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UNFCCC EXPERT MEETING ON DATA AND OBSERVATIONS
Mexico City, Mexico

AN OVERVIEW OF THE GLOBAL CLIMATE OBSERVING SYSTEM AND ITS INTERACTION WITH THE UNFCCC

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The GCOS Mission

⇨ *To ensure that the data required to meet the needs of users for climate information are obtained and made available for:*

- Climate system monitoring;
- Climate change detection and attribution;
- Operational climate prediction on seasonal-to-interannual timescales;
- Research to improve understanding, modelling and prediction of the climate system;
- Applications and services for sustainable economic development;
- Assessment of the impacts of, and vulnerability and adaptation to, natural climate variability and human-induced climate change;
- Meeting the requirement of the UNFCCC and other international conventions and agreements.

⇨ *Global, long-term, high-quality, sustainable, reliable, …*

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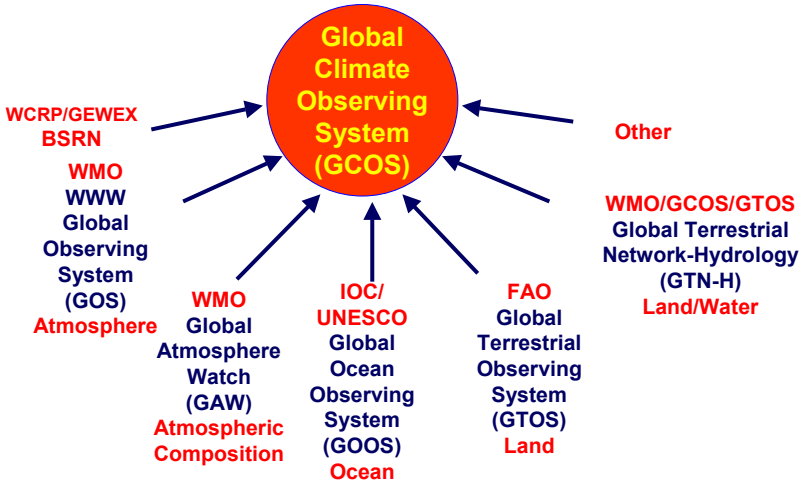
GCOS as a System of Systems



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The GCOS Strategy

- **Identify observational requirements for climate applications**
  - SC, Science Panels (AOPC, OOPC, TOPC), partners, sponsors
  - Identify networks/systems needed to meet requirements
- **Build on existing systems to the extent possible**
  - Encourage existing systems to meet GCOS standards: other observing systems, sponsors, CBS, CAS, CCl, CHy, JCOMM, GTOS, CGMS, CEOS, IGOS-P
- **Engage intergovernmental, regional and national bodies**
  - UNFCCC/COP on 'systematic observation' requirements
  - National and regional entities to address deficiencies
  - Regional Workshops
  - Capacity building
- **Resource mobilization**
  - Seek multi-governmental funding, national support
  - GCOS Cooperation Mechanism

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GCOS Implementation Plan (October 2004)

- **Builds on requirements in the 'Second Adequacy Report' (2003)**
  - **Essential Climate Variables (ECVs)**
  - **Integrated global analysis products**
- **Uses existing global, regional and national plans**
- **Defines indicators for measuring its implementation**
- **Sets implementation priorities, agents and resource requirements**
- **131 Actions**
- **Estimated USD 631M additional annually recurring cost**
- **Major satellite component**

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Essential Climate Variables (ECVs)

Domain	Essential Climate Variables	
Atmo-spheric (over land, sea, and ice)	**Surface:**	Air temperature, Precipitation, Air pressure, Surface radiation budget, Wind speed and direction, Water vapor.
	Upper-air:	Earth radiation budget (including solar irradiance), Upper-air temperature, Wind speed and direction, Water vapour, Cloud properties.
	Composition:	Carbon dioxide, Methane, Ozone, Other long-lived greenhouse gases, Aerosol properties.
Oceanic	**Surface:**	Sea-surface temperature, Sea-surface salinity, Sea level, Sea state, Sea Ice, Current, Ocean colour (for biological activity), Carbon dioxide partial pressure.
	Sub-surface:	Temperature, Salinity, Current, Nutrients, Carbon, Ocean tracers, Phytoplankton.
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, Soil moisture.	

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Some Important GCOS Activities related to Convention Needs

- **GCOS Climate Monitoring Principles**
  - Endorsed in their basic form by the UNFCCC in 1999
  - Completed by satellite specific monitoring principles in 2003
- **Satellite supplement to the GCOS IP (2006)**
  - Further Assistance to Parties for generating products derived from satellite data
- **Revised guidelines for reporting on the status of national climate observing systems**
  - Proposed by GCOS and adopted by COP13 (2007)
  - Considers ECVs
- **SBSTA requests progress report on the GCOS Implementation Plan**
  - Due September 2009

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Regional Workshop Programme

Requested by UNFCCC COP-5 (1999)

"… to identify the priority capacity building needs related to participation in systematic observation…."

The objectives for each workshop were to:

- Assess contribution of the region to the GCOS Baseline Networks
- Identify national/regional needs and deficiencies in climate data
- Initiate development of Regional Action Plans for improving observing systems
- Understand guidelines for reporting to the UNFCCC
- Highlight GCOS objectives and needs in the regions

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Regional Workshop Programme

- All ten regional workshops in the Programme completed between 2000 to 2006
- …and of ten Regional Action Plans finalized
- Facilitation of follow-up implementation activities including the evolving Climate for Development in Africa Programme (ClimDev Africa)
- Additional implementation activities planned in other regions

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Climate for Development in Africa (ClimDev Africa)

- An integrated, multipartner programme addressing
  - Climate observations,
  - Climate services,
  - Climate risk management, and
  - Climate policy needs in Africa
- Programme will support efforts to achieve the Millennium Development Goals
- Opportunity for substantial funding support for observations and climate service provision programmes of African NMHSs
- Principal partners are: African Union, African Development Bank, UN Economic Commission for Africa, GCOS, and WMO
- Potential donors include UK Department for International Development, European Commission, African Development Bank

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GCOS Implementation in Central America, Mexico, and the Caribbean

- Follow-up to GCOS RAP for CAC countries
- Donors invited to consider proposals
- A focus on regional coordination and cooperation
- Some actions participants would like to see include:
  - Creation of a regional coordination committee under the auspices of the regional counterparts of GCOS sponsors
  - Appointment of a GCOS Regional Coordinator with responsibility to update RAP, facilitate implementation, and liaise with regional donor & partnership organizations
  - Hold annual implementation coordination meeting
  - Establish ongoing communication between Regional Coordinator and GCOS Secretariat

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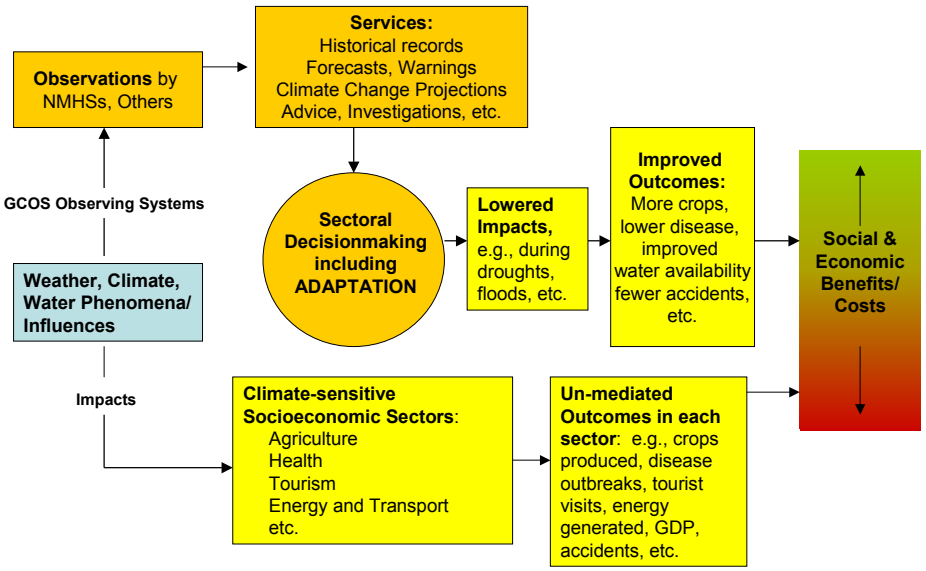
GCOS, WCRP, & IGBP Learning from the IPCC Fourth Assessment Report -- Sydney, October 2007

- Purpose: To draw lessons from IPCC AR4 for research and observation needs
- Some Conclusions related to adaptation:
  - A need to identify an authoritative set of information needs for adaptation policies and a recognition of increasing demand by decision makers for such information
  - A requirement for observations of sufficient detail and scope to improve models and to ensure that control climate change can be elucidated, predicted, and projected
  - A need to and communicate uncertainties and limitations in the use of regional observations and model products
  - A need to underpin an increasing range of user/stakeholder needs related to adaptation

Climate Observations: Delivering Benefits Through Adaptation



"The foundation for essentially all informed decision-making aimed at reducing the costs and enhancing the benefits of weather, climate, and water events is the systematic observation of the atmosphere, ocean and land surfaces…"

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Observation Needs and Adaptation

- **Continued accumulation of basic climate data is vital to:**
  - **Understand past and current climate change**
  - **To improve projections of future climate**
  - **To develop effective adaptation strategies**
- **To what climate should we adapt?**
  - **Still many uncertainties related to changes in climate & climate extremes that are relevant to impacts of CC & thus to adaptation**
  - **Impacts of concern are at regional and local levels**
- **Therefore, there is a need for:**
  - **Better monitoring of current climate, especially improvements in denser regional networks – to provide greater spatial and temporal detail**
  - **Rescue of available historical climate data**
  - **Improved regional climate models / projections**

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GCOS, the UNFCCC, and Adaptation

- In the data and observations element of the Nairobi Work Programme , SBSTA invited GCOS to provide information on how it can contribute to the implementation of the Programme
- Responds with "The Role of Observations in Support of Adaptation: The GCOS Contribution to the Nairobi Work Programme"
- WCRP submits parallel paper, WMO/WCP joins with both
- The 3 programmes propose a joint integrated programme of regional workshops to focus on improving observations and regional modeling in support of adaptation planning

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Thank you!

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Observation Needs and Adaptation

- **Continued accumulation of basic climate data is vital to:**
  - Understand past and current climate change
  - Test, verify, and improve global and regional models
  - To improve projections of future climate
  - To develop effective adaptation strategies
- **To what climate should we adapt?**
  - Still many uncertainties related to changes in climate & climate extremes that are relevant to impacts of CC & thus to adaptation
  - Impacts of concern are at regional and local levels
- **Therefore a need for:**
  - Better monitoring of current climate, especially improvements in denser regional networks – to provide greater spatial and temporal detail
  - Rescue of available historical climate data
  - Improved regional climate models / projections for more reliable characterization of future climate

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Observations in Support of the Design of Effective Adaptation Strategies

- **Reliable and detailed regional climate information, including current and future assessments of climate variability and change, is essential in the design of effective strategies and depends on:**
  - availability of good quality climate observations with sufficient spatial coverage over a long period of time
  - adequacy of models to depict current and future regional climate
  - thorough understanding and appreciation of the uncertainties and constraints associated with the use of both data and regional and global models
- **GCOS, WCRP, CLPA/WMO proposal addresses these issues**

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Proposed GCOS-WCRP-CLPA Workshop Programme

- 3 workshops in each of 10 regions as a joint initiative of GCOS, WCRP, and the Climate Prediction and Adaptation Branch of WMO
- W1 would would assess the adequacy for the given region of global and regional climate observations for determining regional climate trends and for adaptation planning
- W2 would use the available observations to evaluate the adequacy and reliability of regional climate models for adaptation needs
- W3 would consider the assessments provided by the first two workshops and provide advice on how model outputs could best be used to develop effective adaptation strategies
- An initial planning workshop would convene experts to plan detailed implementation of the programme

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A Pilot Project: Climate Observations and Regional Modeling in Support of Climate Risk Management and Sustainable Development

- **Who: GCOS, WCRP, CLPA/WMO, ICPAC**
- **Where: Greater Horn of Africa**
- **With funding from: World Bank**
- **Other Partners: Hadley Centre, NCDC**
- **Objectives of 3-workshop programme:**
  - **Ensure attention given by countries in Eastern Africa to observation and data needs**
  - **Demonstrate the use and value of regional models**
  - **Provide advice on model limitations**
  - **Improve regional capabilities for using data records and model projections for adaptation planning**

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GCOS and Adaptation--Summary

- Better knowledge base ➔ better forecasting & climate services ➔ enhanced ability to adapt
- Importance of regional, national data as well as global data—denser networks are required for adaptation needs than for global CC needs ➔ need to improve observations at all levels
- Importance of recovering historical data
- Importance of making data accessible to users; all benefit
- Importance of understanding limits, as well as benefits, of the use of regional model output for adaptation planning
- Importance of building support among the user communities, demand for climate information
- Importance of promoting greater collaboration between the providers and users of climate information