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SUBSIDIARY BODY FOR SCIENTIFIC AND TECHNOLOGICAL ADVICE
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RESEARCH AND SYSTEMATIC OBSERVATION

Priorities for actions arising from the second adequacy report, with particular reference to the Global Climate Observing System steering committee report to the Subsidiary Body for Scientific and Technological Advice at its eighteenth session

Synthesis report from the Global Climate Observing System secretariat

1. The Subsidiary Body for Scientific and Technological Advice (SBSTA), at its eighteenth session, requested Parties to submit to the secretariat, by 15 September 2003, views on the priorities for actions arising from the *Second Report on the Adequacy of the Global Observing Systems for Climate in Support of the UNFCCC*[1] (second adequacy report) and the related Global Climate Observing System (GCOS) steering committee report.[2] These submissions were compiled by the secretariat in document FCCC/SBSTA/2003/MISC.10 and Add.1. The SBSTA also requested the GCOS secretariat to prepare a synthesis of these submissions and to forward this synthesis to the secretariat for consideration by the SBSTA at its nineteenth session.

2. This document contains the synthesis report, prepared by the GCOS secretariat, based on the submissions from Parties.

[1] Available as report no. GCOS-82 at http://www.wmo.ch/web/gcos/gcoshome.html

[2] *Report to SBSTA 18 from the GCOS steering committee regarding the Second Report on the Adequacy of the Global Observing Systems for Climate*, available at http://www.wmo.ch/web/gcos/gcoshome.html

PAPER SUBMITTED BY THE GLOBAL CLIMATE OBSERVING SYSTEM SECRETARIAT

SYNTHESIS OF VIEWS BY PARTIES ON PRIORITIES FOR ACTIONS ARISING FROM THE SECOND ADEQUACY REPORT AND THE RELATED GCOS STEERING COMMITTEE REPORT TO SBSTA 18

1. Introduction

1.1 This report is provided to the SBSTA in response to its request1 that Parties submit views on the priorities for actions arising from the Second Report on the Adequacy of the Global Observing Systems for Climate in Support of the UNFCCC (the 'Second Adequacy Report' or '2AR') and the associated GCOS Steering Committee report to SBSTA 182. These submissions were seen as a further step towards the development of an implementation plan for integrated global observations for climate. The SBSTA requested that the submissions be compiled into a miscellaneous document33 and also that the GCOS Secretariat prepare this synthesis of the submissions for consideration of the SBSTA at its nineteenth session.

1.2 This synthesis is based on submissions from ten Parties: Argentina, Australia, China, Croatia, Italy (on behalf of the European Community and its Member States (hereinafter referred to as the European Community)), Japan, New Zealand, Sri Lanka, Sudan and the United States of America.

2. General comments

2.1 Many of the responding Parties (Australia, China, Croatia, the European Community, Japan, the United States) **welcomed** the 2AR and the associated report of the GCOS Steering Committee to SBSTA 18 and thanked the many scientists who participated in the process of preparing the comprehensive report. One responding Party (Argentina) noted that the consideration of the 2AR must be made in the context of the full discussion of Agenda Item 7 - Research and Systematic Observation and Agenda Item 5 - Development and Transfer of Technologies.

2.2 Many submissions (Australia, China, Croatia, the European Community, New Zealand, the United States) acknowledged the findings of the 2AR and emphasized again the **critical areas** as presented in the GCOS Steering Committee report where **immediate improvements to global observing systems for climate, covering all domains, are required,** i.e.:

- Observing standards and data exchange.
- Integrated global climate-quality products.
- Capacity building and systems improvements.
- Reporting by Parties.

One Party (Australia) **welcomed the interaction between GCOS and the IPCC** that contributed to scoping the 2AR in the context of the outcomes of the IPCC Third Assessment Report and the complex information requirements of the UNFCCC. The Parties also encouraged the continued **participation of**

[1] FCCC/SBSTA/2003/L.4, paragraph 9
[2] "Report to SBSTA 18 from the GCOS Steering Committee regarding the Second Report on the Adequacy of the Global Observing Systems for Climate"
[3] FCCC/SBSTA/2003/MISC.10

the international research programmes in the development of the GCOS implementation planning activity.

2.3 One Party (Australia) noted that "the full 2AR report contains **an enormous number of findings that address deficiencies, gaps and recommended improvements** across the breadth of global observing systems for climate. Many of these are very specific, to particular systems, regions or activities. They are all important, some to only limited constituencies, and action to address any of them will contribute to improvement of the global systems…. …..the order or **priority of implementation** will depend to a considerable extent on the immediate needs, resources and opportunities of Parties." Several responses (Australia, Croatia, the European Community, New Zealand, the United States) suggested that Parties review all the findings and conclusions of the 2AR and consider what actions they can take, individually, multilaterally and/or through internationally-coordinated programmes, to respond as they can to specific findings, against the broader context of the overarching recommendations.

2.4 Several Parties (Australia, the European Community, Japan, the United States) drew attention to the **Earth Observation Summit** (Washington DC, July 31 2003) and its potential complementary relationship to GCOS. The Summit proposed the development of a comprehensive, coordinated and sustained Earth observation system and created the *ad hoc* Group on Earth Observations (GEO) which met on August 1-2, 2003. Many countries and international agencies have expressed a desire to work in the context of GEO to develop a forward-looking strategy to improve global environmental systems. One Party noted that, "from a SBSTA perspective, there needs to be a clear recognition of the critical importance of climate as a global monitoring issue. In the development of the GCOS implementation plan, it is **critical that there be close cooperation between GCOS and the GEO** so that climate systems are strengthened, linkages maximized, and resources used most productively and efficiently. In this regard there is a need for Parties to work closely with the established intergovernmental agencies whose existing systems and coordination infrastructure are devoted to meeting needs both from a global perspective and in terms of the priorities, capabilities and capacities of their member countries."

3. Observing standards and data exchange

3.1 Several Parties (Australia, the European Community, the United States) pointed out that, of the three principal climate domains, **terrestrial observations have benefited the least from the existence of an international coordination mechanism(s)** to guide the development and application of monitoring standards and regulations. Agreement on standards of observations and the implementation of standards and regulations for the observing systems, data and products, will assist in development of a coherent global system. Such agreement will also better facilitate the integration of terrestrial data and products with data from climate observing systems, including atmospheric and oceanographic components, and contribute to development of fully-integrated and coupled climate models. Two of the Parties (Australia, the United States) suggested that the Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology **(JCOMM) could be a model** that the relevant intergovernmental agencies might consider as a structure that could usefully serve the needs of the various terrestrial monitoring communities.

3.2 Several Parties (Australia, the European Community, Japan) emphasized that **satellite observations** are increasingly critical in global observing programmes including terrestrial observation, especially from the perspective of attaining broad spatial coverage in a timely manner and in developing a diversity of measurements. The satellite and *in situ* communities have established close and collaborative working relationships in respect of atmospheric and oceanographic observations, with regard to guidelines, standards and regulations. Similar relationships will also be critical in establishing an effective intergovernmental terrestrial mechanism.

3.3 Some Parties (Australia, the United States) noted again that the **principles of free and unrestricted exchange of data** are critical to the development of integrated, and hence more fully effective, global observation systems for climate. The implementation plan should seek to reinforce the requirements on Parties for the free and unrestricted exchange of the designated Essential Climate Variable set.

3.4 Several Parties (Australia, the European Community, the United States) emphasized that adherence to the **GCOS Climate Monitoring Principles** (*an expanded version of the UNFCCC climate monitoring principles which specifically includes guidance for satellite observations*) was critical to improvements in all areas of observations, including satellite observations, and must be highlighted in the implementation plan.

3.5 The submission by some Parties (e.g. Argentina, Australia) suggested that the 2AR did not adequately address the **deteriorating state of the meteorological networks**, especially in the developing regions, and suggested that the implementation plan address this issue. In this context, it was cautioned that improvements in the *in situ* networks were absolutely necessary and that simply increasing satellite information could not be expected to satisfy the GCOS requirements.

3.6 Concerns relating to the issue of **automation of surface observing stations** were raised in one response (Argentina). On the one hand observations from the automatic stations have often proved to be inhomogeneous with the long-term record; on the other hand, the cost of implementing and even continuing operation of manned stations is often prohibitive. The implementation plan should address the issue of incorporating automatic station data into the climate data sets.

3.7 Two responses (Japan, New Zealand) highlighted the fact that many climate data (e.g. satellite data and oceanic data) arise out of focused research rather than dedicated operational (systematic) observing programmes. Nonetheless, research programmes can provide high-quality and long-term data sets relevant to GCOS. It is seen as a high priority that within the development of observing standards and protocols, full recognition is given to the **potential role of research programmes as data sources**, and that methods and options are considered and described to integrate research data into observing databases at minimal cost to data providers and database hosts while maximizing the potential use of those data. Guidance should also be produced on migrating research observations to systematic observations status.

3.8 The sustainable operation of sites with **long climatological time series** was mentioned by several responding Parties (Argentina, the European Community, the United States) as an important component of the implementation plan. It was noted that some Parties are undertaking special efforts to create national climate reference networks operating in strict accordance with the GCOS Climate Monitoring Principles. Parties also endorsed the need to **rescue historical data** by digitizing them.

3.9 Some Parties (Australia, Croatia, the European Community, New Zealand) emphasized the importance of internationally-standardized observing methods, data acquisition, processing, archiving, and data and information exchange, and that this data management concern applies to all GCOS domains and to proxy data as well as instrumental records.

3.10 Several Parties (Argentina, the European Community, Japan, Sri Lanka, the United States) specified variables and observation programmes they felt were especially important. These included: GCOS Baseline Networks; greenhouse gas measurements; ozone; aerosols; clouds and water vapour; precipitation, including extreme events; evaporation; surface and sub-surface hydrological observations; phenological observations; and proxy data and metadata. Broader observing programmes mentioned

included the global water cycle and the global ocean observing initiatives. The responses, in aggregate, suggest that priority focus should be on the Essential Climate Variables laid out in the 2AR.

4. Integrated global climate quality products

4.1 One responding Party (New Zealand) pointed out that there are **"...strong links and synergies** between improving systems, increasing active participation and submission of data by developing countries, building capacity, and developing and supporting climate products and tools that are relevant to the needs of the Convention as a whole as well as regional and short-term decision-making by individual countries. It is important that those synergies be considered and explored in the GCOS implementation plan."

4.2 Several Parties (Croatia, the European Community, New Zealand, Sudan) mentioned the **synergies that exist between the global observing system and the regional and national needs and programmes**. One response (New Zealand) neatly summarized these views: "..integrated products that support short-term decision-making increase the direct benefits to participating countries and hence encourage greater participation in the global observing system, while application of relevant products and tools in the management of climate variability helps building vital capacity in developing countries in dealing with climate information in the context of sustainable development. In turn, this growing capacity to deal with information related to climate variability would also increase the quality of climate data submitted to international data centres. We therefore suggest as a high priority that tools and products that support regional short-term decision-making are fully integrated into the range of climate quality products that are to be developed and made available under GCOS. **Regional GCOS plans, in combination with other sustainable development and environmental monitoring plans, appear to be the most relevant place to identify such synergies** between short-term climate-related decision-making and implementation of GCOS including its long-term and global objectives."

4.3 One response (the United States) noted that the **importance of reanalysis** as a tool to provide integrated products has been clearly demonstrated in the atmospheric domain, and the implementation plan should place priority on additional international and coordinated efforts especially in the oceanic and terrestrial domains. The rescue of historical data and metadata is critical in this regard.

4.4 One Party (New Zealand), noting that individual Parties or institutions will undertake the sustained production and international dissemination of integrated climate products, considered it important that the **utility and applications of climate-quality products** are understood at a national government level. This can be assisted by linking, in the implementation plan, the need for such products, and for the underlying systematic climate observations, to a range of national needs, such as monitoring, climate alert systems, vulnerability assessment, climate risk management, adaptation strategies and disaster management.

5. Capacity building and systems improvement

5.1 Most Parties (Argentina, Australia, China, the European Community, Japan, Sudan, the United States) pointed out that the 5- to 10-year implementation plan for global observing systems for climate should recognize the extent of the resource requirements, particularly in respect of the developing countries, associated with all aspects of the sustained operation of an integrated global climate monitoring system, which includes funding for infrastructure establishment and maintenance; technology transfer; education and training; ongoing operational needs; and capacity building. The implementation plan should include the **assessment of urgent capacity needs** as reflected in the GCOS Regional Action Plans as a priority action.

5.2 Several of the responding Parties (Australia, China, Croatia, New Zealand, Sri Lanka) endorsed the **establishment of a financial mechanism** (e.g. the proposed GCOS Donor Fund) and envisaged that it would be modeled on existing mechanisms, that it would develop flexible options for methods of contribution, that it would work with other relevant funding and implementation mechanisms, and that it would address the breadth of funding needs, including those relating to infrastructure, ongoing operations and capacity building. Priorities for donor funding would be to those areas that are currently deficient in observations, and that consideration be given to areas where data are urgently required for impacts assessment or adaptation purposes, or where climate models suggest significant climate change may occur. In this regard, Parties also suggested that the relevant international organizations mobilize resources in support of the GCOS priority objectives.

5.3 It was emphasized in one submission (Australia) that bilateral and multilateral funding support in respect of global observing systems for climate include an **explicit commitment to adhere to the UNFCCC climate monitoring principles and to the principles of data exchange (including metadata and historical data)**.

6. Reporting by Parties

6.1 Several responding Parties (Australia, the European Community, the United States) emphasized that in order to improve the understanding of climate and climate change, and for the UNFCCC to be implemented effectively, **accurate and credible information relative to all elements of GCOS must be exchanged according to the relevant guidelines** (Decision 4/CP5). In summary, the submissions offered the following list of suggestions for the GCOS implementation plan:

- The Supplementary Reporting Format (submitted to SBSTA 13), modified as necessary to remain compatible, should be institutionalized within the revised guidelines.
- The reporting guidelines should include a requirement to report against commitments.
- The Parties should be urged to report on measures aimed at adhering to climate monitoring principles and data rescue and preservation.
- The UNFCCC climate monitoring principles should be revised and extended to address the application of the principles, and development of new principles, to satellite observing systems.
- All Parties should participate in the reporting process.

6.2 Some responses (Australia, Japan) noted that the **barriers to free and unrestricted exchange of data** need to be understood, and strategies developed and implemented to remove these barriers. To this end, SBSTA should request Parties to report on their achievement of this requirement and on the barriers that prohibit or limit free and unrestricted exchange. The information gathered should be used, collaboratively with the various Parties, agencies and institutions involved, in developing strategies for removal of the barriers.

7. Summary

7.1 The following list summarizes the essential points brought forward by Parties in their responses to the Second Adequacy Report and the related GCOS Steering Committee document.

- Establish close cooperation/collaboration with the *ad hoc* Group on Earth Observations (GEO) and their emerging activities (Australia, the European Community, Japan, the United States).
- Develop an international coordinating and standard-setting mechanism in the terrestrial domain (Australia, the European Community, the United States).
- Further expand the integration of satellite data with *in situ* data in all domains (Australia, the European Community, Japan).

- Emphasize the need for adherence to the GCOS Climate Monitoring Principles (Australia, the European Community, the United States).
- Reinforce the principles of free and unrestricted exchange of data and seek to minimize the impact of national and international data policies that are barriers to the exchange (Australia, Japan, the United States).
- Ensure that standards and protocols are in place to facilitate the inclusion of data acquired in research programmes into the GCOS data streams (Japan, New Zealand).
- Rescue historical data and metadata to help ensure long historical time series and to facilitate reanalysis (Argentina, the European Community, the United States).
- Develop data exchange/data management standards for all domains and for proxy data as well as instrumental records (Australia, Croatia, the European Community, New Zealand).
- Focus on the Essential Climate Variables (Australia, the European Community, Japan, the United States).
- Utilize regional GCOS plans (Australia, the European Community, Japan, the United States).
- Emphasize the importance of reanalysis as an integrating tool for all GCOS domains (the United States).
- Undertake an assessment of urgent capacity building needs (Argentina, Australia, China, the European Community, Japan, Sudan, the United States) and establish a funding mechanism along the lines of the Donors Fund proposed by Australia (Australia, China, Croatia, New Zealand, Sri Lanka).
- Maintain and extend reporting by Parties to UNFCCC on systematic observations (Australia, the European Community, the United States) and use the supplementary reporting format presented by Australia at SBSTA 13 (Australia, the European Community).

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