



ГЛОБАЛЬНАЯ СИСТЕМА
НАБЛЮДЕНИЙ ЗА КЛИМАТОМ
НЕУСТАННО СЛЕДИМ ЗА КЛИМАТОМ

SYSTÈME MONDIAL
D'OBSERVATION DU CLIMAT
NOUS VEILLONS SUR LE CLIMAT

النظام العالمي
لرصد المناخ
لنضع المناخ نصب أعيننا

全球气候观测系统
密切监视气候

SISTEMA MUNDIAL
DE OBSERVACION DEL CLIMA
SIEMPRE VIGILANDO EL CLIMA

GLOBAL CLIMATE
OBSERVING SYSTEM
KEEPING WATCH OVER OUR CLIMATE

10.1 GCOS and its role to support Adaptation

31st Session of the GCOS Steering Committee
Geneva, 2-5/07/2024

Thelma Krug, GCOS Chair



Supported by the European Union



1 - Mandate

1992 and 1998 MoU

CONCEPT OF GCOS - GCOS is intended to meet the needs for:

1. *climate system monitoring, climate change detection, and monitoring the impacts of and the response to climate change, especially in terrestrial ecosystems and mean sea-level;*
2. *data for application to national economic development;*
3. *research towards improved understanding, modelling and prediction of the climate system.*

2014 Review

Recommendation 17 - The sponsors should consider giving GCOS a mandate that includes adapting to and mitigating climate change and its regional impact. The sponsors should consider clarifying the language in the MoU concerning “assessing the impacts of climate variability and change and applications to national economic development” and “monitoring the impacts of and the response to climate change, especially in terrestrial ecosystems and mean sea level” because, ***in the modern context, this implies a mandate that extends into adaptation and mitigation and regional impacts.*** In making this clarification the options would appear to be (a) to use the scope and mandate of the GFCS (Global Framework for Climate Services) as a guide, in particular, the GFCS Information System, (b) to extend the GCOS mandate explicitly into regional impacts, adaptation and vulnerability, and mitigation, in line with the IPCC assessments and using ‘climate’ in the sense of IPCC or UNFCCC, or (c) to restrict explicitly the scope of GCOS by retaining an emphasis on global systems and the physical climate variables as captured by the ECVs.

1. The goal of the Global Climate Observing System (GCOS) is to provide comprehensive information on the total climate system, involving a multi-disciplinary range of physical, chemical and biological properties, and atmospheric, oceanic, hydrologic, cryospheric and terrestrial processes.
2. The GCOS is intended to meet the needs for:
 - (a) Climate system monitoring, climate change detection and monitoring the impacts of and the response to climate change, especially in terrestrial ecosystems and mean sea-level;
 - (b) Data for application to national economic development;
 - (c) Research toward improved understanding, modelling and prediction of the climate system.
3. The GCOS will build, as far as possible, on existing operational and scientific observing, data management and information distribution systems, and further enhancements of these systems. The GCOS will be based upon, *inter alia* :
 - (a) Improved World Weather Watch systems and the Integrated Global Ocean Services System;
 - (b) The Global Atmosphere Watch and related atmospheric constituent observing systems;
 - (c) The Global Ocean Observing System for physical, chemical and biological measurements;
 - (d) The Global Terrestrial Observing System for land surface ecosystem, hydrosphere, and cryosphere measurements;
 - (e) The maintenance and enhancement of programmes monitoring other key components of the climate system, such as terrestrial ecosystems (including the International Geosphere-Biosphere Programme), as well as clouds and the hydrological cycle, the earth's radiation budget, ice sheets and precipitation over the oceans (including the World Climate Research Programme);
 - (f) Programmes to monitor the key physical, chemical and biological aspects of the impacts of climate change (including the World Climate Impact Assessment and Response Strategies Programme);
 - (g) Data communication and other infrastructures necessary to support operational climate forecasting (including the World Climate Data and Monitoring Programme and the Climate Information and Prediction Services).

1 - Mandate

2015 - COP 21 in Paris – The Paris Agreement

Article 7 established the global goal on adaptation of enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change, with a view to contributing to sustainable development and ensuring an adequate adaptation response in the context of the temperature goal referred to in Article 2.

2022 – GCOS Joint Study Group report

High Level Recommendation 4: The GCOS programme should continue to address new challenges, especially those caused by changing climate on fresh water, food security and biodiversity, by evolving, revising and improving the utility of the ECVs. Their requirements should contribute to a better understanding of the energy, water and carbon climate cycles, support climate adaptation and mitigation measures and policies, and address the biosphere, biodiversity and biogeochemistry, next to the currently recognized GCOS domains of atmosphere, ocean and land.

2024 – New MoU

CONCEPT OF GCOS

1. *To support the Paris Agreement, contributing to its adaptation and mitigation measures, GCOS promotes observing systems that allow the quantification of climate impacts (e.g., health, energy, water, and food sectors) and support national economic development.*

Not a big change

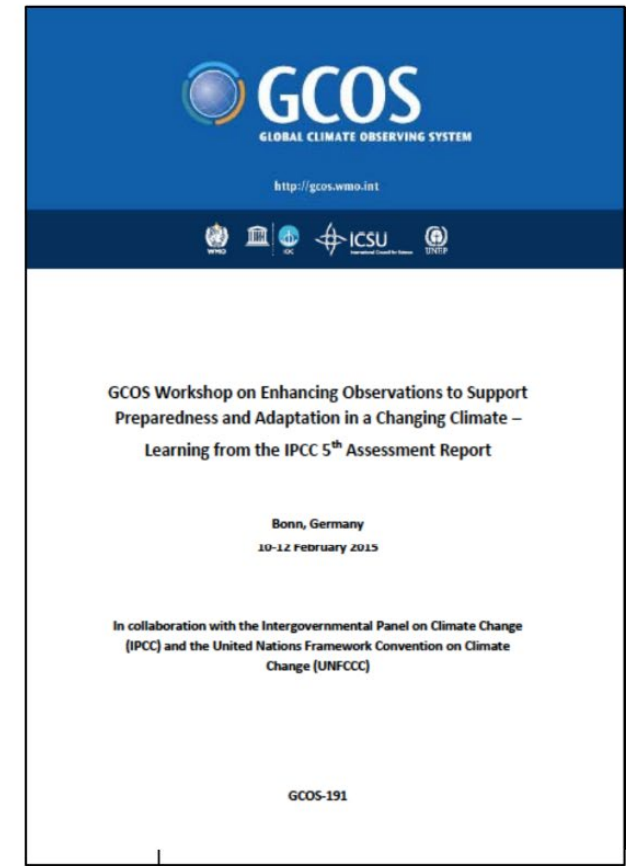
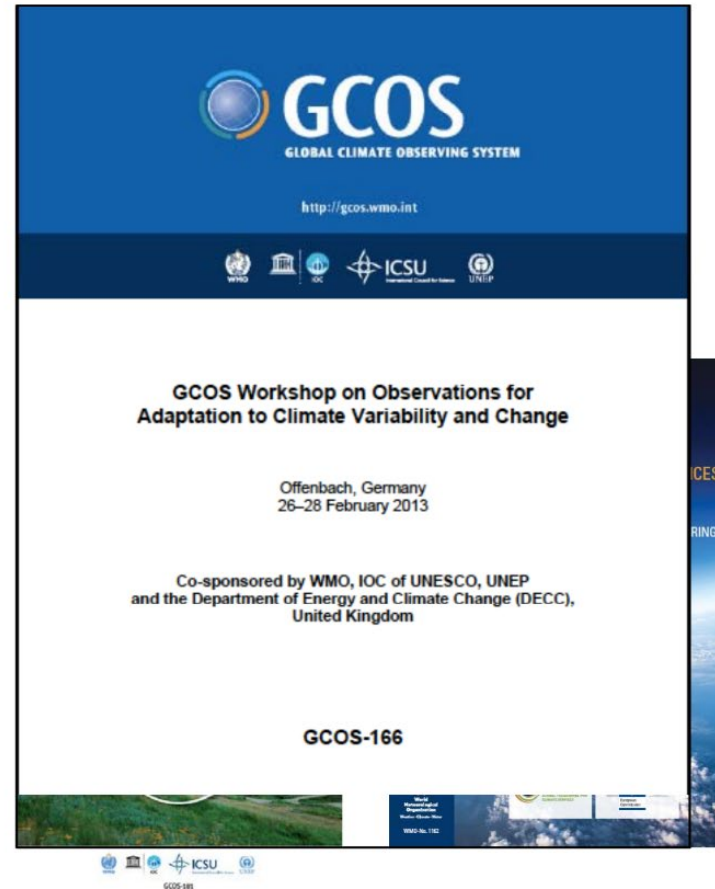
2 – Highlights of GCOS related to Adaptation

2010 GCOS IP -The IP will enable to build a system that will “enable characterization of extreme events important in impact assessment and adaptation and in the assessment of risk and vulnerability” (but no specific actions included!)

WORKSHOPS IN 2013 AND 2015

2013 - Exploring how relevant climate observations are, very broad scope, local and global, full value chain, not exclusively focused in GCOS

2015 – Addressing specifically needs stemming from IPCC; recognition that the problem needs to be tackled by several institutions at different levels (from global to local), proposal to do use cases to show how climate data were important (sea level use case)



2 - Highlights of GCOS related to Adaptation

2016 GCOS involved mainly in support of activities of WG1, but since COP22 the imperatives changed with a new focus to include what we can do to support WG2, especially around adaptation. Mostly, but not entirely within the realm of TOPC.

GCOS IP 2016 -

Action G1: Produce guidance and best practice for adaptation observations

Action G4: Identify indicators for adaptation and risk

2017: GCOS SC endorses the list of *Climate Indicators* (but they are not specific on adaptation and risk)

2018: TOPC Task Team on Adaptation

2019: Task Team reports to Joint Panel Meeting and GCOS SC-27

[PowerPoint Presentation \(wmo.int\)](https://www.wmo.int)

The conclusion was: With current capabilities, GCOS adds much value to the Global Stocktake of adaptation- and with modest enhancement of products, could add considerably more, both in terms of ECVs for adaptation and of adaptation.

2 - Highlights of GCOS related to Adaptation

2020: SC-28 Decision - The SC will hold an off-line discussion on how to be more proactive on adaptation, and relevant links to IPCC and other organizations.

Late 2020 - GCOS Adaptation Task Team (GATT) is set up with experts from outside GGCOS involved.

2021-2023: GATT works decides to focus on three Case Studies. Progress is presented at several conferences (GCOS Climate Conference, WCRP Open Conference...)

2022 GCOS Implementation Plan: more Actions addressing adaptation included.

2022 GCOS Steering Committee Decision SC-30/1

The Steering Committee decides that: 1. The GATT is asked to complete its work on the case studies for presentation at the Joint Panel Meeting in June 2023. 2. GCOS should hold an Adaptation workshop in 2023/4 (or a set of workshops around key adaptation concerns) with major implementers and supporters of adaptation as well as thematic experts. The aim of this workshop will be to identify, from their point of view, what are the most important datasets and climate information they need, what are the major gaps, and whether the existing GCOS ECVs/products including their spatial and temporal specifications are adequate for adaptation.

2023 Panel Chairs meeting: brainstorming → this needs to be brought forward to the Steering Committee

3- How does GCOS contribute? (background, permanent)

GCOS works to make sure that **climate observations available**, that enable to build climate datasets with global coverage for ECVs. This encompasses a full suite of activities, from the international coordination of the networks, to the definition of requirements, best practices, quality standards, Climate Monitoring Principles, data rescue, capacity building etc.

→ All GCOS activities lead to making more climate datasets with global coverage available.

Climate datasets with global coverage are essential for Adaptation because:

- Reanalysis: it serves as an integrator between different time scales, combining vast amounts of observations into maps without gaps
- Forecasts/Extremes – which requires operational global data sets available at daily resolutions
- Climate predictions - global data sets and historical data can play an important role in validating climate model outputs
- Climate projections – global data sets and historical data can play an important role in evaluating projections

3- How does GCOS contribute? (background, permanent)

GCOS works to make sure that there are climate observations available, that enable to build climate datasets with global coverage for ECVs. This encompasses a full suite of activities, from the international coordination of the networks, to the definition of requirements, best practices, quality standards, Climate Monitoring, Data Rescue, data rescue, capacity building etc.

→ All GCOS activities lead to making more climate datasets with global coverage.

Climate datasets with global coverage are essential for:

- Reanalysis: it serves as an integrated data set at global scales, combining vast amounts of observations into maps without gaps
- Forecasts/Evaluation: operational global data sets available at daily resolutions
- Climate Model Validation: global data sets and historical data can play an important role in validating climate model outputs
- Climate Model Projections – global data sets and historical data can play an important role in evaluating projections

GCOS IS NOT ALONE IN THIS "INTERNATIONAL/COORDINATION SPACE": WMO, CEOS/CGMS, GEO...

3 - How does GCOS contribute? (recently, specific)

GATT report (looking into how ECVs are already used for Adaptation and how they should evolve to be more useful)

2022 GCOS Implementation Plan Actions

- D5: Undertaking additional Data Rescue Activities
- E1: Foster regional engagement in GCOS
- F1: Responding to the needs fo users for higher resolution, real time data
- F3: Improve monitoring of castal EEZs
- F4: Improve monitoring of urban areas

Higher resolution climate datasets: Daily Climate Data Exchange - DayCli

3 - How does GCOS contribute? (recently, specific)

GATT report (looking into how ECVs are already used for Adaptation and how they should evolve to be more useful)

2022 GCOS Implementation Plan Actions

- D5: Undertaking additional Data Rescue Activities
- E1: Foster regional engagement in GCOS
- F1: Responding to the needs for... on, real time data
- F3: Improve monitoring...
- F4: Improve... areas

Again, GCOS does not do this alone, but in coordination with other experts and bodies within and outside WMO

High resolution climate datasets: Daily Climate Data Exchange - DayCli (Exchanging quality-controlled values of temperature, rain and snow parameters all around the world for better climate services)

What next

- In the morning we will be taking stock of the different aspects where GCOS is working nowadays and we will hear from the needs from UNFCCC.

11:00-12:30	10.	Adaptation		
20'	10.1	Presentation on a historical overview of GCOS and Adaptation: what has GCOS done over the years?	Thelma Krug	Background (GATT Report , GGA) - Presentation
10'	10.2	UNFCCC on adaptation	TBD	
10'	10.3	How are global climate datasets and global climate data networks already supporting Adaptation	Peter Thorne	Presentation
15'	10.4	Paper on fire	Chiara Cagnazzo	Presentation on 10.4
	10.5	Paper on reanalysis and adaptation		Presentation on 10.5
10'	10.6	Extremes	Sabrina Speich	Presentation
10'	10.7	Adaptation and ESA: Report from Bern/ISSI	Thelma Krug	

- In the afternoon we will explore different avenues for GCOS to make sure that there is a meaningful and realistic contribution to efforts to support Adaptation.

14:00-17:00	10.	Adaptation (continued)		
	10.8	Discussion/Break-out Groups: Set the goal: Where can GCOS make a difference in a congested world of climate information/action for adaptation, also considering the work that has already been done – What does it mean for GCOS to support adaptation?		
17:00-17:30	10.9	Report back from adaptation session and possible decision on how GCOS should proceed		