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 OBSERVACIÓN DEL CLIMA
SIEMPRE VIGILANDO EL CLIMA

GLOBAL CLIMATE OBSERVING SYSTEM
KEEPING WATCH OVER OUR CLIMATE

The Global Climate Observing System 2021:

The GCOS Status Report and beyond…

Caterina Tassone - GCOS Secretariat

GLOBAL CLIMATE OBSERVING SYSTEM
KEEPING WATCH OVER OUR CLIMATE

WMO IOC International Science Council UN environment

Supported by the European Union
Copernicus Europe's eyes on Earth

GCOS

- GCOS was established in 1992 to address the UNFCCC systematic observation agenda
- GCOS is cosponsored by WMO, IOC, UNEP and ISC
- GCOS is governed by a Steering Committee and has 3 panels of experts: AOPC and TOPC, cosponsored with WCRP; and OOPC, sponsored by WCRP and GOOS.
- Director: Anthony Rea
- Chair of Steering Committee: Professor Han Dolman
- Currently a Joint Study Group between the co-sponsors is looking at the governance and outputs of GCOS to make it more efficient and reflect developments since the last MoU was signed in 1998

- Identifies and specifies Essential Climate Variables and monitors how well they are observed
- Prepares plans and guidance for improving global climate monitoring

Identify user needs. for climate monitoring - adaptation, sustainable development, the UNFCCC

ensure that climate **observations are enhanced and continued into the future**

Advocate for **free and open access to relevant data**

demand for information about climate and its impacts is exploding

as the climate changes the frequency of extreme weather events is increasing

the vulnerability of people living in high-risk areas is growing. Concerns are increasing about issues such as food security and migration

PARIS2015
UN CLIMATE CHANGE CONFERENCE
COP21·CMP11

the UNFCCC Paris Agreement focus on adaptation and mitigation leads to dramatically increased demand for climate services

GCOS | WMO

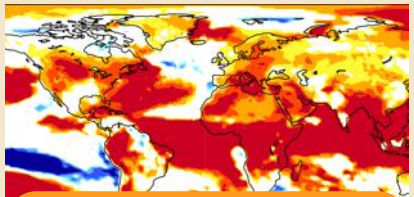
Successful delivery and use of climate services depends on all elements in the value chain working properly

Climate-related infrastructure – must be designed and managed globally

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

Observations from the entire globe

International exchange of observations

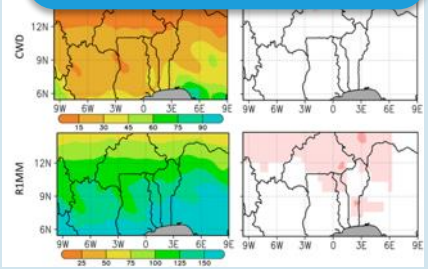


Global climate modelling

GLOBAL ACTIVITIES

LOCAL ACTIVITIES

Local Data Processing, forecast, warning and advisory products

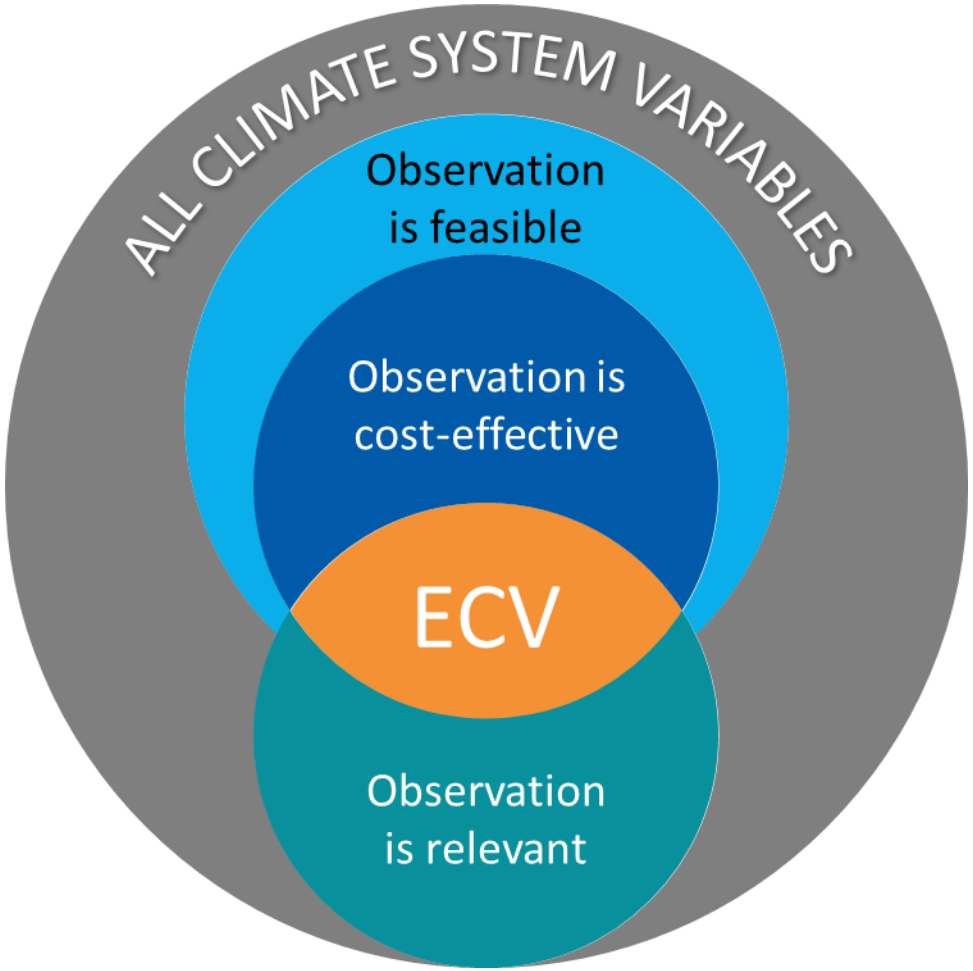


Delivery of climate services

Effective decision making and action

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

Essential Climate Variables - ECV



Essential Climate Variables (ECV)

- are physical, chemical or biological variables that critically contribute to the characterization of Earth's climate.
- are not of stand-alone variables; they are part of a wider concept.
- are founded on climate science and observational capability and infrastructure.

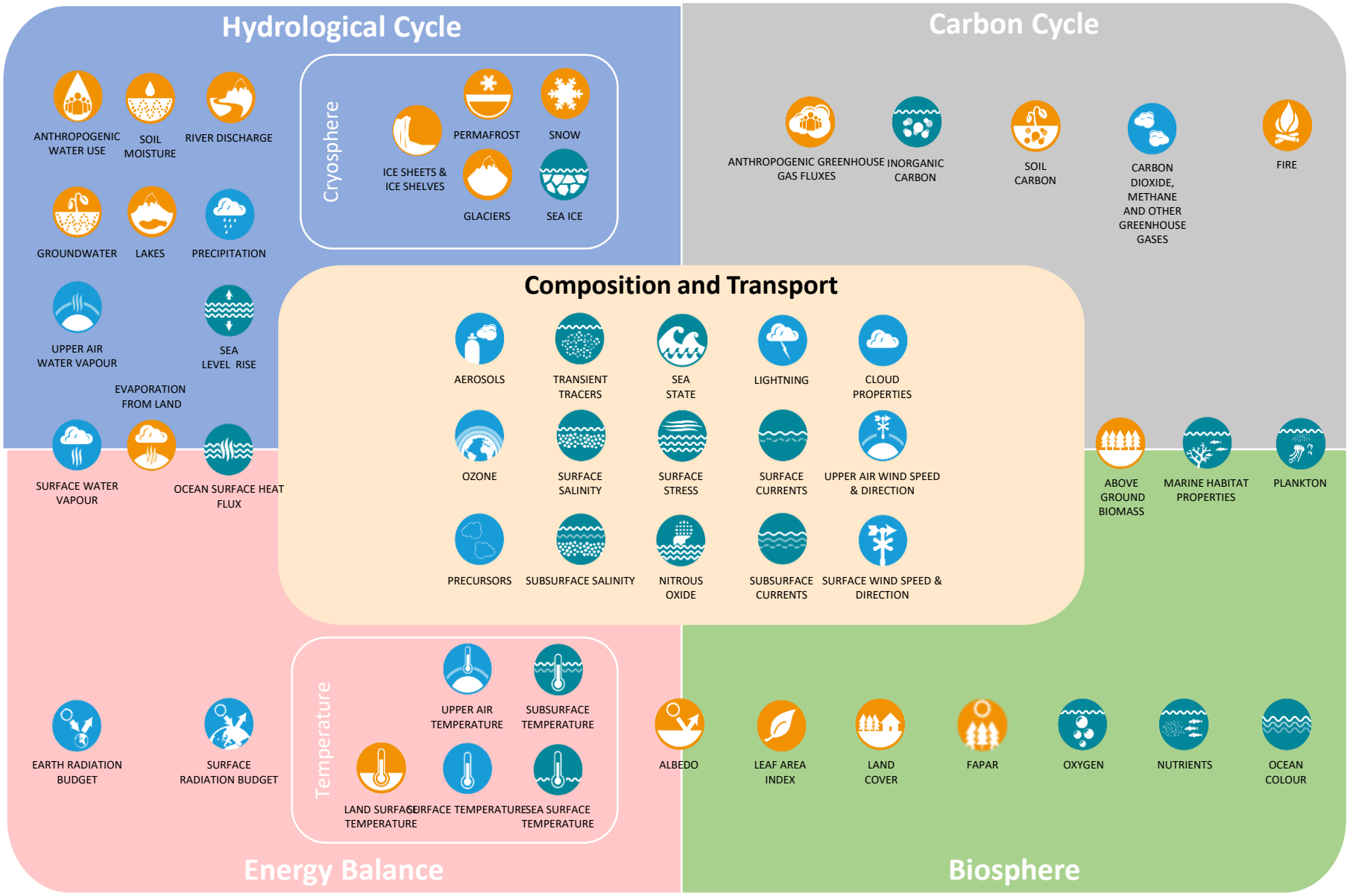
ECV datasets provide the empirical evidence

- to understand and predict the evolution of climate,
- to guide mitigation and adaptation measures,
- to assess risks
- to enable attribution of climatic events to underlying causes,
- to underpin climate services.

SOURCE: Bojinski, S. et al., 2014

ECV

- GCOS currently specifies 54 ECVs.
- Looking at the climate system as a whole is one way of assessing how well the ECV monitor the climate



ECV Domain (Panel Responsibility):
- Land ECVs (TOPC)
- Ocean ECVs (OOPC)
- Atmosphere ECVs (AOPC)

What is needed?

ECV Requirements Implementation Plans, Principles and Guidelines (1)

Implementation Plan 2022

Support to observations

implementation plans, Regional workshops and plans, capacity development, (2)

Where are we now?

adequacy of ECV observations and evaluation of improvements

(1)

Status Report 2021

Observations

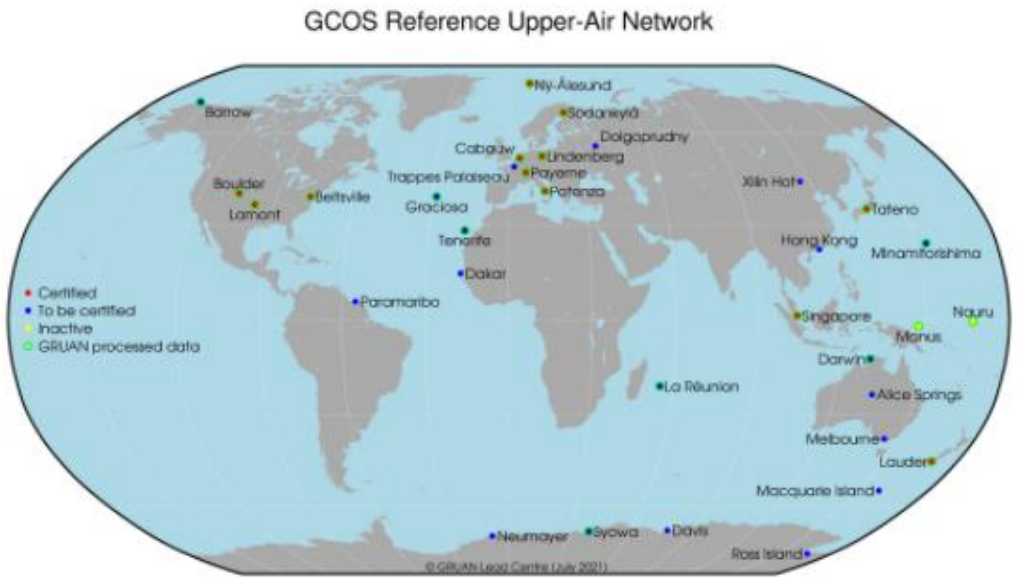
NMHSs, Space Agencies, Other networks and research organisations

GCOS Cooperation Mechanism

GCOS WMO IOC International Science Council UN environment

GCOS Reference Networks

GRUAN



- GRUAN is envisaged as a global network of 30-40 measurement sites.
- To the extent possible, it builds on existing observational networks and capabilities.
- As at August 2020, GRUAN comprises of 30 sites, 12 of which have been GRUAN certified
- GRUAN Lead Centre Lindenberg (DWD)

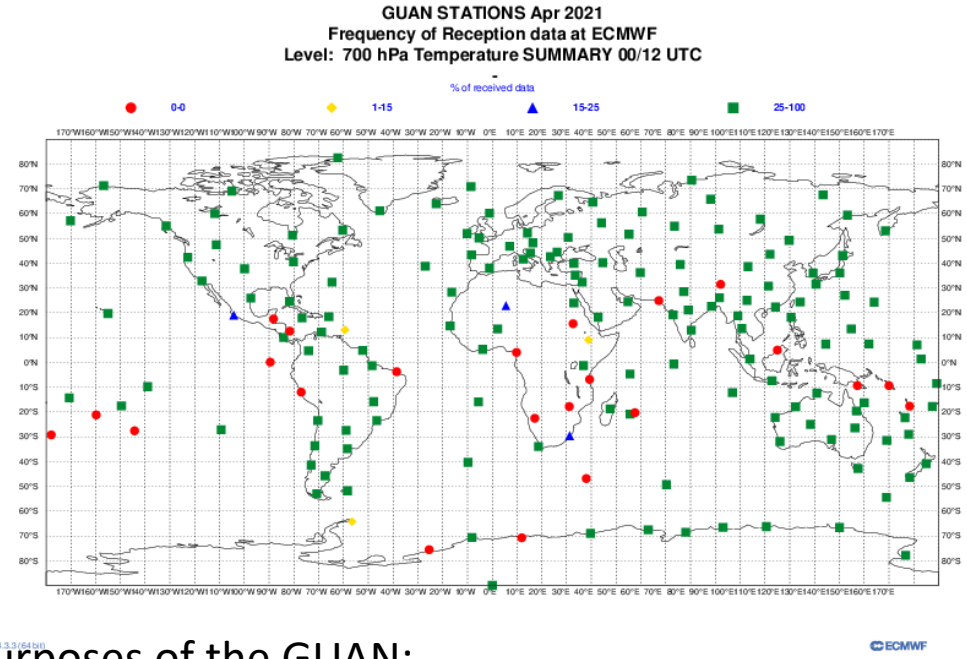
GSRN

Improved long-term accuracy, stability and comparability of observations.

- Provide sustained reference quality observations, with full traceability and fully defined uncertainty, on a global scale (on land) of <u>at least</u> the **ECVs surface temperature and precipitation** in order to quantify their variability, long-term change and inform on extremes
- Deliver an implementation plan for the inclusion of additional ECVs
- May be based on existing networks such as the US Climate Reference Network and the Cryonet sites

GCOS Baseline networks

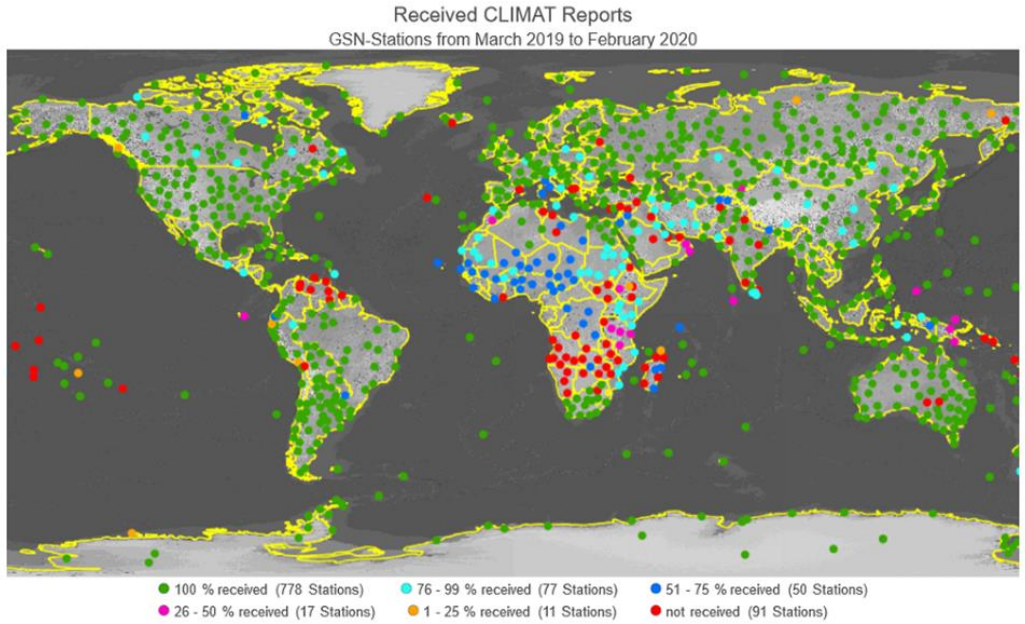
- GUAN



Purposes of the GUAN:

- establish national commitments for the preservation of a minimum set of upper-air stations for the foreseeable future
- build a collection of validated data from these stations in standardized formats
- provide this information to the global climate community with no formal restriction – 1 GUAN Station in Austria

- GSN



Subset of about 1000 stations chosen mainly to give a fairly uniform spatial coverage from places where there is a good length and quality of data record. Mandatory parameters measured by a GSN station are temperature and precipitation.

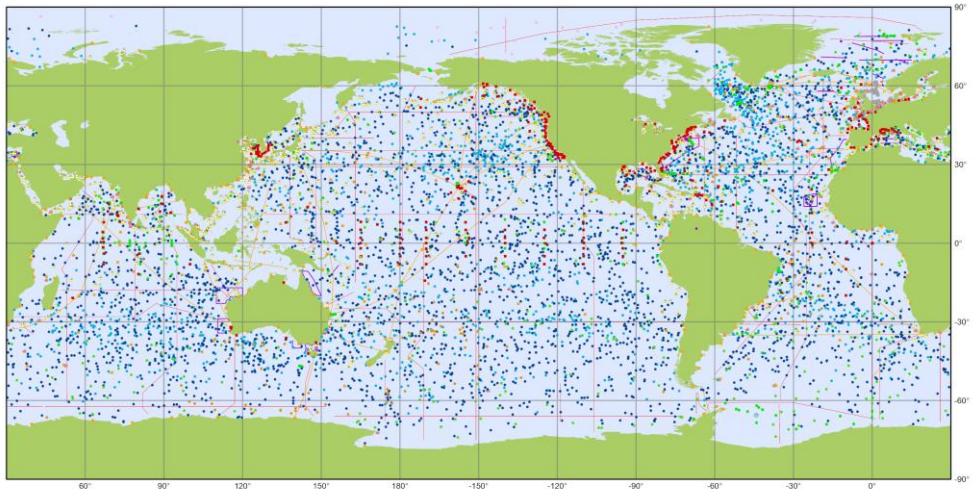
2-GSN stations in Austria

GCOS Cooperates with a WIDE Range of networks

Examples of other Global Networks for specific terrestrial ECV

Satellite observations are coordinated by the Joint CEOS/CGMS Working Group on Climate

GOOS coordinates a number of different ocean networks

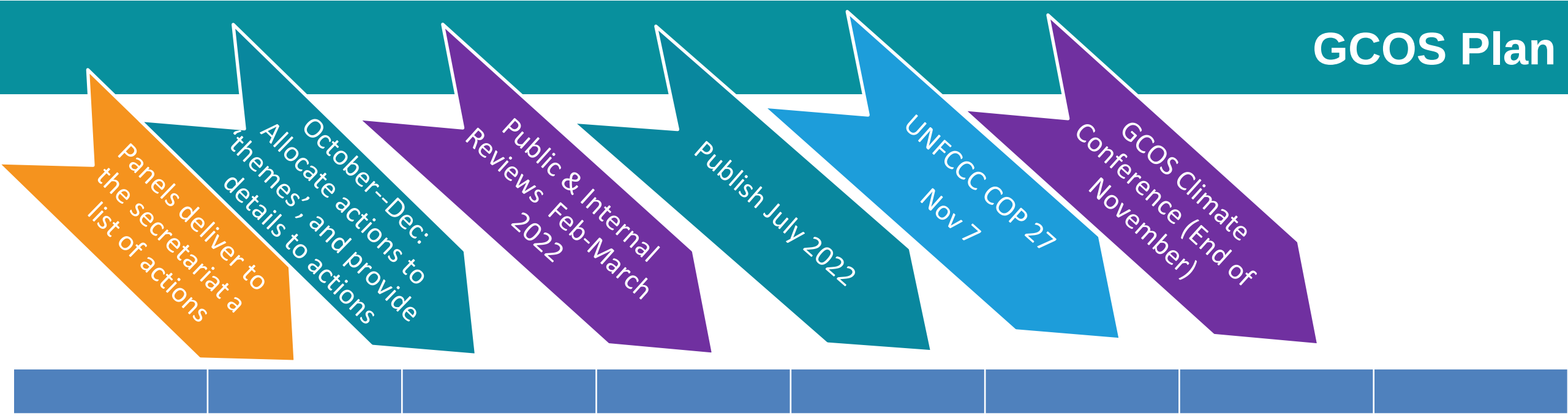


And a wide range of other partners who support GCOS, host data centres, etc …

Examples of global networks associated with GCOS

Examples of national and regional networks

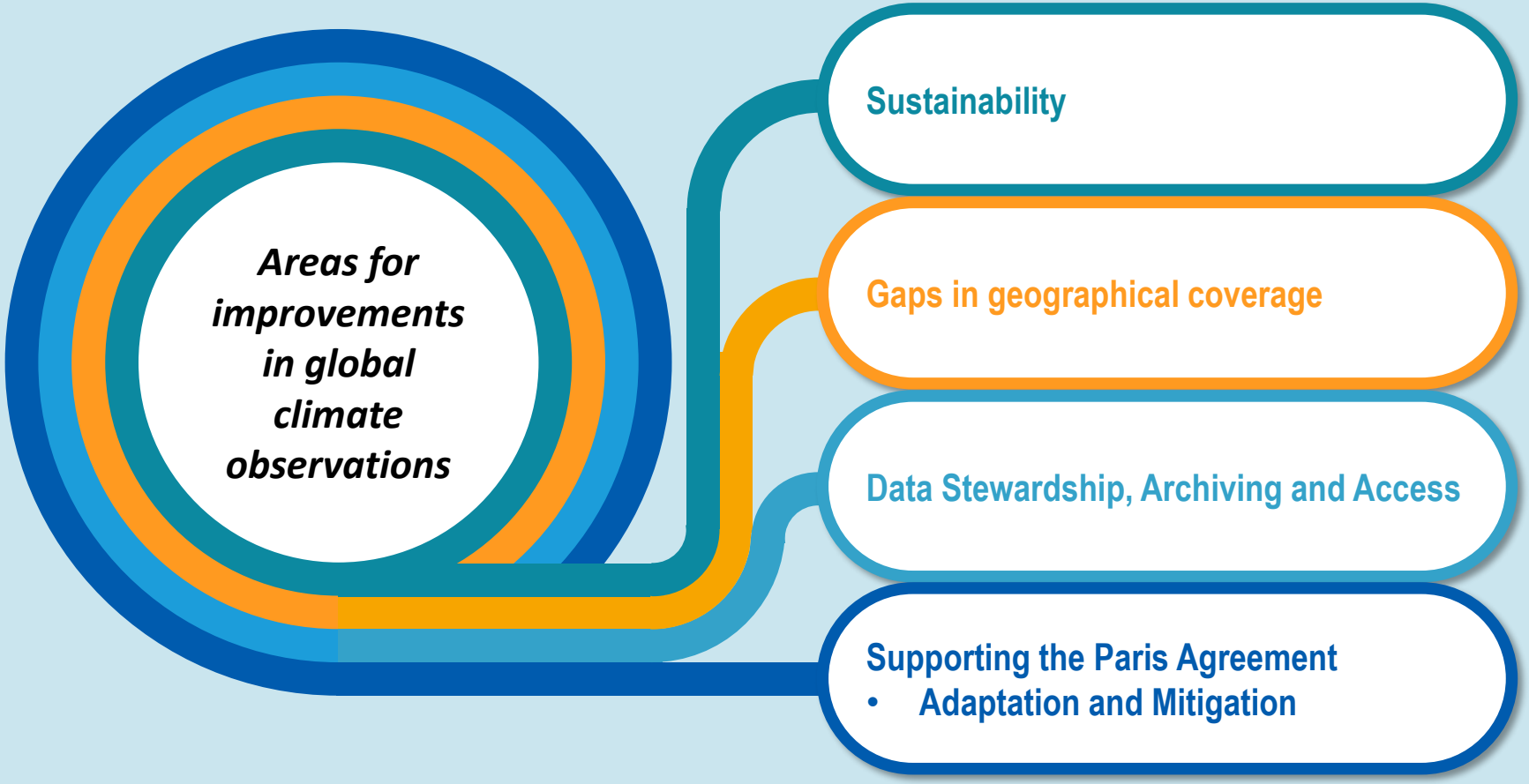
GCOS Plan


Panels deliver to the secretariat a list of actions
October--Dec: Allocate actions to 'themes', and provide details to actions
Public & Internal Reviews Feb-March 2022
Publish July 2022
UNFCCC COP 27 Nov 7
GCOS Climate Conference (End of November)
April 2021
October 2021
December 2021
April 2022
July 2022
November 2022
December 2022
Prepare 5th Status Report and submit to UNFCCC
Finalise ECV Requirement
Develop Actions
Finalise
Panels
Approval
GCOS SC
Editorial Board Oversight
Editorial Board

Areas for improvements identified in the GCOS Status Report

GCOS Status Report was published in …2021 and will be submitted for their consideration by the UNFCCC SBSTA and COP presented at the COP 26

- The report identifes four key areas where improvements are needed
- The GCOS Implementation plan to be published in 2022 will adress these four areas.



Implementation Plan 2022

- Inputs: The GCOS Status Report, IPCC findings and the outcomes of the revisions of the ECV requirements

- The 2022 IP will not replicate the 2016 Plan. It will be:

  – **More targeted at observing systems – at those who implement it**
  – **Actions by Observing System NOT by ECV**
  – **Clear priorities**
  – **A shorter, more concise document**

  Public Review: February-March 2022: Please contribute!

Other future work

- Establishing the GCOS Surface Reference Network
- Adaptation Task Team
  - Examining how the global system can support and monitor adaptation
  - Extremes
- Climate Cycle Task Team
  - The climate cycles provide a way of considering observations of the climate system as a whole across all domains
  - Following the publication of papers on the cycle, the task team will design a future work plan
- Lightning Task Team
- Ensuring long term sustainability of data centres
- Organizing the GCOS Climate Conference (November 2022)

Thank you

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WMO

IOC

International Science Council

UN environment

Supported by the European Union

Copernicus

Europe's eyes on Earth