Minutes

of the

Seventh Plenary Meeting

November 16-18, 1993
Tsukuba Space Center, Japan

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Committee on Earth Observation Satellites
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Final Version
CEOS-7 Plenary

February 18, 1994

Minutes of the Committee on Earth Observation Satellites Seventh Plenary Meeting November 16-18, 1993 Tsukuba Space Center, Japan

1. INTRODUCTION

The seventh Plenary meeting of the Committee on Earth Observation Satellites (CEOS) was held at Tsukuba Space Center, Japan on November 16-18, 1993. The meeting was hosted by the Science and Technology Agency of Japan (STA) -- the 1993 CEOS Chair -- and the National Space Development Agency of Japan (NASDA). The following organizations attended:

- **Members**
  - Agenzia Spaziale Italiana (ASI)
  - British National Space Centre (BNSC)
  - Chinese Academy of Space Technology (CAST)
  - Canadian Space Agency (CSA)
  - Centre National d'Etudes Spatiales (CNES)
  - Commonwealth Scientific and Industrial Research Organisation (CSIRO)
  - Deutsche Agentur fur Raumfahrtangelegenheitan (DARA)
  - European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT)
  - European Space Agency (ESA)
  - National Aeronautics and Space Administration (NASA)
  - National Oceanic and Atmospheric Administration (NOAA)
  - Russian Federal Service for Hydrometeorology and Environment Monitoring (ROSHYDROMET)
  - Russian Space Agency (RSA)
  - Science and Technology Agency of Japan (STA)
  - Swedish National Space Board (SNSB)

- **Observers**
  - Belgian Science Policy Office (BSPO)
  - Canada Centre for Remote Sensing (CCRS)
  - Commission of the European Community (CEC)
  - National Remote Sensing Centre of China (NRSCC)
  - Norwegian Space Centre (NSC)

- **Affiliates**
  - Global Climate Observing System (GCOS)
  - Global Ocean Observing System (GOOS)
  - Intergovernmental Oceanographic Commission (IOC)
  - International Council of Scientific Unions (ICSU)
  - International Geosphere-Biosphere Programme (IGBP)
  - United Nations Environment Program (UNEP)
  - World Meteorological Organization (WMO)

The Japanese Ministry of International Trade and Industry (MITI), Japan Meteorological Agency (JMA), and Japan Environment Agency (JEA) attended as guests invited by the CEOS Chair. The Atmospheric Environment Service (AES) of Environment Canada attended as part of the Canadian delegation. The Swedish Ministry of Environment (SME) attended as part of the delegation from Sweden.

The following organizations were unable to attend the meeting: Crown Research Institute (CRI), Indian Space Research Organization (ISRO), Instituto Nacional de Pesquisas Especiais (INPE), United Nations Food and Agriculture Organization (FAO), and World Climate Research Program (WCRP).

A list of documents (Doc. 7-0), list of participants (Doc. 7-1), list of Plenary action items (Doc. 7-2), and list of ongoing plenary commitments (Doc. 7-43) are provided.

2. OPENING REMARKS

Mr. Fujita, Director of the International Space Affairs Division of STA and CEOS Chair, welcomed the participants. Mr. Miyabayashi, Deputy Director General of Research and Development of STA, expressed gratitude to the participants, many of whom had traveled great distances, for their attendance at the meeting. Mr. Miyabayashi remarked that international discussions are increasingly focused on environmental problems and CEOS activities will become increasingly important to these discussions. He noted that Japan recognizes CEOS activities are very important, and Japan looks forward, along with the other CEOS participants, to contributing to the success of CEOS and to related initiatives, such as Agenda 21 adopted at the United Nations Conference on Environment and Development (UNCED). Mr. Tateno, Executive Director of NASDA, also extended a warm welcome to CEOS participants and said that NASDA shares with STA the pleasure and honor of hosting the CEOS Plenary. NASDA is very pleased to be involved in international coordination of Earth observation satellite activities through CEOS.

3. ADOPTION OF AGENDA

Mr. Fujita presented the agenda for review, noting that it was previously circulated to the CEOS membership for review. The agenda was adopted as modified by changes requested by the participants (Doc. 7-3). It was agreed that the Plenary would address coordination of CEOS developing-country activities with those of other international organizations, such as the Space Agency Forum (SAF), and would also address CEOS representation at appropriate international meetings, such as the WMO Commission on Basic Systems (CBS) Working Group on Satellites and the International Group of Funding Agencies (IGFA).

4. ADOPTION OF MINUTES OF SIXTH CEOS PLENARY MEETING

Mr. Fujita reported that BNSC, the 1992 CEOS Chair, prepared and distributed the minutes of the Sixth CEOS Plenary to the participants for comments. The draft minutes were revised based on the comments and were distributed to the participants. The minutes of the Sixth CEOS Plenary were adopted by the Plenary. Mr. Fujita reported that all the action items stemming from the Sixth CEOS Plenary have been completed or would be addressed at the present meeting.

5. MEMBERSHIP ISSUES

Mr. Fujita described the membership issues currently under review (Doc. 7-4). He noted that, in response to Action 6-1 from the Sixth CEOS Plenary, the Members were polled concerning the applications for membership by CAST and NRSCC. He noted that the Members had approved the CAST application for Member status and the NRSCC application for Observer status. NRSCC subsequently applied for Member status and the Members were asked to consider this application during the present meeting. In response to Action 6-2, the Members had been polled and the BSPO application for Observer status was approved. In response to Action 6-3, the Members were polled as to their position on the United Nations Office of Outer Space Affairs (OOSA) application for Affiliate status. Because a consensus among Members was not reached, the OOSA application for Affiliate status was not approved.

Since the Sixth CEOS Plenary the following new membership applications were received, in addition to the new NRSCC application for Member status:

- For Member status: National Space Agency of Ukraine (NSAU)
- For Observer status: Austrian Space Agency (ASA)
  Danish National Space Board (DNSB)
- For Affiliate status: Malaysian Centre for Remote Sensing (MACRES)
  United Nations Food and Agriculture Organization (FAO)

Mr. Fujita reported that the decision to invite FAO Affiliate status was approved based on a poll of the Members prior to the present meeting.

Mr. Fujita invited the Members to respond to the outstanding applications of NRSCC, NSAU, ASA, DNSB, and MACRES. He reviewed the CEOS requirements for Member, Observer, and Affiliate status (Doc. 7-5). It was noted that the CEOS Terms of Reference require that potential Observer and Affiliate organizations be invited by CEOS to become Observers or Affiliates, while potential Members need to request membership. It was also stressed that all applications for Member, Observer, and Affiliate status require consensus among CEOS Members to be approved, and that approval by Observers and Affiliates is not required. It was agreed that the CEOS Chair/Secretariat, in the future, will not seek the input of CEOS Observers and Affiliates on CEOS membership applications.

It was the consensus of the Members that the NSRCC and NSAU applications for Member status be approved.

For the Observer status applications of ASA and DNSB, several Members noted that the written requests did not demonstrate that the agencies met the requirements for Observer status as stated in the CEOS Terms of Reference. In contrast, other Members supported the ASA and DNSB applications based on their active ESA membership and involvement in ERS-1 development, operations, and data use. As consensus was not reached among the Members, the applications of ASA and DNSB were declined at this time. Dr. Duchossois confirmed that ESA will communicate with ASA and DNSB to make sure their views are represented within CEOS by the ESA delegation.

With respect to the MACRES application for Affiliate status, it was noted that a requirement for Affiliate status, per the CEOS Terms of Reference, is that the organization be invited based on consensus of the Members. The Members could not reach consensus on the MACRES application for Affiliate status, so the application was not approved.

ACTION 7-1: Secretariat to address CEOS membership requirements at its next meeting. Secretariat to prepare a description of the CEOS requirements for Member, Observer, and Affiliate status, with the aim of providing the description to organizations expressing interest in CEOS membership. Secretariat to prepare an article for the CEOS Newsletter describing CEOS membership requirements.

ONGOING COMMITMENT 7-1: As an ongoing commitment, Members, Observers, and Affiliates to inform the Chair/Secretariat concerning any change in the status of their organizations. Chair/Secretariat to report the outcomes of this effort to the Plenary as appropriate.

6. CEOS SECRETARIAT REPORT

Mr. Ishida of NASDA reported on the CEOS Secretariat's activities for 1993 (Doc. 7-6). He noted that 1993 was a very productive and successful first year for the Secretariat. He provided a brief background on the creation of the Secretariat and the Secretariat Terms of Reference. He explained the division of responsibilities in the tripartite Secretariat and the outcomes of the four Secretariat meetings held during 1993.

Mr. Ishida described the Secretariat's 1993 activities, which were pursued at the direction of the Plenary and in support of the Chair. These activities included plans to:

- Implement the Data Exchange Pilot Project
- Prepare a CEOS Yearbook
- Present to the Plenary the Global Satellite Observation and Information Networks concept and Working Group on Networks proposal
- Update the Dossier
- Provide an additional Dossier volume on resource management and related topics.

He also summarized CEOS activities for the G-7 Tokyo Economic Summit Initiative and indicated that response to the CEOS brochure prepared in conjunction with the Economic Summit was very positive.

In response to a question by Dr. Bescond of CNES regarding the limits of the Secretariat's functions, it was clarified that the Secretariat's functions are administrative in nature in accordance with the Secretariat Terms of Reference. The Secretariat does not make decisions but supports and responds to the direction of the Plenary.

Dr. Hinsman extended his appreciation to CEOS Members for the Dossier and stated he considered it the single most valuable reference document on Earth observation satellites and programs.

7. REPORTS OF THE CEOS WORKING GROUPS

The following incorporates the outcomes of the Plenary's consideration of the recommendations in the discussion paper on the CEOS five-year strategy.

A. Working Group on Data (WGD):

Mr. Lauritson of NOAA, Chair of WGD, presented WGD activities for 1993 and plans for 1994 (Doc. 7-7). He noted that details on all these activities are available in the CEOS Consolidated Report and in minutes of the WGD meetings (WGD meeting minutes are available from the WGD Library).

With respect to data management activities, the WGD recommended that Members provide their Directory Interchange Format (DIF) generation plans to the WGD as very few were received in the past year. The WGD also provided its conclusions on the proposed Working Group on Networks (WGN), in which it agreed with the proposal in principle but expressed concern that close coordination with existing network activities be maintained. Mr. Lauritson reviewed the Global Land 1km AVHRR Data Project, and recommended that Members support attendance at WGD and its Subgroup meetings. Mr. Lauritson also noted that a five-year plan for the WGD data management activities is being prepared. He confirmed that WGD activities are closely coordinated with activities of the International Standards Organization and the Consultative Committee on Space Data Systems.

The Plenary endorsed the following WGD recommendation:

> *Recognizing that developing countries are an important source of global change data, the WGD recommends that the CEOS Plenary endorse the expansion of the CEOS International Directory Network (IDN) into developing countries and that CEOS Members, Observers, and Affiliates support this expansion.*

It was reported that NASDA has already expressed support for expansion of the CEOS IDN in the Asian Region. Germany reported that it will support developing country participation. Mr. Lauritson reported WMO and IOC had expressed interest in supporting developing country involvement as well. It was noted that WGD efforts to expand IDN into developing countries may be a relevant topic for discussion at upcoming meetings addressing the CEOS role in developing countries, including the SAF Focus Group meeting in December, 1993.

ACTION 7-2: WGD/Lauritson to provide Members with information on priorities for developing country participation in CEOS IDN and an estimate of time and resources required to generate DIFs for developing countries.

ONGOING COMMITMENT 7-2: *As an ongoing commitment, WGD to continue to coordinate closely its activities with those of the International Standards Organization and Consultative Committee on Space Data Systems as appropriate.*

Additional Plenary instructions related to WGD activities are in Section 19.

B. Working Group on Calibration/Validation (WGCV):

Dr. Till of CCRS, Chair of WGCV, reported on the activities of the WGCV in 1993 and plans for 1994 (Doc. 7-8 and Doc 7-9).

Dr. Till summarized the WGCV's recommendations to the Plenary. In response to Action 6-9 from the Sixth CEOS Plenary, the WGCV produced a "pilot" Cal/Val Dossier (Doc. 7-10). Dr. Till noted that the "pilot" Cal/Val Dossier defines the content and structure of the recommended cal/val section of the CEOS Dossier; it is meant only to give an idea of what such a section might contain. The WGCV recommended that the Plenary support preparation of a cal/val section of the CEOS Dossier as a next step. In response to Action Item 6-10 from the Sixth Plenary, the WGCV determined specifications and costs for proposed ground test sites for calibration/validation. Dr. Till noted that a survey was conducted to gather this information which is provided in the "pilot" Cal/Val Dossier. The survey provided preliminary information on test site characteristics, parameters, and cost estimates. The WGCV's recommendation proposes extension of this work to build on the efforts thus far.

In addition, the WGCV recommended that CEOS space agencies supplying sensors use common transfer standards to ensure accurate cross-calibration of all Earth observation sensors. Dr. Till noted that it is necessary to know these standards and the cal/val methods used when comparing data from different satellites. The WGCV also recommended that the Plenary recognize the importance of sound validation of Digital Elevation Models (DEMs) and consider new WGCV activities in this regard. Also, Dr. Till reported that the WGCV considers the CEOS Dossier a valuable source of information and proposed the widest possible dissemination of the document. She reported that the WGCV has established an electronic bulletin board (CEOS.WGCV.NEWS on Omnet) to disseminate information on WGCV activities.

The Plenary endorsed the following WGCV recommendations:

Secretariat to commission the cal/val section of the CEOS Dossier.

Member agencies to support identification, characterization, and maintenance of ground test sites for verification of on-board calibration systems, in-flight calibration, and subsequent cross-calibration of instruments, and support the establishment of a comprehensive data base on selected test sites.

Within available resources, all CEOS agencies to develop, as required, and employ common transfer standards and to coordinate frequent intercomparisons of standards and techniques to ensure accurate cross-calibration of all Earth observation sensors. All CEOS agencies should make available information on technologies employed for the use of standards (including transfer standards).

Space agencies within CEOS to support:

- *The establishment of test sites for validating Digital Elevation Models (DEMs);*
- *Provision of data (satellite, airborne, and ground) over the test sites free of charge to organizations wishing to demonstrate the quality of algorithms for DEM generation; and*
- *Archiving, maintenance, and open distribution of test site data.*

CEOS to support wider distribution of the CEOS Dossier.

Space agencies within CEOS to use the following definitions consistently:

- *Calibration: the process of quantitatively defining the system response to known, controlled signal inputs.*

- *Validation: the process of assessing by independent means the quality of the data products derived from the system outputs.*

Mr. Haruyama stated that Japan is initiating a cal/val program for ADEOS data and has had discussions with NASA and NOAA to initiate close cooperation on cal/val of ocean data. He proposed that the WGCV consider the formation of a new Subgroup on Ocean Data. Dr. Till welcomed Japan's efforts in this regard and encouraged its participation in the WGCV's strategic planning meeting slated for February, 1994.

Dr. Rasool of IGBP-DIS noted the importance of documenting sensor gain changes as a continuing cal/val requirement in relation to long-time-series global change data.

ACTION 7-3: WGCV/Till to provide more detailed information on the number and locations of ground test sites for validating Digital Elevation Models and the long-term costs of maintaining them at the Eighth CEOS Plenary.

ACTION 7-4: WGCV/Till to report on the status of activities related to validation of Digital Elevation Models at the Eighth CEOS Plenary.

Additional Plenary instructions related to WGCV activities are in Section 19.

8. FUTURE CEOS STRATEGY

Dr. Williams of BNSC described the discussion paper on Future CEOS Strategy (Doc. 7-11). He stressed that the paper was provided for discussion purposes and intended to present ideas and issues for the Plenary's consideration. The Future CEOS Strategy paper outlined seven CEOS activity areas (Dossier, interaction with Affiliates, data policy, activities of the WGD and WGCV, proposed Working Group on Networks, pilot projects, and external awareness) and recommendations for each area for the Plenary's consideration. The paper also recommended that the Plenary accept general criteria to be used to assess proposals for future CEOS activities.

Mr. Fujita welcomed general comments and impressions on Dr. Williams' paper. The Members expressed their appreciation to Dr. Williams for developing the paper and for sharing his vision on CEOS strategy. Members agreed that Dr. Williams' paper was a useful framework to be kept in mind during the discussions of CEOS activities. Several additional comments were made on the paper, relating to topics such as the costs of expansion of CEOS activities, the need for priorities, support for commercial opportunities, focusing on user needs, and coordination of Affiliates' requirements with system designs. It was also noted that consideration of any proposed CEOS activity should focus on whether a long-term commitment is required, whether Members are willing to support it, and how critical the activity is to CEOS success.

The Plenary endorsed the following Future CEOS Strategy paper recommendation concerning assessment criteria for activity proposals to CEOS:

Members should assess proposals to CEOS against the following criteria:

- *Is the activity focused on improving cooperation of space missions and ensuring they meet user needs?*
- *Is the activity a role uniquely suited to CEOS? Would it be possible outside the CEOS framework? Would it be beneficial to Members generally?*
- *Activities should "assist" not "direct" Member agencies.*
- *Are Members willing to support an activity? It cannot be left to the Secretariat to pursue all initiatives because it is not an executive body.*

It was agreed that the recommendations in the Future CEOS Strategy paper relating to the WGD and WGCV were consistent with those presented by Mr. Lauritson and Dr. Till (see Section 7).

Dr. Williams agreed to prepare a list of consolidated recommendations, based on the Future CEOS Strategy paper, for the Plenary to reconsider on the final day of the meeting (Doc. 7-12).

Professor Stoewer indicated that DARA, as the 1994 CEOS Chair, would coordinate with Dr. Williams and follow up on the Future CEOS Strategy paper for the 1994 Plenary, as necessary.

9. CEOS AFFILIATES' INTEGRATED DATA REQUIREMENTS

Mr. Haruyama reviewed the outcomes of the CEOS User Requirements Workshop held on May 27, 1993 in Tokyo (Doc. 7-13). He noted that all of the action items stemming from the Workshop were completed. He stated that the Affiliates have agreed to a requirements process and a format for requirements presentation. He noted that the Affiliates have developed a combined list of requirements to determine what instruments the Affiliates collectively require. Dr. Hinsman noted that the User Requirements Workshop was an historical milestone in that it was the first time that user organizations have met with system providers to discuss requirements.

Dr. Hinsman presented the status of the CEOS Affiliates' efforts to define user requirements for Earth observation satellite data (Doc. 7-14). He noted that the individual Affiliate data requirements and the Affiliates' integrated data requirements, as well as the process to develop these requirements are presented in Volume C of the CEOS Dossier. He reported that, since the May 1993 User Requirements Workshop, the Affiliates' Dossier was revised and incorporated, among other things, comments from some CEOS Member agencies. He noted that this is the first joint presentation of the various Affiliate program requirements to the major space sector providers at a CEOS Plenary meeting. He indicated that the Affiliates agree that CEOS is the forum within which they will continue to present and refine their requirements.

Dr. Hinsman requested that the CEOS Dossier be made available in digital form for ready access prior to the next Dossier revision, and Dr. Hopkins noted that the Secretariat is already considering how to accomplish that.

Each of the CEOS Affiliate organizations provided brief status reports on definition of their individual requirements and noted that their requirements are contained in the CEOS Dossier Volume C. Each of the Affiliate representatives confirmed acceptance of the Affiliates' integrated data requirements as presented in the same document.

CEOS Members agreed that the Affiliates' requirements statement will be very helpful to space agency planning activities and commended the Affiliates for their efforts. Some Members expressed concern that the Affiliates' integrated requirements were expressed in terms of instruments and that parameters required were not sufficiently detailed. Some Members also expressed concern that individuals outside of CEOS may be confused by the synthesis of Affiliate requirements as presented in Figure A-1 of the Affiliates' annex to Dossier Volume C. This is because individuals outside of CEOS, such as those responsible for approving space agency funding requests, may interpret such a synthesis to mean that there is no real need for multiple instruments of the same type to achieve adequate coverage. It also was noted that it needs to be clear that single instruments will not provide all the required measurements in every case for a range of applications. Space agency Members requested that the requirements be stated in more specific terms (e.g., accuracy, coverage, frequency), as presented in Figure A-2. There was also concern that the requirements of regional and other user organizations be included in the user requirements. Dr. Bizzarri also presented a detailed ASI response to the Affiliates' integrated data requirements (Doc. 7-15).

Dr. Hinsman explained that in the process of developing the integrated Affiliates' requirements, the preliminary consolidating point upon which agreement could be reached was the type of instruments that are required. He noted that some Affiliates were able to provide detailed requirements based on measurement required, but not all Affiliates are able to provide this detailed definition. On behalf of the Affiliates, Dr. Hinsman agreed to involve regional users as much as possible in the Affiliates' requirements process.

It was agreed that the key outstanding issues concerning the Affiliates' data requirements are determining how to proceed with the requirements dialogue and how to refine documentation of the Affiliates' requirements.

The Plenary endorsed the following Affiliates' recommendations concerning Affiliates' requirements:

Continue the dialogue between CEOS Members and Observers and the Affiliates.

Affiliates to refine the Affiliates' Dossier, including provision of:

- *Final form of data from user's viewpoint*
- *Impacts expected*
- *More comprehensive and detailed requirements*
- *Input for instrument design*

CEOS to make CEOS Dossier available on electronic media.

Affiliates to reassure the user communities that requirements are well represented.

CEOS to remain the forum where the Affiliates will present their requirements.

The Plenary endorsed the following Future CEOS Strategy paper recommendations concerning interaction with Affiliates:

Affiliates to provide a current list of measurements that can be provided by satellites. Future updates to Affiliates' requirements are to be parallel to the CEOS Dossier updates.

Affiliates to prioritize their list of measurement requirements.

Affiliates to collectively provide an analysis of areas of overlap and omission in the current set of satellite data measurements. This activity to be completed by March, 1995 and thereafter on a biennial basis.

A workshop to be convened in 1994 to continue interaction between Members and Observers and the Affiliates.

ACTION 7-5: Affiliates/Hinsman invited to provide the Secretariat/ESA a current list of measurements that can be provided by satellites for inclusion in the next update of the CEOS Dossier.

ACTION 7-6: DARA to host a User Requirements Workshop in the May, 1994 time frame to continue the dialogue with Affiliates on user requirements.

Mr. Fujita announced that, at EUMETSAT's request, a correction was made to the Minutes of the User Requirements Workshop, May 27, 1993, in Tokyo, Japan (Doc. 7-16).

Additional Plenary instructions concerning the CEOS Dossier are in Section 13.

10. SIGNIFICANT EVENTS OF MEMBERS, OBSERVERS, AND AFFILIATES

Mr. Fujita invited the CEOS agencies to discuss the status and significant events in their respective programs. Due to time constraints, oral status reports were limited to those of Members. Many CEOS agencies also provided written status reports (Doc. 7-17-a to Doc. 7-17-q).

Mr. Verbauwhede of BSPO commended NASDA's issuance of the ADEOS Announcement of Opportunity (AO), with its data policy providing the international scientific community with broad access to ADEOS data. However, he expressed concern that the AO issuance was not widely publicized and recommended that CEOS participant organizations promptly inform Members, Observers, and Affiliates of AO releases.

ONGOING COMMITMENT 7-3: As an ongoing commitment, Members and Observers to provide CEOS participants with information on relevant Announcements of Opportunity as they become available.

11. REPORTS OF RELATED MEETINGS

Mr. Fujita summarized SAF activities during 1993 (Doc. 7-18). He noted that one SAF Focus Group concerns the spread of benefits of Mission to Planet Earth towards developing countries. CEOS involvement in this focus group was proposed by Mr. Bizzarri of ASI. Furthermore, he noted that SAF is considering a one-day ad hoc meeting on natural disaster monitoring. In such a meeting, famous scientists would be invited to lecture on the importance of natural disaster monitoring from space and, based on this lecture, SAF members would discuss future activities of SAF agencies in this field as well as SAF's role for these activities. Mr. Fujita also described the outcomes of the first session of the Asia-Pacific Regional SAF (Doc. 7-18).

Dr. Lindberg presented the status of the Earth Observation-International Coordination Working Group (EO-ICWG) (Doc. 7-19). During 1993, progress was made toward agreement on the International Earth Observing System (IEOS) Data Exchange Principles, the IEOS Implementation Plan, and technical coordination between the EO-ICWG and the WGD. Dr. Tilford and Professor Stoewer stated that a long-term goal could be to fully integrate EO-ICWG activities with those of CEOS.

Mr. Hussey presented the status of the International Polar Orbiting Meteorological Satellites (IPOMS) group (Doc. 7-20), which successfully completed its objectives and was disbanded in October, 1993.

Dr. Smith summarized the Organization for Economic Cooperation and Development (OECD) Megascience Forum activities (Doc. 7-21). CEOS was asked to send a representative to the OECD Megascience Forum to elaborate on its coordination efforts with respect to international global change activities. The OECD Megascience Forum recognized "...at the mission planning and operational level, CEOS already organizes effectively the interaction between the global change research community and the space agencies of the countries ... concerned." In addition, the Forum concluded that "closer liaison should also be developed between IGFA and CEOS, since both represent informal groupings addressing issues of global change." The CEOS global change data exchange principles were also recognized as valuable by the Forum.

Mr. Lafeuille presented the outcomes of the Coordination Group on Meteorological Satellites (CGMS) meeting (Doc. 7-22) annual plenary meeting held in April, 1993, in Beijing, China. CGMS focused its coordination on global geostationary coverage, global contingency planning, and telecommunications matters. CGMS discussed WMO user requirements and the applications of meteorological satellites developed for meteorology and environmental monitoring. CGMS adopted the Low Rate Information Transmission (LRIT) standard data transmission format, replacing the Weather Facsimile (WEFAX) format. CGMS agreed to consider CEOS data formats for future archive and retrieval systems. The Committee also expressed a need for INSAT data for the meteorological community to enhance coverage of the Indian Ocean.

Mr. Cross described the CEC's Interim Report on Use of Satellite Data for Environmental Purposes in Europe (Doc. 7-23), which focuses on the relevance of current and future satellite data for environmental monitoring services in Europe. Mr. Paillon stated that this report will be prepared in a format similar to the CEOS Dossier. Professor Stoewer reiterated his proposal that CEOS move into the area of regional users' requirements development as part of planning for future CEOS space agency systems.

Mr. Haruyama announced that Japan attended the WMO Executive Council meeting in June, 1993 as a CEOS representative.

12. DATA POLICY

A. Outcomes of the Ad Hoc Data Policy Meeting, May 25-26, 1993:

Mr. Haruyama summarized the outcomes of the CEOS Ad Hoc Data Policy Meeting held May 25-26, 1993 in Tokyo (Doc. 7-24). Primary outcomes of the meeting included: 1) agreement on how to proceed with the Data Exchange Pilot Project; 2) acceptance of NOAA's proposal to co-host with NASA an Ad Hoc Data Policy Meeting on Exchange of Data for Operational/Environmental (Public Utility) Use; 3) agreement on CEOS Economic Summit activities; 4) support for NASDA's initiative to prepare a proposal for the Plenary on a cooperative planning effort to coordinate global networks and to form a CEOS Working Group on Networks; 5) agreement to present a report to the Plenary on the CEOS five-year strategy; and 6) recognition of ASI's intent to prepare a proposal on Earth science and technology pilot projects.

B. Progress on the CEOS Data Exchange Pilot Project:

Dr. Rasool reported the accomplishments of the Data Exchange Pilot Project* since the Ad Hoc Data Policy meeting held May 25-26, 1993 (Doc. 7-25). The objective of the Data Exchange Pilot Project is to evaluate the applicability of the newly-enunciated CEOS data exchange principles in support of global change research. Dr. Rasool described the IGBP research projects and measurements required and the process followed by IGBP to develop the detailed data requirements. Since the May, 1993 meeting, IGBP-DIS provided to the contributing space agencies and data providers more detailed data requirements (Doc. 7-26). Landsat Thematic Mapper (TM), Marine Observation Satellite (MOS) Multispectral Electronic Self-Scanning Radiometer (MESSR), and Systeme pour l'Observation de la Terre (SPOT) data were requested. The contributing space agencies and data providers responded with descriptions of the data to be contributed and the terms and procedures under which the data would be made available. IGBP also defined a process for accomplishing the Data Exchange Pilot Project.

Dr. Rasool reported that discussions were in progress, on the one hand, between SPOT IMAGE and its partners (SSC-SATELLITBILD and the concerned receiving stations) and, on the other hand, between sponsors from France, United Kingdom, Sweden, Belgium, and CEC to establish procedures for providing SPOT scenes in support of the Data Exchange Pilot Project. IGBP met with NASA to discuss provision of data within the Landsat Pathfinder Program. IGBP gained access, through NASDA's Satellite data INFOrmation Network based on Individual Archiving (SINFONIA), to metadata covering 1000 scenes of MOS data. Dr. Rasool also noted that IGBP-DIS will soon discuss with ESA the integration of ERS-1 data into the Data Exchange Pilot Project. IGBP Principal Investigators have also requested JERS-1 data, and Dr. Rasool plans to meet with ISRO on December 20-21, 1993 to discuss the possibility of obtaining ISRO data.

Ms. Chevrel clarified the arrangement under which CNES, SPOT IMAGE, and their partners are facilitating access to SPOT data in support of the Data Exchange Pilot Project. A twofold arrangement is proposed to provide the selected SPOT scenes to the selected IGBP scientists. First, the selected SPOT scenes are made available at a special price (US$1200/multispectral scene, Level 1B; US$1500/panchromatic scene, Level 1B) through SPOT IMAGE and SSC-SATELLITBILD thanks to a commercial effort of these companies and the concerned ground receiving stations. Second, sponsor agencies from France, United Kingdom, Sweden, Belgium, and CEC are ready to buy part of these data at this special price, to make them available to selected scientists on CD-ROM at the price of US$ 200 (taxes and shipping not included). At this time, CNES estimates that around 100 scenes may be funded in this manner, but further dialogue with IGBP is required to determine exact needs and the exact number of SPOT scenes which can be provided.

Dr. Embleton expressed CSIRO's strong support of the Data Exchange Pilot Project. He noted that one of the test sites related to the IGBP research is located in Australia. He offered to contribute 20,000 Australian dollars to finance purchase of TM and SPOT data required for IGBP investigations of this test site, subject to final negotiations with the Australian Centre for Remote Sensing (ACRS). addition, CSIRO is investigating with NASDA provision of MOS data, with the cooperation of ACRS. He also noted

* The Data Exchange Pilot Project involves high resolution data; the Global 1km Land AVHRR Pilot Project, discussed in a later paragraph, involves coarse-resolution data.

that CSIRO has extended the Australian component of the Global 1km Land AVHRR Pilot Project by three years and was planning a calibration ground site network.

The Russian delegation was asked about the availability of high-resolution land data in support of the CEOS Data Exchange Pilot Project, and it was noted that, at the present time, all such data for international use is being provided by commercial companies. Dr. Shaffer reported that NASA is concluding negotiations with EOSAT for preferential arrangements for Landsats 4 and 5 data and is committed to continued support of IGBP with data from appropriate satellites. Mr. Haruyama noted that Japan is also very supportive of the Data Exchange Pilot Project.

With respect to the Global 1km Land AVHRR Pilot Project, Dr. Rasool also noted that, with the help and funding of CEOS agencies, 28 High Resolution Picture Transmission (HRPT) stations around the world are collaborating with IGBP to provide coarse-resolution data in support of IGBP research projects.

The Plenary recognized the excellent progress made by IGBP and the contributing space agencies and data providers in the Data Exchange Pilot Project. The Plenary commended all the contributors to the Data Exchange Pilot Project and expressed gratitude for support of this project.

ACTION 7-7: IGBP/Rasool and Secretariat/ESA to report on progress of the CEOS Data Exchange Pilot Project at the Eighth CEOS Plenary.

C. Ad Hoc Data Policy Meeting on Exchange of Data for Operational/Environmental (Public Utility) Use:

Dr. Smith described a plan for the proposed Ad Hoc Data Policy Meeting to discuss data exchange principles in support of operational/environmental (public utility) use of data (Doc. 7-27). He noted that all CEOS Members and those Observers and Affiliates involved in operational activities would be invited to participate in the meeting. He solicited ideas for other invitees and suggested the possibility of including representatives of environmental agencies which participated in the April, 1992 London meeting. The goal of the meeting would be to identify the extent to which there is a common view on data provision for this purpose which could provide a framework for new CEOS data exchange principles. This would require recognition of the differences across agencies in funding mechanisms and national or international policies, as well as identification of common objectives regarding public health and safety and environmental management. Use of data from all sources – satellite and related airborne and *in situ* data -- would be addressed.

Dr. Smith proposed that a draft agenda and invitation to the meeting be circulated for review before the end of 1993. He said it would be essential for those responding to the invitation to provide advance information on their agency's programs, policies, data availability, and user requirements for operational/environmental monitoring data in their countries or regions. The CEC, EUMETSAT, Japan, NASA, and NOAA would meet in February, 1994 and use this information to draft a proposed set of principles to be considered at the meeting. The Ad Hoc Data Policy Meeting would take place in April, 1994.

Mr. Paillon commented that the CEC is ready to participate in this important meeting and can provide information on user requirements. Mr. Lafeuille noted that NOAA/NASA and EUMETSAT had interacted in a constructive fashion on this issue, and that EUMETSAT was confident and ready to participate further in preparation for the meeting. Dr. Tilford stressed that most of the data NASA is planning to produce over the coming two decades have many more uses besides global change research, including operational meteorological, environmental monitoring, and other uses. He stated that CEOS needs to begin to define operational requirements on a much broader basis and take them into account in its activities. Mr. Fujita commented that coordination with domestic agencies, such as the Japan Meteorological Agency, is required and Japan is very supportive of this initiative in principle.

Mr. Withrow, of IOC, noted that IOC and WMO held a conference in September, 1993 on space-based ocean observations (Doc. 7-28). The focus of the conference was international environmental satellite activities and their applications to oceanography and marine meteorology activities. One outcome of the meeting, which may be helpful to organizers of the CEOS Ad Hoc Data Policy Meeting, was a data policy

statement concerning availability of satellite data for the oceanography and marine meteorology communities.

The Plenary accepted the proposed initiative to hold an Ad Hoc Data Policy Meeting to discuss data exchange principles in support of operational/environmental monitoring (public utility) use of data. The approach and purpose of the Ad Hoc Data Policy Meeting as outlined in the NOAA proposal were accepted.

There was considerable discussion on the data policy recomme.· ·rom Dr. Wil ·s' discussion paper related to commercial data policy. It was debated whether to a· ·is topic at · time, but Members reached consensus on a recommendation that CEOS take ·.mercial inte· ·sts into account in elaboration and implementation of its data exchange principles.

In addition, on behalf of UNEP, Dr. Harasawa (UNEP/Global Resources Information Database-Tsukuba) presented a recommendation to the Plenary to consider endorsement of a Resolution on Satellite Data Exchange Principles in Support of Implementation of Agenda 21 (Doc. 7-29). The recommendation contained seven data exchange principles which would guide use of satellite and other data for sustainable development and environmental assessment and monitoring purposes. Dr. Tilford stated that NASA would fully support such a resolution. It was agreed that this issue may relate to other CEOS activities, such as the planned Ad Hoc Data Policy Meeting on Exchange of Data for Operational/Environmental (Public Utility) Use and the CEOS developing country initiative. The recommendation was not endorsed by the Plenary, but it may be reviewed in connection with the April 1994 Ad Hoc Data Policy Meeting and discussed at the next Plenary.

The Plenary endorsed the following Future CEOS Strategy paper recommendations concerning data policy:

Data Policy Group to consider the development of data exchange principles in the context of operational/environmental monitoring. NOAA/NASA to co-host a meeting in the Spring of 1994 based on the proposed approach presented by NOAA at the Plenary.

CEOS Members will not take a central role in implementation of the CEOS data exchange principles. It is for the Affiliates or other groups who require data to put forward coherent proposals for those data requirements so that CEOS Members can assess the extent to which they can fulfill them.

CEOS to ensure that commercial interests are taken into account in elaboration and implementation of its data exchange principles.

ACTION 7-8: NOAA/NASA to co-host the Ad Hoc Data Policy Meeting on Exchange of Data for Operational/Environmental (Public Utility) Use.

ACTION 7-9: Members, Observers, and Affiliates to provide background information to NOAA/NASA as requested in support of the Ad Hoc Data Policy Meeting on Exchange of Data for Operational/Environmental (Public Utility) Use.

ACTION 7-10: NOAA/NASA to report on the outcome of the Ad Hoc Data Policy Meeting on Exchange of Data for Operational/Environmental (Public Utility) Use at the Eighth CEOS Plenary meeting.

13. CEOS DOSSIER, SPECIAL REPORT, AND YEARBOOK

Dr. Lindberg presented the status of the Resource Management Dossier proposed by CSA (Doc. 7-30). At the time the Resource Management Dossier was originally proposed, there was a focus within CEOS on global change research and not on other areas of use and applications of Earth observation data. Since the Sixth CEOS Plenary, CSA provided an outline of a proposed Resource Management Dossier and circulated it for comment to CEOS Members. Based on the responses received, Dr. Lindberg concluded that the Resource Management Dossier was not received with enthusiasm. He noted that the proposed Resource Management Dossier was related to other initiatives under the Plenary's

consideration and may be appropriately included in those initiatives. Dr. Lindberg indicated that CSA intends to produce a special report on resource management; however, due to funding constraints the report would focus on Canadian use of Earth observation data for resource management.

Dr. Hopkins presented the status of the CEOS Dossier and explained its various sections (Doc. 7-31). The Plenary reaffirmed their strong support for the Dossier and noted the Dossier is absolutely critical to ongoing CEOS activities. The Plenary conveyed its deep gratitude to ESA for commissioning the Dossier and commended the ESA team for its excellent technical and professional work. It was the consensus of the Members that the CEOS Dossier has been a major contribution to the success of CEOS activities over the past two years. CEOS has relied heavily on the Dossier to communicate its missions and programs to the Earth observation and political communities and has depended on the Dossier as a key tool in coordinating and implementing its programs.

Mr. Ishida presented the STA/NASDA proposal for a Satellite Data Applications Dossier, to be used as a guide to the successful use of Earth observation satellite data in real applications programs (Doc. 7-32). For a range of applications areas, the Dossier would detail which satellite data are in use; how the data are acquired, processed, and used; the benefits derived from the data; and the implications in terms of new policies and national practices. Mr. Ishida expressed appreciation for the Members' interest in the proposed Satellite Data Applications Dossier. He proposed that STA/NASDA formulate a more detailed proposal for developing a special report on this topic and circulate it among Members for review. Japan would subsequently develop a pilot Dossier, circulate it among Members for review, and based on the pilot Dossier, develop a special report.

Mr. Lafeuille suggested that the "Directory of Applications of Meteorological Satellites" issued by EUMETSAT could be of relevance to the proposed effort to prepare a document on resource management and satellite data applications.

The Members discussed the Canadian and Japanese Dossier proposals, and the Dossier and external awareness recommendations in the Future CEOS Strategy paper. After extended discussion, the Plenary agreed to the following, which are consistent with recommendations in the Future CEOS Strategy paper:

Additional volumes of the CEOS Dossier should not be created at this time.

The proposed Canadian and Japanese Dossiers on Resource Management and Satellite Data Applications should be formulated into special CEOS reports rather than a formal Dossier. Special reports on resource management and satellite data applications should be appropriate to the ten-year anniversary of CEOS to be recognized in 1994 and address the needs of developing countries.

The existing Dossier volumes should be updated in 1994, to include revision of the individual and integrated Affiliates' requirements (Volume C, Appendix A), inclusion of a section on calibration and validation, and inclusion of new CEOS Member programs. The 1994 CEOS Dossier update should be an incremental update (page replacement versus re-publication of the three-volume set), if possible. The Dossier should be updated biennially after 1994 in a manner coordinated with the Affiliates' requirements process.

The Dossier should be given a wider distribution, including use of CD-ROM and other electronic media based on the 1994 update.

Each Member should analyze the Dossier and assess the extent to which they can identify overlaps and omissions in space and ground programs. The Secretariat should consolidate agency inputs and present an overall analysis to the Plenary.

Publication of a CEOS Yearbook on a biennial basis should be pursued, but the issue of funding should be resolved. The CEOS Yearbook should convey information concerning CEOS activities and plans and support increased awareness of developing countries. The Secretariat should present to the membership a plan of action and funding scheme for this effort.

Dr. Hopkins indicated that these additional efforts may require resources beyond those ESA can provide and ESA may seek contributions from other Members in financing the activities.

ACTION 7-11: STA/NASDA to develop a more detailed proposal on the CEOS Special Report on Satellite Data Applications and report to the Eighth CEOS Plenary.

ACTION 7-12: Members are invited to analyze the Dossier and assess the extent to which they can identify overlaps and omissions in space and ground programs; inputs to be provided to the Secretariat by February 28, 1994. Secretariat to consolidate agency inputs and present an overall analysis to the Eighth CEOS Plenary.

ACTION 7-13: Secretariat/ESA to attempt to identify funding for development, publication, and distribution of the calibration/validation section of the Dossier, the 1994 Dossier update, and the CEOS Yearbook. Secretariat/ESA to investigate methods to minimize distribution costs associated with the CEOS Dossier and other publications. Secretariat/ESA to investigate means to broaden distribution of the CEOS Dossier (1994 update), including use of CD-ROM and other electronic media.

ACTION 7-14: Secretariat to present to the membership a plan of action and funding scheme for the CEOS Yearbook.

14. GLOBAL SATELLITE OBSERVATION AND INFORMATION NETWORKS

Dr. Kikuchi of NASDA presented the Japanese proposal for the CEOS Working Group on Networks (WGN) and the Global Satellite Observation and Information Networks (GSOIN) concept (Doc. 7-33). This concept was first proposed by STA/NASDA at the Ad-Hoc Data Policy Meeting in May, 1993. In addition, a special report on these topics was distributed to the CEOS membership prior to the Plenary. The proposal discussed the need for a WGN and the scope, structure, approach, and draft terms of reference for the proposed WGN. In addition, the proposal suggested the WGN consider establishment of a small, core membership to manage the execution of the initial work plan to be undertaken in the first year. Dr. Kikuchi presented a proposed schedule that focused on a survey of requirements and review of network capabilities and plans, culminating with a WGN report to the next Plenary. Dr. Kikuchi and Mr. Fitson noted that this proposal had been extensively coordinated with the WGD and its Network Subgroup (NS). Dr. Kikuchi noted that coordination of networks within CEOS is becoming increasingly important. He pointed out that, in the Dossier, CEOS agencies describe 98 existing and planned sensors and ground segment infrastructure which includes networks accommodating an estimated 20 terabytes per week.

Dr. Duchossois presented the European views on the CEOS networks initiative (Doc. 7-34). He noted that ESA recognizes the effort made by Japan and the importance of the subject. ESA proposed that near-term activities focus on a preparatory and definition phase aimed at addressing requirements definition, services offered, and accommodation of all CEOS-relevant data types (satellite, airborne, and *in situ*) for all the CEOS-relevant categories of data use. ESA also proposed that the WGN be established initially as an ad hoc working group as opposed to a full-fledged working group. In addition, ESA proposed that Europe, the U.S., and Japan form the core technical lead of the ad hoc working group. An interim report based on the user requirements survey would be submitted for review in April, 1994. The outcome of these activities and the future of the Ad Hoc WGN would be reported to the Eighth CEOS Plenary, at which time Members could evaluate the progress of the activities and the status of the Working Group.

After the presentations, Mr. Haruyama asked the Plenary for their comments and extended discussion ensued. It was the consensus of the Members that the proposal to create an Ad Hoc WGN was appropriate and that CEOS needs to address networks. The Members congratulated Japan for its efforts and for elevating the matter to the Plenary for consideration in such a clear and concrete manner. The Members agreed that the critical activities for the Ad Hoc WGN in the near term would be defining user requirements and existing and planned capabilities, and developing a methodology for addressing and refining user requirements. The Members agreed that the Terms of Reference and initial work plan

contained in the Japanese proposal could serve as a starting point for the Ad Hoc WGN and could be reviewed if necessary before the CEOS Plenary meeting.

Mr. Lafeuille reported that network arrangements to accommodate real-time access to data from meteorological satellites have been developed within the framework of WMO and CGMS. Dr. Smith clarified that the current bilateral initiative on networks between the U.S. and the Japanese is compatible with the CEOS proposals under discussion. In addition, Professor Stoewer stated that DARA, as the 1994 CEOS Chair, was prepared to give the required emphasis to any consensus reached by the Plenary on this subject. He also announced that the European co-chair for the Ad Hoc WGN would be Dr. Robert William Witty, Director of the Institute for Systems Engineering and Informatics of the CEC.

The Plenary noted the Japanese and European presentations, and adopted the following resolution with respect to CEOS networks activities.

CEOS Resolution on Networks

The CEOS Plenary 1993:

- *considering the proposal by Japan about a Global Satellite Observation Information Network for Earth observation data;*
- *recognizing the utmost importance of global networks for the development and promotion of the utilization of Earth observation data for various scientific and operational application purposes;*
- *acknowledging that major regional activities in the field are ongoing in Asia, North America, and Europe;*
- *recognizing the role of CEOS as the appropriate forum for coordination;*

decided the following:

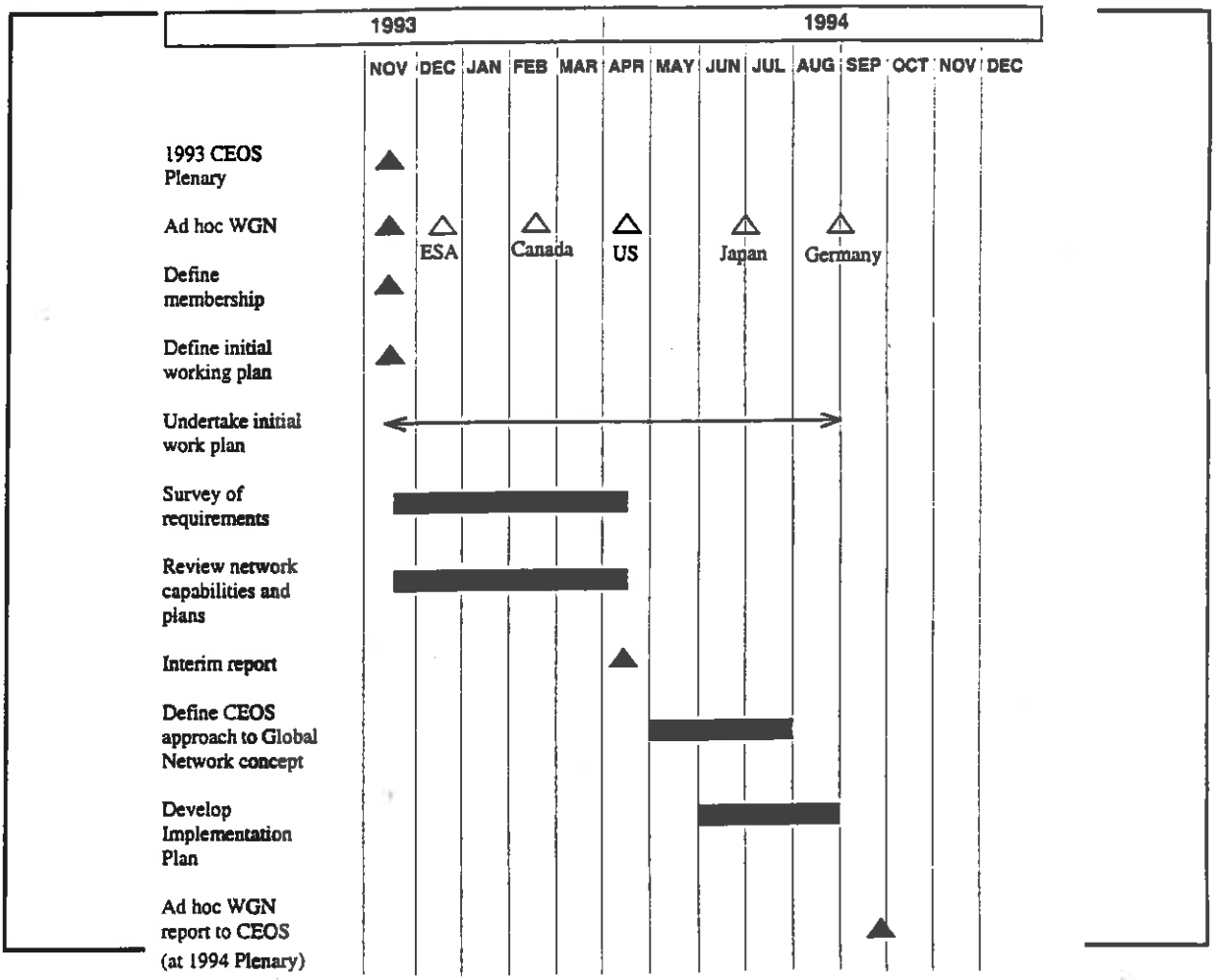
1. *CEOS shall establish an ad hoc Working Group on Networks, to be co-chaired by NASDA (Dr. Kikuchi) and Europe (Dr. R.W. Witty).*
2. *The ad hoc WG on Networks shall produce a report in time for the 1994 CEOS Plenary with an interim report in April 1994 at the time of the NOAA/NASA Data Policy meeting.*
3. *This process will represent the Preparatory/Definition Phase during which the ad hoc WG will consist of a reduced tri-partite core of Japan, USA, and Europe, with the possibility to invite and/or consult with other appropriate experts. The WG also will maintain contact with the Network Subgroup of the WGD and the WGCV.*
4. *During the Preparatory Phase the Secretariat will be coordinated by the CEOS Plenary Chair.*
5. *The provisional scope for activities of the WG during the Preparatory Phase is given at Annex A (below).*
6. *CEOS Plenary 1994 will decide on:*
   - *the implementation of recommendations of the ad hoc WG contained in its report;*
   - *the future of the ad hoc WG on Networks*
   - *whether or not to maintain the WGD Network Subgroup.*

Annex A - Provisional scope for activities of the ad hoc Working Group on Networks

The ad hoc WG on Networks shall initially concentrate on internal network issues through, in particular, the following activities.*

- *a review of overall high level requirements for network connectivity and interoperability, analyzing the projected evolution of the acceptable data input capability/environment of the end users with a view to determining the optimum pace for developing high rate data networks.*
- *an examination of existing and emerging network capabilities, exploiting the work already carried out by the Network Subgroup.*
- *preparation of guidelines for the future development of Members' network services.*
- *the development of an implementation Plan and the coordination of the CEOS approach to a global network system.*

The timetable for the above work is given in Annex B (below).



Annex B: Initial Work Plan for Ad Hoc WGN

** These networks connect Earth observation satellite data acquisition sites and product generation and dissemination centers.*

ACTION 7-15: The Ad Hoc Working Group on Networks (WGN) to produce a report in time for the Eighth CEOS Plenary, with an interim report to be circulated in April, 1994 at the time of the NOAA/NASA co-hosted Ad Hoc Data Policy meeting.

15. DEVELOPING COUNTRY INITIATIVES

Dr. Bizzarri presented the status of the SAF Focus Group on the Spread of Benefits of Mission to Planet Earth Towards Developing Countries (Doc. 7-35). He noted that SAF engages in international coordination via exchange of information and discussion of policy issues, and the purpose of the SAF Focus Group is to examine the policy role of space agencies with respect to developing nations. The SAF Focus Group requested CEOS participation in its meeting planned for December 13-15, 1993 in Rome, Italy. The Plenary determined that DARA would represent CEOS at the SAF Focus Group meeting.

Dr. Shaffer reported that INPE had proposed, in a letter to the CEOS Chair, an INPE-hosted workshop in Brazil in September, 1994 to begin to address the CEOS role with regard to non-CEOS countries, particularly developing countries. Dr. Shaffer described the details of the INPE proposal and presented issues concerning CEOS involvement in developing country activities (Doc. 7-36). She noted that all CEOS Members, Observers, and Affiliates would be invited to the workshop. The purpose of the Workshop would be to define the unique role CEOS could play in support of developing countries.

A discussion of the CEOS role in developing country activities ensued. Dr. Shaffer noted that, at the First CEOS Plenary, it was agreed that it was not a role of CEOS to conduct training programs or provide financial assistance to developing countries. She stated that CEOS needs to focus on what CEOS data providers can do to be more effective in cooperating with Affiliates who have training and development assistance mandates. Dr. Smith noted that many of the CEOS Affiliates have among their numbers developing countries which can participate in the process to develop and refine Affiliate requirements before they are conveyed to CEOS. Mr. Kingwell noted that there are developing countries with space programs, and that United Nations Economic and Social Council for Asia and the Pacific (ESCAP) is examining the relationship between space applications and national development. ESCAP is preparing for a Ministerial-level meeting of Asia-Pacific countries to take place in Beijing September 22-25, 1994. This meeting would involve several Asia-Pacific CEOS members and the timing may conflict with the proposed workshop. Mr. Aikang concluded that CEOS also needs to define developing countries' requirements and explore what developing countries can bring to the CEOS process. Dr. Tilford noted that Brazil and other developing countries are increasingly being asked to support integrated airborne and ground cal/val campaigns and this may be an appropriate topic at the workshop. Mr. Withrow drew the Plenary's attention to a WMO report which indicates ways individual space agencies can assist WMO in their training activities in support of developing countries (Doc. 7-37). Mr. Paillon stressed the CEC's strong interest in this field and its readiness to participate in this effort.

The Members agreed that further discussion of the CEOS role in developing country activities is required and Members will look forward to the leadership of DARA as the 1994 Chair in facilitating those discussions. It was agreed that the outcomes of the above mentioned meetings would serve as valuable input to the discussion.

The Plenary endorsed the following Future CEOS Strategy paper recommendations concerning developing country initiatives:

INPE's offer to host a workshop in Brazil in 1994 was accepted, with the proposal that the workshop be timed so as to precede the Eighth CEOS Plenary in September, 1994 and to take advantage of the outcomes of the SAF Focus Group meeting in December, 1993 and a subsequent meeting if it is held. The purpose of the workshop should be to identify proposed CEOS activities in support of developing countries and to propose a plan of action for consideration at the Eighth CEOS Plenary.

ACTION 7-16: DARA to report at the Eighth CEOS Plenary on its participation on behalf of CEOS in the December 13-15, 1993 meeting of the SAF Focus Group on the Spread of Benefit of Mission to Planet Earth Towards Developing Countries.

ACTION 7-17: ASI/Bizzarri to report at the Eighth CEOS Plenary on the status of the SAF Focus Group on the Spread of Benefits of Mission to Planet Earth Towards Developing Countries.

ACTION 7-18: Secretariat/USA to work with INPE to plan a workshop to address the CEOS role with respect to developing countries.

ACTION 7-19: INPE to report to the Eighth CEOS Plenary on the outcomes of the INPE-hosted workshop on the role of CEOS in developing country activities.

16. EARTH SCIENCE AND TECHNOLOGY PROJECTS

Dr. Shaffer summarized the status of the CEOS Earth science and technology projects accepted from the Space Agency Forum for the International Space Year (SAFISY) (Doc. 7-38). She noted that the Secretariat found it unnecessary to develop an implementation plan for CEOS oversight of SAFISY projects, as required in Action 6-20 from the Sixth CEOS Plenary. This was because the projects are sponsored by individual CEOS Member agencies, are managed independently, and require little attention from CEOS. Dr. Shaffer noted further that the discussion paper on the CEOS five-year strategy recommended no further CEOS Earth science and technology projects.

Mr. Haruyama invited Members to present the status of Earth science and technology projects for the information of the Plenary. Mr. Tanaka described the purpose and outcomes of the NASDA-sponsored project to develop sea surface temperature and polar ice environment data sets (Doc. 7-39). He noted that the project will be completed in 1993. Mr. Bronstein reported that the global change encyclopedia products have been distributed and the project is rapidly nearing completion. Mr. Embleton noted that Australia intends to maintain the catalog produced as a result of the global land cover change project.

Dr. Rosenberg noted that a role of CEOS is to provide the results of the projects for the use of CEOS Members and recommended that a complete set be provided to CEOS Members.

The Plenary endorsed the following recommendations which are consistent with the Future CEOS Strategy paper and Secretariat recommendations:

CEOS will not actively pursue further the ISY Earth science and technology projects as a part of its ongoing activities. The Earth science and technology projects should be implemented and supported by the individual CEOS Members leading or participating in the projects. Requests for participation in or support for the projects should be directed to the individual CEOS Members.

ACTION 7-20: CEOS Members leading Earth science and technology projects to provide CEOS Members, Observers, and Affiliates with the results of their projects.

17. ASI PROPOSAL FOR CEOS ACTIVITY ON PILOT PROJECTS

Dr. Bizzarri described ASI's proposal for an activity on Earth observation pilot projects (Doc. 7-40). ASI proposed building a data base on pilot projects which have high potential for commercial applications or operational/public benefit applications. The goal of this activity would be to promote the growth of these user communities by identifying technology pilot projects with high potential for independent survival beyond the proof-of-concept and demonstration phases.

In response to the proposal, some Members noted that, although it would be helpful to have such a data base of information, it cannot be justified at this time in light of the many activities under consideration in the context of the CEOS five-year strategy. It was agreed that the proposal requires further definition and discussion and no consensus was reached as to Plenary support for the proposal.

ACTION 7-21: CEOS Members to contact ASI/Bizzarri if interested in the data base on Earth science and technology projects.

18. OTHER BUSINESS

Mr. Gibson reported that at its last meeting the European Council agreed to establish the European Environment Agency in Denmark. The agency is to focus in the first three years on efforts to establish a European observation and information network. He also noted that the Agency will be governed by a Management Board which is scheduled to meet December 17, 1993.

Dr. Shaffer announced that the Alaska SAR Facility plans to organize a meeting of polar station operators in Fairbanks, Alaska the week of May 16, 1994 to discuss capabilities and plans and explore approaches for ensuring collection of a global data set in both polar regions.

It was agreed that ASI would represent CEOS at upcoming WMO CBS Working Group on Satellites meetings and STA/NASDA would represent CEOS at the upcoming January 1994 IGFA meeting.

ACTION 7-22: CEC/Gibson to provide CEOS membership with information describing the European Environment Agency.

ACTION 7-23: ASI/Bizzarri to represent CEOS at the WMO CBS Working Group on Satellites meetings and to coordinate with Members as appropriate.

ACTION 7-24: STA/NASDA to represent CEOS at the January 1994 IGFA meeting and report at the Eighth CEOS Plenary.

19. ADDITIONAL INSTRUCTIONS TO WORKING GROUPS AND SECRETARIAT

A. Working Groups:

In order for the Plenary to further consider the long-term direction for the CEOS Working Groups, it was agreed that five-year plans for the WGD and WGCV were required. The Plenary endorsed the following Future CEOS Strategy paper recommendations with respect to the CEOS Working Groups:

CEOS should continue to support the Working Groups; in the short-term they need to bring forward five-year plans.

The Working Groups should critically analyze progress to date and, in particular, identify the extent to which common standards are both necessary and consistent with user requirements.

The Working Groups should propose five-year plans at the 1994 Plenary.

B. Secretariat:

On behalf of the Secretariat, Dr. Shaffer presented proposed changes to the CEOS Terms of Reference (Doc. 7-41). Proposed changes included revision of the CEOS title, procedures for notifying the membership of a change in status of CEOS organizations, and additional procedures on naming points of contact and to clarify the Chair and Secretariat roles and responsibilities. The Plenary adopted the proposed changes in the CEOS Terms of Reference with minor modifications. The changes in the Terms of Reference included a requirement that CEOS Members' consensus is necessary to exclude a CEOS organization from membership if its status changes.

ACTION 7-25: Working Group Chairs to prepare and submit first drafts of five-year implementation plans by July 31, 1994 and final drafts by September 1, 1994, and to present the plans at the Eighth CEOS Plenary.

ACTION 7-26: Secretariat/USA to revise the CEOS Terms of Reference per the Plenary discussion and provide revised Terms of Reference to the membership.

20. PLANS FOR UPCC ..IG PLENARY MEETINGS

Professor Stoewer announced that DARA, the 1994 CEOS Chair, proposes to hold the Eighth CEOS Plenary in September, 1994 in Berlin, Germany. Dr. Jan-Baldem Mennicken will serve as the CEOS Plenary General Chairman. Professor Stoewer will act as Executive CEOS Chair and principal point of contact. Dr. Volker Liebig will be the Secretariat point of contact. Professor Stoewer proposed that the 1994 Plenary focus on strategic issues, such as the Working Groups' five-year plans, the networks initiative, user needs and interactions including regional users, and developing country activities. A celebration of the CEOS ten-year anniversary was proposed as well. Professor Stoewer invited CEOS Members, Observers, and Affiliates to communicate their ideas for future CEOS activities and papers for the Eighth CEOS Plenary .

The Canadian Space Agency confirmed that it will host the 1995 CEOS Plenary.

The Commonwealth Scientific and Industrial Research Organisation of Australia confirmed that it will host the 1996 CEOS Plenary.

ACTION 7-27: Members are invited to provide the Chair with any ideas for future CEOS activities and papers for the Eighth CEOS Plenary no later than July 1, 1994.

21. ADJOURNMENT

Mr. Fujita thanked all the meeting participants for their efforts at making the Seventh CEOS Plenary extremely successful and adjourned the meeting.

List of Documents
Document 7-0

Doc. 7-34 Europea- ews on the CEOS Networks Initiative (Duchossois)
Doc. 7-35 Status R- ort on the Preparation of the SAF Focus Group on the Spread of Benefits of Mission to Planet Earth Towards Developing Countries (Bizzarri)
Doc. 7-36 CEOS Relationship With Non-CEOS Countries, A Presentation to the Seventh CEOS Plenary (Shaffer)
Doc. 7-37 WMO letter to CEOS, November 1, 1993, regarding WMO Initiative in Education and Training with regard to Satellite Data, Products, and Services (Withrow)
Doc. 7-38 CEOS Oversight of Earth Science and Technology Projects, A Report to the Seventh CEOS Plenary (Shaffer)
Doc. 7-39 The Plan for Developing ISY Datasets in 1993 (Tanaka)
Doc. 7-40 Proposal for an Activity on Earth Observation Pilot Projects (Bizzarri)
Doc. 7-41 Proposed Changes to the CEOS Terms of Reference (Shaffer)
Doc. 7-42 Acronyms
Doc. 7-43 Ongoing Plenary Comm- ents

List of Participants
Document 7-1

Committee on Earth Observation Satellites
Seventh Plenary Meeting
November 16-18, 1993
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List of Action Items
Document 7-2

Committee on Earth Observation Satellites
Seventh Plenary Meeting
November 16-18, 1993
Tsukuba Space Center, Japan

ACTION 7-1: Secretariat to address CEOS membership requirements at its next meeting. Secretariat to prepare a description of the CEOS requirements for Member, Observer, and Affiliate status, with the aim of providing the description to organizations expressing interest in CEOS membership. Secretariat to prepare an article for the CEOS Newsletter describing CEOS membership requirements.

ACTION 7-2: WGD/Lauritson to provide Members with information on priorities for developing country participation in CEOS IDN and an estimate of time and resources required to generate DIFs for developing countries.

ACTION 7-3: WGCV/Till to provide more detailed information on the number and locations of ground test sites for validating Digital Elevation Models and the long-term costs of maintaining them at the Eighth CEOS Plenary.

ACTION 7-4: WGCV/Till to report on the status of activities related to validation of Digital Elevation Models at the Eighth CEOS Plenary.

ACTION 7-5: Affiliates/Hinsman invited to provide the Secretariat/ESA a current list of measurements that can be provided by satellites for inclusion in the next update of the CEOS Dossier.

ACTION 7-6: DARA to host a User Requirements Workshop in the May, 1994 time frame to continue the dialogue with Affiliates on user requirements.

ACTION 7-7: IGBP/Rasool and Secretariat/ESA to report on progress of the CEOS Data Exchange Pilot Project at the Eighth CEOS Plenary.

ACTION 7-8: NOAA/NASA to co-host the Ad Hoc Data Policy Meeting on Exchange of Data for Operational/Environmental (Public Utility) Use.

ACTION 7-9: Members, Observers, and Affiliates to provide background information to NOAA/NASA as requested in support of the Ad Hoc Data Policy Meeting on Exchange of Data for Operational/Environmental (Public Utility) Use.

ACTION 7-10: NOAA/NASA to report on the outcome of the Ad Hoc Data Policy Meeting on Exchange of Data for Operational/Environmental (Public Utility) Use at the Eighth CEOS Plenary meeting.

ACTION 7-11: STA/NASDA to develop a more detailed proposal on the CEOS Special Report on Satellite Data Applications and report to the Eighth CEOS Plenary.

ACTION 7-12: Members are invited to analyze the Dossier and assess the extent to which they can identify overlaps and omissions in space and ground programs; inputs to be provided to the Secretariat by February 28, 1994. Secretariat to consolidate agency inputs and present an overall analysis to the Eighth CEOS Plenary.

ACTION 7-13: Secretariat/ESA to attempt to identify funding for development, publication, and distribution of the calibration/validation section of the Dossier, the 1994 Dossier update, and the CEOS Yearbook. Secretariat/ESA to investigate methods to minimize distribution costs associated with the CEOS Dossier and other publications. Secretariat/ESA to investigate means to broaden distribution of the CEOS Dossier (1994 update), including use of CD-ROM and other electronic media.

ACTION 7-14: Secretariat to present to the membership a plan of action and funding scheme for the CEOS Yearbook.

ACTION 7-15: The Ad Hoc Working Group on Networks (WGN) to produce a report in time for the Eighth CEOS Plenary, with an interim report to be circulated in April, 1994 at the time of the NOAA/NASA co-hosted Ad Hoc Data Policy meeting.

ACTION 7-16: DARA to report at the Eighth CEOS Plenary on its participation on behalf of CEOS in the December 13-15, 1993 meeting of the SAF Focus Group on the Spread of Benefit of Mission to Planet Earth Towards Developing Countries.

ACTION 7-17: ASI/Bizzarri to report at the Eighth CEOS Plenary on the status of the SAF Focus Group on the Spread of Benefits of Mission to Planet Earth Towards Developing Countries.

ACTION 7-18: Secretariat/USA to work with INPE to plan a workshop to address the CEOS role with respect to developing countries.

ACTION 7-19: INPE to report to the Eighth CEOS Plenary on the outcomes of the INPE-hosted workshop on the role of CEOS in developing country activities.

ACTION 7-20: CEOS Members leading Earth science and technology projects to provide CEOS Members, Observers, and Affiliates with the results of their projects.

ACTION 7-21: CEOS Members to contact ASI/Bizzarri if interested in the data base on Earth science and technology projects.

ACTION 7-22: CEC/Gibson to provide CEOS membership with information describing the European Environment Agency.

ACTION 7-23: ASI/Bizzarri to represent CEOS at the WMO CBS Working Group on Satellites meetings and to coordinate with Members as appropriate.

ACTION 7-24: STA/NASDA to represent CEOS at the January 1994 IGFA meeting and report at the Eighth CEOS Plenary.

ACTION 7-25: Working Group Chairs to prepare and submit first drafts of five-year implementation plans by July 31, 1994 and final drafts by September 1, 1994, and to present the plans at the Eighth CEOS Plenary.

ACTION 7-26: Secretariat/USA to revise the CEOS Terms of Reference per the Plenary discussion and provide revised Terms of Reference to the membership.

ACTION 7-27: Members are invited to provide the Chair with any ideas for future CEOS activities and papers for the Eighth CEOS Plenary no later than July 1, 1994.

MACRES	Malaysian Centre for Remote Sensing
MESSR	Multispectral Electronic Self Scanning Radiometer
MITI	Ministry of International Trade and Industry
MOS	Marine Observation Satellite
NASA	National Aeronautics and Space Administration
NASDA	National Space Development Agency of Japan
NOAA	National Oceanic and Atmospheric Administration
NRSCC	National Remote Sensing Centre of China
NS	Network Subgroup
NSAU	National Space Agency of Ukraine
NSC	Norwegian Space Centre
OECD	Organization for Economic Cooperation and Development
OOSA	United Nations Office of Outer Space Affairs
RESTEC	Remote Sensing Technology Center of Japan
ROSHYDROMET	Russian Federal Service for Hydrometeorology and Environment Monitoring
RSA	Russian Space Agency
SAF	Space Agency Forum
SAFISY	Space Agency Forum for the International Space Year
SAR	Synthetic Aperture Radar
SINFONIA	Satellite data INFOrmation Network based on Individual Archiving
SME	Swedish Ministry of Environment
SNSB	Swedish National Space Board
SPOT	Systeme pour l'Observation de la Terre
STA	Science and Technology Agency of Japan
TM	Thematic Mapper
UNCED	United Nations Conference on Environment and Development
UNEP	United Nations Environment Program
WCRP	World Climate Research Program
WEFAX	Weather Facsimile
WGCV	Working Group on Calibration/Validation
WGD	Working Group on Data
WGN	(Ad Hoc) Working Group on Networks
WMO	World Meteorological Organization

List of Acronyms
Document 7-42

Committee on Earth Observation Satellites
Seventh Plenary Meeting
November 16-18, 1993
Tsukuba Space Center, Japan

ACRS	Australian Centre for Remote Sensing
AES	Atmospheric Environment Service
ADEOS	Advanced Earth Observing System
AO	Announcement of Opportunity
APRSAF	Asia-Pacific Regional Space Agency Forum
ASA	Austrian Space Agency
ASI	Agenzia Spaziale Italiana
AVHRR	Advanced Very High-Resolution Radiometer
BNSC	British National Space Centre
BSPO	Belgian Science Policy Office
CAST	Chinese Academy of Space Technology
CBS	Commission on Basic Systems
CCRS	Canada Centre for Remote Sensing
CEC	Commission of the European Community
CEOS	Committee on Earth Observation Satellites
CGMS	Coordination Group on Meteorological Satellites
CNES	Centre National d'Etudes Spatiales
CRI	Crown Research Institute
CSA	Canadian Space Agency
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DARA	Deutsche Agentur fur Raumfahrtangelegenheiten
DEM	Digital Elevation Model
DIF	Directory Interchange Format
DNSB	Danish National Space Board
EO-ICWG	Earth Observation-International Coordination Working Group
EOSAT	Earth Observation Satellite Company
ERS-1	European Remote Sensing Satellite
ESA	European Space Agency
ESCAP	United Nations Economic and Social Council for Asia and the Pacific
EUMETSAT	European Organisation for the Exploitation of Meteorological Satellites
FAO	United Nations Food and Agriculture Organization
GCOS	Global Climate Observing System
GOOS	Global Ocean Observing System
GSOIN	Global Satellite Observation and Information Networks
HRPT	High-Resolution Picture Transmission
ICSU	International Council of Scientific Unions
IDN	International Directory Network
IEOS	International Earth Observing System
IGBP	International Geosphere-Biosphere Programme
IGBP-DIS	International Geosphere-Biosphere Programme Data and Information System
IGFA	International Group of Funding Agencies
INPE	Instituto Nacional de Pesquisas Especiais
INSAT	Indian Satellite
IOC	Intergovernmental Oceanographic Commission
IPOMS	International Polar Orbiting Meteorological Satellites group
ISRO	Indian Space Research Organization
JEA	Japan Environment Agency
JERS-1	Japanese Earth Resources Satellite
JMA	Japan Meteorological Agency
LRIT	Low Rate Information Transmission

List of Ongoing Commitments
Document 7-43

Committee on Earth Observation Satellites
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November 16-18, 1993
Tsukuba Space Center, Japan

ONGOING COMMITMENT 7-1: *As an ongoing commitment, Members, Observers, and Affiliates to inform the Chair/Secretariat concerning any change in the status of their organizations. Chair/Secretariat to report the outcomes of this effort to the Plenary as appropriate.*

ONGOING COMMITMENT 7-2: *As an ongoing commitment, WGD to continue to coordinate closely its activities with those of the International Standards Organization and Consultative Committee on Space Data Systems as appropriate.*

ONGOING COMMITMENT 7-3: *As an ongoing commitment, Members and Observers to provide CEOS participants with information on relevant Announcements of Opportunity as they become available.*

Highlights of the 7th CEOS Plenary

The 7th CEOS Plenary meeting was held November 16-18, 1994, in Tsukuba, Japan. NOAA was represented by John Hussey, Brent Smith and Levin Lauritson (in his capacity as CEOS Working Group Data Chair). Smith and Lauritson serve on the CEOS Secretariat which met prior to and following the Plenary. Shelby Tilford, Lisa Shaffer and Woody Turner represented NASA. Highlights of the Plenary and Secretariat meetings are as follows:

- In response to a Japanese proposal, the Plenary agreed to establish an ad hoc Working Group on Networks to be initially comprised of a core group involving Japan (STA and NASDA), the U.S. (NOAA and NASA) and Europe (European Community lead). This core group is charged in the upcoming year with developing an implementation plan and coordinating a CEOS approach to a global network system. NOAA, NASA and STA expressed their expectation that this network activity would be fully compatible with the ongoing bilateral Global Observation Information Network high-level initiative between the U.S. and Japan. Greg Withee and the NOAA/NASA/NSF team involved in the U.S./Japan bilateral activity will participate in the CEOS global network effort.

- The Plenary agreed to a NOAA/NASA proposal to host an ad hoc data policy meeting to develop principles for the exchange of data for operational, environmental (public utility) use. This follows completion of CEOS data principles in support of global change research. The meeting will provide an opportunity for exchange of information regarding satellite data availability and user requirements for operational public utility purposes with the goal of achieving a common view that can be stated in additional CEOS data exchange principles. The meeting will take place April 18-19, 1994, in the Washington area, following a NOAA-hosted CGMS meeting and preceding a NASA-hosted EO-ICWG meeting.

- CEOS agreed to a Brazilian space agency proposal to organize a 1994 workshop to focus on potential CEOS outreach activities involving developing countries. NOAA and NASA pointed out the importance of developing a mechanism to improve access to in situ data from such countries. This activity is expected to build upon, not duplicate, a December 1993 Italian-organized Space Agency Forum Focus Group effort on involving developing countries in global Earth observation activities.

- The Plenary agreed in principle to a British National Space Centre-proposed long-term strategy for CEOS which aims to consolidate ongoing work and to limit future activities to those that are uniquely suited to CEOS and of general benefit to members. Under continuing European Space Agency

sponsorship, the CEOS space and ground segment dossiers are to be updated in 1984 and thereafter every two years. ESA provided all members with a diskette (Microsoft Word 5.1/Apple Macintosh) version of the first (space segment) volume of the CEOS dossier. (Contact E/IA Linda Moodie if interested in obtaining a copy of this diskette.) A Calibration/Validation dossier is also to be prepared in connection with the Cal/Val Working Group. Special reports on data applications and resource management are to be undertaken by STA/NASDA and by the Canadian Space Agency respectively.

- The Data and Calibration/Validation Working Groups were both charged with development of five year plans for presentation to the 1994 Plenary.

- The National Space Agency of Ukraine was admitted as a CEOS member. The Chinese National Remote Sensing Centre was upgraded from observer to member status. The Food and Agricultural Organization (FAO) of the UN was invited to participate as a CEOS affiliate. The Plenary determined who should represent CEOS at upcoming IGFA, SAF Focus Group on Earth Observation, and WMO Commission on Basic Systems Satellite meetings.

- The Director General of the German Space Agency (DARA), Jan-Baldem Mennicken, assumes the CEOS Chair for 1994, with Heinz Stoewer to serve as Executive Chair and Voelker Liebig as DARA Secretariat member. DARA envisions an active leadership role and will host an environmental user workshop in the May 1994 timeframe and the 8th Plenary during the week of September 26-30, 1994. Stoewer shared DARA's intention to stage a political event to commemorate the tenth anniversary of CEOS in connection with the final day of next September's Plenary. The German Foreign Minister, foreign ambassadors and CEOS member agency heads will be invited to participate.

CEOS Plenary Session Held: *Many Significant Plans on Earth Observation Data Utilization Proposed*

The plenary session of the Committee for Earth Observation Satellite (CEOS) was held from November 16 to November 18, 1993 in the large conference room in the Space Experiment Building of Tsukuba Space Center. The session was co-sponsored by the Science and Technology Agency of Japan (STA) and the National Space Development Agency of Japan (NASDA).

CEOS is an international organization which coordinates Earth observation satellite programs and policies for effective utilization of the observation data. It was established in 1984 as a result of an economic summit. The CEOS plenary session is held once a year to report the past year's activities and coordinate and decide the future activity program. The session was attended by a total of 71 persons in charge of Earth observation from 25 organizations of 14 countries, including space agencies, satellite on-orbit operation organizations, and international Earth change research organizations.

The session was chaired by Director Fujita of the International Space Affairs Division, Research and Development Bureau, STA. At the opening of the session, Deputy Minister Miyabayashi for Science and Technology of STA gave the opening speech and Executive Director Tateno of NASDA gave a welcome speech. Activities conducted in 1993 were reported on the first day, programs for 1994 and later were coordinated on the second day, and the results were summarized on the third day. Main results of the session are described below.

(1) Earth Observation Data Policy

CEOS has been coordinating to maximize the effectiveness of Earth observation data utilization. It adopted the "Principles of Data Exchange for Earth Change Research" to provide data at low prices to Earth change researchers. In the session, the results of the data policy specialist session held in May 1993 were reported by Japan. The status of the pilot project for the trial application of the above data exchange principles and the "data exchange principles for supporting on-orbit phase operations and environment monitoring," the next step, were also discussed.

Data supply at low prices to the pilot project at low prices was proposed by Russia. It was decided that the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA) would hold a workshop on the "data exchange principles for supporting on-orbit phase operations, and environment monitoring" in April 1994 in Washington, DC.

(2) Summarization of Data Users Requirements

CEOS facilitates exchanges of views between space development organizations and data user organizations to reflect the users' requirements in the Earth observation satellite programs of the space development organizations. In this session, the results of the first data users' requirements workshop held in May 1993 were reported by Japan.

CEOS Plenary Session Meeting

The integrated data requirements of international Earth change research organizations compiled mainly by the World Meteorological Organization (WHO) were also reported. The requirements are integrated data requirements of a number of international Earth change research organizations. They were highly evaluated as very useful information for the space development organizations in drawing up their Earth observation satellite programs.

It was decided that the second data user requirements workshop would be held in May 1994 in Berlin to reflect the integrated data user requirements in the Earth observation satellite programs of space development organizations.

(3) CEOS Long-Term Plan

The CEOS long-term plan (draft) was proposed by the British National Space Center (BNSC). It was agreed that CEOS must promote international Earth observation activities peculiar to CEOS. Earth observation data policy, coordination with international Earth change research organizations, technical coordination through working groups, maintenance and revision of the Earth observation dossiers, and public relations and diffusion activities were cited as appropriate areas for CEOS envolvement.

(4) Global Network

Japan proposed the construction of a CEOS global network and the establishment of a network working group for its construction. The network would connect the data centers of the participant countries and researchers around the world to enable easy access to and maximum utilization of the data. The significance of the global network was recognized in the resulting discussions. It was decided that a network specialist working group co-chaired by NASDA and the European Community (EC) would be established to set up a working plan by the next session.

(5) Others

The roles to be played by CEOS in the developing countries were cited as an area requiring attention. It was decided that Brazil would hold a workshop to investigate the roles. Compilation of a report concerning examples of Earth observation satellite data applications was proposed by Japan and agreed upon by a number of countries.

As stated above, the session lasted only three days. However, substantial discussions were held on many subjects. In between the sessions, Tsukuba Space Center tour was conducted, and visitors watched the Advanced Earth Observing Satellite (ADEOS) being prepared for the thermal vacuum test.

The plenary session of 1994 will be sponsored by DARA at the end of September in parallel with the tenth anniversary of CEOS.

3rd NASDA-CNES Meeting Held: 32 Participants Met in Paris; *Desire for Cooperation between Japan and France Deepens*

The third regular meeting of the National Space development Agency of Japan (NASDA) and the Centre National d'Etudes Spaciales (CNES) was held for three days beginning December 13, 1993 in Paris, France. The meeting was attended by 24 participants, including President René Pellat and Director-General Jean-Daniel Lévi, from CNES and eight participants, including Executive Vice President Takashi Matsui, from NASDA.

In the general meeting on the first day, the future programs of both NASDA and CNES were presented. Four Working Groups titled "General Affairs," "Earth Observation," "Reliability" and "Tracking and Control," were then held.

The "General Affairs" Working Group (WG) was first established this year to search for future cooperation possibilities in fields beyond the scope of existing WGs. In the subcommittee meeting, CNES reported that they were considering lunar and planetary exploration and small satellites as candidate cooperation themes.

President Pallat stated that the Defence Ministry was added to the competent authorities for CNES. CNES attaches importance to bilateral cooperation and intends to further promote cooperation with NASDA on definite themes.

The next meeting will be held in Japan.

7th Plenary

17 November 1993

Proposed Changes to the CEOS Terms of Reference

1. Change in the CEOS title

As agreed by the members following a request by mail, the s on "Observations" has been dropped. Therefore, through the Terms of Reference, CEOS will be referred to as the Committee on Earth Observation Satellites.

2. Change of Status

Under the heading of Participants, following the paragraph on Affiliates, insert the following new subheading and text:

> *Change of Status*
>
> It is the responsibility of each member, observer, and affiliate to inform the CEOS Chairperson of a change in its status with regard to CEOS participant ~~qualifications~~ as outlined in the Terms of Reference. In the event that an organization's status changes, CEOS members will review the change and ~~continued participation~~ in CEOS will be by consensus of the CEOS members.

3. Additional Details regarding Organizations and Procedures

The following paragraphs provide additional procedural details and are recommended to enhance the current paragraph 1 under the heading, Organization and Procedures.

> CEOS will convene once every year in Plenary session. CEOS meetings will be organized and chaired by the designated host organization. Each member will designate a point-of-contact for coordination between meetings. *Each member , observer and affiliate should inform the CEOS chairperson of principal and point-of-contact changes.*
>
> A standing Secretariat will be maintained by ESA, NASA/NOAA, and STA/NASDA *and chaired by the incoming host organization* in support of the CEOS Plenary. Each year's incoming Plenary host *will lead the activities* of the Secretariat for that year. The Secretariat will prepare and distribute minutes for the Plenary meetings, serve as a point of contact for external organizations interacting with CEOS, maintain and update the CEOS dossier on space and ground segment

activities, produce other periodic publications, ensure communications among members between meetings, report at each Plenary session on its activities and the status of action items from previous Plenary meetings, and perform other tasks as assigned by the CEOS Plenary. The chairpersons of the CEOS Working Groups will be invited to all meetings of the CEOS Secretariat and will be copied on all relevant correspondence. The Plenary guides the work of the Secretariat, with CEOS member points-of-contact serving as a steering committee in between Plenary sessions.

At each meeting of CEOS, the time place, and host for at least the next two meetings will be established. *The incoming CEOS host will assume chairperson responsibilities at the conclusion of the Plenary meeting. Allocation of Plenary actions will be coordinated between the incoming and outgoing chairpersons .*

A list of members, affiliates, and observers and the dates they were accepted will be updated as appropriate, included as Appendix A to the Terms of Reference, and distributed with the minutes after each meeting.

Draft Background Paper
Ad Hoc Data Policy Meeting on The Exchange of Data for Operational, Environmental (Public Utility) Use

Background: At Abingdon, U.K. in April 1991, CEOS held an ad hoc data policy meeting to discuss a draft data exchange policy resolution, intended to establish general principles covering satellite data policy and data exchange. The meeting recognized four categories of satellite data use as a framework for data exchange: global change/environmental research, other research not necessarily related to global environment change, operational/environmental monitoring (public utility), and other (including commercial). From this meeting and as a first step, CEOS adopted a set of "Satellite Data Exchange Principles in Support of Global Change Research" at its plenary meeting in December 1991.

Again, in April 1992, CEOS met in London with senior, national and international environmental officials in connection with an initiative proposed by U.K. Prime Minister Major. The meeting participants agreed to increase "the use of satellite data to support environmental information needs of national and international environmental programmes."

Later, in ~~April~~ October 1992, a CEOS ad hoc data policy meeting was held, resulting in the revision of the CEOS data principles in support of global change research at the December 1992 plenary meeting. Moreover, CEOS members agreed at the 1992 plenary to discuss with observers and affiliates a mechanism to make commercial satellite data available at reduced costs for global change research purposes. The third CEOS ad hoc data policy meeting was held in May 1993 to discuss a possible mechanism, and a pilot project with the International Geosphere-Biosphere Program was begun.

One provision of the CEOS Satellite Data Exchange Principles in Support of Global Change Research states that "[P]rinciples for data exchange in support of other data uses beyond global change/ climate an environmental research will be developed for CEOS endorsement as a next step." The "other uses" identified in this provision include operational environmental monitoring.

Invitation: At the May 1993 ad hoc data policy meeting, NOAA offered to host, along with NASA, the next ad hoc data policy discussion in the Spring of 1994 to address potential CEOS data

principles for the exchange of data for operational, environmental public utility use. The meeting participants accepted the offer.

Purpose of Meeting: NOAA and NASA are proposing the dates of April 18-19, 1994 for the meeting to be held in the Washington, D.C. area. The purpose of the meeting will be to discuss and develop for CEOS plenary consideration a set of "Data Exchange Principles in Support of Operational, Environmental, Public Utility Use."

Scope: In order to achieve this purpose, the meeting preparation should include exchange of information among CEOS members, observers, and affiliates regarding satellite data availability and user requirements for operational public utility purposes. The meeting should identify the extent to which there is a common view on data provision for this purpose which could provide a framework for new CEOS data exchange principles. This requires recognition of the differences across agencies in funding mechanisms and national or international policies, as well as identification of common objectives regarding public health and safety and environmental management.

The focus of the meeting should be the use of satellite and related airborne and in situ data for operational environmental use for public utility purposes.

Participants : All CEOS members, and those observers/ affiliates involved in operational activities would be invited to participate, as well as participants who might play a key role in the process, including representatives of environmental agencies that participated in the April 1992 senior-level meetings in the U.K. In order to promote a productive meeting and efficient use of time, an attempt will be made to keep the meeting to a manageable size.

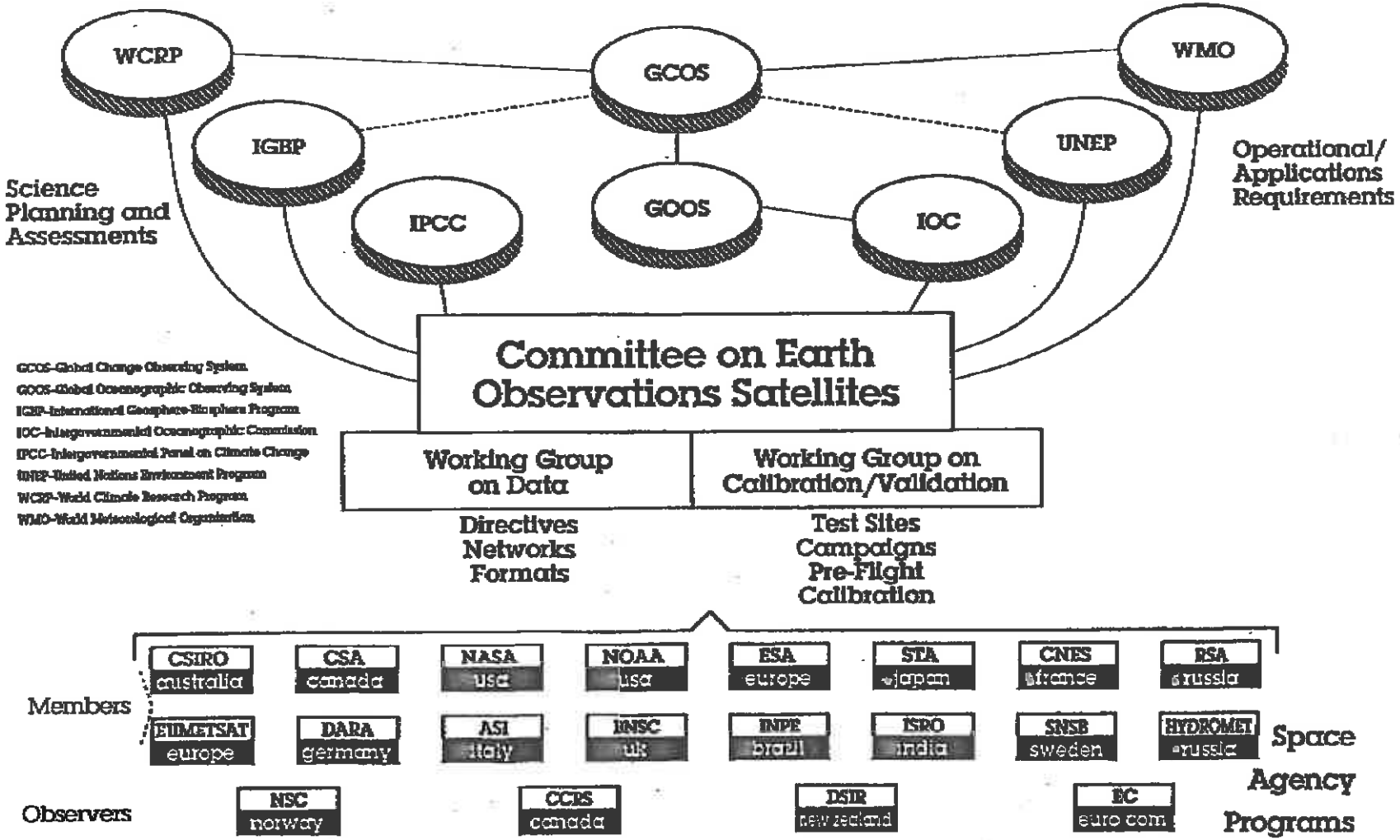
Pre-Meeting Preparation :

1) An invitation and draft agenda will be sent to CEOS members and relevant observers and affiliates for comment. The meeting organizers are open to suggestions as to others who should be invited.

2) Invitees will be requested to provide background material on relevant data policies and/or user requirements.

3) A draft set of data principles will be developed taking into account material provided by invitees.

INTERNATIONAL COORDINATION



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****

Date : April 3, 1993

Pages :1+21

To: **Dr. Brent Smith**
Chief,
International and Interagency Affairs
NOAA

Phone : 301-763-4586
Fax : 301-738-5828

From: Chu Ishida
Earth Observation Planning Department
NASDA HQs

****

Subj: CEOS presentation at Graz

****

Dear Dr. Smith,

Thank you very much for sending viewgraph materials for Mr.Fujita's presentation on CEOS activities at Graz.
Attached please find overall viewgraphs prepared for him, incorporating your materials and CEOS 1993 plans.
It is a pity that you can not attend the 2nd CEOS secretariat meeting.

Best regards,

Chu Ishida
NASDA/EOPD

MISSION AND STRUCTURE OF CEOS AND CHIEF PLENARY-LEVEL INTEREST

April 6, 1993
Graz, Austria

Akihiro Fujita
Science and Technology Agency, Japan

COMMITTEE ON EARTH OBSERVATIONS SATELLITES (CEOS)

- Created in 1984 as a result of the international Economic Summit of industrialized nations
- Serves as the focal point for international coordination of space-related, Earth observation activities
- Addresses policy and technical issues related to the whole spectrum of Earth observation satellite missions and data received from such

CEOS OBJECTIVES

- To optimize the benefits of spaceborne Earth observations through cooperation of its members in mission planning and in the development of compatible data products, formats, services, and policies

- To aid its members and the international user community by serving as the focal point for international coordination of space-related Earth observations activities, including those related to global change

- To exchange policy and technical information to encourage complementarity and compatibility among spaceborne Earth observations systems

Individual members of CEOS will use their best efforts to implement CEOS recommendations in their respective Earth observations programs.

CEOS OBJECTIVES (Cont'd)

The international cooperation and coordination that has taken place through CEOS has benefited not only to those space Earth observation agencies that comprise CEOS, but also the global community that uses satellite data.

CEOS has sought to strengthen the dialogue with the user community so that members might better incorporate user needs and requirements into current and planned Earth observation missions.

CEOS MEMBERS

- Those national and multinational government agencies with funding and program responsibilities for a satellite Earth observation program (currently operating or in the later stasges of system development)

- Members agree to provide to the international community non-discriminatory and full access to sensor data.

CEOS MEMBERS (Cont'd)

Current members are:

- o CSIRO, Australia
- o INPE, Brazil
- o CSA,Canada
- o CAST, China
- o ESA, Europe
- o EUMETSAT,Europe
- o CNES, France
- o DARA, Germany
- o ISRO, India
- o ASI, Italy
- o STA,Japan
- o Hydromet, Russia
- o RSA,Russia
- o SNSB, Sweden
- o BNSC,United Kingdom
- o NASA,United States
- o NOAA, United States

CEOS OTHER PARTICIPANTS

Observers

Governmental entities with a space-based Earth observation program in the early stages of development or with a significant ground segment activity that supports CEOS member agency programs may be invited to participate as observers.

Affiliates

To strengthen interaction with international scientific programs and intergovernmental user organizations, the following bodies may be invited to participate as affiliates:

- **o International intergovernmental bodies,**
- **o International scientific organizations, and**
- **o Other international satellite coordination groups.**

Current affiliates have agreed to provide requirements for space-based Earth observations to CEOS

CEOS OTHER PARTICIPANTS (Cont'd)

Current affiliates are:

- **Global Climate Observing System (GCOS)**
- **Global Ocean Observing System(GOOS)**
- **International Council of Scientific Unions(ICSU)**
- **International Geosphere Biosphere Program(IGBP)**
- **Intergovernmental Oceanographic Commission(IOC)**
- **U.N.Environment Programme(UNEP)**
- **World Climate Research Program(WCRP)**
- **World Meteorological Organization(WMO)**

CEOS STRUCTURE

Plenary meets at least once a year to:

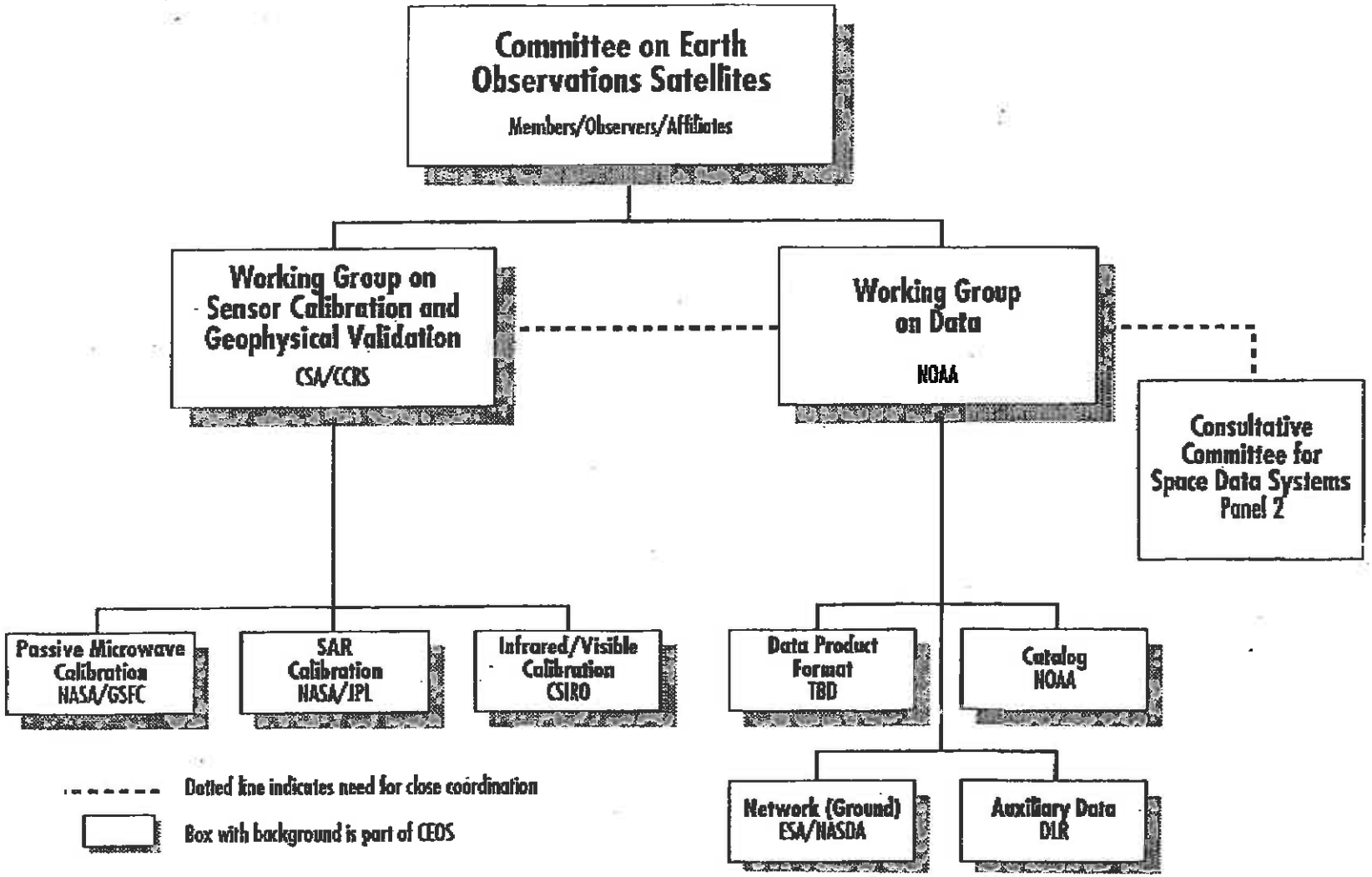
-- Pursue technical and policy coordination
-- Receive progress reports from and provide direction to its technicasl working groups

Technical Working Groups and Subgroups meet up to three times a year:

-- Working Group on Calibration/Validation
  : SAR Calibration Subgroup
  : Passive Microwave Subgroup
  : Visible/Infrared Optical Sensors Subgroup

-- Working Group on Data
  : Data Product Formats Subgroup
  : Catalog Subgroup
  : Network Subgroup (ground-to-ground systems)
  : Auxiliary Data Subgroup

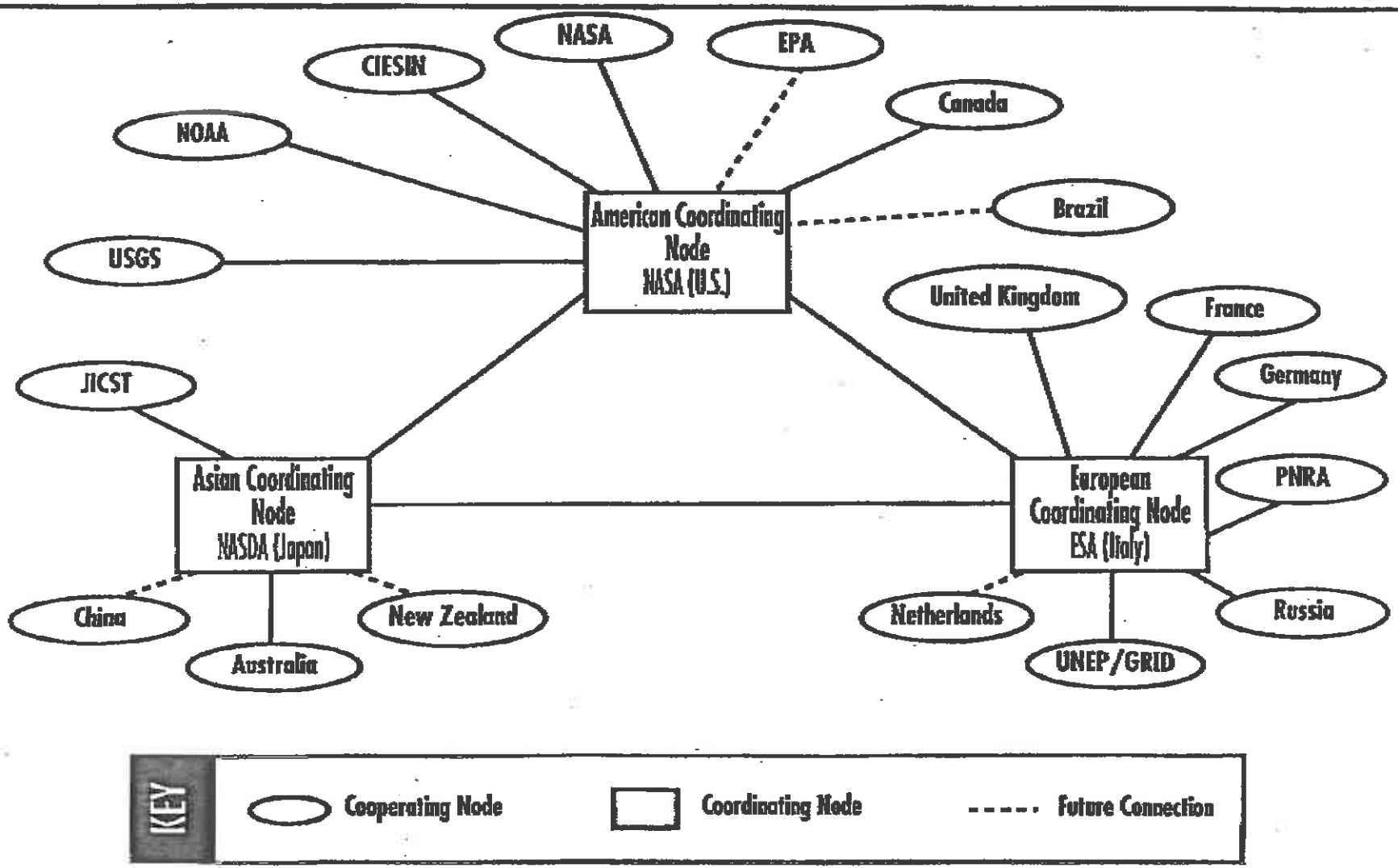
CEOS WORKING GROUP STRUCTURE



CEOS INTERNATIONAL DIRECTORY NETWORK(IDN)

- CEOS-IDN is a on-line catalogue system of Earth observation data, which allows a user to locate data and know how to obtain them.
- CEOS IDN is fully operational, with coordinating Nodes and cooperating Nodes, and interconnects Data Providing Agencies in the world.
- CEOS IDN allow a user to access inventory information system of a Data Providing Agency and retrieve detailed information on the data.
- A user can access latest Earth observation data in the world through CEOS IDN at no cost, fully open and non-discriminatory basis

CEOS INTERNATIONAL DIRECTORY NETWORK



CEOS ACCOMPLISHMENTS

1. Data Exchange Principle
   CEOS members endorsed the Data Exchange Principle in support of global change research, by agreeing to a fundamental objective of maximizing the use of data through implementation of an exchange/sharing mechanism.

2. Coordination of Mission and User Requirements
   DOSSIER(Vol.1~Vol.3) were compiled, providing detailed information on satellite, sensor, ground system and user requirements for global change research. DOSSIER provide agencies and data users.

3. Development of Standards
   - o CEOS-IDN was developed as standard catalogue system and is fully operational
   - o CEOS standard digital data formats were developed and adopted for various Earth observation missions.

1993 CEOS PLAN -PLENARY-LEVEL INTEREST

- To further strengthen interaction and communications between data "provider" and data "user"
- To demonstrate data exchange mechanism for global change researchers through pilot project
- To discuss data exchange principles for non-global change researchers, uncommercial operational users, etc.
- To adopt and continue ISY Earth science and technology projects
- To add of Data Application Programs to Dossier
- To conduct feasibility study of a global observation information network

1993 CEOS PLAN -PLENARY-LEVEL MEETINGS

o Ad-hoc Data Policy Meeting, May 25-26, Tokyo
  - to define and plan pilot project for implementing data exchange principle
  - to discuss data exchange principle for non-global change researches, non-commercial operational use, etc.

o CEOS User Data Requirement Workshop, September, Location(TBD)
  - to update satellite mission planning by space agencies
  - to identify data requirements by users
  - to report on pilot project for data exchange mechanism

o CEOS Plenary Meeting, November 15-17, Tsukuba
  - to report on 1993 activities
  - to report on 1994 planning

1993 CEOS PLAN -G-7 TOKYO SUMITT INITIATIV

Coordinations are under way to obtain supports and consensus among CEOS members on seeking endorsement of the Summit on the work of CEOS for Earth Observation satellite program and data applications.

- **to establish the concept of a rational world-wide Earth observation satellite constellation**
- **to conduct feasibility study of a global satellite observation information network**

1993 CEOS PLAN -SATELLITE MISSION COORDINATION AND USER DATA REQUIREMENTS

- CEOS Earth observation dossier gives detailed information on current and planned all satellite mission, including sensor specifications, ground system and data products, and provides a basis for satellite mission coordination.

- Data requirements are being reviewed by observers and affiliates and their output will provide an important information for planning and coordinating satellite missions and ground system.

- User Data Requirement Workshop is being planned for September at location (TBD). Data requirements of international research organizations and various application users will be presented.

1993 CEOS PLAN -DATA EXCHANGE PRINCIPLE

- The data exchange principle in support of global change research was endorsed at 1991 plenary meeting.

- General mechanism for implementing the data exchange principle was endorsed at 1992 plenary meeting and initiating a pilot project to test the effectiveness and procedure was suggested.

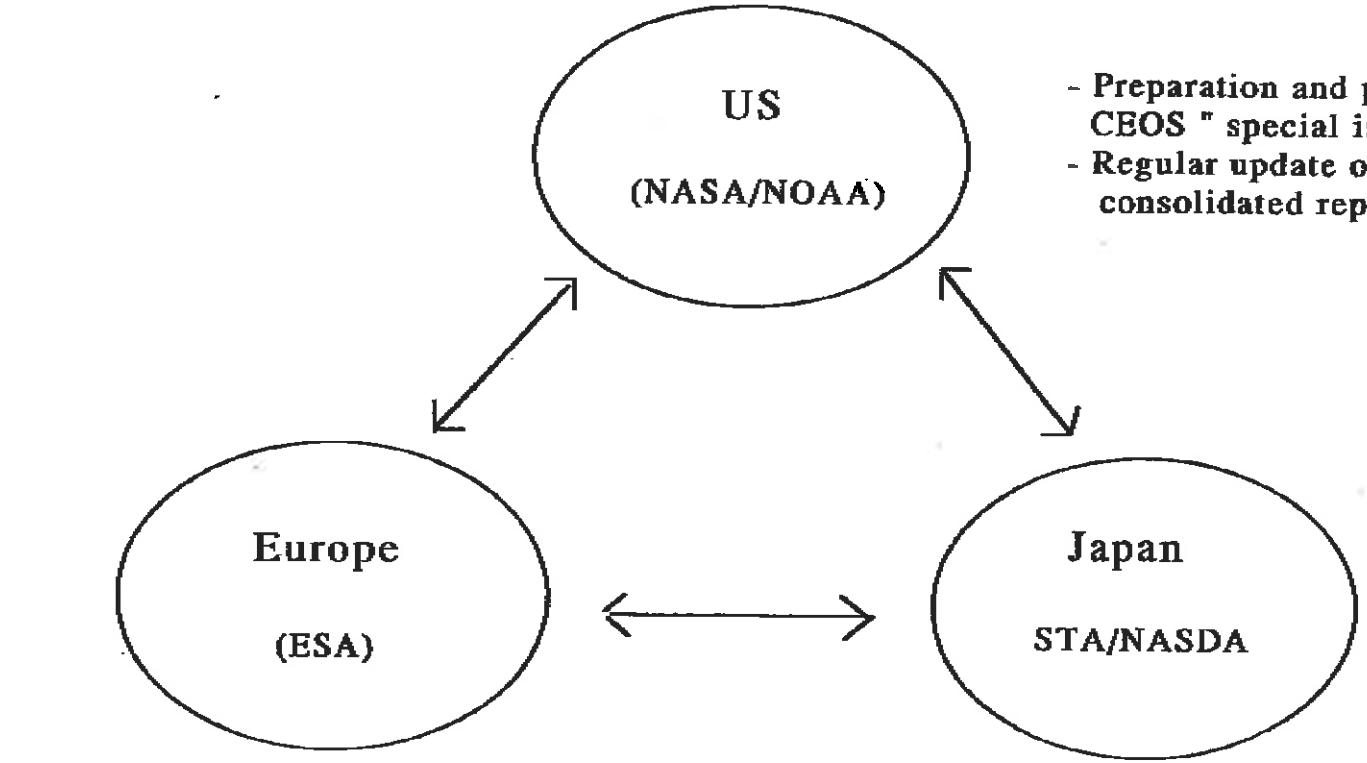
- Definition and start of the pilot project and data exchange principle for non-global change research and non-commercial operational uses, etc. will be discussed at Ad-hoc data policy meeting, May 25-26, Tokyo.

1993 CEOS PLAN -ADOPTION AND CONTINUATION OF ISY PROJECTS

- 1992 plenary meeting agreed to endorse in principle the continuation of the ISY Earth science and technology projects.

- The ISY Earth science and technology project will be continued within the framework of the CEOS, if each of the sponsoring agencies of the ISY project agree to continue.

13 CEOS Secretariat



- Preparation and publication of CEOS " special issue" reports
- Regular update of CEOS consolidated report

- Regular update of CEOS Earth Observation Dossier and yearbook

- Maintenance of CEOS database for mailing and circulation
- Issuance of CEOS newsletter