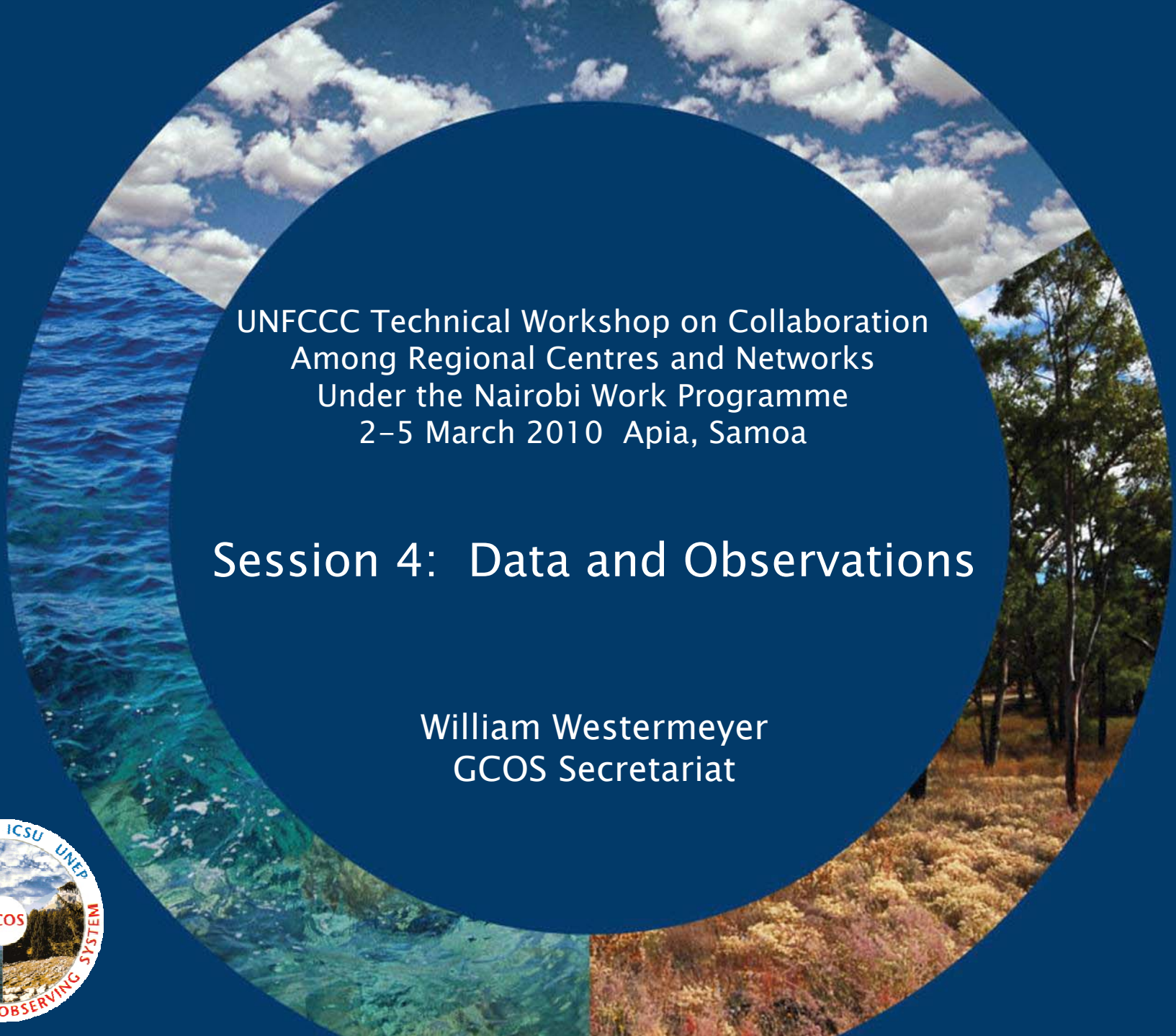


UNFCCC Technical Workshop on Collaboration
Among Regional Centres and Networks
Under the Nairobi Work Programme
2-5 March 2010 Apia, Samoa

Session 4: Data and Observations

William Westermeyer
GCOS Secretariat

The GCOS Mission

- To ensure the availability and quality of the atmospheric, oceanic and terrestrial and related earth observations needed for monitoring, understanding, predicting and protecting the global climate system
- …and for assisting communities and nations to live successfully with natural climate variability and human-induced climate change
- *Requires long-term, high-quality, sustainable, reliable, observations at global (and increasingly at regional and national levels)*

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**
  - Work with partners to implement systems to GCOS standards: other observing systems, sponsors, EUMETSAT, CGMS, CEOS, GEOSS…
- **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

GCOS Progress Report 2004-2008

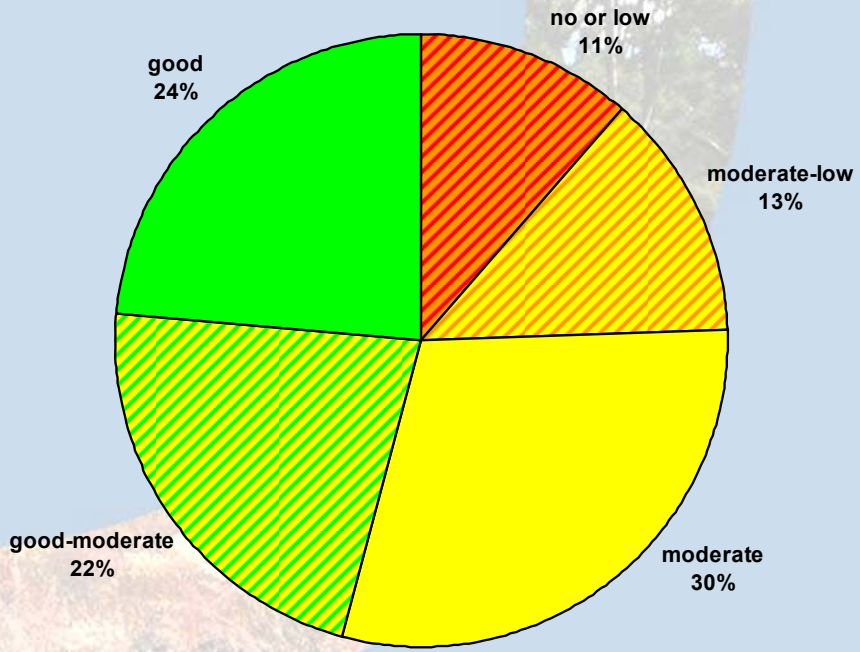
- **Based on 2004 GCOS Implementation Plan:**
  - **Submitted to COP 10 -> decision 5/CP.10**
  - **131 recommended Actions in Atmosphere, Ocean, Terrestrial domains**
  - **To ensure the availability of observations of Essential Climate Variables in support of, *inter alia*:**
    - **Prediction of global climate change, and attribution of its causes**
    - **Projection of global climate change information down to regional and local scales;**
    - **Characterization of extreme events important in impact assessment and adaptation, and to the assessment of risk and vulnerability**
    - **Mitigation assessment**
- **Actions on Parties, int'l organizations and other institutions, with: Timelines, Performance Indicators, Costs**
- **Assessment of progress 5 years later, following invitation by UNFCCC at SBSTA 23 (2005)**

Examples of GCOS Observing Networks

- **Atmosphere**
  - GCOS Upper Air Network (GUAN) (~ 160 stations)
  - GCOS Surface Network (GSN) (~ 1000 stations)
  - Global Atmosphere Watch (GAW) (22 global and 300 regional stations)
- **Ocean**
  - Voluntary Observing Ships (~ 7000 ships, 52 countries)
  - Global Sea-Level Observing System (~300 global sea-level stations)
  - Argo (~ 3000 profiling floats, 14 countries)
- **Terrestrial**
  - Global Terrestrial Network for Glaciers (GTN-G) (~750 glaciers monitored)
  - Global Terrestrial Network for Permafrost (GTN-P) (300 boreholes, 15 states)
  - Global Terrestrial Network for Hydrology (GTN-H) (⇨ GTN-R, GTN-L)
- **Space-based Observations**
  - Crucial for observation of 26 essential climate variables such as atmospheric temperature, precipitation, sea level, sea ice, etc.

GCOS Progress Report 2004-2008: Summary

- Increasing profile of climate change has reinforced awareness of the importance of a Global Climate Observing System
- Developed Countries have improved their climate observation capabilities, but limited progress in resolving financial issues related to long-term continuity
- Developing Countries have only made limited (in-situ) progress, with decline in some regions, and capacity building support remains small in relation to needs
- Operational and Research Networks show increasing regard to climate needs; long-term continuity a challenge
- Satellite agencies have improved both mission continuity and capability and are increasingly meeting climate needs
- GCOS has progressed, but still falls short of meeting all UNFCCC needs



GCOS Progress Report 2004-2008: Outlook for the Next 5 Years

The preparation of the 2004-2008 Progress Report has helped to identify a number of important priorities for GCOS for the future, including:

- **The urgent need for funding support for implementation of the GCOS Regional Action Plans developed over the period 2001-2006;**
- **Immediate attention to the design and implementation of the national and local-scale networks needed for impact assessment and adaptation to climate change;**
- **The appointment of GCOS National Coordinators in many more than the present 14 countries which have well established national coordination arrangements for climate observations;**
- **Much stronger and higher-level commitment of Parties to the GCOS Cooperation Mechanism for supporting GCOS implementation in developing countries.**

GCOS Regional Workshop Programme

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

- **Goals of the Regional Workshop Programme**
  - National reporting on systematic observation to UN Framework Convention on Climate Change
  - Identify regional and national needs and priorities for climate data, e.g., GCOS Baseline Networks
  - Develop Regional Action Plans for improving observing systems
  - Address resource mobilization issues
- **Pacific Islands Workshop: Apia, Samoa, August 2000**

Some Common Themes of Regional Action Plans

- Sustaining/improving operational observing networks, e.g., GSN and GUAN, Ocean Obs
- Recovering historical data
- Improving national and regional co-ordination
- Education, training, and capacity building
- National planning and reporting

Lessons Learned

- Need a focused regional organization & full-time regional program officer
- Need solid planning mechanism to advance projects
- Need to identify partners & donors to participate in projects &/or contribute resources
- Leverage existing bi- and multi-lateral agreements
- Need a regional steering or leadership group; regular communication w. GCOS for better monitoring, fundraising, advocacy
- People with *interest* should be involved
- Broad-based membership needed—not just meteorological community

Needs for National and Regional Coordination

- Importance of designating national coordinators, national committees, regional coordination
- PI GCOS as an example of regional coordination
- Belize implementation strategy meeting—recommendations
  - Establish CAC-GCOS Regional Coordination Committee composed of representatives of GCOS sponsors
  - Seek donor support for regional GCOS coordinator
  - Arrange for annual implementation coordination meeting
  - Establish link bet regional coordinator and GCOS Secretariat
- ACMAD, other regional centers in Africa
- WMO intent to establish RCCs

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
- Principal partners are: African Union, African Development Bank, UN Economic Commission for Africa
- Opportunity for substantial funding support for observations and climate service provision programmes of African NMHSs
- ACMAD, ICPAC other regional organizations have received some initial funding
- Desire to replicate in other areas, e.g. ClimDev SAsia

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

Summary of annual additional cost needed to implement Actions in 2010 GCOS IP Update (draft v1.0)

All numbers in million USD

Cost Category	Cross-Cutting Actions	Atmosphere Actions	Oceanic Actions	Terrestrial Actions	Total
Estimated total cost	260	810	**680**	360	2110
Costs for enhancements in developing countries (non-Annex-I Parties)	160	110	**100**	60	430
Costs for enhancements in extraterritorial systems, and in developed countries (Annex-I Parties)	100	700	**580**	300	1680

Status: 13 November 2009

Thank you

For more information about the GCOS programme
please visit our website

www.wmo.int/pages/prog/gcos/index.php

Contact Information
GCOS Secretariat
c/o World Meteorological Organisation (WMO)
7 bis, Avenue de la Paix
P.O. Box 2300
1211 Geneva 2, Switzerland
Tel: +41 22 730 80 67
Fax: +41 22 730 80 52
E-mail: gcosjpo@wmo.int

GCOS Progress Report 2004-2008 Atmosphere

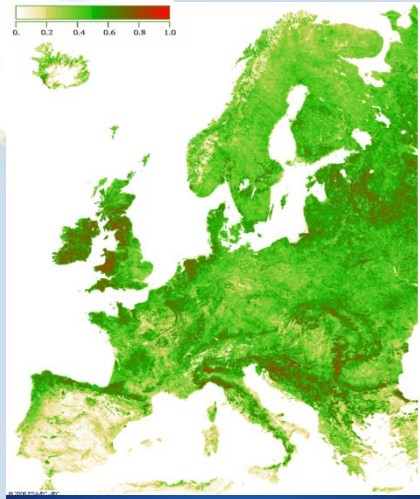
- Good progress with availability, quality and exploitation of data from **satellites** for climate purposes across the range of ECVs, from basic meteorological variables to radiation and atmospheric composition
- Good progress in general with **in-situ meteorological networks**, and support through the system improvement programme has helped maintaining a baseline; however, overall progress in developing countries has been limited
- Some **specific issues** persist (e.g., measurement of precipitation, clouds, snow depth; precipitation data exchange; sunshine obs; metadata)
- Good progress in advancing **climate reference networks**
- Improved planning and progress with implementation of **atmospheric composition networks** meeting climate needs

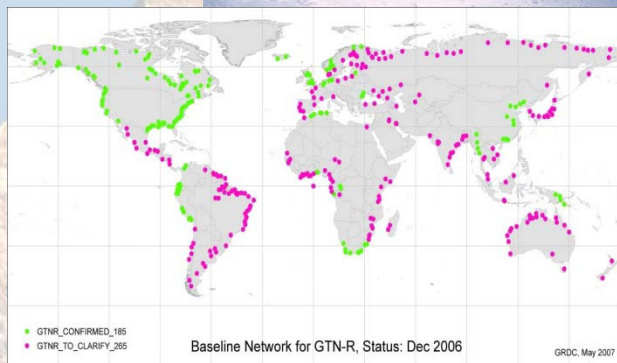
GCOS Progress Report 2004-2008 Oceans

- Useful progress in almost every action called for in the Plan, but many actions remain incomplete.
- The ice-free upper 1500 m of the ocean are being observed systematically for temperature and salinity for the first time in history.
- Most in-situ networks have made progress (e.g., tide gauges, moored reference sites, tropical moored arrays, full ocean depth observations)
- Most in-situ observing activities continue to be carried out under research agency support and on research programme time limits.
- Important progress in provision of critical ocean satellite data of sea surface ECVs has been made, but not for all variables, and data access remains to be ensured.
- Important progress in development of historical ocean reanalysis and in high resolution ocean forecasting capabilities.
- Promising developments in improved methods and standards will allow wider measurement of biological and chemical ECVs and consideration of new ECVs in the years ahead.
- Data sharing remains incomplete, particularly for tide gauges and biogeochemical ECVs. Data archeology needs to continue.

GCOS Progress Report 2004-2008 Terrestrial

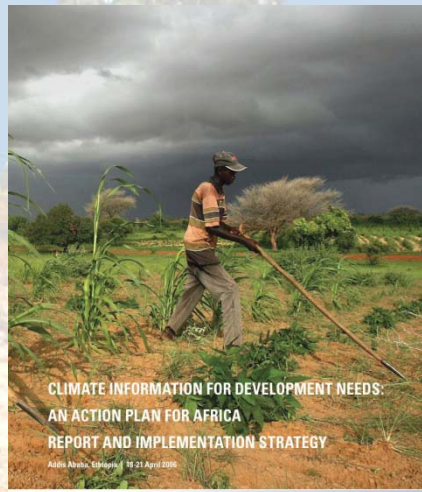
- Increasing significance and recognition of terrestrial data for climate change adaptation and impact studies
- Good progress in defining standards for observation of terrestrial variables
- Slow take-up of institutional support for terrestrial climate observations has limited some in-situ progress
- Networks dealt with by research community show some good progress
- Progress towards establishment of Global Terrestrial Networks (GTN) for many of the ECV's
- Good engagement of satellite needs including product development, reprocessing and continuity





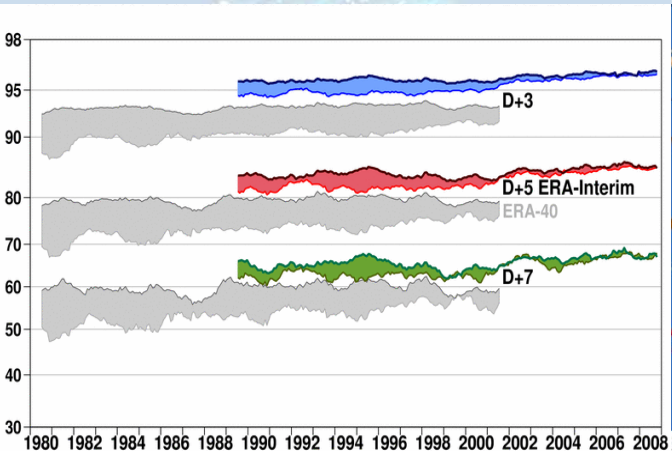
GCOS Progress Report 2004-2008 Crosscutting

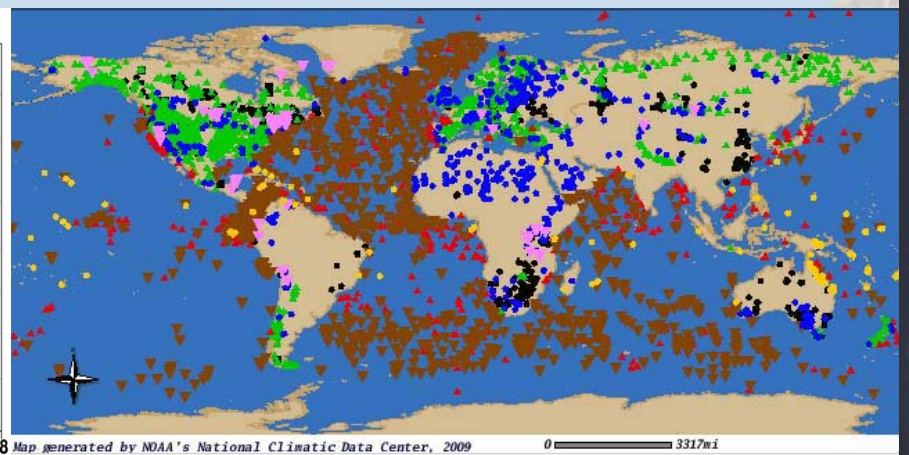
- Good engagement of GCOS IP by GCOS Sponsors and Partners
- Implementation is partial in many/most cases
- Increasing national attention to climate change observation needs, despite remaining gaps in national coordination
- Capacity building activities may have seen some improvement, but overall support to developing countries has fallen well short of needs
- Research networks and systems have been maintained, long-term continuity remains a challenge

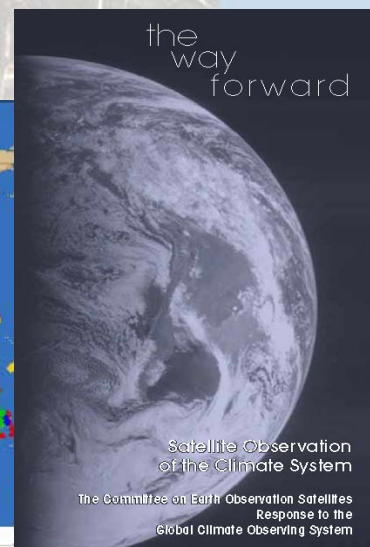


GCOS Progress Report 2004-2008 – Cross-cutting

- Good commitment to GCOS climate monitoring principles, and some improvements in data exchange
- Good engagement by satellite agencies
- Reprocessing, Analyses and Reanalysis progressing
- Moderate to good progress in the assembly of historical data records and in acquiring and archiving palaeoclimatic records
- National reports show financial difficulties and limits in most countries







GCOS as a System of Climate Observing Systems