



INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE



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PROGRESS REPORTS

GCOS ADEQUACY REPORT

(Submitted by the GCOS Secretariat)

Status Report on the GCOS Second Adequacy Report

1. The UNFCCC Subsidiary Body on Scientific and Technological Advice (SBSTA-15) endorsed the preparation of a Second Adequacy Report at its 15th session in Marrakech in November 2001. SBSTA also noted the need to complete the Second Adequacy Report in the shortest possible time to provide a framework for further work to improve global monitoring systems. It asked for an interim report (www.wmo.ch/web/gcos) on the synthesis and analysis of the national reports from Parties by June 2002 and for the final report by SBSTA-18 (June 2003) in order for it to be considered by COP-9.
2. The “Second Report on the Adequacy of the Global Observing Systems for Climate” was completed in April 2003 and is available on the GCOS homepage: <http://www.wmo.ch/web/gcos/>. Since the last IPCC Plenary in March 2003 in Paris, an Executive Summary was developed and included in the final report. In addition, the Executive Summary in the 6 official UN languages and a final draft of the “Technical Supplement” to the Second Adequacy Report for comment are now available on the GCOS homepage.
3. The GCOS Steering Committee prepared a set of four priority recommendations arising from the conclusions of the Second Adequacy Report that it transmitted to SBSTA-18 in June 2003. These recommendations are presented in the Attachment.
4. The WMO Congress (Geneva, May 2003) “strongly endorsed the conclusions of the report and urged all WMO Members to support the implementation of its recommendations as a matter of urgency, as well as to assist other Members in their implementation to the extent possible”.
5. The SBSTA-18 in considering the Report noted that it “provides an opportunity to build momentum among governments to improve the global observing systems for climate”. Also a pre-session meeting was held with the Parties to discuss the conclusions and issues arising from the Report. The SBSTA is also proposing that COP-9 in Milan (December 2003) adopt a decision on GCOS, which, *inter alia*, requests GCOS “to coordinate the development of a phased five- to ten-year implementation plan for the integrated global observing systems for climate, using a mix of high-quality satellite and *in situ* measurements, dedicated infrastructure and targeted capacity-building”.
6. GCOS has embarked on the early stages to prepare an Implementation Plan and will be seeking the participation of the IPCC community in the development of an Implementation Plan. GCOS has informed all participants in the GCOS/IPCC Expert Meeting held in April 2003 in Boulder (USA) on the proposed SBSTA decision and invited to participate in the planning. Completing an Implementation Plan will be an important milestone in the development of GCOS. It is the intention of the GCOS Secretariat to complete the plan within a year, in time for its consideration at COP-10 and other fora.
7. GCOS also participated in the Earth Observation Summit on 31 July 2003 and is involved in the follow-on Global Earth Observation (GEO) activities, especially on the Working Groups on User Requirements and Data Utilisation. It is understood that the Second Adequacy Report will be a contribution to the GEO activity by documenting many of the user requirements for climate observations and that a 5- to 10-year Implementation Plan for climate observations will make a further contribution to the climate component of an overall the GEO effort.

Attachment

SECOND REPORT ON THE ADEQUACY OF THE GLOBAL OBSERVING SYSTEMS FOR CLIMATE IN SUPPORT OF THE UNFCCC *Summary of Conclusions*

The Second Report on the Adequacy of the Global Observing Systems for Climate was prepared in response to a request from the GCOS Steering Committee and endorsement by the UNFCCC Subsidiary Body on Scientific and Technological Advice (SBSTA) at its 15th session in November 2001. The goals of the Report are to:

- Determine what progress has been made in implementing climate observing networks and systems since the First Adequacy Report in 1998;
- Determine the degree to which these systems meet with scientific requirements and conform with associated observing principles; and
- Assess how well the current systems, together with new and emerging methods of observation, will meet the needs of the Convention.

The Report concludes that there have been improvements in implementing the global observing systems for climate, especially in the use of satellite information and in the provision of some ocean observations. However, serious deficiencies remain in their ability to meet the identified needs. For example:

- Atmospheric networks are not operating with the required global coverage and quality;
- Ocean networks lack global coverage and commitment to sustained operation; and
- Global terrestrial networks remain to be fully implemented.

Based on the analysis in the Report, four overarching (and equally high priority) conclusions with accompanying recommendations for action have emerged.

1. ***Data Exchange and Standards:*** There is a need for intergovernmental and international agencies to sustain and strengthen existing intergovernmental mechanisms relating to climate data and products. In particular, for the terrestrial domain, there is a need to establish a mechanism to prepare guidance materials and develop agreements on standards and regulations for observing systems, data, and products. In all cases, adherence to the principles of free and unrestricted exchange of data should be strongly encouraged, particularly in relation to the designated Essential Climate Variables (see table below), which are both currently feasible for global implementation and have a high impact on UNFCCC requirements. Adherence to the GCOS Climate Monitoring Principles is an essential goal for all climate observations.

Domain	Essential Climate Variables
Atmospheric (over land, sea and ice)	<p>Surface: Air temperature, Precipitation, Air pressure, Surface radiation budget, Wind speed and direction, Water vapour.</p> <p>Upper-air: Earth radiation budget (including solar irradiance), Upper-air temperature (including MSU radiances), Wind speed and direction, Water vapour, Cloud properties.</p> <p>Composition: Carbon dioxide, Methane, Ozone, Other long-lived greenhouse gases¹, Aerosol properties.</p>
Oceanic	<p>Surface: Sea-surface temperature, Sea-surface salinity, Sea level, Sea state, Sea ice, Current, Ocean colour (for biological activity), Carbon dioxide partial pressure.</p> <p>Sub-surface: Temperature, Salinity, Current, Nutrients, Carbon, Ocean tracers, Phytoplankton.</p>
Terrestrial	River discharge, Water use, Ground water, Lake levels, Snow cover, Glaciers and ice caps, Permafrost and seasonally-frozen ground, Albedo, Land cover (including vegetation type), Fraction of absorbed photosynthetically active radiation (FAPAR), Leaf area index (LAI), Biomass, Fire disturbance.

¹ Including nitrous oxide (N₂O), chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), hydrofluorocarbons (HFCs), sulphur hexafluoride (SF₆), and perfluorocarbons (PFCs).

2. **Integrated Global Climate Products:** Nations, in conjunction with the GCOS Sponsors and other international agencies, should institutionalize appropriate processes for generating and making available, on a sustained basis, a range of integrated climate-quality products relevant to the needs of the Convention, including those largely dependent upon satellite observations (see table below) and/or benefiting from the reanalysis of homogeneous historical data. In doing so, the relevant nations and intergovernmental agencies will need to address identified deficiencies in the underlying data and observing systems.

Domain	Variables largely dependent on satellite observations
Atmospheric (over land, sea and ice)	Precipitation, Earth radiation budget (including solar irradiance), Upper-air temperature (including MSU radiances), Wind speed and direction (especially over the oceans), Water vapour, Cloud properties, Carbon dioxide, Ozone, Aerosol properties.

Oceanic	Sea-surface temperature, Sea level, Sea ice, Ocean colour (for biological activity).
Terrestrial	Snow cover, Glaciers and ice caps, Albedo, Land cover (including vegetation type), Fraction of absorbed photosynthetically active radiation (FAPAR), Fire disturbance.

3. **National Reporting to the UNFCCC:** SBSTA, in consultation with the GCOS Secretariat, should review the guidelines for national communications on research and systematic observation (Decision 4/CP.5) to include, *inter alia*, a specific requirement to report on the exchange of the Essential Climate Variables and associated products and on the submission of current and historical data and metadata to international data centres. All Parties are strongly urged to submit this information, as part of their national communications.
4. **Capacity-Building and System Improvements:** The full implementation of an integrated global observing system for climate, sustained on the basis of a mix of high-quality satellite and *in situ* measurements, dedicated infrastructure and targeted capacity-building, will require the strong commitment of all Nations. Furthermore, those Nations with the ability to do so are encouraged to contribute to a voluntary (non-UNFCCC) funding mechanism to support high-priority needs relating to global observing systems for climate in developing countries, especially the least developed countries, small island developing states, and some countries with economies in transition.

In addition, there is a continuing need for action on the priorities reflected in previous assessments and decisions, including:

- Full implementation of designated baseline observing systems;
- Rescue of historical data and metadata;
- Free and unrestricted exchange of data and their provision to international data centres;
- Development of national plans for systematic observation;
- Development and implementation of regional action plans for climate observing systems;
- Addressing the special needs of developing countries and some countries with economies in transition, particularly the least developed countries and the small island developing states;
- Use of climate data as input to decision-making processes.