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SUBSIDIARY BODY FOR SCIENTIFIC AND TECHNOLOGICAL ADVICE

Eleventh session

Bonn, 25 October - 5 November 1999

Item 8 (a) of the provisional agenda

**NATIONAL COMMUNICATIONS FROM PARTIES INCLUDED  
IN ANNEX I TO THE CONVENTION**

**GUIDELINES FOR THE PREPARATION OF NATIONAL COMMUNICATIONS**

**Guidelines for the preparation of national communications by Parties  
included in Annex I to the Convention: Part II**

**Addendum**

**DRAFT GUIDANCE FOR REPORTING ON GLOBAL CLIMATE OBSERVING SYSTEMS**

**Note by the secretariat**

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## I. INTRODUCTION

### A. Mandate

1. The Subsidiary Body for Scientific and Technological Advice (SBSTA), at its tenth session, expressed its appreciation to the secretariat of the Global Climate Observing System (GCOS) for making available preliminary draft guidance relating to reporting on systematic observation, to the UNFCCC workshop on guidelines for the preparation of national communications by Parties included in Annex I to the Convention, held in Bonn, from 17 to 19 March 1999. It noted that the GCOS preliminary draft guidance is undergoing further review. The SBSTA decided to consider the issue at its eleventh session and urged the GCOS secretariat to make the revised draft guidance available in sufficient time for that session (FCCC/SBSTA/1999/6, para. 75 (b)).

### B. Background and scope of the note

2. In response to the above mandate, this note contains draft guidance, as prepared by the GCOS secretariat on the recommendations of the GCOS Steering Committee. In preparing the draft guidance, consideration was given to comments provided by: the GCOS/WCRP<sup>1</sup> Atmospheric Observation Panel for Climate (AOPC), at its fifth session, in April 1999; by the GCOS/GOOS<sup>2</sup> Ocean Observation Panel for Climate (OOPC) at its fourth session, in May 1999; the GCOS/GTOS<sup>3</sup> Terrestrial Observation Panel for Climate (TOPC) at its fifth session, in July 1999; and the participants attending the tenth session of the SBSTA.

3. Experts from 13 countries (Australia, Botswana, Canada, China, France, Japan, Mauritius, the Netherlands, Switzerland, Togo, Uganda, the United Kingdom of Great Britain and Northern Ireland and the United States of America) were invited by the GCOS secretariat to provide technical comments on the draft. The present document takes into consideration, where appropriate, comments received up to mid-August 1999. Further technical comments are expected to be provided by the GCOS/GOOS/GTOS Global Observing Systems Space Panel at its fifth session in August 1999. Relevant information from this panel will be made available by the GCOS secretariat at the eleventh session of the SBSTA.

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<sup>1</sup> WCRP: World Climate Research Programme.

<sup>2</sup> GOOS: Global Ocean Observing System.

<sup>3</sup> GTOS: Global Terrestrial Observing System.

4. The draft guidance is contained in the annex below.<sup>4</sup> In summary, it proposes that the systematic observation section of a national communication should be divided into five subsections. The first of these would be a general section and would describe:

(a) The present status of national programmes to meet the needs for meteorological and atmospheric, oceanographic and terrestrial observations of the climate system;

(b) The extent to which the data from the Party's national networks are being exchanged with other Parties and provided to international data centres;

(c) The actions taken or planned to support the building of capacity in developing countries to acquire and use climate information; and

(d) The actions taken or planned to strengthen international and intergovernmental programmes associated with global observing systems for climate.

5. Three additional subsections would provide information on meteorological and atmospheric observations, oceanographic observations and terrestrial observations. A fifth subsection, on space-based observation programmes, would provide information on the operation and/or use of satellite data.

### **C. Possible action by the SBSTA**

6. The SBSTA may wish to consider the information in this note and determine whether a review by Parties is warranted and whether or how elements of the guidance might be modified and reflected in either of the texts contained in documents FCCC/SBSTA/1999/INF.6 and Add.1.

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<sup>4</sup> The draft guidance made available by the GCOS secretariat, as provided in the annex to this document, is reproduced as received, without formal editing by the Convention secretariat.

Annex

**DRAFT GUIDANCE FOR REPORTING ON GLOBAL  
CLIMATE OBSERVING SYSTEMS**

**1 PURPOSE**

The purpose of this guidance for the preparation and reporting of information on systematic observations for the purposes of the United Nations Framework Convention on Climate Change (UNFCCC), by Annex I Parties and, as appropriate, non-Annex I Parties to the Convention, is to:

- (a) Assist Parties in meeting their commitments under Articles 4.1(g), 5 and 12.1(b) of the Convention and Articles 3.3 and 3.4 of its Kyoto Protocol taking into account decision 14/CP.4 of the Conference of the Parties (COP);
- (b) Facilitate the process of gathering and synthesising information on systematic observations contained in annual submissions and in national communications, including the preparation of global technical analysis and synthesis documentation;
- (c) Facilitate the process of informing future sessions of the COP regarding development of observational networks, difficulties encountered, inter-alia, with respect to the needs of developing countries and options for financial support to reverse any deterioration in observational networks; and
- (d) Facilitate the process of identifying the priority needs for action to improve global observations for climate in relation to the needs of the Convention.

**2 NEEDS OF THE UNFCCC FOR SYSTEMATIC OBSERVATIONS**

Drawing on the experience of, inter alia, the Intergovernmental Panel on Climate Change (IPCC), the Global Climate Observing System (GCOS) has established the requirements for an integrated global climate observing system to meet the basic needs of the UNFCCC. As presented to COP 4,<sup>1</sup> these requirements are that such an integrated observing system must provide data to:

- 1. Characterize the current climate, including its inherent variability and extreme events;
- 2. Obtain information useful to detect climate change, determine the rate of change and assist in attributing the causes of change;

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<sup>1</sup> Contained in document FCCC/CP/1998/MISC.2 and summarized in document FCCC/CP/1998/7.

3. Provide observations to determine climate forcing resulting from changing concentrations of greenhouse gases and other anthropogenic and natural causes;
4. Provide observations to evaluate models and assist in prediction of the future climate;
5. Contribute observations to understand and quantify impacts of climate change on human activities and natural systems.

### **3 GLOBAL OBSERVING SYSTEMS FOR CLIMATE**

The observations of the climate system required to meet the needs of the UNFCCC as well as of other national, regional and international users are global in nature and are provided from a wide range of systems and networks that cover the Atmosphere, Oceans and Land. Creating global data sets requires that the observations be collected in accordance with an internationally co-ordinated strategy. As the responsibility for specifying and coordinating various elements of these systematic observations rests with a variety of agencies and programmes, several international organizations (ICSU, IOC, UNEP and WMO) established GCOS to ensure the development and implementation of a comprehensive approach for systematic climate observations. GCOS participates as a partner in the Integrated Global Observing Strategy (IGOS), which looks at requirements more broadly stated than climate and works with data-providing entities to help ensure that observational gaps are filled through adjustments in current systems, and enhancements and alterations to future systems.

The Initial Observing System (IOS)<sup>2</sup> which has been specified by GCOS, if implemented, would start to meet many environmental needs, including those of the UNFCCC; but it must continue to evolve as capabilities and understanding grow, and this evolution will require ongoing funding. It must also encompass data management, calibration, validation, quality control and assurance, archiving, assimilation, analysis and dissemination systems. This infrastructure is as important as the hardware to the successful operation of GCOS.

The IOS also specifically addresses the need to adhere to guiding principles that ensure long-term integrity and the need to integrate data fully from both space and surface based observing systems. The GCOS has also documented for the COP the specific components of the IOS that need to be implemented to meet the needs of the UNFCCC.

The responsibility for the actual implementation of individual GCOS components currently lies with national agencies and organizations working within the GCOS framework for the global system. Therefore the implementation of GCOS is fundamentally dependent upon the preparation and implementation of national plans and programmes for systematic observations of the climate system. Such plans and programmes should address both the global observations required for GCOS and the national needs for local and regional observations of climate for national applications and decision making objectives.

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<sup>2</sup> Many details of the IOS can be found at <http://www.wmo.ch/web/gcos/gcoshome.html>

It needs to be emphasized that the systematic observations identified by GCOS include a wide range of environmental observations collected for many different purposes by a variety of national agencies and organizations. This approach of using in a synergistic manner specific observing systems established for other purposes is clearly highly efficient. However, it requires, in most nations, the introduction of new co-ordination mechanisms as well as the imposition of a new set of demands on the contributing observational networks to meet the GCOS' requirements.

Further, the sophisticated technology required for climate observations requires a high-level of technical capability. In addition, there must be an ongoing transition from "research" observations to fully operational ones. This requires a transition from research funding to funding by operational agencies but not at the expense of the related research which must continue.

#### **4 REPORTING REQUIREMENTS**

Reporting on national plans is intended to assist in the development of an initial integrated implementation plan covering global observation systems for climate. Future reports will be essential in the ongoing need to ensure that the observing systems are providing the data required.

In developing a national response, information will likely be required from a number of agencies including those with responsibility for meteorology, hydrology, oceanography, geology, agriculture, forestry, the cryosphere, space programmes, as well as institutions and agencies conducting research in these disciplines and central agencies of government such as foreign affairs and finance. Additional guidance on the requirements contained within the Initial Operational System of GCOS and the interpretation of this guidance is available from the GCOS Secretariat.

##### **General**

**4.1 The COP has urged** Parties to undertake programmes of systematic observation including the preparation of specific national plans, in response to requests from agencies participating in the Climate Agenda, based on the information developed by GCOS and its partner programmes.

Describe the present status of national programme planning for systematic observations to meet the needs for meteorological and atmospheric, oceanographic, and terrestrial observations of the climate system identified by the GCOS and its partner programmes that are required to meet the requirements of the UNFCCC, including planning for and implementation of an Integrated Global Observing Strategy.

Questions to consider could include: Has a national plan for implementing the GCOS requirements been prepared and adopted by the Party? Does the plan contain specific commitments to address the stated GCOS requirements for the territory under the Party's jurisdiction? Has the plan been made available to other Parties and international agencies? If an overall plan has not yet been adopted, is a national plan currently under development and if so what is the time frame for its adoption? If applicable, has the Party's space agency been consulted?

**4.2 The COP has urged** Parties to undertake free and unrestricted exchange of data to meet the needs of the Convention, recognizing the various policies on data exchange of relevant international and intergovernmental organizations (These include WMO Resolution 40 Cg-XII - Policy and Practice for the Exchange of Meteorological and Related Data and Products, WMO Resolution 25 Cg-XIII - Exchange of Hydrological Data and Products; IOC Resolution XX-11 – Oceanographic Data Exchange Policy).

Describe the extent to which the data from the Party's national networks for the systematic observations required by GCOS and the UNFCCC are currently being exchanged with other nations and provided to the appropriate international data centres. Indicate the extent to which there is adequate guidance on specific policies on data exchange covering GCOS observations. Describe any institutional barriers to the exchange of the data required by GCOS to meet the needs of the UNFCCC.

**4.3 The COP has urged** Parties to actively support the building of capacity in developing countries, to enable them to collect, exchange and utilize data to meet local, regional and international needs.

List any actions that have been taken or are being planned to be taken by the Party to support the building of such capacity in developing countries.

**4.4 The COP has urged** Parties to strengthen international and intergovernmental programmes assisting countries to acquire and use climate information;

List any actions that have been taken or are being planned to be taken by the Party since COP 4 to strengthen international and intergovernmental programmes associated with global observing systems for climate.

## **Meteorological and Atmospheric Observations**

**4.5 The COP has urged** Parties to actively support national meteorological and atmospheric observing systems, including measurement of greenhouse gases, to ensure that the stations identified as elements of GCOS networks, based on the WWW and GAW, and underpinning the needs of the Convention are fully operational and use best practices.

Describe any national programmes that are in place to meet the needs of GCOS for meteorological and atmospheric observations including the GCOS Surface Network (GSN)<sup>3</sup>, GCOS Upper Air Network (GUAN) and Global Atmosphere Watch (GAW)<sup>4</sup>

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<sup>3</sup> See <http://www.wmo.ch/web/gcos/gcoshome.html> for details of GSN and GUAN requirements.

<sup>4</sup> GAW requirements are specified by the WMO Executive Council Panel of Experts on Environmental Pollution and Atmospheric Chemistry and its best practices are guided by GAW Quality Assurance/Science Activity Centres and calibration centres.

requirements, and the degree to which these observations adhere to guidelines for best practices.<sup>5</sup>

Questions to consider could include: Are the data being exchanged internationally? Have metadata been provided to the World Data Centres? Is the Party operating any part of the international quality control and archiving programme?

To facilitate integration of national reports to provide information on the state of the *global* meteorological and atmospheric observing systems, the Party's report might include information such as the following:

	GSN	GUAN	GAW	Other*
For how many stations is the Party responsible?				
How many of those are operating now?				
How many are exchanging data internationally now? now				
How many are expected to be operating in 2005?				
Does the Party host an international archiving centre?				
Does the Party host an international QA/QC centre?				

Note: \* Provide brief details

## Oceanographic Observations

**4.6 The COP has urged** Parties to actively support national oceanographic observing systems, to ensure that the elements of the GCOS and the Global Ocean Observing System (GOOS) networks in support of ocean climate observations are implemented and, to the extent possible, support an increase in the number of ocean observations, particularly in remote locations, and to establish and maintain climate reference sites.

Describe any national programmes that are in place to meet the needs of GCOS for oceanographic observations<sup>6</sup> including, for example, sea surface temperatures, sea level, temperature and salinity profiles, and energy and carbon fluxes requirements and the degree to which these observations adhere to guidelines for best practices.<sup>7</sup>

Questions to consider could include: Are the data being exchanged internationally? Is the Party operating any part of the international quality control and archiving programme?

To facilitate integration of national reports to provide information on the state of the *global* oceanographic observing systems, the Party's report might include information

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<sup>5</sup> GSN and GUAN best practices are given in the WMO Manual on the Global Observing System sections 2.10.3.17 and 2.10.4.9 respectively.

<sup>6</sup> See [http://ioc.unesco.org/goos/act\\_pl.htm](http://ioc.unesco.org/goos/act_pl.htm) for details of ocean observation requirements and for guidance on best practices.

<sup>7</sup> See [http://ioc.unesco.org/goos/act\\_pl.htm](http://ioc.unesco.org/goos/act_pl.htm) for details of ocean observation requirements and for guidance on best practices.



such as the following:

	VOS	SOOP	TIDE GAUGES	SFC DRIFTERS	SUB-SFC FLOATS	MOORED BUOYS	ASAP
For how many platforms is the Party responsible?							
How many are exchanging data internationally now?							
How many are expected to be operating in 2005?							
Does the Party host an international archiving centre?							
Does the Party host an international QA/QC centre?							

## Terrestrial Observations

**4.7 The COP has urged** Parties to actively support national terrestrial observing systems including programmes to collect, exchange and preserve climate related terrestrial data according to the priorities of the GCOS and the Global Terrestrial Observing System (GTOS) and particularly for those data derived from hydrosphere, cryosphere and ecosystem observations.

Describe any national programmes that are in place to met the needs of GCOS for terrestrial observations<sup>8</sup> including the Global Terrestrial Network – Glaciers (GTN-G),<sup>9</sup> Global Terrestrial Network – Permafrost (GTN-P),<sup>10</sup> and the Global Terrestrial Network – Carbon (FLUXNET),<sup>11</sup> and other networks monitoring land use, land cover, land use change and forestry, fire distribution, CO<sub>2</sub> flux, glaciers, snow and ice extent, and permafrost, and the degree to which these observations adhere to guidelines for best practices. As the GCOS requirements for hydrological data are still being developed, at this stage only a general description of probably relevant programmes, particularly in the context of WMO Resolution 25 Cg-XIII, should be provided. The requirements will almost certainly include a range of parameters such as surface waters storage fluxes and flow discharge, ground water storage fluxes, evapotranspiration, soil moisture, precipitation and water use, on a range of time scales.

<sup>8</sup> See [http://www.wmo.ch/web/gcos/pub/topv2\\_1.html#](http://www.wmo.ch/web/gcos/pub/topv2_1.html#) contents for a general outline of terrestrial observations requirements.

<sup>9</sup> See <http://www.geo.unizh.ch/wgms/> for guidance on GTN-G requirements and best practices.

<sup>10</sup> See <http://www.geography.uc.edu/~kenhinke/CALM/> for guidance on GTN-P requirements and best practices .

<sup>11</sup> See <http://www-eosdis.ornl.gov/FLUXNET/fluxnet.html> for guidance on FLUXNET requirements and best practices.

Questions to consider could include: Are the data being exchanged internationally? Do metadata exist for these networks? Is the Party operating any part of the international quality control and archiving programme?

To facilitate integration of national reports to provide information on the state of the *global* terrestrial observing systems, the Party's report might include information such as the following:

	GTN-P	GTN-G	FLUXNET
For how many sites is the Party responsible?			
How many of those are operating now?			
How many are exchanging data internationally now?			
How many are expected to be operating in 2005?			
Does the Party host an international archiving centre?			
Does the Party host an international QA/QC centre?			

### Space-based Observing Programmes<sup>12</sup>

Information under this heading may not need to be provided by all Parties. However, it should be included in the report of a Party which operates a space programme, or which uses satellite data to derive climate-related observations. In view of the importance of satellite data time series for global climate monitoring, relevant reports should indicate the priority given by space agencies to ensuring data quality and long-term data continuity in conformity with climate observing requirements and principles.

Questions to consider could include: Does the programme give explicit recognition to the need for long-term continuity and has it adopted procedures that are in conformity with climate observing requirements and principles? Are the data provided to international programmes or other countries in accordance with GCOS principles? Is the Party operating any part of the international satellite quality control and archiving programme? What meteorological, atmospheric, oceanographic and terrestrial satellite observations and products for climate purposes are provided as contributions to international programmes?

To facilitate integration of national reports to provide information on the state of relevant *global* space-based systems, both operational and research, the Party's report might include information such as the following:

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<sup>12</sup> The GCOS Plan for Space-based Observations, Version 1.0, June 1995 (GCOS-15) is available at <http://www.wmo.ch/web/gcos/publist2.html#plan> while GCOS space-based observations requirements can be found by specifying GCOS as the user in [http://sat.wmo.ch/stations/asp\\_hlx\\_idc/Requirementsearch.asp](http://sat.wmo.ch/stations/asp_hlx_idc/Requirementsearch.asp)

	Possible response
Does the Party have a space programme?	Series/mission/ instrument
Is there a commitment to data quality and continuity for climate purposes?	Yes/Planned/No
Are there national programmes to derived climate data from space-based data?	Domain(s): atmosphere/ ocean/terrestrial
Are climate data sets distributed regularly?	
Are the data made freely available?	
Does the Party host an international archiving centre?	
Does the Party host an international QA/QC centre?	

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