WORLD METEOROLOGICAL ORGANIZATION

COMMISSION FOR BASIC SYSTEMS
OPEN PROGRAMMME AREA GROUP ON INTEGRATED OBSERVING SYSTEMS

EXPERT TEAM ON OBSERVATIONAL DATA REQUIREMENTS AND REDESIGN OF THE GLOBAL OBSERVING SYSTEM
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ITEM 3

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REVIEW OF Cg-XIV AND CBS-EXT.(02); RECOMMENDATIONS FOR EVOLUTION OF SURFACE AND SPACE-BASED COMPONENTS OF THE GOS

Summary of Recommendations made by CBS-Ext.(02)

(Submitted by Dr J. Purdom, Chair of OPAG-IOS)

Summary and Purpose of Document

The purpose of the document is to inform the Expert Team of the decisions by CBS-Ext.(02) with regard to the GOS issues and appropriate follow-up actions.

ACTION PROPOSED

The meeting is invited to review the recommendations of CBS-Ext.(02) on the GOS issues and consider the status of implementation of follow-up actions.

DISCUSSION

Background

1. The Chair OPAG IOS presented a complete report of activity within the OPAG at CBS-Ext.(02) in Cairns, Australia in December 2002.
    - The report was accepted with very minor revision by CBS.
    - Terms of reference for the ET's were reviewed and work plans modified to reflect successes and pertinent activities for the next two years.

2. Guidelines from Cg-XIV
    - Comments concerning GOS and redesign issues
    - Satellite Activities elevated to status of Major WMO Programme by Cg-XIV
    - GCOS Climate Monitoring Principles accepted by CG-XIV

3. Mr Rosner is unable to continue as Rapporteur on GCOS Matters. Mr Sato is not able to continue as mesoscale Rapporteur on OSEs and OSSEs.

4. CBS-Management Group Meeting in Langen, Germany, October 13-17, 2003.

Actions resulting from CBS Ext-2002 that impact the OPAG-IOS

5. The work of the ETs within the OPAG IOS was greatly appreciated by CBS. See comments from Congress that reflect CBS in ***Notes from Cg-XIV*** below (ref. Doc. 3.2)

6. CBS reviewed the work plans of the ETs and produced the action sheet (excerpts extracted to IOS relevant actions) in Appendix A of this document.

    - Action items 6.1.20 and 26 are of particular interest to the ET ODRRGOS.

Notes from Cg-XIV

7. Comments concerning the GOS and redesign issues (See Document 3.2 of this meeting.):
    - Sections 1-7 reflect the status of the GOS, revealing deficiencies and opportunities
    - Sections 8 & 9 reflect the report of the Chair to CBS concerning the activity within ET-ODRRGOS and CBS response to that report
    - Section 10 reiterates some thoughts of CBS (through Congress) and also points to important links to other WMO Programmes with respect to redesign activity

8. Satellite Activities elevated to status of Major WMO Programme by Cg-XIV. Comments:

    - This area will be explored more fully by Dr Hinsman in document 3.3 of this session**.**
    - Important for ET ODRRGOS Consideration:
        - Role of R&D satellites in redesign of GOS
        - ET recommendations to both operational and R&D satellite operators through CGMS and appropriate WMO channels

9. GCOS Climate Monitoring Principles accepted by Cg-XIV. Comments:
- 20 GCOS Climate Monitoring Principles were presented to and accepted by Cg-XIV. Those principles are presented in Appendix B.
- These principles should be taken into consideration when the ET puts forward recommendations to CGMS and WMO (note 1, 2, 9, 12 & 13 in Appendix B)

Replacement of certain Rapporteurs

10. Neither Mr Rosner nor Mr Sato is able to continue as Rapporteurs in their respective areas. Their work is greatly appreciated, but now it is time to find suitable replacements that can carry on the activities as spelled out in the terms of reference.

TOR of the Rapporteur on GCOS Matters

a) Liaise with the existing data quality monitoring centres of CBS and GCOS, regional rapporteurs on the GOS and GCOS to review, and provide information back to Members, as to how existing formal and informal arrangements can be used to improve the monitoring of CLIMAT and CLIMAT TEMP messages.

b) Provide a brief report to the 2002 session of CBS describing, (1) changes, to the extent possible, in the exchange of CLIMAT and CLIMAT TEMP messages over the 1996–2002 period and (2) advice provided to Members in relation to this matter.

c) Continue preparation and maintenance of reviews of observing systems that are being designed under the auspices of GCOS (e.g., GUAN, GSN).

<u>Note</u>: *Due to internal shifts and responsibilities within Deutscher Wetterdienst Mr Stefan Rosner is unable to continue as Rapporteur. Deutscher Wetterdienst will continue to operate the GSNMC.*

TOR of the Rapporteur on Scientific Evaluation of Observing System Experiments (OSEs) and Observing System Simulation Experiments (OSSEs)

a) Prepare and maintain reviews of OSEs and OSSEs that are being undertaken by various NWP Centres around the globe and provide information for consideration by the OPAG IOS.

b) Develop proposals and guidance for specific OSE/OSSEs in consultation with the Expert Team on Observational Data Requirements and Redesign of the GOS, that are required for the redesign of the GOS.

<u>Note</u>: *There is one Rapporteur for synoptic scale and one for mesoscale.*
- *Mr Jean Pailleux (Météo-France)is the synoptic scale rapporteur and <u>will continue in that capacity</u>*
- *Mr Nobu Sato (JMA) is the mesoscale Rapporteur and is unable to continue due to other commitments within both JMA and WMO*

CBS Management Group Meeting in Langen, Germany

11. This report is being submitted prior to the Langen Meeting and together with other OPAG Chairs reports, is available on the WMO WEB SITE.

12. Relevant to the ambitious work plan proposed for the ET-ODRRGOS, two full meetings were requested:

- One full meeting is scheduled from 3 to 7 November 2003 in Geneva.
- One full meeting around mid 2004. This meeting is expected to follow by about two months the Third WMO Workshop on the Impact of Various Observing Systems on NWP in Alpbach, Austria during 9–11 March 2004

Other Items expected to impact ET ODRRGOS

13. Relationship to THORPEX. Major points:

- Among the THORPEX objectives: "It will conduct regional and global campaigns as demonstrations of the impact on the forecast skill of THORPEX improvements to the forecast system. Thereby, THORPEX will provide input to the operational forecast centres on improvements to the forecast system and to the relevant bodies concerning optimisation of the global and regional observing-system."
- The international coordination of THORPEX is under the auspices of the World Meteorological Organization (WMO), World Weather Research Programme (WWRP) and the Working Group on Numerical Experimentation (WGNE).
- A THORPEX Program office is expected to be established within WMO.

14. Earth Observation Summit. Major points:

- Held August 1&2, 2003 in Washington, D.C.
- Summit purpose

  (i) Promote the development of a comprehensive, coordinated, and sustained Earth observation system or systems among governments and the international community to understand and address global environmental and economic challenges.

  (ii) Begin a process to develop a conceptual framework and implementation plan for building this comprehensive, coordinated, and sustained Earth observation system or systems.

- Summit activity:

  (i) As a result of the Earth Observation Summit, an ad hoc Group on Earth Observations (GEO) -- was established to prepare a 10-year implementation plan for a coordinated, comprehensive, and sustained Earth observation system or systems.

  (ii) WMO is represented in all major summit activities.

  (iii) Declaration of the Earth Observation Summit is given in Appendix C.

APPENDIX A

ACTION SHEET

(CBS-Ext.(02), Cairns, Australia, 4 to 10 December 2002

Para.	Subject	Action required	Responsible	Deadline	Status/remarks
3.4	Innovative Collaboration	(a) The OPAGs to consider the report of the Rapporteur on Innovative Collaboration and to identify the subjects that are relevant to their respective programme areas and to take benefit of the relevant findings.	Chairs of the OPAG	May 2003	ET SDUP and ET ODRGOS: This seems most focused toward Hans Peter's ET with the Virtual Lab, and perhaps Paul's ET in OSE coordination activity (see also 6.1.26 and 6.1.x5 PINK 6.1(4))
6.1.11	Plans for multi-purpose geostationary and polar-orbiting satellites	To suggest that the Republic of Korea should approach CGMS for appropriate consultations.	SSO/SAT	February 2003	SSO/SAT: Information and status please
6.1.19	Requirement for four LEO satellites	To update the Manual on GOS	AC/OSY	ASAP	SSO/SAT: Information and status please

Para.	Subject	Action required	Responsible	Deadline	Status/remarks
6.1.20	Redesign of the GOS	(a) To develop as soon as possible an infrastructure and implementation plan including a detailed time schedule within WMO to assure full utilisation of the evolving GOS; (b) To support a focused funded activity for the study of observing system design; (c) To continue updating the database of user requirements and observing system capabilities and include user reviewed R&D expected performances; (d) To continue the RRR process in application areas already started and expand into new areas relevant to missing disciplines; (e) To facilitate organisation of the next Workshop on Impact of Various Observing Systems on NWP during the first quarter of 2004; (f) To pursue early implementation (with particular attention to the developing countries).	Chair of the OPAG-IOS AC/OSY, SSO/SAT	(a) ASAP (b), (c), (d), (f) and (e) on-going during 2003	ET ODRGOS with SSO/SAT
6.1.26	OSEs and OSSEs	Leading NWP centres and relevant scientific groups to continue their efforts in OSEs and OSSEs.	Chair of the OPAG-IOS	On-going	ET ODRGOS

Para.	Subject	Action required	Responsible	Deadline	Status/remarks
6.1.30	Satellite system utilisation and products	To implement the recommendations and strategies as contained in the Status of the Availability and Use of Satellite Data and Products by WMO Members, (WMO/TD-No. 1119, SAT-30)	Chair of the OPAG-IOS SSO/SAT	On-going	ET SDUP with SSO/SAT
6.1.32	Requirements and representation of data from AWSs	To implement the recommendations of the Expert Team on Requirements for Data from Automatic Weather Stations	Chair of the OPAG-IOS AC/OSY	On-going	Also involving OPAG-ISS and CIMO ET AWS
6.1.33	Manual on the GOS	The Secretary-General to publish the revised document at the earliest practical time	AC/OSY	I Quarter 2003	Secretariat: Sasha please update status
6.1.35	Improvement of Volume A	(a) To describe the consequences of the changes in the index numbering system. (b) To initiate the implementation of the proposed changes to Volume A.	AC/OSY	II Quarter 2003	Consultant (Apr 03) For your information
6.1.x.7 PINK 6.1(3)	New WMO Space Programme	(a) To formulate relevant tasks for the OPAGs (including both IOS and ISS). (b) To include representatives from the R&D space agencies the membership of appropriate Expert Teams and Implementation/Coordination Teams .	Chairs of the OPAG-ISS and IOS, SSO/SAT	June 2003	CBS-MG meeting June 03 ET ODRGOS and ET SDUP with SSO/SAT
6.1.x8 PINK 6.1(3)	CGMS	WMO Members to be kept informed of the need to convert satellite ground receiving stations as and when new satellite systems become available.	SSO/SAT	On-going	

Para.	Subject	Action required	Responsible	Deadline	Status/remarks
6.1.x5 PINK 6.1(4)	Scientific Evaluation Group (SEG) of the Coordination Group on the Composite Observing System for the North Atlantic	The Management Group to review the working arrangements of the OPAG-IOS with respect to retaining in the OPAG the tasks of the SEG, which are carried out by the global NWP Centres.	CBS/MG	June 2003	CBS-MG meeting June 03 ET ODRGOS (representation on ET, please coordinate with Horst B. who chairs the SEG)
6.2.86	Future WMO information system	(a) To develop into more details the comparison and mapping of the respective functions and responsibilities of FWIS and WWW centres	Chair of the OPAG-ISS, ITT-FWIS C/TEM X/WDM	2003	ITT-FWIS task ET SDUP and SSO/SAT involvement in this task with respect to satellite data flow within FWIS
6.2.88		To urgently compile and consolidate the requirements from the relevant WMO Programmes			
6.2.90		To organize the consultant(s) study; To inform Cg and EC of the outcome of CBS on the issue; and assist to outcome of study	D/WWW-B C/TEM	Feb. 2003 March 2003	Done Incl. in Cg Doc 3.1.2 + planned ADD
6.4.16	Improving the capacity of NMSs to provide users and the public with high quality warning products	Forecasters to receive specific training	C/PWS	As part of PWS training events in 2003-2004	ET SDUP become involved in this???
6.4.19	Olympic games	Prepare draft guidelines for weather support to Olympic games for submission to the International Olympic Committee	Chair of the OPAG/PWS C/PWS	2004	ET SDUP becomes involved in this???
6.4.32	Links with WWRP	Chair of the OPAG-PWS to maintain close links with WWWRP	Chair of the OPAG-PWS	On-going	ET ODRGOS and ET SDUP to become involved in this???

Para.	Subject	Action required	Responsible	Deadline	Status/remarks
6.4.36	Technical Conference on PWS	to organize a technical conference on Public Weather Services to be held in conjunction with next session of CBS	Chair of the OPAG-PWS C/PWS	2004	ET SDUP to become involved in this???
7.2.5	Renaming CBS	the CBS Management Group to further study the issue and develop a proposal for consideration by the next session of the Commission	CBS Management Group	2004	To be discussed at the June meeting Input from all ETs would help me here
7.2.7	Sixth WMO Long-term Plan	To update the Sixth WMO Long-term Plan	D/WWW-B	May 2003	Done For your information
8.2	Terms of reference and tasks of the Expert Teams and Rapporteurs of each OPAG	(a) each OPAG chairperson to ensure that the specific tasks be adequately addressed. (b) The Management Group to keep under review the work programme and make arrangements, as necessary, upon proposals of OPAG chairpersons	Chairs of OPAG CBS Management Group	June 2003	June meeting Must have inputs from ET/ODRGOS, ET/SDUP and ET/AWS confirming CBS-2002 workplans are accurate and address your major issues I will also need your meeting requirements: ET/SDUP please coordinate with SSO/SAT

Para.	Subject	Action required	Responsible	Deadline	Status/remarks
8.3	Total Quality Management	Management Group to make necessary arrangements, including within the OPAGs, for efficiently carrying out the tasks that would stem from the relevant decisions and directives of Congress	CBS Management Group	September 2003	To be discussed at the June meeting taking into account pertinent Cg decisions ALL – The June CBS Mg group meeting is shortly after Congress. I will try and see issues relevant to our work, but if each of you would try and keep abreast of issues relevant to your area and let me know before the CBS Mg Meeting it would hellp insure we can meet the OPAGs needs

APPENDIX B

GCOS CLIMATE MONITORING PRINCIPLES

Effective monitoring systems for climate should adhere to the following principles:*

1. The impact of new systems or changes to existing systems should be assessed prior to implementation.

2. A suitable period of overlap for new and old observing systems is required.

3. The details and history of local conditions, instruments, operating procedures, data processing algorithms and other factors pertinent to interpreting data (i.e., metadata) should be documented and treated with the same care as the data themselves.

4. The quality and homogeneity of data should be regularly assessed as a part of routine operations.

5. Consideration of the needs for environmental and climate-monitoring products and assessments, such as IPCC assessments, should be integrated into national, regional and global observing priorities.

6. Operation of historically-uninterrupted stations and observing systems should be maintained.

7. High priority for additional observations should be focused on data-poor regions, poorly-observed parameters, regions sensitive to change, and key measurements with inadequate temporal resolution.

8. Long-term requirements, including appropriate sampling frequencies, should be specified to network designers, operators and instrument engineers at the outset of system design and implementation.

9. The conversion of research observing systems to long-term operations in a carefully-planned manner should be promoted.

10. Data management systems that facilitate access, use and interpretation of data and products should be included as essential elements of climate monitoring systems.

Furthermore, operators of satellite systems for monitoring climate need to:

(a) **Take steps to make radiance calibration, calibration-monitoring and satellite-to-satellite cross-calibration of the full operational constellation a part of the operational satellite system; and**

(b) Take steps to sample the Earth system in such a way that climate-relevant (diurnal, seasonal, and long-term interannual) changes can be resolved.

Thus satellite systems for climate monitoring should adhere to the following specific principles:

11. Constant sampling within the diurnal cycle (minimizing the effects of orbital decay and orbit drift) should be maintained.

12. A suitable period of overlap for new and old satellite systems should be ensured for a period adequate to determine inter-satellite biases and maintain the homogeneity and consistency of time-series observations.

13. Continuity of satellite measurements (i.e. elimination of gaps in the long-term record) through appropriate launch and orbital strategies should be ensured.

14. Rigorous pre-launch instrument characterization and calibration, including radiance confirmation against an international radiance scale provided by a national metrology institute, should be ensured.

15. On-board calibration adequate for climate system observations should be ensured and associated instrument characteristics monitored.

16. Operational production of priority climate products should be sustained and peer-reviewed new products should be introduced as appropriate.

17. Data systems needed to facilitate user access to climate products, metadata and raw data, including key data for delayed-mode analysis, should be established and maintained.

18. Use of functioning baseline instruments that meet the calibration and stability requirements stated above should be maintained for as long as possible, even when these exist on de-commissioned satellites.

19. Complementary in situ baseline observations for satellite measurements should be maintained through appropriate activities and cooperation.

20. Random errors and time-dependent biases in satellite observations and derived products should be identified.

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APPENDIX C

DECLARATION OF THE EARTH OBSERVATION SUMMIT

We, the participants in this Earth Observation Summit held in Washington, DC, on July 31, 2003:

Recalling the World Summit on Sustainable Development held in Johannesburg that called for strengthened cooperation and coordination among global observing systems and research programmes for integrated global observations;

Recalling also the outcome of the G-8 Summit held in Evian that called for strengthened international cooperation on global observation of the environment;

Noting the vital importance of the mission of organizations engaged in Earth observation activities and their contribution to national, regional and global needs;

Affirm the need for timely, quality, long-term, global information as a basis for sound decision making. In order to monitor continuously the state of the Earth, to increase understanding of dynamic Earth processes, to enhance prediction of the Earth system, and to further implement our environmental treaty obligations, we recognize the need to support:

- (1) Improved coordination of strategies and systems for observations of the Earth and identification of measures to minimize data gaps, with a view to moving toward a comprehensive, coordinated, and sustained Earth observation system or systems;

- (2) A coordinated effort to involve and assist developing countries in improving and sustaining their contributions to observing systems, as well as their access to and effective utilization of observations, data and products, and the related technologies by addressing capacity-building needs related to Earth observations;

- (3) The exchange of observations recorded from in situ, aircraft, and satellite networks, dedicated to the purposes of this Declaration, in a full and open manner with minimum time delay and minimum cost, recognizing relevant international instruments and national policies and legislation; and

- (4) Preparation of a 10-year Implementation Plan, building on existing systems and initiatives, with the Framework being available by the Tokyo ministerial conference on Earth observations to be held during the second quarter of 2004, and the Plan being available by the ministerial conference to be hosted by the European Union during the fourth quarter of 2004

To effect these objectives, we establish an ad hoc Group on Earth Observations and commission the group to proceed, taking into account the existing activities aimed at developing a global observing strategy in addressing the above. We invite other governments to join us in this initiative. We also invite the governing bodies of international and regional organizations sponsoring existing Earth observing systems to endorse and support our action, and to facilitate participation of their experts in implementing this Declaration.
