

WMO ACTIVITIES TOWARDS THE REDESIGN OF THE GLOBAL OBSERVING SYSTEM

(Submitted by WMO)

Summary and purpose of document

To inform CGMS Members of WMO activities related to the redesign of the Global Observing System.

ACTION PROPOSED

CGMS Members to note WMO activities related to the redesign of the Global Observing System and comment as appropriate.

DISCUSSION

1. Within the CBS OPAG IOS, a number of important activities are underway dealing with the Global Observing System and its "Redesign," or more appropriately perhaps, its "systematic evolution." The future GOS is being vigorously investigated by a team of experts within the Expert Team on Observational Data Requirements and Redesign of the GOS (ET ODRRGOS) which is led by Dr W.P. Menzel of NOAA. That team is charged with the responsibility of recommending a "Redesign" for consideration by CBS 2002. As can be seen by inspection of the ET ODRRGOS terms of reference, below, they are taking a total systems approach in their activity by comparing user requirements to total observing system capabilities, both present and future. They are also considering the role of research satellite contributions to the GOS. The ET ODRRGOS works in close coordination with two Rapporteurs that deal with the Scientific Evaluation of Observing System Experiments (OSEs) and Observing System Simulation Experiments (OSSEs). One important component of a "Redesign" is scientific experimentation using numerical models, and the activity of the ET ODRRGOS has benefited from the support of the Rapporteurs and NWP centers from around the globe.

Terms of Reference for the Expert Team on Observation Data Requirements and Redesign of the Global Observing System (ET ODRRGOS)

- (a) Update and report on observational data requirements of the WWW as well as other WMO and international programmes supported by WMO;
- (b) Review and report on the capability of both surface-based and space-based systems that are candidate components of the evolving composite Global Observing System;
- (c) Carry out the Rolling Requirements Review of several application areas using subject area experts (including atmospheric chemistry, marine meteorology and oceanography through liaison with JCOMM, aeronautical meteorology through liaison with CAeM, and seasonal to inter-annual forecasting as well as climate change detection through liaison with CCI and GCOS);
- (d) Review the implications of the Statements of Guidance concerning the strengths and deficiencies in the existing GOS and evaluate the capabilities of new observing systems and possibilities for improvements of existing observing systems to reduce deficiencies in the existing GOS; taking particular care to examine the implications of changes in observing technology, in particular changes to automated techniques (such as Automated Surface Observing Stations), on the effectiveness of all WMO Programmes, and report on major consequences in a timely fashion;
- (e) Carry out studies of hypothetical changes to the GOS with the assistance of NWP centres;
- (f) Prepare a prioritised list of proposals for modification to the GOS that are both practicable and amenable to testing, and propose mechanisms for testing them; offer redesign options for CBS consideration;
- (g) Develop criteria for dealing with design issues of the composite GOS, paying particular attention to developing countries and the southern hemisphere;
- (h) Prepare a document to assist Members, summarising the results from the above activities.

2. As mentioned above, the ET-ODRRGOS has been studying user requirements versus observing capabilities (for the combined space based and in situ observing systems) and considering options for redesign of the GOS towards more comprehensive observations for the

World Weather Watch and other WMO programmes. In late April 2001, the ET ODRRGOS benefited from Coordination Group for Meteorological Satellites (CGMS) Workshop on long-term future of the basic satellite sounding and imaging missions. That workshop, held Geneva, Switzerland at the World Meteorological Organization (WMO) brought together experts from around the world to address questions concerning whether important gaps exist in the post-2000 satellite-based component of the Global Observing System (GOS), how they could be filled, and how to prepare for the replacement of the current satellite systems with the next generation satellite systems in the post-2015 era. The CGMS workshop was held concurrent with a meeting of the ET-ODRRGOS; Dr. Menzel will report results in WMO WP 7.

Other important past activity

3. The OPAG Chairman's report to CBS 2000 identified a potential role for Research Satellites as contributors to the GOS:

- Important realities (not in OPAG Chair report but relevant to this discussion):
 - ERS-1 and ERS-2 demonstrated ocean winds;
 - Windsat providing operational ocean surface winds;
 - JASON altimetry for seasonal to interannual forecasting;
 - NASA contributions to operations:
 - MODIS global direct readout;
 - Planned AIRS data in direct readout and for use in global NWP;
 - Planned GIFTS data for operational utilization both for nowcasting and regional and global NWP;
 - NASDA - The GCOM has from its planning stages included an operational concept:
 - "The GCOM system would support the science community as well as operational users, including JMS, NOAA and JAFIC (Japan Fishery Information Center). Mission operations supports global data acquisition, level 0 processing on a real-time basis, and on-line delivery to sensor providers. It will support near real-time processing for operational users and standard processing for earth science users."
 - ESA, ENVISAT – No current plans for operational sharing of data.

4. WMO mechanism for policy level interaction with operators of environmental satellites:

- First Consultative Meeting on High-Level Policy on Satellite Matters January 2001:
 - Guidelines for minimum requirements to provide operational users a measure of confidence in the availability of R&D observational data;
 - Take into account the needs of developing countries;
 - Access to satellite data, products and services and appropriate education and training programmes;

5. At the CBS Management Group Meeting held in January 2001:

- The president {of CBS} informed the meeting of the results of the recent Consultative Meeting on High-level Policy on Satellite Matters, especially with respect to the possible impacts on the GOS. He noted that the research and development satellites were likely to become components of the GOS and that this presented several interesting opportunities.

6. The fifty-third WMO Executive Council held in June 2001 "requested the Commission for Basic Systems to review, as a matter of urgency in order to provide the fourteenth WMO Congress appropriate input, the space-based component of the Global Observing System with a goal of defining an overall system that included appropriately identified R&D satellite missions." At the first session of the CGMS International Precipitation Working Group (IPWG), there was "recognition of the role of research and operational satellites in both regional and global precipitation estimation (to be reported on in WMO WP 14).

7. The CGMS focus group on Virtual Laboratory for education and training:

- Established global training network to help assure benefits from satellite systems would be utilized by WMO Members in a timely fashion (to be reported on in WMO WP)

8. Some important benchmarks lie in the future for the OPAG IOS concerning the "Redesign" activity:

- The President of CBS will brief the second session of the "Consultative Meetings" in February 2002 on activities within CBS addressing the space-based component of the Global Observing System, including activity designed toward appropriately identifying the role of R&D satellite missions;
- The next OPAG ICT meeting in conjunction with ET ODRRGOS will:
 - Make recommendations on the capability and utilization of composite observing systems comprising different observing networks to meet the requirements of the WMO Programmes;
 - Review deficiencies in coverage and performance of the existing GOS;
 - Co-ordinate the development of standardized high-quality observing practices and prepare related recommendations;
 - Assess the impacts of introducing new technology systems into the GOS;
 - Consider and report on the issues of costing, joint funding and management of the GOS;
- There are ET ODRRGOS meetings in January and July 2002 to:
 - Summarize R&D satellites to be considered for GOS;
 - Hear about progress on non-satellite components to GOS (esp. in situ ocean observations);
 - Plan for the updating of the observing system technologies available in the next decade;
 - Review satellite and in-situ observing system Statements of Guidance (SOGs) and their implications for redesign of GOS;
 - Introduce new applications areas to the SOG (e.g., atmospheric chemistry);
 - Interact with AOPC to revise the seasonal to interannual SOG;
- Review OSEs and their implications for the GOS;

- Before CBS 2002, the OPAG IOS's Rapporteur on Regulatory Material will:
 - Review and update sections of the Manual on the GOS, and harmonise available material on the conventional (in-situ) and satellite components of the GOS; and, with support from others in the OPAG,
 - Arrange for the review of the revised draft of the Manual on the GOS by a consultant/small expert group with the aim of submitting the resulting text to the 2002 session of CBS.