CGMS

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UPDATE OF THE IMPLEMENTATION ACTIVITIES

FOR THE

GLOBAL CLIMATE OBSERVING SYSTEM

The GCOS includes surface-based, air-borne, and space-based components and constitutes, in aggregate, the climate observing component of the Global Earth Observation System of Systems (GEOSS).

A strengthened Global Climate Observing System will be important to the successful implementation of the Global Framework for Climate Services (GFCS), recognizing that observations and monitoring constitute one of the essential pillars of the GFCS. The implementation of improvements to the climate observing system will also support assessment and development of policy related to climate change.

One of the next steps of the GCOS improvement and assessment cycle will be the preparation of the Third Adequacy Report and progress report on the implementation of GCOS, based on findings of a Workshop on Observations for Adaptation to Climate Variability and Change, on the fifth IPCC Assessment process, on other workshops or symposia, from the 2014 National Communications to UNFCCC, from the GCOS-led domain panels and calling on writing-team meetings, consultations and a public review.

Progress and future needs in the development of the architecture for climate monitoring from space will be addressed in the next GCOS Adequacy Report and the new Implementation Plan that will follow. GCOS will remain engaged in the next stages of development and implementation of the architecture for climate monitoring from space.

Action/Recommendation proposed: CGMS members to take note.

UPDATE OF THE IMPLEMENTATION ACTIVITIES FOR THE GLOBAL CLIMATE OBSERVING SYSTEM

1 GCOS as a Contribution to the Global Framework for Climate Services

Many of the needs for climate observations in support of the Global Framework for Climate Services (GFCS) will be addressed by the actions identified in the 2010 updated Implementation Plan for the Global Observing System for Climate in Support of the United Nations Framework Convention on Climate Change (UNFCCC).

As recognized by the World Climate Conference-3, an adequate global climate observing system is an essential element of the GFCS, underpinning all other elements. The overarching framework for observing the climate is the Global Climate Observing System (GCOS), which was launched in 1992 by its four co-sponsors WMO, IOC of UNESCO, UNEP and ICSU. GCOS encompasses the entire observations community and is intended to meet the full range of national and international requirements for climate-related observations. The role of GCOS is to help ensure the sustained provision and availability of reliable physical, chemical and biological observations and data records for the total climate system – across the atmospheric, oceanic and terrestrial domains, including hydrological and carbon cycles and the cryosphere.

The success of the GFCS will be dependent on the availability of reliable information and therefore on the adequacy of the component observing networks on which the GCOS is built: the Global Observing System (GOS) and Global Atmosphere Watch (GAW) (key components of WIGOS); the climate-related networks of the Global Ocean Observing System (GOOS) and Global Terrestrial Observing System (GTOS), including the hydrological and carbon cycles and the cryosphere; and research and operational observing systems.

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The implementation of improvements in the climate observing system, which is needed to support the GFCS and needs for assessment and policy development in general, will be facilitated by close coordination with the GCOS programme.

2 Third Adequacy Report and Progress Report

At the thirty-seventh session of the Subsidiary Body for Scientific and Technical Advice (SBSTA) of the UNFCCC in November 2012, GCOS was invited to submit a Third Adequacy Report to SBSTA in 2015, and a new Implementation Plan in 2016, with a draft of the latter encouraged to be provided one year before.

The GCOS programme has started on the process of producing reports on progress and adequacy of climate observation and the new plan, which should identify not only verifiable and costed actions as previously but also specific requirements for data products, to meet the needs for adaptation to variability and change and for provision of services, in addition to those for assessment and mitigation of climate change.

The content will be based on input from a review of actions set out in the in 2010 updated Implementation Plan, from the recent Workshop on Observations for Adaptation to Climate Variability and Change (26-28 February 2013, Offenbach, Germany), from the fifth IPCC Assessment process through one or more workshops or other meetings that include participation of lead authors from Working Group 1 and Working Group 2 and other experts, from the 2014 National Communications to UNFCCC, from panel chairs and panel members and calling on writing-team meetings, consultations and a public review.

3 GCOS Expert Panels for Land, Atmosphere and Oceans

The GCOS/GTOS/WCRP Terrestrial Observation Panel for Climate (TOPC) had held its fifteenth session from 6 to 7 March 2013, at WMO, in Geneva. On that occasion, the current Chairman, Prof Han Dolman (Free University of Amsterdam, The Netherlands) handed over the chairmanship to Prof Konrad Steffen (Federal Institute for Forest, Snow and Landscape Research, Switzerland). TOPC reviews the climate-observing components of terrestrial global observing systems and is managed by the GCOS Secretariat. Prof Riccardo Valentini (University of Tuscia, Italy) had handed in his resignation as the Chairman of the Global Terrestrial Observing System (GTOS) Steering Committee on 5 March 2013, and the GTOS Secretariat, formally still hosted at FAO, has been without staff support for more than one year.

The GCOS/WCRP Atmospheric Observation Panel for Climate (AOPC), chaired by Prof Adrian Simmons, met for its 18th session from 2 to 5 April 2013, at WMO, Geneva. This Panel is an efficient platform for discussions on the climate-components of existing research and operational atmospheric observing systems and the related programmes, including important cross-cutting links to the World Climate Research Programme (WCRP) as well as to the Global Atmosphere Watch (GAW) Programme. The Panel in particular was informed of key outcomes of CGMS-40 and formulated views on a number of the topics presented. It also focused on the GCOS Surface Network (GSN), the GCOS Upper-Air Network (GUAN) and the GCOS Reference Upper-Air Network (GRUAN). The Panel in its future sessions will continue to advise explicitly on climate-observing elements of the WMO Integrated Global Observing System (WIGOS), and seek to ensure that there is full cooperation between GCOS, WIGOS and WIS as they develop.

The Secretariat for the GCOS/GOOS/WCRP Ocean Observations Panel for Climate (OOPC) has moved from IOC of UNESCO, Paris to the GCOS Secretariat. Following the approval of the Framework for Ocean Observations, GOOS Panels have been reorganized. GOOS will now be overseen by a steering committee and three Panels for Ocean Physics (OOPC), Biogeochemistry (the International Ocean Carbon Coordination Project will expand to include Nutrients and Oxygen) and a new Biology Panel. The GOOS Steering Committee, Secretariat, and Panel chairs met in Qingdao at the end of March. Key tasks for the Panel are coordinating a review of the Tropical Pacific Observing System, reducing uncertainty in air-sea flux estimates and identifying requirements for observations of western boundary currents. The Panel is also expected to expand its focus to the coastal oceans and shelf seas.

In the context of the GCOS Panels' work, the close liaison with the space agencies on dedicated space-based observations for climate, is important, in particular through the Committee on Earth Observation Satellites (CEOS), the Coordination Group for Meteorological Satellites (CGMS), the WMO Space Programme and their development of the architecture for climate monitoring from space.

4 GCOS Programme Review

The GCOS programme has had substantial success in the past 20 years, but several new developments and some emerging issues have given rise to the need to re-examine the mandate and terms of reference of GCOS. The GCOS Steering Committee at its 19th session in 2011 welcomed an independent review of GCOS and appreciated the willingness of WMO to take the lead in seeking to carry this out in 2013. The review board had held its first meeting from 26 to 27 March 2013. The report of review board will be available by the middle of 2014.

5 Report on GCOS Activities related to space-based observations for climate

The CEOS Response to the 2011 update to the Satellite Supplement to the GCOS Implementation Plan, coordinated with CGMS and other bodies, reinforces the needs called out by the GCOS Satellite Supplement and provides more detail on the deliverables, coordination, activities, and who within CEOS will lead the effort. The Response, considered by the 37th session of the SBSTA in Doha (26 November-7 December 2012) provides a view of what can be achieved with current funding and additional funding with respect to some 48 satellite-related actions in the GCOS Implementation Plan. Atmosphere, ocean, and terrestrial domain leads are specified for follow-up. These coordinate with CEOS working groups, CEOS virtual constellations, climate-related external groups (e.g., SCOPE-CM, GSICS, WCRP, CGMS), and experts to develop plans responding to the actions in the GCOS Implementation Plan via templates. It is expected that this new CEOS Response will help space agencies plan their climate change programmes.

SCOPE-CM received specific attention at the 2012 session of the GCOS Steering Committee. It was suggested that a SCOPE-CM representative be invited to report regularly to either GCOS Panel meetings or to the Steering Committee.

GCOS was represented at three meetings on “Climate from Space” held in Geneva in February 2013. These comprised a CEOS/CGMS/WMO Space Programme meeting on the development of the architecture for climate monitoring from space, the third meeting of the CEOS Working Group on Climate and a meeting of the SCOPE-CM Executive Panel. These meetings discussed several issues, including architecture, ECV inventory, maturity matrices and in-depth ECV assessment. The desirability of developing the ECV inventory to include datasets based on *in situ* as well as space-based observation was recognised, and steps to be taken towards achieving this were identified.

The ESA Climate Change Initiative (CCI) is pursuing its work on 13 ECVs started in 2010/11 for a first 3-year phase, in a second phase running for another 3 years until end of 2016. Its main objective is to improve quality to meet climate needs and to ensure free open access to CCI data products, to promote wide exploitation of CCI data sets, to maximize scientific impact (publications) and to evolve from prototype to sustainable systems. The GCOS programme is considered as a high-level user and the Chairman of the GCOS Steering Committee is actively involved in giving guidance and advice to the ESA CCI science advisory body.

6 CONCLUSION

The GCOS programme appreciates the contributions of CGMS members to the global observing system for climate, and the specific activities undertaken by CGMS working groups and expert teams. It looks to continued support in future, including by:

- assisting the GCOS programme in its assessment of progress in climate observation and adequacy of the current and foreseen observing system, and in its identification of implementation actions;
- continuing to generate fundamental climate data records and ECV products, including from reprocessing of past data records where needed;
- continuing its work with CEOS and the WMO Space Programme on the inventory of climate datasets;
- promoting the intercomparison and assessment of datasets.