

AD HOC INTERGOVERNMENTAL GROUP ON EARTH OBSERVATIONS (GEO)

(Submitted by WMO)

Summary and purpose of document

To inform CGMS Members of the activities of the ad hoc intergovernmental Group on Earth Observations (GEO).

ACTION PROPOSED

The Meeting is invited to take note of the information contained in this document.

DISCUSSION

Introduction

1. Since July 2003, a number of countries and organizations have been working towards the development of a comprehensive, coordinated and sustained Earth observation system or systems covering various sciences, disciplines and related issues facing our planet. This activity has been conducted by the ad hoc intergovernmental Group on Earth Observation (GEO) within which WMO is a participating organization. As of March 2004, there were forty-three countries and the European Commission (GEO members) and twenty-six participating organizations represented in GEO.

2. WMO Members and the Secretariat have been extremely active in the GEO process. For example, the WMO Bureau at its January 2004 meeting discussed GEO and noted the rapid pace at which GEO was proceeding. The fourth session of the WMO Consultative Meetings on High-level Policy on Satellite Matters (January 2004) also discussed GEO (more details presented below) with regard to spatial activities, as did the meeting of the Presidents of Technical Commissions. WMO's efforts in GEO have been guided by two strategic goals: first to make all efforts to strengthen relevant WMO Member national observing systems, as well as national support for them; and secondly to make the most effective contribution to the resulting observing system components within WMO mandate.

3. As of 1 May 2004, there have been four sessions of GEO and two Earth Observation Summits.

The first Earth Observation Summit (EOS-I)

4. At the invitation of the United States of America, on 31 July 2003 in Washington, DC, thirty-three nations, and the European Commission, joined together at the first Earth Observation Summit (EOS-I) to adopt a Declaration that called for action in strengthening global cooperation on Earth observations. The stated purpose of the Summit was to:

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; and begin a process to develop a conceptual framework and implementation plan for building this comprehensive, coordinated, and sustained Earth observation system or systems.

5. To this end, the Summit participants had launched the ad hoc intergovernmental Group on Earth Observations (GEO), with the goal of furthering the creation of a comprehensive, coordinated, and sustained Earth observing system or systems. The group, co-chaired by the United States, the European Commission, Japan, and South Africa, and joined by more than 21 international and intergovernmental organizations, began its work by organizing five Sub-Groups, as well as a secretariat to support its activities. In order to promote the development of the now named Global Earth Observing System of Systems (GEOSS), GEO decided that a document describing the GEOSS framework and an associated 10-Year Implementation Plan would be developed.

6. The document describing the GEOSS framework (referred to as the Framework Document) for the 10-Year Implementation Plan was presented for adoption at the second Earth Observation Summit (EOS-II) attended at the ministerial-level, in Tokyo, Japan on 25 April 2004, and the 10-Year Implementation Plan itself will be presented for adoption at the third Earth Observation Summit (EOS-III) hosted by the European Commission to be held February 2005 in Brussels.

7. Building on these efforts, the GEO process would:
 - ?? cover the full spectrum of *in situ* and remotely sensed (space-based and aircraft) observations;
 - ?? provide an opportunity for all nations and international organizations to work together for a common cause, under a commonly agreed approach, framework, and methodology;
 - ?? actively involve developing countries in making improved observations within their national territories, and access and use observations made by others;
 - ?? provide a means to build on the efforts of these international efforts to assess user requirements, identify gaps in global observations, improve communication among nations and organizations with common interests in similar observation capabilities;
 - ?? provide high-level (ministerial) recognition of the universal need for improved Earth observation;
 - ?? promote consensus-building among participants about the highest priority observation needs, which are unmet or require significant increase in resources to provide comprehensive solutions.

8. In the long-term, implementation of the 10-Year plan should result in:
 - ?? commitment of nations to make more complete long-term collection of high-priority Earth observations;
 - ?? filling of the gaps in observing capabilities;
 - ?? attention to capacity-building in both developing and developed countries;
 - ?? greater interoperability and connectivity among individual component observing systems for improved exchange and appropriate sharing of data and information to commonly agreed standards.

GEO-1 (August 2003)

9. The first session of GEO (GEO-1) occurred immediately following EOS-I. At GEO-1, WMO Secretariat personnel were nominated to participate in the work of each of the five Sub-Groups. Furthermore, two Sub-Groups were co-chaired by Permanent Representatives of WMO and the WMO Secretariat became one of three entities with Co-Chair responsibilities for the Sub-Group on Architecture.

GEO-2 (November 2003)

10. GEO-1 requested each Sub-Group, with assistance from the GEO Secretariat, to develop a Framework Document for review at GEO-2. GEO-2 met in Baveno, Italy, 28-29 November 2003, reviewed the work of each Sub-Group and made two important decisions relevant to WMO Members.

11. GEO-2 agreed with the following recommendation from the Sub-Group on Architecture:

GEOSS should be a system of systems supplemented by new observing components as and where required. This architecture would allow existing individual observing systems, e.g., WMO's WWWW GOS, to remain within their mandates as well as providing for new observing components. The architecture would require a new interface between individual observing components as well as a new component to exchange and disseminate observational data between those components. GEO members and participating organizations would need to agree upon a global interoperability specification to which all individual observing components would adhere. GEOSS would contain the necessary network structure to make available all required observations to satisfy the Data Utilization Model.

A possible high-level functionality that would address the advantages identified in the above discussion while mitigating the disadvantages could be based on the following description.

High-Level Functionality

GEOSS shall be a comprehensive, coordinated, and sustained virtual observing system of systems. It shall address all observations required within the application areas necessary to make informed analyses, products, forecasts and related decisions by members and participating organizations. User observational data requirements shall include all those of the individual component observing systems, e.g., those of WMO, as well as those mutually agreed upon by members and participating organizations.

GEOSS will include the system components required to exchange and disseminate observational data and information as well as the systems required to acquire the observations. GEOSS will provide access to all required observations in order to make informed analyses, products, forecasts and related decisions by members and participating organizations at local, national, regional and global entities. The GEOSS component required to exchange and disseminate observational data and information will provide interoperability between individual component observing systems.

GEOSS shall be a system of systems. For existing individual observing system components, and their associated telecommunications services, their responsibility including technical operations, shall remain with those entities having national, regional and/or intergovernmental ownership, e.g., WMO would maintain responsibility for the WWW GOS. For required new observing components, GEO members and participating organizations shall establish, or encourage their establishment as appropriate, or find an organizational entity already existing to assume the new responsibility, while following the high level functionality. Each individual component shall provide for the necessary interfaces following an appropriate global interoperability specification to allow full exchange of observations. This would be a new task for WMO to implement for the GOS if the GOS became one of the GEOSS existing systems. The global interoperability specification will be agreed upon and adhered to by all members and participating organizations. The global specification will provide for full interoperability between all individual systems including all necessary metadata and the system component required to exchange and disseminate observational data. Individual components will declare and adhere to their observing standards.

12. GEO-2 agreed that GEOSS should encourage an end-to-end process of transforming data into information. This implied that a World Weather Watch-like structure, including telecommunication and data processing should be developed for each of the end user communities.

CM-4 (January 2004)

13. CM-4 reviewed WMO activities related to the Earth Observation Summits and associated ad hoc Group on Earth Observations (GEO). The CM-4 Chairman (President of WMO) noted that the GEO initiative was most important and a historical opportunity. Within GEO, integrated observing systems were now of political value. CM-4 also noted that additional resources would be required to fully implement the resulting GEO observing system. It was informed that the WMO Space Programme strategic goals for the GEO initiative were two-fold: first to make all efforts to strengthen relevant WMO Member national as well as intergovernmental space-based observing systems, as well as national support for them; and secondly to position the WMO Space Programme to make the

strongest possible contribution to the resulting space-based observing system components within the WMO mandate.

14. CM-4 felt strongly that the space-based sub-system of the WWW's GOS, as described in WMO WP-15, should be a major component of the space-based component of the resulting observing system agreed upon in the GEO initiative. While the total breadth of user requirements and data utilization structure for the complete GEO observing system were yet to be identified, the satellite systems contained in the present and future space-based component of the GOS had the potential to meet a significant fraction of the future GEO observing system needs. It also represented a near complete set of possible satellite systems and new contributors were actively engaged in joining the GOS.

15. CM-4 also noted that external coordination mechanisms for the space-based component of the GOS were robust through CGMS and CEOS activities. Internal coordination and structure were strong with the establishment of the new major WMO Space Programme that has as one of its major goal to make an increasing contribution to the development of the WWW GOS, as well as to the other WMO-supported Programmes and associated observing systems (such as AREP's GAW, GCOS, WCRP, HWR's WHYCOS and JCOMM's implementation of GOOS) through the provision of continuously improved data, products and services, from both operational and R&D satellites, and to facilitate and promote their wider availability and meaningful utilization around the globe. Since GTOS was also WMO-supported observing system, the space-based component of all four of the major international observing systems (GOS, GOOS, GTOS and GCOS) were within the mandate of the WMO Space Programme. WMO's role in the IGOS Partnership would ensure proactive activities towards identifying observational requirements for present and future theme areas. The proposed CBS Expert Team on Satellite Systems (see WMO WP-6) would further strengthen the role of satellite systems in all relevant observing systems, as well as the continued rolling review of requirements for WMO programmes.

16. CM-4 strongly urged WMO to take a proactive role in seeking to establish a dialogue with other potential international partners. It suggested that the Secretary-General could contact the heads of other relevant intergovernmental organizations involved in earth observation programmes with a view to obtain agreement to work together in implementing and maintaining a comprehensive, coordinate and sustained observing system of systems while recognizing the respective roles of partners whose mandates would fall outside that of WMO. If such agreement could be made, an offer could be made to Earth Observation Summit II (a joint statement by the Executive Heads of FAO, UNESCO including its IOC, UNEP and WMO was made at EOS-II, see paragraph 21 below). Furthermore, WMO could discuss GEO activities at its next session of the Executive Council in order to seek agreement by the fuller set of WMO Members (a GEO paper and resolution for consideration by the WMO Executive Council has been prepared, see paragraph 20 below). In order to highlight the importance of GEO for WMO, one of the GEO Co Chairs could be invited to address the WMO Executive Council (VADM Lautenbacher is scheduled to speak to EC-LVI). CM-4 also felt it important that WMO articulate national benefits and outcomes in order to demonstrate to ministers at Earth Observation Summit II the value of the GEO process and any future observing system(s). CM-4 recalled the request from the UN General Assembly in 1961 to explore the potential of satellite systems resulting in the formation of the World Weather Watch and felt that such a request could be directed to the family of UN organizations resulting from decisions made at the Earth Observation Summits.

GEO-3 (February 2004)

17. GEO-3 was hosted by the government of South Africa in Cape Town from 23 to 27 February 2004. There were four major accomplishments at GEO-3: approval of a draft Communiqué; approval of a draft Frame Work Document; agreement on Terms of Reference for an Implementation Plan Task Team (IPTT) and approval of the report from all five Sub Groups. Prominence was given to WMO's mandate in the draft Frame Work Document, as well as the universally recognized contributions made by the World Weather Watch in the draft Communiqué.

18. Copies of the draft Communiqué, draft Frame Work Document, Terms of Reference for the Implementation Plan Task Team and the report from Sub-Groups are available on the GEO home page at <<http://earthobservations.org/>>.

19. Communiqué – It should be noted that the last paragraph in the Communiqué invited the governing bodies of international and regional organizations sponsoring existing Earth observing systems to support GEO actions. This is a significant recognition of the role intergovernmental organizations will play in not only providing observation but also in the governance of the GEOSS. The WMO mandate is also prominent in the list in the fourth paragraph.

20. Framework Document (FD)- Section 2 of the FD describes nine major areas where GEOSS should provide societal benefits. The FD also notes WMO achievements in section 3.1 and the need for advancements in other areas including WCRP, GOOS, ISDR, GCOS and the IGOS Themes (that will be implemented by those governing council and members responsible for GOS, GAW, GOOS, GTOS and GCOS – all either completely or co-sponsored by WMO). The FD also confirms the concept of a system of systems and building upon existing structures.

21. Section 7 points to the way forward. While GEO-3 did not agree on detailed specifics for the governance of GEOSS, the FD states “the implementation of the “10-Year Implementation Plan” will require a ministerial-guided successor mechanism with maximum flexibility—a single intergovernmental group for Earth observations drawing on the experience of the ad hoc GEO, with membership open to all interested governments and the European Commission, and with representatives of relevant international organizations taking part.

22. IPTT – GEO-3 agreed to its Terms of Reference to be constituted by one person from each of the GEO Co Chairs (USA, Japan, the European Commission and South Africa). IPTT will prepare the 10-Year Implementation Plan. It has already submitted a high-level draft outline of the Implementation Plan to the full GEO community on 5 April. It was anticipated that the Task Team would depend heavily on input from the GEO Sub Groups.

23. A Communiqué stating approval of the Framework Document, pointing the way forward in the GEO effort, and encouraging broad participation in and support for the GEO effort, was approved at EOS-II on 25 April 2004. Also agreed at EOS-II was a Framework Document consisting of: a high-level synopsis of the GEO effort for senior policymakers; a description of the GEOSS purpose and expected benefits; and a broad framework for developing the 10-year Implementation Plan. The Framework Document was prepared by the GEO Secretariat with substantive input from GEO Sub-Groups, GEO Co-Chairs, and high-level experts within GEO.

24. The EOS-II Communiqué invited the governing bodies of international and regional organizations sponsoring existing Earth observing systems to support GEO actions. It is WMO's intention, as well as its associated uniquely sponsored observing systems, to participate in GEOSS. Additionally, WMO is encouraging other sponsoring organizations of jointly sponsored observing systems to join with WMO in supporting GEO actions. It is anticipated that the fifty-sixth session of the WMO Executive Council, to be held in Geneva, Switzerland, 8-18 June 2004, will endorse a Resolution to support GEO and the resulting GEOSS.

GEO-4 and EOS-II Summary

25. The fourth session of the ad hoc intergovernmental Group on Earth Observations (GEO-4) and the second Earth Observation Summit (EOS-II) were held in Tokyo, Japan on 22-23 April 2004 and 25 April 2004, respectively. EOS-II was opened by Mr Junichiro Koizumi, Prime Minister of Japan, who addressed the meeting. The Secretary-General attended EOS II and SSO/SAT attended both sessions supported by Dr James Rasmussen as a WMO consultant. The Secretary-General made two statements at EOS II, the first describing WMO's vast experience in observations and its commitment and potential contribution towards the goal to establish a

comprehensive, coordinated and sustained Global Earth Observing System of Systems (GEOSS). The second was a joint statement on behalf of the Executive Heads of FAO, UNEP, UNESCO, including its IOC, and WMO to identify modalities for increased integration and coordination of a resulting enhanced UN-based observing system, and to seek approval from their respective governing bodies. The Executive Heads also offered to work within the GEO process and resulting intergovernmental coordination mechanism in order to ensure the success of GEOSS. The joint statement was historic and unprecedented in the field of observations by the four organizations. EOS-II culminated with the agreement of a Framework Document for GEOSS, as well as a Communiqué, endorsed at ministerial level.

26. At GEO-4, a draft Implementation Plan Outline was discussed and several suggestions were made to the Implementation Plan Task Team (IPTT) for further strengthening the outline. However, the initial proposed timeline to develop the Implementation Plan was accelerated to allow governments sufficient time to comment and approve it. It was also agreed to prepare three tiers of documentation for the Implementation Plan: a Communiqué (1 page), an Executive Summary of the 10-Year Implementation Plan (10 pages, but to be called the 10-Year Implementation Plan and contain key principles and action items for ministers) and the Implementation Plan Technical Blueprint (50 or more pages, i.e., the detailed Implementation Plan). The Communiqué and the Executive Summary of the 10-Year Implementation Plan will be negotiated at GEO-5 scheduled to be held in Ottawa, Canada, 28-29 November 2004, and signed at the third Earth Observation Summit (EOS-III) to be held in Brussels, Belgium, 16 February 2005. While the Implementation Plan Technical Blueprint will not be negotiated, it will be the basis for the Executive Summary of the 10-Year Implementation Plan and there must be direct linkages between it and the Implementation Plan Technical Blueprint (50 or more pages). Thus, it is now required that the IPTT finish the drafts for the 10-Year Implementation Plan and the Implementation Plan Technical Blueprint by early October for distribution to governments. In order to prepare the required documents, IPTT has further elaborated the draft outline that addresses each of the nine societal areas contained in the Framework Document. IPTT will identify a Topic Leader for each of the nine societal areas and he/she will be responsible for writing a majority of the 10-Year Implementation Plan and the Implementation Plan Technical Blueprint. However, some of the chapters in the 10-Year Implementation Plan Technical Blueprint (50 or more pages) will be drawn from the existing Sub-Group Reports. The Sub-Groups also have the responsibility to provide support to each of the nine Topic Leaders as needed during the preparation of their portion of the Implementation Plan. Sub-Group Liaisons will help identify appropriate Sub-Group members to support the Topic Leaders. Topic Leaders will be identified by 30 April. There will be a meeting of the IPTT, Sub-Group Liaisons to the IPTT and Topic Leaders in Paris, 13-14 May. A first draft of the Implementation Plan will be prepared either before or at a meeting to be held in Washington, DC, 10-11 June 2004.

27. The other major discussion area concerned International Cooperation. Although, there were "Non-papers" submitted by France and the USA and significant progress was made, agreement could not be reached. However, GEO-4 did agree on 8 principles towards a successor mechanism to GEO. Further, it agreed to meet again on 27-28 September in Brussels as a Working Session of GEO to discuss comments by GEO Members on the 8 principles. Comments must be submitted by 1 August. GEO-4 also requested those intergovernmental organizations with observing systems, especially those countries that are not within the GEO membership, to provide their views. It was agreed that a successor mechanism must be identified at the September meeting to allow it to be inserted into the Executive Summary of the 10-Year Implementation Plan and the Implementation Plan Technical Blueprint as this is required by the Framework Document. The issue of the need for a successor mechanism secretariat will also be discussed.