

**COMMITTEE ON EARTH OBSERVATIONS SATELLITES
FIFTH PLENARY MEETING**

Herndon, Virginia, USA, December 9-10, 1991

The fifth meeting of the Committee on Earth Observations Satellites (CEOS) was held in Herndon, Virginia, December 9-10, 1991, hosted by the National Aeronautics and Space Administration (NASA) and the National Oceanic and Atmospheric Administration (NOAA). In addition to the hosts, Members from the Agenzia Spaziale Italiana (ASI), the British National Space Centre (BNSC), the Centre National d'Etudes Spatiales (CNES), the Canadian Space Agency (CSA), the Australian Commonwealth Scientific and Industrial Research Organisation (CSIRO), the Deutsche Agentur fuer Raumfahrtangelegenheiten (DARA), the European Space Agency (ESA), the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), the Instituto Nacional de Pesquisas Espaciais (INPE), the Indian Space Research Organization (ISRO), the Japanese Science and Technology Agency (STA), and the Swedish National Space Board (SNSB) were represented. Official Observers from the Canadian Centre for Remote Sensing (CCRS) and the Commission of the European Communities (EC) also attended. The New Zealand Department of Scientific and Industrial Research (DSIR) and the Norwegian Space Centre (NSC) were unable to send representatives to the meeting. Representatives of the International Council of Scientific Unions (ICSU), including the International Geosphere-Biosphere Programme (IGBP), the Intergovernmental Oceanographic Commission (IOC), the World Climate Research Program (WCRP) and the World Meteorological Organisation (WMO) participated as official Affiliates. Representatives of the State Meteorological Administration (SMA) of the People's Republic of China attended as guests. A list of participants and invited guests is attached. (DOCUMENT 5-1)

OPENING OF THE MEETING

Dr. Shelby Tilford (NASA) and Mr. Russell Koffler (NOAA) co-chaired the meeting. Dr. Tilford and Mr. Koffler welcomed the guests to Washington, noting the growth in CEOS participation. Mr. Koffler noted the past success of earlier CEOS meetings and projected that this would continue. Mr. Koffler welcomed ICSU/IGBP, IOC, WCRP and WMO as CEOS Affiliates. He also welcomed as guests the delegation from the SMA of the People's Republic of China.

REVIEW AND ADOPT AGENDA

An updated agenda was distributed and approved. (DOCUMENT 5-2)

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REPORT ON ACTION ITEMS 4.4, 4.5, 4.9

ACTION 4.4: Dr. Tilford reported that the secretariat for 1991 informed CCRS, NSC, and DSIR of the approval of their Observer status in CEOS and provided them with copies of minutes from the last CEOS plenary meeting.

ACTION 4.5: Mr. Serra (INPE) reported that INPE had sent the CEOS Terms of Reference to the USSR Academy of Sciences, the USSR State Committee for Hydrometeorology, the PRC Academy of Sciences and the PRC State Meteorological Administration.

ACTION: 4.9: Dr. Tilford noted with pleasure the participation of guests from the PRC, and that ICSU, IOC, WCRP, WMO accepted Affiliate status in CEOS and sent representatives to this meeting. He also noted that the United Nations Environment Programme (UNEP) was invited but was unable to send a representative to this meeting.

Dr. Tilford also mentioned that the EC had accepted Observer status in CEOS. In response to an inquiry about possible participation by representatives from the Soviet Union, Dr. Tilford noted the lack of response by Soviet authorities to letters sent by the previous secretariat and suggested that this might be due to the current political situation in the USSR.

APPLICATIONS FOR MEMBER/OBSERVER/AFFILIATE STATUS

Mr. Nobinder (SNSB) stated SNSB's interest in joining CEOS and explained that the SNSB is a government agency responsible for coordination of Swedish remote sensing activities. Regarding international cooperation, Mr. Nobinder noted that SNSB participates in all ESA Earth observations activities and works closely with France on the SPOT program, providing 4% of the satellites' cost. He expressed his hope that these activities qualified SNSB for membership in CEOS. Mr. Stoewer (DARA) and Mr. Levi (CNES) indicated their strong support for Swedish membership in CEOS. The Plenary unanimously accepted SNSB as a new CEOS Member. Mr. Nobinder thanked the participants and expressed his desire to make a positive contribution to future CEOS activities.

Mr. Bizzarri raised the concern that CEOS could be faced with too many applications for membership and suggested that Sweden might possibly serve as a rapporteur for other Nordic nations. Dr. Tilford noted that the CEOS Terms of Reference specify the requirements for participation and should serve as the standard for future applications.

Dr. Tilford reported that the International Society for Photogrammetry and Remote Sensing (ISPRS) had requested Affiliate status with CEOS. He indicated that NOAA's and NASA's position

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was that professional societies should not be granted Affiliate status and requested the views of the other Members. Dr. Revah (CNES) concurred with the view of Dr. Tilford, and noted that other fora are available to ISPRS and other similar groups to discuss their particular interests in Earth observation activities.

Dr. Tilford pointed out that CEOS has significantly broadened participation to include the Affiliates present at today's meeting. The Members agreed that professional societies should not be accepted as Affiliates of CEOS.

ACTION 5.1: Outgoing secretariat to respond to ISPRS request for Affiliate status, informing ISPRS of CEOS' view that professional societies are not eligible for CEOS Membership.

REPORTS ON ACTIVITIES OF MEMBER/OBSERVER COUNTRIES/AGENCIES

REPORT ON ACTION ITEM 4.12 (NASA)

ACTION 4.12: Ms. Shaffer (NASA) noted that NASA and NOAA developed a common format for agency status reports, circulated the approved format for the submission of country/agency reports and had received few comments from the Members. Based on reports received by December 6, 1991, a consolidated status chart of Member spacecraft was prepared and presented by Ms. Shaffer. Copies of all complete Member, Affiliate and Observer reports received in advance of the meeting and at the beginning of the plenary session meeting were distributed to plenary attendees.

It was agreed that a more detailed report was necessary, giving information on sensors, orbits, approval status, ground stations, launch dates, etc. Some Members suggested establishment of a working group, using as an example the work done in IPOMS and EO-ICWG, to provide a comprehensive view of planned capabilities. Dr. Tilford agreed that greater cooperation is required and proposed this be discussed after presentations by the Affiliates.

HIGHLIGHTS OF MEMBER/OBSERVER COUNTRIES/AGENCIES ACTIVITIES

Mr. Goldsmith (ESA) gave a report on the recent ESA Ministerial meeting. The Ministers approved a resolution giving greater priority to Earth observations as part of ESA's long-term plan. The revised program proposal and Declaration for POEM-1 will be completed within the next several months. Mr. Goldsmith noted that the ESA POEM program includes follow-on instruments, ERS-1 and -2, plus new atmospheric sensors and AO instruments. The program's cost will be approximately 1 billion Accounting Units (AU). Mr. Goldsmith also noted that the polar platform design is flexible, allowing for several possible payload configurations.

Follow-on polar missions will be addressed at a future Ministerial meeting. Regarding other satellites, the Ministers strongly endorsed ARISTOTELES. Mr. Goldsmith also noted support for the TOPEX/POSEIDON program with NASA as well as the continuation of the METEOSAT program. Finally, support for expansion of ESA's ground segment was indicated at the meeting. In sum, Mr. Goldsmith suggested that the outcome of the meeting was very positive for Earth observations programs--the major programs have been endorsed, and the details are now to be finalized.

Dr. Tilford presented updated information on the restructuring of the EOS programs. As required by the US Congress, the EOS budget was reduced from \$17 billion to \$11 billion through the year 2000. In addition, new launch vehicles have become available for polar orbiting missions, allowing more flexibility in program planning. The results of a review over the past 6 months will be presented to the NASA Administrator in the near future. Dr. Tilford indicated that the original goals of EOS are being maintained as well as possible and that high priority has been given to maintaining international instrument exchange plans. In sum, Dr. Tilford noted that EOS will have a multiple series of smaller platforms with fewer instruments, further highlighting the need for CEOS cooperation to maintain shared goals and avoid redundancies. Dr. Tilford offered to provide updated information on EOS to the participants as soon as it becomes available.

Mr. Bizzarri presented a brief report on the Earth Observations World Information Centre (EOWIC) concept. He noted that a meeting of experts was convened in Rome this past summer at the invitation of the Italian Foreign Ministry to discuss EOWIC. Referring to a report that was distributed to the participants, he summarized that two *ad hoc* working group meetings have been held since the Rome meeting to discuss EOWIC definition. Mr. Bizzarri indicated that some groups of data users (e.g., developing countries) will likely need more facilities for easy access to environmental data. He emphasized that EOWIC's goal is to provide information on data access and not actual distribution of data. He noted that the primary interfaces for EOWIC are the CEOS WGD and the various data centers (EOSDIS, NESDIS, ESRIN, JRC, NASDA, etc.) throughout the world. Mr. Bizzarri characterized EOWIC as an information center. Regarding the EOWIC implementation plan, Mr. Bizzarri hopes to report on this at the next CEOS Plenary meeting.

Dr. Williams (BNSC) noted that, with the successful launches of ERS-1 and UARS, 1991 has been an important and positive year for Earth Observations. Regarding UK contributions to ERS-1, Dr. Findlay presented some results obtained from the Along Track Scanning Radiometer (ATSR) developed by the Rutherford-Appleton Laboratory and CSIRO. Dr. Findlay also presented information on

data from the U.K. Microwave Limb Sounder (MLS) flown on the UARS satellite.

Presenting highlights on Brazilian space activities, Mr. Serra noted that SCD-1 is to be launched in May of 1992 on a launch vehicle provided by Orbital Sciences Corporation (OSC). The follow-on satellite, SCD-2, will be launched in 1993. The CBERS satellites, jointly developed by Brazil and the PRC and designated SSR-1 and -2, will be launched around 1994. Mr. Serra also noted that the President of Brazil has proposed a working group to review national space activities, with results expected in early 1992.

Professor Stoewer announced an addendum to the DARA report. In the report, the ATMOS satellite has been characterized as being cancelled. However, a formal decision on the satellite has not yet been made. Stoewer characterized the ATMOS mission objectives and instrument plans as very much alive, with the issue of implementation to be determined in the near future. Implementation of ATMOS through ESA's Earth Observation Program appears to be the likely option. He also noted that the MOMS instrument would be flown on the D-2 Space Shuttle mission (1993) and may be flown on the USSR MIR Station-Priroda module. Mr. Stoewer extended an invitation to the CEOS participants to the European ISY Conference planned for March-April 1992 in Munich.

Regarding Spot-1, Ms. Chevrel (CNES) announced that efforts will be undertaken to reactivate direct transmission from the Spot-1 satellite for vegetation studies beginning in March 1992.

Dr. Harris (CSIRO) noted that a review of Australian space activities was being prepared and would likely be available in March of next year.

Mr. Bizzarri reported that the proposed WECOS satellite has been cancelled.

REPORTS FROM WORKING GROUPS

Working Group on Data (WGD)

Mr. Levin Lauritson (NOAA), Chairman, WGD, gave the report on WGD activities, suggesting that interested participants refer to details available in the complete report distributed at the meeting. Mr. Lauritson noted several accomplishments of WGD in the past year and addressed the issues of data formats, catalog systems, networks, including the CEOS International Directory Network (IDN), ancillary data sets, lexicon activities, and the need for prioritization of WGD activities. He briefly discussed the AVHRR data work plan which includes WGD coordination on a project to develop a 1 km global land data set, beginning in early 1992. This project is a joint activity of NOAA, the U.S.

Geological Survey (on behalf of NASA) and ESA in cooperation with IGBP. Mr. Lauritson also mentioned the catalog guidelines document developed by WGD (a copy of which was provided to each delegation for review) and a technology survey underway by DLR.

Mr. Lauritson presented the WGD recommendations to the CEOS Plenary:

- 1) encourage Members/Observers/Affiliates to support the generation and maintenance of data set descriptions in the Directory Interchange Format (DIF) for inclusion in the CEOS International Directory Network (IDN);
- 2) encourage Members to support the publication and distribution of CEOS formats;
- 3) encourage the participation of CEOS Affiliates in WGD meetings and projects; and
- 4) endorse the Global Land 1 Km AVHRR Data Set Project and WGD's intention to coordinate with IGBP and the implementing agencies in the development of requirements and specifications for higher-level products.

Regarding data directories, Dr. Rasool noted the difficulty of gaining easy access to space data by lay users and hoped that cooperative efforts could lead to a simplification of access to such data. Dr. Rasool asked for clarification of the possible relationship between WGD directory efforts and EOWIC. Mr. Lauritson noted that contact has been made between the CEOS WGD and EOWIC. Ms. Shaffer noted that the EOWIC concept is still being formulated and that the EOWIC ad hoc working group recognized that any future EOWIC efforts should build upon existing projects and systems. Thus, the WGD IDN is the directory system in use and will be what EOWIC uses as well. Professor Stoewer, noting that vast amounts of data will be created in the near future, highlighted the need for WGD and others to ensure that end users will have access to easily useable data. The Chairmen commended WGD on its significant progress.

ACTION 5.2: CEOS participants to designate appropriate points of contact for WGD Catalog Subgroup activities to ensure the generation of Directory Interchange Formats (DIFS) for the International Directory Network and submit the name to the WGD Catalog Subgroup.

Working Group on Sensor Calibration and Geophysical Validation
(WGC/V)

REPORT ON ACTION ITEMS 4.1 AND 4.2

ACTION 4.1: Canada to chair the *ad hoc* WGC/V and report at the next Plenary.

Dr. Susan Till (CCRS) gave the report on the *ad hoc* WGC/V meeting hosted by CCRS. Dr. Till summarized the major activities of WGC/V as follows:

- re-establishment of the group with members designated from the CEOS member organizations
- coordination with CEOS WGD
- formation of contacts with international organizations
- meeting of WGC/V, August 1991 (first since 1988)
- meeting of subgroup on SAR calibration group, October 1991
- plans to establish subgroups on a) IR sensors and b) test sites
- efforts to establish contact with other related groups

Dr. Till presented the recommendations from WGC/V to CEOS Plenary:

- 1) approve the Terms of Reference for the working group;
- 2) encourage Members to support resource requirements necessary for attending meetings, which is necessary to assure continuity of the group's work;
- 3) encourage Members to expedite availability of data for cal/val activities; and
- 4) establish WGC/V as a standing working group, not requiring annual approval from the Plenary.

Dr. Till also reported that the action items assigned at the 4th CEOS Plenary were all closed and are summarized in detail in the written report distributed to the Plenary participants.

Ad Hoc Working Group on Space Networks (WGSN)

REPORT ON ACTION ITEM 4.6

Mr. Haruyama (NASDA) reported on the meeting of experts hosted by NASDA in June, 1991, to discuss a possible CEOS WGSN. The group met to assess user requirements for space networks, especially as they related to Earth Observations satellites; evaluate roles and responsibilities of existing groups that coordinate and recommend international standards related to space networks; and review draft Terms of Reference for the CEOS WGSN.

Mr. Haruyama presented WGSN recommendations to the CEOS Plenary:

- 1) a group should be identified to coordinate end user requirements for real-time data and near real-time Earth observation data acquisition and delivery of these data to terrestrial networks;
- 2) a group should be identified to coordinate satellite data acquisition among CEOS Members; and
- 3) CEOS Working Group on Data's Subgroup on Networks should be activated under a permanent chairman to coordinate data exchange among CEOS Members, recommend exchange standards, and evaluate requirements for space network interfaces to ground networks.

Summarizing, Mr. Haruyama noted that, although no future meeting of WGSN is now planned, the group stands ready to meet on an *ad hoc* basis at the request of the Plenary.

ACTION 5.3: STA to send a copy of the report of the Experts Meeting on Global Networks to IOC.

Mr. Lauritson noted that WGD has taken note of recommendation 3 and modified the Terms of Reference of the WGD Network Subgroup accordingly. It was also noted that NASDA and ESA are co-chairing the WGD Network Subgroup, which is now active. Regarding WGSN recommendations 1 and 2, Mr. Lauritson stated that WGD could support activities on a case-by case basis, but could not take responsibility for overall coordination. Dr. Mohr (WMO) noted that the WMO is willing to participate in a WGSN.

WORKING LUNCH

Dr. Robert Corell, Chairman, Working Group on Global Change, U.S. Committee on Earth and Environmental Sciences (CEES), and Advisor to Dr. Allan Bromley, Director of the Office of Science and Technology Policy, spoke on the U.S. Global Change Research Program (GCRP) and data policy during a working lunch, noting in particular the efforts of the Interagency Working Group on Data Management for Global Change (IWGDMGC) in the development of a U.S. national data policy. He presented the resulting data principles, which have been enunciated as U.S. policy. Dr. Corell recognized CEOS activities as a vital part of global change/environmental research efforts.

REPORTS ON ACTIVITIES OF OTHER SATELLITE COORDINATION GROUPS

Earth Observation-International Coordination Working Group (EO-ICWG)

Dr. Duchossois (ESA) gave a presentation on EO-ICWG meetings (December 1990, April 1991 and December 1991) since the last CEOS Plenary meeting. He listed the areas of high priority activity in EO-ICWG: payload composition, orbital configuration and data exchange principles. EO-ICWG has developed agreement modules for polar platform programs addressing instrument exchange, calibration/validation, data management and mission planning/management. The next EO-ICWG meeting is planned for July 1992.

International Polar-Orbiting Meteorological Satellite Group (IPOMS)

Mr. Koffler presented the IPOMS report, noting that this group is expected to dissolve after arrangements for placement of NOAA instruments on the European polar platform have been finalized. The next meeting has yet to be scheduled.

Coordination Group on Meteorological Satellites (CGMS)

Mr. Morgan reported on the most recent CGMS meeting which was held in Tashkent, USSR, in December 1990. The CGMS members visited the facility where the GOMS satellite is under construction. They also visited the Central Asian facility that will play a major role in this geostationary meteorological satellite program, particularly in the provision of WEFAX services. A CGMS Charter was provisionally approved, and the Group's name was changed from Coordination on Geostationary Satellites (CGMS). Transmission standard formats (i.e., LRPT/LRIT) were also discussed. CGMS has also served as a "pre-negotiation" forum for frequency coordination. The next meeting is planned for January 1992 in Japan.

CEOS-RELEVANT HIGHLIGHTS FROM RELATED MEETINGS

International Space Year (ISY)

Ms. Cline (NASA) reported on 3 activities related to ISY.

1. 3rd Panel on SAFISY Earth Science and Technology, Montreal, February 1991. All individual projects proposed by SAFISY members were reviewed. Ms. Cline noted in particular a proposal by Japan to study the productivity of the global ocean and a project co-led by CSIRO (Australia), CNRS (France) and the Russian Academy of Sciences, to study land cover change. Ms. Cline also noted that the final report of the Panel will be available in the near future. The Panel identified those activities that should continue after ISY under IGBP auspices.

2. Space Agency Forum for ISY (SAFISY) Plenary Meeting, Moscow, May 1991. The President of the USSR Academy of Sciences called for continued facilitation and coordination of international Earth observation and global change research. Ms. Cline noted that CEOS provides a good mechanism to support this continued activity. At the next full meeting of SAFISY, NASA on behalf of the Secretariat will present a matrix to indicate the existing international fora to coordinate such activities.

3. Second Pacific ISY Conference, Hawaii, October 1991. Ms. Cline noted two ISY working groups relevant to Earth observations activities. Recommendations were made calling for data necessary for global change research to be made available, additional national and international Earth Observations workshops, continuation of ISY education efforts, and a review of members' current data policies. Regarding Earth observations projects, begun under the SAFISY Panel of Experts on Earth Science and Technology, the Conference recommended that these projects, as appropriate, be continued under the auspices of WCRP or IGBP, and coordinated through CEOS.

Professor Stoewer called for CEOS attendance at the next SAFISY Plenary. Ms. Cline noted that SAFISY has already requested a presentation by CEOS at its next meeting. Dr. Rasool noted that many of the ISY projects require data from satellites and the obvious need for coordination with CEOS. Dr. Tilford noted that CEOS, IGBP, and WCRP and others should discuss those activities currently undertaken within ISY that should be continued after 1992. At the next full meeting of SAFISY, NASA/NOAA will represent CEOS as requested.

ACTION 5.4: NASA/NOAA to organize a CEOS presentation at the next SAFISY meeting.

International Group of Funding Agencies for Global Change Research (IGFA)

Dr. Corell gave a report on IGFA, which he characterized as an informal partnership of national agencies that fund global change research programs and other activities supporting such research. He described IGFA's purpose as facilitating international global change research in the natural, social and economic sciences by bringing the perspective of the national funding agencies to strategic planning and implementation. He summarized IGFA's objectives as follows: 1) exchange information on national global change programs 2) discuss approaches to the integration and phasing of implementation of global change research in light of available resources, 3) promote coordination of access to and

deployment of specialized research facilities, and 4) optimize allocation of national contributions to global change research. IGFA's emphasis, he added, is on strategic planning.

IGFA focuses on the resource needs identified by IGBP, WCRP and the Human Dimensions of Global Environmental Change (HDGEC) group. IGFA seeks to understand these needs and relate and compare them to resources (funding, personnel, facilities, etc.) allocated by national funding entities, and identify gaps where known. From the perspective of the funding agencies, IGFA reviews existing and planned global observing systems and data management activities. IGFA also seeks to coordinate with CEOS and others to implement the Global Climate Observing System (GCOS) and the Global Oceans Observing System (GOOS). For the future, Dr. Corell indicated that IGFA's major effort through its working groups will be to identify needs (five-year horizon) and allocations with a focus on the major international research programs (IGBP, WCRP, and HDGEC).

IGFA has met four times since its inception, most recently in December 1991. In conclusion, Dr. Corell stated that a major goal for IGFA will be the development by July 1992 of an assessment of needs of major science projects and government resources required to meet these needs. In response to questions, Corell noted that resource assessments by IGFA will be useful recommendations for the prioritization of resource allocation decisions. Recommendations will be based on IGBP, WCRP and others. Recalling Dr. Corell's outline of a five-year horizon for the IGFA assessments, Professor Stoewer noted that the planning times for most space assets are much longer. Dr. Corell agreed and suggested that CEOS is probably the best forum to address space system needs, but hoped that CEOS would do so in cooperation with IGFA.

DISCUSSION OF CEOS DATA EXCHANGE PRINCIPLES

Mr. Pyke (NOAA) noted the important goal of ensuring ready access for researchers to global change data as well as provision of analyses of these data to policy makers. Dr. Knauss (NOAA) discussed the recently approved U.S. Policy Statements on Data Management for Global Change Research. Based upon these statements, U.S. Government agencies are now reviewing their particular policies to move toward these principles. He described the national policy as a reconfirmation of a commitment to full and open exchange of data. He emphasized that the U.S. is committed to the principle of full and open access to the full suite of global change research data and information at the lowest possible cost to global change researchers. Dr. Knauss noted his desire to see this policy extended to all researchers outside the global change community and to those in the operational/environmental monitoring community. He reminded the delegates that the challenge of data management was growing with

the data volumes. Summarizing, Dr. Knauss stated that data will be useless if not readily available and user friendly--now and for future researchers. He concluded by stating that in the last analysis satellites are launched for the benefit of humankind and not for pecuniary gain. He endorsed CEOS' effort at Abingdon to develop common data exchange principles for global change research as a good "first step."

Resolution on CEOS Data Exchange Principles

REPORT ON ACTION ITEMS 4.7 AND 4.8

ACTION 4.7 NASA and NOAA provided CEOS Members with a discussion paper on the proposed data exchange principles.

ACTION 4.8 BNSC hosted a meeting in Abingdon in April 1991 to discuss these principles. A report was issued and sent to the Members.

Dr. Tilford recounted CEOS efforts to develop data policy over the past year. He presented a draft resolution on CEOS data exchange principles for global change research, based on discussions held at the Abingdon meeting, and called for comments. The CEOS principles were modified to clarify that the goal for release of data, as stated in the Principles, is within three months after the start of routine data acquisition. In addition, Dr. Revah requested that all references to global change research also state climate and environmental research, as that was the accepted terminology in Europe. The resolution was so modified and adopted.

RESOLUTION ON DATA EXCHANGE PRINCIPLES

RECOGNIZING that the members of CEOS are actively involved in supporting global change/climate and environmental research and monitoring efforts of the international scientific community, as well as pursuing other uses of Earth observations data such as local/regional research, operational environmental monitoring, and commercial;

AWARE that success in global change/climate and environmental research and monitoring requires a continuing commitment to the establishment, maintenance, validation, description, accessibility, and distribution of high-quality long-term data sets, many of which rely on space-borne observations;

ANTICIPATING the potential benefits of compatible policies and mechanisms for data exchange in obtaining access to global data;

CEOS members endorse the following principles relating to data exchange in support of global change/climate and environmental research and agree to work toward implementing them to the fullest extent possible. Principles for data exchange in support of other data uses beyond global change/climate and environmental research will be developed for CEOS endorsement as a next step.

1. Preservation of all data needed for long-term global change/climate and environmental research and monitoring is required.
2. Data archives should include easily accessible information about the data holdings, including quality assessments, supporting ancillary information, and guidance and aids for locating and obtaining the data.
3. International standards, including those generated by the CEOS Working Group on Data, should be used to the greatest extent possible for recording/storage media and for processing and communication of data sets.
4. Maximizing the use of satellite data is a fundamental objective. An exchange/sharing mechanism among CEOS members is an essential first step to maximize use.
5. Programs should have no exclusive period of data use. Where the need to provide validated data is recognized, any initial period of exclusive data use should be limited and explicitly defined. The goal should be release of data in some preliminary form within three months after the start of routine data acquisition.
6. Criteria and priorities for data acquisition, archiving, and purging should be harmonized.

Outstanding Data Principle Issues

Dr. Williams (BNSC) noted that the Abingdon discussion identified four areas of data use: global change/environmental research; other research; operational monitoring, and commercial. The last three areas have not been fully discussed. Even within the first category, he enumerated unresolved data issues, including possible limitations (i.e., missions and instruments), rules (i.e., access and misuse), costs (i.e., payment for certain data sets and long-term funding) and non-CEOS involvement in use of data sets (i.e., for special studies and/or organizations).

Dr. Rasmussen (WMO), speaking from the perspective of operational data users, noted the terms used by Dr. Williams might have different meaning for operational versus research users. Dr. Morel (WCRP) noted the dependence of international organizations on access to data provided by the space agencies. He noted that more and more derived products (not raw data) are required by these users.

Dr. Rasool noted his concern about the effect of data principles on the use of space data by non-traditional (non-space data researchers) users. These users are confronted by different data formats, data archive systems and various data access policies. Dr. Rasool hoped that CEOS would help to harmonize these access policies. Dr. Ohring (ICSU), noting the tradition of timely and free exchange of meteorological data, suggested that global change research will require a similar policy. Dr. Williams

pointed out the different perspectives of data users and funders of data systems.

Dr. Corell informed the participants that the U.S. was reviewing its Landsat data policy, placing the highest priority on making data available for global change research, with commercial objectives taking second priority.

Dr. Kullenberg (IOC) called for a eventual policy that harmonizes the needs of users and providers of all types of data. Dr. Tilford suggested that, for the purposes of CEOS, the definition of data should be confined to satellite observations and ancillary data.

Mr. Levi summarized the French position on Earth observations data policy. He noted that Earth Observation data (and more generally space data) have intrinsic value. This has to be recognized in one way or the other in order to fund development of space systems and to ensure their continuity. On the other hand, France is in favor of a mechanism that would allow the easiest access to necessary data for global change research programs. Therefore, the French approach takes into consideration two types of missions: scientific missions, aimed at having the best scientific return, and market-oriented missions. For scientific missions, data are distributed at a marginal cost. For commercial missions, data must be available to all users at the same price--the market price--so as not to undermine the development of the market; however, a subsidizing mechanism is required in order to mitigate the cost of these data for global change research scientists. Regarding the acquisition of SPOT data by French scientists, this is already accomplished by the ISIS funding program.

Returning to the example of Landsat and the legislation proposed by U.S. Congressman Brown, Dr. Tilford suggested that the commercial market will not sustain the cost of the space and ground segments. Regarding future use of Landsat data, the emphasis will switch to research use. However, he noted, a commercial side will remain. Regarding the issue of who pays for the data, Dr. Tilford observed that, because there is not a consistent situation within the various participating nations, different approaches to the issue have resulted. The focus for CEOS is on international exchange on an equitable, reciprocal basis. Dr. Williams, noting the difference in mission objectives for particular satellites and instruments, suggested that certain missions can be inherently defined as non-research or commercial. When such data are required by users, researchers in the U.K. will be required to assume costs of data.

Dr. Corell noted that use of Landsat data by the science community dropped significantly after the implementation of the

commercialization policy. He concluded that the high cost to individual researchers did affect scientific use of the data.

Mr. Langham noted Canada's strong support for environmental research, but noted that the RADARSAT program is based on government policy that calls for a return on investment in the satellite system. He noted Canada's sensitivity to the issue of the cost of making data available. Ms. McNutt (CSA) noted that CSA is developing a data policy that, like the French policy, will recognize two types of data use. In the final analysis, she noted, someone must pay for data creation and distribution and each government has approached this differently. Dr. Tilford noted that, if we ask the research community to buy data based on profit-motivated policies, we may ultimately reduce the use and demand for these data since development of new understanding and applications would be inhibited.

Recognizing the high cost of the space data systems, Mr. Pyke emphasized humankind's need for the data. He also noted the possibility of commercial policies inhibiting the expansion of data use and ultimately the commercialization goals. Again, recognizing the cost limitations faced by all space agencies, he called for a bias in favor of sharing data so that they be fully exploited in our collective best interests. Dr. Morel, summarizing various uses of data and goals of particular space systems, noted that data could be made available at cost of reproduction on a delayed basis after commercial value becomes minimal. He suggested that CEOS consider how data might be made available after the commercial value has diminished.

Using the example of Landsat/EOSAT, Mr. Langham concluded that data were and will continue to be used for various purposes, and suggested that research users should be identified through some kind of peer review process. Dr. Knauss, remarking on Landsat, suggested that it was an ill-conceived experiment which has since required significant subsidy. Although the U.S. is interested in the commercialization of space, he noted that a more successful example of commercialization was based on free exchange of meteorological data, which gave rise to a profitable value-added industry in the U.S. He suggested that this might offer a more applicable example for future data use, that is, make raw data available and allow a value-added industry to develop.

Mr. Haruyama (NASDA) called for a balanced policy for data use by researchers and by those who may wish to have unrestrained use of data for possible commercial opportunities. He assessed the current situation regarding the use of Earth observations data as somewhere between the traditional meteorological data policy and full commercial opportunities.

Dr. Rasool suggested simplifying the issue by asking the scientific community to prioritize its data needs--assess which

data are available, how these data are made available across borders, and, finally, address the issue of commercially available data.

Mr. Goldsmith recognized the conflict between the need to provide data to researchers and the commercial value of the data. He called for practical efforts to satisfy both communities. As an example, he noted that ESA had expanded the amount of Synthetic Aperture Radar (SAR) data to be made available to researchers based on a reassessment of research needs. He called for additional consideration of the unresolved data use issues and further discussion at the next meeting of the CEOS Plenary. It was agreed that CNES would host a follow-on meeting to address outstanding issues, related to CEOS data exchange principles, during the second half of 1992. (ACTION 5-5)

STATEMENTS OF CEOS AFFILIATES AND DISCUSSION OF SPACE-BASED EARTH OBSERVATION REQUIREMENTS

Intergovernmental Oceanographic Commission (IOC)

Dr. Kullenberg gave a report on the IOC structure and ocean observing activities, including the Integrated Global Ocean Service System (IGOSS) and the Global Sea Level Observing System (GLOSS). Regarding climate and research on global change, IOC is involved through the Committee on Climatic Changes and the Ocean (CCCO) in the development of the WCRP, including the Tropical Ocean and Global Atmosphere (TOGA) study and the World Ocean Circulation Experiment (WOCE). Within these programs, IOC participates in cal/val activities and development of data access policies. Dr. Kullenberg noted that IOC, along with WMO and ICSU, will also cooperate in the planning of the Global Climate Observing System (GCOS), and, along with WMO and UNEP, will lead the development of the Global Ocean Observing System (GOOS).

Dr. Kullenberg called for greater cooperation in ocean research/ observation, particularly involving developing nations. He noted that at the IOC Executive Council and Assembly in March 1991 a resolution on ocean observations was passed and that the IOC will include this issue in its preparations for the UNCED Conference. Dr. Kullenberg predicted that in the near future the importance of the oceans will be realized, and the need for adequate information will be recognized. Dr. Kullenberg expressed his appreciation for the invitation of IOC to CEOS and hoped that CEOS representatives would participate in relevant IOC meetings.

ACTION 5.6: IOC to provide CEOS secretariat with information on the IOC structure, including governing body rules and Terms of Reference for its relevant working groups.

Intergovernmental Council of Scientific Unions (ICSU)

International Geosphere-Biosphere Programme (IGBP)

Dr. McCarthy gave a report on the structure, status and scientific objectives of the IGBP. He noted that Earth observations are critical to IGBP activities, particularly for the Joint Global Ocean Flux Study (JGOFS), the Global Change and Terrestrial Systems (GCTE) study and the International Global Atmospheric Chemistry (IGAC) Project. He emphasized the international nature of all of the IGBP's activities. Dr. McCarthy expressed his appreciation for the coordination of Earth observations provided by CEOS.

Dr. Rasool described the science goals behind IGBP's study of the climate system. He noted IGBP's efforts to determine the scientific data needs for global climate research. He mentioned specifically the need for information on land vegetation coverage, indicating the existing data available and their inadequacies. As an example, Dr. Rasool noted the lack of a complete global AVHRR data set at 1 km resolution.

Regarding cooperation between IGBP and CEOS, he noted that CEOS could help to resolve issues of prioritization and collection of environmental data. In the short-term, CEOS could assist IGBP efforts by developing and disseminating a 1 km AVHRR global land data set. (Specific activities are already underway in conjunction with the CEOS WGD.) Concerning longer-term efforts, Dr. Rasool suggested that the development of standardized data formats, coordination between space agencies of sensors in design phase, and coordination of remote sensing programs would facilitate IGBP activities. Dr. Rasool suggested that IGBP could aid CEOS by giving added value to space data and by helping to specify future space data needs.

Committee on Space Research (COSPAR)

Dr. Ohring gave a presentation on COSPAR, describing its structure, purpose and objectives. He described the history of COSPAR and the activities of its various Commissions. He noted that the majority of scientists participating in the Commissions are specialists on remote sensing. Dr. Ohring gave examples of the many COSPAR activities (symposia, workshops, etc.) focusing on remote sensing applications with a wide variety of scientific goals. Through these activities, COSPAR brings together the scientific user community for remote sensing data. COSPAR also plans and organizes international projects, such as the International Satellite Land Surface Climatology Project (ISLSCP) and First ISLSCP Field Experiment (FIFE), and performs special studies.

Dr. Ohring suggested that COSPAR can help to develop the necessary Earth observations systems for global change studies. COSPAR can bring together ICSU/IGBP, remote sensing specialists and experts on data systems. He proposed that COSPAR assist CEOS

by participating in specific workshops on remote sensing activities.

World Climate Research Program (WCRP)

Dr. Morel, Director, WCRP, gave a brief presentation on WCRP activities. Dr. Morel noted the broad scope of participation in WCRP, with most of the world's nations contributing. Dr. Morel's presentation focused on GCOS. He noted that most of what is known today about climate has been learned from operational observing system designed for other purposes. As a result, however, the current system suffers from certain inadequacies, particularly a geographic bias toward coverage of highly populated areas of the Earth's land surface. The objective of the GCOS is to rectify these past biases through the development of a comprehensive observing system that will include operational and research systems. It is hoped to involve space agencies and funding agencies, but not in a programmatic role.

In order to organize the GCOS, a small planning staff headquartered at the WMO in Geneva is envisioned. Dr. Morel hoped that this staff would be in place before the next CEOS Plenary. WMO, IOC and ICSU will jointly sponsor these activities based on a Memorandum of Agreement, which was distributed to the CEOS participants.

As part of this effort, a Joint Scientific and Technical Committee for GCOS is also to be established. As currently envisioned, the Committee would have 15 members: 4 specialists on meteorology, 4 specialists on oceanography, 4 space systems experts (1 representative of operational/meteorology systems and 3 representatives of research systems), and 3 experts on global climate integration. Dr. Morel noted that a request has been made to the CEOS secretariat for CEOS assistance in providing candidates for the Joint S & T Committee. He suggested that 3 CEOS representatives from the major regions of the world be nominated by CEOS.

World Meteorological Organization

WMO Executive Council Panel of Experts on Satellites (ECSAT)

Dr. Mohr noted that WMO represents perhaps the largest satellite data user community. Regarding space activities coordination, WMO works through its Commission on Basic Systems (CBS) and ECSAT. ECSAT advises WMO on the technical and programmatic aspects of satellite programs. He noted WMO's long cooperation with CGMS and looked forward to future cooperation with CEOS.

Regarding ECSAT, at its most recent (9th) meeting in March of 1991, a report was developed which outlines WMO requirements for the space segment of the World Weather Watch, including requirements on scientific parameters and systems, particularly for meteorological and atmospheric chemistry measurements. Dr. Mohr outlined those requirements for the participants, and noted

that a list of 20 or so parameters will be presented to the space agencies.

Dr. Mohr noted the following ECSAT recommendations:

- 1) over the next two years, ECSAT be replaced by a Special Working Group on Satellites within the WMO CBS, which would coordinate WMO user requirements for satellite data;
- 2) enhance liaison with CEOS and CGMS through ECSAT;
- 3) invite CGMS and CEOS to participate in appropriate WMO meetings.

The next ECSAT meeting is scheduled for March 1992. At that time, new Terms of Reference will be developed and satellite data requirements will be reviewed.

CEOS PLENARY DIRECTION TO WORKING GROUPS

Discussion of Possible Additional CEOS Working Groups

NASA and NOAA proposed a Science Advisory Group that would review and advise the Plenary on an integrated set of space-based Earth observation requirements, actively work with the Affiliates, coordinate (with IGBP and WCRP) continuation of appropriate projects begun by the SAFISY Earth Science and Technology Panel of Experts, and monitor development of the GCOS. The group would also provide a mechanism for identifying CEOS participants and speakers for science-related organizations and meetings requesting CEOS participation. Several Affiliates mentioned the need for long-term interaction between themselves and CEOS.

Some members recognized that much of the substantive progress made through CEOS to date has been the result of the working groups which involve technical level personnel from the various agencies and have ongoing actions and responsibilities. At the same time, several CEOS members expressed reservations about creating additional groups and organizing additional meetings, given the potential for overlap with existing groups and the already busy schedules of all CEOS participants. CEOS participation in already existing working groups and meetings of international organizations was proposed, but Members again noted the plethora of meetings. Mr. Goldsmith preferred not to delegate this responsibility, but to discuss these items in the Plenary. Dr. Kullenberg agreed he would prefer a direct interface. Several Members commented that such an arrangement would require a longer Plenary meeting and/or much more comprehensive preparatory work.

A consensus was achieved on the need for CEOS to compile and maintain up-to-date information on satellite, sensor, and ground system capabilities and plans, as well as up-to-date requirements from scientific organizations and other bodies for data from CEOS assets. Furthermore, ongoing coordination at the technical and programmatic level between CEOS and scientific groups, including the Affiliates participating in the Plenary, must be assured. It was recognized that both short-term actions and longer-term work need to be addressed.

The following actions and decisions were agreed:

IGBP and WCRP will define and prioritize those programs and data sets, which are under their auspices and underway through the ISY process, that should be continued beyond 1992. This assessment will be reported back to CEOS through NASA and NOAA prior to the SAFISY Plenary meeting in May 1992. (ACTION 5-7)

NASA, ESA, and STA/NASDA will represent CEOS in the GCOS Joint Scientific and Technical Committee, coordinating appropriately with other CEOS Members, and will report at subsequent Plenary meetings. (ACTION 5-8)

The CEOS Affiliates will develop a statement of their requirements related to space-based Earth observations and provide this to the incoming CEOS secretariat (BNSC) for use in preparing for the next plenary. (ACTION 5-9)

BNSC, as incoming secretariat, will compile a "handbook," similar in concept to the EOS Reference Handbook, for all the CEOS space segment and associated ground segment assets, both existing and planned. CSIRO (Australia) offered to help with the ground segment component, and ASI offered to help with the space segment element. ESA and CNES volunteered their support as well. (ACTION 5-10)

NASA and ESA reiterated their commitment to provide updated program status information as soon as possible, given ongoing review and approval processes in both agencies. (ACTION 5-11)

Resolution on CEOS Participation in GCOS

A NOAA/NASA-proposed resolution on CEOS participation in the Global Climate Observing System was modified and adopted by the Plenary:

RESOLUTION ON CEOS PARTICIPATION IN THE GLOBAL CLIMATE OBSERVING SYSTEM

WHEREAS it has been recognized that comprehensive information on the properties and evolution of the Earth system needs to be acquired to detect global change, support climatological

applications, and develop Earth system science and global change predictions;

RECOGNIZING that a comprehensive global observing system, including space-based and in situ components, would provide an essential contribution to the collection, analysis, and distribution of global change data;

RECOGNIZING that no single country or international organization has the scientific and financial resources to support the entire global observing system and that such a system would be developed and implemented primarily through national contributions;

RECOGNIZING that a comprehensive system must involve national agencies with program and funding responsibilities for space-based Earth observations and concomitant data management;

RECOGNIZING that CEOS members are actively involved in supporting global change research and environmental monitoring efforts of the international scientific community;

AWARE that the Global Climate Observing System (GCOS) and the Global Ocean Observing System (GOOS), planning for which has already been initiated by the World Meteorological Organization (WMO), Intergovernmental Oceanographic Commission (IOC), and International Council of Scientific Unions (ICSU), are expected to contribute substantively to a comprehensive global observing system;

NOTING that the WMO, IOC, and ICSU have agreed to establish a Joint Scientific and Technical Committee (JSTC) to provide scientific and technical guidance for the organization and further development of the GCOS; and

CONSIDERING the request of the Joint Scientific Committee (WMO and ICSU) of the World Climate Research Program (WCRP) that CEOS take a leading role in providing scientific and technical guidance for the space research components of the GCOS and that CEOS assist in identifying three experts in this field as candidates for membership in the JSTC;

CEOS AGREES to confer with governmental agencies with space-based Earth observation programs and to provide the names of three candidates, with appropriate expertise, for the GCOS Joint Scientific and Technical Committee.

CEOS ENCOURAGES the JSTC to focus on identification and prioritization of requirements for the GCOS and ENCOURAGES GCOS to bring these recommendations to CEOS so that CEOS members can review and incorporate these requirements into the planning and development of their respective Earth observation and data management programs.

CEOS further ENCOURAGES its members to consider secondments of staff members to the GCOS and GOOS Planning Offices when appropriate.

Working Group on Data

The Plenary accepted the WGD's recommendations.

Dr. Revah announced that CNES has offered to include its SPOT digital quick-look and browse system in the CEOS IDN and has committed to hosting a cooperating node on the IDN. DIFs for CNES data will be submitted to the IDN, including data from the DORIS positioning system.

ESA and NASDA confirmed their agreement to co-chair the WGD Network Subgroup.

The WGD was asked to give particular attention over the next year to the provision of browse/quick-look data through the IDN.
(ACTION 5-12)

Working Group on Sensor Calibration and Geophysical Validation

The Plenary endorsed WGC/V recommendations and by so doing agreed to make WGC/V a standing Working Group. Mr. Findlay announced that BNSC was prepared to host the next WGC/V meeting in May 1992.

Working Group on Space Networks

The Plenary endorsed the recommendation to activate the WGD Subgroup on Networks noting that action has already been taken. The incoming secretariat offered to address WGSN recommendations 1 and 2 as part of its preparations for the next CEOS Plenary.
(ACTION 5-13)

Instruction to CEOS Working Groups

A NOAA/NASA proposal giving instruction to the CEOS working groups on involving non-members in CEOS activities was modified and adopted by the Plenary:

INSTRUCTION TO THE CEOS WORKING GROUPS ON INVOLVING NON-MEMBERS IN CEOS ACTIVITIES

As the number of worthwhile CEOS technical programs and projects grows, the involvement in CEOS working groups, subgroups and ad hoc groups of those who are neither members nor observers nor affiliates must be considered. In general, the involvement of those organizations that make a positive contribution to the goal(s), as defined by CEOS, of the particular program/project should be welcomed within the following guidelines:

- o Encourage the active involvement of CEOS observers and affiliates.
- o CEOS members are free to include in their delegations to working group and subgroup meetings non-member experts/participants whom they consider important to the purpose of the meeting.
- o The working group chair may use his/her discretion in inviting non-member experts/participants to participate in

working group and subgroup meetings provided the other working group members are notified one month in advance.

- o Non-member organizations may become Cooperating Nodes on the CEOS International Directory Network, but must work through a CEOS Coordinating Node to input and update data set information for the IDN.
- o CEOS working groups, subgroups, and ad hoc groups should work through the CEOS member and/or observer agency (ies) to interface with government agencies within a CEOS member's government. CEOS members may make exceptions to this guidance on a case-by-case basis.

Presentation on ERS-1

Dr. Duchossois gave a presentation on ERS-1. He noted that the first images from the satellite were acquired July 27, 1991. SAR data is being collected on a regional and global basis.

DISCUSSION OF CEOS CONSOLIDATED REPORT

REPORT OF ACTION ITEMS 4.3 AND 4.11 (NASA, EUMETSAT)

ACTION 4.3: Ms. Shaffer reported that NASA had coordinated and compiled a CEOS Consolidated Report, which was distributed to Members. Mr. Morgan thanked the secretariat for producing the Consolidated Report and hoped that it could be updated for successive Plenary meetings. NASA agreed to update the report for the next Plenary. (ACTION 5-14)

ACTION 4.11: EUMETSAT sent copies of the CGMS and IPOMS Consolidated Reports to Members.

REPORT OF ACTION ITEM 4.10 (NOAA)

ACTION 4.10: NOAA compiled a list of CEOS principal members, inter-meeting points of contact, and points of contact for the WGD and WGC/V. It was requested that those members that have not formally designated the above names do so as soon as possible

GENERAL DISCUSSION ON OTHER ISSUES OF INTEREST TO CEOS

CEOS Secretariat

BNSC will serve as CEOS secretariat through the 1992 Plenary.

CEOS participation in international meetings

WMO requested that CEOS participate, as an observer, in meetings of ECSAT. NOAA will represent CEOS at the next meeting of ECSAT. (ACTION 5-15)

Action Items

A list of action items from the fifth CEOS Plenary is attached. (DOCUMENT 5-3)

Future Meetings

Dr. Williams (BNSC) reconfirmed plans to host the next CEOS Plenary meeting in the UK and set the dates tentatively for December 9-10, 1992.

Mr. Haruyama (STA) reconfirmed Japan's interest in hosting the CEOS Plenary in 1993.

Mr. Langner (DARA) offered to host the CEOS Plenary in Germany in 1994.

A list of future meetings of the CEOS Working Groups is attached. (DOCUMENT 5-4)

Meeting Documents

A list of documents distributed at the meeting is also attached. (DOCUMENT 5-5)

Other Items

The participants thanked NASA and NOAA for hosting the meeting and serving as CEOS secretariat over the past year.

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Invited Guests

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Working Group on Global Change
Committee on Earth and Environmental Sciences
USA

Mr. Louis Brown
Staff Director
Task Group on International
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Committee on Earth and Environmental Sciences
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Mr. Allen Watkins
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Acting Deputy Director
Office of Advanced Technology
U.S. Department of State

Mr. Granville Sewell
Adaptation Officer
Office of Global Change
U.S. Department of State

Dr. John Townshend
University of Maryland
USA

**FINAL AGENDA
COMMITTEE ON EARTH OBSERVATIONS SATELLITES
Fifth Plenary Meeting
December 9-10, 1991**

**Ramada Renaissance Hotel
Herndon, Virginia**

December 9, 1991

8:00 a.m. REGISTRATION

**9:00 WELCOME (USA)
Logistical and Administrative Matters**

REVIEW AND ADOPT AGENDA

**REPORT ON ACTION ITEMS 4.4, 4.5, 4.9 (NASA, INPE)
APPLICATIONS FOR MEMBER/OBSERVER/AFFILIATE STATUS**

**9:30 REPORTS ON ACTIVITIES OF MEMBER/OBSERVER
COUNTRIES/AGENCIES**

REPORT ON ACTION ITEM 4.12 (NASA)

**: STATUS REPORT OF CEOS MEMBER AND OBSERVER
PROGRAMS (as compiled by the Secretariat from
member and observer inputs sent in the common
format)**

**: HIGHLIGHTS (an opportunity for members and
observers to BRIEFLY note additional aspects
of their programs)**

10:45 COFFEE BREAK

11:15 REPORTS FROM WORKING GROUPS

: Working Group on Data (NOAA)

**: Working Group on Sensor Calibration and
Geophysical Validation (CCRS)**

REPORT ON ACTION ITEMS 4.1 AND 4.2 (CCRS)

: Working Group on Space Networks (Japan)

REPORT ON ACTION ITEM 4.6 (Japan)

12:30 p.m. LUNCH BREAK

December 9, 1991 (continued)

2:00 CEOS-RELEVANT HIGHLIGHTS FROM OTHER SATELLITE COORDINATION GROUPS

- : Earth Observation International Coordination Working Group [EO-ICWG] -- ESA**
- : International Polar-Orbiting Meteorological Satellite Groups [IPOMS] -- NOAA**
- : Coordination Group on Meteorological Satellites [CGMS] -- EUMETSAT**

2:30 CEOS-RELEVANT HIGHLIGHTS FROM RELATED MEETINGS (5-10 minutes each)

- : International Space Year Experts Panel on Earth Science and Technology, Montreal, February 18-20, 1991; SAFISY Plenary Meeting, Moscow, May 16-10, 1991; 2nd Pacific ISY Conference, Hawaii, October 13-15, 1991**
- : International Group of Funding Agencies for Global Change Research, Brighton, UK, May 1-3, 1991; The Hague, December 3-5, 1991**

The Secretariat will be assembling copies of written reports on the following meetings, as well as any others that members may suggest. If you have other meeting reports, please provide copies to the Secretariat for distribution.

- : Economic Summit of Industrialized Nations, London, July 15-17, 1991**
- : Intergovernmental Panel on Climate Change Fifth Plenary Session, Geneva, March 13-15, 1991, and negotiations for a Framework Convention on Climate Change, February, June, and September 1991**

3:00 DISCUSSION OF CEOS DATA EXCHANGE PRINCIPLES

REPORT OF ACTION ITEMS 4.7 AND 4.6 (NASA, BNSC)

- : Finalization and adoption of data principles related to global change research**

December 10, 1991

9:00 a.m. **STATEMENTS OF CEOS AFFILIATES AND DISCUSSION OF SPACE-BASED EARTH OBSERVATION REQUIREMENTS (20 minutes each)**

- : Intergovernmental Oceanographic Commission, including report on IOC Executive Council and Assembly, March 5-22, 1991
- : International Council of Scientific Unions, including the International Geosphere-Biosphere Program and the Committee on Space Research (COSPAR)
- : Joint Scientific Committee of the World Climate Research Program, including report on the Global Climate Observing System Workshop, Winchester, UK, January 14-15, 1991.
- : World Meteorological Organization including report on Executive Council Panel of Experts on Satellites, Geneva, March 18-22, 1991, Congress, and Executive Council, May 1-29, 1991

11:00 **COFFEE BREAK**

11:15 **CEOS PLENARY DIRECTION TO WORKING GROUPS**

- : Working Group on Data
- : Working Group on Sensor Calibration and Geophysical Validation
- : Working Group on Space Networks
- : Discussion of need for any additional working groups

12:15 **LUNCH**

1:30 **DISCUSSION OF CEOS CONSOLIATED REPORT**

REPORT ON ACTION ITEMS 4.3 AND 4.11 (NASA, EUMETSAT)

REPORT ON ACTION ITEM 4.10 (NOAA)

December 10, 1991 (continued)

**2:00 GENERAL DISCUSSION ON OTHER ISSUES OF INTEREST TO
CEOS**

- : Incorporation of user requirements into space-based Earth observations and data management systems**
- : CEOS participation in international meetings**
- : Other**

3:00 COFFEE BREAK

3:30 CONCLUSIONS

- : Formulation of Resolutions**
- : Action Items**
- : Confirm locations for CEOS Plenary Meetings in 1992 and 1993**
- : Set location for CEOS Plenary Meeting in 1994**

4:30 ADJOURN

December 9, 1991 (continued)

4:00

COFFEE BREAK

4:15

DISCUSSION OF DATA POLICY

: Further discussion of data policy issues

6:30

TRANSPORTATION LEAVES FOR DINNER SITE

7:00

DINNER (NOAA AND NASA HOST)

CEOS V Plenary - ACTIONS

- 5.1 Outgoing secretariat to respond to ISPRS request for CEOS Affiliate status, informing ISPRS of CEOS' view that professional societies are not eligible for CEOS Membership.
- 5.2 CEOS participants to designate appropriate points of contact for WGD Catalog Subgroup activities to ensure the generation of Directory Interchange Formats (DIFS) for the International Directory Network and submit the name to the WGD Catalog Subgroup.
- 5.3 STA to send a copy of the report of the Experts Meeting on Global Networks to IOC.
- 5.4 NASA/NOAA to organize a CEOS presentation at the next SAFISY meeting.
- 5.5 CNES to host a meeting to address outstanding issues related to the CEOS data exchange principles.
- 5.6 IOC to provide CEOS secretariat with information on the IOC structure, including governing body rules and Terms of Reference for its relevant working groups.
- 5.7 IGBP and WCRP to define and prioritize those programs and data sets under their auspices and underway through the ISY process that should be continued beyond 1992. This assessment is to be reported back to CEOS through NASA and NOAA prior to the SAFISY meeting in May 1992.
- 5.8 NASA, ESA, and STA/NASDA to represent CEOS in the GCOS Joint Scientific and Technical Committee, coordinating appropriately with other CEOS Members, and will report at subsequent Plenary meetings.
- 5.9 CEOS Affiliates to develop a statement of their requirements related to space-based Earth observations and provide this to the incoming CEOS Secretariat (BNSC) for use in preparing for the next Plenary.
- 5.10 BNSC, as incoming Secretariat, to compile a "handbook," similar in concept to the EOS Reference Handbook, for all the CEOS space segment and associated ground segment assets, both existing and planned.
- 5.11 NASA to distribute, as soon as available, information on the EOS restructuring to Plenary participants. ESA to provide updated information on POEM as the final program plan is completed.

- 5.12 WGD to address accessibility of browse and quick-look data systems through the International Directory Network.
- 5.13 Incoming secretariat to address WGSN recommendations 1 and 2 as part of its preparation for the next Plenary meeting.
- 5.14 NASA to update CEOS Consolidated Report for the next CEOS Plenary
- 5.15 NOAA to represent CEOS at the next meeting of WMO's ECSAT.

CEOS V Plenary
Upcoming CEOS Meetings

CEOS Plenary

CEOS-6	December 9-10, 1992	United Kingdom (BNSC)
CEOS-7	1993	Japan (STA)
CEOS-8	1994	Germany (DARA)

CEOS Working Group on Data (WGD)

WGD-12	April 7-9, 1992	Darmstadt, FRG (EUMETSAT)
WGD-13	week of Nov. 23, 1992	Australia (ACRES)
Catalog Subgroup	February 5-7, 1992	Ottawa (CCRS)
Networks Subgroup	February 3-4, 1992	Ottawa (CCRS)
Ad hoc Group Auxiliary Data Sets	February 6-7, 1992	Pasadena, Cal. (NASA/JPL)

CEOS Working Group of Geophysical Calibration/Validation (WGC/V)

WGC/V-5	May 6-8, 1992	Abingdon, U.K. (BNSC)
WGC/V-6	November 1992	Brazil (INPE)

**CEOS V Plenary
December 9-10, 1991**

Document Distribution List

Member Status Reports

Australia: Commonwealth Scientific and Industrial Research Organisation (CSIRO) Report: Highlights Since Last Meeting

Canadian Space Agency (CSA): Update On Activities for the CEOS Plenary

Country Report From Italy (ASI)

CNES Report - Earth Observation Programme

Current French Policy On Earth Observation Data Dissemination (CNES)

EUMETSAT: Report To The Committee on Earth Observations Satellites, Status Report

EUMETSAT Data Policy (as agreed by the 15th EUMETSAT Council on June 4-5, 1991)

European Space Agency (ESA): Update On Activities For 5th CEOS Plenary

ESA Earthnet Activities Related to the Global Environmental Data Network (A European Initiative for Long Term Environmental Data Management)

INPE Report (Datafax from Roberto Periera Da Cunha)

ISRO Report - Highlights Since Last Meeting

NOAA Status Report

Report of the German Space Agency (DARA) to CEOS Plenary Meeting

Status Report: Japan's Earth Observation Program

Reports by Observers and Affiliates

Background Paper for the Committee On Earth Observations Satellites by The Intergovernmental Oceanographic Commission (IOC)

CEOS and IGBP (Presentation by Dr. Rasool)

COSPAP Presentation at 5th CEOS Plenary, December 9-10, 1991

EC Report to CEOS Plenary Meeting: Growth Points in European Commission Activities in Earth Observation

High Level WMO Statement of General Requirements

Improved Global Data For Land Applications: A Proposal For High Resolution Data Set (IGBP)

Report By Canada/Canada Centre For Remote Sensing (CCRS)

CEOS Working Group Reports

Guidelines for an Internationally Interoperable Catalogue System (CEOS Working Group Data/Catalogue Subgroup)

Report of CEOS Working Group on Data to Fifth Meeting of the CEOS Plenary (NOAA/NESDIS)

Report of the CEOS Working Group On Calibration And Validation to the Fifth CEOS Plenary Meeting (CCRS)

Report by Working Group on Space Networks (NASDA)

Reports to the Plenary

Earth Observation World Information Centre (EOWIC) (ASI)

EUMETSAT: Report to the Committee on Earth Observations Satellites, Summary CGMS Report

**Second Pacific ISY Conference Reports:
Working Group On Earth Observation And Global Change
Working Group On Earth Observation and Dynamic Processes**

Additional Materials Distributed

Atlas of Fengyun (FY-1) Meteorological Satellite (PRC)

Centre for Earth Observations (A Joint Project Proposal of ESA and CEC) (Draft Version 03/12/1991)

CEOS Consolidated Report 1991

Detection of Climate Change Due to the Enhanced Greenhouse Effect (NASA)

Environment Programme (Chapter 3, 1990 Annual Report of the Executive Director, UNEP)

Environmental Sections of G-7 Summit Declaration

**Intergovernmental Negotiating Committee For A Framework
Convention on Climate Change: Revised Single Text on Elements
Relating To Mechanisms**

International Group of Funding Agencies (IGFA) Presentation

**Memorandum Of Understanding Between The World Meteorological
Organization, The Intergovernmental Oceanographic Commission, And
The International Council Scientific Unions on...**

**Overview of Development of Earth Resources Observations
Satellites in China**

**Protection of the Atmosphere: Options for Agenda 21 (Preparatory
Committee for the United Nations Conference on Environment and
Development, third session, August 12-September 4, 1991)**

U.S. Data Management For Global Change Research Policy Statements

**U.S. Global Change Research Program Data Management Policy, July
1991 (presentation by Dr. Corell)**

**WMO Executive Council Panel Of Experts On Satellites, Ninth
Session March 18-22, 1991), Final Report**

**WMO/UNEP Intergovernmental Panel on Climate Change (IPCC):
Report of the Fourth Session of IPCC Working Group III (August 5-
8, 1991)**

**WMO/UNEP Intergovernmental Panel on Climate Change (IPCC):
Report of the Fifth Session of the WMO/UNEP IPCC (March 15-15,
1991)**

CEOS Consolidated Status Report

In accordance with CEOS action 4.12 cited below, the secretariat has compiled a Consolidated Status Report. As of Friday, December 6, Member reports had been received by CSIRO, DARA, ESA, EUMETSAT, INPE, ISRO, NASA, NOAA, and STANASDA. Copies of the complete Member reports, as well as reports submitted by Observers and Affiliates, are available for distribution.

4.12 As incoming secretariat, NASA and NOAA will develop a format for agency status reports, and circulate it in draft for agency comments. The resulting agreed format will be distributed to members 3 months prior to the next Plenary meeting. Members must provide information in the agreed format to the U.S. representative no later than 45 days prior to the meeting. The secretariat will compile the results and present a Consolidated Status Report at the next Plenary.

CEOS Consolidated Status Report

Spacecraft Status	Launches Planned for 1992	Missions Planned Beyond 1992
<ul style="list-style-type: none"> • In Orbit (Operating) <ul style="list-style-type: none"> - ERS-1* - GMS - GOES-7 - INSAT-1D * - IRS-1A - IRS-1B * - LAGEOS-1 - METEOSAT-3,4,5* - MDS-1 NOAA-10,11,12* - SPOT-2 - TOMS/Meteor-3* - UARS* 	<ul style="list-style-type: none"> • ATLAS (STS Mission) • INSAT-2A • JERS • LAGEOS-2 • Landsat-6 • NOAA-1 • SCD-1 • ATLAS • TOPEX/Poseidon 	<ul style="list-style-type: none"> • ADEOS • ADEOS-2 • CBERS • EOS --> • ERS-2 • IRS-1C • IRS-1D • Landsat-7 • MOP --> • NOAA-J --> • POEM --> • Radarsat • SPOT-3 --> • TRMM

*Launched since last CEOS Plenary

DRAFT
INSTRUCTION TO THE CEOS WORKING GROUPS
ON INVOLVING NON-MEMBERS IN CEOS ACTIVITIES

As the number of worthwhile CEOS technical programs and projects grows, the involvement in CEOS working groups, subgroups and ad hoc groups of those who are neither members nor observers nor affiliates must be considered. In general, the involvement of those organizations that make a positive contribution to the goal(s), as defined by CEOS, of the particular program/project should be welcomed within the following guidelines:

- o Encourage the active involvement of CEOS observers and affiliates.
- o CEOS members are free to include in their delegations to working group and subgroup meetings non-member experts/participants whom they consider important to the purpose of the meeting.
- o The working group chair may use his/her discretion in inviting non-member experts/participants to participate in working group and subgroup meetings.
- o Non-member organizations may become Cooperating Nodes on the CEOS International Directory Network, but must work through a CEOS Coordinating Node to input and update data set information for the IDN.
- o CEOS working groups, subgroups, and ad hoc groups should work through the CEOS member and/or observer agency (ies) to interface with government agencies within a CEOS member's government. CEOS members may make exceptions to this guidance on a case-by-case basis.

A CANADIAN COOPERATIVE PROPOSAL:

- Recognizing the need to correlate the remote sensing sensors/platforms in terms of development and data collection;
- Recognizing the need to understand the data acquisition systems for these data;
- Recognizing the need of the satellite operators to understand the requirements of the user community for data collection, access and distribution in order to plan and allocate resources;
- Acknowledging the concerns on creating endless CEOS Working Groups;
- Recognizing the need for discussion and decision-making at the CEOS Plenary level;

We propose the following:

A CEOS Task Force to do the following:

1. Collect and analyze information on instrument development, system definition, space segment planning and data acquisition plans (ground segments and data products/volumes) as made known by the CEOS members.

Concurrently, the "user community" task force would:

2. Collect and analyze information from the user community to create a concise list of the actual data requirements of their science community, based on satellite data needed and the supporting analyses to be collected for specific satellite programs.

The two groups would meet to:

3. Review the fitness of instruments/systems/scenarios to the requirements stated by the user community, and prepare a consolidated summary report at least three months before the next CEOS Plenary meeting.

The Plenary would then use this document as a basis for discussion of:

4. Harmonization of the instruments/missions and data collection.
5. A discussion of the availability of data for support of the research community in Global Change/Environmental Climate research.
6. Recommendation on the science programs to be supported.

adapted 12/9/11

Resolution on Data Exchange Principles

RECOGNIZING that the members of CEOS are actively involved in supporting global change research and monitoring efforts of the international scientific community, as well as pursuing other uses of Earth observations data such as local/regional research, operational environmental monitoring, and commercial;

AWARE that success in global change ^{climate & environmental} research and monitoring requires a continuing commitment to the establishment, maintenance, validation, description, accessibility, and distribution of high-quality long-term data sets, many of which rely on space-borne observations;

ANTICIPATING the potential benefits of compatible policies and mechanisms for data exchange in obtaining access to global data;

CEOS members endorse the following principles relating to data exchange in support of global change/environmental research and agree to work toward implementing them to the fullest extent possible. Principles for data exchange in support of other data uses beyond global change/environmental research will be developed for CEOS endorsement as a next step.

1. Preservation of all data needed for long-term global change research and monitoring is required.
2. Data archives should include easily accessible information about the data holdings, including quality assessments, supporting ancillary information, and guidance and aids for locating and obtaining the data.
3. International standards, including those generated by the CEOS Working Group on Data, should be used to the greatest extent possible for recording/storage media and for processing and communication of data sets.
4. Maximizing the use of satellite data is a fundamental objective. An exchange/sharing mechanism among CEOS members is an essential first step to maximize use.
5. Programs should have no exclusive period of data use. Where the need to provide validated data is recognized, any initial period of exclusive data use should be limited and explicitly defined. The goal should be release of data in some preliminary form within three months after the start of ^{baseline} data acquisition.
6. Criteria and priorities for data acquisition, archiving, and purging should be harmonized.

DRAFT RESOLUTION on CEOS PARTICIPATION
in the GLOBAL CLIMATE OBSERVING SYSTEM

WHEREAS it has been recognized that comprehensive information on the properties and evolution of the Earth system needs to be acquired to detect global change, support climatological applications, and develop Earth system science and global change predictions;

RECOGNIZING that a comprehensive global observing system, including space-based and in situ components, would provide an essential contribution to the collection, analysis, and distribution of global change data;

RECOGNIZING that no single country or international organization has the scientific and financial resources to support the entire global observing system and that such a system would be developed and implemented primarily through national contributions;

RECOGNIZING that a comprehensive system must involve national agencies with program and funding responsibilities for space-based Earth observations and concomitant data management;

RECOGNIZING that CEOS members are actively involved in supporting global change research and environmental monitoring efforts of the international scientific community;

AWARE that the Global Climate Observing System (GCOS) and the Global Ocean Observing System (GOOS), planning for which has already been initiated by the World Meteorological Organization (WMO), Intergovernmental Oceanographic Commission (IOC), and International Council of Scientific Unions (ICSU), are expected to contribute substantively to a comprehensive global observing system;

NOTING that the WMO, IOC, and ICSU have agreed to establish a Joint Scientific and Technical Committee (JSTC) to provide scientific and technical guidance for the organization and further development of the GCOS; and

CONSIDERING the request of the Joint Scientific Committee (WMO and ICSU) of the World Climate Research Program (WCRP) that CEOS take a leading role in providing scientific and technical guidance for the space research components of the GCOS and that CEOS assist in identifying three experts in this field as candidates for membership in the JSTC;

CEOS AGREES to confer with governmental agencies with space-based Earth observation programs and to provide the names of three candidates, with appropriate expertise, for the GCOS Joint Scientific and Technical Committee.

CEOS ENCOURAGES the JSTC to focus on identification and prioritization of requirements for the GCOS and ENCOURAGES the ~~WERP or sponsoring organizations~~ to bring these recommendations to CEOS so that CEOS members can review and incorporate these requirements into the planning and development of their respective Earth observation and data management programs. GCOS

CEOS further ENCOURAGES its members to consider secondments of staff members to the GCOS and GOOS Planning Offices when appropriate.

CEOS Advisory Group On Observing Systems

The task of the Advisory Group is to provide CEOS Plenary with synoptic information and preliminary evaluations to be used as a basis for Plenary discussion on the evolution of planned observing systems and possible identification of areas for coordinating actions.

In order to accomplish this task, the AGOS will:

- a. collect and analyze information on instrument development, system definition and space segment planning, as made known by CEOS members (possibly integrated by other information sources);
- b. review the fitness of instruments/systems/scenarios to the requirements stated by the international user community as represented by WMO, ICSU, WCRP, IGBP, IOC, etc.;
- c. identify possible deficiencies, corrective actions, harmonization efforts and new opportunities for improved plans;
- d. report to CEOS not later than three months before Plenary sessions;
- e. provide input to other CEOS Working Groups as necessary.

CEOS SCIENCE COORDINATION
ADVISORY TASK GROUP

PROPOSED OBJECTIVES:

1. RECEIVE, REVIEW, AND ADVISE THE CEOS PLENARY ON CEOS AFFILIATES' SCIENTIFIC REQUIREMENTS.
2. ACTIVELY WORK WITH CEOS AFFILIATES, AS DIRECTED BY THE PLENARY.
3. TOGETHER WITH THE IGBP AND WCRP, COORDINATE THE CONTINUATION, AS APPROPRIATE, OF PROJECTS BEGUN BY THE SAFISY EARTH SCIENCE AND TECHNOLOGY PANEL OF EXPERTS, AND DEFINE A LIMITED NUMBER OF COORDINATED SCIENCE OBSERVATIONAL SCENARIOS FROM EXISTING REMOTE SENSING IMAGING SYSTEMS IN THE 1991-93 TIME FRAME. (REFERENCE: SECOND PACIFIC ISY CONFERENCE WORKING GROUP ON EARTH OBSERVATION AND GLOBAL CHANGE)
4. AS DIRECTED BY THE PLENARY, MONITOR DEVELOPMENT OF, PROVIDE SCIENTIFIC EXPERTISE TO, AND ASSIST IN CEOS INVOLVEMENTS IN THE GLOBAL CLIMATE OBSERVING SYSTEM.

**HANDOUT MATERIALS AVAILABLE AT FIFTH CEOS PLENARY SESSION
December 1991**

Report On CNES - Earth Observation Programme

The Current French Policy On Earth Observation Data Dissemination

Country Report From Italy

Earth Observation World Information Centre (EOWIC)

Report By Canada/Canada Centre For Remote Sensing (CCRS)

Report, Working Group on Space Networks (WGSN)

Status Report: Japan's Earth Observation Program

Report of the German Space Agency (DARA) to CEOS Plenary Meeting

CEOS Report: Highlights Since Last Meeting (CSIRO)

EUMETSAT Report to CEOS Plenary Meeting: Growth Points in European Commission Activities in Earth Observation

EUMETSAT: Report To The Committee on Earth Observations Satellites, Summary CGMS Report

EUMETSAT: Report To The Committee on Earth Observations Satellites, Status Report

EUMETSAT Data Policy

Background Paper for the Committee On Earth Observations Satellites By The Intergovernmental Oceanographic Commission (IOC)

Status Report From Brazil (Datafax from Roberto Periera Da Cunha, 12/04/91)

Highlights Since Last Meeting (Indian Space Research Organisation)

National Oceanic and Atmospheric Administration (Report to the Committee)

Report Of CEOS Working Group On Data To Fifth Meeting Of The CEOS Plenary (NOAA/NESDIS)

Report Of The CEOS Working Group On Calibration And Validation To The Fifth CEOS Plenary Meeting

COSPAR: Presentation at 5th CEOS Plenary, December 9-10, 1991

Overview of Development of Earth Resources Observations Satellites in China

Handout Materials, p.2

U.S. Global Change Research Program Data Management Policy, July 1991 (Dr. Corell's vugraphs)

International Group of Funding Agencies (IGFA) Presentation

Intergovernmental Negotiating Committee For A Framework Convention on Climate Change: Revised Single Text on Elements Relating To Mechanisms

WMO/UNEP Intergovernmental Panel on Climate Change (IPCC): Report of the Fourth Session of IPCC Working Group III

Memorandum Of Understanding Between The World Meteorological Organization, The Intergovernmental Oceanographic Commission, And The International Council Scientific Unions

Chapter 3, 1990 Annual Report of the Executive Director, UNEP

Protection Of The Atmosphere: Proposal Submitted By The Chairman, Preparatory Committee for the United Nations Conference on Environment and Development (third session)

Final Report Of The WMO Executive Council Panel Of Experts On Satellites, Ninth Session

High Level WMO Statement of General Requirements

Environmental Sections of G-7 Summit Declaration

Data Management For Global Change Research Policy Statements

CEOS Consolidated Report 1991

Second Pacific ISY Conference:

Working Group On Earth Observation And Global Change

Working Group On Earth Observation and Dynamic Processes

Improved Global Data For Land Applications: A Proposal For High Resolution Data Set

Canadian Space Agency: Update On Activities for CEOS Plenary

ESA: Update On Activities For 5th CEOS Plenary

CEOS V SUMMARY
December 9-10, 1991
Herndon, Virginia

NOAA and NASA hosted the fifth plenary meeting of the Committee on Earth Observations Satellites (CEOS) December 9-10, 1991 in Herndon, Virginia. All 14 member agencies participated, including ASI (Italy), BNSC (U.K.), CNES (France), CSA (Canada), CSIRO (Australia), DARA (Germany), ESA (Europe), EUMETSAT (Europe), INPE (Brazil), ISRO (India), NASA (U.S.A.), NOAA (U.S.A.), STA (Japan), and the Swedish National Space Board, which was accepted as a member at this meeting. Also participating were two official observer agencies, CCRS (Canada) and the European Communities, as well as new affiliates from the major international scientific and intergovernmental organization user bodies (ICSU, IGBP, IOC, WCRP, WMO). Attending as a guest was the State Meteorological Administration of the Peoples' Republic of China.

- o CEOS approved a set of six data exchange principles, based on those endorsed earlier this year by Dr. Allan Bromley, the President's Science Advisor, and originally developed by the IWGDMGC. Dr. John Knauss presented the NOAA position and participated fully in the data policy discussion. Data policy issues will continue to be discussed at a plenary-level ad hoc meeting to be hosted by CNES of France in 1992.
- o In response to requests, CEOS agreed to send representatives to the Global Climate Observing System Joint Scientific and Technical Committee, the WMO Executive Council Panel of Experts on Satellites, and the Space Agency Forum for the International Space Year.
- o This year CEOS will produce a document describing the space and ground segments of CEOS members, the types of measurements taken, launch dates and other time lines, and an integration of end user requirements.
- o CEOS will also update annually the CEOS Consolidated Report, which describes the organization, including Terms of Reference and Points of Contact.
- o The Plenary endorsed the work of the Working Group on Data, instructed it to move forward on accessing browse and digital quick look data through the CEOS International Directory Network, and reaffirmed its intention to coordinate with IGBP and the implementing agencies in the development of requirements and certain technical specifications for the 1 Km AVHRR Data Set Project.
- o The Plenary also endorsed the work of the Working Group on Calibration/Validation, accepted its new Terms of Reference, and established it as a standing working group.

RESOLUTION ON DATA EXCHANGE PRINCIPLES

RECOGNIZING that the members of CEOS are actively involved in supporting global change/climate and environmental research and monitoring efforts of the international scientific community, as well as pursuing other uses of Earth observations data such as local/regional research, operational environmental monitoring, and commercial;

AWARE that success in global change/climate and environmental research and monitoring requires a continuing commitment to the establishment, maintenance, validation, description, accessibility, and distribution of high-quality long-term data sets, many of which rely on space-borne observations;

ANTICIPATING the potential benefits of compatible policies and mechanisms for data exchange in obtaining access to global data; CEOS members endorse the following principles relating to data exchange in support of global change/climate and environmental research and agree to work toward implementing them to the fullest extent possible. Principles for data exchange in support of other data uses beyond global change/climate and environmental research will be developed for CEOS endorsement as a next step.

1. Preservation of all data needed for long-term global change/climate and environmental research and monitoring is required.
2. Data archives should include easily accessible information about the data holdings, including quality assessments, supporting ancillary information, and guidance and aids for locating and obtaining the data.
3. International standards, including those generated by the CEOS Working Group on Data, should be used to the greatest extent possible for recording/storage media and for processing and communication of data sets.
4. Maximizing the use of satellite data is a fundamental objective. An exchange/sharing mechanism among CEOS members is an essential first step to maximize use.
5. Programs should have no exclusive period of data use. Where the need to provide validated data is recognized, any initial period of exclusive data use should be limited and explicitly defined. The goal should be release of data in some preliminary form within three months after the start of routine data acquisition.
6. Criteria and priorities for data acquisition, archiving, and purging should be harmonized.

RESOLUTION on CEOS PARTICIPATION
IN THE GLOBAL CLIMATE OBSERVING SYSTEM

WHEREAS it has been recognized that comprehensive information on the properties and evolution of the Earth system needs to be acquired to detect global change, support climatological applications, and develop Earth system science and global change predictions;

RECOGNIZING that a comprehensive global observing system, including space-based and in situ components, would provide an essential contribution to the collection, analysis, and distribution of global change data;

RECOGNIZING that no single country or international organization has the scientific and financial resources to support the entire global observing system and that such a system would be developed and implemented primarily through national contributions;

RECOGNIZING that a comprehensive system must involve national agencies with program and funding responsibilities for space-based Earth observations and concomitant data management;

RECOGNIZING that CEOS members are actively involved in supporting global change research and environmental monitoring efforts of the international scientific community;

AWARE that the Global Climate Observing System (GCOS) and the Global Ocean Observing System (GOOS), planning for which has already been initiated by the World Meteorological Organization (WMO), Intergovernmental Oceanographic Commission (IOC), and International Council of Scientific Unions (ICSU), are expected to contribute substantively to a comprehensive global observing system;

NOTING that the WMO, IOC, and ICSU have agreed to establish a Joint Scientific and Technical Committee (JSTC) to provide scientific and technical guidance for the organization and further development of the GCOS; and

CONSIDERING the request of the Joint Scientific Committee (WMO and ICSU) of the World Climate Research Program (WCRP) that CEOS take a leading role in providing scientific and technical guidance for the space research components of the GCOS and that CEOS assist in identifying three experts in this field as candidates for membership in the JSTC;

CEOS AGREES to confer with governmental agencies with space-based Earth observation programs and to provide the names of three candidates, with appropriate expertise, for the GCOS Joint Scientific and Technical Committee.

CEOS ENCOURAGES the JSTC to focus on identification and prioritization of requirements for the GCOS and ENCOURAGES the GCOS to bring these recommendations to CEOS so that CEOS members can review and incorporate these requirements into the planning and development of their respective Earth observation and data management programs.

CEOS further ENCOURAGES its members to consider secondments of staff members to the GCOS and GOOS Planning Offices when appropriate.