

WGClimate

*status, next steps and key
recommendations for CGMS plenary*

V.-H. Peuch (ECMWF, vice-chair) on behalf of W. Su (NASA, chair)

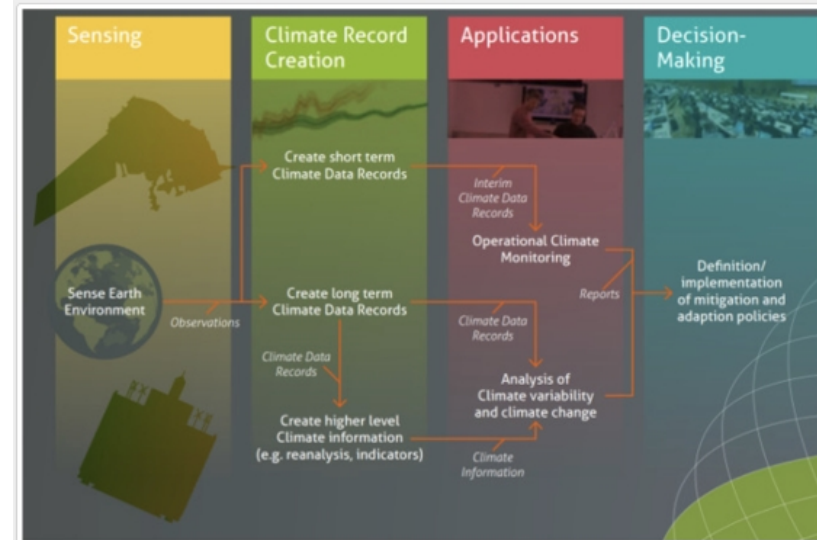
WG Climate 24 (in person)



- ❖ Harwell (UK), 9 -12 February 2026
- ❖ Joint meeting with GCOS panels (some plenary & some parallel sessions)

❖ The overarching goal is to improve the systematic availability of Climate Data Records through the coordinated implementation, and ongoing development of the architecture for climate monitoring from space:

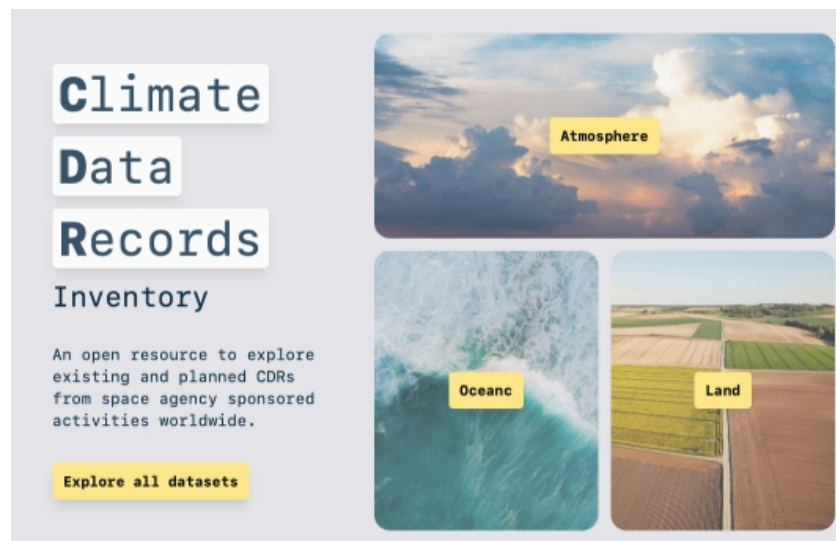
- Providing a comprehensive and accessible view of existing and planned climate data records;
- Delivering further climate data records, including multi-mission, through best use of available data to fulfil GCOS requirements;
- Optimizing the planning of future satellite missions and constellations to expand existing and planned climate data records.
- Coordinating GHG observations across CEOS-CGMS agencies, working closely with WMO G3W and UNEP IMEO.



ECV → CDR Inventory

The CDR Inventory is an information database of satellite-derived thematic Climate Data Records addressing geophysical quantities contributing to the GCOS-defined space-observable ECVs / ECV Products.

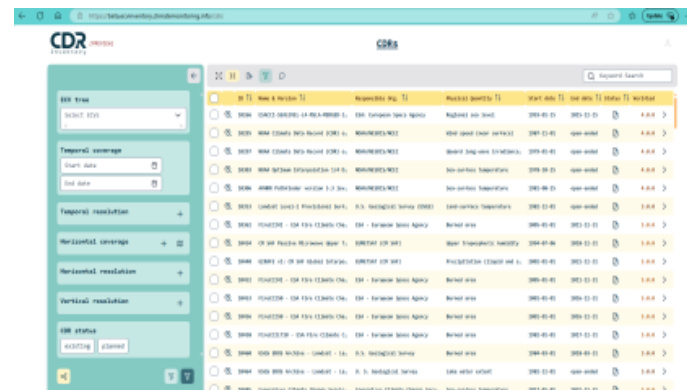
- ❖ Capture the number of existing and planned satellite-derived CDRs addressing GCOS ECVs
- ❖ Provide the most accurate information concerning the data records: *Generation Process, Record Characteristics, Documentation, Accessibility, Applications*
- ❖ Ensure completeness and consistency of the information displayed



CDR Inventory: comprehensive and accessible view

- ❖ New interface to enhance discoverability and uptake of CDR Inventory
- ❖ Added functionalities to make it easier to navigate the Inventory
- ❖ Streamlined information for easier filtering and analysing the data
- ❖ Simplified process to populate the database and verify the contents

- ❖ Continuous publication, individual time tags used for record updates
- ❖ Accommodation of non-GCOS climate-relevant variables
- ❖ Discussion on further cooperation/synergies with WMO OSCAR/Space, MIM, and WGISS



New capabilities added

https://beta.ecvinventory.climatemonitoring.info/cdrs

CDR Inventory

Keyword Search

ID	Name & Version	Responsible Org.	Physical Quantity	Start date	End date	Status	Verified at
10206	ESACCI-SEALEVEL-L4-MSLA-MERGED-19950115000..	ESA: European Space Agency	Regional sea level	1995-01-15	2015-12-15	📄	4.0.0 >
10295	NOAA Climate Data Record (CDR) of Ocean No.	NOAA/MESDIS/NCEI	Wind speed (near surface)	1987-11-01	open-ended	📄	4.0.0 >
10297	NOAA Climate Data Record (CDR) of Daily Gu.	NOAA/MESDIS/NCEI	Upward long-wave irradiance at TOA	1979-01-01	open-ended	📄	4.0.0 >
10303	NOAA Optimum Interpolation 1/4 Degree Dail.	NOAA/MESDIS/NCEI	Sea-surface temperature	1978-10-25	open-ended	📄	4.0.0 >
10306	AVHRR Pathfinder version 5.3 level 3 colla.	NOAA/MESDIS/NCEI	Sea-surface temperature	1981-08-25	open-ended	📄	4.0.0 >
10395	Landnet Level 2 Product of Surface Temper.	U.S. Geological Survey (USGS)	Land-surface temperature	1982-12-01	open-ended	📄	3.0.0 >
10400	ESACCI-SEAICE-ESA-Sea-Climate-Change-Initia.	ESA - European Space Agency	Burned area	2005-01-01	2011-12-31	📄	5.0.0 >
10434	CR SAF Passive Microwave Upper Tropospheri.	EUMETSAT (CR SAF)	Upper tropospheric humidity	1994-07-06	2018-12-31	📄	5.0.0 ⌵

Detailed view (> new page)!

Expanded view

Direct link to CDR

Active links to WMO OSCAR / Space

Physical_Quantity: Upper tropospheric humidity [GCOS154|GCOS200]
ECV_Product: Upper tropospheric humidity [GCOS154|GCOS200]
ECV: Upper-air Water Vapour [GCOS154|GCOS200|GCOS245]
Domain: Atmosphere [GCOS154|GCOS200|GCOS245]

Temporal coverage: Start date 1994-07-06, End date 2018-12-31, Temporal resolution 1 month

Horizontal coverage [Long, Lat]: N/E [-180, 60], N/W [180, 60], S/W [180, -60], S/E [-180, -60]

Horizontal resolution: 1 deg
Vertical resolution: 100 hPa, 500 hPa

Satellites/Instruments: DMSP-F11 | SSM/T-2 | DMSP-F12 | SSM/T-2 | DMSP-F14 | SSM/T-2 | DMSP-F15 | SSM/T-2 | FY-3A | PMHS-1 | FY-3B | PMHS-1 | FY-3C | PMHS-2 | Metop-A | MHS | Metop-B | MHS | NOAA-15 | AMSU-B | NOAA-16 | AMSU-B | NOAA-17 | AMSU-B | NOAA-18 | PHS | NOAA-19 | PHS | SNPP | ATMS

Released on 2024
CDR Access: http://dx.doi.org/10.5676/EUP_SAF_CR/UTH/V002
TCDR Resp. organization: EUMETSAT (CR SAF)

- ❖ 2024 analysis of ECV Inventory found that **CDRs exist for 35 out of 37 ECVs accessible from space** constituted in the 2016 GCOS Implementation Plan.
 - All ECVs in the atmospheric and oceanic areas
 - No data for permafrost and the anthropogenic fluxes of greenhouse gases.
 - Permafrost data records covering the Northern Hemisphere for about 20 years have now been generated.
- ❖ For most there is a short-term (next 5 years) continuity in measurements, but not the required long-term continuity
- ❖ A looming gap exists for water vapour measurements by stratospheric Limb sounders used for profiling

A collection of related factual information (such as measurements or statistics) about Climate System elements and their variations, organised and treated as a single unit over a long period of time, (to represent the long-term conditions at a particular location).

- Under revision with GCOS and other domain experts
- Will be published in the [CEOS EO Glossary](#)
- Feedback welcomed

Expanding the Utility of the CDR Inventory

- ❖ Objective: Improve discoverability and uptake of the Climate Data Record Inventory by external users/stakeholders of Earth observation data
- ❖ Develop a typology supporting research and application
- ❖ Use this typology as the interface of the CDR inventory to improve its discoverability and usability



Proposed Typology Structure

Categories aligned with Science, Services, and Policy Support

Based on existing where possible e.g. UNFCCC/NAP subdivisions for adaptation

Application tags: space/time resolution, product level, AI-readiness

Keep initial typology small & manageable, avoid excessive complexity

WGClimate CDR Inven WGClimate CDR Inventory Typology

- Science
 - WCR
 - Climate
 - Climate
 - [ESM
 - [GCP
 - Tippi
 - Attrib
 - SRM
- ### WGClimate CDF
- Science
 - Services
- categories taken from C3S S
- Hydrology and Wat
 - Agriculture
 - Forestry
 - Tourism
 - Insurance
 - Transport
 - Energy
 - Renewables
 - Grid Balancing
 - Health
 - Infrastructure
 - Disaster Risk Redu
 - Coastal Areas

- Science
- WCRP + GCOS
- Carbon Cycle
- Water Cycle
 - Soil Moisture
 - River discharge
 - Groundwater
 - Lakes
 - Precipitation
 - Upper-air water vapour
 - Total water storage
 - Sea level
 - Ice sheets and ice shelves
 - Permafrost
 - Snow
 - Glaciers
 - Sea ice
 - Evaporation from land
 - Ocean surface heat flux
 - Sea surface salinity

CEOS-ARD Stability

- ❖ WGClimate defining a requirement for CEOS Analysis Ready Data (CEOS-ARD) specifications to quantify stability
- ❖ Aim to increase support of CEOS-ARD for scientific applications and environmental adaptation and resilience issues
- ❖ Draft goal level (optional) requirement:



Provide indicative metrics on stability, via stability uncertainty expressed as a stability standard uncertainty (with a 66% confidence level) or stability expanded uncertainty (with a 95% confidence level), alongside the time scale and space scale the stability uncertainty is evaluated against. Include considerations of:

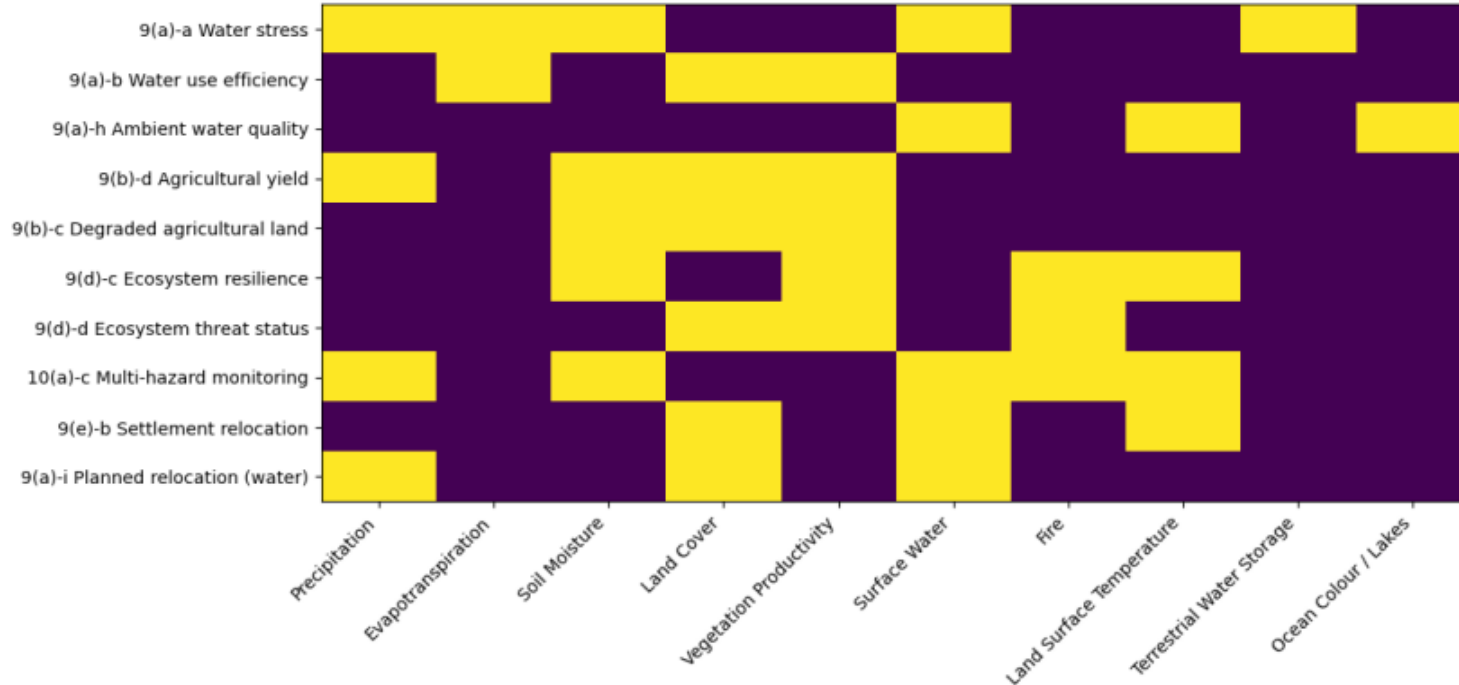
- (a) temporal drift of individual sensors,
- (b) inter-sensor biases as instruments are replaced, and
- (c) changes in the spatial and/or temporal sampling regime, and the impacts on aliasing with, e.g., diurnal and seasonal cycles and spatial patterns.

- ❖ Will start implementing this requirement with test CDRs
- ❖ Encourage providers to also provide these metrics with their products for the CDR Inventory

Adaptation Indicators

WORK IN PROGRESS

Matrix / Heatmap: Direct EO GGA Indicators x GCOS Essential Climate Variables



❖ UNFCCC coordination is now a core task of WGClimate:

- Maintaining dedicated primary Points of Contact between WGClimate and UNFCCC Secretariat for overall coordination purpose. The current contacts are Heather Maseko and Vincent-Henri Peuch.
- Working with the UNFCCC Secretariat and the thematic workstream leads to ensure appropriate support from the satellite EO community across all aspects of UNFCCC work.
- Contributing to Earth Information Day and side events at COP and SB to showcase the use of space-based data, working with WMO, GEO, other organisations and relevant programmes.
- Coordinating the presence of CEOS/CGMS Agencies at UNFCCC COP and other relevant events.

❖ SBSTA SB64 in Bonn in the next two weeks

❖ We start collecting inputs for COP-31 SBSTA statement and EID Themes

❖ 2nd WGClimate-UNFCCC Secretariat workshop planned for September 2026, with a possible focus on adaptation aspects as well as climate finance

Thematic Area 8 “Fostering Stakeholder Engagement”

- ❖ Reaching inventory agencies “*BYO Inventory Compiler*”
 - Harwell meeting 2025 was a success and aim is to repeat in other regions with plan to hook up with Asian inventory agencies
- ❖ UNEP IMEO
 - CEOS SIT Chair and GHG TT engaged with ASI and DLR to facilitate access for IMEO to PRISMA and EnMAP
 - Enable access to hyperspectral data for methane monitoring, esp GEO data
- ❖ WMO IG3IS & G3W
 - Notably, many activities identified in the GHG Roadmap should eventually land or be taken over by IG3IS & G3W (if not already done so)

WGClimate vice-chair 2026-2028



- ❖ Call for candidates process initiated at the beginning of the year.
- ❖ Interest expressed by 2 agencies (ESA, ISRO). Further discussion with ISRO led them to support ESA candidacy this time.
- ❖ Discussion of ESA proposed candidate at WGClimate “Exec” online meeting on 29 May. Unanimous recommendation to support the application of Dr. Susanne Mecklenburg, a key members of the WG.

Susanne Mecklenburg

Nomination for CEOS/CGMS WGClimate Vice Chair

Affiliation

Head of Division on Climate and Long-Term Action

European Space Agency, [Susanne Mecklenburg | LinkedIn](#)

Expertise

More than 20 years of experience in the space sector, observing the Earth from space, linking climate observations, science and modelling communities and feeling strongly about contributing to global climate policy. Significant experience in managing satellite operations and large space projects providing actionable climate information

Background

- Since 2007 working in ESA, leading on climate activities and managing operations for ESA's satellite missions SMOS, Sentinel-3 and FLEX.
- Since 2019 member of the CEOS/CGMS WGClimate
- Observer and official point of contact to UNFCCC and IPCC
- 2002 - 2007 working for the UK's Natural Environment Research Council being responsible for the UK's EO Programme as part of the British National Space Centre (predecessor of UK Space Agency)
- PhD in Atmospheric Physics from the Swiss Institute of Technology (ETH), Zurich
- MsC in Hydrology from University of Dresden, Germany

