider leadership of the Task Force and whether it is more appropriate to continue with a single chair or to appoint a succeeding co-chair. Dr. Lindberg also noted that the final Report of the Task Force on Planning and Analysis was circulated for review prior to the Plenary meeting.

### **7.b. Status Report**

Drs. Rasool and Bizzarri, co-chairs of the Task Force during 1995, presented a progress report on the Task Force's activities and sections from the final report (Doc. 9-4A, 9-4B). Dr. Rasool summarized the terms of reference, objectives, membership, meeting history, and work approach of the Task Force. Dr. Bizzarri summarized the conclusions and recommendations contained in the Task Force Report.

Dr. Rasool noted that the Task Force's overall objective was to assess whether current and planned satellite instruments provide information sufficient to meet user requirements. With respect to membership, he recalled that the co-chairs represented research and operations perspectives and suggested that there should be continuity in membership through the end of the year. Dr. Rasool also summarized the Task Force's work approach. He stated that the Task Force studied Dossier Volumes A and C and found disparities and lack of detail in the information contained therein and was unable to conduct a thorough comparative analysis of the two documents. Therefore, it proposed a new information structure for the Dossiers, based on a standard format to be completed by users and providers, and demonstrated at the User Requirements Workshop that the new format could be effectively used. The Task Force requests that the Plenary consider asking CEOS agencies to provide enhanced information in the new format, to enable the comparative requirements analysis that will provide information on compatibility, gaps, and duplications.

Dr. Bizzarri summarized the conclusions and recommendations contained in the Task Force Report. He noted that in the preliminary requirements analysis exercise it was necessary to make assumptions while interpreting requirements and instrument capabilities because information was not always available in the Dossier. He also noted that not all the Affiliates have provided their requirements to the Dossier Volume C and the level of detail in the requirements provided varies from organization to organization. Data quality requirements were sometimes unreasonably severe as a consequence of picking-up and associating the most demanding figures from the many applications of a single geophysical parameter. In other cases, data quality requirements were too general or not provided. A few useful parameters easy to be observed from space were not considered, either because the Affiliates thought to derive them from other parameters more comprehensive but difficult to be observed, or because the present set of Affiliates is not fully representative of all possible applications of Earth observation satellites. With respect to space segment capabilities, as reflected in Dossier Volume A, Dr. Bizzarri noted that information on real and expected instrument performance, instrument technical specifications, satellite characteristics, and programmatic information was not always available.

Dr. Bizzarri stated that, to resolve the disparities in requirements and capabilities information, the Task Force devised a standard format to collect revised and complementary information from the space agencies and user organizations. This information can be used by the Task Force to complete its work and can serve as input to update the CEOS Dossier in 1996. Dr. Bizzarri also presented a schedule for the Task Force to complete a comprehensive requirements analysis during 1996, with a report to be given to the 1996 CEOS Plenary.

Dr. Bizzarri also said that the Task Force will require expanded participation from CEOS agencies because experts are needed to link with Affiliates for favouring the flow of new information and carrying out possible interactions if needed, vetting the incoming information before it is loaded in the database, and conducting the gap/overlap analysis.

#### **7.c. Discussion of the Task Force Report**

Dr. Lindberg invited questions and observations on the Task Force Report. The following is a summary of the points raised during the discussion.

- Dr. Townshend of IGBP stated that the requirements assessment activity will be a long-term continuing exercise because requirements change as knowledge changes. He said that prior efforts to specify requirements were critical to the present exercise. He added that the Affiliates should be required to prioritize requirements because the space agencies cannot evaluate one observation in isolation--various observations must be evaluated in concert to determine how they interact functionally.
- Dr. Holland of IOC noted that there seems to be a disconnect between applications of satellite data and the technical description of parameters and capabilities of sensors and satellites. He said that the origin of the requirements is the need for applications of the data; this is a planning and justification exercise and it is applications that are understood by politicians and others who make decisions based on factors such as economic benefits and environmental importance. Unless we understand this connection we are missing an important thread that binds it all together.
- Dr. Ratier of CNES said it is important to reconstruct the link between user applications, associated observation requirements and capabilities of space systems, without loss of continuity. It may be misleading to address only the link between oversynthesized requirements (e.g. a table for each parameter) and the capabilities of space systems, in isolation from the applications and the user environment, including other sources of information. Therefore, more specific analyses conducted by Affiliates themselves may be more significant and will preserve the specific priorities of each Affiliate. On the other hand, deriving specifications from mission or measurement objectives requires, for each project, more dedicated efforts and inspection than the Task Force can afford. In light of this, CEOS needs to assess the viability of the task, beyond the establishment of the database and ensure that the Task Force report includes a clear explanation of the product of its work as well as its limitations.
- Dr. Embleton of CSIRO pointed out that in populating the database, CEOS needs to consider a number of the infrastructure support activities and the requirements on Members. He suggested that the Working Groups may have responsibilities and interests in the database and that they may have a role in helping to make the requirements analysis activity a long-term CEOS exercise. In addition, he said the Plenary should provide direction that will enable the Task Force to provide a tangible product that Members can use on an ongoing basis. He said that Members need to accept responsibility to provide the information needed by the Task Force. He added that he thinks it is important to control the quality of Members' inputs so that the database and Dossier contain high-quality information.
- Mr. Townsend of NASA noted that the CEOS requirements analysis task is a difficult one; it is also a very important one that may not be achieved as soon as we would prefer. He suggested that the work needs to proceed incrementally, by having the CEOS agencies provide the improved data so that the Task Force can accomplish its proposed work for one more year. At this time the CEOS Members should decide whether additional, highly focused work should be pursued on a dedicated (funded) basis.

- Professor Lin Quan of NRSCC stated that a lot of necessary assessment and analysis has been done by the Task Force and it is important to properly define the standard format and definitions for both providers and users. He said that he understood the requirements analysis process would include the ground segment in the future. He said this would be very important for developing countries because having this information would help them to identify how to improve or enhance their own capabilities and make better contributions to other countries.
- Dr. Liebig of DARA said he feels it is important for the Task Force to take into account the data products that will be available, because improvements in this area can provide relatively large returns, especially as compared to the cost of space missions.
- Dr. Hinsman of WMO noted that the Task Force had to work with the requirements that were available at the time it was conducting its preliminary analysis. He reported that the IGBP, GCOS, and IOC have submitted updated requirements in the new format and they now are included in the Affiliates database, which is a portion of the proposed new database. He added that CEOS agencies should contribute to and use the database.
- Dr. Apling of UK-DOE stated that he hopes that CEOS will decide, for the moment, not to expand the requirements analysis process to include requirements of users not represented by the Affiliates. There is no other group of users better able to define their requirements for Earth observation data and CEOS should learn as much as possible from them before considering the needs of much less sophisticated users.

In response to some of these comments, Dr. Bizzarri pointed out that:

- it is understood that the assessment of requirements and capabilities will be an open-ended exercise; however, the Task Force estimated that, in one year's time, if Affiliates and Space Agencies respond to the request to provide revised information, the assessment will be thorough enough for the purpose of CEOS planning. Continuous updating of the exercise could be done nearly automatically if the recommendation to implement a relational database is accepted;
- the possibility to work by applications instead of by geophysical parameters was considered by the Task Force, and certainly the approach by applications will be useful at the time when synoptic conclusions will be drawn. The Task Force adopted the approach by geophysical parameters basically because of the present structure of the Dossier, and because it proved to be workable. However, with the relational database, it will be possible to sort the information by a number of keys, including applications, user communities etc;
- it is confirmed that, working with the present set of Affiliates, a set of conclusions representative enough for CEOS planning can be achieved in one year. Also it is confirmed that the Task Force will support the implementation of the database by monitoring the quality of the information to be loaded;
- expansion of consideration to the ground segment and to algorithms/processing is obviously necessary. However, it was not recommended to start this activity this year and by this Task Force: a more rational scheme for handling this aspect could be envisaged on the basis of the consolidated results of the work so far undertaken.

#### 7.d. Conclusions

In conclusion, Dr. Rasool said the guidance from the Plenary seemed to be that: 1) a dedicated group needs to develop prioritized requirements for the Affiliates; 2) the Task Force needs to take the next incremental step and provide a useful analysis of gaps and overlaps for the space agencies; 3) the Task Force needs to provide a description of its accomplishments and products, including their limitations; and 4) the space agencies have benefited from the Task Force's work and the preliminary requirements analysis because it revealed that some minor adjustments to planned missions could be made to better meet some Affiliates' requirements.

Dr. Lindberg added that it was generally agreed that CEOS will not seek non-Affiliate requirements as input to this process at this time. How to address non-Affiliate requirements remained an activity to be pursued as future CEOS business. In addition, while prioritizing the Affiliates' requirements is an important next step, it is not clear that the Task Force will be able to incorporate this into its 1996 activities, as it will need to focus on the analysis of gaps and overlaps.

On behalf of the Task Force on Planning and Analysis, Drs. Rasool and Bizzarri presented the following recommendations to the Plenary:

#### *Task Force on Planning and Analysis Recommendations to the Ninth CEOS Plenary*

*The Task Force on Planning and Analysis recommends that CEOS:*

- a. invite its Affiliates to review, update, and complement the information provided on user requirements, following the proposed format and instructions in Appendix 2 of the Report of the Task Force on Planning and Analysis. In this context, the CEOS Plenary should consider the issue of collecting requirements which are unlikely to emerge from the present set of Affiliates;*
- b. invite its Members to review, update, and complement the information provided on instruments and satellite programmes and plans, following the proposed format and instructions in Appendix 4 of the Report of the Task Force on Planning and Analysis;*
- c. arrange for the above information to be collected into a database, to be used for further work of the Task Force and for updating the CEOS Dossier; and*
- d. extend the time frame allocated to the Task Force to accomplish its mandate, up to the 1996 CEOS Plenary.*

The Plenary adopted these recommendations. The Plenary discussed and confirmed that the Task Force be extended by one year. Plenary discussed and agreed that the Task Force would proceed during this year under sole chairmanship of Dr. Bizzarro Bizzarri. Plenary agreed to the following four actions:

**Action 9-1:** Members, Observers, and Affiliates are requested to provide the information as specified in Annexes 2 and 4 of the Task Force Report. This entails updating the information contained in Volume A of the CEOS Dossier and completing the standard formats on user requirements and space system capabilities. Inputs to go to Dr. Bizzarri by 31 January 1996.



**Action 9-2:** Task Force on Planning and Analysis to confirm Task Force membership with the CEOS chair.

**Action 9-3:** ESA to define and create the new requirements and capabilities database, provide for its configuration control, and coordinate with the Task Force on Planning and Analysis regarding the inputting and maintenance of the database. ESA to report on the database at the 10th Plenary.

**Action 9-4:** Task Force on Planning and Analysis to compile and review the input for population of the new database, in conformance with inputs from Members, Observers, and Affiliates, complete the agreed analysis, iterate as required with Principals, and provide a final report to the 10th Plenary.

## **8. CEOS DOSSIER**

Dr. Hopkins of ESA reported on the status of the CEOS Dossier activities (Doc. 9-5). He noted that the biennial update of the Dossier is planned during 1996, in accordance with the CEOS Future Strategy. He announced that ESA offers to provide a database version of Volumes A and C available on-line at ESA/ESRIN, incorporating an interactive search capability, in conjunction with the efforts of the Task Force on Planning and Analysis. He said that ESA agrees that the WMO relational database is a good starting point for this effort and should encourage use of the Dossier. He stressed that ESA does not have the resources to update Volume B on the ground segment, and noted that the Task Force's schedule for providing products will need to be coordinated with the ESA schedule for developing the database. Mr. Marelli of ESA added that the Dossier will also be made available on disk and that a paper version is not planned for wide distribution.

## **9. RE-LOOK AT CEOS STRATEGY**

Dr. Lindberg recalled that in adopting the 1995 Future CEOS Strategy Plan, the 8th Plenary had agreed that it would be reviewed and updated as necessary at future plenary meetings. He suggested that it would be appropriate to review briefly the Strategy Plan at this time, so that Members might keep potential changes in mind throughout the Plenary meeting.

Dr. Chambers of the CSA recalled the major sections of the Strategy Plan for the Plenary and noted some areas where ongoing discussions and those that would take place during this meeting might suggest changes in the document, for example, the paragraphs dealing with Analysis and Planning, and Working Groups.

Dr. Mohr of EUMETSAT stated that there was an absolute need to review and update the strategy, in view of CEOS past achievements and future plans. On one hand, CEOS has accomplished a lot in assembling the leading space agencies and has been successful in bringing in Affiliates who represent users on a worldwide basis. However, an important role of CEOS should be coordination, and the coordination that has been done has been restricted to a "low level" coordination, especially in the Cal/Val area which is very important but remained on a purely technical level. It is time to consider a strategy to coordinate Earth Observation satellites. The establishment of a Global Observing System should be the goal of CEOS and should thus be addressed as a major item on the agenda.

Dr. Lindberg said that this was a very valid point to raise, and suggested that discussion about changing the Strategy Plan to reflect this be postponed until after the informal discussion on Global Observing Systems scheduled for Thursday evening.

Dr. Townshend of IGBP said that although it was not clear how an integrated global Earth observation strategy would develop, he would assume that whoever was doing it, CEOS should play a major role. He also said he agreed that the GOS discussion should not be an informal side discussion but formally part of the CEOS agenda.

Dr. Spence of GCOS drew attention to the GCOS-sponsored document provided to the participants, the GCOS Plan for Space-based Observations. He asked the participants to assess the scientific and technical issues within. He also said that the plan was intended to integrate the climate requirements so Agencies and CEOS could respond. He hoped that a Member-Affiliate dialogue would begin to address what is needed and what can be delivered.

Dr. Bizzarri of ASI said that the items in the Strategy Paper on Developing Countries are stated in a weaker way than they could be. He said that most of these items are administrative in nature, but in fact, CEOS has activities that are technical in nature. He said that he would like to see CEOS re-visit this section of the Strategy Plan and give it more technical content. Dr. Ratier expressed his agreement with this.

**Action 9-5:** Members, Observers, and Affiliates are invited to review the *GCOS Plan for Space-Based Observations* (Version 1.0, June 1995) and the *GCOS Guide to Satellite Instruments for Climate* (June 1995) and provide feedback to GCOS/Spence by 29 February 1996.

## **10. WORKING GROUP REPORTS**

### **10. a. Working Group on Calibration/Validation**

Dr. Till provided a status report on WGCV activities (Doc. 9-6). Major activities included the WGCV newsletter; the Cal/Val Dossier, the final version of which will be complete May/June 1996; participation in the CEOS-GCOS Workshop on Calibration and Validation of Global Change Measurements. The WGCV Strategic Plan has been reviewed and is now available through the CEOS Infosys. The four subgroups have been active. Regarding the proposed creation of a Subgroup on Atmospheric Chemistry, it is instead recommended that the existing subgroup roles be expanded to include this area. Dr. Till encouraged the participants to propose potential participants from the atmospheric chemistry field.

In response to the request of the Chair to consider adding a vice-chair position or to have a strict two-year rotation of the WGCV chair, it was felt that this would contribute to a lack of continuity and consistency. The WGCV did agree that a suitable term of office for the Chair is 3-5 years, and that a one year notice of the Chair's wish to step down would allow a new chair to be identified in time for a suitable overlap. Subgroup chairs would be handled in same manner. The Plenary agreed to this process. At this time Dr. Till announced her intention to step down as Chair at the next plenary; the Working Group will seek to nominate a new chair to succeed her at that time.

Mr. Townsend of NASA observed that in NASA's view, Cal/Val is a very important issue. He also expressed his support for the proposed WG chair arrangement and agreed that continuity of a technical nature is very important. He further noted that the response to the action item to establish an atmospheric chemistry sub-group was acceptable to NASA.

Dr. Rasool said that IGBP would propose names for the atmospheric chemistry activity.

Mr. Jayaraman of ISRO observed that India has test sites for Cal/Val and would be glad to provide information on them and to receive information in exchange.

The Plenary thanked the WGCV and Dr. Till for their impressive accomplishments and hard work during 1995. The Plenary adopted the following WGCV recommendations:

#### *Recommendations of WGCV to Ninth CEOS Plenary*

1. *A specific concern of the WGCV is the availability of calibration and validation data and information to and from developing countries. Many of these nations offer unique knowledge concerning the condition of critical calibration and validation test sites. Two-way exchange of satellite information and validation data is important if CEOS is to have access to, and the participation of, the developing countries in the use of such sites. Towards this end, the WGCV requests that the CEOS, and the WGISS, take steps to ensure that information systems function over an appropriate range of technological levels.*

2. *Competition for frequency allocation for satellite bands for data collection and transmission is intense and is expected to become more intense during the next decades. Competition arises from commercial, as well as from other governmental activities, within the CEOS national programs.*

*Passive observing systems are particularly affected because these types of sensors "listen". Ground and other transmissions within these bands create high levels of noise and can negate the environmental signal. Active sensors need transmission authority in the three world regions and these need to be protected within the World Radio Conference (WRC). It is recommended that the CEOS review long term needs for sensor frequency allocation and be encouraged to seek appropriate representation in the WRC.*

3. *The WGCV notes the lack of sufficient national programs, and their integration for the calibration of sensors and the validation of their algorithms and data products. The WGCV, therefore, recommends that the CEOS Members, within their Earth observation programs, shall consider enhancing activities in the following areas:*

- *emphasize the use of airborne and surface campaigns for pre- and post-launch periods*
- *integrate all available remote sensing and in-situ data, from platforms such as buoys, aircraft, balloons, and from ground test sites*
- *compare data from other sensors making similar measurements*
- *compare the geophysical parameters derived from space measurement to model predictions*

*In some instances, this is most effectively accomplished through international cooperation. Recommendation 3 should be seen as an integral part of a satellite development program and should not be seen in isolation. Appropriate resources of the space missions must be allocated for calibration and validation in the early stages.*

4. *WGCV recommends to the CEOS Plenary that, as the CEOS working group structure is undergoing a major change, CEOS should make it an action item for CEOS Members to review the membership of the working groups to ensure that their interests and activities are represented. Members should also ensure that adequate support is provided for the Member's representatives to enable them to fully participate in the work of the working groups and subgroups and to attend their meetings.*

*Note 1: The increasing role of subgroups will lead to more opportunities for participation.*

*Note 2: Most of the work is done, and advances are initiated, at the working group and subgroup meetings. Unfortunately, it appears that some Members do not have sufficient support to attend or participate on a regular basis.*

5. *Specific recommendations were made at the recent CEOS-GCOS workshop on calibration and validation of global change measurements. WGCV has to date reviewed the recommendations coming out of the land panel, and recommends that CEOS Members give them due consideration.*

**Action 9-6:** WGCV Chair to give courtesy notice to the CEOS Chair on the results of the WGCV's recommendation for the successor WGCV Chair. CEOS Chair will then inform CEOS Members, Observers, and Affiliates.

**Action 9-7:** CEOS Members, Observers and Affiliates are requested to review membership of the Working Groups, in light of Working Group realignments, to ensure their interests and activities are represented. Adequate support needs to be provided for the representatives to enable them to fully participate. Membership requests to be conveyed to the Working Group Chairs.

**Action 9-8:** CEOS Members are requested to review WGCV recommendations 3 and 4 to the 9th Plenary (regarding the recommendations of the CEOS-GCOS Workshop on Calibration and Validation of Global Change Measurements and enhancements to calibration and validation programs, respectively) and given them due consideration. Responses to be conveyed to the WGCV Chair.

#### **10.b. Working Group on Data**

Mr. Lauritson of NOAA reported the WGD's activities during 1995 and also summarized subgroup activities and accomplishments (Doc. 9-7). He noted that joint meetings had been held between WGD and WGINS, and that the two groups recommend that CEOS consolidate the two groups into WGISS and accept the jointly drafted Terms of Reference and CEOS Resolution on WGISS, which have been distributed to Members.

Mr. Lauritson also drew the attention of the Plenary to the need to avoid purging data without ascertaining whether it is important to other organizations; he noted a prototype WGD bulletin board, accessible through CEOS Infosys, for posting and reading purge alert messages.

Dr. Edel of the Canadian Department of Fisheries and Oceans commented that as a user agency DFO supports the WGD recommendation that satellite data and associated data be archived in a way that maximizes their interuse.

#### **10.c. Working Group on International Network Services**

Mr. Marelli of ESA presented the WGINS status report (Doc. 9-8), covering background, tasks from Plenary, action items and meetings held during 1995. He also summarized the background of the proposed merger of WGD with WGINS to create the WGISS.

Regarding Mr. Marelli's point that we are looking forward to the use of networks for the supply of data Dr. Townshend/IGBP noted that others are developing infrastructures such as high capacity networks that are able to exchange very large volumes of data and suggested that CEOS should take advantage of some of these opportunities.

### **11. REALIGNMENT OF WORKING GROUPS**

#### **11.a. Harmonization of CEOS Working Groups and Subgroups Terms of Reference - Joint Proposal from the WGD and WGINS**

Mr. Kikuchi of STA/NASDA described the joint WGD and WGINS proposal to disband those two working groups and create a single working group, the Working Group on Information Systems and Services (WGISS) (Doc. 9-9). He noted that this effort was pursued in response to action items assigned by the eighth Plenary. WGCV functions were assumed to be beyond the scope of this effort.

Mr. Kikuchi explained that the WGD and WGINS worked together to develop joint conclusions and recommendations to restructure the two working groups. He presented jointly-developed draft WGISS terms of reference, a draft CEOS WGISS resolution, plans for an inaugural WGISS meeting in November, 1995 and a process to develop a five-year implementation plan for WGISS.

Mr. Kikuchi also explained that the drivers for harmonizing the functions of the WGD and WGINS were the needs to: 1) improve progress toward providing the on-line services proposed by WGINS; 2) rationalize WGINS objectives and resources with ongoing WGD activities; 3) more quickly realize actual system and service interoperability; 4) enhance user involvement; and 5) maximize the returns on agency investment in CEOS activities to ensure continued participation (e.g., by reducing travel costs).

Mr. Kikuchi also briefly reviewed the draft resolution and terms of reference for WGISS. In the presentations on WGISS, Mr. Kikuchi presented the key points arising from joint WGD/WGINS meetings in Baltimore. One of the key points raised proposed 'higher level political exposure and impetus (e.g. links to G-7)'. Discussion on this point noted that it would be clearly inappropriate for a CEOS WG to entertain any desire to be involved with the G-7 at a political level. The CEOS Resolution on WGISS was amended accordingly. It was noted however that there were meetings in Rome and Brussels recently that addressed

at the G-7 level, the global environment and information infrastructure (many CEOS agencies were represented at these meetings). A number of working level Pilot Projects were launched. Information on some of these Pilot Projects was tabled at the Plenary. It was noted that this type of technical, working level activity might include activities that would relate to WGISS activities. There was no further discussion on this topic.

Mr. Lauritson presented the joint WGD-WGINS proposal on the WGISS five-year implementation plan, including the plan's scope, content and strategy (Doc. 9-10.) He reported that the first formal draft of the WGISS five-year plan is to be distributed in advance of the first WGISS meeting scheduled for 13-16 November 1995 in Moscow. It was generally agreed that the proposed process and content of the WGISS five-year plan was acceptable to the Plenary.

Dr. Lindberg facilitated a review of the draft CEOS Resolution on WGISS and terms of reference. He noted that there had been much discussion and review by CEOS agencies of these proposals prior to the Plenary meeting.

#### **11.b. Plenary Action on WGISS Executive**

Dr. Lindberg facilitated discussion of the nominations for the WGISS leadership. He noted that the CEOS Chair had invited and received nominations for the WGISS Chair and Vice Chair prior to the Plenary. He reported that, after extensive consultations with CEOS agencies, there appeared to be agreement on the need for Chair and Vice Chair positions and on the Chair appointment. He noted, however, that three nominations for the WGISS executive remained for the Plenary's consideration.

To aid the Plenary's decision making with respect to the Vice Chair appointments, Dr. Lindberg presented two options to the Plenary (Doc. 9-11A) with respect to dealing with the three nominations. The first option entailed creating a second Vice Chair position and leaving open the question of succession until the next Plenary. During 1996, a review of appointment procedures and the need for two Vice Chairs could be conducted. The second option also entailed creating a second Vice Chair position, but the decision would be made that one of the two Vice Chairs would be at this time a succeeding Vice Chair. Dr. Lindberg stated that he favours the second option.

Dr. Lindberg also noted that the CEOS terms of reference and strategy do not address procedures for selecting and appointing persons to CEOS positions. He reviewed some questions that have surfaced as a result of this situation, including whether appointments are made by the Plenary or the Working Groups; whether a candidate is selected based on the person nominated, the sponsoring agency, or geographic area; how to respond when a person resigns their CEOS position; and whether a more formal process is needed to address this scenario. He proposed that the Secretariat be tasked to examine these issues and bring recommendations to the next Plenary.

The Chairman's proposal concerning the two options for the WGISS executive was extensively discussed by the Plenary with considerable support for each option. During the subsequent debate the following issues were raised by various delegations:

- o It was generally agreed that any Member, Observer, or Affiliate could serve as the WGISS Chair and Vice Chair.

- Some delegations insisted that it was the person that was being nominated and not the organization, but there was no unanimity on this issue.
- Several members agreed that the Secretariat should consider the question of whether a more formal process should be established for making working group nominations and determine how this might be reflected in the CEOS Terms of Reference.

Since, at this point in time no consensus was emerging, the Plenary decided to postpone taking a final decision until Friday. Upon resuming the discussion, Dr. Gerard Szejwach clarified his position on the matter and his availability. The Chairman then presented his revised recommendation (Doc. 9-11B) which was unanimously endorsed with no further discussion.

The Plenary appointed Ms. Helen Wood of NOAA to serve as WGISS Chair. The Plenary also appointed Mr. Hiroshi Kikuchi of STA/NASDA to serve as WGISS Vice Chair (designated to assume the Chair after two years), and Dr. Gerard Szejwach, who is transiting from EUMETSAT to IGBP-DIS, to serve as WGISS Vice Chair charged to facilitate effective interaction with users.

The Plenary endorsed the following CEOS Resolution on WGISS and adopted the WGISS terms of reference as revised.

#### ***CEOS Resolution on WGISS***

*CEOS,*

*recognizing the unique characteristics of Earth observation information systems and data communications networks as tools for timely access to, and dissemination and exchange of, data and information,*

*and recognizing the need to advance the understanding of environmental processes and Earth resources management and monitoring,*

*also recognizing the necessity to promote effective international cooperation,*

*establishes the Working Group on Information Systems and Services (WGISS) by consolidating the CEOS WGD and WGINS,*

*thus stimulating, coordinating, and monitoring initiatives, thereby enabling users worldwide to exploit more effectively and benefit from data generated by Earth observing satellites and other sources for national, regional, and global purposes, aware that this measure will provide a more effective way forward than the current structure.*

#### ***Terms of Reference***

#### ***CEOS Working Group on Information Systems and Services (WGISS)***

##### ***Mission Statement***

*Recognizing the importance of global issues, the WGISS will stimulate, coordinate, and monitor initiatives, thereby enabling users at a global, regional, and local level to exploit more effectively, and benefit from, data generated by Earth observing satellites and other sources.*

### *Overall Objective*

*The overall objective of WGISS is to facilitate data and information management and services for users and data providers in dealing with global, regional, and local issues. It will address in particular the capture, description, processing, access, retrieval, utilization, maintenance, and exchange of spaceborne Earth observation data and supporting ancillary and auxiliary data and information, enabling improved interoperability and interconnectivity of information systems and services.*

*Specific goals are to:*

*Enable Earth observation data and information services to be more accessible and usable to data providers and data users worldwide through international coordination;*

*Enhance the complementarity, interoperability, and standardization of Earth observation data and information management and services;*

*Foster easier exchange of Earth observation data and information through networks and other means, to meet the requirements of users and data providers.*

*To achieve these objectives and goals, WGISS will:*

- 1. Synthesize and respond to the needs of users and data providers in a diverse international community.*
- 2. Foster global interconnectivity and interoperability of data and information systems and services.*
- 3. Identify, influence, and recommend standards for effective data interuse.*
- 4. Support improvements in the quality and reliability of data, information, and supporting systems and services.*
- 5. Monitor development of new technologies and encourage their use as appropriate.*
- 6. Develop agreement on common terminology.*
- 7. Foster ongoing, effective communications among CEOS participants and others.*

### *Implementation*

*Strategies and activities to meet the objectives and goals of WGISS, stated above, will be fully defined via a long term plan covering five years. The long term plan will be submitted to the Plenary for endorsement.*

### *Structure and Procedures*

*The WGISS will meet twice per year, rotating meeting venue among participants. The WGISS Chair and two Vice Chairs will be designated by the CEOS Plenary, and will rotate among WGISS Members every two years. One Vice Chair will be designated to assume the Chair after two years. One Vice Chair will be charged to facilitate effective interaction with users. The Chair of WGISS will prepare and distribute*



*minutes for each meeting. At each meeting of the WGISS, the time, place, and host for the next meeting will be established.*

*The WGISS will coordinate its work with other CEOS working groups and other international groups involved in related activities, to cooperate and avoid duplication of effort.*

*Membership in WGISS will be open to all Members, Observers, and Affiliates of CEOS as defined in the CEOS Terms of Reference. Delegations may include relevant experts from non-Member organizations when appropriate.*

*Each CEOS Member, Observer, and Affiliate will designate a point of contact for WGISS correspondence.*

*Subgroups may be established by the consensus of the WGISS, to perform detailed technical work in specific areas. Subgroup Chairs will be appointed by the WGISS for three years, based on nominations from each Subgroup. The WGISS will approve Terms of Reference for each Subgroup. The Chair of each Subgroup will report at each WGISS meeting on the Subgroup's progress and plans.*

*The WGISS will report to the CEOS Plenary, bringing forward recommendations and proposals as appropriate.*

*The WGISS may propose modifications to these Terms of Reference, and such modifications will be submitted to the CEOS Plenary for approval at the next CEOS Plenary meeting.*

On behalf of the Plenary, Dr. Lindberg thanked NOAA, ESA and STA/NASDA for their vital contributions to the former WGD and WGINS and to the new WGISS. He also extended hopes for successful tenures to the Chair and Vice Chairs and expressed confidence that WGISS will have a very productive future. The Plenary gave special recognition to Mr. Kikuchi, Mr. Lauritson, and Mr. Marelli for their efforts at streamlining the Working Groups.

**Action 9-9:** WGISS Chair to complete development of the WGISS five-year implementation plan and report to the 10th Plenary.

## **12. CEOS YEARBOOK**

Dr. Hopkins presented a report on the CEOS Yearbook and recognized Smith Systems for their excellent support. Input for the Yearbook had been requested from all CEOS Members, and while the content may appear unbalanced, it is an accurate reflection of the total input received. The content had been reviewed by the CEOS Secretariat during several working sessions but it was not practical to distribute to the CEOS membership for comment. The Yearbook was to be launched at the G-7 meeting in Halifax but was postponed to the IGARSS Meeting in Florence. Each CEOS Member will receive 40 copies of the Yearbook to distribute as they wish. Dr. Hopkins noted that it was an excellent opportunity to gain a great deal of exposure for CEOS. The Plenary recognized the resources and efforts that made the Yearbook a success and thanked ESA for sponsoring this valuable contribution to CEOS.

### 13. IOC OCEAN COLOUR WORKSHOP

Mr Withrow opened with a brief presentation on the process that led to the IOC Ocean Colour Workshop and the concepts that went into the development of the suggested approach (Doc. 9-12). He pointed out that IOC places a high priority on ocean colour data for understanding of the ocean ecosystem and that parallel activities within the CEOS WGCV and WGD also focused on the imminent availability of ocean colour sensors and the steps necessary to prepare for these data. In order to facilitate the coordination and development of this important new data stream and promote user community involvement, IOC proposed to set up an International Ocean Colour Coordination Group. The Plenary agreed that this was a timely and appropriate action and expressed its support of these activities through its endorsement of the following resolution in this regard.

#### *CEOS Resolution on Ocean Colour*

*The Committee on Earth Observation Satellites:*

*Noting the executive summary of the IOC Workshop on Ocean Colour Data Requirements and Utilization (Sidney, B.C. 21-22 September 1995);*

*Recognizing the value of ocean colour data in the understanding of the marine ecosystem and their contribution to the global ecosystem;*

*Also recognizing the need for increased coordination among space-based data providers; in-situ data providers, and the global user community to improve data utilization and reduce cost;*

*Supports the formation by IOC of the International Ocean Colour Coordination Group (IOCCG);*

*Encourages all CEOS Members, Observers, and Affiliates with relevant scientific, technical, or other interests to fully participate in the IOCCG.*

*Requests WGISS, WGCV and IOCCG to coordinate relevant activities in order to foster the best collective use of the various ocean colour sensors to be launched by different nations over the next decades.*

#### *Annex to CEOS Resolution on Ocean Colour Draft Terms of Reference for the IOCCG*

- 1. Cooperate with CEOS Working Group on Calibration and Validation in the coordination of calibration and validation activities.*
- 2. Cooperate with the CEOS Working Group on Information Systems and Services in the coordination of data management activities relevant to the user community including merging of data, data access and product development.*
- 3. Work closely with CEOS in the development of Ocean Colour using feedback from activities and developments in the user community.*
- 4. Development of international ocean colour activities geared toward expanding the use of ocean colour data products including training.*

CNES informed the meeting that it will be hosting an international workshop on ocean colour calibration and validation in April 1996 and agreed to coordinate closely with IOC and the IOCCG in the preparations for this workshop. The Plenary welcomed this initiative on the part of CNES.

**Action 9-10:** WGCV Chair and WGISS Chair to support actions called for in the CEOS Resolution on Ocean Colour.

#### 14. SFCG

Dr. Taylor described the Space Frequency Coordination Group (SFCG) and its activities related to the World Radio Conferences (WRCs), which are organized by the International Telecommunications Union (Doc. 9-13). He drew attention to a document provided by EUMETSAT on space frequency allocations (Doc. 9-14). He also described SFCG's activities as they relate to Earth observation and meteorology. He stated that commercial and other interests are increasingly successful in acquiring radio frequencies for their use, and this impacts the availability of frequencies for Earth observation, research, and meteorological use. He observed that the CEOS Working Groups have expressed concern over this issue during the present Plenary meeting.

Dr. Taylor reported that WRCs will be held in November, 1995 and in 1997. He noted that the 1997 WRC may offer CEOS an opportunity to influence frequency allocations for Earth observation and meteorology. He also suggested that CEOS may be invited to become an Observer at SFCG meetings, to advance CEOS space frequency interests. He further suggested that CEOS consider providing the CEOS Yearbook to delegates at the 1997 WRC, to increase awareness of CEOS activities at the conference.

Mr. Townsend said that, in NASA's view, this is an extremely important issue for Earth observation because it depends heavily on clear and protected bands in which to operate and significant erosion has occurred over the last several years. This lack of availability of radio frequencies impacts hardware and algorithm design and development and, in some cases, prevents physical phenomenon from being observed. He further noted that the CEOS space agencies should work closely together to help ensure that our limited frequency allocations are preserved.

Dr. Hinsman noted that WMO attends WRCs as an Observer because it considers radio frequencies to be vitally important. He said that, even though WMO cannot vote at WRCs, it has been successful in influencing frequency allocations by working through National Meteorological Services to stress their importance. He stated that CEOS is likely to be able to make more of an impact than WMO due to its broad membership. Dr. Hinsman also reported that he is maintaining a list of delegates to the upcoming WRC and offered to provide CEOS participants a copy on request. Dr. Taylor added that the CEOS agencies may also be able to work through their national telecommunications agencies and ministries to influence outcomes in this regard.

It was generally agreed that it is in CEOS' best interest to pursue activities related to the availability of radio frequencies for Earth observation.

**Action 9-11:** Chair/Secretariat to discuss the desirability and, if appropriate, methods for CEOS to be involved with Space Frequency Coordination Group (SFCG) activities.

## 15. HIGH-RESOLUTION DATA EXCHANGE PILOT PROJECT

Dr. Skole of IGBP presented the status of the CEOS high-resolution data exchange pilot project (Doc. 9-15A,B). He reported that the pilot project is now in the implementation phase. A working group was formed and held its first meeting. Full metadata listings were acquired and analyzed, sites and specific scenes required to support the project were defined, and an analysis of data exchange policies begun. He noted that the project is moving into the evaluation phase, wherein analysis of scientific results and inter-sensor comparison will be completed and scientific results presented.

## 16. DEVELOPING COUNTRY ACTIVITIES

### 16.a. Space Information System Feasibility Study

Dr. Liebig of DARA reported on the Space Information System Feasibility Study, an action item from the last plenary (Doc. 9-16). He noted that Volume 2 of the study is available from DARA upon request. Dr. Liebig noted that Earth observation data, information about Earth observation projects in developing countries and the respective points of contact are currently scattered throughout different archives without uniform structure or common catalogue and the major problem for developing countries is to find out how to get access to additional information. Therefore, the study team proposes an Information Locator System (ILS) which is a system containing links and pointers to data and databases. The network concept includes a coordinating node responsible for the implementation of the ILS at a host site and a coordinating organization. After an initial build-up phase, the system could be maintained by a fellowship, perhaps sponsored by CEOS agencies, to keep the database current. A pilot project is proposed with the goals of developing a skeletal system, for plenary approval, for an end-to-end demonstration of the ILS with concentration on a region of the world, with user feedback.

CEOS involvement should be in the creation of a small temporary ad hoc working group which will report to CEOS on progress. DARA offered to assume the responsibilities of the coordinating organization if the Plenary approved such an activity. Dr. Liebig predicted that the project would take 2 years to complete. Phase 1 (12 months) would include the establishment of the coordinating node and a WWW home page and the integration of the most important databases. Phase 2 (12 months) would include the integration of experience of the users, especially in the pilot area and the expansion of the database.

Mr. Kikuchi of NASDA strongly supported DARA's feasibility study and pilot project proposal and recommended it be strengthened in support of developing countries through coordinating nodes. NASDA will play a role in investing and developing the network activities in Asia. Noting the importance of this work, Mr. Lauritson of NOAA requested that DARA make a presentation at the next WGISS meeting. Dr. Embleton also added his support to the proposal and indicated that there are a number of equally important and complementary regional activities that should be taken into account in designing such a system. He is encouraged that this proposal will assist with the more extensive use and application of satellite data in developing countries but noted that it is a two way process--after providing information, advice and support to developing countries, they have a role in feeding information back into our systems as well.

Dr. Bizzarri noted that 3 or 4 years ago ASI undertook a similar initiative but it was coolly received by the Plenary. The proposal seems more attractive now that CEOS has a strategy with respect to developing countries. He indicated his hope that CEOS colleagues would support DARA strongly in its effort.

Mr. Paillon noted that an exhaustive study on the EC approach toward developing countries will be completed soon. A group has been setup in the EC framework to coordinate various ongoing activities in the EU and to determine future common initiatives in this field. Dr. Brent Smith of NOAA noted that this project may be of some interest to the G-7 global information community and its Global Information Society Pilot Project in which many Members of CEOS are already involved. Mr. Jayaraman of ISRO was happy to note the active support extended by CEOS to this important activity and appreciated specifically DARA's efforts and offer to host the pilot project. He felt that the database should contain not only data on Earth observation but also other facilities available. It should also contain details on experts/expertise.

Ms. Wood encouraged the Plenary to ask DARA to work with WGISS beginning immediately, to set up a coordinating and assessment activity in conjunction with WGISS's first meeting in Russia. DARA agreed to proceed in this manner. Mr. Seipel of DARA indicated they appreciated the support they received. He agreed to the suggestion of working with WGISS but noted that it was not yet possible to commit to a strict schedule. He also noted that it might be worthwhile to include in the WGISS discussion those Members who offered to make available regional resources. He requested suggestions and/or feedback so that a reasonable schedule could be developed.

**Action 9-12:** DARA to organize the pilot phase of a DC Information Locator System (ILS) and to work with WGISS Chair to consider new Working Group activities supporting the DARA-sponsored ILS proposal and report to the 10th Plenary.

#### **16.b. CD-ROM Project**

Mr. Kingwell described the CSIRO CD-ROM project in support of developing countries (Doc. 9-17). He described related activities during the development phases and the recommendations from various international organizations and bodies that support developing country activities. He noted that CD technology has been widely used in developing countries and academic bodies. For effective use, it is critical that reproduction of the contained material be facilitated through a royalty-free license agreement. The planned structure for the CD was outlined: it will incorporate case studies, remote sensing basics, image manipulation software, and sample data sets. The CD will be geared toward students in their senior year of high school. He requested that contributions to case studies and sample data sets be forwarded to the project manager by 15 Dec 1995.

Mr. Townsend of NASA fully supports the development of this training tool for the students that are our future Earth observation scientists and engineers. Mr. Kikuchi of NASDA also supports this project and observed that versions in languages other than English would be very valuable especially in the Asia Pacific Region. He offered assistance of NASDA to effect this, and also in facilitating use of case studies from the STA/NASDA special report. Mr. Kingwell thanked NASDA for this offer and noted that previous studies by the Economic and Social Commission for Asia and the Pacific had also emphasized the desirability of making Earth Observation training material available in major languages. Dr. Lindberg asked participating agencies to consider what contributions they could make and forward case studies and data sets to CSIRO.

**Action 9-13:** Members, Observers, and Affiliates are encouraged to provide contributions (case studies and data sets) to the CSIRO CD-ROM in support of developing countries by 15 December 1995. Inputs to be provided to: Murray Wilson, CSIRO Earth Observation Centre, GPO Box 3023, Canberra ACT 2601, Australia; fax: 61 6 216 7222; e-mail: m.wilson@eoc.csiro.au

#### **16.c. EC Activities in Support of Developing Countries**

Mr. Inglis reported on the Action Item 8-5 from the last Plenary, i.e. EC to develop and maintain a calendar of planned airborne campaigns related to developing countries and report status to the ninth Plenary. The European Commission's Joint Research Center is pursuing this action through the European Airborne Remote Sensing Capabilities element of its Advanced Techniques Unit. A suitable database has been designed and developing countries are now invited to supply data entries giving details of airborne campaigns undertaken in their territories.

**Action 9-14:** Members, Observers, and Affiliates are encouraged to provide inputs to EC/JRC's effort to complete a database of airborne campaigns undertaken in developing countries. Inputs to be provided to Alan Belward, IRSA, JRC, Ispra, Italy; telephone: 332 786 765; fax: 332 789 536; e-mail: alan.belward@jrc.it

#### **16.d. Interactions with SAF**

Dr. Bizzarri reported on SAF interactions during 1995. The report of the Focus Group on Developing Countries was not made at the SAF-3 meeting in Oslo in October 1995 as the session was cancelled due to logistical problems. SAF-4 is scheduled for Beijing in 1996. He noted that in a list of topics provided by SAF there are 9 technical fields requiring improved cooperation to help developing countries. He commented that CEOS strategy was focussed in an administrative and non-technical way. Dr. Bizzarri believes that it is possible to formalize the CEOS strategy such that it contains a higher level of technical content. He suggested revisiting the strategy text and CEOS Long Term Plan.

Dr. Lindberg invited feedback. He noted that a more comprehensive cataloguing of national activities would be the first step in revising the strategy or better defining how CEOS can better support developing country activities. Dr. Mohr of EUMETSAT added his support to any concrete actions aimed at assisting developing countries and cited those of DARA and NASDA as excellent examples.

Mr. Lauritson of NOAA noted that some of these recommendations could be included on the agenda of the existing working groups. Professor Lin stated that China, as a developing country appreciates the efforts of CSIRO, DARA, NASDA, and ASI. He emphasized that every effort would be made to participate in developing country activities, and would like to offer certain conditions if the group would launch some pilot project in China.

Copies of the SAF Action Item list and other SAF materials are available from Dr. Bizzarri. Copies of the report of the CEOS Workshop on Developing Countries held in 1994 in San Jose dos Campos are available from the Secretariat.

#### **16.e. EUMETSAT Support to Developing Countries**

Mr. Lafeuille reported on EUMETSAT activities (Doc. 9-18A,B). He noted the wide potential of meteorological satellites in support of sustainable development in Africa in particular for operational meteorology, precipitation estimates and disaster early warning. He indicated the main lines of action decided by EUMETSAT in order to maximize the benefit of developing country users: facilitating access to data and services, provision of data free of charge, enhancing user interaction through User Forums and the support of two Regional Meteorological Training Centers. He concluded that all of these efforts have been stimulated by discussion in CEOS, IAF, SAF and WMO.

## **17. RELATED MEETINGS**

### **17.a. EUMETSAT Report on Outcome of CGMS XXIII 15-19 May, Darmstadt**

Mr. Lafeuille of EUMETSAT presented a report on Outcome of CGMS XXIII (Doc. 9-19). He noted that CGMS was established 12 years before CEOS but the groups have similar objectives. The main topics discussed within CGMS included general coordination, telecommunications, and satellite products issues. Major enhancements in Members systems had occurred since the last meeting as a result of the successful launch and operations of several metsats: GOES-8, GOES-9, NOAA-14, GOMS-N1, GMS-5, Meteosat-6, Meteosat Ground Segment. Mr. Lafeuille reviewed long term plans and described how met-sat geo-stationary coverage will develop over coming years. He noted that in certain areas the system still needed to be consolidated and secured by a contingency strategy. CGMS XXIII has adopted the principle of such a strategy. Concerning telecommunications issues, he highlighted the threat for metsat frequencies as addressed in Doc 9-18. He furthermore reported on progress achieved in IR cross-calibration and harmonization of wind derivation and verification methods. The next meeting will be held in May 96 in Switzerland hosted by WMO.

### **17.b. Report to the Plenary on CEOS Open Fora**

Dr. Lindberg noted that this report has been received by participants and encouraged Members to read and review recommendations. The following actions were agreed.

**Action 9-15:** Chair/Secretariat to continue to seek venues for CEOS Open Fora; NASA offered to develop a display for use at CEOS Open Fora, and to review the proposed concept with the Secretariat prior to committing to its development.

**Action 9-16:** Members, Observers, and Affiliate are encouraged to inform the Chair/Secretariat of opportunities for CEOS Open Fora.

### **17.c. Report on Interaction with GEO**

Dr. Lindberg reported that he had received a letter from a small group representing private sector interests named Global Earth Observation. The group requested formal or informal dialogue with CEOS. It was agreed that this item may be considered in the context of broader CEOS interaction with the commercial sector (see Section 21).

## **18. REPORT ON ANALYSIS OF GEOGRAPHIC COVERAGE BY HIGH RESOLUTION SATELLITES.**

Dr. Skole of IGBP reported on Analysis of Geographic Coverage by High Resolution Satellites and noted the 2 project objectives: to develop (1) a WWW site to provide an opportunity for global change researchers to obtain data from all high resolution satellites in existence; and (2) a global meta data system - an effort to acquire on a single platform all the meta data that is available from high resolution satellites. Dr. Skole then demonstrated the system, using S.E. Asia as an example.

Dr. Rasool of IGBP recalled the background of this project - an action had been given to IGBP to assemble a database of high resolution satellite data. He noted that this action had come in response to Plenary.

discussions about developing countries and asked the Members to consider whether the system as demonstrated would be useful.

Dr. Von Glehn of SNSB congratulated the team for the progress that has been achieved. She observed that problems and delays have been overcome and that she looks forward to seeing their further results next year.

#### **19. IGFA ACTIVITIES**

Mr. Louis Brown of IGFA presented an outline of the International Group of Funding Agencies for Global Change Research (IGFA) (Doc. 9-20). He said that IGFA had been created to fill a specific need: to identify and address issues related to the funding of global change research. In particular IGFA seeks to identify gaps and overlaps and to address these; and to resolve issues by Members taking action through their national systems.

IGFA has extended an invitation to CEOS to be represented at their meetings and as a result Mr. Haruyama of NASDA will attend the next IGFA meeting in October 1995.

Mr. Seipel of DARA asked what process IGFA uses to identify the funds that are being provided for support of global change research under IGFA's purview. Mr. Brown responded that IGFA is now conducting its second resource assessment survey through which IGFA invites each of its member funding agencies to identify the resources they (and other funding agencies in their countries) provide for global change research.

#### **20. REPORT ON SPECIAL APPLICATIONS OF SATELLITE DATA**

Mr. Ishida of NASDA stated that the report proposed two years ago is now completed (Doc. 9-21). He summarized the contents of this report which is available to Members, covering background, aims, application areas, distribution and future plans. He thanked CEOS Members for their inputs of data which had helped make this study and report possible.

Professor Lin Quan of NRSCC expressed appreciation of the effort of his Japanese colleagues and the hope that this work can continue in which case, China will continue to offer examples for study.



## 21. CEOS INTERACTIONS WITH THE COMMERCIAL SECTOR

Dr. Lindberg invited discussion on CEOS interactions with the commercial sector.

- Dr. Borg of SNSB stated that he was pleased that CEOS Open Fora were initiated during 1995. He reported that he participated in the CEOS Open Forum held in conjunction with the International Astronautical Federation meeting held in Norway in October 1995. He noted that the Plenary report on the CEOS Open Fora indicated that there was little feedback received on commercial requirements and suggested that it may be that the appropriate organizations were not polled for requirements. He said that the commercial sector will be an important user of Earth observation satellite data (e.g., JERS and RADARSAT data) and can offer experience in data use to CEOS. He said he is not convinced that representation of the commercial sector through government agencies in CEOS is the best route, and that the GEO organization is not representative enough of the commercial sector. He suggested that CEOS undertake an effort to examine the issue of interactions with the commercial sector during 1996 and offered to assist in the process.
- Dr. Smith recalled that CEOS agreed that commercial data policy was one of four areas discussed at the Ad Hoc Data Policy meeting in Abingdon and that CEOS subsequently dealt with data policy for global change research and operational use, but has elected so far not to address commercial data use. He suggested that the Chair/Secretariat look into these issues and that CEOS at Plenary level be prepared to focus on commercial sector interaction when it is appropriate to do so. He indicated that this will become much more important when there are private sector satellites developed independently of CEOS Members.
- Dr. Shaffer said that three CEOS Open Fora were held in 1995 to provide opportunities for CEOS interactions with the commercial sector and other potential users. She noted that the Secretariat has invited suggestions from the CEOS agencies regarding venues for the CEOS Open Fora and other means for publicizing CEOS activities.
- Dr. Ratier said he appreciates the progress in dialogue with the private sector and encouraged future Chairs to continue along that line. He noted that CEOS has had difficulty in addressing regional applications, perhaps because the commercial sector is a big user in this area.

It was generally agreed that CEOS needs to continue to pursue CEOS interactions with the commercial sector.

**Action 9-17:** Chair/Secretariat to examine CEOS interactions with the commercial sector and report to the 10th Plenary.

## 22. REVIEW OF ACTION ITEMS FROM THE 8TH PLENARY

G. Lindberg noted that all action items of the 8th Plenary could now be considered closed. He noted that the complete list would be included in these minutes so that the membership could review and comment as necessary (Doc. 9-22).

### 23. COUNTRY REPORTS

The following reports were briefly presented, or made available to the membership, on significant activities within the last year:

Australia (CSIRO)  
Canada  
Europe (ESA, EUMETSAT)  
France (CNES)  
Germany (DARA)  
India (ISRO)  
Japan (STA/NASDA)  
Norway (NSC)  
Russia (Roshydromet)  
Sweden (SNSB)  
USA (NASA)  
USA (NOAA)

### 24. CEOS STRATEGY TOWARDS DEVELOPING COUNTRIES

Dr. Lindberg presented the revised text for paragraph 23 of the Future CEOS Strategy relating to Developing Countries. The text, initially provided by Dr. Bizzarri (and coordinated with others), was slightly modified during the discussion and finally adopted as follows (the original paragraph was split into four paragraphs):

#### Developing Countries

23 *Within the framework of CEOS objectives, activities in support of developing countries will have increasing priority. The areas addressed for improved cooperation are:*

- *Assessment of space capabilities versus user requirements*
- *Data access, ground structures, information services*
- *Assessment of data use, analysis of lessons from the past*
- *Analysis of limitations, identification of gaps (occasional/structural)*
- *Promotion of well-designed pilot projects; user involvement*
- *Increased education and training, basically on-the-spot*
- *Growth of local talent (primary objective)*
- *Provision of infrastructures suited to local operational conditions*
- *Improved use of existing user interfaces; augmentation if necessary*

24 *CEOS will operate in these areas through relevant activities of its Members, and will provide a forum for discussing experiences, harmonizing efforts and possibly stimulating new initiatives. Both working groups on international network services and calibration/validation will pay special attention to aspects involving cooperation with developing countries.*

25 *CEOS will foster awareness of developing countries on the capability of space systems to support their national plans, by being represented at, and possibly supporting, relevant meetings, and through inclusion of documentation of specific interest to developing countries in its series of publications.*

26 *As a rule, the initiatives of CEOS and of its Members in favour of developing countries will be coordinated with Affiliates and with national/international bodies responsible for aid to development.*

**Action 9-18:** Chair/Secretariat to update the Future CEOS Strategy reflecting agreed change to paragraph 23 (relating to developing countries) and the formation of WGISS, and report to the 10th CEOS Plenary.

## **25. GLOBAL OBSERVING SYSTEM**

Mr. Winokur proposed that CEOS schedule and participate in an Ad Hoc Meeting to explore the question of a Global Observing System. He added that the U.S. CEOS Members are willing to help organize such a meeting and he presumed that the other presenters from Thursday evening's informal discussion on this topic (which included STA/NASDA, NOAA/NASA, EUMETSAT, GCOS) would also want to be involved. Mr. Mohr of EUMETSAT, Mr. Haruyama of NASDA, Mr. Seipel of DARA, Dr. Ratier of CNES, Mr. Paillon of EC, and Mr. Emiliani of ESA expressed interest in such discussions within CEOS. Dr. Lindberg proposed and Mr. Winokur agreed that the CEOS Chair/Secretariat coordinate preparations for the ad hoc meeting. It was generally agreed that it is important for CEOS to be actively involved in Global Observing System activities, and that although the work of the Task Force on Planning and Analysis is very relevant to this activity, there is no need to wait for the availability of final results before CEOS undertakes to consider the subject.

**Action 9-19:** Chair/Secretariat to coordinate an ad hoc meeting among CEOS Members, Observers and Affiliates on the Global Observing System and report to the 10th Plenary.

## **26. CEOS PLANNING FOR NEXT THREE YEARS**

Dr. Embleton confirmed that CSIRO will host the 10th Plenary in Canberra, Australia on 13-15 November, 1996.

Dr. Ratier confirmed that France would host the 11th Plenary in 1997.

Mr. Jayaraman proposed that India host the 12th Plenary in 1998. To be confirmed by India.

## **27. CONFIRMATION OF ACTION ITEMS**

Dr. Lindberg noted that the Secretariat would review the list of 9th Plenary Action Items and would fulfil its responsibility to ensure that they reflect the discussion at this meeting.

## **28. ADJOURNMENT**

Dr. Lindberg thanked the CEOS participants for their many contributions to CEOS during the year. He also thanked the Working Group Members, who are the heart of CEOS, for their work and support throughout the year and acknowledged the assistance of his CSA colleagues in hosting the Plenary.

As Incoming Chair, Dr. Embleton thanked Dr. Lindberg for his leadership and chairmanship for the past year and for running a splendid meeting.

The meeting was adjourned.

# List of Documents

(9th CEOS Plenary Minutes)

9-0	9th CEOS Plenary Action Items List
9-1	9th CEOS Plenary Participants List
9-2	9th CEOS Plenary Annotated Agenda
9-3	CEOS User Requirements Workshop
9-4A	CEOS Task Force on Long Term Planning
9-4B	Report of Task Force on CEOS Planning and Analysis
9-5	Future Development of CEOS Dossier
9-6	Report of the CEOS Working Group on Calibration and Validation
9-7	Report of the CEOS Working Group on Data
9-8	Interim WGINS - Report of the co-chairs to the 1995 Plenary
9-9	Harmonisation of CEOS WG & SG Terms of Reference - Joint Proposal from WGD and WGINS
9-10	Overview of the development of a WGISS plan - Report from WGD and WGINS
9-11A	Chairman's Proposal for Executive of WGISS
9-11B	Structure and Procedures (revised text)
9-12	IOC Ocean Colour Workshop
9-13	Space Frequency Coordination Group (SFCG)
9-14	Radio Frequency Issues for Earth Observation Systems
9-15A	CEOS-IGBP Pilot Project on High Resolution Data
9-15B	CEOS High Resolution Data Exchange Pilot Project, SPOT data sponsoring: status
9-16	DARA - Space Information System in Support of Developing Countries - Feasibility Study
9-17	CSIRO CD-ROM Project
9-18A	EUMETSAT Support to Developing Countries
9-18B	EUMETSAT status and plans
9-19	Outcome of CGMS XXIII 15-19 May 1995, Darmstadt
9-20	IGFA presentation
9-21	CEOS Special Report on Successful Applications of EO Satellites Data
9-22	Eighth CEOS Plenary Action Items List

**9th CEOS Plenary  
Action Items List**

- Action 9-1: Members, Observers, and Affiliates are requested to provide the information as specified in Annexes 2 and 4 of the Task Force Report. This entails updating the information contained in Volume A of the CEOS Dossier and completing the standard formats on user requirements and space system capabilities. Inputs to go to Dr. Bizzarri by 31 January 1996.
- Action 9-2: Task Force on Planning and Analysis to confirm Task Force membership with the CEOS Chair.
- Action 9-3: ESA to define and create the new requirements and capabilities database, provide for its configuration control, and coordinate with the Task Force on Planning and Analysis regarding the inputting and maintenance of the database. ESA to report on the database at the 10th Plenary.
- Action 9-4: Task Force on Planning and Analysis to compile and review the input for population of the new database, in conformance with inputs from Members, Observers, and Affiliates, complete the agreed analysis, iterate as required with Principals, and provide a final report to the 10th Plenary.
- Action 9-5: Members, Observers, and Affiliates are invited to review the *GCOS Plan for Space-Based Observations* (Version 1.0, June 1995) and the *GCOS Guide to Satellite Instruments for Climate* (June 1995) and provide feedback to GCOS/Spence by 29 February 1996.
- Action 9-6: WGCV Chair to give courtesy notice to the CEOS Chair on the results of the WGCV's recommendation for the successor WGCV Chair. CEOS Chair will then inform CEOS Members, Observers, and Affiliates.
- Action 9-7: CEOS Members, Observers, and Affiliates are requested to review membership of the Working Groups, in light of Working Group realignments, to ensure that their interests and activities are represented. Adequate support needs to be provided for the representatives to enable them to fully participate. Membership requests to be conveyed to the Working Group Chairs.
- Action 9-8: CEOS Members are requested to review WGCV recommendations 3 and 4 to the 9th Plenary (regarding the recommendations of the CEOS-GCOS Workshop on Calibration and Validation of Global Change Measurements and enhancements to calibration and validation programs, respectively) and give them due consideration. Responses to be conveyed to the WGCV Chair.

- Action 9-9: WGISS Chair to complete development of the WGISS five-year implementation plan and report to the 10th Plenary.
- Action 9-10: WGCV Chair and WGISS Chair to support actions called for in the CEOS Resolution on Ocean Colour.
- Action 9-11: Chair/Secretariat to discuss the desirability and, if appropriate, methods for CEOS to be involved with Space Frequency Coordination Group (SFCG) activities.
- Action 9-12: DARA to organize the pilot phase of a DC Information Locator System (ILS) and to work with WGISS Chair to consider new Working Group activities supporting the DARA-sponsored ILS proposal and report to the 10th Plenary.
- Action 9-13: Members, Observers, and Affiliates are encouraged to provide contributions (case studies and data sets) to the CSIRO CD-ROM in support of developing countries by 15 December 1995. Inputs to be provided to: Murray Wilson, CSIRO Earth Observation Centre, GPO Box 3023, Canberra ACT 2601, Australia; fax: 61 6 216 7222; e-mail: m.wilson@eoc.csiro.au
- Action 9-14: Members, Observers, and Affiliates are encouraged to provide inputs to EC/JRC's effort to complete a database of airborne campaigns undertaken in developing countries. Inputs to be provided to Alan Belward, IRSA, JRC, Ispra, Italy; telephone: 332 786 765; fax: 332 789 536; e-mail: alan.belward@jrc.it
- Action 9-15: Chair/Secretariat to continue to seek venues for CEOS Open Fora; NASA offered to develop a display for use at CEOS Open Fora, and to review the proposed concept with the Secretariat prior to committing to its development.
- Action 9-16: Members, Observers, and Affiliates are encouraged to inform the Chair/Secretariat of opportunities for CEOS Open Fora.
- Action 9-17: Chair/Secretariat to examine CEOS interactions with the commercial sector and report to the 10th Plenary.
- Action 9-18: Chair/Secretariat to update the Future CEOS Strategy reflecting agreed change to paragraph 23 (relating to developing countries) and the formation of WGISS, and report to the 10th CEOS Plenary.
- Action 9-19: Chair/Secretariat to coordinate an ad hoc meeting among CEOS Members, Observers and Affiliates on the Global Observing System and report to the 10th Plenary.

# 9th CEOS Plenary Participants List, CSA, October 11-13, 1995

ORGANIZATION	NAME	PRINCIPAL/CONTACT
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## MEMBERS

ASI	Dr. Bizzarro Bizzarri	1	C
BNSC	Dr. David Williams	2	C
BNSC/NERC	Dr. S. Briggs	3	
BNSC/DOE	Dr. Alan Apling	4	
CNES	Mr. Hervé Bozouklian	5	
	Dr. Alain Ratier	6	
CSA	Dr. Jack Chambers	7	C
	Mr. Alain Desfossés	8	
	Mr. Mac Evans - (Day 1)	9	
	Dr. Garry Lindberg	10	P
	Ms. Davinder Manak	11	
CSA/AES	Dr. Hans Teunissen	12	
CSIRO	Dr. Brian J.J. Embleton	13	P
	Mr. Chris Graham	14	
	Mr. Jeff Kingwell	15	C
DARA	Mr. Arndt Langner	16	
	Dr. Volker Liebig	17	C
	Mr. Heinz-G. Seipel	18	P
	Mr. Stefan Waas	19	
EC	Mr. Ken Inglis	20	
	Mr. Michel Paillon	21	C
ESA	Mr. René Bonnefoy	22	
	Mr. Lanfranco Emiliani	23	P
	Dr. Huw Hopkins	24	C
	Mr. Livio Marelli	25	



ORGANIZATION	NAME		PRINCIPAL/CONTACT
EUMETSAT	Mr. Jerome Lafeuille	26	C
	Dr. Tillmann Mohr	27	P
	Dr. Gerard Szejwach	28	
INPE	Dr. Volker Kirchhoff	29	
ISRO ISRO/INDIAN EMBASSY	Mr. V. Jayaraman	30	
	Mr. L.S. Satyamurthy	31	
NASA	Ms. Leslie Charles	32	
	Mr. Mike Luther	33	
	Dr. Lisa R. Shaffer	34	C
	Mr. William Townsend	35	
NOAA	Mr. Levin Lauritson	36	
	Dr. Brent Smith	37	C
	Mr. Robert S. Winokur	38	P
	Ms. Helen Wood	39	
NRSCC	Mr. Cao Xuejun	40	C
	Mr. Chu Liangcai	41	
	Mr. Li Chuanrong	42	
	Prof. Lin Quan	43	P
NRSCC/COSTIND	Mr. Li Wenbiao	44	
ROSHYDROMET	Prof. S.I. Avdjushin	45	P
	Dr. Alexander V. Karpov	46	C
SNSB	Mr. Claes-Goran Borg	47	
	Dr. Marianne Von Glehn	48	C
STA	Mr. Takao Kuramochi	49	P
STA/JAPANESE EMBASSY	Mr. Kisashi Dodashi	50	
STA/JMA	Dr. Tetsu Hiraki	51	
STA/MITI	Dr. Yoshinori Miyazaki	52	
STA/NASDA	Mr. Yukio Haruyama	53	C
	Mr. Chu Ishida	54	
	Mr. Hiroshi Kikuchi	55	
	Ms. Kazuko Misawa	56	
	Mr. Stephen Ward	57	

## ORGANIZATION

## NAME

## PRINCIPAL/CONTACT

## OBSERVERS

CCRS	Mr. Richard Boudreau	58	
	Dr. Leon Bronstein	59	
	Mr. Terry Fisher	60	
	Dr. Ed Shaw	61	P
	Dr. Karl Staenz	62	
	Dr. Susan Till	63	C
NSC	Mr. Per Erik Skrovseth	64	C
OSTC/BELGIUM EMBASSY	Mr. Peter Grogard	65	

## AFFILIATES

GCOS	Dr. David Croom	66	
	Dr. Thomas Spence	67	P
IGBP	Dr. Ichtiaque Rasool	68	C
	Dr. John Townshend	69	
	Dr. David Skole	70	
	Mr. Thomas Baker	71	
	Mr. Bill Solas	72	
IOC/GOOS	Mr. Geoff Holland - (Day 1)	73	
	Mr. John Withrow	74	C
WMO/WCRP	Dr. Donald E. Hinsman	75	C

## SPECIAL OBSERVERS

CANADA/DFAIT	Mr. Bob Craig - (Day 3)	76	
CANADA/DFO	Dr. Howard Edel	77	
IGFA	Dr. Lou Brown	78	
SFCG	Mr. Robert Taylor	79	

9th CEOS Plenary Annotated Agenda  
October 11-13, 1995  
Canadian Space Agency, Saint-Hubert

**DAY 1 - October 11 (Wednesday)**

- 11h30 Bus transportation from Hotel to CSA
- 12h15 Lunch buffet at CSA
- 13h00 Registration
- 13h30 Opening Remarks  
Adoption of the Agenda
- 14h00 Record of the 8th CEOS Plenary  
Report by DARA
- 14h15 Membership Issues
- 14h30 CEOS Secretariat Report - 1995 activities  
Secretariat report to be presented by CSA
- 14h45 Report of CEOS Task Force  
Introductory remarks by G. Lindberg  
Presentations by I. Rasool and B. Bizzarri  
Plenary to discuss proposed work plan and approve proposed T.F. leader(s)
- 15h30 break (15 min.)
- 15h45 CEOS Dossier  
Presentation by ESA on status of Dossiers  
- presentation of Database Creation proposal
- 16h00 Re-look at CEOS Strategy  
CSA introduce discussion based on Introductory piece to Re-look at CEOS Strategy
- 17h00 Adjourn
- 17h15 Bus transfer to Hotel
- 18h30 Reception and Dinner for CEOS Delegates, hosted by CSA

**DAY 2 - October 12 (Thursday)**

8h00 Bus transportation from Hotel to CSA

9h00 Working Group Reports (WGCV, WGD, WGINS)  
Report of the WGCV to the 9th Plenary by its chairwoman  
Report of the WGD to the 9th Plenary by its chairman  
WGINS report to the Plenary by its co-chairman (L. Marelli/ESA)

10h00 break (15 min.)

11h00 Realignment of Working Groups  
Presentation of proposed WGISS structure by WGINS co-chairman (H. Kikuchi/NASDA).  
Ask Plenary to approve WGISS and disbanding of WGD and WGINS (G. Lindberg).  
Presentation of draft WGISS terms of reference by G. Lindberg.  
Plenary approval of proposal of Chair and Vice-chair (G. Lindberg).  
Plenary direction re: WGISS 5 year plan.

12h30 CEOS Yearbook  
Presentation by ESA

12h45 Report on outcomes of IOC Ocean Colour Workshop  
Discussion of Proposed Resolution on Ocean Colour

13h00 Lunch

14h00 Developing Country Activities

- Presentation by IGBP on analysis of geographic coverage by high-resolution satellites
- IGBP to report on Pilot Project
- CSIRO to report on Developing Country training package
- DARA to report on Space Information System feasibility study
- EC to report in response to Action 8-5 of the last Plenary
- B. Bizzarri to report on interactions with SAF, in response to Action 8-7
- J. Lafeuille to report on EUMETSAT experience with Developing Countries

15h00 break (15 min.)

16h00 Related meetings

- Report on interaction with Commercial Sector (G. Lindberg)
- Report to the Plenary on CEOS Open Forums (G. Lindberg, L. Shaffer, H. Hopkins)
- EUMETSAT to report outcomes of the 1995 CGMS Plenary meeting
- Presentation on IGFA activities by L. Brown

16h45 Special Report on Successful Applications of EO Satellite Data  
Presentation by Japan

17h00 Adjourn

17h15 Bus transfer to Hotel

[20h30 Informal Discussion on Global Observing Systems, Holiday Inn Crowne Plaza]

**DAY 3 - October 13 (Friday)**

8h00 Bus transportation from Hotel to CSA

9h00 Direction to the Working Groups  
Plenary direction to WGCV and WGISS

9h30 Direction to the Task Force  
Plenary direction to the Task Force on Planning and Analysis  
Also Plenary direction w.r.t. Dossiers and Database Creation proposal

10h00 Review Action Items from 8th Plenary

10h15 break (15 min.)

10h30 Significant events of the Members/Observers/Affiliates  
- Country reports

11h15 CEOS Strategy Paper

11h45 Other business

12h15 Plans for upcoming (next 3 years) Plenary meetings  
Australia as next years host is expected to propose a date for the 1996 Plenary.  
The host for 1997 is France, but the host for 1998 is yet to be nominated.

12h30 Confirmation of Action Items  
All of the Action Items coming from the 9th Plenary shall be summarized and confirmed  
by the delegates.

13h00. Adjourn and Lunch

14h30 Bus transfer to Hotel

Tour of CSA (optional)

15h30 Bus transfer to Hotel

HIGHLIGHTS OF THE 9TH CEOS PLENARY MEETING  
OCTOBER 11-13, 1995, MONTREAL/SAINT HUBERT, CANADA

- o The 9th CEOS Plenary was hosted by the Canadian Space Agency and chaired by Dr. Garry Lindberg, CSA Vice President, Corporate Development. Dr. Mac Evans, President of CSA, provided welcoming remarks. Most CEOS Members, Observers and Affiliates attended.
- o The Plenary reviewed the work of the CEOS Task Force on Planning and Analysis, which had been created at the 8th Plenary to cross-correlate user requirements and CEOS agency space assets. The Task Force, with Dr. Bizzarro Bizzarri of the Italian Space Agency confirmed as ongoing Chair, was given a charge to complete this requirements analysis in the upcoming year prior to the 1996 Plenary. ESA was then further charged to use Task Force inputs in the development of a new requirements and capabilities database, which will serve as a new electronic version to update Volumes A and C of the CEOS Dossier.
- o The Plenary approved creation of a new standing Working Group on Information Systems and Services (WGISS) which consolidates the activities of the former Working Group on Data and the Interim Working Group on International Network Services. The overall objective of WGISS will be to facilitate data and information management and services for users and data providers in dealing with global, regional, and local issues. This will include the capture, description, processing, access, retrieval, utilization, maintenance and exchange of spaceborne Earth observation data and supporting ancillary and auxiliary data and information, enabling improved interoperability and interconnectivity of information systems and services. WGISS was charged to develop a draft 5-year plan for approval by the Plenary at its 1996 meeting.

Ms. Helen Wood, Director of the NOAA/NESDIS Office of Satellite Data Processing and Distribution, will serve a two-year term as WGISS Chair. Mr. Hiroshi Kikuchi, Head of Strategy and Planning in NASDA's Earth Observation Planning Department, will serve as Vice-Chair, to succeed in two years as Chair. Dr. Gerard Szejwach, who is leaving EUMETSAT later this year to assume the directorship of the Data and Information System for the International Geosphere Biosphere Program, will serve as Vice Chair with particular responsibility for user liaison.

- o The Plenary responded favorably to the report of the Working Group on Calibration and Validation (WGCV) and directed it to continue its activities. WGCV Chair Susan Till, of the Canada Centre for Remote Sensing, informed the Plenary that she will be stepping down from the Chair within the coming

year. WGCV will inform the CEOS Chair of its nomination for the Incoming Chair position.

- o DARA reported on its initiative to study the feasibility of an information system to provide developing countries with updated information on Earth observation, proposing development and use of an Information Locator Service. DARA accepted the recommendation of the Plenary that this concept be further investigated in context of the new Working Group on Information Systems and Services.
- o The CEOS Chair and Secretariat reported on the results of the effort to engage in dialogue with potential users (other than the current set of CEOS Affiliates) at a series of CEOS Open Forums held in late September/early October in connection with remote sensing symposia in Washington and Paris, and the IAF in Oslo. The Plenary agreed that opportunities for such open forums should continue to be sought. Given ongoing developments in the commercial remote sensing sector, the Chair and Secretariat were directed to examine CEOS interactions with this sector and to report to the next Plenary.
- o The Plenary approved a resolution on Ocean Color, supporting increased coordination among space-based data providers, in-situ data providers, and the global user community to improved data utilization and to reduce cost of Ocean Color activities; agreed to insertion of language relating to WGISS and to CEOS efforts with developing countries in the Future CEOS Strategy document; and received reports from invited observers on the activities of the Space Frequency Coordination Group (SFCG) and the International Group on Funding Agencies (IGFA).
- o Status reports as to their respective views concerning development of a global observing system/strategy were provided in an informal evening session by STA/NASDA, NOAA/NASA, EUMETSAT and GCOS. Lively discussion followed these presentations with a particular focus on the role of CEOS with regard to a global strategy. At the next day's Plenary closing session, NOAA proposed that these presenters organize an ad hoc meeting on this topic in 1996 and accepted the proposal of the CEOS Chair that the incoming Chair and Secretariat coordinate plans for such a meeting.
- o At the conclusion of the Montreal Plenary, Brian Embleton, Head of the Australian CSIRO Office of Space Science and Applications, assumed the position of CEOS Chair for the upcoming year. Canberra was confirmed as the site of the next Plenary, November 13-15, 1996. CNES confirmed its readiness to host the Plenary and assume the Chair position in 1997, and ISRO proposed, with acceptance by the Plenary, that it host the 1998 Plenary.