

# Update from GCOS

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ГЛОБАЛЬНАЯ СИСТЕМА  
НАБЛЮДЕНИЙ ЗА КЛИМАТОМ  
НЕУСТААННО 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



**GLOBAL CLIMATE  
OBSERVING SYSTEM**

KEEPING WATCH OVER OUR CLIMATE



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# PPT Outline

1. What is GCOS
2. GCOS Updates
3. GCOS & Switzerland



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# GCOS – Global Climate Observing System



**GLOBAL CLIMATE OBSERVING SYSTEM**  
KEEPING WATCH OVER OUR CLIMATE

GCOS is a Co-Sponsored Programme:

- WMO 
- IOC - UNESCO 
- UNEP 
- ISC  International Science Council

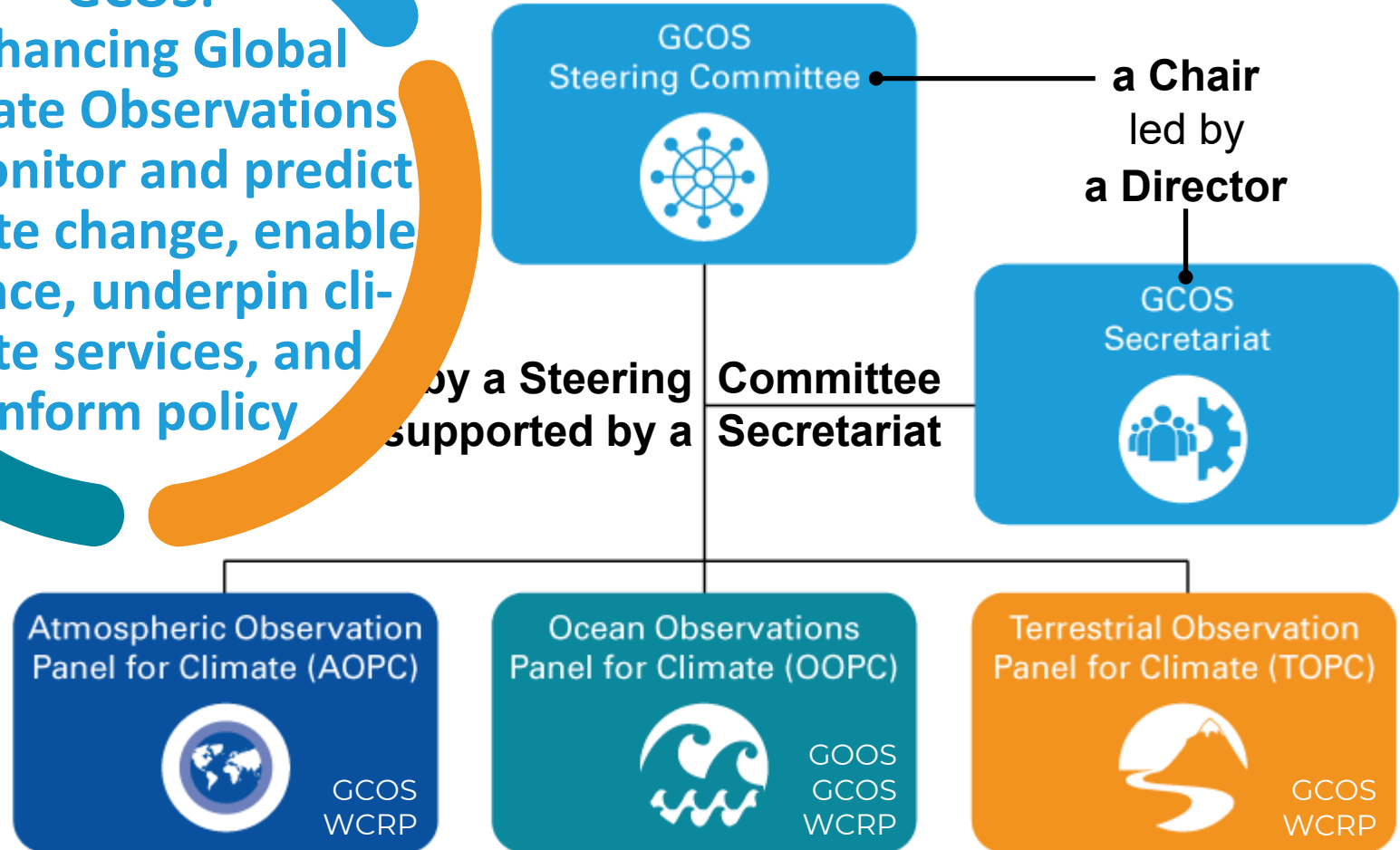
**unesco**  
Intergovernmental Oceanographic Commission

**WCRP**

Additional contributors:  
EU Commission, **US State Dept.**, NOAA, Germany (DWD), EUMETSAT, UK

**GCOS:**  
enhancing Global Climate Observations to monitor and predict climate change, enable science, underpin climate services, and inform policy

Established in 1992 to address the UNFCCC systematic observation agenda



Guided by 3 panels of experts: AOPC, OOPC, TOPC

# GCOS: a system of systems

GCOS does not make observations itself, it is a system of systems integrating the contribution from a wide range of organizations, networks and observing systems (in situ and space-based)

Countries  
(National  
GCOS)



GSN, GUAN, GRUAN



GBON

...

WHYCOS

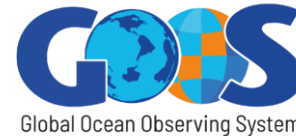


Meteorological  
Networks  
coordinated  
by WMO



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

a number of different ocean climate-related networks, in collaboration with GOOS



Other Global Organizations and Networks for specific terrestrial ECV

Examples of global networks associated with GCOS



a wide range of other partners support GCOS, host data centres, etc...

Examples of national and regional networks



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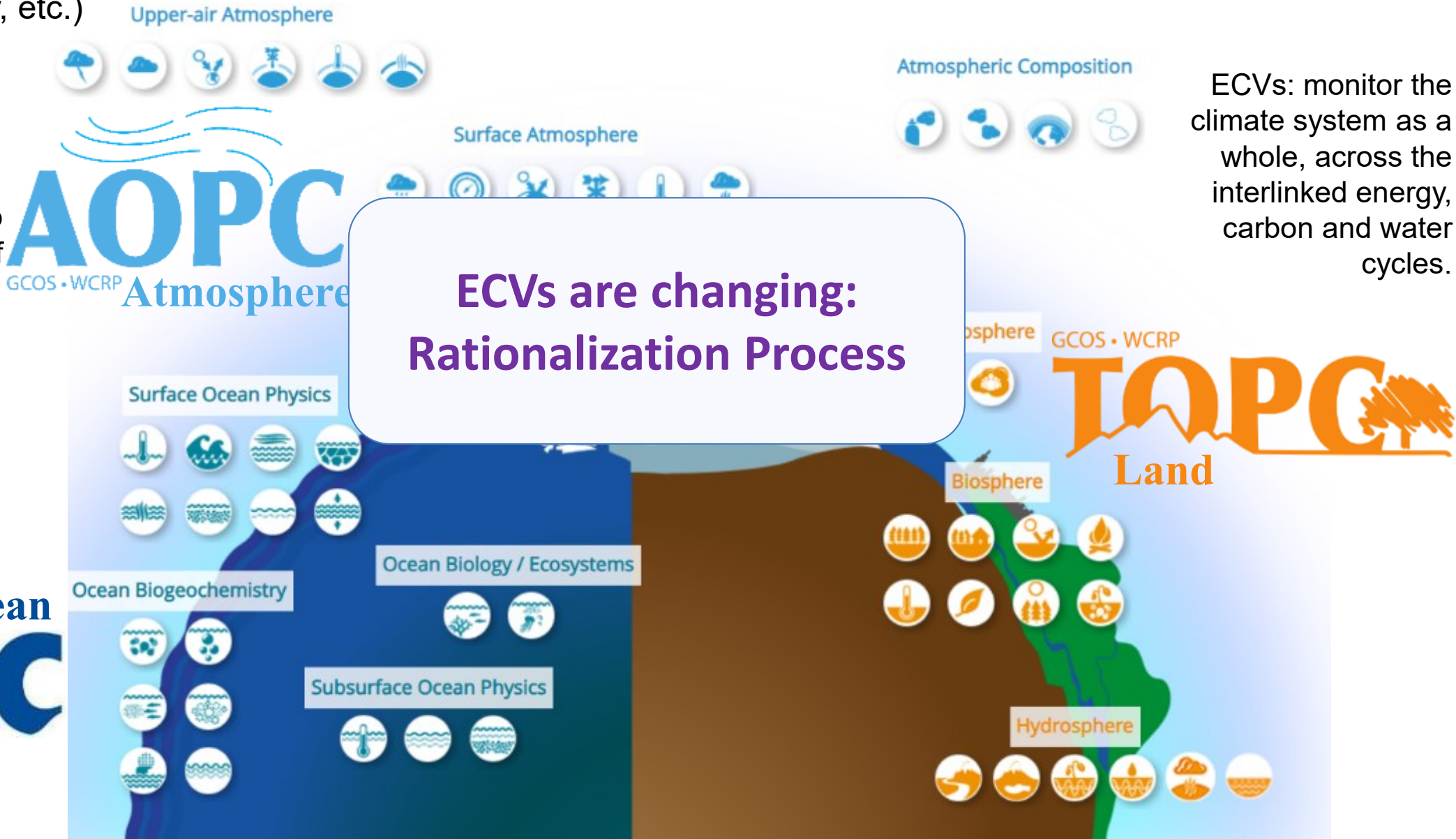
# GCOS 55 ECVs - Essential Climate Variables

GCOS routinely maintain, review and revise the list of ECV requirements (e.g. spatial and temporal resolutions, uncertainty, stability, etc.)

An ECV is a physical, chemical or biological variable (or group of linked variables) that critically contributes to the characterization of Earth's climate

ECVs observations need to be:

- Feasible
- Cost-effective
- Relevant



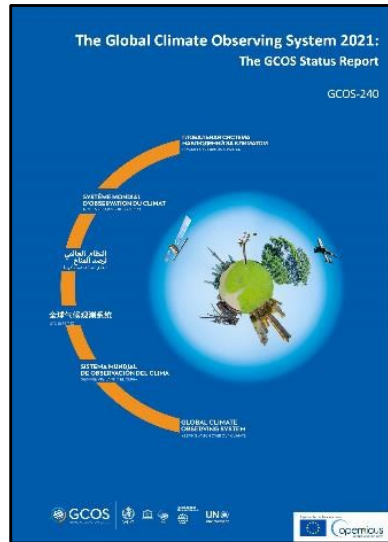
ECVs: monitor the climate system as a whole, across the interlinked energy, carbon and water cycles.

GCOS • GOOS • WCRP **Ocean**  
**OOPC**

# GCOS Reporting to UNFCCC

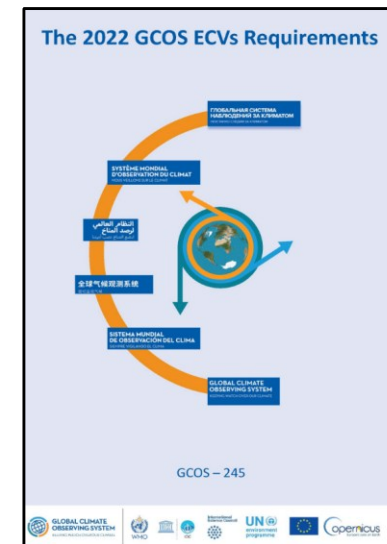
GCOS is mandated to report to UNFCCC on Research and Systematic Observations

## GCOS STATUS REPORT (2021)



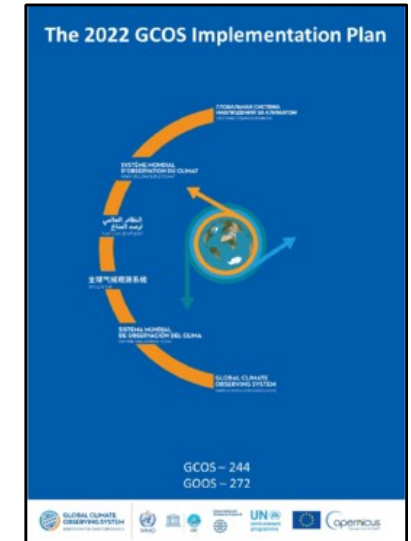
Assess if the status of the observing system for climate meets those requirements

## GCOS ECVs REQUIREMENTS (2022)



Identify what we need to measure (ECVs requirements)

## GCOS IMPLEMENTATION PLAN (2022)



Propose actions to improve the observing system for climate

≈ 5 years cycle

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# ECV Rationalization – Why?

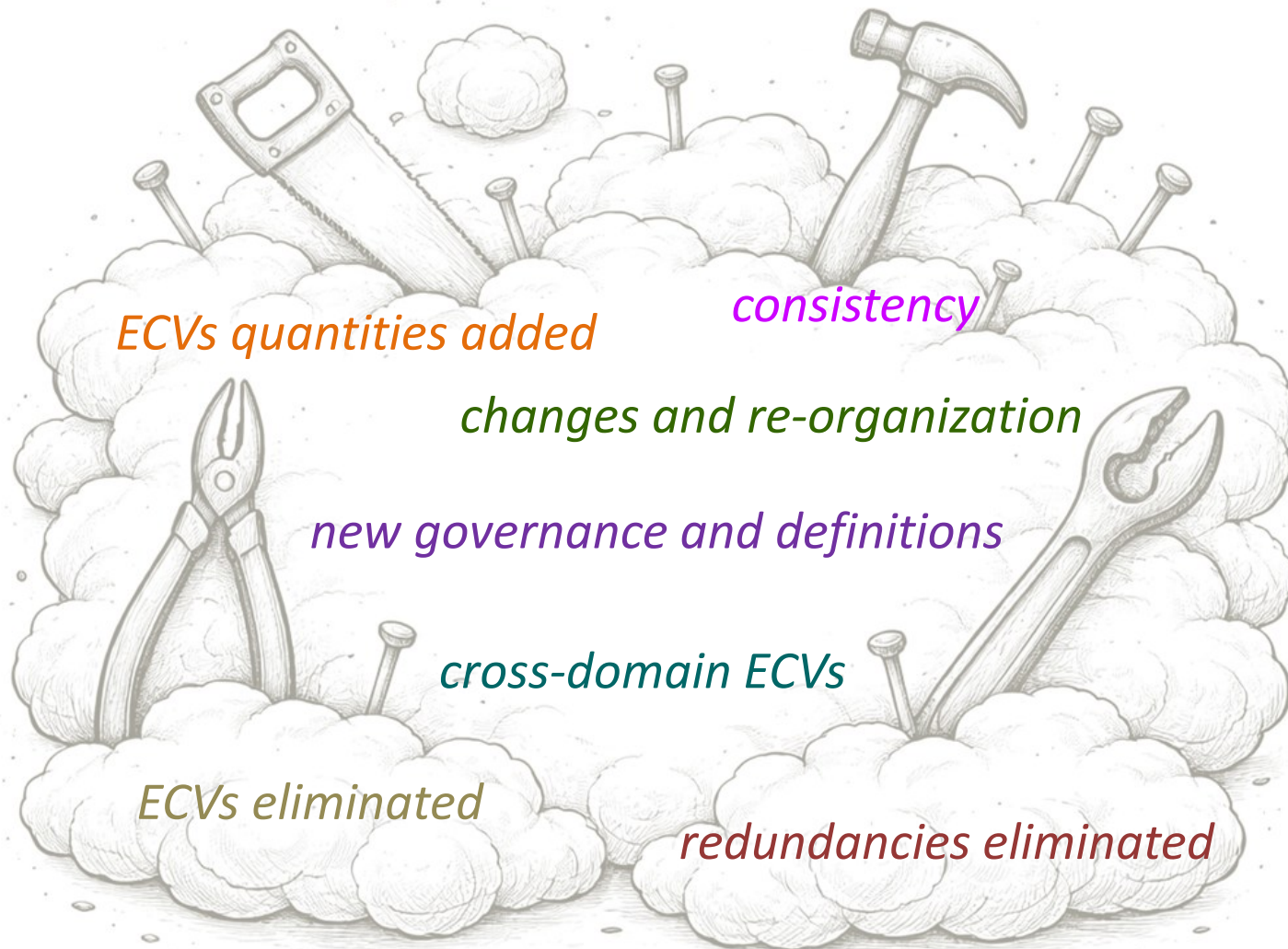
- Are all the 55 Essential Climate Variables **still essential**? Are we **missing anything**?
- Is the **current grouping the best possible one**? Is it **balanced**? Is it **consistent** across domains and across earth cycles?
- Is there **enough transparency** and **coherence** in the process that leads to including a new ECV in the list?

**ECVs  
Rationalization  
Process**

# Rationalization Process: ECV are changing

## Now:

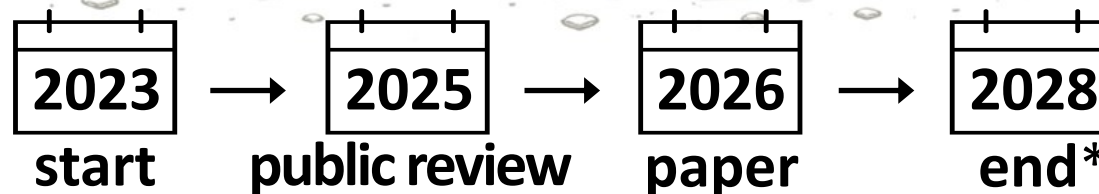
- 55 ECVs
- 177 products



## After:

- 41 ECVs
- 174 quantities

- 22 unchanged
- 19 new ECVs (from regrouping/moving existing ones)
- 2 removed



# GCOS at COP30 – EID 10/11/2025

## GCOS participation in UNFCCC COP30

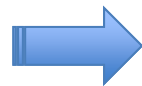
*Belém, Brazil, 10–21 November 2025*

- GCOS [Statement](#) at the SBSTA63 Plenary
- GCOS Chair speech in the opening segment of the [Earth Information Day 2025](#)



2 key messages:

- **Global climate systematic observations are in peril:** threats to the in-situ networks and uncertainty in follow-on satellite missions were highlighted
- Without **sustained financial support the GCOS Programme will not survive beyond 2027**



The GCOS messages provoked reactions from Parties and stakeholders, resulting into several references in the [SBSTA-63 conclusions](#), e.g. the SBSTA:

- “noted the importance of and expressed appreciation for the work and contribution of the GCOS secretariat”
- “noted with concern the decline in support for sustained long-term observation networks, including for GCOS”

# GCOS (re)action!

## GCOS-WGClimate-iClimateAction joint meeting, ESA-ECSAT, Harwell (UK), 9-13/02/2026

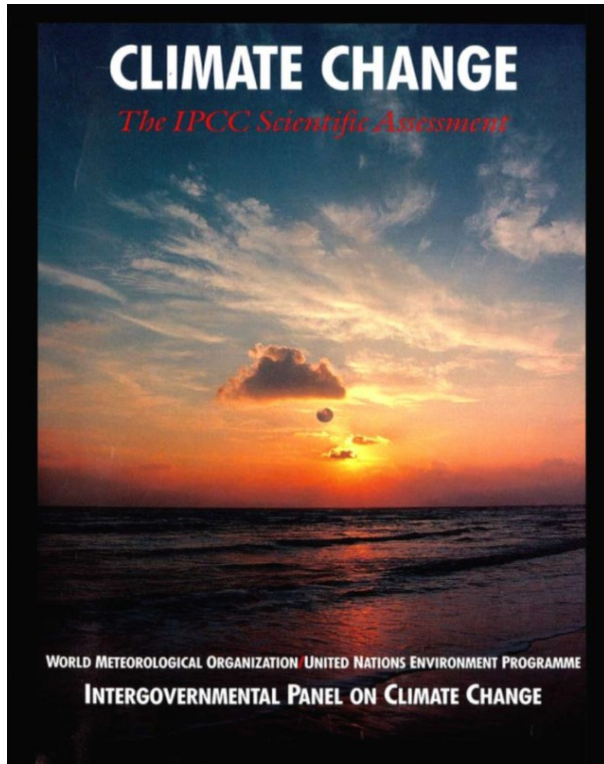
- To work on the preparation of the next GCOS Status Report, to be published in 2027
- The GCOS Status Report will identify gaps in global climate observations focusing on i) **sustainability**, ii) **threats** to the observing components, iii) single **points of failure**, iv) risk of **inaction**.
- Given the increased threats to the observing system (including data management), GCOS Steering Committee has decided to publish the next GCOS Status Report jointly with a High Priority Action Plan describing urgently needed actions to address the concerns identified by the SR itself



# GCOS a long history coming to an end?

1990

IPCC 1<sup>st</sup> Assessment Report



2<sup>nd</sup> World Climate Conference  
Geneva 1990



*“there is an urgent need to create a **Global Climate Observing System** ... including both space-based and surface-based components”*

*“improved predictability of climate change would require improved **systematic observation of climate related variables on a global basis**”*

1992

UNITED NATIONS FRAMEWORK CONVENTION  
ON CLIMATE CHANGE



UNITED NATIONS  
1992

Article 4

Promote and cooperate in scientific, technological, technical, socio-economic and other research, **systematic observation** and development of data archives related to the climate system...



34 yrs!

since  
**1992**

GCOS has enabled trusted global climate monitoring

**2026**

Funding uncertainty threatens continuity

**2028**

GCOS Programme closure without renewed support

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# GCOS National Coordinators

*GCOS National Coordinators: coordinate amongst many departments and agencies dealing with climate observations at national level, and liaise with UNFCCC*

- Currently **16 members**: Australia, Austria, Chile, China, Finland, Germany, Ireland, Japan, Kenya, Netherlands, New Zealand, Norway, Pacific Islands, Russian Federation, Senegal, **Switzerland – Michelle Stalder**
- **2 online meetings** in 2025 + several **bilateral meetings** (including Switzerland)
- **National publications** (on ECVs inventory, gap analysis, implemented actions) to be **aligned to the GCOS reporting** cycle (modalities to be agreed)
- Already published relevant national reports could be included as **annexes** in the next GCOS Status Report
- For the following GCOS reporting cycle, GCOS Sec shall produce a **template** for collecting the national inputs
- GCOS National Coordinators to encourage their national community to **contribute to the public review of the next GCOS SR and HPAP**

# Swiss contribution to GCOS

- **Swiss GAW-GCOS Office**
- **Inventory of long-term climatological time series including 34 ECVs**
- **Long-term atmospheric monitoring (temperature, precipitation, ozone, etc.)**
- **Active participation in GRUAN – GCOS Reference Upper-Air Network**
- **Swiss station (Payerne) for the GSRN pilot – GCOS Surface Reference Network**
- **Leadership in cryosphere monitoring (glaciers, permafrost, snow, etc.) and the related Global Terrestrial Networks and Data Centers (e.g. GTN-G, WGMS)**
- **Research projects contributing to the GCOS implementation plan**
- **GCOS Switzerland Strategy 2017-2026 & Swiss GCOS Inventory 2025**



# Global Terrestrial Networks - Glaciers



**2025**  
International  
Year of Glaciers'  
Preservation

2025-2034 – Decade

WMO/GCOS Policy Brief  
From Data to Decision:  
Strengthening Glacier Monitoring

wgms

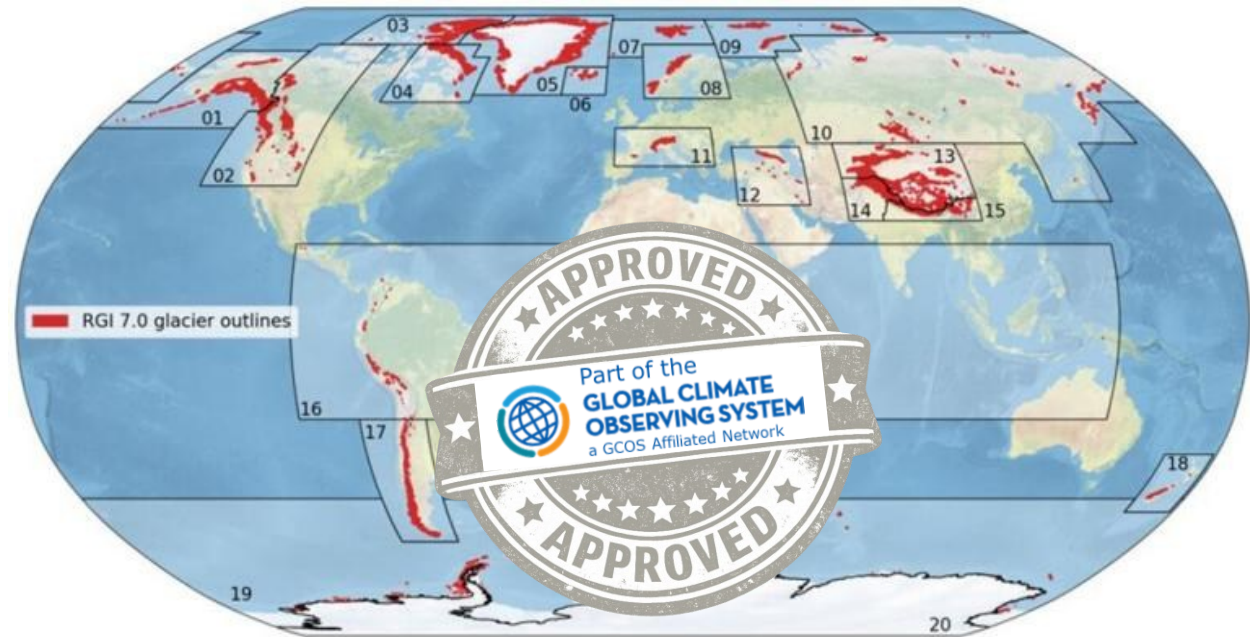
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contributing to  
working group  
for the global climate data  
repositories requirements

**GTN-G accredited as  
GCOS Affiliated Network  
(February 2026)**



Part of the  
**GLOBAL CLIMATE  
OBSERVING SYSTEM**  
a GCOS Affiliated Network



# Observations are needed now more than ever!

CSS Analyses in Security Policy

No. 290, September 2021



## Climate Change in the Swiss Alps

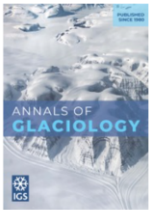
Climate change will increasingly impact everyday life in Switzerland. A marked rise in heat, extreme precipitation, and associated natural hazards is already damaging ecosystems, infrastructure, health, and livelihoods. Collaboration and swift adaptation measures are required to mitigate and cope with the consequences.

## Summer drought influence on lightning-induced fires



In a changing climate, lightning-caused wildfires might increase in Switzerland over the next decades. Our studies aim at understanding patterns and conditions under which these fires develop.

## Vanishing Glaciers



Vanished glaciers of the Swiss Alps: An inventory-based assessment from 1973 to 2016

Part of: Vanishing Glaciers

Published online by Cambridge University Press: 14 November 2025

Andreas Linsbauer, Matthias Huss, Elias Hodel, Andreas Bauder and Martina Barandun

## Environmental Research Communications

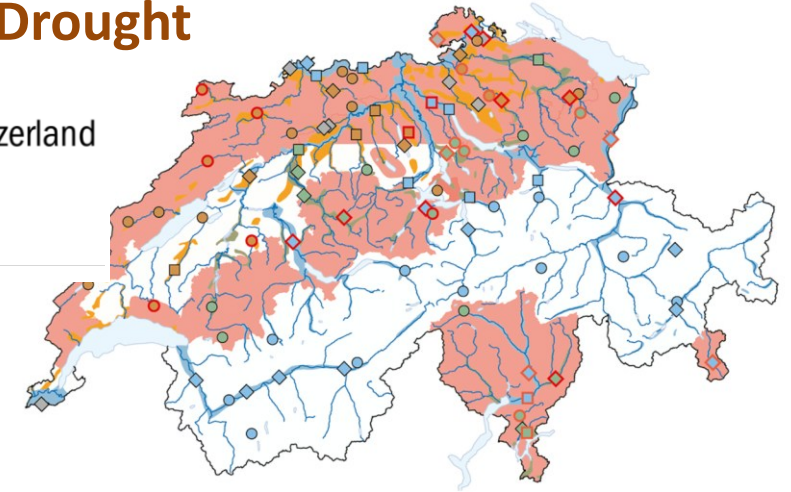
### Trends and drivers of recent summer drying in Switzerland

S C Scherrer<sup>1</sup>, M Hirschi<sup>2</sup>, C Spirig<sup>1</sup>, F Maurer<sup>1</sup> and S Kotlarski<sup>1</sup>

<sup>1</sup> Federal Office of Meteorology and Climatology MeteoSwiss, Zurich-Airport, Switzerland

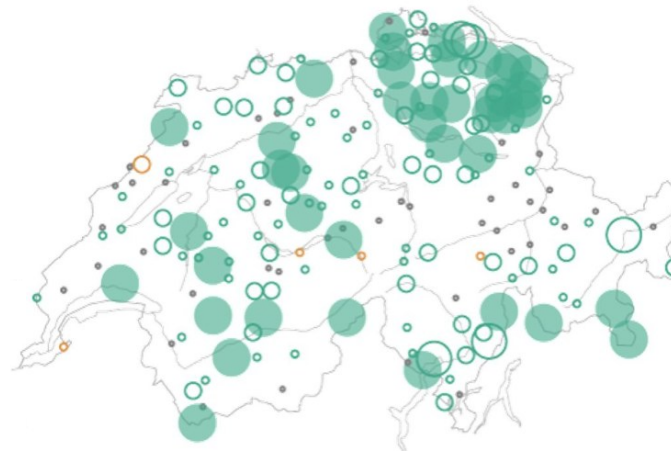
<sup>2</sup> Institute for Atmospheric and Climate Science, ETH Zurich, Zurich, Switzerland

## Drought



- Type of station
  - Pumping well
  - Piezometer
  - Spring
- Groundwater regime
  - Pluvial
  - Pluvio-nival
  - Nivo-glacial
  - Deep groundwater
- Drought 2018
  - Regions with restrictions
  - Low values
  - New low values

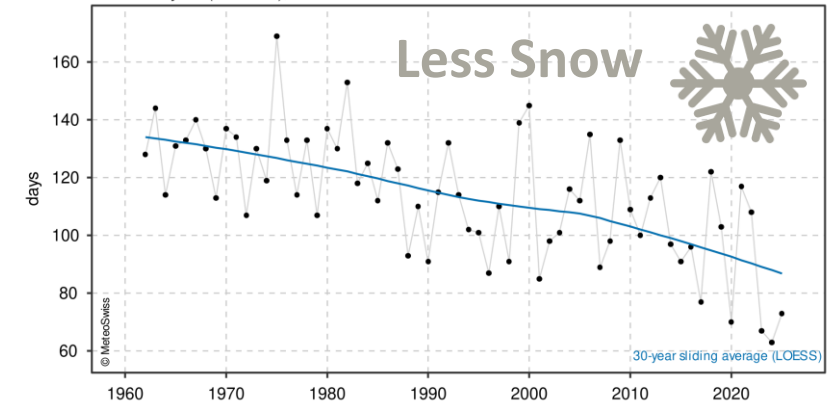
## Switzerland is facing new challenges!



## Heavy Rainfall

## Snow days

Winter halfyear (ONDJFM), 1961/1962 – 2024/2025



based on: snow\_depth (hs000d0) / 2025-10-02 19:06  
ATTENTION: For interpretation of the time series, refer to the product information!  
climind.data (0.1.12), climind.catic (0.1.20), climind.trend (0.1.8), climind.plot (0.1.27)

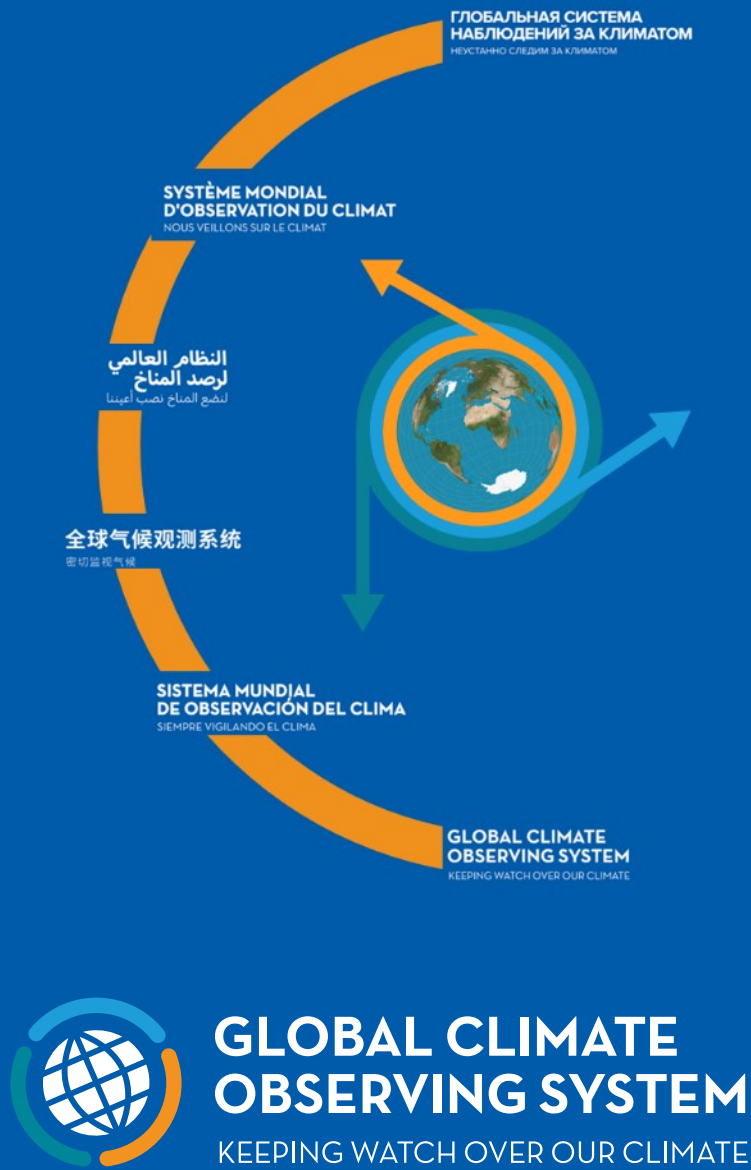


# Conclusions

- **National observations** are the foundations of a global observing system for climate
- GCOS acknowledges the importance of the **Swiss contribution**
- Swiss partners are welcomed to **review the next GCOS Status Report** (Swiss-GCOS Inventory Report as annex to it?) and **High Priority Action Plan** (next GCOS Swiss Strategy to be aligned)
- These documents can be reflected in the next Swiss GCOS National Projects
- **Supporting GCOS?**



Merci      Danke  
 Grazie      Grazia



Schweizerische Eidgenossenschaft  
 Confédération suisse  
 Confederazione Svizzera  
 Confederaziun svizra  
 Swiss Confederation

GCOS

MeteoSwiss

Federal Department of Home Affairs FDHA  
 Federal Office of Meteorology and Climatology MeteoSwiss

**SWISS NATIONAL GAW/GCOS SYMPOSIUM**  
 Global Atmosphere Watch & Global Climate Observing System

25-26 March 2026



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