WMO Activities in support on Climate Data

Contribution from SERCOM Expert Teams
Standing Committee on Climate Services

Teams:

ET-DDS - Expert Team on Data Development and Stewardship

ET-MCCVC - Expert Team on Monitoring and Communications of Climate Variability and change

Speakers:

Robert Dunn – UK Met Office (**ET-DDS**)
Blair Trewin – Bureau of Meteorology, Australia (**ET-MCCVC**)

…Supporting Members in delivering high-quality, consistent and usable climate data

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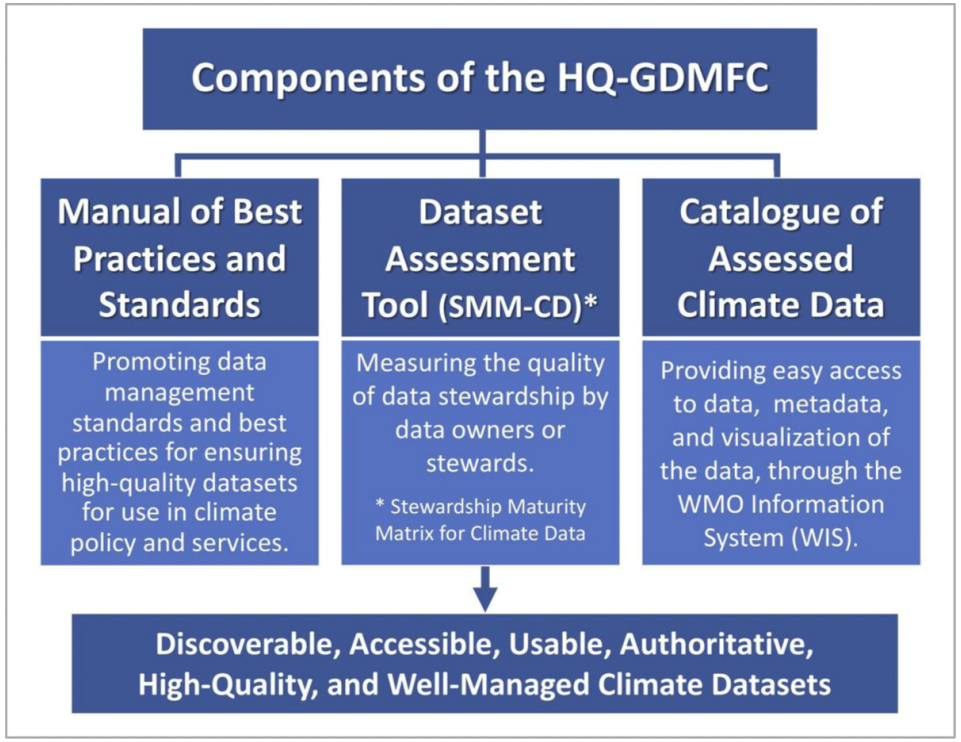
Data Rescue, Generation, and Homogenization: Core Priorities for WMO Climate Data

Recognised as key components in the WMO Climate Data Framework
Strengthened in:
WMO-No. 1238 - Manual on the High-quality Global Data Management Framework for Climate
WMO-No. 1131 - Climate Data Management System Specifications



Data Rescue
- Preservation and digitization of historical climate records
- Essential for extending and enhancing long-term climate series
- Increasingly embedded in national strategies and WMO guidance

Climate Dataset Generation
- Climate Observations, Data Exchange
- QC, Basic statistics
- Data Stewardship

Homogenization
- Ensures consistency and comparability of climate time series
- Critical for climate monitoring, trends and indices
- Requires sustained methodological coordination across Members

Together, Data Rescue and Homogenization form the foundation of reliable, long-term climate datasets.

Engaging Members : Consultations on key domains 1/2

Consultation on Homogenization (2025)

- Global consultation held in November 2025
- Two sessions, multiple languages
- Participation from:
  - Homogenization experts
  - Regional Climate Centres use cases (South America)
  - NMHSs use cases (Madagascar, Hungary)
- Survey on homogenization practices

➡ **Results in the following presentation (Jose Guijarro)**

Engaging Members: Dataset Maturity Assessment 2/2

Upcoming consultation on the WMO Stewardship Maturity Matrix for Climate Data [SMM-CD] (WMO-No. 1328)

- Enables NMHSs and RCCs to:
  - Self-assess climate datasets
  - Improve transparency and usability
  - Provide consistent information to users

Dunn et al, 2021

	→ SMM-CD Category →			
↓ Aspect ↓	**Data Access**	**Usability & Usage**	**Quality Management**	**Data Management**
	Discoverability	Data Portability	Quality Assurance & Control Procedure	Preservation
	Accessibility	Documentation	Quality Assessment	Metadata
		Usage & Impact	Data Integrity	Governance

Towards harmonization

- Four key dimensions:
  - Data Access
  - Usability and usage
  - Quality Management
  - Data Management

⇒ Need to harmonize existing maturity approaches across regions and organizations

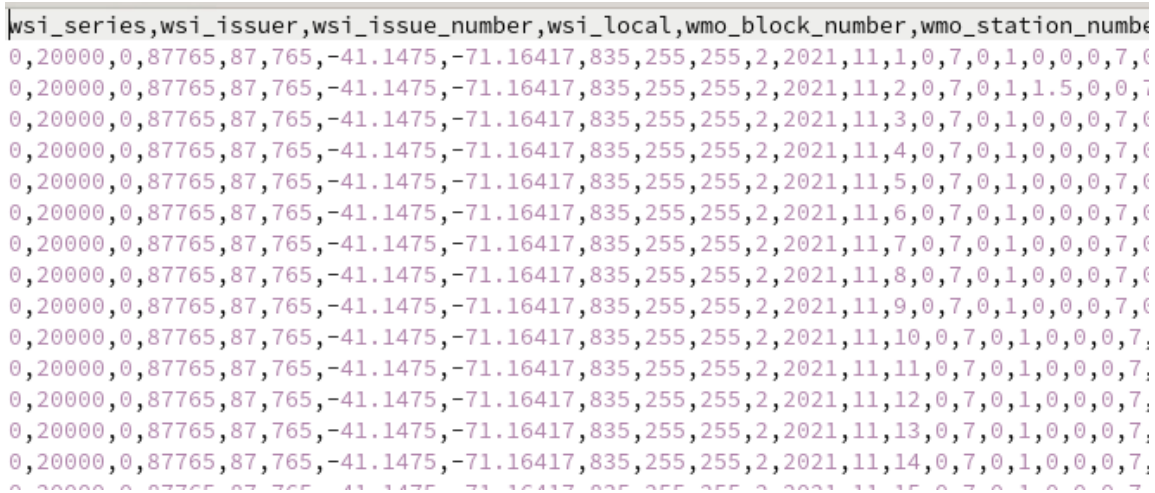
DAYCLI: Standardizing the Exchange of Daily Climate Data 1/2

What is DAYCLI?

- WMO Standard for the **monthly** exchange of **daily climate data**
- Covers key variables:
  - Temperature (min, max, mean)
  - Precipitation
  - Snow depth (fresh and total)
- Supports climate **monitoring, assessment, and services**

Key Principles

- Exchange of **validated, nationally consistent datasets**
- Derived from CDMS workflows (not raw observations)
- Based on **national climatological practices**
- Includes **metadata and quality information**



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DAYCLI: Standardising the Exchange of Daily Climate Data 2/2

DAYCLI complements existing WMO Data Exchange:

- Real-time observations
- Monthly CLIMAT messages

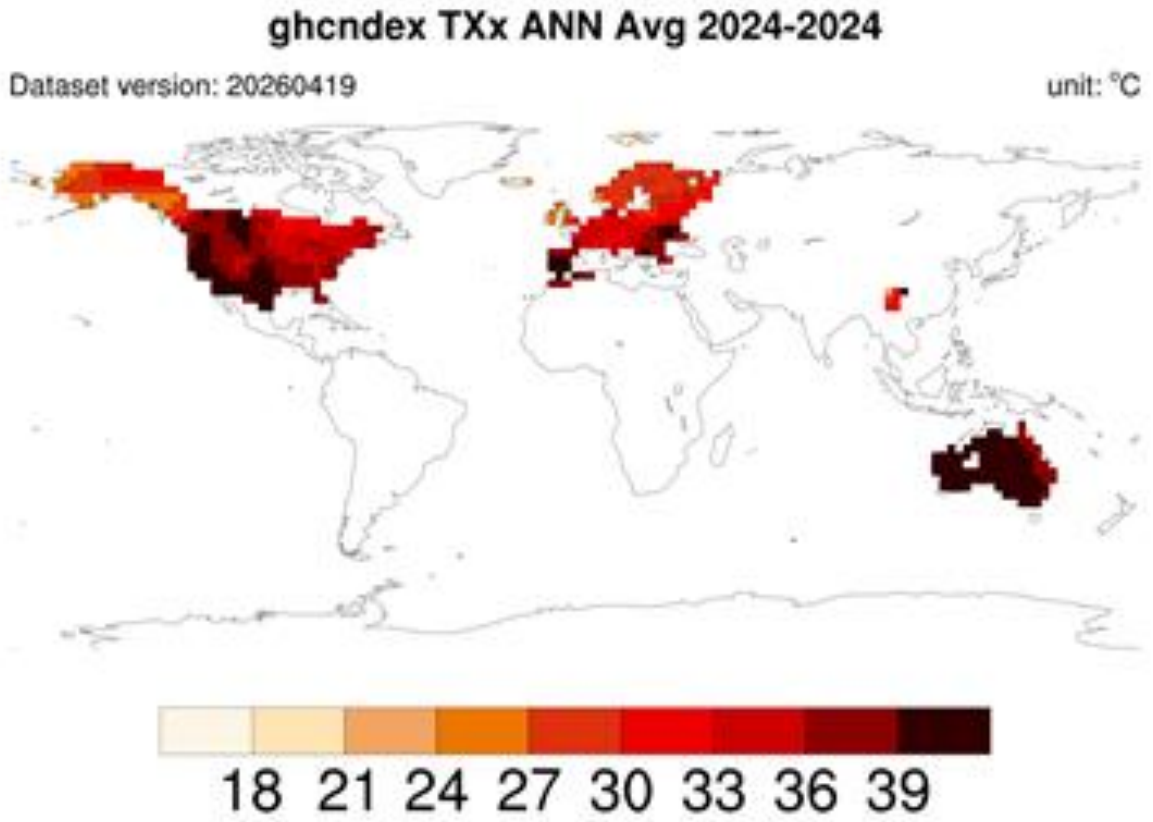
→ **Provides a standardized framework for daily climate data exchange**

2026 update: Key improvements:

- Reinforces exchange of quality-controlled data
- Preserves long-term time series consistency
- Aligns with NMHS operational practices
- Reduces ambiguity in time references
- Improves global comparability and reliability

→ **DAYCLI bridges the gap between real-time observations and climate data stewardship**

Lack of accessible daily data limits our capacity to monitor climate extremes



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UNSW SYDNEY

Climate indices: Towards a New Generation of Climate Metrics 1/2

Led by ET-MCCVC

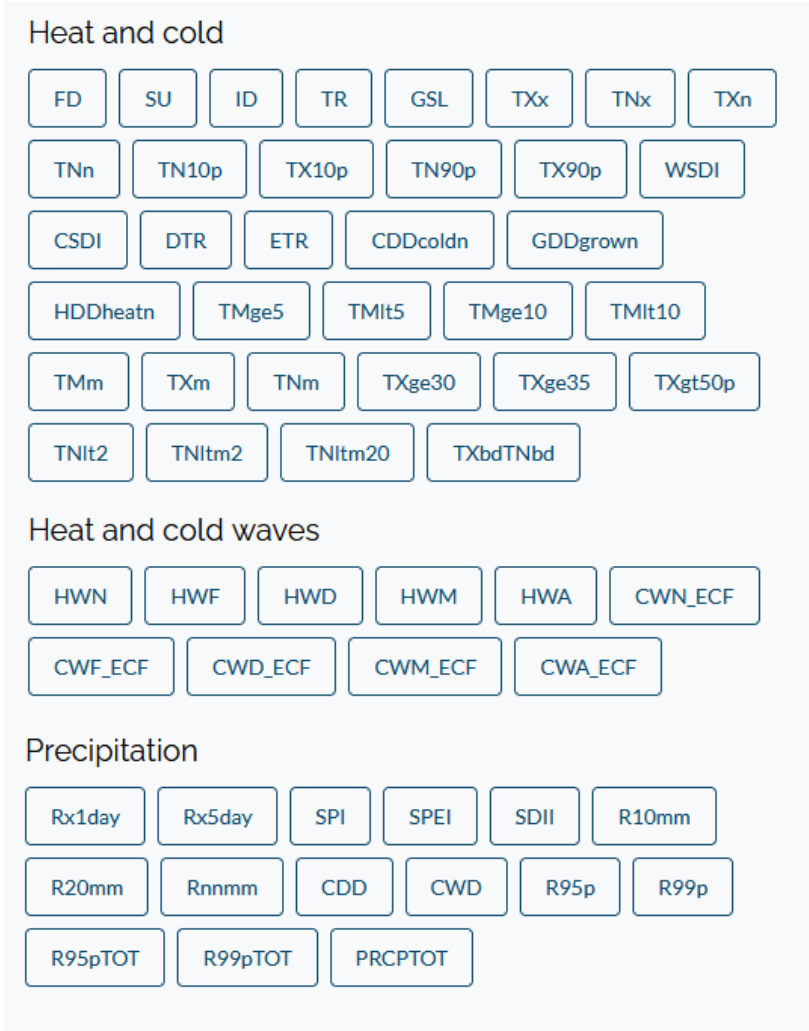
Why a review is needed

- Evolving user needs and decision-making contexts
- Increasing focus on extremes and impacts
- Emergence of new variables (e.g. heat stress, humid heat)
- Expansion to new domains (e.g. marine, hydrology)

Key Areas of Work

- Review and update existing indices (ETCCDI, ET-SCI)
- Explore new variables and timescales (including sub-daily)
- Assess availability and sustainability of datasets
- Strengthen links between indices and user needs
- Evaluate tools, software, and governance frameworks

https://www.climdex.org/learn/indices /



Climate indices: Towards a New Generation of Climate Metrics 2/2

Strategic Direction

- Move towards a **more flexible and user-oriented framework**
- Consider **tiered indices** (different levels of priority)
- Improve coordination on **data exchange and licensing**
- Ensure long-term institutional support

Monitoring Outputs

- Refreshed and revised indices will support **monitoring activities**

→ **This work will define the next generation of climate indices, supporting both scientific analysis and operational climate services.**

Strengthening Climate Data for Services and Decision-Making

High-quality climate data are the foundation of climate understanding, monitoring and services

No data → No understanding
No data → No services

WMO addresses climate data challenges through coordinated global action, with SERCOM Expert Teams playing a central role:

- **ET-DDS** – Standardisation of climate information, climatological practices, Data Rescue and Scientific methods (e.g. homogenisation, datasets assessment)
- **ET-MCCVC** - Monitoring, climate indices, communication of variability and change

Together, these activities ensure that climate data are:

- Accessible
- Reliable
- Consistent
- Fit for purpose

Reliable climate services start with reliable climate data

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