

**MINUTES OF THE COMMITTEE ON EARTH OBSERVATION SATELLITES
(CEOS)**

13th PLENARY MEETING : 10-12 NOVEMBER 1999, STOCKHOLM

(Papers and background material related to individual agenda items are cross referred to in the minutes)

1 INTRODUCTION

The 13th Plenary was conducted under the chairmanship of EUMETSAT and hosted in association with the Swedish National Space Board (SNSB). The meeting was held from 10-12 November 1999 at the Royal Swedish Academy of Sciences (IVA) in Stockholm. A total of 88 delegates from 19 Member and 12 Associate organisations attended. A list of the participants is set out at **Annex 1**.

2 WELCOME CEREMONY

Dr Tillmann Mohr, Director General of EUMETSAT and 1999 CEOS Chairman, started the meeting by inviting Dr Per Tegnér, Chairman of SNSB to give an opening address on behalf of the Swedish Minister for Industry.

Dr Tegnér warmly welcomed delegates to the 13th CEOS Plenary and expressed his delight at the large turn out, noting with particular pleasure the significant number of lady delegates. He was grateful to Eumetsat for providing Sweden with the opportunity of hosting the meeting, which he thought appropriate given Sweden's ambitions in space, notably in the field of Earth observation from satellites. As a long-standing member of both CEOS and the European Space Agency (ESA), Sweden sought to foster the transition from space science into beneficial applications. Sweden had developed important ground station facilities at Kiruna. It was a participant in relevant ESA programmes and was a partner in the French-led SPOT Earth observation programme. It was planning to launch its own ODIN satellite in the Spring of 2000. Though not very large, the Swedish space industry played an important part in their space activities through such key companies as Ericsson.

In conclusion Dr Tegnér drew attention to growing demands at all levels for better environmental protection and the crucial role Earth observation techniques were assuming in monitoring and measuring the effects of measures taken to achieve that goal. He saw CEOS as fulfilling a vital function in that particular context, and consequently the meeting took on a particularly important dimension. He wished delegates every success in their deliberations.

Responding, Dr Mohr shared Dr Tegnér's sentiments about the increasing impact of CEOS activities on emerging environmental protection initiatives. He highlighted as significant achievements in the course of a busy year : significant progress in implementing IGOS; taking full advantage of the platform offered by Unispace III; reinforcing contacts with relevant UN Convention Secretariats at COP 5; widening promotion of CEOS activities in various fora; the output of the Working Groups; and continuation of dialogue with the private sector. Dr Mohr welcomed CONAE and IOCCG as applicants to join CEOS and then thanked Swedish colleagues for their efforts in making excellent arrangements for the Plenary.

Finally he noted that letters regretting unavoidable absence had been received from Messrs Barbosa (INPE), Dahl (UNEP) and/or Asrar (NASA).

3 ADOPTION OF AGENDA

Dr Mohr proposed Document, **CEOS/13/99/AGN Rev 3**, as the agenda for the meeting and this was adopted. A copy is at **Annex 2**.

4 RECORD OF THE 12TH CEOS PLENARY

Mr Mukund Rao (ISRO) presented the 12th CEOS Plenary Minutes with a short overview of the key decisions taken at Bangalore. Plenary then adopted the minutes as presented in Document, **12th CEOS/Min/1**.

Reviewing the actions from the 12th Plenary, Dr D Williams (Eumetsat) reported that 17 of the 19 actions had been completed. The two outstanding actions, (Action 12/17 - CEOS representation at the 2nd ESCAP Ministerial Meeting; and Action 12/19 - CEOS participation in the World Conference in Science), would be dealt with off-line.

5 REPORT OF CEOS CHAIRMAN

Summarising the main activities of 1999, (**Refer Document CEOS/13/99/Doc/22**), Dr Mohr highlighted the following achievements :

- **IGOS** : IGOS-P had been firmly established and the partnership was working well.
- **SIT** : Significant progress had been made under the admirable leadership of Mr R Winokur (NOAA).
- **Unispace III** : The CEOS presence, primarily through the IGOS Forum, had borne fruit both in terms of opening up IGOS opportunities and of securing wider publicity for CEOS activities as a whole. Thanks were due in particular to FAO for their preparatory work.
- **Contacts with the Private Sector** : Dialogue with the Private Sector continued in side meetings in the course of Unispace III and of the IAF Plenary. The Secretariat ascertained that there is no pressure for Private Sector membership of CEOS, but that they have a strong desire to maintain contact and to exchange information and opinions on developments.
- **CEOS Working Groups** : Dr Mohr had attended a WGCV meeting and had been represented at a WGISS meeting. He had been impressed by the substance of the work undertaken, and would be offering guidance later in the meeting on integrating the efforts of the Working Groups more closely with the overall workings of CEOS.
- **CEOS Secretariat** : The CEOS Secretariat had worked hard throughout the year, coordinating their activities through meetings, telephone conferences and e-mail. Dr Mohr paid tribute to their efforts.

6 MEMBERSHIP ISSUES

Dr L Charles (NASA), speaking for the Secretariat, introduced two applications to join CEOS which had been received in 1999, (**Refer Document CEOS/13/01 and related Annexes**).

One was from the Comision Nacional de Actividades Espaciales (CONAE), the national space agency of Argentina, for full membership status. The other was an application for associate status from the International Ocean Colour Coordinating Group (IOCCG). Dr Charles pointed out that both applicants met the CEOS criteria for the type of membership sought. She also reported that IOCCG had undertaken to work closely with GOOS within IGOS in identifying requirements.

Commenting on the IOCCG application, Prof D Southwood (ESA) supported their admission on the specific merits of their case, but warned against treating this as a precedent in dealing with any future applications from entities closely linked with existing CEOS Associates. From a GOOS standpoint, Dr P A Bernal (UNESCO/IOC) said identification of all requirements of a particular type from a single source would be beneficial to the IGOS process.

Plenary approved both applications as follows :

- CONAE to become a CEOS Member;
- IOCCG to become a CEOS Associate.

Thanking plenary for their confidence, Dr C Varotto (CONAE) outlined the main elements of Argentina's space programme, much of which was involved in Earth observation activities and consequently relevant to CEOS.

Dr T Platt (IOCCG) said that his organisation was delighted to be accepted as a CEOS Associate and very much welcomed the opportunity to contribute directly to IGOS. He confirmed IOCCG's intention of inviting GOOS representatives to future meetings involving GOOS issues and indicated IOCCG's willingness to advise IOC on ocean colour matters.

7 CEOS PARTICIPATION IN IGOS PARTNERSHIP

Dr Mohr explained that the purpose of this item was to :

- report to CEOS on developments in IGOS-P during 1999;
- advise CEOS representatives on the issues arising at the IGOS-P meeting later that day;
- prepare a common CEOS position on issues being considered at the IGOS-P meeting later that day.

7.1 IGOS-P Briefing

Reviewing IGOS-P activities in 1999, (**Refer Document CEOS/13/Doc/02**), Dr D Williams (EUMETSAT) highlighted the main developments as :

- All IGOS Partners had formally confirmed their membership of IGOS-P and their acceptance of the Partnership terms of reference.
- The 3rd IGOS-P meeting, hosted by FAO in Rome, had re-iterated support for a "theme approach" to IGOS.
- The Oceans Theme was accepted as a path-finder.
- Two further theme proposals had come forward following the 3rd IGOS-P meeting. These were :
 - a Disaster Application Theme, together with an associated proposal for a CEOS ad-hoc group on the same subject;
 - a Terrestrial Carbon Cycle Theme.

- An updated Themes paper and an IGOS process paper, (**Refer Documents CEOS/13/Doc/18 and CEOS/13/Doc/20 respectively**), had been circulated as information documents for the 13th Plenary.
- Activities promoting awareness of IGOS, including in particular the IGOS Forum at Unispace III, had been undertaken during the year.
- A paper on data and information management issues, (**Refer Document IGOS-P/4/04+Add.1**) had been prepared for consideration at the 4th IGOS-P Meeting.

7.2 IGOS Space Component

Dr D Williams (EUMETSAT) explained that the concept of a document defining the space component of IGOS had been overtaken by the integration of both space and in-situ requirements embodied in the pilot projects, and currently in the "theme approach", (**Refer Document CEOS/13/Doc/03**). The factual description of space requirements would now be incorporated within individual theme structures and by that token would constitute the definition of the space component for that particular theme. A definition of the space component divorced from specific themes was neither desirable nor necessary. Mr R Landis (WMO) questioned how the Partners would test integrated systems within themes. Dr Williams said that the CEOS/WMO database, which was planned eventually to be a descriptor of both space and in-situ components, would be the tool for assessing such systems. Reporting on the status of the CEOS/WMO database, Dr D E Hinsman (WMO) said that some agencies had still to provide their inputs to the 1999 updating process. He urged that this should be done as soon as possible and he asked that the new CEOS Member, CONAE, and Associate, IOCCG, also provide inputs.

Responding to this discussion, the CEOS Chairman, Dr Mohr, asked Dr Hinsman to contact those agencies still to update their database entries for 1999 and to seek early inputs from them, as well as from the two new members.

[Actions 13/1 and 13/2 - Dr D E Hinsman (WMO), CONAE and IOCCG]

7.3 SIT Report

Mr R S Winokur (NOAA), Chairman of the Strategic Implementation Team (SIT), reviewed the activities of SIT in 1999, (**Refer Document CEOS/13/Doc/04**). He recalled that the 12th Plenary had approved the continuation of SIT in 1999, tasking it to evaluate the lessons gained from the pilot projects, to foster the move from a project strategy to a theme approach to future implementation of IGOS, to continue to develop the space component of IGOS, to respond to space requirements identified in projects and themes and to work throughout in close cooperation with the IGOS Partners.

At its 4th meeting in January SIT received reports from project leaders or their representatives, provided a collective response to project requirements and facilitated the transition of IGOS elements within projects to current or prospective themes. It agreed to take forward the thematic approach, endorsed criteria for selecting future IGOS activities and proposed the Oceans Theme as a path-finder with NASA as the lead. In a move to increase visibility of IGOS, SIT also commissioned at its 4th meeting production of an IGOS brochure, led by NASDA, and an IGOS bulletin, led by CNES.

At the 5th SIT meeting in June discussions with the Oceans Theme Team Leader, Dr E Lindström (NASA) clarified the shaping and content of the report to be submitted to IGOS Partners. Encouragement was given to bringing forward proposals for new themes on Disaster Application (following on from the earlier IGOS pilot project), and on the Terrestrial Carbon Cycle. Preparations were made, too, for giving IGOS visibility at the UNFCCC COP 5 meeting in October.

Overall Mr Winokur thought SIT had made good progress over the year. There was in his view still a role for SIT to play and a consensus of team members supported its continuation for another year.

7.4 GOSSP Status Report

Professor F Bretherton (Chairman) outlined the involvement of the G3OS Space Panel (GOSSP) in the IGOS process and their assessment of progress. GOSSP had participated in the Oceans Theme Report to Plenary, (considered under Item 11), and believed it correctly identified the issues to be resolved. Timely resolution of these was now necessary.

From their experience of the Oceans Theme work, GOSSP recognised that the CEOS/WMO database was a useful tool. However, they identified several shortcomings. In the integration of space-based and in-situ requirements, the database was angled too heavily towards the space side. They used input from the GODAE and Ocean Biology projects to circumvent the problem in the case of the Oceans Theme, but this was a temporary expedient and the in-situ side of the database needed improvement. Furthermore GOSSP concluded that the database ought to extend its knowledge base to data-derived products, since without an appreciation of the latter there was no easy way to judge results.

7.5 CEOS Position

Dr Mohr invited discussion on three emerging issues on which the Plenary needed to establish a CEOS position in preparation for the ensuing IGOS-P Meeting. These were :

(i) Oceans Theme Paper (**Refer Document Dual No CEOS/13/Doc/18 and IGOS-P/4/Doc/08**)

Plenary representatives were content with the broad thrust of the paper, but the following reservations were expressed :

- clearer proposals were needed on how integration of space and in-situ observations would be effected - Dr P A Bernal (UNESCO/IOC)
- the paper should be more closely aligned with the IGOS criteria to indicate how recommendations were to be taken forward - Prof D Southwood (ESA)
- the scope of the theme was too broad; a breakdown into smaller elements would for instance make it easier to handle ocean carbon - Dr S Briggs (BNSC); Dr E Shaw (CCRS); Dr T Platt (IOCCG); Mr P Van der Westhuizen (CSIR).
- The paper should bring out the policy drivers more clearly - Dr E Shaw (CCRS)

Dr Lindström acknowledged a measure of mismatch with the IGOS criteria in his paper, explaining that as a path-finder the Oceans Theme Team had been working to a SIT-driven action plan rather than to specific criteria.

Dr Mohr concluded that, while the paper was a valid basis for seeking space component commitments, the discussion had indicated some deficiencies, especially on the in-situ side, and some refinement was needed. As Plenary concurred with his summing up, Dr Mohr asked for an updated version of the paper to be produced by mid-January 2000 for consideration by SIT at its next meeting.

[Action 13/3 - Dr Lindström]

(ii) Disaster Application Theme (**Refer Document IGOS-P/4/Doc/02 + Annex**)

Ms H Wood (NOAA) set the discussion in context, explaining the respective roles of the proposed new theme and a proposed new CEOS working group. Essentially the latter would continue the overall work of the original IGOS project including non-IGOS issues and the new theme would deal with specific IGOS matters arising from the work of the new group.

A number of representatives supported the proposal to have a theme in parallel with a CEOS group. Mr C Patermann (EC) underlined the global aspect of disaster management work which necessitated an international approach beyond the space contribution. Prof L Dingsheng (NRSCC) concurred and considered that the proposed structuring would generate an important contribution to planning at the international level. Dr J-L Fellous (CNES), Mr C Ishida (NASDA) and Mr M Rao (ISRO) felt that the proposed group and theme would be complementary and that the CEOS activity should be continued for some time for fear of losing momentum. Other representatives were uneasy about having both a CEOS group and an IGOS theme. Dr S Briggs (BNSC) favoured focusing the work under an IGOS theme, while Prof D Southwood (ESA) preferred to continue the activities under a CEOS group. Mr R Landis (WMO) said that, following the decade for disaster reduction activity, a new body was being set up to carry forward strategy for disaster reduction. CEOS was envisaged as participating in one of the groupings under the new body.

With the agreement of Plenary, Dr Mohr concluded that he should indicate to IGOS-P that there was majority support within CEOS for initiating a Disaster Application Theme. If overall IGOS-P opinion favoured setting up such a theme, he would seek to allay the doubts of those CEOS representatives with reservations.

(iii) Terrestrial Carbon Cycle Theme (**Refer Document IGOS-P/4/Doc/09**)

Recalling the background to this proposal, Mr J Tschirley (GTOS) said that IGOS-P had decided to investigate this prospective theme at its 3rd meeting in Rome. Mr J Cihlar (CCRS) had drawn up the proposal now to be considered by IGOS-P, which envisaged a dual approach embracing the activities of atmospheric modellers and taking in inputs from individual local sites. The broad aim was to proceed along the lines adopted by the Oceans Theme.

While Prof J Townshend (SIT) supported the need to set up a carbon theme, he questioned whether this should not be pitched on a global rather than on a terrestrial scale. Many representatives echoed this view, pointing out that the ocean element was a critical aspect of a carbon analysis so that a global approach was desirable. Mr C Patermann (EC) welcomed the proposal as promising to make an important contribution to the work initiated under the Kyoto Protocol on carbon sinks.

Dr Mohr concluded with the agreement of Plenary that CEOS was ready to proceed with a carbon theme, but on a global level encompassing both terrestrial and ocean elements.

8 EO EDUCATION/TRAINING IN DEVELOPING COUNTRIES

Mr M Rao (ISRO) presented a paper (**Refer Document CEOS/13/Doc/09**) on measures for strengthening education and training on Earth observation techniques in developing countries. Against a background of widening use of such methods combined with non-space data such as integration with GPS/GIS data, Earth observation from space was potentially a useful tool for developing countries in tackling a range of developmental problems in areas such as crop, forest, urban, water resource and land management. A number of education/training initiatives in use of space data were under way, including a network of UN regional centres, programmes for graduate students by EURISY, ISU and various regional institutions. CEOS was in a good position to provide a focus in the field of EO education/training and the paper therefore proposed the creation of a CEOS task group for one year to develop a strategy and an action plan for CEOS involvement in this area.

Mr J F W Purdom (WMO) described a WMO education/training programme in this area which was structured round centres of excellence for trainers. Many representatives expressed their strong support for the ISRO proposal. Dr Mohr referred Plenary to **Resolution CEOS/Doc09/Res.1** (attached at **Annex 3**) which invited ISRO to lead the proposed ad-hoc working group. Plenary passed this resolution.

[Action 13/4 - CEOS Participants]

9 INTERACTION WITH PRIVATE SECTOR

Introducing this subject, (**Refer Document CEOS/13/Doc/10**), Dr D Williams (EUMETSAT), reported that a number of informal discussions had taken place during the year with senior representatives of EO companies, including those at two side meetings in the margins of the Unispace III and IAF Conferences. While industry were not pressing for membership of CEOS, they wished to maintain contact and continue a regular dialogue.

Mr L Fritz (ISPRS) said that ISPRS had set up an advisory committee to oversee the interface with CEOS, but that the issue was complex and rapid progress was unlikely. Dr G W Withee (NOAA) recognised the benefits of keeping in touch with the private sector EO community and NOAA was interested in finding ways of working with it. As incoming WGISS Chairman, Mr P Churchill (EC) said there was increasing need to exchange views with the private sector in the field of information systems and services. While endorsing these comments, Prof D Southwood pointed out the need to ensure that all sides of industry were represented in such interaction and suggested operating through trade associations. Mr G Schreier (DLR) drew attention to the fact that the current UN legal framework surrounding space activities was attuned to national state rights and obligations and made no distinction between public and private sector activities.

On the basis of the views expressed, Dr Mohr drew the following conclusions :

- At least one meeting should be arranged in 2000 to further the dialogue with the EO private sector. The CEOS Chairman in 2000 is recommended to arrange with the help of NOAA and ISPRS such a side meeting in the margins of the IAF Conference scheduled to be held that year in Brazil.

[Action 13/5 - 2000 CEOS Chairman]

- The CEOS Chairman was encouraged to work closely with ISPRS in dealing with the various parts of the EO private sector community.

[Action 13/6 - 2000 CEOS Chairman]

- The CEOS Secretariat should make a consolidated report to Plenary on the outcome of meetings and contacts with the EO private sector.

[Action 13/7 - CEOS Secretariat]

- CEOS members are encouraged to arrange meetings with the EO private sector at national or regional level as appropriate.

[Action 13/8 - CEOS members]

- CEOS Working Groups should continue to encourage the participation of the EO private sector in their work.

[Action 13/9 - Working Group Chairmen]

10 WORKING GROUP RECOMMENDATIONS

10.1 Chairman's Report

Introducing his note on the activities of the Working groups (**Refer Document CEOS/13/Doc/05**), Dr Mohr said that he had made a special effort to keep in touch with the Working Groups in recognition of their valuable work. Having been present at a WGCV meeting and been represented at a WGISS meeting, he was in no doubt that the groups were performing an important function. However, he doubted whether CEOS was making best use of the output from the groups. This was in his view largely due to shortcomings in the reporting procedures employed by the groups in their dealings with Plenary. His impression was that the groups tended to formulate their recommendations in too general terms with the result that Plenary often accepted them without appreciating the implications for individual members. Accordingly he had advised the groups to couch their recommendations in future in more specific, concrete terms. He also felt that more formal procedures should be introduced to govern the development of products and tools, the submission of proposals for their adoption to individual Plenary members and the subsequent approval and utilisation of these by Plenary members.

Endorsing the Chairman's views, Prof D Southwood (ESA) said that ESA department heads decided on representation on the groups according to the perceived benefits likely to accrue from representation. Dr Mohr thought, by the same token, that when members designate representatives to serve on groups they should ensure adequate funding for them to make an effective contribution.

10.2 WGCV Recommendations

The Chairman of WGCV, Dr A Belward (EC) outlined the activities of the group in 1999, (**Refer Document CEOS/13/Doc/07**). He singled out as key developments :

- The establishment of links with some National Standard Laboratories aimed at ensuring traceability in sensor calibration, and the plan to set up a one year study group to examine this issue.

- In response to needs identified by the GOFC Pilot Project and by a combined WGCV/ISPRS workshop in May, a new sub-group was planned to examine land surface parameter validation.
- WGCV may have a role to play in harmonisation of parameter measurements for atmospheric chemistry and seeks to identify relevant points of contact to consult on this issue.

Dr E Shaw and Mr J Cihlar (CCRS), and Dr D Jupp (CSIRO), urged support for WGCV activities particularly on validation of high level products. Prof F Bretherton (GOSSP) said that GOSSP was beginning to recognise traceability as an issue, since traceability back to original radiances was needed when algorithms changed. Prof D Southwood (ESA) said ESA would be unable to field a representative for the proposed traceability sub-group unless it met simultaneously with the main WGCV meeting. Dr Belward (Chairman WGCV) confirmed that it was indeed the intention for the traceability sub-group to meet within the framework of the main WGCV meeting. Prof Southwood also explained that given its multi-national character ESA did not consider it appropriate for them to identify a "partner" National Standards Laboratory as requested in the second WGCV recommendation.

Taking account of the comments made, Dr Mohr obtained the following commitments from Plenary in response to WGCV recommendations :

- CEOS participants would nominate representatives for the ad-hoc sub-group on traceability on the understanding that it would meet at the same time and location of plenary WGCV meetings.

[Action 13/10 - CEOS Participants]

- Where appropriate CEOS participants would identify a "partner" National Standards Laboratory to take part in WGCV meetings.

[Action 13/11 - CEOS Participants]

- CEOS participants would nominate representatives for the new sub-group on Land Surface Parameter Validation and would support their nominee's attendance at at least one meeting in 2000.

[Action 13/12 - CEOS Participants]

- CEOS participants would identify individuals leading their atmospheric chemistry validation programmes.

[Action 13/13 - CEOS Participants]

- CEOS participants would participate in a vicarious sensor calibration campaign results intercomparison workshop.

[Action 13/14 - CEOS Participants]

Item 10.3 was transferred to item 11 as it was closely linked to a related theme proposal under the latter.

10.4 Spectrum Management

On behalf of Dr K Maeda (NASDA and Chairman of the ad-hoc Spectrum Management Group) Mr C Ishida (NASDA) introduced the report of the group. He emphasised the significance of the CPM-99 meeting taking place the following week in Geneva as a key milestone in preparation for the WRC-2000 Conference on frequency allocation. He identified the frequency bands where CEOS members needed to consider proposals to ensure the protection of EO frequencies. Mr Ishida then tabled a resolution identifying specific agenda items which CEOS members should support in CPM-99 and WRC-2000.

Mr A Cross (EU) drew attention to a recent EU document which opened the way for links between EC observers at CPM-99 and WRC-2000 and CEOS participants in spectrum management discussions.

Following a general expression of support from members, Dr Mohr recognised that the work of the group was of crucial importance to CEOS space agencies and he wished to convey Plenary's thanks to Dr Maeda and his colleagues for their efforts. He thought it preferable in future to put this work on a more formal footing and therefore proposed that Dr Maeda should act as a rapporteur reporting back to CEOS. Plenary agreed that Dr Maeda should be asked in future to act as CEOS rapporteur on international negotiations on frequency allocation and decided to support the specific proposals set out in **Resolution CEOS/13/Doc/08/Res 4** (attached at **Annex 4**).

10.5 WGISS Recommendations including GOIN

Reviewing the achievements of WGISS in 1999, Mr T Moriyama (NASDA and WGISS Chairman) identified the highlights which included :

- The GLOBE Team successfully completed its task on global representation of land surface elevations.
- Catalogue interoperability was now a practical reality through WGISS development of the CIP protocol.
- WGISS set up a task team to conduct an evolution study of the GOIN network, put in place by the USA and Japan. The team will recommend a framework for exploitation of GOIN benefits to the 2000 CEOS Plenary.
- The CEOS Information Infrastructure put in place on the web by the CII team became operational in April 1999.
- Outreach initiatives included production of a WGISS brochure and the forging of links with the GIS community and other relevant organisations.

Dr E Shaw (CCRS) suggested WGISS should extend its collaboration with the geomatics community. Mr P Churchill (EC and incoming WGISS Chairman) gave a short presentation on the main themes WGISS would be pursuing over the coming two years. The directions to be followed would include that suggested by Dr Shaw.

Dr Mohr thanked WGISS and in particular Mr Moriyama for the achievements under his chairmanship. In the interest of securing better uptake of results he proposed to Plenary that in future submissions on new products and tools should be made to individual members before recommendations on their use were made to Plenary. Plenary agreed to this procedure and decided it should be applied to all CEOS groups.

[Action 13/15 - Working Group Chairmen]

Plenary then adopted the WGISS recommendations set out in **CEOS/13/Doc/06/Res.5** (attached at **Annex 5**).

Dr. G Withee (NOAA) and Mr Y Miki (STA) set the scene for a GOIN demonstration which was led by Mr M Schwaller (NASA) and which extended into the lunch break.

11 Discussion of Recommendations from 4th IGOS

11.1 Report on IGOS-P 4

Dr D Williams (EUMETSAT) reported the outcome of the 4th IGOS-P. The main points were:

- In-situ measurements - Mr Landis' paper on this subject was discussed. Comments should be sent to Mr Landis who will prepare a revision in time for discussion at the 5th IGOS-P meeting in mid 2000.
- Oceans Theme - Dr E Lindström will update the interim paper and distribute a revised version by 15 January, for discussion at the 6th SIT meeting on 26/27 January 2000 where initial indications on space contributions will be expected. Status reports on space (SIT) and in-situ (Dr Bernal) positions will be given at the 5th IGOS-P meeting.
- Disaster Application - While recognised as an important area of activity, some doubt was evident about the way to proceed. NOAA will consult IGOS Partners further and, if the responses merit it, will produce a revised proposal for a future IGOS-P meeting, indicating the degree of conformity with IGOS theme criteria.
- Terrestrial Carbon Cycle - IGOS-P tasked a team to develop a Terrestrial Carbon Cycle Team within a global carbon approach. GTOS would lead this with support in particular from IGBP and FAO. Partners would nominate team participants by end November 1999. An ocean carbon cycle element would be included in the Oceans Theme Report. Partners would nominate participants for this part of the Oceans Team by end November 1999. IGOS-P decided to initiate an over-arching activity to link the terrestrial and ocean elements of the global carbon cycle. G3OS would make a start on organising this with GCOS, IGBP, GTOS, and NASA all involved. These partners would decide which organisation should lead the activity.
- IGOS Process - IGOS-P agreed **Document CEOS/13/Doc/20** should be a living document updated periodically to take account of experience gained in running themes.
- Data Management - **Document IGOS-P/4/04** was agreed as covering an issue worthy of further consideration. Volunteers were invited to join Prof J Townshend (SIT) in a group of interested participants to develop the subject further and to report to the IGOS-P 5th meeting.
- COP 5 - The efforts of IGOS Partners, particularly GCOS, GOOS, NOAA, EUMETSAT and the EC, in participating in COP 5 were commended. The incoming IGOS-P Chairman, Mr R Landis (WMO), in cooperation with GCOS, would lead IGOS-P preparations for COP 6. UNEP would continue to lead in building up closer cooperation with UN Convention Secretariats.
- Next Meeting - The IGOS-P 5th meeting would be held on 7 June 2000 in Geneva.

11.2 Oceans Theme Recommendations

Dr E Lindström briefly summarised the Oceans Theme Report (**Refer Document CEOS/13/Doc/19**) giving a flavour of the recommendations for consideration by the next SIT meeting. He said a key feature would be those recommendations for making the transition into operational activities. As an example he cited the ERS/QuikSCAT ocean winds measurement plan for transition to an operational basis. The key requirement in that instance was to close the observational gaps in current planning in the post-2004 period. An early decision was needed in this connection on flying a scatterometer on a Japanese satellite. In updating the Oceans Report, Dr Lindström would endeavour to present required scenarios together with associated timelines.

Dr Mohr thanked Dr Lindström and his team for their work. He asked SIT to be ready to address specific recommendations which would be contained in the update of the Oceans Report and to report the outcome to the 2000 CEOS Plenary.

[Action 13/16 - SIT]

11.3 Involvement in New Themes/Groups

(i) Disaster Application Theme and Disaster Management Support Group (**Refer Documents CEOS/13/Doc/21 + Annex and IGOS-P/4/Doc/02 + Annex**)

Dr Mohr reminded Plenary that IGOS-P had been uncertain at their 4th meeting on the previous day about the way forward on a Disaster Application Theme. Accordingly NOAA had agreed to consult Partners further and to report the outcome to a future IGOS-P meeting. He then invited Ms H Wood (NOAA) as leader of the IGOS Disaster Management Support Pilot Project to present the proposal for a CEOS Disaster Management Support ad-hoc group.

Setting the scene, Ms Wood briefly reviewed the activities of the DMS Pilot Project in 1999. She went on to distinguish between the proposals for setting up an IGOS theme team and for an ad-hoc CEOS group. The group would continue the essential function of the former project as a forum to identify, and interact with, current and potential users of space-derived data as one of the tools to deal with disasters. As well as providing this crucial channel in identification of observational requirements, the group would address policy and technical issues extending beyond the role of the proposed theme team, which was intended to focus on a comparison of requirements against capacity and on taking steps to correct any mismatches between the two. In the course of their activities the group would pass on the results of their identification and refinement of user requirements.

A number of Plenary representatives registered strong support for the creation of such a CEOS ad-hoc group. Dr Mohr established that there was overall support for the proposal and Plenary passed resolution, **CEOS/13/Doc/21/Res.3** (attached at **Annex 6**), creating a CEOS ad-hoc working group on Disaster Management Support and setting out its terms of reference.

(ii) Terrestrial Carbon Cycle Theme 9 (**Refer Document IGOS-P/4/09**)

Dr Mohr recalled that IGOS-P had on the previous day tasked a team to develop a Terrestrial Carbon Cycle Theme. He pointed out that nominations for the team were requested, and he asked CEOS participants to do this by the end of November 1999, sending copies simultaneously to the SIT and IGOS-P Chairmen and to the CEOS Secretariat.

[Action 13/17 - CEOS Participants]

Turning to the related IGOS-P decision to include an Ocean Carbon element in the Oceans Theme Report, Dr Mohr asked for nominations for participation in this activity to be made also by the end of November 1999.

[Action 13/18 - CEOS Participants]

11.4 Future of SIT

Bearing in mind the progress in the development of IGOS stimulated by the SIT, Mr R Winokur (Outgoing Chairman) judged that it still had a vital role to play in sustaining the momentum so far generated. He therefore recommended the continuation of SIT for another year and commended Dr J L Fellous (CNES and current Vice Chairman) as his successor in the chair. Dr Mohr thanked Mr Winokur warmly for his sterling work as Chairman in the past year. He established that there was overall Plenary support for continuation of SIT throughout 2000. Mr Y Miki (STA) accepted appointment as Vice Chairman of SIT. Plenary passed **Resolution CEOS/13/Doc11/Res.2** (attached at **Annex 7**), reflecting these decisions and setting SIT tasks for 2000.

12 UNISPACE III

12.1 Report on CEOS Participation

Reporting on Unispace III (**Refer Document CEOS/13/Doc/12**), Mr S Camacho (UNOOSA) said that CEOS had made an important contribution to the Conference, with the IGOS strategy being one of the more structured initiatives to be pursued. A major outcome of the Conference had been the adoption of the "The Space Millennium : Vienna Declaration on Space and Human Development." The strategy to address global challenges set out in the Vienna Declaration called for measures to :

- use space technology to enhance human security and welfare;
- enhance education and training opportunities;
- increase public awareness of the importance of space activities
- strengthen and reposition space-related activities in the UN system

Following on from the Vienna Declaration a draft General Assembly resolution had been drawn up requesting the Secretary General to recommend measures ensuring adequate resources to implement follow-up actions to Unispace III recommendations. This resolution had been adopted by the Fourth Committee of the General Assembly and would be referred to the General Assembly Plenary for adoption in December 1999.

12.2 Opportunities for CEOS

Included in the opportunities set out in the Annex (**Refer Document CEOS/13/Doc/13 + Annex**), which Mr M Rao (ISPRO) introduced were calls for :

- Development and implementation of IGOS and the creation of comprehensive long term global observation data sets.
- Improved management of Earth's natural resources by coordination of remote sensing systems.

- Enhanced climate and weather forecasting by expanding international cooperation in meteorological satellites.
- Implementation of an integrated global system for managing natural disaster mitigation.
- Enhancing education and training opportunities by capacity building, awareness programmes and establishing national mechanisms to coordinate training activities.

Dr Mohr felt that some feedback mechanism was necessary on follow up to these opportunities. Accordingly he asked the Secretariat to arrange for the topic to be on the Plenary agenda, and invited UNOOSA to advise the CEOS Secretariat on a suitable feedback mechanism so that they could report to the 2000 CEOS Plenary.

[Action 13/19 - UNOOSA and CEOS Secretariat]

13 OUTREACH ACTIVITIES

Dr D Williams (EUMETSAT) reviewed the events where CEOS had been represented during the year, (**Refer Document CEOS/13/Doc/14**). He went on to underline the importance of having a CEOS presence at key space-related events and reminded participants of the desirability of informing the CEOS Secretariat of impending events of this kind.

14 FORWARD LOOK

Dr Mohr spoke to his paper on the way forward, (**Refer Document CEOS/13/Doc/15**). On internal matters he saw no need to change the terms of membership. He thought the current tri-partite structure of the secretariat worked well, though it represented a significant burden on those involved. The arrangement of having outgoing, current and future Chairmen involved in the workings of CEOS had also proved effective and he was ready to play his part next year in helping the new Chairman. Dr Mohr made a plea for high level attendance at the Plenary. Turning to the outward-looking side of operations, he underlined the importance of IGOS and of providing a creditable CEOS input. Finally he stressed the importance of outreach activities, pointing out that it was up to all participants to get across the message about CEOS and its initiatives.

Dr Mohr invited participants to give support to these reflections in the future. Dr D Southwood (ESA) took the opportunity of introducing Dr S Bruzzi who was taking over from Dr H Arend as the ESA representative on the CEOS Secretariat. Welcoming Dr Bruzzi, Dr Mohr paid tribute to the significant contribution Dr Arend had made to the work of the Secretariat and, with Plenary's concurrence, he undertook to write to Dr Arend conveying the thanks of CEOS for his efforts.

[Action 13/20 - Dr Mohr]

15 PLENARY PLANNING

Dr Mohr invited Dr V Kirchhoff (INPE) to update Plenary on plans for the Plenary meeting in 2000, (**Refer Document CEOS/13/Doc/16**).

Dr Kirchhoff said the Plenary meeting would take place 8-10 November 2000 in Brazil. The exact location had yet to be decided.

Mr Y Miki (STA) confirmed that Japan would take over the chairmanship in 2001 and the Plenary meeting would be held in Kyoto.

Dr Mohr thought it desirable to have a mid-term meeting of outgoing, current and incoming Chairmen, preferably at around the time of the IGOS-P meeting in June 2000.

[Action 13/21 - incoming Chairman]

Prof D Southwood (ESA) re-iterated ESA's offer to take over chairmanship in 2002.

Dr G Withee (NOAA) indicated that the NOAA would offer to take over chairmanship in 2003. Dr Mohr noted this with thanks.

16 ANY OTHER BUSINESS

Dr A Belward (Chairman WGCV) announced he would be stepping down from the Chairmanship of WGCV at the Plenary in 2000 and he asked participants to consider putting forward early nominations for the Chair. Dr Mohr proposed with Plenary's concurrence that the new designate Chairman should become Vice Chairman of WGCV for 2000. Accordingly he invited participants to put forward nominations as soon as possible and not later than the end of 1999.

[Action 13/22 - Participants to nominate candidates for Chair/WGCV before end 1999]

Mr J L Fellous (Chairman SIT) announced that the next meeting of SIT would take place on 26/27 January 2000 in Paris.

17 SIGNIFICANT EVENTS REPORTS

Dr Mohr took the view that the CEOS Consolidated Report provided an adequate vehicle for recording significant events in the course of the year reported by participants. It was accepted that for the future, oral interventions in plenary should be restricted to significant recent events, with written reports being provided in advance to the plenary for information. As that had not been the prescribed procedure in the current year, he invited those participants who wished to give oral reports. The following participants then gave such reports: INPE, ISRO, ESA, CSA, ASI, NASDA, NOAA, NRSCC, EC, CSIRO and CNES.

18 TRANSFER TO NEW CHAIRMAN

In handing over the Chairmanship Dr Mohr said he had greatly enjoyed his tenure. He had benefited from strong support from all quarters and he was very grateful to all concerned for that. As outgoing Chairman he would do his utmost to help the new Chairman. With those words he handed over the CEOS gavel to Dr Kirchhoff .

Dr Kirchhoff said he took great pleasure in accepting the responsibility on behalf of Marcio Barbosa, Director of INPE, who unfortunately had been unable to attend in person. As Chairman, Dr Barbosa, would dedicate much of his time to CEOS in 2000 and had already taken steps to install his secretariat. It was also his intention to assign an INPE representative to all important CEOS Working Groups and it is one of his aims to implement recommendations of the latter.

Dr Kirchhoff saw it as particularly fitting that INPE should be assuming the Chair at this juncture since many of the topics covered by the UN Conventions were of direct interest to Brazil, and the Brazilian Minister of Environment had a long-standing interest in these issues. Dr Barbosa as CEOS Chairman would be focusing in particular on issues such as Agenda 21,

UNFCCC and the associated Kyoto Protocol, and the Montreal Protocol on the Protection of the Ozone Layer.

In conclusion, Dr Kirchhoff said that Dr Barbosa relished the challenges facing him as CEOS Chairman and he was convinced that Dr Barbosa's term would be very fruitful. Thereupon Mr Kirchhoff formally received transfer of the Chairmanship on behalf of Dr Barbosa.

Dr Mohr then closed the meeting, expressing his gratitude to the SNSB, particularly to Dr Tegnér and to Dr Treschow, for the excellent arrangements put in place for the meeting.

19 ACTION LIST

The action list is attached at **Annex 8**.