



GCOS SC-31

INF. 7.3

(11.VI.2024)

GCOS STEERING COMMITTEE THIRTY FIRST SESSION

GCOS SC-31, 2–5 July 2024
WMO, Geneva, Switzerland

Update on the GCOS work on the Climate Data Centres

1. Introduction

This information document describes the progress on implementing the GCOS IP Action D1 "Define governance and requirements for Global Climate Data Centres", and in particular the Activity D1.1 "Draft requirements for the activities of Global Climate Data Centres and identify the relevant internationally agreed standards".

This action addresses the need for well-maintained long-term time series of climate data (and metadata) in order to ensure free and open access to climate datasets from the Global Climate Data Centres. A lot of work has been done by WMO and GCOS on requirements and standards for measurements, but less has been done for data storage and curation, including documentation.

Once collected, if data are not made available, they are of no value to climate monitoring. It is therefore vital that all users have unrestricted access to well-documented, historical, and near-real-time climate data and associated metadata, including relevant documentation. However, despite various efforts to implement appropriate data stewardship and sharing standards, "free and open" access to well-maintained data archives is not available consistently across all data centres and data types.

Open exchange of easily accessible and findable data, particularly well-maintained long-term time series, will improve the completeness and accuracy of the data and metadata necessary for climate science, climate adaptation activities, and climate change mitigation planning.

GCOS is working on the identification of a set of requirements on processing, quality controlling, archiving, and distributing climate-related observations, that are feasible for the climate data centres with global-scale data holdings.

2. The first meeting in Bonn

During the 3rd GCOS Joint Panels Meeting, held in Bonn, 26-30 June 2023, a Cross Panel Group met in two different sessions to brainstorm about how to address the GCOS IP Action D1 and

discuss other aspects of data management. This group included representatives of AOPC, OOPC and TOPC, as well as the WMO Data and Information Management Division, and of a range of data centres and specialised climate archives: GTN-H; GTN-P; EUMETSAT; C3S; NCEI; IQUOD; GRDC; Global Ocean database; RCC; NMHS.

The group agreed to start by taking advantage of an existing certification process, instead of creating a new one. Therefore, different types of data certification were reviewed, like the CoreTrustSeal (CTS, www.coretrustseal.org) and the WMO Maturity Matrix, among others. The group recognized that not all data centres perform the full range of functions needed to obtain the various certifications on requirements, depending on the purpose, resources, and history of each single data centre.

The group decided to:

- use the term data-repository rather than data-centre;
- consider also regional/national (not only global) data-centres for some ECVs;
- use the existing CoreTrustSeal requirements as a reference process for certification, noting that CoreTrustSeal is mandatory for the World Data System (WDS) that is an Affiliated Body of ISC.

It was also agreed that:

- NCEI will make available their CoreTrustSeal assessments;
- the data repositories represented at that meeting will undergo a self-assessment using the CoreTrustSeal requirements process;
- an online follow up meeting will be organized to discuss the progress of this 'self-assessment' exercise.

3. The CoreTrustSeal preliminary assessment

The follow up meeting was organized by the GCOS Secretariat on 30/04/2024 (online). The main conclusion of this meeting was that it is not easy to fulfil all the 16 CTS requirements and obtain the related certification; support would be required for the application process, especially for small data centres. However, members of the team agreed that assessing the data repositories against the requirements for the CTS certification is a useful exercise, as it helps identifying and addressing different data management issues.

Considering those constraints, the CTS certificate could be a useful reference for GCOS related data repositories, without necessarily becoming a formal approval process, and alternative options should be explored. For example, a GCOS recognition process for global climate data centres could be developed: it should be a simplified process (rather than creating a new standard) tailored to climate data centres needs. Moreover, this does not prevent data centres to apply for CTS.

It was then discussed how the WMO Stewardship Maturity Matrix for Climate Data presents similarities with the CTS requirements, even if they do not assess the same thing: CTS assesses an individual data centre, while the WMO Maturity Matrix assesses each single dataset within a data centre. They are complementary. On the other hand, GCOS should promote the consideration of climate-related needs (including data management aspects) in the WMO process for data centres.

4. Proposed way forward

- a) A mapping exercise can be done by producing a matrix across the 16 CTS requirements to identify what requirements are most difficult to fulfil by the data centres. This exercise will be helpful to understand which are the easier requirements versus the ones more

- complex to document, and to identify which ones are the most important for a global climate data centre to meet.
- b) Following the analysis in (a), a 'tiered' approach, with 2 or 3 different categories of requirements, could be defined. The highest category will have the requirements needed for the CTS certification. "Lower" categories will have a reduced number of easier requirements. A data centre will apply for the category that best suits their size, capacity, mandate and other needs.
 - c) Climate data users shall be involved to get their feedback.

Appendix – linked activities

GCOS IP Action D.2

The work on the requirements for Global Climate Data Centres (GCOS IP Action D1) should be coordinated with the Action D2 "Ensure Global Climate Data Centres exist for all in situ observations of ECVs" and in particular its Activity D2.1 to "Identify ECVs for which adequate global centres do not exist or are insufficiently supported and facilitate and support the creation or improvement of global data centres for these ECVs".

The aim of this action is to ensure that all available observations for each ECV are distributed from integrative data centres that meet the requirements established in Action D1. Data centres do not exist for every ECV and the continued existence of some of those that do exist is not assured due to the lack of long-term funding. This action addresses this issue and targets specifically in situ data.

The GCOS Secretariat started working on this Action by making an inventory of relevant (i.e. the ones recognized by GCOS or relevant to one or more ECVs) Data Centres in order to identify the ECVs for which no data centre exists, or they are not adequate and are in need of additional support.

INFCOM-3 Decision on the WMO Global Hydrological Data Centres

At the INFCOM-3, the 3rd Session of the WMO Commission for Observation, Infrastructure, and Information Systems (Geneva, 15-19 April 2024) a decision was taken concerning Global Hydrological Data Centres.

It was recognized that the Global Runoff Data Centre (GRDC), the International Groundwater Resources Assessment Centre (IGRAC), the International Data Centre on Hydrology of Lakes and Reservoirs (HYDROLARE), the Global Precipitation Climatology Centre (GPCC), together with the International Soil Moisture Network (ISMN) and the Global Terrestrial Network - Hydrology (GTN-H), are supporting WMO efforts in hydrological cycle observing systems.

All those data centres are also part of the GCOS community and work in close collaboration with the GCOS Secretariat supporting the implementation of the GCOS IP.

INFCOM adopted a decision to develop a detailed workplan with the goal of defining a path for registering these centres as WMO centres. This decision has relevance to the possible GCOS recognition process for global climate data centres.

[INFCOM-3 Decision on the Global Data Assembly Centre for marine meteorological and oceanographic climate data within the Marine Climate Data System](#)

Coriolis centre, hosted by the French Research Institute for Exploitation of the Sea (Institut Français de Recherche pour l'Exploitation de la Mer, Ifremer), became a Global Data Assembly Centre for moored buoys within the Marine Climate Data System. The evaluation was conducted by an ad-hoc panel comprising of representatives nominated by WMO and the Group of Experts on Biological and Chemical Data Management and Exchange Practices (IODE),
