



CONTENTS

CEOS Plenary 2000 and the 6th IGOS Partners Meeting	12
Water Cycle & CEOP Initiative	3
SIT looking forward	4
Terrestrial Carbon Observation Initiative (TCO): recent developments	4/5
Ocean Theme Report Published!	5
The IGOS Integrated Global Carbon Observation Theme	6
Working Group on Calibration and Validation Highlights and Future Plans	7
The Working Group On Information Systems And Services	8
Disaster Management Support Ad Hoc Working Group	9
CEOS Working Group on EO Education and Training	10/11
U.S. Geological Survey Joins CEOS Plenary	11
From the CEOS Chair / Meeting Calendar	12

CEOS Plenary 2000 and the 6th IGOS Partners Meeting

Mr. Marcio Barbosa, INPE (Brazil), Outgoing CEOS and IGOS-P Chair

After 10 years, the CEOS Plenary convened again in Brazil, this time for its 14th Meeting. Things were simpler in 1990, when the main issues were still centered on better understanding sensor behavior and performance, improving compatibility of product formats and fostering the development of applications that could properly benefit from recent advances in a technology that was not yet fully mature. Hosting the Plenary at that time was not tied with chairing it. Year 2000 was the first time Brazil, through INPE, was Chair of CEOS. The responsibilities of the position are heavy and complex, but fortunately, being one of the early Members helped us develop the required familiarity with the organization's operating ways and procedures, as well as with the collective concerns and priorities that have a life of their own behind the wording of the Terms of Reference. Also, as I recorded about a year ago in my Incoming Chair note, there is a mighty good team of people involved in the CEOS background, and this team, especially the CEOS Secretariat, makes everything easier for the Chair. We believe this was a good year.

Rio de Janeiro was chosen for the CEOS Plenary venue. Following a recently established procedure, the IGOS Partnership (IGOS-P) meeting, in its 6th edition, and the 8th CEOS SIT (Strategic Implementation Team) meeting were held in conjunction with the Plenary. An effort was made to schedule these meetings in a coherent manner: first the SIT meeting (see article on Page 4) where the CEOS contribution to IGOS was reviewed, then the Partners meeting where the IGOS Themes and their

development and requirements were discussed, then the Plenary where, among the other CEOS agenda items, the agencies were briefed on the IGOS-P meeting and prompted by SIT for their further participation in IGOS activities.

The CEOS Chair is also the IGOS-P Chair in the period after the mid-year Partners meeting up to, and including, the year-end meeting, when chairmanship is handed, in rotation, to a non-CEOS Partner. Therefore, the CEOS Chairman chairs also the IGOS-P meeting held in conjunction with the Plenary. This is why this single article addresses both meetings.

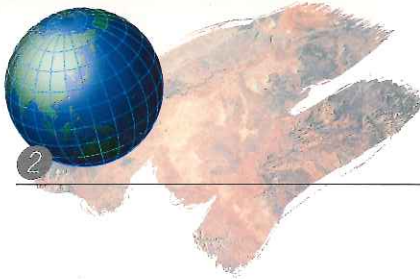
IGOS-P6 was a much awaited meeting, since quite a few important issues were identified as requiring definition at P5 (Geneva, June 2000) and during the months that followed. To begin with, the IGOS Partnership process itself lacked adequate documentation, and this was achieved at this meeting with the approval of a Process Paper submitted to the Partners by EUMETSAT. The meeting also approved the Terms of Reference and the constitution of a standing, distributed IGOS-P Secretariat to support and assure reliable continuity to the administrative work in between meetings. This Secretariat in fact started its contribution, in a provisional fashion, right after P5, employing the participants of an existing Liaison Group who felt they could do it, and they had more than one opportunity to certify their usefulness. The development of the Process Paper benefited from their inputs, as well as the graceful resolution of sensitive management situations. This was a pleasant case where a new body could be already commended for its work at its very creation.

In the Themes arena, the pathfinder Ocean Theme achieved and presented their Final Report. The theme will now move on to the Implementation phase, under responsibility of the Global Ocean Observing System (GOOS). The Terrestrial Carbon Theme advanced in its definitions and requirements, and the concept of a Global

(to be continued on next page.)



The 14th CEOS Plenary participants against the Gávea Rock in Rio



(continued from Page 1.)

Carbon Cycle Theme was endorsed by the meeting. A future Water Cycle Theme can profit from a Japanese-proposed Coordinated Enhanced Observation Period (CEOP) experiment to be carried out in 2001, with the support of CEOS agencies. Possibilities for a new Theme regarding Hazards and another one on Atmospheric Chemistry were also presented and favorably discussed by the Partners.

The meeting dedicated also substantial time to the issue of promoting IGOS visibility and activities at appropriate events and fora. STA/NASDA as incoming CEOS Chair expressed their strong intention to support and promote IGOS in their 2001 term.

At the closing of the meeting, I had the pleasure of passing IGOS-P Chairmanship to Dr. Patricio Bernal of UNESCO/IOC (Intergovernmental Oceanographic Commission). Dr. Bernal, after a very active and positive participation at the meeting, had no difficulty in conveying to the audience, through his inaugural speech, his enthusiasm about taking office and confidence on a bright future for the IGOS Partnership.



IGOS-P Chair Handover

Separated from the IGOS-P6 closing by just a lunch break, CEOS 14 opened in good mood with the approval of USGS (United States Geological Survey) as the 22nd CEOS Member. Participants were briefed by the SIT Chair and Theme leaders on the developments and recommendations of IGOS-P6. CEOS support to IGOS activities was endorsed and translated into resolutions and action items for the Agencies.

An area of interest for CEOS since the 13th Plenary has been a potential symbiotic involvement with the commercial Earth Observation sector, and several initiatives carried in this direction during 2000 were presented and discussed. Although the general feeling was that the concept still needs some maturing, there was

ample support to the continuity of the efforts and dialogue with the EO industry.

In the context of CEOS interaction with other organizations, the interface with the Space Frequency Coordination Group (SFCG) was discussed in the frame of the results of WRC-2000 and the Plenary addressed perspectives for future meetings where Members' recommendations affecting spectrum allocation for EO sensors can be considered. UNOOSA activities following the resolutions undertaken at UNISPACE III were reported, particularly in relation with training and education and with thematic areas such as disaster management. The Plenary discussed extensively the possibilities of collaboration and reaffirmed the interest in being kept informed in this area.

The four CEOS Working Groups (WGISS, WGCV, DMSG and WGEdu) presented their reports and recommendations to the Plenary and were all commended for their work quality after rich and enlightening discussions that confirmed the importance of their charters in CEOS. All four are contributing articles in this Newsletter, so I will not preempt their communications in here. DMSG and WGEdu had their ad-hoc status extended for another year. Dr. Alan Belward, chairman of WGCV for four years, stepped down at this Plenary and received special appreciation for his sterling contribution during this period. Mr. Yves-Louis Desnos was welcomed as the new WGCV Chair.

Within the planning topics, the Plenary endorsed a SIT recommendation that in 2001 CEOS conducts a review of its activities and interaction with IGOS, aiming at identifying and correcting shortcomings and improving the overall effectiveness. The SIT work was also commended and its mandate extended for another year.

Finally, having completed all of the agenda, I handed over CEOS Chairmanship to STA/NASDA and Dr. Yoji Furuhashi drew a positive panorama of their views and plans for CEOS and IGOS during 2001, ending with a warm invitation to the next Plenary in Kyoto.

I believe all participants will have taken home pleasant memories of their stay in Rio, with special mentions to the friendly atmosphere of the welcome cocktail by the pool, the magnificent surroundings of the venue and the splendid, caipirinha-powered barbecue dinner at O Porcão.

Water Cycle & CEOP Initiative

Prof. Toshio Koike, University of Tokyo (Japan)
Dr. Rick Lawford, NOAA Office of Global Programs (USA)

There is a growing concern about global and regional water issues and the need to address them in a more coordinated way. The Integrated Global Observing Strategy (IGOS)-Partners are taking action to develop an integrated approach to observing the water cycle.

An integrated water cycle observational system would bring together the capabilities of both satellite based and ground based (remote and in situ) observing systems. These observing systems would support research activities dealing with the role of the atmospheric water cycle in climate, and prediction systems through the specification of initial and boundary conditions (e.g., soil moisture). In addition, networks and systems for monitoring surface and sub-surface water cycle components such as streamflow and soil moisture are needed to provide background information on the impacts of variability and trends in the global water cycle. More initiatives will likely be developed over the next few years. Key elements for a water cycle observing system will be comprehensive satellite measurements, a coordinated in situ observing program and a "state-of-the-art" data assimilation system that can effectively ingest these data sets and produce integrated products.

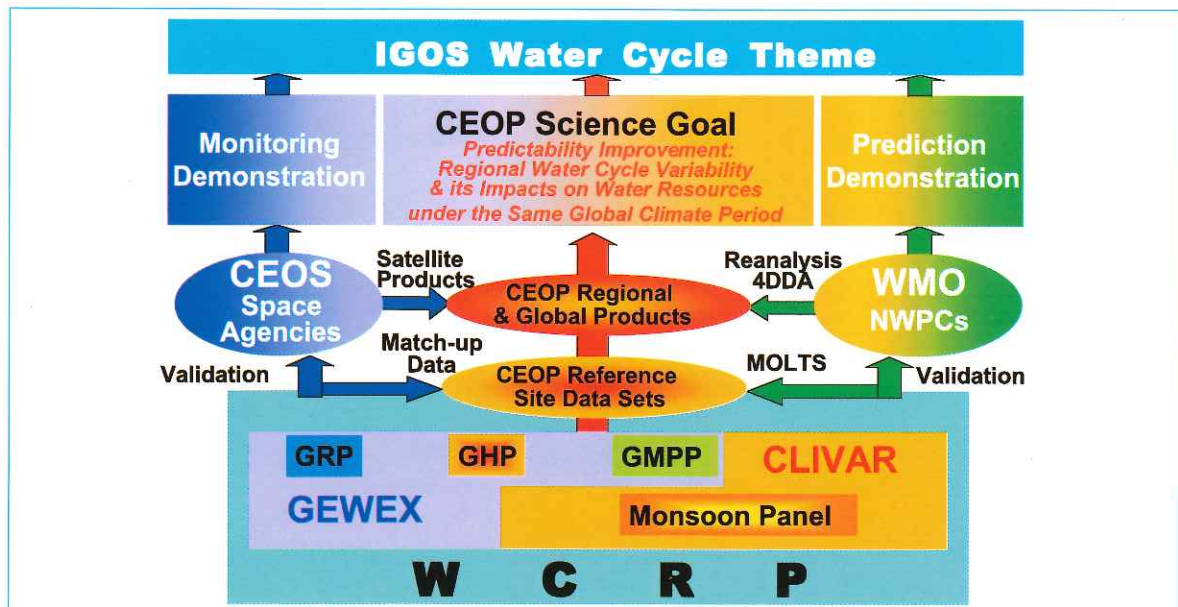
At the 6th IGOS-Partners (IGOS-P) meeting and the 14th CEOS Plenary meeting held in Rio de Janeiro, Brazil during the week of November 6, 2000, the World Climate Research Programme (WCRP) presented a proposal on the Coordinated Enhanced Observing Period (CEOP) Project. As illustrated below CEOP represents a unique opportunity to improve the scientific basis needed to achieve overall water cycle documentation and prediction goals, based on the reference site data collection

activities by WCRP, the satellite product provision by the CEOS space agencies and the 4DDA and reanalysis product provision by the WMO numerical weather prediction centers. CEOP received strong support as a much desired precursor for IGOS Water Cycle Theme by IGOS-P and CEOS. Through CEOP, CEOS will be able to contribute greatly to understanding and prediction of water cycle through integrated use of satellites of CEOS members in cooperation with IGOS-P. CEOS contributions to CEOP which were discussed at the meetings include:

- supporting the implementation of a CEOP Satellite Data Integration Center;
- establishing a CEOP Satellite Working Group, and
- providing field campaigns at reference sites with proper access to satellite observations.

Detailed, specific requirements will be prepared by CEOP and directed to the cognizant space agencies for their consideration at the CEOS Plenary to be held in Kyoto, Japan in 2001.

IGOS-P has asked WCRP to organize a process for developing a water cycle theme proposal. A presentation on the development of an IGOS water cycle theme was also made by WCRP at the IGOS-P meeting in Rio. The first step in the preparation of a water cycle theme proposal is a planning workshop that was held in Irvine California in the USA. This workshop will be followed by the production of a draft document for comment and for submission to IGOS-P in late 2001.





SIT looking forward

Dr. Jean-Louis Fellous

CNES (France)

Chair, Strategic Implementation Team

The 8th Strategic Implementation Team (SIT) meeting was held in Rio de Janeiro on 7 November 2000, attended by 45 participants, representing over 15 CEOS Members, Associates and IGOS Partners. The meeting objective was to prepare recommendations to the 6th IGOS-Partnership meeting (November 7 and 8) and to report to CEOS 14th Plenary (November 8 to 10) on current issues as well as on prospective views for the mid and long term evolution of CEOS and SIT, in the IGOS context.

In 2000, SIT followed and stimulated fruitful developments of IGOS activities. These addressed the functioning of the IGOS Partnership with the preparation of an updated IGOS Process paper, which clarifies the range of IGOS activities and the Theme approach. They also dealt with the practical setting of Themes with the production and further adoption of the Ocean Theme final report (see article page 5) and of reports on the terrestrial and atmospheric aspects of the Carbon Cycle and Integrated Global Carbon Observations (see article below and page 6). Other developments concerned a potential new Theme on geophysical and geological hazards and CEOS agencies contribution to the CEOP project on water cycle.

It was recognized in Rio that the SIT, established in 1996 to address the role and function of the space component of an IGOS, has been successful in accomplishing its tasks and instrumental in the development of IGOS, has greatly contributed in the creation of the IGOS Partnership, and should be

continued. It was also recognized that the rapidly evolving situation called for the need for a thorough review of the whole history of progress made in the IGOS Partnership Process, and of its implications in terms of CEOS structure. This review should not in any way be construed as a weakening of CEOS support to the IGOS Partnership, but simply a realization that the arrangements which have evolved with associated organizations over the past ten years may not be entirely appropriate for the next decade.

Consequently the CEOS Plenary asked the incoming CEOS Chair to appoint a group to conduct a review of the development of CEOS activities over the past years, especially with regard to participation in the IGOS Partnership, analyzing its success and shortcomings, and aiming at improving its effectiveness. The review group should make recommendations to the 15th Plenary on any changes that may appear advisable, in order to cater for the longer term, in particular the mechanism for contributing to and implementing IGOS Themes and relations with other related coordinating bodies. The review should address the SIT, its future status, mandate and membership. It should also evaluate the implication of its recommendations onto the overall CEOS structure and activities.

SIT is continued in 2001 and will focus its efforts on new Themes, while working with the Partners in the implementation of the Ocean Theme.

Terrestrial Carbon Observation Initiative (TCO): recent developments

Dr. Josef Cihlar, TCO Theme Leader,

Mr. Scott Denning, and Mr. Jeff Tschirley*1

*1 Respectively affiliated with:

Canada Centre for Remote Sensing, Colorado State University, and
Food & Agriculture Organization of the UN.

This report is a follow-up to an article in the previous newsletter that reported the substantial progress that has been achieved since November, 1999 when the TCO theme was approved by IGOS-P. The steps taken during 2000 included a GTOS-IGBP sponsored workshop on the synthesis of observation requirements and the current status of satellite as well as in situ observations; establishment of a theme team representing Integrated Global Observing Strategy Partnership (IGOS-P) and their constituencies; an EC-IGBP-GTOS - sponsored scientific meeting which among others considered the terrestrial carbon observation requirements from a research perspective; and initial links with the ocean carbon community. Based on this preparatory work the TCO theme team completed a draft report to IGOS following the format specified in the IGOS theme process paper. The report was then sent for comments to about 200 professionals involved with terrestrial carbon issues. Based on their feedback, the

report was revised and on October 6 submitted to the IGOS Partnership in advance of its meeting in Rio de Janeiro.

The report summarised the case for terrestrial carbon observation in terms of needs, urgency, type and gaps, with the latter receiving considerable attention. Two types of gaps were identified, continuity (where an existing observation program may have no assured continuation) and knowledge (lack of understanding or tools to obtain needed observations). Both terrestrial and atmospheric measurements are needed for a comprehensive assessment of the terrestrial carbon fluxes, using the concept of dual constraint to reconcile flux estimates founded on ecosystem and atmospheric observations, respectively. The report proposed a way forward, based on goals for terrestrial carbon products to be generated by 2005 and (with improved accuracy and spatial detail) in 2008.

Ocean Theme Report Published!

Dr. John Marra
 NASA Headquarters (USA)
 Ocean Theme Leader

The 14th CEOS Plenary and the IGOS Partners Meeting in Rio de Janeiro (November 7-10, 2000) saw the publication of "AN OCEAN THEME FOR THE IGOS PARTNERSHIP." The Ocean Theme Report was initially presented and distributed at the CEOS SIT-8, and formally accepted, and then presented to the IGOS Partners and the 14th CEOS Plenary. The 40-page document represents the culmination of about two years' work on the part of the Ocean Theme Team, and also is the first of the Theme Reports commissioned by the IGOS Partners. The Theme Reports are designed to develop a strategies for earth observing systems, and one purpose of the Ocean Theme was to serve as a 'pathfinder' for the other IGOS themes.

The overall goal of an ocean observing system, as applied to the IGOS, is to be able to predict the state of the ocean and its variability for application to human needs. In pursuing this goal, IGOS will point the way to create an observing system for the oceans that serves both the research and operational oceanographic communities. Researchers will always need continuous and long-term observations to develop and test hypotheses about how the ocean works. Operational oceanographers require the same observations to create forecasts for ship routing, fish locations, hurricanes and storms, and the like. The Ocean Theme shows how the complimentary efforts of research and operations can be combined. The Report outlines the needs for satellite and in situ observations, and focuses as well on some of the immediate decisions required by satellite agencies needed to proceed to a fully operational Ocean Observing System. The Report proceeds from observations and modeling activities, and how these are assimilated into a view of the ocean's state and its variability. Data assimilation is therefore the key step in the creation of data products, which can then be applied by entities such as the World Meteorological Organization and the Food and Agricultural Organization of the United Nations. In turn, there is the provision for modifying the data products in response to the needs of the end-user community.

The Report discusses the two primary observational

In November, the report was presented to IGOS-P and the Strategic Implementation Team (SIT). Both groups expressed satisfaction with the rapid and substantial progress made in the definition of the TCO theme, and made preliminary comments on the changes to be made to the report. IGOS Partners agreed to provide final comments by 10 January 2001, and requested that the revised final report be submitted as soon as feasible after January 10, 2001. Partners' consensus on the final report will then be sought by early March, 2001.

challenges facing the operators of earth-observing satellites and those concerned with in situ observations: observational continuity, and the knowledge necessary to enhance the observations. To this end, CEOS organized a listing of current and planned missions by the members for space-based observations of sea-surface temperature, ocean winds, wave spectra, sea-surface height, ocean color, sea ice, etc, as well as the data systems needed to archive and distribute data from satellites. Future satellite programs entail improvements and enhancements of current observational capabilities. The listing of satellite missions is now Appendix 1 to the Ocean Theme Report. Similarly, in situ observational programs are now summarized as Appendix 2 of the Report (organized by C. Summerhayes, the GOOS Project Office), and Data Products and Services are given as Appendix 3. Plans for satellite missions (prepared by Dr. David Williams, EUMETSAT) are also presented in graphical form within the report, for ready understanding of the multitude of missions planned in the next 12 years.

As has been mentioned, the IGOS Ocean Theme Report was internally distributed at the CEOS SIT, CEOS Plenary and IGOS Partners meetings in Rio, November 2000. The Report was first distributed to policy makers and external groups at the UNFCCC Congress of Parties meeting in The Hague (November 13-17, 2000). The report will be made available that the February session of the UN Committee on Peaceful Uses of Outer Space Scientific and Technical Subcommittee, the April session of the Committee on Sustainable Development, upcoming WMO and IOC meetings, and other appropriate venues throughout 2001. Having been slightly revised since November, the Report is now in its third and final printing and can be requested from Ms. Leslie Charles at NASA Headquarters (lcharles@hq.nasa.gov). The Report can also be downloaded from the IGOS Partners web-site (<http://igospartners.org>) under the "Documents" heading.

In the meantime, discussions are underway regarding preparatory steps for obtaining commitments to, and support for, TCO implementation. These will likely involve an additional meeting, this time with representation of potential providers of data products and users of these for modeling, analysis and assessment.

TCO-related documents may be found at the GTOS site (www.fao.org/gtos).



The IGOS Integrated Global Carbon Observation Theme

Dr. Will Steffen

Executive Director, IGBP (Sweden)
Will@igbp.kva.se

The IGOS Partnership, at their November 2000 meeting in Rio de Janeiro, recommended the development of an Integrated Global Carbon Observation (IGCO) Theme. IGCO will become the third pillar of international carbon activities, joining the assessment process of the Intergovernmental Panel on Climate Change (IPCC) and the joint carbon research project of the international global environmental change programmes.

The aim of IGCO is to develop a flexible and robust strategy for international, integrated global carbon observations over the next decade. The theme should:

- * Seek integrated approaches that efficiently combine both remote and in situ observations;
- * Build upon existing efforts to identify priority observation requirements in terrestrial, oceanic and atmospheric components of the carbon cycle;
- * Integrate observational strategies in the terrestrial, oceanic, and atmospheric compartments, and appropriate palaeo and human dimensions components/sectors of the carbon cycle;
- * Be integrated with the international framework for carbon research being developed by the three international global environmental change programmes (IGBP - International Geosphere-Biosphere Programme, IHDP - International Human Dimensions Programme on Global Environmental Change, WCRP - World Climate Research Programme) and responsive to the policy needs of the UNFCCC, via the IPCC;
- * Be flexible enough to incorporate new observation approaches as both science and measurement technologies develop and requirements evolve;
- * Be robust enough to meet the challenges of continuity and consistency;

Several ongoing activities provide the nucleus for an IGCO theme. First, the existing TCO (Terrestrial Carbon Observation) theme, based on a partnership involving GTOS (Global Terrestrial Observing System) and IGBP, is reaching maturity and provides a sound base on which to build towards an IGCO theme. Second, the existing Oceans Theme Team, in partnership with GOOS (Global Ocean Observing System), has completed its work, which has considerable relevance to ocean carbon observations. Third, in addition to the broad Oceans Theme, an ad hoc

ocean carbon observation group, with close connections to both GOOS and IGBP, has developed an ocean carbon observation strategy. Finally, the ongoing initiative of IGBP, IHDP and WCRP to develop an international framework for research on the global carbon cycle provides an appropriate in-built platform on which to develop the IGCO theme in close collaboration with the scientific community. More information on international carbon research under the auspices of IGBP, IHDP and WCRP will be presented at the Global Change Open Science Conference, Amsterdam, NL, 10-13 July 2001 (see below posters).

Two written products will be delivered as outcomes of the IGCO theme:

- * The IGCO Theme report, July 2002, ca 30-40 pages. This is the final product and will clearly set out the IGCO strategy for both the observational and scientific communities.
- * An IGCO Prospectus, May 2001, ca 10-12 pages. The aim of this document is to present the scope, objectives, and broad outline of the IGCO Theme, as a way to raise the profile of IGOS in the policy and scientific communities.

Working Group on Calibration and Validation

Highlights and Future Plans

Mr. Yves-Louis Desnos
European Space Agency, ESRIN (Italy)
Chair, WGCV

The National Oceanic and Atmospheric Administration and the National Institute of Standards and Technology kindly co-hosted the CEOS Working Group on Calibration and Validation 17th meeting at Gaithersburg, Maryland, USA, from 25th to 27th October 2000. Dr Katherine Gebbie, Director of the Physics Laboratory, NIST, and Dr. Marie Colton, Deputy Director NOAA/NESDIS Office of Research and Applications, welcomed the participants.

The presentation of Earth Observation calibration activities at NOAA and NIST provided important ground setting for the WGCV's continued debate on the topic of traceability. A special session on traceability allowed to complete a report on the traceability issue in sensor calibration.

The new CEOS WGCV three-year work plan was discussed and amended at the meeting, and it has been put forward to CEOS Plenary for endorsement.

The objectives of the WGCV are to enhance technical co-ordination, to promote international co-operation and to focus Earth Observation Calibration Validation activities for the benefit of CEOS Members and the international user community. The plan will be implemented via plenary meetings and technical work of the sub-groups.

The new sub-group on Land Product Validation, chaired by Dr. Jeff Privette of NASA was formally accepted by the WGCV. The goal of the subgroup is to develop standard practices on a 'per product' basis and to promote adherence to these standards by various space agencies. The first meeting was held in May 2000 at EU-JRC, Italy and provided a forum to share experiences, develop basic standards for comparison, and promote and co-ordinate international validation activities. The next meeting is planned in conjunction with WGCV 18th at ESA-ESRIN early June 2001.

The proceedings of the SAR sub-group workshop sponsored by CNES-ESA were published in May 2000 (reference ESA SP 450- 729 pages). The next SAR sub-group workshop, jointly organised by NASDA and ESA, will be hosted by NASDA-EORC in Tokyo, Japan from 2nd to 5th April 2001. At the meeting Dr. Masanobu Shimada of NASDA-EORC will take the sub-group chair.

The Terrain Mapping sub-group held its meeting in conjunction with WGCV 17th. A number of new developments arising from the Shuttle Radar Topography

Mission were addressed. At the meeting Prof. Ian Dowman of UCL stood down as Chair and WGCV offered him sincere thanks for his work in establishing this internationally recognised sub-group.

Under the auspices of the Infrared and Visible Observing Sensors Sub-group Dr. Ian Barton of CSIRO presented a proposal at WGCV for the "second international infrared radiometer calibration and inter-comparison". The goal is to compare and calibrate radiometers used to validate the different surface temperature products derived from Earth Observation satellites. The proposal was put forward to Plenary and received positive support.

The WGCV 17th meeting allowed for consolidation of communication and outreach activities along with revised expectations for the Cal Val dossier. The specifics of education will continue to be addressed under the ad hoc-working group on Education. WGCV will closely work with WGEdu and its Chair.

Since its inception in 1984 the Working Group on Calibration and Validation has focused on ways in which the international co-operation can help ensure long term confidence in the accuracy and quality of Earth observation data and products from satellites. The new three-year plan and sub-group activities will also aim to facilitate improved dialog between the calibration/validation expert groups and the science and application user community.

The European Space Agency will host the 18th WGCV plenary meeting at ESRIN, Frascati, Italy, from 5th to 7th June 2001. A special session will be held on the ENVISAT mission (launch mid 2001) and its Calibration/Validation program.

Finally I would like to take this opportunity on behalf of WGCV to thank Dr. Alan Belward for his four years of sterling service to CEOS as WGCV Chair. We all look forward to his continued contribution to WGCV.

For more information, see the WGCV web site at wgcv.ceos.org or contact WGCV Chair (email: Yves-Louis.Desnos@esa.int).



The Working Group On Information Systems And Services

Mr. Peter N. Churchill
 European Commission (Italy)
 Chair, WGISS

The role and work of WGISS is driven by the belief that information systems and services are an essential element of successful Earth observation programmes. Users need to be able to find and access products on a global basis. Harmonised and coordinated data and information systems that easily and efficiently provide access to data, information and services are essential if this is to be achieved.

WGISS is there to address these aspects. It facilitates and coordinates Earth observation data and information management and services throughout CEOS organisations.

By so doing it sets out to provide data providers and users with harmonised data and information systems on a global scale.

To this end WGISS, and its predecessors the Working Group on Data (WGD) and the interim Working Group on Network Services, has developed a full range of tools, techniques, services and guidelines addressing information systems and services (ISS). This is illustrated by a selection of WGISS's achievements described below:

Information System & Service Area	Example Achievements
<i>Resource discovery and access</i>	
Archive	Purge alert in place; archive interchange format in preparation
Catalogue	Developed Catalogue
Interoperability Protocol (CIP).	Over 1200 catalogues linked to Interoperable Catalogue system (ICS)
Search	One-stop-shop directory search in place (over 8000 entries of data set descriptions in the International Directory Network - IDN); 20,000 search queries per month
Browse	Browse guidelines available
Order	Data ordering now integrated into CIP
Access	Constant network performance monitoring
<i>Resource generation, evaluation and utilisation</i>	
Data sets	Global data sets supported
Data formats	Data format guidelines issued
<i>Outreach</i>	
Promotion material	2,000 copies of WGISS brochure distributed; 20,000 copies of the CD-ROM distributed
Workshops	150 attendees at annual EO-GEO Workshop

These tools, techniques, services and guidelines are detailed on the WGISS web site at <http://wgiss.ceos.org/>. They also form the basis of the WGISS Test Environment (WTE). The WTE, which was detailed in the last issue of this Newsletter, offers a framework under which WGISS will work in partnership with selected international science and EO projects to test and develop information systems and services to meet their requirements. A first partnership has already been established with the Global Observation of Forest Cover (GOFC) project / Terrestrial

Carbon IGOS Theme. Initial contact has also been made with the CEOS Disaster Management ad hoc Working Group, and the IGOS Ocean Theme to explore interest for a second Test Facility.

For more information, contact CEOS WGISS Chair, Peter N. Churchill (peter.churchill@jrc.it), European Commission, Directorate General Joint Research Centre, Space Applications Institute, I-20120 Ispra (VA), Italy

Disaster Management Support Ad Hoc Working Group

Ms. Helen M. Wood

NOAA (USA)
Chair, DMSG

The Ad Hoc Working Group on Disaster Management Support (DMSG) was approved for continuation at the 14th CEOS Plenary held in Rio de Janeiro, Brazil, November 2000. The Group has published its first annual report, which emphasizes the use of Earth observing satellites for hazard support in eight hazard areas. Recommendations in the report will continue to be developed and refined, with some ready for implementation. The Group has developed and implemented a work plan to work closely with space agencies, international and regional organizations, and the commercial space sector on the implementation of these recommendations.

Since its last two meetings in Tokyo, Japan in February and in Ottawa, Canada in June, the Group has focused on writing and publishing its annual report and implementing its new work plan. The report includes a Chair's overview and reports from the eight hazard teams and an information tools team. The overview includes overarching findings and recommendations and hazard team reports include several hazard specific recommendations. Many of the recommendations are ready for implementation.

The work plan calls for hazard teams and the information tools team to continue their respective activities, as well as to address new elements. These include fostering more pro-active cooperation amongst space agencies, with international disaster organizations, and with the commercial sector. Also, DMSG is working with the CEOS Working Group on Information Systems and Services (WGISS) to find ways that DMSG can leverage tools and capabilities developed by WGISS.

Cooperation amongst space agencies

The DMSG will also work closely with the French Space Agency (CNES) and the European Space Agency (ESA) and other participating agencies in the implementation of the "Charter on Cooperation to Achieve the Coordinated Use of Space Facilities in the Event of Natural or Technological Disasters." Hazard teams will seek opportunities to initiate demonstrations of coordinated use of such space facilities related to their specific hazard area. A DMSG planning meeting in Paris, France in January 2001 focused on cooperation with the Charter participants.

Cooperation with international disaster organizations

The DMSG is working closely with key international organizations such as the United Nations International Strategy for Disaster Reduction (ISDR) and Committee on Peaceful Use of Outer Space (COPUOS) that have

roles in coordinating aspects of disaster management. The ISDR is the successor to the UN International Decade for Disaster Reduction that ended in 1999. The ISDR will focus on creating a culture for disaster prevention. COPUOS has launched a three-year work plan to develop an integrated, global disaster management support system through its Scientific and Technical Subcommittee (STSC). ISDR and COPUOS have both agreed to maintain a close liaison with DMSG regarding coordination of disaster management related to remote sensing. Cross briefings and joint activities will be pursued. In this regard, the DMSG Chair participated in a workshop on the use of Earth orbiting satellites for disaster reduction held in La Serena, Chile, in November 2000. The workshop was cosponsored by COPUOS, ESA and the Government of Chile.

Cooperation with the commercial sector

The Group's work plan calls for a closer relationship with the commercial sector. At its last meeting, the DMSG invited representatives from four commercial remote sensing operators (Spot Image, RADARSAT International, Orbimage and Space Imaging) to convene a panel that would provide perspectives on using satellite data for disaster management support. The panel was tasked to introduce the capabilities of each of their respective companies, to identify barriers to improving the use of satellite data for disaster management, and to identify potential areas for collaboration to mitigate such barriers.

Perceived barriers and some possible remedies were identified. It was recognized that requirements must be sufficiently identified; but they often are not. Funding and contracts must be in place and available when disaster strikes; they often are not. Realistic training is essential and experience is needed (e.g. through pilot projects). It was also recognized that there are no robust stand-alone solutions. Information must often be gleaned from multiple data sources and integrated into a usable format.

For more information, see the group website at disaster.ceos.org or contact DMSG Chair, Helen Wood (e-mail: Helen.Wood@noaa.gov; Tel: +1-301-457-5120; Fax: +1-301-457-5184).



CEOS Working Group on EO Education and Training

Mr. Mukund Rao
ISRO (India)
Chair, WGEdu

CEOS Working Group on EO Education and Training (WGEdu) has been charged by the 14th Plenary to formalise the CEOS Strategy for the EO Education and Training. Chair, WGEdu presented the WGEdu report to the 14th Plenary at Rio-de-Janeiro.

The WGEdu report to the 14th Plenary was based on a questionnaire survey of CEOS agencies for assessing their existing and future programmes of EO Education/Training/Professional Development and also a detailed survey of EO educational institutions of the world.

WGEdu has observed in its report that the CEOS Strategy for EO Education and Training would not be defined ab-initio but would build or provide an overarching framework on the already on-going efforts of CEOS agencies and other international agencies. CEOS could provide an effective coordination mechanism of the EO education and training efforts - where space agencies, institutions offering programmes, other experts could meet annually and exchange experiences and issues related to EO education and training. In particular, WGEdu identified following actions for CEOS:

- Work closely with education institutions, especially the recently established UN regional Centres for Space Science and Technology Education, so as to enable the outreach of EO data/services/tools/experts to the developing countries in the world.
- CEOS agencies develop/promote a wide variety of materials and teaching aids and there is need to strengthen educational institutions with these resources.
- Educational institutions need access to the variety of EO data available from the EO satellites for building applications and enabling scholars to utilize and get familiar with them. CEOS could bring together E/T institutions and space agencies to ensure diffusion of this resource to the most needy E/T institutions.
- CEOS could contribute to a curricula "standardization" activity and participate in the UN efforts for the regional Centres for Space Science and Technology Education.
- CEOS could enable initiation of education/training programmes in newer areas - Disaster Management Support, Interferometry, Global Change,

Photogrammetry, Tropical region applications, Natural Resources Management, Education/Training Technologies, High Resolution Image Analysis techniques, Hyper-spectral Imaging techniques and applications, GIS Ingest and Integrated Modelling, Web-enabled EO techniques and Information Extraction techniques. CEOS agencies and E/T institutions need to work together to address these areas for future programmes.

- CEOS agencies have professional experts in the field of EO and some of them could be forwarded to educational institutions to serve as expert faculty. The best approach seems to be for E/T institutions to directly approach CEOS agencies and work out modalities - considering the positive response of the CEOS agencies.
- CEOS WGCV, WGISS and DMSG also address issues related to education and training and there is a need to establish a formal mechanism of coordination - either as back-to-back meetings or special dialogue sessions. This is felt essential to be able to bring about a harmony amongst the WGs on this issue.
- EO E/T activities offer considerable scope for private sector participation and CEOS could consider promoting this as part of its Industry interface (through ISPRS).

14th CEOS plenary appreciated the work done by WGEdu and endorsed its report. 14th Plenary also extended WGEdu's term by one more year so as to continue developing the CEOS Strategy for EO Education and Training activities. CEOS Plenary charged the WGEdu to initiate actions on the recommendations and establish a network with like-minded institutions/organisations. Mr Sergio Camacho (UN-OOSA) was confirmed as Vice-Chair of WGEdu by the Plenary.

In 2001, WGEdu will continue its informal meetings (tele-conferencing) and will formally meet once. WGEdu also plans to organise the 2nd CEOS International EO Education and Training Workshop in coordination with UN-OOSA; the regional Centres for Space Science and Technology Education and various other international agencies like ITC, AIT, ISPRS and so on. The Workshop is planned for August/September, 2001 - either in India or in Europe. The Workshop should hopefully be able to provide inputs for defining the CEOS Strategy. The

(to be continued on next page.)

U.S. Geological Survey Joins CEOS Plenary

Mr. R. J. Thompson
Mr. Raymond A. Byrnes
USGS (USA)

At the direction of the President of the United States, the U.S. Geological Survey (USGS) assumed full responsibility for operation of the Landsat 7 space and ground segments after completing a year-long transition on October 1, 2000 from NASA operations and NOAA oversight. While the USGS will continue to work in partnership with NASA in Landsat Program Management activities, especially in regard to long-range planning, the USGS, as operator of an Earth observation satellite system, applied in late 1999 for membership in the 2000 CEOS Plenary.

On November 8, 2000, shortly after opening the CEOS Plenary, Chairman Marcio Barbosa called for and received unanimous approval by CEOS members of the USGS application. R.J. Thompson, Landsat 7 Program Manager for the USGS, gratefully accepted the agency's membership on behalf of Director Charles Groat. Mr. Thompson later provided a briefing on Landsat 7 operations that highlighted international cooperation by regional ground receiving stations in the successful collection of calibrated, seasonal, global data sets. (For further information on Landsat 7 operations and data availability see <http://landsat7.usgs.gov>)

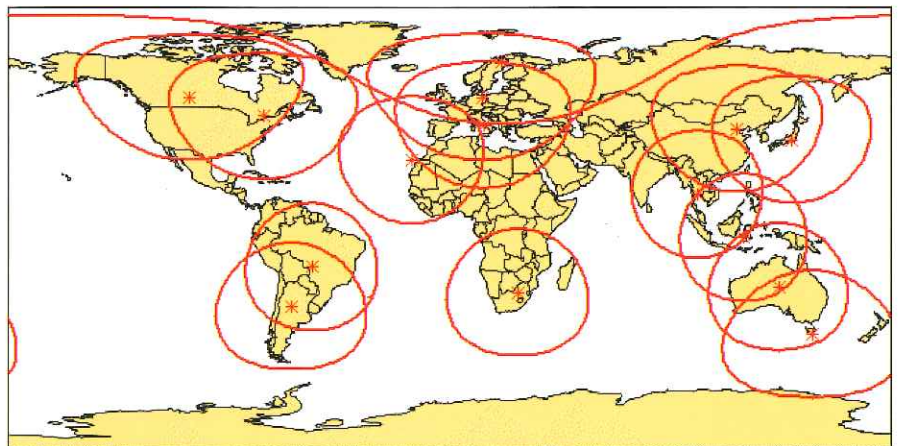
The USGS is America's primary Earth and biological science agency, gathering and providing the nation with critical geologic, biologic, hydrologic, and geographic data and information in the form of data bases, analysis

reports, maps, and images that deal with water, energy, mineral and biological resources, land surfaces, marine environments, geologic structures, natural hazards, and the dynamic processes of the earth.

The USGS has for many years been an active participant in the CEOS Working Group on Information Systems and Services and has had occasional participation in the Working Group on Calibration and Validation. In cooperation with NASA and NOAA, the Survey has also been heavily involved in the U.S. Global Change Research Program.

In addition to its vast holdings of historical satellite data sets in the National Satellite Land Remote Sensing Data Archive at the USGS EROS Data Center (Landsat 1-5 data from 1972 forward; AVHRR land-observation data from 1992 forward; and declassified national reconnaissance data from 1960-72), the USGS manages NASA's Distributed Active Archive Center for Land Data that includes products derived from Terra mission sensors (see <http://eos.nasa.gov/ims/welcome>)

The USGS looks forward to a long, productive, and mutually beneficial working relationship with CEOS Plenary members.



Landsat 7 International Cooperator Ground Station Areas of Reception

(continued from Page 10.)

WGEdu is also initiating the development of web-enabled training for professionals on EO and GIS - through a joint partnership with ISPRS Technical Commission-VI. Yet another area of activity that WGEdu will participate is in the international endeavour to address technical

curriculum and programme standardisation efforts of UN-OOSA for the regional centres - and champion them in other institutions of the developing countries.

From the CEOS Chair

Dr. Yoji Furuhashi
MEXT/NASDA (Japan)
CEOS Chairman



It is an honor and a challenge to take over the CEOS Chairmanship at the start of the 21st century. We have an excellent foundation thanks to the work of our predecessors and those who have worked so tirelessly to build this unique community.

CEOS activity, including the development of the Integrated Global Observing Strategy (IGOS), might be likened to a beautiful growing tree, planted 16 years ago, now spreading its boughs and soon to bear ample fruit. The challenge here is how to guide its growth into sunlight, every leaf flourishing green and with just enough branches for the optimum harvest.

If we turn our eyes to the surrounding landscape, numerous Earth observation satellites will be launched in the coming years. Japan will launch the Global Change Observation Mission (GCOM) series starting with ADEOS-II. In 2002, the UN Earth Summit will take place for the second time, as "Rio+10". It is particularly timely for us to intensify our efforts, along with the various international partner organizations working together to tackle the global environmental issues facing us.

Thus, the first priority of MEXT/NASDA as the CEOS Chair in 2001 will be to pursue the primary CEOS objective of international program harmonization, through our contribution to

IGOS: (1) Reinforcing the structure and technical progress of the IGOS Themes, especially Oceans and Carbon Observations - a response to the Kyoto Protocol, and the new Water Cycle Theme/CEOP; (2) Increasing the visibility of IGOS, to secure essential support from the international community; (3) Encouraging and supporting the CEOS Working Group activities, particularly to bring their accomplishments, such as the WGISS test environment concept, to the Plenary and IGOS Partners.

Another critical task is to review the results of CEOS efforts, especially relating to participation in the IGOS Partnership over the past years, and the Strategic Implementation Team (SIT) that has been the key to bridge these two. This will have special significance as we begin to look at the future of CEOS beyond IGOS.

The next Plenary will take place in the historic and ancient capital of Kyoto. We hope to welcome new space agencies from the region to CEOS. Preparations have already started for the Kyoto Plenary to be held in the week of November 5, 2001. I hereby wish you a successful year of 2001, and would like to ask for your continued support for CEOS into the next millennium.

Contributions for future issues of the CEOS Newsletter from the CEOS Members and Associates, and subscriptions to the CEOS Newsletter, please contact CEOS Japan Secretariat : ceos-jpn@nasda.go.jp or misawa@restec.or.jp http://nasda.ceos.org/ceosnews_menu_e.html

Meeting Calendar

As of February 2001

Activities	2000				2001											
	November	December	January	February	March	April	May	June	July	August	September	October	November	December		
CEOS Plenary	▲ 8-10 14th Plenary INPE, Rio												▲ 5-8 15th Plenary MEXT/NASDA, Kyoto			
CEOS WGISS (Working Group on Information Systems & Services) Subgroups/Task Team							▲ 7-11 WGISS-12/SubG USGS, Sioux Falls				▲ 24- WGISS-13 NASDA, Tokyo					
CEOS WGCV (Working Group on Calibration and Validation) Subgroups						▲ 2-5 SAR SG Workshop NASDA, Tokyo		▲ 5-7 WGCV-18 ▲ 7-8 LPV SG Workshop ESA/ESRIN, Frascati, Italy								
CEOS DMSG (Ad Hoc Working Group on Disaster Management Support)			▲ 9-10 Planning Meeting CNES, Paris					26-27 DMSG Workshop EC, Brussels								
CEOS WGEdu (Ad Hoc Working Group on EO Education and Training)											△ WGEdu Workshop-2 ISRO/UNOOSA					
IGOS/SIT (Strategic Implementation Team) Themes:	▲ 7 SIT-8 INPE, Rio		△ 8-10 Water Cycle Irvine, Calif.	20-21 ▲ GOCF Workshop ▲ 13-16 GODAE ISTD New Caledonia			31 ▲ SIT-9 CNES, Paris △ Geo Hazards UNESCO, Paris	▲ 12-14 GOCF SIC ESA/ESRIN △ IGCO Workshop, Tokyo					△ (TBC) SIT-10			
IGOS Partners	▲ 7-8 IGOS-P6 INPE, Rio							▲ 1 IGOS-P7 IOC, Paris					▲ 10/29-11/9 IGOS-P8 MEXT/NASDA, Kyoto			
Others	▲ 13-24 COP-6 Hague ▲ 7-16 SFCG-20		▲ 12-23 COPUOS Vienna 22 ▲ IWS2001 Tokyo	19-24 ▲ WCRP JSC/Boulder, US ▲ 14-16 GOOS/SC Viña del Mar, Chile		▲ 16-27 CSD-9 New York	▲ 21-29 SBSTA / COP-6 Bonn 31 ▲ G3OS UNESCO, Paris	▲ 10-13 Open Science Conf. IGBP, Amsterdam		24-29 ▲ IPCC London	▲ 1-6 IAF Toulouse		▲ 10/29-11/9 SBSTA / COP-7			

▲ : determined (Date, Host organization/Location)
△ : to be determined

CEOS-related meetings are open only to designated participants.

Published by
**National Space Development Agency
of Japan (NASDA)**
2-4-1, Hamamatsu-cho, Minato-ku,
Tokyo 105-8060, JAPAN
For inquiry:
Ms. K. Misawa, RESTEC
e-mail: misawa@restec.or.jp

For further information contact in each area allocated:

[Asia, Pacific]
Mr. C. Ishida, NASDA
TEL:+81-3 3438 6318
FAX:+81-3 5401 8702
e-mail:ishida.chu@nasda.go.jp

[North & South America]
Ms. L. Charles, NASA
Dr. B. Smith, NOAA
TEL:+1-202 358 0793
FAX:+1-202 358 2798
e-mail:leslie.charles@hq.nasa.gov,
brent.smith@noaa.gov

[Europe, Africa]
Dr. S. Bruzzi, ESA
TEL:+33-1 5369 7550
FAX:+33-1 5369 7735
e-mail:sbruzzi@hq.esa.fr