

J3.4 The U.S. Global Climate Observing System (GCOS) Program Office's Involvement in the International GCOS Effort

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1. INTRODUCTION

The international Global Climate Observing System (GCOS) was established in 1992 to ensure that the observations and information needed to address climate-related issues are obtained and made available to all potential users. It is cosponsored by the World Meteorological Organization (WMO), the Intergovernmental Oceanographic Commission (IOC) of United Nations Educational Scientific and Cultural Organization (UNESCO), the U.N. Environment Program (UNEP) and the International Council of Scientific Unions (ICSU). GCOS is intended as a long-term, user-driven operational system capable of providing the comprehensive observations required for monitoring the climate system, for detecting and attributing climate change, for assessing the impacts of climate variability and change, and for supporting research toward improved understanding, modeling and prediction of the climate system. It addresses the total climate system including physical, chemical and biological properties, and atmospheric, oceanic, hydrologic, cryospheric, and terrestrial processes. More information on the international program can be found at <http://www.wmo.ch/web/gcos/gooshome.html>

2. BACKGROUND OF THE U.S. GCOS PROGRAM

The United States (U.S.) has been involved with GCOS since its inception. Since 1992, a considerable amount of work has been done by various federal agencies. In particular, federal agencies have supported the international GCOS Steering Committee, and the work of the GCOS data, space, and science panels, as they have engaged in planning GCOS, defining its requirements, and contributing parts of the initial system. NOAA's National Climatic Data Center (NCDC) in Asheville, North Carolina, supports a number of GCOS data management activities. A national GCOS program has begun to emerge over the past two years. In November 1999, a full-time national GCOS program manager position was established and filled by NOAA/NESDIS to manage the national program. The primary focus of this position is to coordinate the development of a national GCOS program that involves all U.S. federal agencies with a role in climate observing

and monitoring. Those agencies include all of NOAA's line offices, the National Aeronautics and Space Administration (NASA), the National Science Foundation (NSF), the U.S. Departments of Energy and Agriculture, the Environmental Protection Agency, and the U.S. Geological Survey. As part of this effort, a national GCOS Coordination Group was formed in January 2000 to aid in the various aspects of the national GCOS program. The initial focus of the group was the production of a national report detailing the current state of the various components of GCOS in the U.S.

3. U.S. NATIONAL GCOS REPORT

In November 1999, the United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties (COP-5) directed all Annex I industrialized nations (reference the following link for a list of Annex I nations <http://www.unfccc.int/resource/natcom/nctable.html>) to prepare detailed reports on systematic observations in time for the October 2001 meeting of the UNFCCC Conference of the Parties. The UNFCCC directed the GCOS Secretariat at the WMO in Geneva, Switzerland, to be involved in the preparation and eventual adequacy assessment of the global climate observing system. As such, the U.S. State Department assigned the task for preparing the U.S. national report to the GCOS program coordinator at NOAA.

The U.S. report on systematic observations (also known as the U.S. GCOS Report) delineates climate monitoring in the U.S. in five distinct yet integrated areas: (1) *in-situ* atmospheric observations; (2) *in-situ* oceanographic observations; (3) *in-situ* terrestrial observations; (4) satellite based observations, which by their nature cut across the atmospheric, oceanographic, and terrestrial domains; and (5) data and information management related to systematic observations.

Actual work on the national report was begun in November 2000 with the establishment of four writing groups as follows: (1) atmospheric observations headed up by Russell Vose of NCDC; (2) oceanographic observations headed up by Steve Piotrowicz of NOAA's Ocean and Atmospheric Research line office; (3) terrestrial observations headed up by David Clark of NOAA's National Geophysical Data Center; and (4) satellite observations headed up by Robert Schiffer of NASA. The data and information section of the report, as well as the overall coordination of the format and content of the report were handled by the author of this

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paper in his role as U.S. national GCOS Coordinator.

The report was finalized and made available to the U.S. State Department in August 2001 for transmission to the UNFCCC Secretariat. The full report as well as a summary of the report are available in Adobe PDF format at the U.S. national GCOS home page at http://www.eis.noaa.gov/gcos/soc_long.pdf

4. INTERNATIONAL INVOLVEMENT

In addition to the requirement for national reports on systematic observations, the UNFCCC at its 1999 meeting invited the GCOS Secretariat to continue to assist with and facilitate the establishment of an appropriate intergovernmental process that would identify potential improvements in the global observing system for climate and set priorities for acting on those improvements. As such, the U.S. GCOS program has been one of the leaders in this effort.

The U.S. continues to be an active participant in and large supporter of the international Global Climate Observing System (GCOS) program in a number of areas. These areas of support can be characterized in two categories of support: (1) global; and (2) regional.

Global Support

The global support represents the overall U.S. Government's support of GCOS. In May 2002, the U.S. State Department contributed \$600K (US) in funding to the GCOS Secretariat in order to conduct the second adequacy study of GCOS on a global basis. This adequacy study was called for by the UNFCCC and is a joint GCOS/Intergovernmental Panel for Climate Change effort. This is intended to produce an adequacy report based on among other things the analysis of GCOS national reports in order to focus attention on where critical gaps in the overall global climate observing are in order for resources to be better directed.

Currently in development, *The Second Report on the Adequacy of GCOS* will provide an estimate of the adequacy of GCOS. According to the present plan, an interim version will be submitted to the 8th Conference of the Parties (COP-8) under the U.N. FCCC next month in India. This will be an extremely important document for GCOS, because it will be subsequently reviewed and endorsed by Environmental and Foreign Affairs Ministers around the world, with the final report being presented to COP-9 in December of 2003.

As part of this global aspect of U.S support for GCOS, and in response to a United States Presidential Climate Change Research Initiative (CCRI), the U.S. has formulated a Framework for International GCOS Support plan. This plan focuses on the status of GCOS, what is needed to bring GCOS to its operational-design level, and the support needed from the scientific, donor,

and host communities to implement selected improvements to it. In particular, the plan focuses on needed improvements to meteorological surface-based networks. While still awaiting Congressional approval, the plan calls for \$4M (US) in support in order to address the most critical deficiencies in the GSN, GUAN, and GAW networks. A key component of the US' CCRI funding for GCOS is the hopeful partnership from other developed nations in contributing to this effort.

Vice Admiral Conrad C. Lautenbacher, Jr., U.S. Navy (Ret.) Undersecretary of Commerce for Oceans and Atmosphere and NOAA Administrator has demonstrated great support for and commitment to the international GCOS effort. In speeches to the Executive Councils of the *Intergovernmental Oceanographic Commission of UNESCO* and the WMO in June 2002, Admiral Lautenbacher made the following statements that encourage other nations to join the US in this CCRI partnership to support GCOS.

"I strongly believe that NOAA is the right agency to take a leadership role within the United States, but we know full well that we cannot do this alone. The global observation effort for climate is far too enormous for one organization, or even one country, to undertake alone. We must work together. Perhaps the greatest challenge is to develop one integrated observation plan for the atmosphere, ocean, and land which everyone can support. The Global Climate Observing System (GCOS) and Global Ocean Observing System (GOOS), working with the Integrated Global Observing Strategy (IGOS) Partners and others, have developed international consensus on overall needs. There is, however, much work still to be done. This challenge lies in our ability to provide one coherent plan which integrates space and in-situ observations across those three elements."

The Workshop of the U.S. Climate Change Science Program will be held December 3-5, 2002 to review a discussion draft version of its Strategic Plan, incorporating the U.S. Global Change Research Program (USGCRP) and the Climate Change Research Initiative (CCRI). Members of the international climate science community interested in reviewing and discussing this Strategic Plan will be invited to participate. Workshop discussions—supplemented by written comments submitted during a 30-day post-Workshop period—will be reflected in the final Strategic Plan, a document to reflect U.S. consensus.

Regional Support

The regional support for GCOS represents the efforts on the part of the U.S. GCOS Program office. While the funding levels are not at the same levels as that of the U.S. global support for GCOS, it is far more focused on efforts dealing with regional workshops for

developing nations with a special emphasis on the South Pacific Island States' region.

The Regional Implementation Workshop, initiated by the GCOS in response to Decision 6/CP.5 of the FCCC and held in Apia, Samoa in August 2000 with support and active participation by both Australian and US experts, built on the South Pacific Regional Environment Program's (SPREP) needs analysis and has provided the basis for development of a Pacific Island-GCOS (PI-GCOS). The PI-GCOS Action Plan has identified the high priority actions, many of which can be implemented as stand alone modules, that will assist in restoring and improving observing systems in the region to a level necessary to effectively monitor the climate of the region and systematically detect trends and changes in climate.

The U.S. GCOS Program Office in NOAA has been a supporter of the PI-GCOS effort since the Apia workshop and has contributed resources towards that effort. In FY2000, the contribution to PI-GCOS was \$25K (US) in support of the workshop; in FY2001 and FY2002 the combined contribution to PI-GCOS was an additional \$65K (US) in support of the PI-GCOS Action Plan and Implementation Team meetings, and associated logistics. Beginning in Fiscal Year (FY) 2003 the U.S. GCOS Program Office plans (contingent upon final budget disbursements for FY2003) to at least double its support of the combined \$90K contributed to date. These funds will begin to address some of the more "low-hanging fruit" actions and proposals from the PI-GCOS Action Plan in FY2003. In addition, the US GCOS Program Coordinator plans to continue contributing his in-kind support and facilitation of furthering the goals of PI-GCOS.

Recently, in line with the bi-lateral Climate Action Partnership (CAP) between the U.S. and Australia, there have been some preliminary discussions of the possibility of a similar climate change partnership between New Zealand and the United States. The partnership would be designed to enhance the mutual interest of New Zealand and the United States in reducing greenhouse gas emissions so as to achieve the objective of the UNFCCC, and would also synergize with the efforts of the CAP program in the Pacific. The partnership would be based on areas of existing

cooperation and/or common interest. Current bilateral science collaboration, such as through the US/NZ Science and Technology Treaty, would be enhanced and strengthened.

One issue that the U.S. GCOS program is addressing is the continued operation of the Global Observing System Information Center (GOSIC) located at <http://gosic.org/>. The GOSIC is under a second-phase 3-year development effort under the auspices of Dr. Ferris Webster at the University of Delaware. The U.S. GCOS Coordinator sits on a newly formed GOSIC Advisory Group that had its first meeting in April 2001. The group reviewed the operation and relevance of the GOSIC and provided some good direction and ideas for the GOSIC to pursue. NOAA is providing on-going financial support to the GOSIC for this new 3-year development phase. At the end of that developmental period, the GOSIC plans a 2-year transition period in which to transition its operation to a permanent operational agency. NOAA may be one of the candidate organizations to host the GOSIC system.

In support of the PI-GCOS effort, the GOSIC will be looking at the implementation of a Pacific Islands GCOS portal in order to facilitate the access to Pacific Islands GCOS datasets that may be held in a diverse group of data centers. This portal will be a key tool for a proposed Pacific Islands Regional GCOS Program Manager that is a position to be funded by the U.S. GCOS Program Office as part of the integrated Pacific Islands Regional GCOS Implementation Team effort of which the US is a member along with Australia, New Zealand, and the member nations of SPREP.

5. CONCLUSION

The U.S. has been very supportive of the overall international GCOS program effort and has provided considerable support on both a global as well as regional effort. It is believed that support for GCOS should be global in nature and the US is working to be a leader in helping to make GCOS a sustainable and robust system both regionally and globally, and that can serve the needs of better climate science and analysis.