

WMO and climate change: Opportunities and Challenges



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World Meteorological Organization
Organisation météorologique mondiale

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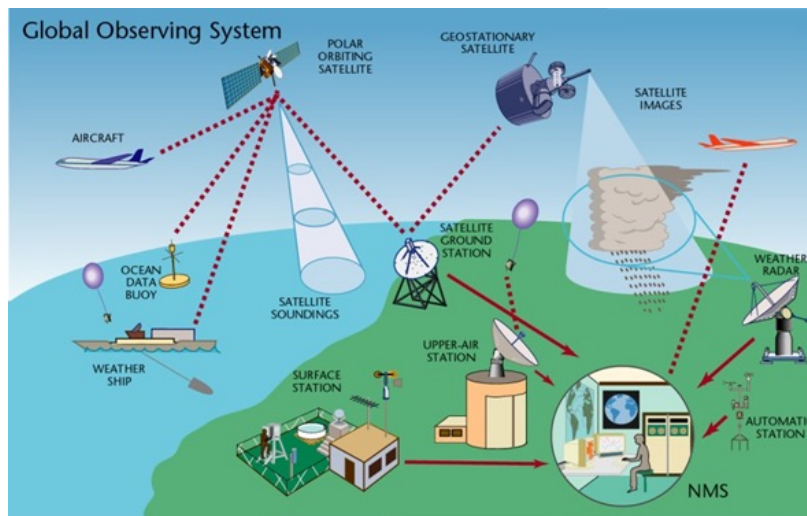
In the beginning there was a storm ...



On **14 November 1854** the "Balaklava Storm" sank thirty allied transport ships engaged in the Crimean War.

It was discovered that the **storm had been tracked across Europe** prior to its arrival off Crimea, but no warning was sent.

As a result, several countries launched **meteorological services** and a **storm warning system** was implemented that developed into an international meteorological service.



In **1873** an International Meteorological Congress agreed to establish the **International Meteorological Organization** (turned into the **World Meteorological Organization** in **1951**) to coordinate the generation and international exchange of meteorological information.



Secretariat main office in Geneva



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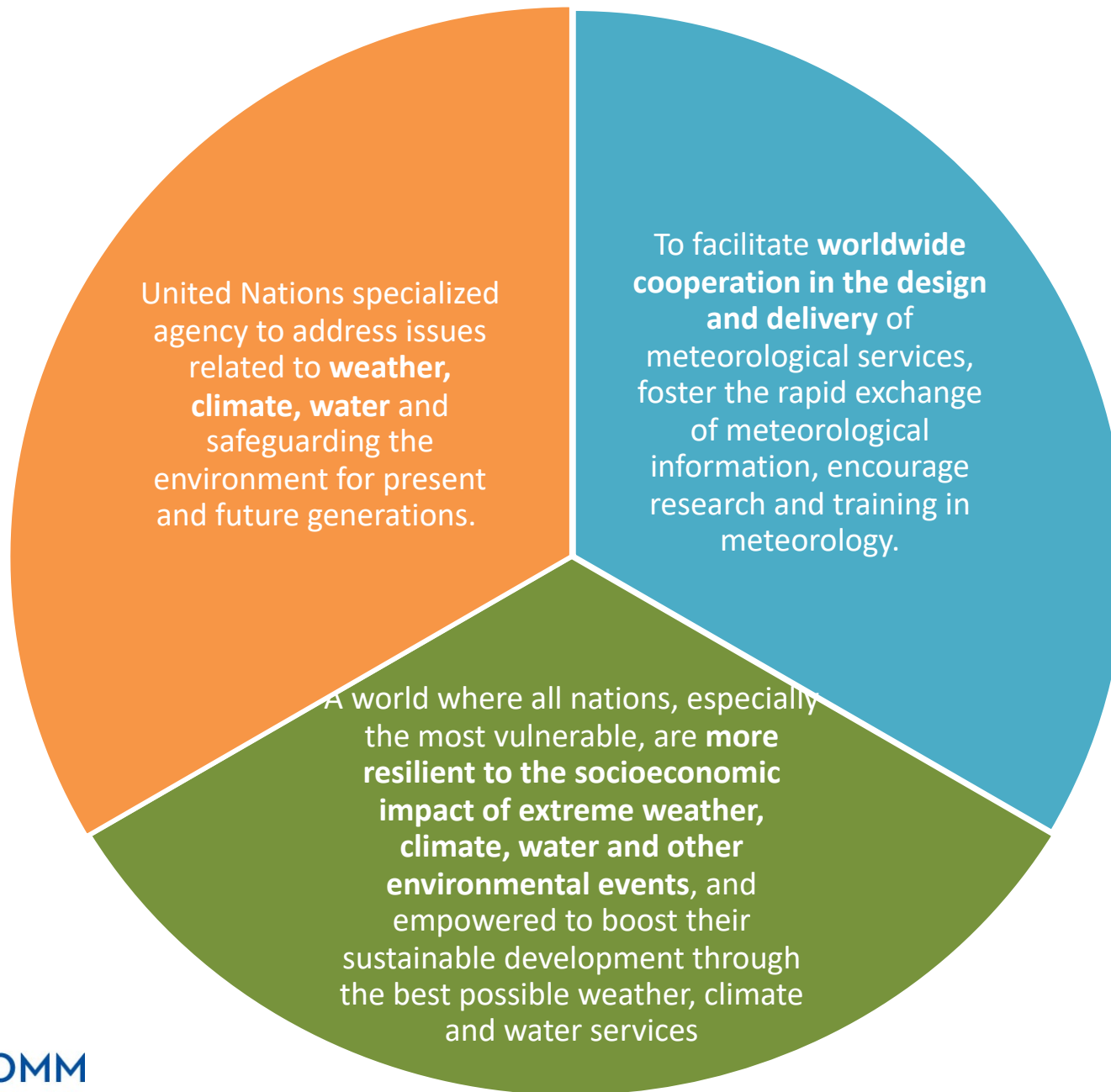
Prof. Celeste Saulo,
Secretary-General of WMO

WMO formally established in **1951**,

Designated as a **specialised agency of the United Nations**,

193 Member states and territories as of 2024.

WMO in a nutshell: **Mandate** – **Mission-** **Vision**



State of the Climate (global, regional, national) – How do we know



Global observing system: More than 10'000 observing stations plus RADAR, satellites etc., operating day in day out

Continuous **routine data exchange** (observational data and metadata) among National Meteorological and Hydrological Services as well as with regional and global data centres

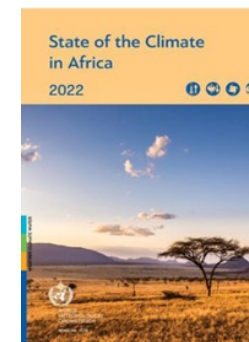
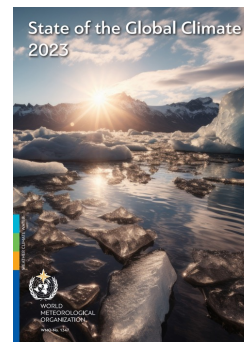
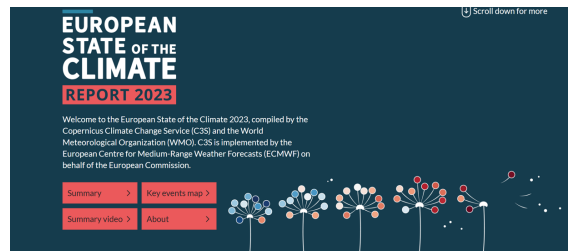
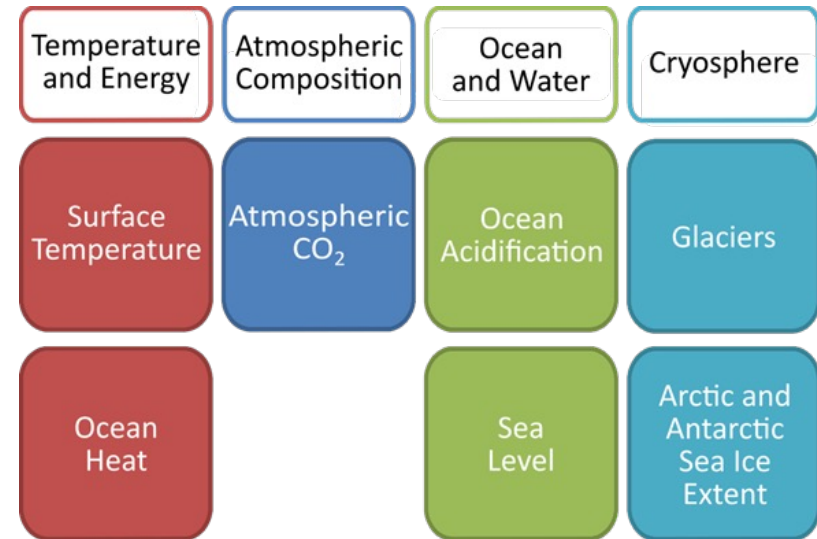
Data consolidation and **dataset development** at national, regional and global levels

State of the Climate (global, regional, national) – How do we know

*Cont.: Data consolidation and **dataset development** at national, regional and global levels*

Calculation of seven **global climate indicators**

Expert assessment and report publication



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Selected latest key messages

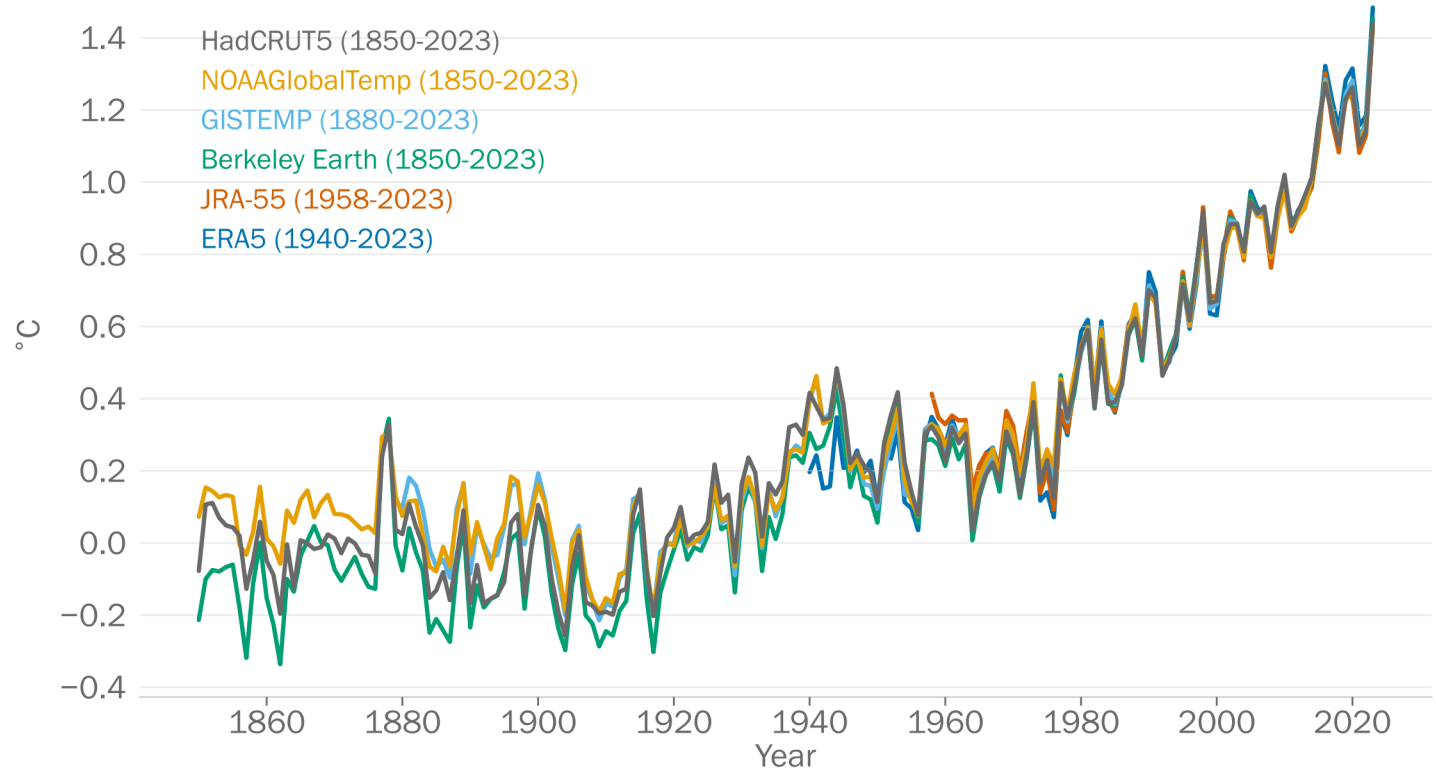
- 2023 was the **warmest year on record**
- Key greenhouse gases reached **record highs** in 2022
- Sea level was the **highest on record** in 2023
- Ocean heat was the **highest on record** in 2023
- Antarctic sea ice reached a **record low** in February 2023
- Extreme weather continued to lead to **severe socio-economic impacts** (2023)
- 2011-2020 was the **warmest decade on record**
- Sea level rose at an annual rate of 4.5mm/yr during 2011-2020
- Extreme events across 2011-2020 had **devastating impacts**, hindering national development and progress toward the SDGs
- **The ozone hole was smaller in the 2011-2020 period than during the two previous decades**



2023 global temperature highest on record

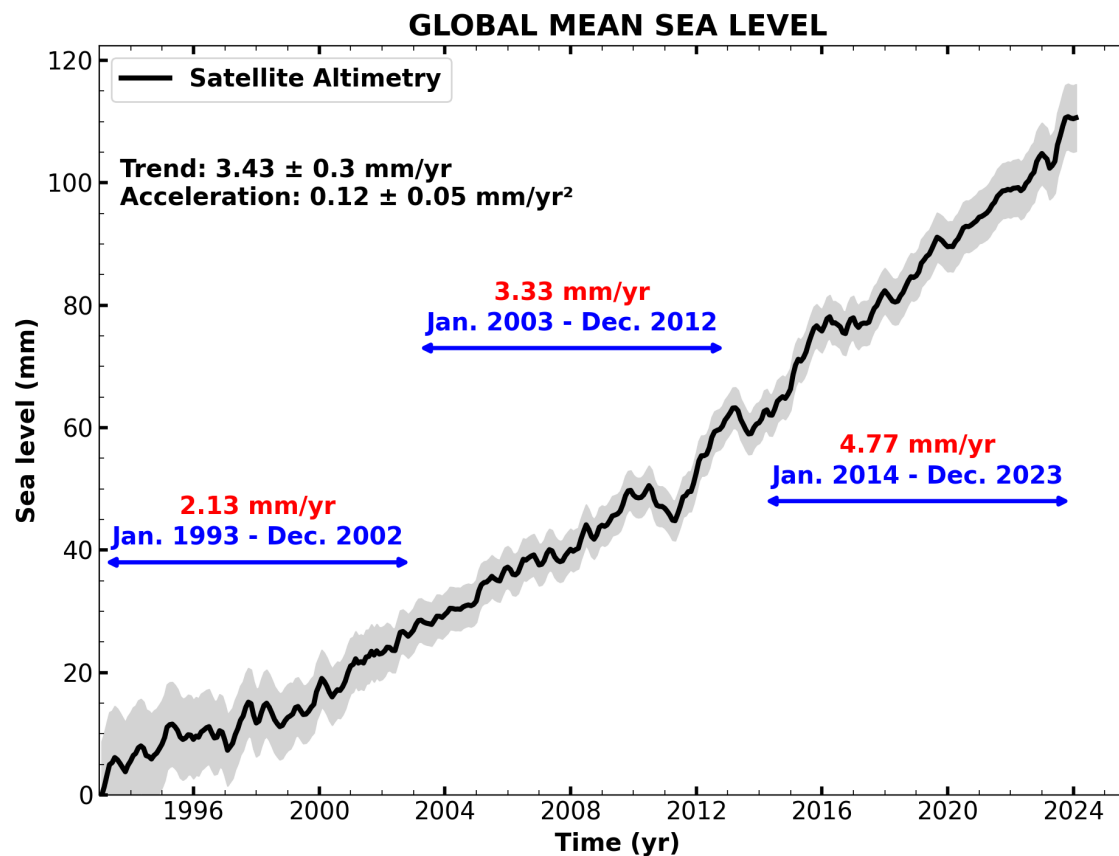
1.45±0.12°C
above
1850-1900
average

Global Mean Temperature Difference (°C)
Compared to 1850-1900 average



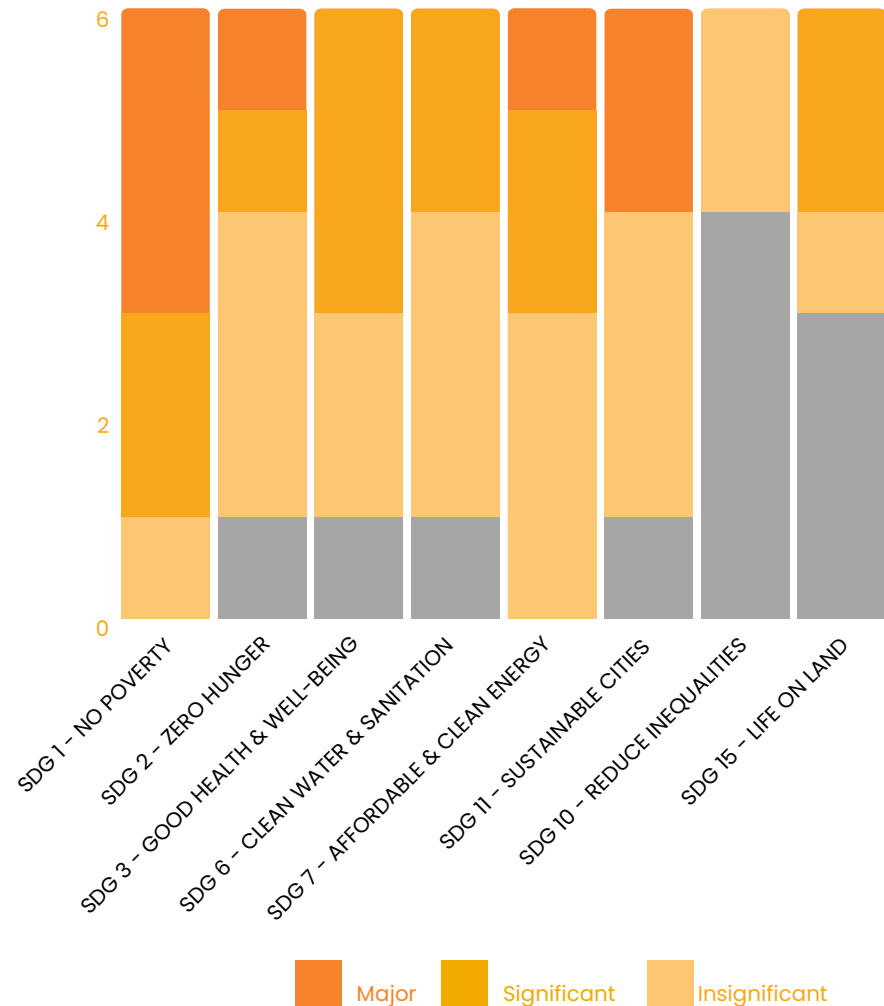
Record high global mean sea level in 2023

- Global mean sea level continues to rise
- Rate of sea level rise has doubled since the first decade of satellite measurements



Impact on SDGs

- In the first ever project of its kind, WMO partnered with National Statistics Offices (NSOs) to collect data on how selected extreme events hindered national progress toward the SDGs.
- All SDGs were found to be negatively impacted. **Major impacts were reported to SDGs 1, 2, 7 and 11.**



Assessment of representative samples of extremes and countries. Extreme events selected included the European heatwaves of 2018-2019, the South American drought from 2015-2017, the East Africa drought (), and [Hurricane Irma in the Caribbean in 2017](#). Results clearly indicated that the SDGs are affected by extremes. Surveyed

All climate indicators on **alarming levels** – What do we do about it (three examples)

- WMO **partners** with the UN system, national governments and regional organisations to understand and document climate impacts on societies (economic and social impacts, fatalities etc)
- WMO develops its service portfolio further **to help** governments understanding, adapting to and mitigating climate change
- WMO **co-leads** an UN-wide initiative to make sure that everyone on Earth is protected from hazardous weather, water, or climate events through life-saving early warning systems by the end of 2027 (EW4All: Early Warnings for All).

Early Warnings for All

The Early Warnings for All initiative is a groundbreaking effort to ensure everyone on Earth is protected from hazardous weather, water, or climate events through life-saving early warning systems by the end of 2027.



Disaster risk knowledge

Systematically collect data and undertake risk assessments

- Are the hazards and the vulnerabilities well known by the communities?
- What are the patterns and trends in these factors?
- Are risk maps and data widely available?



Detection, observations, monitoring, analysis and forecasting of hazards

Develop hazard monitoring and early warning services

- Are the right parameters being monitored?
- Is there a sound scientific basis for making forecasts?
- Can accurate and timely warnings be generated?



Preparedness and response capabilities

Build national and community response capabilities

- Are response plans up to date and tested?
- Are local capacities and knowledge made use of?
- Are people prepared and ready to react to warnings?



Warning dissemination and communication

Communicate risk information and early warnings

- Do warnings reach all of those at risk?
- Are the risks and warnings understood?
- Is the warning information clear and usable?



A photograph of a modern glass skyscraper with a curved facade, reflecting the sky and surrounding greenery. A United Nations flag flies from a tall pole on the roof. The building is set against a clear blue sky with some light clouds. In the foreground, there are green trees and a metal structure, possibly a fence or part of a sports field.

Thank you

Merci

Спасибо

Gracias

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