Process for a network to be accredited as 'Part of the Global Climate Observing System (GCOS)'

Background:

Annex A provides the decision by the 29th GCOS Steering Committee (GCOS SC-29, 7–9 December 2021) on recognizing GCOS Network. There are 3 designations of network: ***GCOS Network***, ***GCOS Affiliated Network*** and ***GCOS Recognized Network***. These designations differ only in their oversight and reporting relationship with GCOS (see Table 2 in Annex A) and in no way reflect differing quality or importance. It is also accepted that not all high-quality networks may wish to apply for this GCOS recognition.

Process:

1) A network wishing to be accredited by GCOS as either a ***GCOS Network***, ***GCOS Affiliated Network*** and ***GCOS Recognized Network*** shall approach the relevant GCOS Expert Panel[1] and must complete the proforma in Table 1. It is recommended that the panel is approached first as they can assist in completing the application and making the process more efficient.

2) The GCOS Expert Panel shall consider the application within 8 weeks. The panel may approach the network for additional information and/or clarifications. If the application meets the requirements agreed by the Steering Committee (see annex A) then they shall accept the proposal and forward it to the Steering Committee for information. In assessing an application, the panel shall:

    a. Review the application to ensure that the requirements laid down in Annex A are met;

    b. Confirm the intent to produce long-term records, accepting that long-term funding may not be guaranteed for a network or data centre;

    c. Accept some partial exceptions to the requirements (e.g. some access restrictions to the data) provided there is clear evidence that these are being addressed. In this case a provisional acknowledgement should be recommended with a date to be reviewed again.

3) The Panel recommendation(s) shall then be reviewed and approved by a representative from each of the Panels and the GCOS Network Manager within 4 weeks.

4) The network shall be notified of the outcome of the process by the GCOS Secretariat.

5) Once approved the network can use the GCOS Network logo (Figure 1) on their website and all publications. Electronic copies of publications should be sent to the GCOS Secretariat. ***GCOS Networks and GCOS Affiliated Networks*** shall report to the appropriate panels and ***GCOS Recognized Networks*** are asked to copy reports on network performance to GCOS.

[1] i.e. the panel responsible for the ECV(s) being monitored

Figure 1. GCOS Network logos

Table 1. Application to become a GCOS Network

Application to be formally acknowledged as a GCOS Network		
1. Name of Network		
2. ECV(s) and ECV products(s) monitored		
3. Contact person (name, email and phone)		
4. Type of network designation proposed?		***GCOS Network***
		GCOS Affiliated Network
		GCOS Recognized Network
5. Does the network abide to the set of basic GCOS Monitoring principles listed below? **Please provide evidence for your answer in boxes 11 to 19**		***FULLY*** ***PARTIALLY***
6. Does the network provide, or contribute to, a worldwide[2] coverage[3]?		
7. How is network performance reported?		
8. Who has responsibility for oversight of the network?		
9. Name & web address of Data repository		
10. Is access to data free and unrestricted? If not, please briefly describe any restrictions.		
11. (GCOS Monitoring Principle #1): How is the impact of new systems or changes to existing systems assessed prior to implementation?		
12. (GCOS Monitoring Principle #2): What period of overlap for new and old observing systems is required?		

[2] Worldwide: i.e everywhere the ECV in question occurs (e.g. permafrost is not global).
[3] The network can either operate at a global scale or be a regional contribution to global coverage.

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13. (GCOS Monitoring Principle #3): How are the metadata (details and history of local conditions, instruments, operating procedures, data processing algorithms and other factors pertinent to interpreting data) documented and treated?	
14. (GCOS Monitoring Principle #4): How is the quality and homogeneity of data regularly assessed as a part of routine operations?	
15. (GCOS Monitoring Principle #6): How is the operation of historically uninterrupted stations and observing systems maintained?	
16. (GCOS Monitoring Principle #7): How is high priority for additional observations focused on data-poor regions, poorly-observed parameters, regions sensitive to change, and key measurements with inadequate temporal resolution?	
17. (GCOS Monitoring Principle #8): How have Long-term requirements, including appropriate sampling frequencies, been specified to network designers, operators and instrument engineers at the outset of system design and implementation?	
18. (GCOS Monitoring Principle #9): Is this an observing system based on limited term funding (e.g. research)? How can long-term operations be assured?	
19. (GCOS Monitoring Principle #10): What data management systems that facilitate access, use and interpretation of data and products are part the climate monitoring systems?	

ANNEX A: GCOS Networks

Decision of GCOS Steering Committee 2021

1) Being recognized as a GCOS Network should:
   - Impose little or no extra effort on the networks;
   - Recognize the contribution these networks make to global climate observations;
   - Allow the networks to clearly show their contribution to global climate observations.

2) It is clear that most, if not all, networks contributing to GCOS also serve other needs e.g. most atmospheric observations are made primarily for weather prediction and warnings. This proposal will not change the requirements on the observing stations but will clearly indicate those that are needed to contribute to the development of long-term climate data records.

3) Networks do not need to be acknowledged by GCOS – this proposal provides option for networks wanting to take part but there is no need for networks to do so if they do not wish.

4) To be acknowledged by GCOS, a network shall:
   - Abide by the GCOS Monitoring Principles (UNFCCC decision 11/CP.13, WIGOS Manual, Annex VIII);
   - Report regularly on the performance of the network;
   - Ensure there is a data repository allowing free and open access to all data and metadata. This can be a data centre associate with the network, or a separate institution. Data repositories should have a commitment to storing data indefinitely;
   - Have identified who has responsibility for oversight of the network. Oversight is the role of monitoring the performance of the network as a whole, identifying non-operational stations and keeping track of the opening and closing of stations. This distinct from the operation and management of individual stations which can be spread across many bodies in a single network (e.g. many NMHS operate stations in GSN);
   - Monitor one or more ECV Products;
   - Aim to provide, or contribute to, a worldwide[4] coverage. The network can either operate at a global scale or be a regional contribution to global coverage;
   - Meet specific climate needs, e.g.:
     - Commitment to provide long-term, historic data records;
     - Adequate accuracy and stability.

5) GCOS acknowledges three types of networks to be identified as: ***GCOS Network, GCOS Affiliated Network*** and ***GCOS Recognized Network*** (see Table 2). This classification is about who has oversight and how the network reports – NOT about quality or importance and is separate from the network tiers.

6) There are additional networks that may not want to be recognized by GCOS, or may not meet all the requirements in (18) above, that, nevertheless, make significant contributions to global climate observations.

7) Where a global coverage is achieved thorough combining several regional networks it may be appropriate for the regional networks to be *recognized* and the global network to be *affiliated*.

[4] Worldwide: i.e everywhere the ECV in question occurs (e.g. permafrost is not global).

8) There is no need for an ECV product to be only measured by a single network.

9) Networks wishing to be acknowledged by GCOS should discuss this with the appropriate GCOS Expert Panel which will consider if they meet the requirements described in this document. If the panel agrees the proposal shall be forwarded to the Steering Committee for approval.

Table 2. Types of GCOS Networks

	Network Oversight[5]	Reporting
GCOS Network	GCOS, oversight by GCOS Network Manager or GCOS panels	Annually to GCOS, represented at GCOS Meetings
GCOS Affiliated Network	Oversight exists but is not GCOS e.g. OCG for ocean networks or this is part of the network as in the GTN	
GCOS Recognized Network		Annual report available but no direct reporting to GCOS

[5] Oversight is the role of monitoring the performance of the network as a whole, identifying non-operational stations and keeping track of the opening and closing of stations. This distinct from the operation and management of individual stations which can be spread across many bodies in a single network (e.g. many NMHS operate stations in GSN).

ANNEX B: Climate Observing System monitoring principles

(Revised Reporting Guidelines as agreed by the UNFCCC at Bali, December 2007, decision 11/CP.13, and adopted by Resolution 9, WMO Congress (Cg-XIV))

Effective monitoring systems for climate should adhere to the following principles:

a) The impact of new systems or changes to existing systems should be assessed prior to implementation;

b) A suitable period of overlap for new and old observing systems is required;

c) The details and history of local conditions, instruments, operating procedures, data processing algorithms and other factors pertinent to interpreting data (i.e. metadata) should be documented and treated with the same care as the data themselves;

d) The quality and homogeneity of data should be regularly assessed as a part of routine operations;

e) Consideration of the needs for environmental and climate-monitoring products and assessments, such as Intergovernmental Panel on Climate Change assessments, should be integrated into national, regional and global observing priorities;

f) Operation of historically uninterrupted stations and observing systems should be maintained;

g) High priority for additional observations should be focused on data-poor regions, poorly observed parameters, regions sensitive to change, and key measurements with inadequate temporal resolution;

h) Long-term requirements, including appropriate sampling frequencies, should be specified to network designers, operators and instrument engineers at the outset of system design and implementation;

i) The conversion of research observing systems to long-term operations in a carefully planned manner should be promoted;

j) Data management systems that facilitate access, use and interpretation of data and products should be included as essential elements of climate monitoring systems.

Furthermore, operators of satellite systems for monitoring climate need to:

a) Take steps to make radiance calibration, calibration-monitoring and satellite-to-satellite cross-calibration of the full operational constellation a part of the operational satellite system;

b) Take steps to sample the Earth system in such a way that climate-relevant (diurnal, seasonal, and long-term interannual) changes can be resolved.

Thus, satellite systems for climate monitoring should adhere to the following specific principles:

a) Constant sampling within the diurnal cycle (minimizing the effects of orbital decay and orbit drift) should be maintained;

b) A suitable period of overlap for new and old satellite systems should be ensured for a period adequate to determine inter-satellite biases and maintain the homogeneity and consistency of time-series observations;

c) Continuity of satellite measurements (i.e. elimination of gaps in the long-term record) through appropriate launch and orbital strategies should be ensured;

d) Rigorous pre-launch instrument characterization and calibration, including radiance confirmation against an international radiance scale provided by a national metrology institute, should be ensured;

e) On-board calibration adequate for climate system observations should be ensured and associated instrument characteristics monitored;

f) Operational production of priority climate products should be sustained and peer-reviewed new products should be introduced as appropriate;

g) Data systems needed to facilitate user access to climate products, metadata and raw data, including key data for delayed-mode analysis, should be established and maintained;

h) Use of functioning baseline instruments that meet the calibration and stability requirements stated above should be maintained for as long as possible, even when these exist on decommissioned satellites;

i) Complementary in situ baseline observations for satellite measurements should be maintained through appropriate activities and cooperation;

j) Random errors and time-dependent biases in satellite observations and derived products should be identified.

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