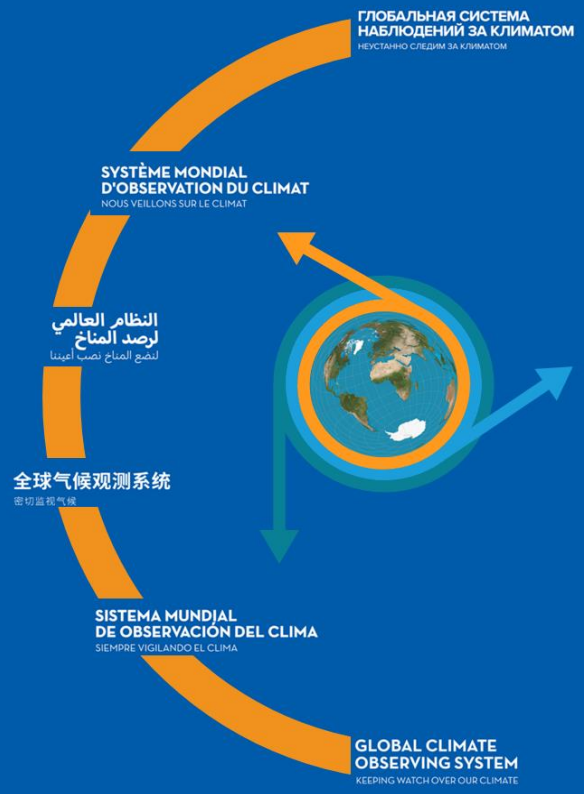


Keeping Watch Over Our Climate: New Recommendations From The Global Climate Observing System

Han Dolman

Chair GCOS Steering Committee

Royal Netherlands Institute for Sea Research and
Free University Amsterdam

Thanks to the GCOS secretariat at
WMO, Geneva

GLOBAL CLIMATE OBSERVING SYSTEM
KEEPING WATCH OVER OUR CLIMATE

WMO IOC International Science Council UN environment

Supported by the European Union

opernicus
Europe's eyes on Earth

Successful delivery and use of climate services depends on all elements in the value chain working properly

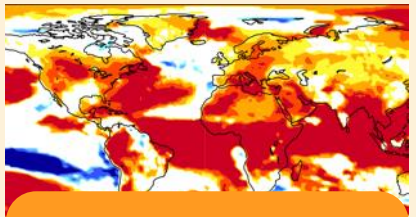
Climate-related infrastructure – must be designed and managed globally

GCOS addresses observations and data exchange but is informed by the needs of the whole value chain

Observations from the entire globe

International exchange of observations

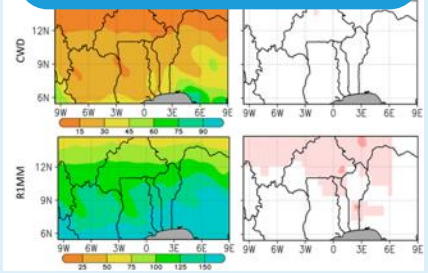
GLOBAL ACTIVITIES



Global climate modelling

Copernicus

Local Data Processing, forecast, warning and advisory products



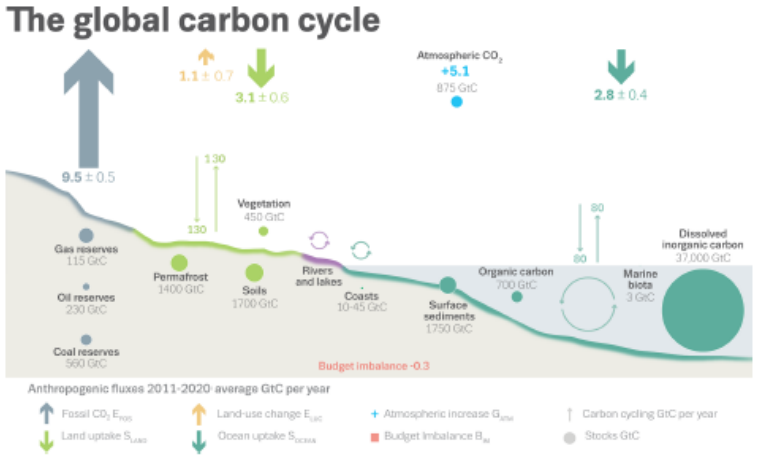
Delivery of climate services

Effective decision making and action

Last-mile activities undertaken at regional, national and local level

Demand for climate information and its impact is changing

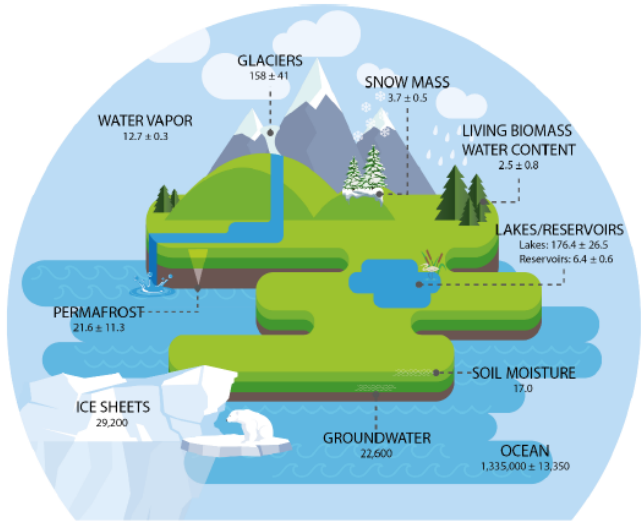
Photograph: Rehan Khan/EPA, Guardian 9-9-22



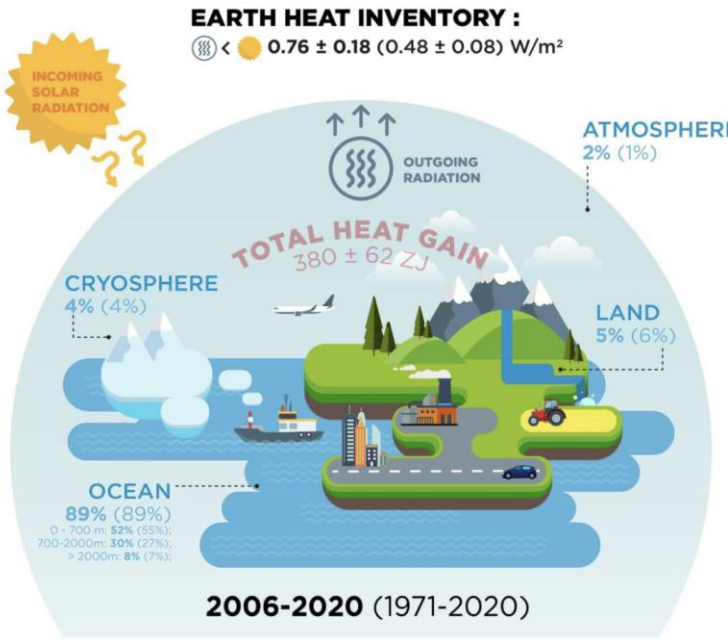
Earth Energy, Carbon and Water Cycles

Mitigation

Adaptation

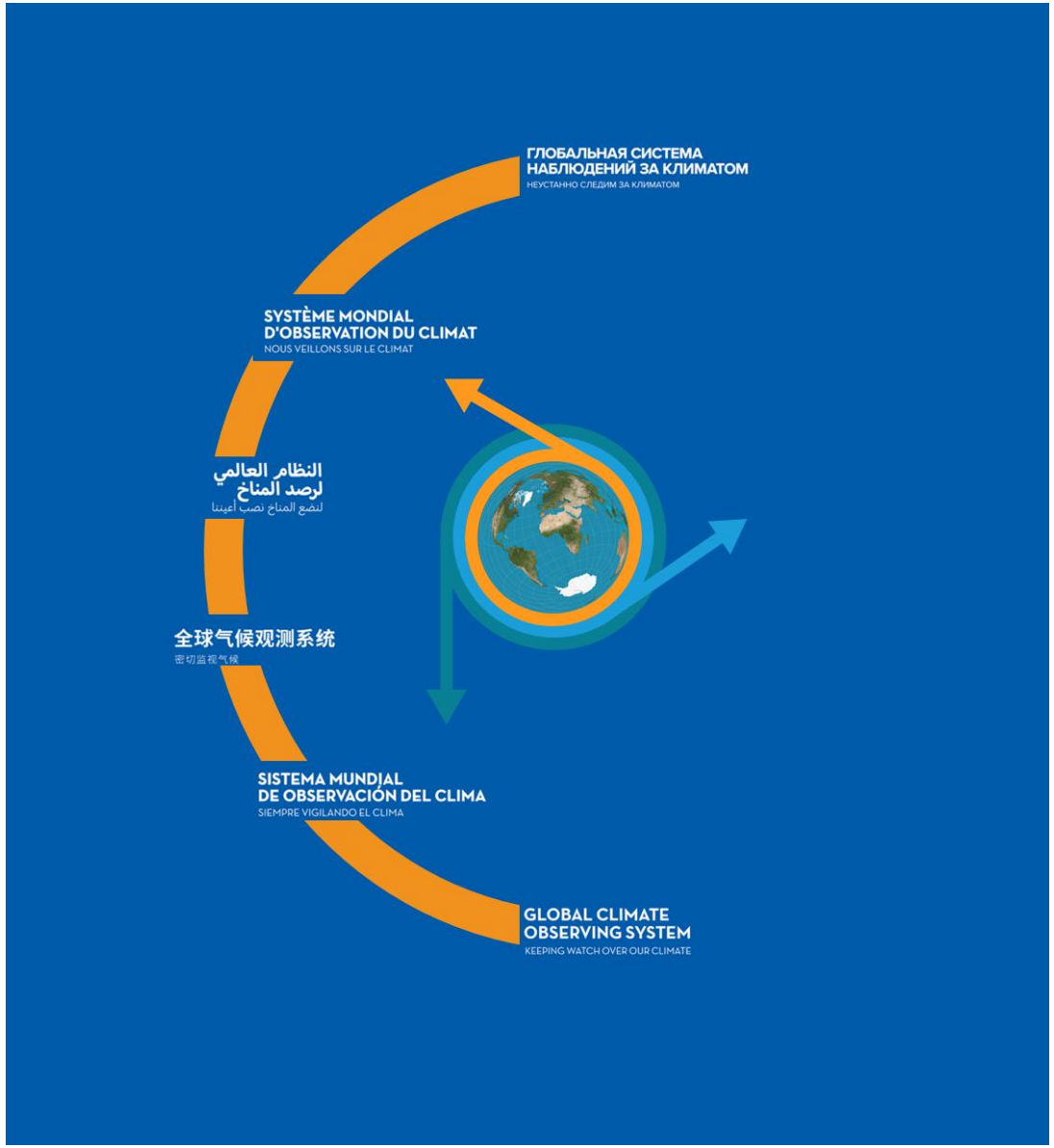


GLOBAL WATER STORAGES

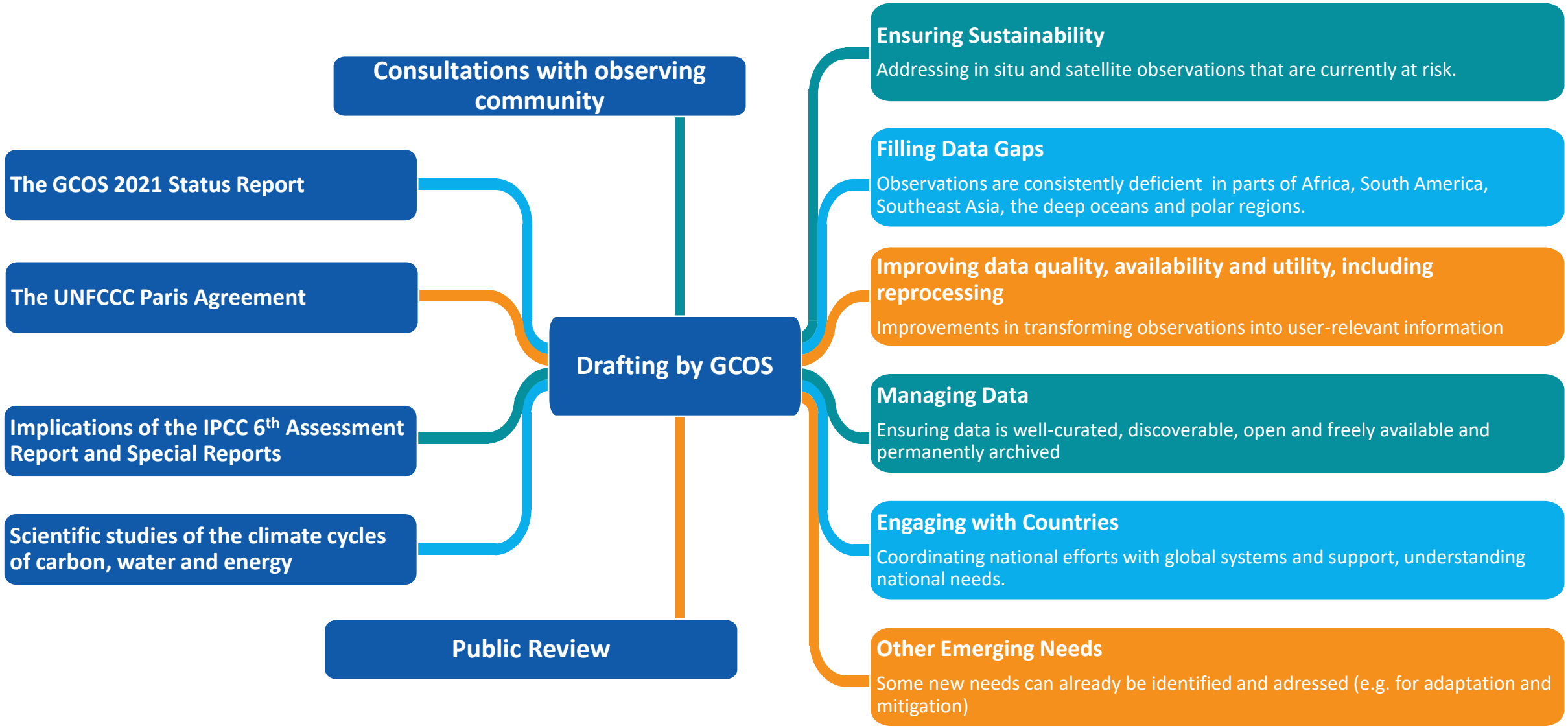


GCOS Implementation Plan

- Produced every 5-6 years, GCOS Implementation Plans:
  - Are submitted to UNFCCC and the GCOS sponsors.
  - Provide recommendations for a sustained **and fit for purpose** Global Climate Observing System.
  - Cover climate monitoring needs over the **entire Earth system** from the atmosphere to the oceans, from the cryosphere to the biosphere.
  - Encompass the water, energy and carbon **cycles**.
- This 2022 GCOS Implementation Plan has a different form to earlier plans, it has:
  - Fewer, more **focused,** and integrated actions.
  - Clearer means of **assessment**.
  - Clearer identification of the stakeholders who need to **respond** to the actions.
  - The updated ECVs requirements are presented in a separate document - *The 2022 GCOS ECVs Requirements* (GCOS 245).



Wide range of views and inputs condensed into 6 themes



Main Inputs → **Broad Engagement** → **Themes for Action**

Themes and issues in the IP2022

A: ENSURING SUSTAINABILITY

- Ensure long-term support for in situ networks
- Address gaps is satellite observations likely to occur in near future – prepare follow-on plans

B: FILLING DATA GAPS

- Development of reference networks: in situ and satellite
- Implement GBON
- Global reporting of hydrological observations,
- Implement trace gas and aerosol, ocean biological, biogeochemical, CO_2 and N_2O observations
- Improve estimates of latent and sensible heat fluxes and wind

C: IMPROVING DATA QUALITY, AVAILABILITY AND UTILITY, INCLUDING REPROCESSING

- Develop standards and best practices
- Improvements to satellite and in situ products
- New and improved reanalysis products

D: MANAGING DATA

- Define governance and requirements of data centre
- Ensure in situ data centres exist for all ECV
- Improve discovery and access
- Data rescue

E: ENGAGING WITH COUNTRIES

- Improve regional and national engagement in GCOS
- Enhance support for national climate observations

F: OTHER EMERGING NEEDS

- Higher resolution real time data
- Improvements in urban, polar, coastal regions and EEZ
- Develop operational Global GHG Monitoring System

Key issues

- **Sustained, long-term funding.** The provision of many observations still supported through limited-term funding, and the climate observing system remains fragile, particularly in the ocean

- **Addressing the key gaps in observations**. Addressing areas where observations are consistently deficient, most notably parts of **Africa, South America, Southeast Asia, in the deep ocean and polar regions**

- **The improvement of data quality, availability, accessibility and utility**. Many climate observations are underexploited because of the lack of consistency, and clarity, in their processing, interoperability and usability. Increased effort is required to ensure that the data can be readily used in reanalysis and are fit for purpose..

- **The creation and maintenance of climate data repositories.** Climate data must be made available through global data repositories, and their access must be free and unrestricted.

Key Issues

- **Addressing the emerging needs.** GHG observing system
- **The engagement with nations.**
- **The improvement of regional and national climate change information.** Improved understanding of the local decision-making context and associated observational requirements, will help address the gap between the “top-down”, global, production of observations and climate information, and the "bottom-up" local-scale decision making.
- **Integrated and collocated observations** of the physical, chemical, and biological components of the climate system
- The conference participants called for the establishment of **a global goal on observations under the UNFCCC.** This should guide the much needed **“action-oriented framework for observation" .**