



MINUTES OF THE

COMMITTEE ON EARTH OBSERVATION

SATELLITES

ELEVENTH PLENARY MEETING

19-21 NOVEMBER 1997

TOULOUSE, FRANCE

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1. INTRODUCTION

The 11th CEOS Plenary meeting was hosted by CNES at Toulouse, France on 19-21 November 1997. Participants included 84 representatives from 18 Members, three Observers, and 12 Affiliates, and three organizations attended as guests. (A list of Plenary action items is at Appendix 1, a list of attachments is at Appendix 2, a participants list is at Appendix 3, a summary of organizations attending is at Appendix 4, and an acronyms list is at Appendix 5.)

2. OPENING REMARKS

The CEOS Chair, Dr. Fellous, of CNES, welcomed the participants and opened the meeting.

Prof. Alain Bensoussan, President of CNES, greeted the participants (Attachment 11-1). He recalled that CEOS was created in 1984 and has answered a real need as CEOS' success shows. He described the policy challenge of CEOS as threefold: 1) the high-skilled technical capability needed to conduct complex satellite projects; 2) the capacity to implement comprehensive and high-technology systems dedicated to large and multiple user communities; and 3) the ability to initiate and conduct international cooperation with worldwide partners. Prof. Bensoussan emphasized the collaboration with users, especially the outstanding collaboration with the meteorological community. He noted that CEOS has successfully stimulated international coordination and happily acknowledged the concept of an IGOS as an example of the continued effort at integration.

Dr. G.O.P. Obasi, Secretary General of WMO, expressed appreciation to the Chair for inviting him to address the Plenary (Attachment 11-2). He recalled that WMO was one of the first international organizations to join CEOS as an Affiliate, and stated that this association has been productive for WMO and is in concert with its long-term strategy to dialog with the space agencies. Continuing this emphasis on integration, he said that WMO endorsed the concept of an IGOS as expressed by the CEOS Chair at various meetings in 1997, and he was confident there will continue to be strong support of the principle of an IGOS. In this connection, he stated that WMO has dedicated expert help to perform elaborate analysis. He noted with pleasure that the Plenary agenda covers many aspects of the concept of an IGOS that interest WMO programs, and said WMO will continue to look to CEOS as a major partner.

A message was read from Mr. Jean-Pierre Beysson, Director General of Meteo France, who regrettably was unable to attend the Plenary.

Mr. Brachet, Director General of CNES, and former Chair of CEOS, spoke about his experience as CEOS Chair. He recalled the continued emphasis during the last year on developing the concept of an IGOS. He stated that it has been a priority for CEOS this year to increase its connection with the user community with regard to IGOS. He pursued contacts with ICSU, GCOS, WMO, IOC, and GTOS regarding an IGOS, and believes that CEOS continues to build upon an excellent relationship with the user community and the Global Observing Systems.

3. ADOPTION OF AGENDA

Dr. Fellous reviewed the Agenda (Attachment 11-3), which was adopted as revised by minor changes.

4. RECORD OF THE 10TH CEOS PLENARY

Mr. Kingwell, of CSIRO, reviewed the activities of the 10th Plenary. He recalled the notable issues covered, including evolution of CEOS documentation, databases, and dossiers; the identification of an IGOS as a major area of focus; spectrum management; developing countries/sustainable development; and, regional capacity and needs in the Asia-Pacific region. Other important issues included the expanding role of the private sector in EO, and the relationship with professional and funding organizations. The 10th Plenary also considered information strategy and management and it developed a media strategy and major projects for developing countries and for schools. Publications included the Consolidated Report, the CD-ROM for education and developing countries, and the Newsletter.

The Plenary adopted the Minutes of the 10th CEOS Plenary.

Only when the Database problems have been addressed can future meaningful requirements analyses be conducted--factual errors in the Database must be corrected as soon as possible.

Projects are able to carry out their analyses--but there is merit in a group that is able to synthesize project issues for the SIT and Plenary. The AG recommends that such activities take place within the framework of the SIT, possibly by establishing a SIT subgroup. The AG considers that its initial task has been achieved. Given the establishment of the SIT subgroup, it is recommended that the AG be dissolved.

The AG also identified candidate tasks for the proposed SIT subgroup, including synthesizing the recommendations of the prototype projects, drawing inferences from the projects' outputs with respect to an IGOS, monitoring the scientific integrity of the common dataset, helping to develop analysis tools for the projects, and overseeing Affiliates' requirements not addressed within the prototype projects. Mr. Haruyama concluded by noting that the AG's recommendations were forwarded to the SIT and Plenary for consideration.

The Plenary endorsed the recommendations of the AG and addressed them further in its endorsement related to IGOS activities and in actions related to the CEOS and Affiliates Databases (see section 8.D.). The Plenary thanked Mr. Morgan, of GOSSP, and Mr. Haruyama for their valuable contributions to the CEOS requirements analysis process.

C. SIT REPORT

Dr. Embleton, the SIT Chair, reviewed the accomplishments and recommendations of the SIT (Attachment 11-9), and noted that the SIT report was made available prior to the Plenary meeting. He reported that the SIT met twice during 1997--in February at Irvine, California and in September at Oxford, England--and that SIT members held several discussions with potential partners, including WMO, IGFA, UNEP, IOC, ICSU, FAO, WCRP, IGBP, and G3OS.

The rationale for the first meeting of the CEOS IGOS SIT was: to continue development of the concept of an IGOS; to examine how CEOS could contribute to the space component of such a strategy; and, to agree on some early implementation activities. Considerations in selecting the six initial prototype project areas included the degree of political and societal importance, the feasibility of early and tangible accomplishments, the clear need for an integrated global strategic approach, and the existence of a CEOS agency and a sponsor/user agency willing to work together in a lead partnership.

The second meeting of the SIT was charged to: review the work of the AG; review the status of, and assess CEOS agency support for, the six prototype projects; address issues common to the projects; consider an IGOS in the context of international conventions; discuss the way forward on an IGOS partnership approach with other entities; and, discuss CEOS' role in an IGOS (future of SIT and AG). It was noted that the SIT was created to be a small group of senior-level members with authority to speak with regard to their agency resources and that the SIT should move back in that direction. On the basis that the AG be dissolved, it was felt by many that a facilitating group with technical and programmatic skills should interact with the projects and support the SIT.

Dr. Embleton observed that there is growing international interest in an IGOS, which is shared by many entities and which CEOS has adopted. He also noted the increasing willingness of organizations to make commitments and that, to evolve, an IGOS needs input and commitment from non-CEOS organizations contributing to its development as equal partners with CEOS. He said that there is a need to reconfirm the CEOS SIT membership purpose, to assure that it remains focused and manageable in size. Dialog with the Affiliates and their sponsor organizations has confirmed their commitment to discussing partnership arrangements with CEOS to progress an IGOS. He noted that, if the Plenary decides to dissolve the AG, the SIT would require a support mechanism for ongoing activities and noted that there would be no formal group to address user requirements analysis of space-based observations on a continuing basis.

Dr. Embleton presented the following SIT recommendations, which were adopted by the Plenary's endorsement:

The SIT Organizing Committee, on behalf of the SIT seeks: the endorsement of Plenary to continue, on an ad hoc basis; approval for the formation of a support/facilitation mechanism; agreement on modifying the SIT Terms of Reference.

(The text of the Plenary resolution on this topic is at 8.D.)

C. DISCUSSION OF THE IGOS CONCEPT PAPER

Dr. Williams summarized a concept paper on an IGOS (Attachment 11-12), which he and Dr. Townshend, of GCOS, drafted on behalf of the SIT Organizing Committee. The IGOS concept paper addresses principles, overall conceptual structure and process, and promotion of an IGOS. Dr. Williams noted that the concept paper focused on a broad process or the essential activities for an IGOS; once the process is decided, agency roles can be applied to the process. He mapped the IGOS prototype projects to the conceptual framework to illustrate how the process would function. He noted that the IGOS prototype projects had addressed different elements of the process diagram, but none had addressed all the elements. All the elements would need to be addressed before pursuing changes in systems or involving policy makers. He noted that the concept presented in the paper offers a simple mechanism to communicate with policymakers and decisionmakers, and offers a structured way to promote integration.

Several participants commented that the IGOS concept paper was very useful and an important explanation of a process for an IGOS. Mr. Townsend, of NASA, with amplification from others, summarized how each prototype project was intended to demonstrate quickly the elements of an IGOS process:

- GODAE: demonstrate, initially on a regional basis, the near-term integration of in situ and space-based observations;
- Ozone: develop a medium-term plan for the collection of future space-based observations of ozone depletion and associated atmospheric chemical constituents; demonstrate the ability to do coordinated planning;
- Ocean biology: demonstrate the ability of agencies to eliminate redundancy in an area in which there are many overlapping plans;
- Forest cover: demonstrate the ability to fill a gap;
- Upper air: address a current concern; i.e., by substituting satellite observations for diminishing radiosonde data; and
- Disaster management support: demonstrate integration of existing in situ and space-based systems for the purpose of improving the ability to provide assistance to national agencies with responsibility for preparing and issuing warnings.

Mr. Townsend felt that there may be a need to reorient some of the projects toward short-term demonstration of IGOS-related results.

Mr. Winokur, of NOAA, noted the importance of obtaining early commitments for implementation and the need to transition from a strategy to a system. Dr. Shaffer, of NASA, stated that the Plenary needs to reach consensus on the process and then assign respective agency roles because this would be an important basis for discussions with G3OS partners in June 1998. Dr. Jha, of CSA, noted that to succeed, champions need to be identified who will implement the strategy. Dr. Dahl felt that there are a number of activities that need to be expanded. This would complete the information chain. Dr. Briggs, of BNSC, stated that there needs to be a body, involving space agencies, users of data, and sponsors, that feels a sense of ownership toward the strategy. This was supported by Dr. Stuyck-Taillandier, and by Dr. Summerhayes, of IOC/GOOS. Dr. Briggs added that he understood that one outcome of the prototype-project approach was a clarification and simplification of requirements to enable requirements analysis from a strategic perspective. Mr. Landis, of WMO, noted that there is not one single system underlying the strategy, but a composite of systems.

The Plenary accepted the IGOS concept paper, noting that the document needs to be refined based on Plenary discussion and further work within the SIT. In particular, the charts within the paper need specific translation as to their relevance and applicability to agency roles and prototype projects and other IGOS activities, and there needs to be an expansion of the activities cited under "Product Use."

D. RECOMMENDATIONS AND CONCLUSIONS FROM IGOS DISCUSSIONS

Based on the foregoing discussions, the Plenary made the following resolution:

9. WORKING GROUP REPORTS**A. WGCV**

Dr. Belward reported on the accomplishments of the WGCV (Attachment 11-13). The WGCV met twice since the 10th Plenary, in December 1996 at Oberpfaffenhofen, Germany, and in September 1997 at Shanghai, China. In response to the 10th Plenary direction for the WGCV to provide information on the use of interferometric SAR and other data WGCV has received, Dr. Belward reported that four interferometric pairs have been received and distributed to seven groups for evaluation. Regarding the Plenary recommendation on calibration and test sites, he provided the definition of on-board calibration:

Calibration of a (radiometric) sensor while it is flying on-board a satellite or aircraft platform. On-Board calibration is usually achieved by "turning" the sensor aperture to measure the radiance of one or more on-board "reference targets." When performed regularly these measurements can be used to reduce the calibration errors caused by slow sensor system gain changes, known as "gain drift."

Dr. Belward also informed the Plenary that the third recommendation from the 10th Plenary--that the WG consider recommendations from the September 1996 in situ conference--had a strong impact on the WGCV's direction. The new focus of the WGCV, as reflected in its work plan, is on implementing validation activities and improving communication and coordination. Dr. Belward said that, in an effort to meet users' increasing expectations regarding the integrity of data, the WG will emphasize validation issues. He asked that the Plenary endorse a WGCV recommendation to this effect.

Dr. Belward also reported on the WGCV's involvement in the prototype projects, and said that the WGCV is ready to provide technical review of the requirements identified by the AG, technical support to the projects to help identify cal/val needs, and cal/val actions and/or formulation of cal/val recommendations as appropriate. In addition, the WGCV will hold an ad hoc WG meeting to concentrate on the IGOS prototype projects on 24-25 March 1998. One goal of this meeting is to identify and clarify the projects' detailed cal/val requirements and implications these may have for organizations participating in an IGOS.

He described the activities of the WGCV IVOS SG, which held special sessions on calibration issues and has agreed to have a special session on atmospheric chemistry in the upcoming year. The MSSG has asked to drop atmospheric chemistry on the understanding that this will be dealt with by the WG, which sought Plenary endorsements of this activity. The SARSG provided a list of technical recommendations for Plenary endorsement.

In conclusion, Dr. Belward confirmed that WGCV will continue to act as a focal point for cal/val activities, even though these activities vary across disciplines, parameters, and sensors.

The Plenary endorsed the following WGCV recommendations:

RESOLUTION

The 11th CEOS Plenary

Endorses the new WGCV focus on validation issues.

Endorses the WGCV's ad hoc meeting with the IGOS prototype projects.

Encourages all CEOS organizations to continue to make data available to the WGCV for its work.

Endorses the Microwave Sensors Subgroup's wish to drop atmospheric chemistry, on the understanding that this will be dealt with by the Working Group.

Endorses the WGCV recommendations that:

- all future SAR systems developers should consider including techniques to limit the occurrence of ADC saturation and to minimize uncertainty in beam points and beam shape, and should utilize yaw steering.

- proper and timely documentation on calibration is required, and all agencies are encouraged to provide this information with all data and data documentation. All instrument operators should regularly issue handbooks and data user notes.

The Plenary joined Dr. Fellous in applauding Ms. Wood's able leadership in organizing WGISS and setting it on a proper course. The Plenary also expressed its gratitude to NOAA for its long-term contributions to CEOS information systems and services activities. The Plenary welcomed Mr. Moriyama and thanked STA/NASDA for supporting WGISS efforts.

C. OTHER DIRECTIONS TO THE WORKING GROUPS

When the Plenary discussed issues related to developing countries, it agreed it is important for the WGs and others to address such activities in their work plans (see section 14.C.).

10. REPORT ON THE STATUS OF THE CEOS AND AFFILIATES DATABASES

Dr. Fellous reviewed the progress on and status of the CEOS and Affiliates Databases (Attachment 11-4). He recalled that the 10th Plenary devised a plan to resolve differences between the online CEOS Database, developed by ESA on behalf of CEOS, and the PC-based Affiliates Database, developed by WMO on behalf of the Affiliates. At a meeting held at WMO on 24-25 January 1997, an action plan was devised to develop a common data set for the two Databases, to revise the CEOS Database Manual, to develop capabilities to exchange data between the two Databases, and to make the CEOS Database available to the AG. In addition, the data set was populated, and a joint team is being proposed to be appointed by CEOS and the Affiliates to validate the common data set. Finally, Dr. Fellous reported on a recent issue raised by ESA's decision to reconsider its responsibility with respect to the CEOS Database.

A. CEOS DATABASE

Dr. Fusco, of ESA, reported the status of activities regarding the CEOS Database (Attachment 11-16). He said that ESA supported the AG's efforts related to CEOS requirements analysis. He noted that the Database has been a useful tool, enabling the space agencies and science users to interact. Many difficulties with the Database have been resolved. However, some difficulties remain, in that the CEOS and Affiliates Databases still conflict in some respects, the definitions of parameters need to be resolved, and the system is not fully supportive of online updates. He noted that he doubts the system can provide coherent answers on requirements versus capabilities, and noted that network access was constrained but improvements had been made. In addition, significant resources are required to implement a complete system, and some space agencies have not entered their capabilities data into the Database. Issues with the Database Manual, which defines the specification for the common data set, remain as well.

Dr. Fusco said that these issues will be addressed by a small technical team, which is to be organized. He added that one objective is to integrate the Database with other online CEOS services, such as the IDN; however, discussions are underway concerning how WGISS may possibly be involved in the effort. Dr. Fusco recalled the AG's finding that the common data set in the Database urgently needs to be corrected. He encouraged CEOS organizations to correct errors in and to populate the Database.

Dr. Southwood, of ESA, reported that an alternative European route to support the Database had not emerged but that financial constraints have eased and ESA is prepared to retain responsibility for providing the online Database capability. He noted that complex technical issues need to be resolved to provide the Database, and ESA and WMO will jointly proceed with a phased approach to evaluating what needs to be done to improve the Database. He noted that the Database content, the Manual, and the system and its operation will be priorities. He urged CEOS organizations to respond when they receive requests for data for the CEOS Database.

B. AFFILIATES DATABASE

Dr. Hinsman, of WMO and the Affiliates Database point of contact, described the status of the Affiliates Database (Attachment 11-17). He said that, in response to the AG's recommendation, the PC-based Affiliates Database was developed and tested; it is a Microsoft Access application on four diskettes. It was provided to support the AG's requirements analysis activities. Several CEOS agency focal points, who were identified and confirmed as authorized users, were provided copies of the Database software. Other CEOS organizations also were provided the software to use as a surrogate for the online Database because some were experiencing network access problems. Dr. Hinsman noted that the benefit of the PC-based version is that it allows the user to update the Database locally and updates are provided to the online version, so the two are identical. Dr. Hinsman informed that a new requirements analysis software tool was developed, which allows the user to conduct local requirements analyses, and is ready for distribution. He announced that WMO will host a meeting to update the Database Manual in early 1998 in Europe.

Takes note and expresses its concerns to ITU about the denial of primary allocation to important frequency bands for Earth Exploration Satellites at the ongoing WRC-97, which will be readdressed at WRC-99.

Invites the CEOS ad hoc coordination group on spectrum management to provide to CEOS a report on the outcome of the WRC-97 concerning frequencies for Earth Observation, to initiate studies on critical frequency bands as necessary, to elaborate timely recommendations and appropriate proposals to WRC-99 in close consultation with SFCG, and to report progress to the 12th Plenary .

Encourages CEOS Members to urge their national administrations to consider the recommendations by the CEOS ad hoc coordination group on spectrum management and make appropriate proposals to WRC-99 to protect the frequency bands for Earth Observation from interference by other services. Observers, Affiliates, and others are also encouraged to support these activities.

Encourages CEOS Members, Observers, and Affiliates to ensure that all missions and instruments, either present or planned, and all reception stations, whether primary or user stations, be registered with their national administrations and with the ITU.

It was noted that ICSU has been working on preparations for WRC-99 and that CEOS may wish to contact ICSU for information.

Action 11-10: The CEOS ad hoc coordination group on spectrum management to provide to CEOS a report on the outcome of the WRC-97 concerning frequencies for Earth Observation, to initiate studies on critical frequency bands as necessary, to elaborate timely recommendations and appropriate proposals to WRC-99 in close consultation with SFCG, and to report progress to the 12th Plenary.

Action 11-11: CEOS Members invited to urge their national administrations to consider the recommendations by the CEOS ad hoc coordination group on spectrum management and make appropriate proposals to WRC-99 to protect the frequency bands for Earth Observation from interference by other services. Observers, Affiliates, and others also are encouraged to support these activities.

Action 11-12: CEOS Members, Observers, and Affiliates to ensure that all missions and instruments, either present or planned, and all reception stations, whether primary or user stations, be registered with their national administrations and with the ITU.

Action 11-13: Chair of the ad hoc coordination group on spectrum management to contact ICSU concerning preparations for WRC-99.

13. CEOS PARTNERSHIPS

In response to Action 10-8, and referencing the definitions in the CEOS Terms of Reference of the three membership categories, Dr. Fellous highlighted two issues regarding CEOS partnerships (Attachment 11-4). First was the question of how to involve international organizations in CEOS in a way that could provide, at least, a mutually beneficial exchange of information, if these organizations do not fit the membership category of Affiliate. Second was the issue of interaction with the commercial sector. He reported that initial discussions in the Secretariat suggest that the Plenary be invited to commission a small group of CEOS Members, which could be chaired by the outgoing CEOS Chair for the sake of continuity, to consult with the CEOS membership and create a report on these important partnership issues to present to the 12th Plenary. Several of the participants offered suggestions for the focus of such a group, and all agreed that this issue should be addressed in the next year by the past CEOS Chair and a group he organizes in consultation with the Secretariat and the CEOS Chair.

In addition, Dr. Fellous suggested that, as a matter of principle, the incoming CEOS Chair could benefit from broader and continuing involvement of the past and next CEOS Chairs in the planning and oversight of activities as happens in many scientific organizations. Thus, the Plenary agreed to the following resolution:

RESOLUTION

The 11th CEOS Plenary

Adopts the principle of involving the past and next Chairs of CEOS in planning and oversight of CEOS activities over one year before and after their respective terms, by working with the new Chair and the Secretariat.

C. UNISPACE III

Dr. Abiodun, of UNOOSA, described the UNISPACE III Conference to occur 9-19 July 1999 in Vienna, Austria (Attachment 11-27). He reported that all UN Member States are entitled to participate. Ideas for CEOS' participation include contribution to the background papers, participation in the regional meetings to occur prior to UNISPACE III, submission of special reports, and presentation of topical seminars, symposia, or exhibitions at UNISPACE III. It was agreed that EUMETSAT, through its ongoing work on developing country activities, would seek complementary input from developing countries that will provide a basis for CEOS' contribution to this important conference. Ms. Charles, of NASA, informed the participants that she is coordinating CEOS' participation in UNISPACE III through the CEOS Secretariat.

With respect to developing countries, the Plenary adopted the following resolution:

RESOLUTION

The 11th CEOS Plenary

Reaffirms its strategy for raising the awareness of and promoting space Earth Observation in support of sustainable development.

Invites the WGISS and the WGCV to take this into account in organizing their work in view of better serving the needs of developing countries and possibly expanding their activities in this respect.

Action 11-17: CEOS Secretariat to prepare CEOS participation in UNISPACE III, including developing country activities, and report to the 12th Plenary.

15. REPORT ON RELATED MEETINGS

Dr. Fellous reported on two related meetings (Attachment 11-4). The IAF held its annual meeting in Torino, Italy in October 1997, at which the CEOS Chair presented a paper and participated, along with the SIT Chair and other CEOS participants, in a plenary event on an-IGOS. CEOS also presented a report on developing countries activities at the SAF annual meeting held in conjunction with the IAF meeting. Mr. Lafeuille provided a written summary of the outcome of the 25th annual meeting of CGMS (Attachment 11-28).

16. SIGNIFICANT EVENTS OF MEMBERS, OBSERVERS, AND AFFILIATES

The following organizations provided verbal reports on the status of programs:

- CSA (Attachment 11-29)
- CSIRO (Attachments 11-30 and 11-31)
- EC
- ESCAP (Attachment 11-32)
- GOOS (Attachment 11-33)
- GTOS (Attachment 11-34)
- ICSU
- INPE (Attachment 11-35)
- ISRO (Attachment 11-36)
- NASA (Attachments 11-37 through 11-41)
- NOAA (Attachment 11-42)
- NRSCC (Attachments 11-43 through 11-45)

The following organizations provided written status reports in lieu of verbal reports:

- CNES (Attachments 11-46 and 11-47)
- DLR (Attachment 11-48)
- EUMETSAT (Attachments 11-49 through 11-54)
- NSAU (Attachment 11-55)
- NSC (Attachments 11-56 and 11-57)
- STA/NASDA (Attachment 11-58)
- WCRP (Attachments 11-59 and 11-60)

20. PLENARY ACTION ITEMS

Dr. Fellous confirmed that all action items from the 10th Plenary were completed prior to or during the 11th Plenary meeting. He reviewed a preliminary list of actions from the 11th Plenary, which were agreed to by the Plenary pending editorial changes by the Chair and the Secretariat.

21. PLANNING FOR FUTURE CEOS MEETINGS

Dr. Kasturirangan, of ISRO, confirmed that ISRO, the 1998 CEOS Chair, will host the 12th CEOS Plenary on 10-12 November 1998 in Bangalore, India. He introduced the main themes that ISRO wishes to highlight during its mandate.

Dr. Williams confirmed that EUMETSAT, the 1999 CEOS Chair, will host the 13th CEOS Plenary, tentatively in Stockholm, Sweden in October or November 1999.

Dr. Barbosa, of INPE, graciously accepted the nomination of INPE as the 2000 CEOS Chair.

22. ADJOURNMENT

Dr. Fellous thanked the Plenary participants for their contributions and for allowing him a rich experience. In closing, he said that the concept of an IGOS has matured in the last year and the partnership around the IGOS concept has grown, and he extended his best wishes to the new Chair, Dr. Kasturirangan, to whom he handed a CEOS flag. The participants thanked Dr. Fellous, Ms. Fourmy-Delloye, Mr. Brachet, and the CNES staff, and the Carte-Blanche, for their valuable contributions to CEOS, which enabled a very productive year for CEOS. Mr. Brachet also thanked the participants on behalf of CNES, and closed the meeting.

Appendix 1
ACTION ITEMS

Action 11-1: SIT Chair to revise the SIT Terms of Reference.

Action 11-2: CEOS Members, Observers, and Affiliates may nominate, by 15 December 1997, suitable experts (scientists, project managers, or technical experts) to support SIT as needed.

Action 11-3: SIT Chair to invite appropriate IGFA participation in SIT activities.

Action 11-4: SIT to finalize the concept paper for IGOS by mid-March 1998.

Action 11-5: SIT to prepare an outline of a strategy document for the space component of an IGOS for discussion at the March 1998 SIT meeting, and report to the 12th Plenary.

Action 11-6: SIT Chair and CEOS Chairs (past/present/next) to participate in the G3OS Sponsors Group discussion on IGOS to be held in June 1998 in Paris.

Action 11-7: ESA and WMO to evaluate how to improve the CEOS Database system and operations, in a phased approach, and report to the 12th Plenary.

Action 11-8: All CEOS Members, Observers, and Affiliates, to complete their inputs to the CEOS Database common data set, using the available tools, by end-January 1998.

Action 11-9: CEOS Chair to formally invite ISPRS to become a CEOS Affiliate.

Action 11-10: The CEOS ad hoc coordination group on spectrum management to provide to CEOS a report on the outcome of the WRC-97 concerning frequencies for Earth Observation, to initiate studies on critical frequency bands as necessary, to elaborate timely recommendations and appropriate proposals to WRC-99 in close consultation with SFCG, and to report progress to the 12th Plenary.

Action 11-11: CEOS Members invited to urge their national administrations to consider the recommendations by the CEOS ad hoc coordination group on spectrum management and make appropriate proposals to WRC-99 to protect the frequency bands for Earth Observation from interference by other services. Observers, Affiliates, and others also are encouraged to support these activities.

Action 11-12: CEOS Members, Observers, and Affiliates to ensure that all missions and instruments, either present or planned, and all reception stations, whether primary or user stations, be registered with their national administrations and with the ITU.

Action 11-13: Chair of the ad hoc coordination group on spectrum management to contact ICSU concerning preparations for WRC-99.

Action 11-14: CEOS Chair to consider the need to revise the CEOS Terms of Reference to encourage the ongoing involvement of the past and next CEOS Chairs in the CEOS Secretariat.

Action 11-15: CEOS Chair and Secretariat to consult with CEOS participants and international organizations, and with the commercial sector, and develop recommendations to address CEOS partnerships, and to report to the 12th Plenary.

Action 11-16: EUMETSAT to extend the analysis of CEOS developing country activities and update the annual report, and report to the 12th Plenary.

Action 11-17: CEOS Secretariat to prepare CEOS participation in UNISPACE III, including developing country activities, and report to the 12th Plenary.

Action 11-18: Members, Observers, and Affiliates to identify contributions to the ISRO-led effort to develop a CEOS publication chronicling achievements in EO over the last 25 years, by end-January 1998.

Appendix 2
LIST OF ATTACHMENTS

- 11-1 "Discours a L'Occasion de L'Ouverture de la 11ème Reunion Pleniére du CEOS" (Bensoussan)
- 11-2 "Address at the Opening Ceremony of the Eleventh Plenary Session of the Committee on Earth Observation Satellites" (Obasi)
- 11-3 Agenda (Fellous)
- 11-4 Presentation by the CEOS Chair (Fellous)
- 11-5 "CEOS Secretariat Report: Activities since the 10th Plenary" (Fourny-Delloye)
- 11-6 "IGOS AG Issues: AG Chairman's Thoughts" (Haruyama)
- 11-7 "CEOS Analysis Group (AG) Report" (Haruyama)
- 11-8 Executive Summary: CEOS Analysis Group (AG) Report (Haruyama)
- 11-9 Presentation: Report of the Strategic Implementation Team (Embleton)
- 11-10 Presentation on IGFA (Patermann)
- 11-11 Sponsors Group for the G3OS: Developing Partnership on an IGOS (Dahl)
- 11-12 "The Concept of an Integrated Global Observing System," by John Townshend and David Williams (Embleton)
- 11-13 Presentation on WGCV (Belward)
- 11-14 Presentation on WGISS (Wood)
- 11-15 "CEOS Working Group on Information Systems and Services Five Year Plan V2.0" (Wood)
- 11-16 Presentation on the CEOS Dossier Database (Fusco)
- 11-17 Presentation on the Affiliates Database (Hinsman)
- 11-18 "A Review for CEOS of the Activities of the International Society for Photogrammetry and Remote Sensing (ISPRS)" (Fritz)
- 11-19 ISPRS: Highlights (April 1997) (Fritz)
- 11-20 ISPRS: Highlights (July 1997) (Fritz)
- 11-21 Presentation on CEOS-SFCG Relations (Arend)
- 11-22 "Report on relations with SFCG (Space Frequency Coordination Group)" (Maeda)
- 11-23 "Tentative Report on WRC-97 Discussion" (Maeda)
- 11-24 Presentation on CILS (Schreier)
- 11-25 Presentation on First CEOS Report on Developing Countries (Lafeuille)
- 11-26 CEOS Annual Report on Developing Countries (Lafeuille)
- 11-27 Presentation on UNISPACE III (Abiodun)
- 11-28 CGMS: Outcome of the 25th Annual Meeting of the Coordination Group for Meteorological Satellites (LaFeuille)
- 11-29 "Canadian Significant Events/Achievements: Report to the 11th CEOS Plenary" (Jha)
- 11-30 "CSIRO & Space" (Kingwell)
- 11-31 "Australia's FedSat Microsatellite" (Kingwell)
- 11-32 Presentation on Significant Events in RESAP (Changchui)
- 11-33 "The Global Ocean Observing System (GOOS)" (Summerhayes)
- 11-34 GTOS: "For a Global Vision of the Earth We Share" (Bied-Charreton)
- 11-35 Presentation on Significant Events in INPE (Serra)
- 11-36 Presentation on Significant Events in ISRO (Kasturirangan)
- 11-37 Presentation on Significant Events in NASA (Townsend)
- 11-38 "NASA Strategic Plan" (Townsend)
- 11-39 "Mission to Planet Earth Strategic Enterprise Plan 1997-2000 (Townsend)
- 11-40 "Mission to Planet Earth Biennial Review" (Townsend)
- 11-41 "Mission to Planet Earth Commercial Strategy" (Townsend)
- 11-42 NOAA: "National Environmental Satellite, Data, and Information Service"
- 11-43 "Report of Developing Country Activities in Earth Observation Satellites: Successful Launching of Chinese Meteorological Satellite FY-2" (Xu)
- 11-44 "Report of Country Activities: Chinese Meteorological Satellite FY-2" (Xu)
- 11-45 "Chinese First Geostationary Meteorological Satellite FY-2" (Xu)
- 11-46 "CNES National Report to the CEOS 11th Plenary Meeting"
- 11-47 CNES Annual Report 1996
- 11-48 "Significant Events since last Plenary: Report of the German Aerospace Center (DLR) to 11th Plenary Meeting"
- 11-49 "EUMETSAT Status and Plans"
- 11-50 "EUMETSAT 1996 Annual Report"
- 11-51 EUMETSAT: IMAGE (June 1997)
- 11-52 EUMETSAT: "The EUMETSAT Polar System"
- 11-53 EUMETSAT: "The Meteosat Transition Programme"
- 11-54 EUMETSAT: "The EUMETSAT Ground Segment"
- 11-55 NSAU: "Results Obtained From Using the SICH-1 for Earth Observation Space System"

Appendix 3
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Guest :

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International Group of Funding Agencies (IGFA)
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Demonstration coordinators :

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ANTIKIDIS Jean-Pierre

COUNIL Jean-Louis

FOURNIER Denis

FRATTER Isabelle

HAGOLLE Olivier

Appendix 4
ORGANIZATIONS ATTENDING THE 11th CEOS PLENARY

MEMBERS:

- British National Space Centre (BNSC)
- Canadian Space Agency (CSA)
- Centre National d'Etudes Spatiales (CNES)
- Commonwealth Scientific and Industrial Research Organisation (CSIRO)
- Chinese Academy of Space Technology (CAST)
- Deutsches Zentrum für Luft- und Raumfahrt (DLR)
- European Commission (EC)
- European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT)
- European Space Agency (ESA)
- Indian Space Research Organization (ISRO)
- Instituto Nacional de Pesquisas Espaciais (INPE)
- National Aeronautics and Space Administration (NASA)
- National Oceanic and Atmospheric Administration (NOAA)
- National Remote Sensing Center of China (NRSCC)
- National Space Agency of Ukraine (NSAU)
- Russian Federal Service for Hydrometeorology and Environment Monitoring (ROSHYDROMET)
- Science and Technology Agency of Japan (STA)
- Swedish National Space Board (SNSB)

OBSERVERS:

- Canada Centre for Remote Sensing (CCRS)
- Federal Office for Scientific, Technical, and Cultural Affairs (OSTC)
- Norwegian Space Centre (NSC)

AFFILIATES:

- Global Climate Observing System (GCOS)
- Global Ocean Observing System (GOOS)
- Global Terrestrial Observing System (GTOS)
- Intergovernmental Oceanographic Commission (IOC)
- International Council of Scientific Unions (ICSU)
- International Geosphere-Biosphere Program (IGBP)
- United Nations Economic and Social Council for Asia and Pacific (ESCAP)
- United Nations Environment Program (UNEP)
- United Nations Food and Agriculture Organization (FAO)
- United Nations Office of Outer Space Affairs (UNOOSA)
- World Climate Research Program (WCRP)
- World Meteorological Organization (WMO)

JAPANESE DELEGATION:

- Japan Meteorological Agency (JMA)
- Ministry of International Trade and Industry (MITI)
- National Space Development Agency of Japan (NASDA)
- Remote Sensing Technology Center (RESTEC)

GUESTS OF THE CEOS CHAIR:

- International Group of Funding Agencies (IGFA)
- International Society for Photogrammetry and Remote Sensing (ISPRS)

National Aeronautics and
Space Administration
Headquarters
Washington, DC 20546-0001



Reply to Attn of:

IY

TO: Distribution

FROM: IY/NASA CEOS Point of Contact

SUBJECT: 11th CEOS Plenary Highlights and Trip Report

DATE: December 18, 1997

The 11th Plenary meeting of the Committee on Earth Observation Satellites (CEOS) was held in Toulouse, France, November 19-21, 1997. The meeting was hosted by the Centre National d'Etudes Spatiales (CNES) and chaired by Dr. Jean-Louis Fellous. The NASA delegation included Bill Townsend, Bob Schiffer, Lisa Shaffer and Leslie Charles. NOAA was represented by Bob Winokur, Brent Smith, and Helen Wood (outgoing chair of the CEOS Working Group on Information Systems and Services). The Plenary was preceded by an ad hoc focus group meeting of the CEOS Strategic Implementation Team (SIT). In addition to the Plenary, SIT Focus Group and related CEOS Secretariat meetings, NASA representatives had bilateral meetings with delegations from STA/NASDA (Japan); ISRO (India); and INPE (Brazil); discussions focused on current cooperation, addressing successes and issues, pledging continued collaboration. Highlights are provided below. The full minutes of the Plenary are being finalized and will be available upon request. Attached to this report is a list of documents distributed at the Plenary (copies of documents available from IY upon request) and a list of participants.

Overall the trip was very productive. The CEOS discussions showed strong interest in the continuing development of an integrated global observing strategy (IGOS).

SIT Focus Group, November 19, 1997:

The SIT Focus Group was well attended by the original participants in the first SIT meeting in Irvine, February 1996, i.e., individuals with authority to make commitments on behalf of their agencies. Senior agency representatives agreed to refocus the SIT, committing their personal involvement and that of their agencies in pursuing an integrated strategy and implementation of the IGOS strategy. The group also addressed the topic of SIT support, an unresolved issue from the September 1997 SIT meeting in Oxford. The group agreed that the current SIT Organizing Committee should be

reformulated/expanded/restructured in order to track and abreast of the activities of the 6 pilot projects, provide the necessary oversight to the projects, and redirect the projects as needed to ensure the retention of the IGOS perspective. This newly reformulated Organizing Committee would also identify steps to be taken by the SIT. Current SIT participants were invited to provide the names of 1-2 experts, whom the Organizing Committee can draw upon as needed for specific tasks.

Specifically, the Organizing Committee was charged to draft a strategy document for the space segment of an IGOS; to develop an outline of the document will be reviewed at the next meeting of the SIT on March 24-25, 1998; and to work with all CEOS agencies to write a first draft of the strategy document by the end of 1998. The goal is to reach a consensus, including the vetting by relevant partner organizations, by the end of the 1999 Plenary, which is five years after CEOS adopted a 5-year goal of agreeing on such a project.

CEOS Plenary, November 19-21, 1997:

- **Attendance:** Representatives from all CEOS Members, except the Italian Space Agency (ASI) and the Russian Space Agency (RSA) attended. A large majority of Observers and Affiliates also attended. See attached list of participants. WMO Director General Obasi joined the CNES President Bensoussan and Director General Brachet in making opening remarks, committing the WMO to continuing support of CEOS and to partnership in the development of an IGOS. The full text of their comments are among the documents available; see attached list.
- **Strategic Implementation Team (SIT):** The Plenary endorsed the continuation of the SIT for another year, and charged its Chair, CSIRO's Brian Embleton, to update its Terms of Reference. The Plenary agreed with the SIT proposals:
 - To form and maintain a small support group based on the current Organizing Committee with a cadre of additional nominated scientists, project managers and technical experts to draw upon as needed;
 - To finalize development of the IGOS concept paper which was drafted for preliminary review by the 1997 Plenary;
 - To track and redirect, as needed, the progress of the 6 prototype projects;
 - To develop an outline and first draft for a strategy document for discussion at the March 1998 SIT meeting and by the larger CEOS membership later in the year;
 - To undertake working level contacts with the G3OS Directors and other parties interested in continuing the development of an IGOS and in partnership in the process. The SIT and CEOS Chairs will participate as the CEOS representatives at the G3OS Sponsors meeting in June.

The next SIT meeting will be held in Paris on March 24-25, 1998.

- Analysis Group (AG): Agreeing with the recommendation of the AG Chair, the Plenary disbanded the CEOS Analysis Group (AG), its original mandate having been fulfilled. The AG was created by the 1996 Plenary to analyze space agency missions in the context of user requirements and led an analysis of the 6 prototype projects. Oversight of the projects will be continued on an ad hoc basis by the expanded SIT Organizing Committee.
- Database: After an indication that budget pressures may force ESA to terminate its database activities, ESA agreed to continue development and management of the CEOS database and to undertake a thorough review of the database structure. ESA will work with WMO, which manages an off-line Affiliates database, to harmonize the databases and make them more user-friendly. CEOS agencies were again entreated to update and correct its information.
- Working Groups: The plans for the two CEOS Working Groups (Information Systems and Services [WGISS], and Calibration and Validation [WGCV]) were presented, discussed, and approved. The chairmanship of WGISS rotated from Helen Wood of NOAA to Takashi Moriyama of NASDA. Both working groups were encouraged to continue their involvement in IGOS activities. WGISS reported that with NASA's help it has reserved the domain CEOS.org for the exclusive use of CEOS.
- Spectrum Management: In a discussion of frequency allocation issues, CEOS members received a status report on the discussion ongoing at World Radio Conference-97. There was some good news: that 10 key bands were upgraded to priority status. The Plenary agreed to have its ad hoc spectrum management coordination group work closely with the Space Frequency Coordination Group in preparing for the 1998 WRC, which will readdress the several bands which did not receive an upgrade in status. CEOS agencies were encouraged to support these positions with their own national administrations.
- Membership Issues: CEOS membership was increased, adding the Economic and Social Commission for Asia and the Pacific (ESCAP), the Global Terrestrial Observing System (GTOS), the International Society for Photogrammetry and Remote Sensing (ISPRS) as Observers.
- Yearbook, CD ROM, Consolidated Report: 1997 editions of the CEOS Yearbook (published by ESA), CD ROM focusing on remote sensing education and developing countries (revised and published by CNES), and Consolidated Report (published by NASA) were distributed at the Plenary. Copies of all publications are available from Code IY upon request. In the Secretariat meeting following the Plenary, NASA was complimented on the display it produced and unveiled at the 10th Plenary in Canberra, and was asked to consider updating the display for use during what is looking like a very busy year for CEOS.
- CEOS Host: ISRO is now the host of CEOS for 1998, with Krishnaswary Kastrurirangan as Chair. EUMETSAT will lead CEOS in 1999, and INPE agreed to be the host for 1999. The 1998 Plenary will be in Bangalore, India November 10-12,

1998. As part of its activities as current CEOS Chair, ISRO unveiled their initiative to publish a compendium of EO data and applications over the past 25 years to manage and understand Earth processes at both a global and local level.

Bilateral Meeting with INPE, November 20, 1997

Mr. Townsend met with INPE's Marcio Barbosa on November 20, 1997 to review the status of current cooperation. Mr. Barbosa reported that INPE had the lead for finalizing the LBA agreement, which would cover the full scope of NASA involvement, including aircraft campaigns. This was very encouraging news. Mr. Barbosa also invited Mr. Townsend to visit Brazil early next year, as part of the periodic bilateral meetings between NASA and INPE. They discussed the possibility of a visit on the occasion of concluding the LBA agreement. NASA and INPE further discussed the proposed loan of a NASA C-130 aircraft to Brazil, which is still under consideration within the Brazilian government.

Highlights of Discussions with ESA, November 24, 1997

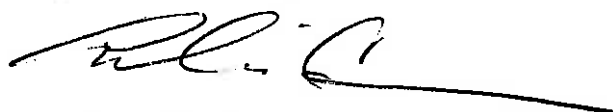
Mr. Townsend met with Dr. Roger Bonnet, Director of ESA's Scientific Programs on November 24, 1997, in Paris, France. Dr. David Southwood, ESA's Strategy Manager for Earth Observations, was also in attendance. Both sides expressed strong desire for increased collaboration in Earth observation. Townsend presented a comprehensive overview of the program and provided many relevant documents. Bonnet described the recent reorganizations in ESA and his new position. He is trying to make some order out of chaos, much like he did with space science, and ensure that currently divided resources in Europe for Earth observation are used in a more coordinated way and according to a strategy. Bonnet noted that Europe will be spending on the order of \$750 million through the end of the century (which includes Envisat and Metop); but that without a coherent strategy, there will be nothing after 2000. And the creation of this strategy is ESA's job.

Bonnet reported that strategy documents are in draft form and nearing completion; he indicated he would share these with NASA as soon as he could. These documents will identify science priorities (what the scientists want to do), a strategy and implementation plan (including budgets) for these priorities and the views of industry. Bonnet indicated that international cooperation is a key element of the ESA strategy. He mentioned that he is not pleased with either the current opinion of Member States or the view within NASA that cooperation with ESA is not easy. There was some discussion about industry involvement in EO and the attendant problems. ESA's basic position is to facilitate industry and bring them along where necessary.

Regarding potential cooperation between ESA and NASA, both sides indicated that collaboration in some form in ESA's Earth Explorer program made the most sense. Currently four of the 9 candidate missions received funding for phase-A studies: solid Earth, radiation budget, atmospheric dynamics and atmospheric chemistry. Both Bonnet and Townsend expressed interest in facilitating working level discussions on the feasibility of cooperation on any of these missions. Bonnet indicated that ESA may be traveling to Canada in late January 1998 for discussions with CSA and identified that as

potential time for face to face meetings (either ESA would travel from Montreal to DC, or NASA would travel to Montreal). Townsend agreed. They agreed to meet again on March 26, after the next SIT meeting, in Paris to discuss the results from the working level discussions.

This meeting came the week following Mr. Goldin's trip to Europe where he pledged that NASA would deal with ESA only on space station implementation issues. It probably is not coincidental, then, that Bonnet mentioned several times that he views it as an impediment that ESA Member States negotiate directly with NASA. Townsend countered, very diplomatically, that this was due to history. A polite reminder of failed attempts to cooperate on the ARISTOTELES mission resulted in an admission by Bonnet that ESA has to take a lot of the blame, but it was mostly due to a lack of a strategy. Bonnet specifically indicated that he sees it a problem that CNES is discussing strategy and cooperation directly with NASA. He said that ESA doesn't want to destroy Member States' objectives or compete with them, but be complementary to their goals. If Goldin's commitment referred to ISS only, Codes IY, IS, Y and S should work together to correct the misunderstanding and get that message across to ESA.



Leslie B. Charles

Distribution:

Y/Townsend, Mann

YF/Luther, Paules, Kahle, Kelley, Schuster, Wende

YS/Maynard, Asrar, Schiffer, Tuyahov, Dodge, Morel

YM/Norton, Williams, Curley

I/Schumacher, Cline

IY/All; Files/CEOS—1997 11th CEOS Plenary (Toulouse)

IS/Higgins, Miller, Feldstein

ESSPO/Price, Hraster, Maiden, Schwaller

NOAA NESDIS/Smith

this end a working-level meeting has been organized for March 26, 1998, in Paris; preparations undertaken will lead to the involvement of the SIT Chair and CEOS Chairs (current, past and future) in an IGOS senior-level discussion, June 6, 1998, also in Paris, in connection with a G30S Sponsors Group meeting.

- The CEOS Analysis Group, established at the 1996 Plenary to analyze space agency missions in the context of user requirements (later taking on analysis of the IGOS prototype projects), was disbanded as recommended by its Chair, its mandate having been accomplished. Work in this area will be continued on an ad hoc basis by the expanded SIT support group.
- ESA and WMO have jointly agreed to restructure the CEOS and Affiliates data bases so that they are compatible and more user-friendly. They will lead an effort to update the Database Manual. ESA has already acquired the services of a new Internet provider which reportedly greatly facilitates access to the ESA/ESRIN Italian Web site. CEOS agencies were again charged to ensure on an urgent basis that their inputs to the data base effort are accurate and complete.
- Helen Wood completed her two years service as WGISS Chair, and with it thirteen years of NOAA leadership in this and predecessor working groups within CEOS. Takashi Moriyama of the Japanese Space Agency (NASDA) succeeds her. The Plenary accepted the recommendations of WGISS as well as those of the other CEOS Working Group on Calibration/Validation. The involvement of both working groups was also stated as being vital to the success of the IGOS initiative.
- Plenary members received a status report on the status of frequency allocations at the ongoing World Radio Conference-97. Concern was expressed about the denial of primary allocation to important frequency bands for Earth observation satellites, and CEOS agreed at Plenary level to have its ad hoc spectrum management coordination group work closely with the Space Frequency Coordination Group in preparing for the 1999 World Radio Conference, encouraging individual CEOS members to urge support of these positions with their own national administrations.
- The Plenary agreed that a small group involving the Secretariat will be formed under the leadership of the outgoing CNES Plenary Chair to conduct a six-month study on categories of participation in CEOS, including the proposal to consider, as appropriate, "dialogue partnerships" with private sector remote sensing and other organizations who are outside the realm of formal CEOS participation. The International Society for Photogrammetry and Remote Sensing (ISPRS) was admitted as an Affiliate at this Plenary.
- Preview copies of the 1997 CEOS Yearbook were distributed at the Plenary. NOAA is receiving 300 additional copies for distribution in early December. NASDA agreed, in addition to the CEOS Newsletter it distributes, to also produce brochures for both CEOS and IGOS.

- At the conclusion of the Toulouse Plenary, Dr. Krishnaswary Kasturirangan of the Indian Space Research Organization (ISRO) took over as 1998 CEOS Chair. The Plenary is planned for November 10-12, 1998, in Bangalore. ISRO proposes within the coming year to undertake generation of a CEOS reference document to chronicle achievements in the 25 years of remote sensing from space since the launch of the first Landsat satellite. EUMETSAT will chair CEOS in 1999, and the Brazilian Space Agency (INPE) has agreed to chair CEOS in 2000.

D. Brent Smith
November 25, 1997