

World Meteorological Organization

FIFTEENTH CONGRESS

GENEVA, 2007



**Cg-XV/Doc. 3.2.3**

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## GLOBAL CLIMATE OBSERVING SYSTEM

### SUMMARY

#### ISSUES TO BE DISCUSSED:

1. Overall strategy for future development of GCOS; enhanced role of WMO technical commissions; implications of increased integration of WMO observing and information systems; activities in support of UNFCCC
2. Activities to implement the GCOS Regional Action Plans resulting from the Regional Workshop Programme, particularly ClimDev Africa
3. GCOS coordination and implementation at the national level
4. GCOS support for user needs
5. Resourcing of GCOS implementation and Secretariat support

#### DECISIONS/ACTIONS REQUIRED:

- (a) Adoption of draft Resolution 3.2.3/1 – Global Climate Observing System (GCOS) given in Appendix B;
- (b) Adoption of the draft text for inclusion in the general summary of Cg-XV given in Appendix A.

#### REFERENCES:

1. Implementation Plan for the Global Observing System for Climate in Support of the UNFCCC, GCOS-92
2. Systematic Observation Requirements for Satellite-based Products for Climate, GCOS-107
3. Climate Information for Development Needs: An Action Plan for Africa, GCOS-108

#### CONTENT OF DOCUMENT:

##### Appendices for inclusion in the final report:

- A. Draft text for inclusion in the general summary of Cg-XV
- B. Draft Resolution 3.2.3/1 (Cg-XV) - Global Climate Observing System (GCOS)

##### Appendix for information:

**Cg-XV/Rep. 3.2.3:** Progress/Activity Report

## **DRAFT TEXT FOR INCLUSION IN THE GENERAL SUMMARY OF Cg-XV**

### **3.2.3 GLOBAL CLIMATE OBSERVING SYSTEM (*agenda item 3.2.3*)**

**3.2.3.1** Congress welcomed the report by Professor John Zillman, Chairman of the GCOS Steering Committee, on progress with the implementation of GCOS. It expressed particular appreciation to the past Chairman, Professor Paul Mason, for his outstanding contribution during his tenure. Congress also recorded its appreciation to the many experts and representatives who had served on the Steering Committee and its Panels, as well as to its constituent bodies and its GCOS co-sponsors for their commitment to GCOS implementation over the past four years.

**3.2.3.2** Congress endorsed the overall strategy for further development of GCOS as proposed by the Steering Committee, including in particular its emphasis on a coordinated, WMO-wide response to the GCOS Implementation Plan (IP) by the technical commissions and other intergovernmental bodies responsible for the component systems of GCOS.

**3.2.3.3** Congress welcomed the completion of the GCOS Regional Workshop Programme and the ten associated Regional Action Plans (RAPs) for improving climate observing systems in developing countries. It called for increased efforts to generate support for the actions identified in the RAPs and in the IP through funding support for NMHSs and other agents for implementation. Congress commended the development of the 'Climate for Development in Africa' Programme ('ClimDev Africa') and its endorsement by the African Union Commission, the UN Economic Commission for Africa, the African Development Bank, the UK Department for International Development, and others. Congress noted that African NMHSs should be among the focal institutions at the national level for the implementation of ClimDev Africa.

**3.2.3.4** Congress expressed grave concern at the continuing difficulty in maintaining adequate climate observing networks in many parts of the world, and the potential unavailability over the next decade of several vital satellite records of Essential Climate Variables (ECVs). It was pleased, however, to note the significant progress that had been made in implementing and improving the GSN and GUAN Baseline Networks, including the revitalization of a number of stations. Congress expressed appreciation for the voluntary contributions of several Members to the Climate Observing System Fund and the GCOS Cooperation Mechanism that had made this progress possible, while stressing the urgent need for additional support to improve the availability and quality of data across the GSN and GUAN networks. It expressed particular appreciation to Australia, Chile, Germany, Iran, Morocco, Mozambique, and the United Kingdom for agreeing to join Japan and the United States as regional CBS Lead Centres for GCOS Data.

**3.2.3.5** Congress noted with appreciation the increasing commitment of WMO Programmes and technical commissions to climate observation, in particular through their acceptance of actions requested of them in the GCOS IP.

**3.2.3.6** Congress welcomed the development of detailed requirements for satellite-based observations for climate, presented in the report *Systematic Observation Requirements for Satellite-based Products for Climate* (GCOS-107). It commended the ongoing collaboration with space agencies through the Committee on Earth Observation Satellites (CEOS), the Coordination Group for Meteorological Satellites (CGMS) and the WMO Space Programme, with the objective of establishing, and ensuring continuity of, the climate data record from space.

**3.2.3.7** Congress was pleased that GCOS has been accepted as the climate component of GEOSS. It encouraged Members and the various climate-related international bodies responsible for the component systems of GCOS to work closely together to ensure that GCOS effectively meets the needs of the 'Climate' Societal Benefit Area (SBA) of GEOSS, as well as the climate-related data needs of other GEOSS SBAs.

**3.2.3.8** Congress welcomed the strong support of the UNFCCC Subsidiary Body for Scientific and Technological Advice (SBSTA) for the implementation and operation of GCOS in support of the research and systematic observation requirements of the UNFCCC. It invited the UNFCCC Conference of the Parties (COP) to join the sponsoring agencies of GCOS in a coordinated international effort to muster the necessary resources for ensuring the full implementation of GCOS in line with the time-frames and strategies of the IP. Congress noted the request by SBSTA-23 for a comprehensive report on progress in implementing the IP for consideration by SBSTA-30 in 2009 and endorsed the plans of the GCOS Steering Committee and Secretariat for preparation of the proposed report.

**3.2.3.9** Congress noted the ongoing efforts towards establishment of a framework for the preparation of guidance materials, standards and reporting guidelines for terrestrial observing systems for climate, as had been requested by Cg-XIV and recommended in the 2004 IP. It reiterated the importance of the development of such a framework by WMO, the other GCOS sponsors and the sponsors of the Global Terrestrial Observing System, and requested that an update on progress in this initiative be presented to the Executive Council at its sixtieth session.

**3.2.3.10** Congress welcomed the collaboration between the governing bodies and the secretariats of GCOS, the WCRP and the IPCC in arranging a workshop later in 2007 aimed at ensuring that the lessons learned from the IPCC's Fourth Assessment Report would be appropriately incorporated in future planning for GCOS and the WCRP.

**3.2.3.11** Congress recognized the vital role of the GCOS Secretariat in facilitating and supporting the work of the Steering Committee and the various WMO and other constituent bodies and agents for implementation in their efforts to achieve the full and successful implementation of GCOS. It commended the Secretariat for its work over the past four years, but concluded that a substantially enhanced effort is needed in support of planning, coordination, communication and implementation if GCOS is to succeed in meeting its objectives and the high expectations of Members. While expressing great appreciation for the significant extrabudgetary resources contributed to date by Members and international organizations in support of GCOS, Congress appealed urgently to Members, GCOS co-sponsors and other climate-related international organizations to explore all available means for substantial strengthening of the joint Secretariat. It particularly encouraged other Members to join Germany in the practice of seconding a Junior Professional Officer to the Secretariat.

**3.2.3.12** Congress adopted draft Resolution 3.2.3/1 (Cg-XV) - Global Climate Observing System (GCOS).

## DRAFT RESOLUTION

### Res. 3.2.3/1 (Cg-XV) - GLOBAL CLIMATE OBSERVING SYSTEM (GCOS)

#### THE CONGRESS,

#### Noting:

- (1) The 1998 Memorandum of Understanding between WMO, IOC of UNESCO, UNEP, and ICSU concerning the Global Climate Observing System,
- (2) The Terms of Reference for GCOS National Coordinators (Annex XII of *Summary Report of the Eleventh Session of the WMO-IOC-UNEP-ICSU Steering Committee for GCOS*, GCOS-87, WMO/TD-No. 1189),
- (3) Resolution 9 (Cg-XIV) - GCOS Climate Monitoring Principles,
- (4) Resolution 10 (Cg-XIV) - Global Climate Observing System,
- (5) Decisions 11/CP.9 – Global observing systems for climate, and 5/CP.10 - Implementation of the global observing system for climate, of the Ninth and Tenth Sessions, respectively, of the Conference of the Parties to the UN Framework Convention on Climate Change (UNFCCC),
- (6) The *Implementation Plan for the Global Observing System for Climate in Support of the UNFCCC* (GCOS-92, WMO/TD-No. 1219),
- (7) *Systematic Observation Requirements for Satellite-based Products for Climate* (GCOS-107, WMO/TD-No. 1338),
- (8) *Climate Information for Development Needs: An Action Plan for Africa – Report and Implementation Strategy* ('ClimDev Africa', GCOS-108, WMO/TD-No. 1358),
- (9) Decision on 'Climate Change and Development in Africa', African Union Assembly/AU/Dec.134 (VIII), January 2007,

#### Considering:

- (1) The increasing needs of Members and international organizations for comprehensive, continuous, reliable climate and climate-related data and information in support of:
  - (a) Climate system monitoring;
  - (b) Climate change detection and attribution;
  - (c) Research to improve understanding, modelling and prediction of the climate system;
  - (d) Operational climate prediction on seasonal-to-interannual timescales;
  - (e) Assessment of the impacts of, and vulnerability and adaptation to, natural climate variability and human-induced climate change;
  - (f) Applications and services for sustainable economic development;

- (g) Requirements of the UNFCCC and other international conventions and agreements,
- (2) The specific observational needs of the WCRP, the IGBP, the IHDP and Diversitas; the requirements for comprehensive observations in support of the assessment processes of the IPCC,
- (3) The essential role of GCOS in underpinning the full range of climate applications and services provided by NMHSs and other organizations, within the framework of the World Climate Programme,
- (4) The deficiencies, and in many parts of the world the decline, in the number and availability of systematic observations of climate,
- (5) The need to implement and, as necessary, to update the Regional Action Plans developed through the GCOS Regional Workshop Programme,
- (6) The need to incorporate climate information into social and economic decision-making, particularly in support of the Millennium Development Goals in developing countries, with a special focus on Africa,

**Recognizing:**

- (1) The importance of efficient coordination and interoperability across the various component observing systems of GCOS and effective integration of *in situ* and space-based observations in meeting user needs,
- (2) The unique opportunities for coordinated national and international observation of Essential Climate Variables across the atmospheric, oceanic and terrestrial domains provided through the joint sponsorship of GCOS by WMO, IOC, UNEP and ICSU,
- (3) The new opportunities for increased international support, enhanced interoperability, and improved integration opened up by the prospect of embedding the GCOS system of systems within the emerging operational structure of the Global Earth Observation System of Systems,

**Recognizing with appreciation:**

- (1) The important contribution of the GCOS Steering Committee and its Panels in providing scientific and technical guidance to WMO and other sponsoring and participating organizations for the planning, implementation and further development of GCOS,
- (2) The critical role of the Executive Council, technical commissions and regional associations in coordinating the implementation of the WMO component systems of GCOS,
- (3) The substantial achievements of Members in implementing their climate observing systems in support of both national needs and the international objectives of GCOS,
- (4) The close collaboration among the co-sponsors of GCOS and with the Steering Committees and Secretariats of their other jointly-sponsored observing systems, GOOS and GTOS,
- (5) The support provided by a range of national and international donor organizations for GCOS planning and implementation and, in particular, the support of the African Union, the UN Economic Commission for Africa, the UK Department for International Development, and the African Development Bank for the ClimDev Africa Programme,

**Reaffirms** WMO's continuing strong commitment to the objectives of GCOS and support for its implementation in order to meet the full range of user needs;

**Decides** to maintain GCOS as a priority programme of the Organization, in partnership with IOC, UNEP and ICSU and such other international sponsors as might be agreed by the Executive Council;

**Urges Members:**

- (1) To strengthen their national atmospheric, hydrological and related oceanic and terrestrial climate observing networks and systems within the framework of GCOS and in support of user needs;
- (2) To assist developing country Members to strengthen their observing networks, to improve their capacity to acquire climate-relevant data, and to enhance their provision of climate services by implementing projects in the ten GCOS Regional Action Plans, and by contributing to the implementation of the ClimDev Africa Programme and to similar initiatives in other regions;
- (3) To ensure, to the extent possible, the long-term continuity of the critical space-based components of GCOS, including the generation and dissemination of the satellite-based climate data and products based on the Essential Climate Variables that are required to meet the needs of the UNFCCC;
- (4) To establish GCOS National Committees and to identify GCOS National Coordinators in order to facilitate coordinated national action on observing systems for climate, taking into account the joint international sponsorship of GCOS and the evolving international arrangements for GEOSS;
- (5) To ensure that their delegations to sessions of the UNFCCC/COP and its subsidiary bodies are properly informed of the key role played by NMHSs in implementing and operating observing systems necessary to meet national obligations under the Convention, for example through the inclusion in national delegations of representatives of NMHSs;
- (6) To encourage their NMHSs to provide effective leadership in the preparation of national reports to the UNFCCC on their activities with regard to systematic observation of the global climate system, including the identification of gaps, using revised UNFCCC reporting guidelines on global climate observing systems which reflect the priorities of the 2004 Implementation Plan and which incorporate reporting on the Essential Climate Variables identified therein;
- (7) To enhance their support to the GCOS Secretariat, through secondment of experts and/or contributions to the Climate Observing System Fund or to specific planning and implementation mechanisms, so as to enable the Secretariat to and support the full range of implementation agents in their efforts to establish an effectively-operating GCOS;

**Requests the Executive Council:**

- (1) To keep the progress of GCOS under regular review and to provide support and guidance on its further development and implementation;
- (2) To advise and assist Members, sponsoring bodies, and other international organizations in the implementation of global observing systems for climate;

**Requests the technical commissions:**

- (1) To lead the development and implementation of the components of GCOS for which they are responsible in the light of advice and guidance from the GCOS Steering Committee;
- (2) To contribute to the UNFCCC 5-year 'Nairobi Work Programme on Impacts, Vulnerability, and Adaptation to climate change', in particular to the elements of the programme related to data and observations;

**Requests the regional associations** to foster effective, coordinated implementation of GCOS at the regional level, in close consultation with the regional counterparts of the other international sponsors of GCOS;

**Requests the GCOS Steering Committee** to continue to provide broadly-based strategic advice and guidance to all relevant WMO bodies on the implementation and further development of GCOS;

**Requests the Secretary-General**, using whatever flexibility might exist within the regular budget and whatever access may be possible to external funding mechanisms:

- (1) To support the further planning, development and implementation of GCOS, including the actions in response to the needs of the UNFCCC/COP and the recommendations of the 2004 Implementation Plan;
  - (2) To encourage and assist Permanent Representatives of Members to take the lead in the establishment of GCOS National Committees and the designation of GCOS National Coordinators;
  - (3) To articulate, at all appropriate fora, the need for broad support by nations of the observational and resource requirements for implementing GCOS;
  - (4) To provide all support possible for the work of the GCOS Steering Committee and its Panels and Secretariat.
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## **GLOBAL CLIMATE OBSERVING SYSTEM**

### **PROGRESS/ACTIVITY REPORT**

#### **SUMMARY**

**Reference:** Cg-XV/Doc. 3.2.3

**CONTENT OF DOCUMENT:**

**Appendix:**

- Progress/activity report for the period since Cg-XIV

## **PROGRESS/ACTIVITY REPORT FOR THE PERIOD SINCE Cg-XIV**

### **Global Climate Observing System (GCOS)**

Major items for GCOS over the reporting period include:

#### ***GCOS Steering Committee***

The joint WMO-IOC-UNEP-ICSU GCOS Steering Committee continued to provide scientific and technical guidance to sponsoring and participating organizations and agencies for the planning, implementation and further development of GCOS, having met on three occasions since Cg-XIV. Professor John Zillman replaced Professor Paul Mason as Chairman of the Steering Committee in January 2006.

#### ***GCOS Planning, Implementation and Further Development***

There has been substantial progress towards the realization of GCOS over the past four years through the development of Regional Action Plans, the *Implementation Plan for the Global Observing System for Climate in Support of the UNFCCC*, and a strategy for implementation of GCOS as the climate component of the Global Earth Observation System of Systems, as well as a range of implementation measures under the WMO technical commissions and other bodies responsible for the component systems of GCOS. Nevertheless, there are major shortcomings in almost all of its component observing systems, and a great deal of further work will be needed worldwide for GCOS to adequately meet its users' needs. Although focussed on meeting the needs of the UNFCCC, the Implementation Plan is now serving as the main overarching plan for the further development of GCOS in support of the full range of its objectives. The Plan was issued in October 2004 and sets out an extensive programme of actions needed to develop some 44 Essential Climate Variables.

#### ***GCOS Regional Workshops and Action Plans***

By the end of 2006, all ten GCOS Regional Workshops and associated Action Plan development meetings had been completed. Regional Action Plans have been prepared for all developing country regions (the Pacific Islands, Eastern and Southern Africa, Central America and the Caribbean, East and Southeast Asia, Western and Central Africa, South America, Central Asia, South and Southwest Asia, Eastern and Central Europe, and the Mediterranean Basin). The plans focussed on sustaining and improving operational observing networks; recovering historical data; improving national and regional coordination; education, training, and capacity building; and national planning and reporting. Some implementation action has been possible in most regions, with more progress so far in those regions in which the earliest workshops were held. The major impediment to progress is the limited capacity for mobilizing resources for implementation actions.

#### ***Climate for Development in Africa***

One important initiative flowing out of the Regional Workshop Programme followed from the specific expression of support for GCOS in the 2005 G8 'Gleneagles Plan of Action'. With the support of the UK Department for International Development (DfID), the GCOS Secretariat and the Secretariat of the UN Economic Commission for Africa (UNECA) organized a meeting in Addis Ababa, Ethiopia in April 2006, with potential donors, representatives of the African Union (AU), a number of NMHSs and other service providers, and users of climate information. The final report and implementation strategy, *Climate Information for Development Needs: An Action Plan for Africa*, was subsequently endorsed by the African Union Heads of State in January 2007. The Programme on Climate for Development in Africa ('ClimDev Africa') is intended to be a fully-integrated, user-driven programme that addresses not only the needs for improved climate

observations as expressed in the GCOS Regional Action Plans, but also the needs for climate services, climate risk management, and associated policy development and implementation. WMO and the GCOS Secretariat are represented on the steering committee of ClimDev Africa.

### ***GCOS and Satellites***

During 2006, the GCOS Secretariat organized the development of a document (*Systematic Observation Requirements for Satellite-based Products for Climate*) that provides supplemental details to the requirements identified in the Implementation Plan. This is the basis for extensive interaction with the Committee on Earth Observation Satellites and the UNFCCC on how Parties with Earth observation space agencies were responding to the needs expressed in the Implementation Plan.

### ***GCOS Implementation and the GCOS Cooperation Mechanism***

Implementation of GCOS has continued at both the international and national levels under the leadership of the WMO technical commissions and other intergovernmental and non-governmental bodies responsible for its component systems. Following the release of the 2004 IP, virtually all of its identified 'Agents for Implementation' have agreed to accept the roles and responsibilities requested of them, including all relevant WMO Programmes and technical commissions. Much improvement of the GCOS networks has been made possible through the support of a number of Members, both directly and through the GCOS Cooperation Mechanism. Given the joint international sponsorship of GCOS, considerable emphasis has been placed on the importance, for effective coordinated implementation at the national level, of the establishment of GCOS National Committees and GCOS National Coordinators. Unfortunately, only a few Members have taken such action to date, and the strengthening of coordination arrangements at the national level in all countries has been identified as a priority by the GCOS Steering Committee.

### ***GCOS, the User Community and the UNFCCC***

Through the ClimDev Africa and other initiatives, renewed emphasis has been placed on the mechanisms for ensuring that GCOS serves the needs of its user communities, especially those represented through the various components of the World Climate Programme and the Intergovernmental Panel on Climate Change. Particular attention has been focussed over the past four years on the role of GCOS in meeting the 'systematic observation' requirements of the UNFCCC. GCOS issues and reports have featured strongly in recent sessions of the UNFCCC Conference of the Parties (COP) and its Subsidiary Body for Scientific and Technological Advice.

### ***GCOS Secretariat Operations***

Funding for the GCOS Secretariat remains inadequate relative to the responsibilities assigned to it under the WMO-IOC-UNEP-ICSU Memorandum of Understanding and the demands of the present stage of implementation of GCOS. The core operation of the Secretariat for 2008-2011 is estimated to cost CHF 1,750,000, in addition to the two fixed-term staff positions (Director and Administrative Assistant) supported by WMO. This estimate consists of CHF 1,030,000 for one Senior Scientific Officer and CHF 720,000 for basic services, travel and organization of Steering Committee and most (but not all) Panel meetings. Even with the budgetary funding of CHF 480,000 from the WMO Regular Budget, a further CHF 1,270,000 will have to be found from other sources. Funds to cover Secretariat operations to the end of 2007 have not yet been identified.

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