ADF

Quarterly Climate Review #3

Climate: Recent developments and outlook

LES ATELIERS DU FUTUR

June 2025

Climate:

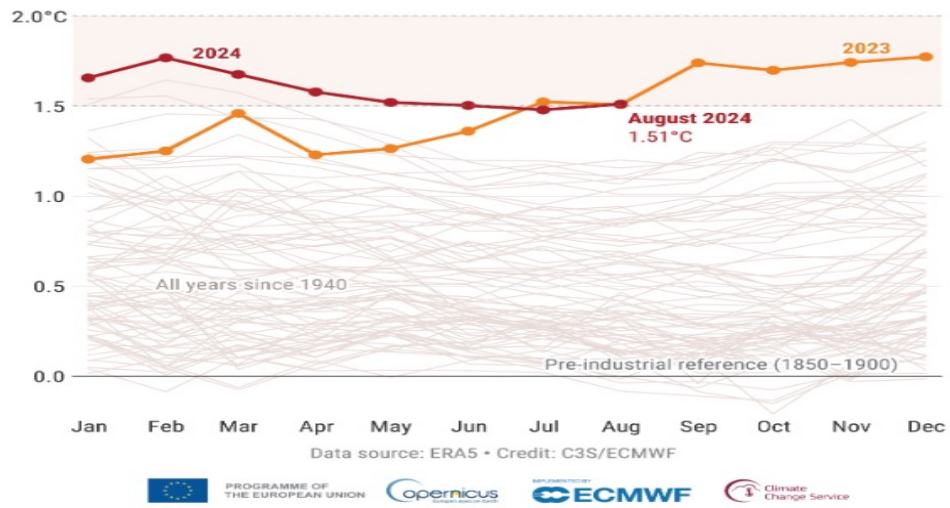
Recent Developments

2023 HAD ALREADY MARKED NEW RECORDS ON GLOBAL TEMPERATURES

Global warming in 2023 is 1.43 [1.32 to 1.53]°C above the preindustrial levels, partly due climate variability (strong El Nino). (Source : Copernicus)

Every month in 2023 was at least **1.2 °C** (2.2 °F) **warmer** than the corresponding 1850 to 1900 monthly average. S1 2024 follows the same pattern

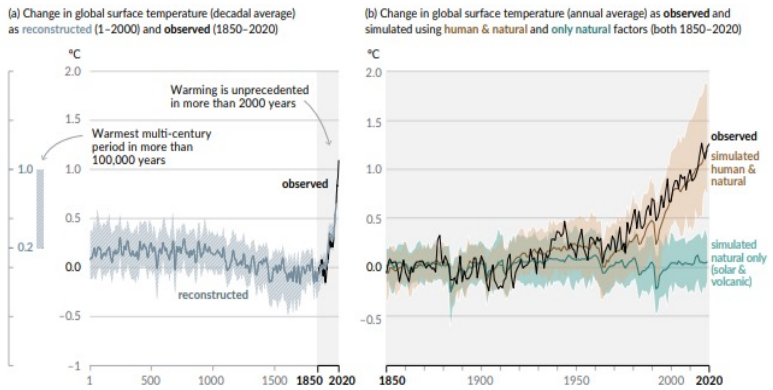
Global surface air temperature anomalies [1850s-2024]



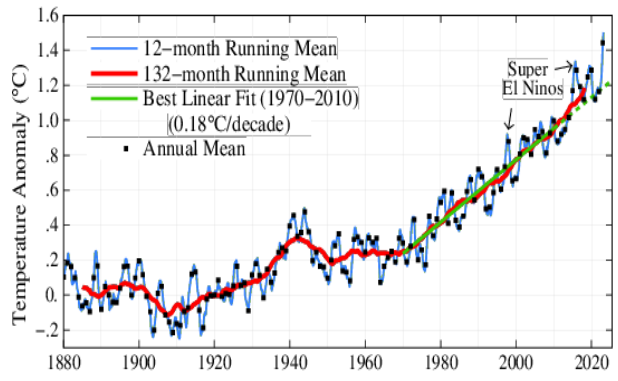
According to IPCC AR6 , human influence has warmed the climate at an unprecedented rate in at least the last 2000 years

Since the 1960s, **each decade has been warmer than the previous one**. 2011-2020 was the warmest decade on record

Changes in global surface temperature relative to 1850-1900



Mean temperature [1880-2023]



Source : Columbia University

2024 - A SECOND RECORD-BREAKING YEAR, FOLLOWING THE EXCEPTIONAL 2023

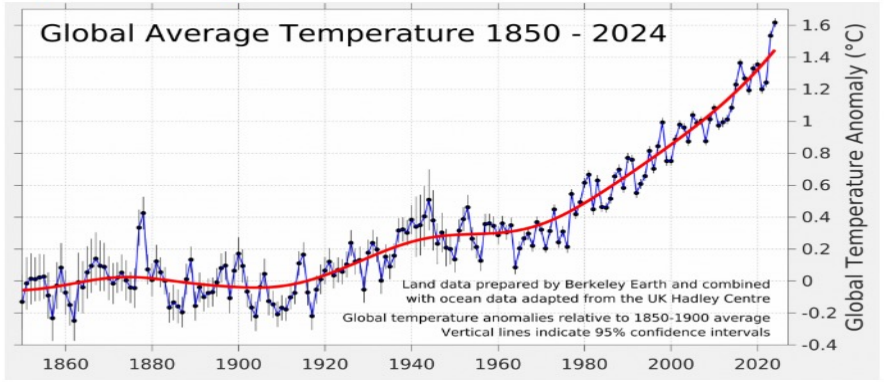
Combined average temperature anomaly for 2023 and 2024 is ~ +1.50°C above pre-industrial levels

2024 observed record in global surface temperature **(1.52°C best estimate**) is well above the best estimate of human-caused warming (1.36°C). However, the 2024 observed warming can still be regarded as a typical year, considering the human induced warming level and the state of internal variability associated with the phase of El Niño and Atlantic variability
El Niño phenomenon seemed to cease in July (El Niño adds 0.1–0.2 °C to global temperatures), paving the way for La Niña to develop between August and September, with its first effects expected to be visible in 2025.

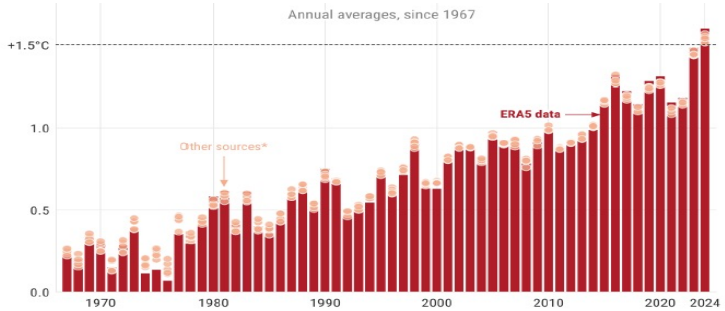
A **global average temperature of 15.10°C**; 0.12°C higher than the previous highest annual value in 2023

2024 was 0.72°C warmer than the 1991–2020 average, and 1.52°C warmer than the pre-industrial level, making it the first calendar year to exceed 1.5°C above that level. Each month from January to June 2024 was warmer than the corresponding month in any previous year. August 2024 equaled the record warmth of August 2023 and from July to December each month was the second warmest after 2023

In 2024, as in 2023, the **tropics and the northern mid-latitudes** contributed the most to the record global temperature anomalies
Earth is warming at a current rate of more **than 0.2°C per decade.** The last ten years have been the warmest ten years on record



Global surface temperature: increase above pre-industrial [°C ; 1850-2024]



Key temperature statistics [2024]

Region	Anomaly (vs 1991–2020)	Actual temperature	Rank (out of 85 years)
Globe	**+0.72°C** (+1.60°C vs pre-industrial)	15.10°C	**1st highest** 2nd - 2023
Europe	**+1.47°C**	10.69°C	**1st highest** 2nd - 2020
Arctic	**+1.34°C**	-11.37°C	**4th highest** 1st - 2016
Extra-polar ocean	**+0.51°C**	20.87°C	**1st highest** 2nd - 2023

Source: Berkeley, ERA5, Copernicus, Climate Change Service

2023 AND 2024 : SEA TEMPERATURES AND LEVEL ARE DANGEROUSLY RISING

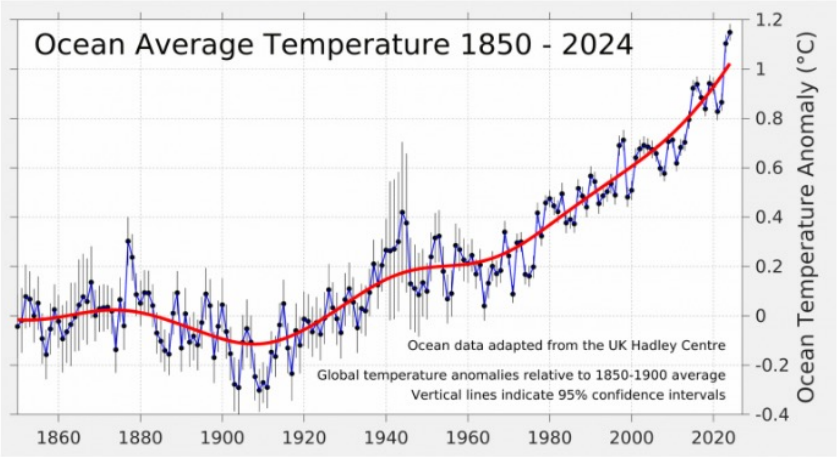
Rising warming anomaly observed in 2023 and 2024:

The annual average sea surface temperature over the extra-polar ocean reached a record high of **20.87°C in 2024**, after the precedent record of 20.81°C. in 2023

According to Berkeley, on the ocean's surface, 2024 was also the warmest observed year reaching an anomaly of **+1.15 °C**, after the previous record of +1.10°C set on 2023 (Baseline : 1850-1900) – Anomaly of +0.6°C on average for 2023 and 2024 but on 1991-2020 baseline according to Copernicus

Global mean sea surface temperature is warming at a rate of 0.13 ± 0.01 °C per decade over the period 1982–2023

The **Arctic continues to warm faster** than the globe overall : In September 2024, the extent of sea ice, which has a profound influence on the Arctic environment, was the sixth-lowest in the 45-year satellite record



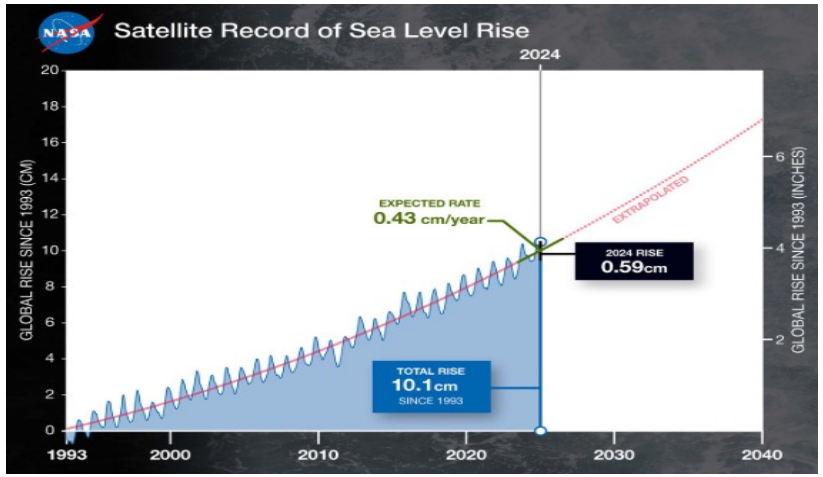
Source: Berkeley

NASA Analysis Shows Unexpected Amount of Sea Level Rise in 2024:

Global sea level rose faster than expected in 2024, mostly because of ocean water expanding as it warms. According to a NASA-led analysis, last year's rate of rise was **0.59 centimeters compared to the expected rate of 0.43 centimeters.** The 2023–2024 El Niño event caused a temporary global sea level rise of several centimetres, primarily due to ocean thermal expansion and shifts in wind-driven circulation

Since the satellite record of ocean height began in 1993, **the rate of annual sea level rise has more than doubled**. In total, global sea level has gone up by 10 centimeters since 1993.

In recent years, about two-thirds of sea level rise was from the addition of water from land into the ocean by melting ice sheets and glaciers. About a third came from thermal expansion of seawater. But in 2024, those contributions flipped, **with two-thirds of sea level rise coming from thermal expansion**.

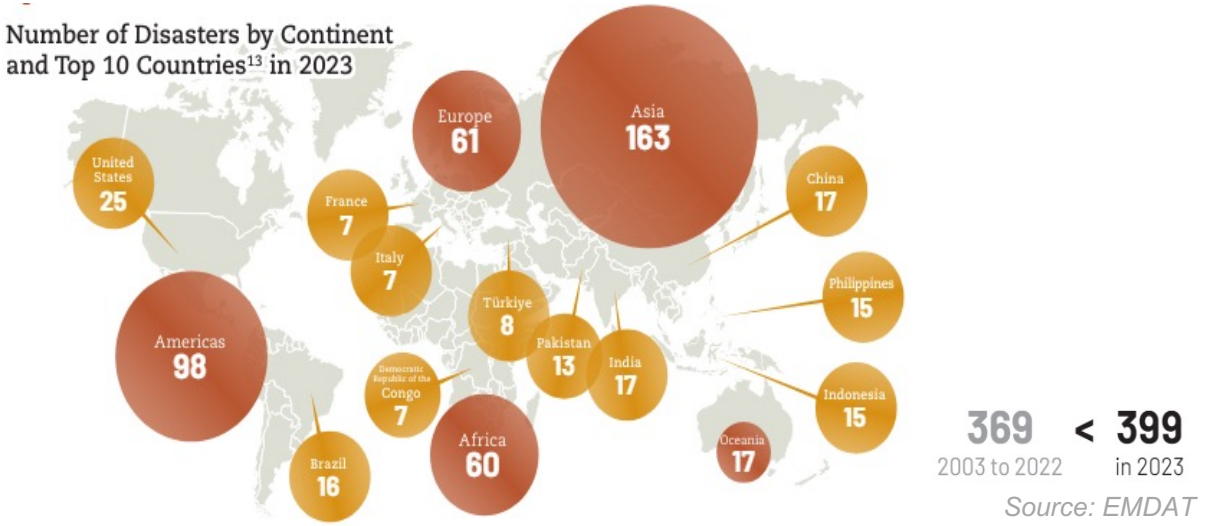


Source: NASA

2023, A RECORD YEAR FOR NATURAL CATASTROPHES EXCEEDING $108 BILLION OF INSURED LOSSES

In 2023, **a large number of extreme events were recorded across the globe**, including heatwaves, floods, droughts and wildfires :

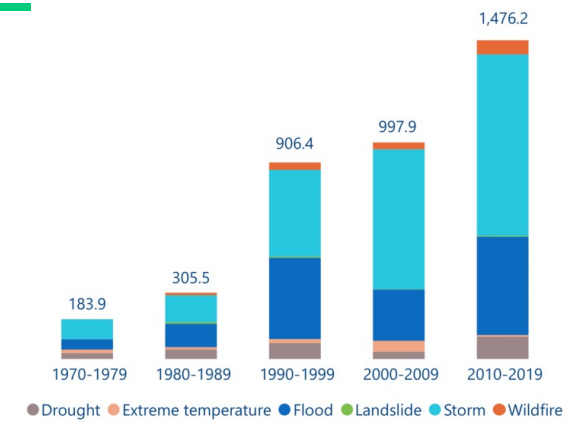
- Strong tropical cyclones (e.g. Cyclone Freddy, the longest-lasting tropical cyclone on record, causing over 1,400 deaths, primarily in Malawi and Mozambique.
- Heavy floods and storms in Libya and Italia
- Heat waves in North America
- Severe droughts affected the US, South America and Europe



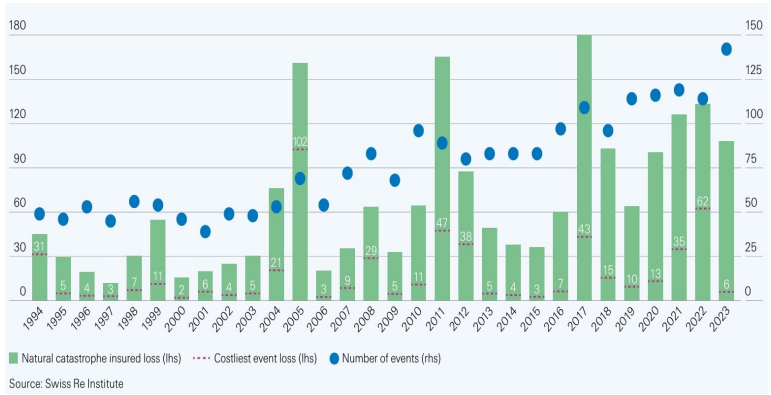
According to Swiss Re, the cost of natural catastrophes covered by insurance reached an estimated **USD 108 billion in 2023**

Annual insured losses of more than USD 100 billion have become the norm and is expected a trend of a **5–7% increase in insured losses**

Reported economic losses
[US$ bn decade ; Inflation adjusted]



Total annual insured losses 1994-2023
[US$ bn-2023 prices ; total number of event/year]



IN 2024, INSURED LOSSES CAUSED BY NATURAL DISASTERS RISED SIGNIFICANTLY TO US$ 140BN

Worldwide, natural disasters caused losses of **US$ 320bn in 2024** (2023, adjusted for inflation: US$ 268bn)

A loss-heavy year for the insurance market: **US$ 140bn in insured losses according to Munich Re and US$ 135bn according to Swiss Re** – since 1980, only two years have been more expensive

Insured losses rose by **16%** compared to the previous year

Many extreme events that took place in the beginning of 2024 were influenced by El Niño. However, most of studies found that climate change played a bigger role than El Niño in fueling these events (Source : World weather Attribution)

Weather catastrophes dominant : powerful hurricanes, severe thunderstorms and floods driving the losses

Regional events : North America with a higher proportion of losses than usual (Hurricane Helene resulted in the largest overall losses from natural disasters in 2024 at US 56bn) and extreme flooding in Europe

Natural disasters [2024]

	The figures of the year 2024	The figures of the year 2023 (adjusted for inflation)	Average of the last 5 years (2019 – 2023) (adjusted for inflation)	Average of the last 10 years (2014 – 2023) (adjusted for inflation)	Average of the last 30 years (1994 – 2023) (adjusted for inflation)
Overall losses in US$ bn	320	268	261	236	181
Insured losses in US$ bn	140	106	106	94	61
Fatalities (approx.)	11,000	77,600	23,000	17,500	42,000

Examples

Flash floods in the Valencia region:
A study found that climate change made an event with this rainfall intensity twice as likely to occur in today's climate, then it would have been in the cooler preindustrial climate without human-caused warming (World Weather Attribution)

Hurricanes Helene and Milton:
Studies have shown that both hurricanes were significantly more severe and brought much more extreme rainfall than in a hypothetical world without climate change (World Weather Attribution)

NATURAL CATASTROPHES CAUSED OVERALL LOSSES OF US$ 320BN WORLDWILDE

Nat cat lost events [2024]

Source: Munich Re, NatCatSERVICE, 2025

Climate: Outlook

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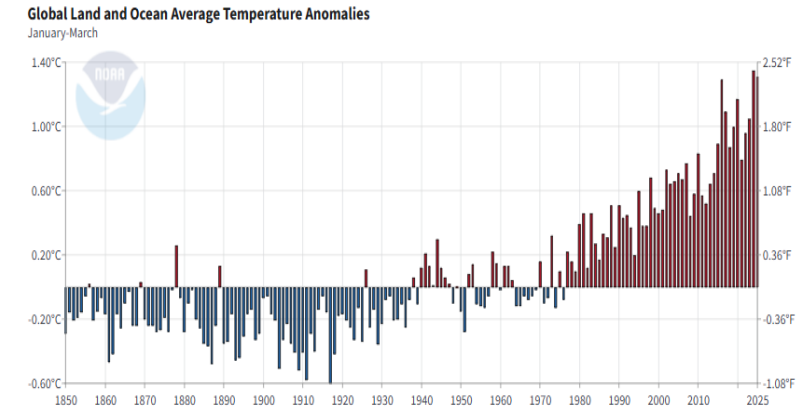
DURING THE FIRST QUARTER OF 2025, TEMPERATURES CONTINUED TO BREAK RECORDS AND A SERIES OF SEVERE NATURAL DISASTERS OCCURRED

Despite cooling La Nina, the **January–March** global surface temperature ranked second warmest in the 176-year record at **1.31°C above the 1901-2000 average** of 12.3°C according to NOAA (January : +1.33°C ; February : 1.26°C; March : 1.31°C)

The **annual average for the latest 12-month period** (April 2024 to March 2025) was: **0.71°C above the 1991-2020 average**, and **1.59°C above the estimated 1850-1900 average** used to define the pre-industrial level according to Copernicus

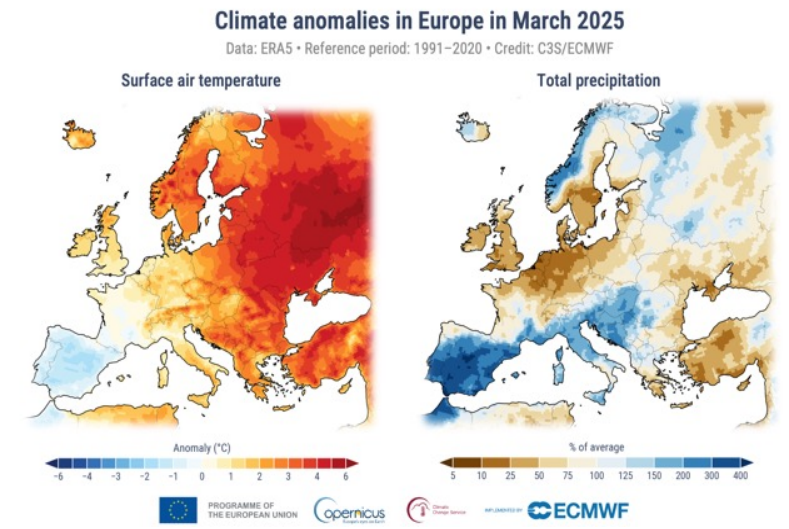


Source: NOAA

Record warmth were observed across many regions, including the Western Arctic, Australia, South and Central America, Asia, and Europe:

Europe, in particular, experienced exceptional warmth in March, with the average temperature reaching **2.41°C** above the 1991–2020 March average, making it the **warmest March ever recorded on the continent**

During the first quarter of 2025, **Europe** also experienced **significant precipitation anomalies**, marked by regional contrasts



Southern California (Los Angeles) experienced **unprecedented wildfires** in January due to drought conditions (estimated economic losses between $250 billion and $275 billion, making them among the most expensive natural disasters in U.S. history)

The tropical **cyclone Dikeledi** caused unprecedented rainfall and strong winds across **Mayotte** and **Northern Mozambique**, triggering floods and disruptions

Prolonged heavy rainfall led to **catastrophic flooding** across **Brazil** (January) and **Bolivia** (March)

ANTICIPATED OVERSHOOT OF THE +1.5°C LIMIT CALLS FOR HIGHER INVESTMENTS IN DECARBONIZATION…

The Met Office outlook for 2025 suggests that it is likely to be one of the three warmest years for global average temperature, falling just behind 2024 and 2023 : The average global temperature for 2025 is forecast to be between 1.29°C and 1.53°C (central estimate of 1.41°C) above the average for the pre-industrial period (1850-1900)

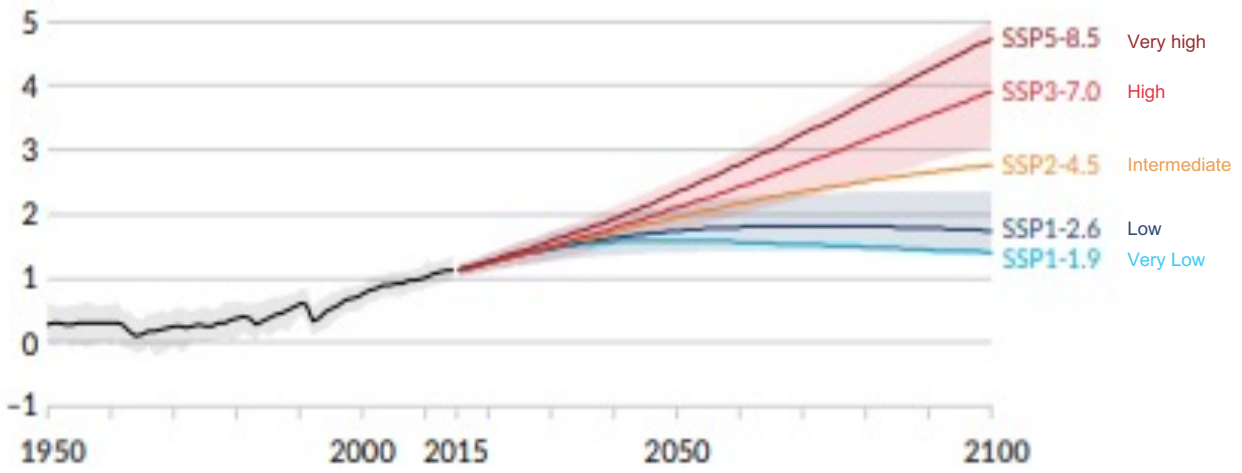
According to **WMO** (Decadal Climate Update 2024/28), there is an **80% likelihood** of at least **one year** exceeding **1.5°C between 2024-2028**

Global warming will continue to increase in the near term (2021–2040) mainly due to increased cumulative CO2 emissions in nearly all considered scenarios and modelled pathways.

In the near term, global warming is more likely than not to reach 1.5°C even under the very low GHG emission scenario (SSP1-1.9) and **likely or very likely to exceed 1.5°C** under higher emissions scenarios

Temperature anomalies will cause significant changes in extremes events. For high temperature anomaly, IPCC predicts the intensification of heavy precipitations and the worsening of droughts.

Global surface temperature change relative [°C ; 1850-1900]



Source: IPCC

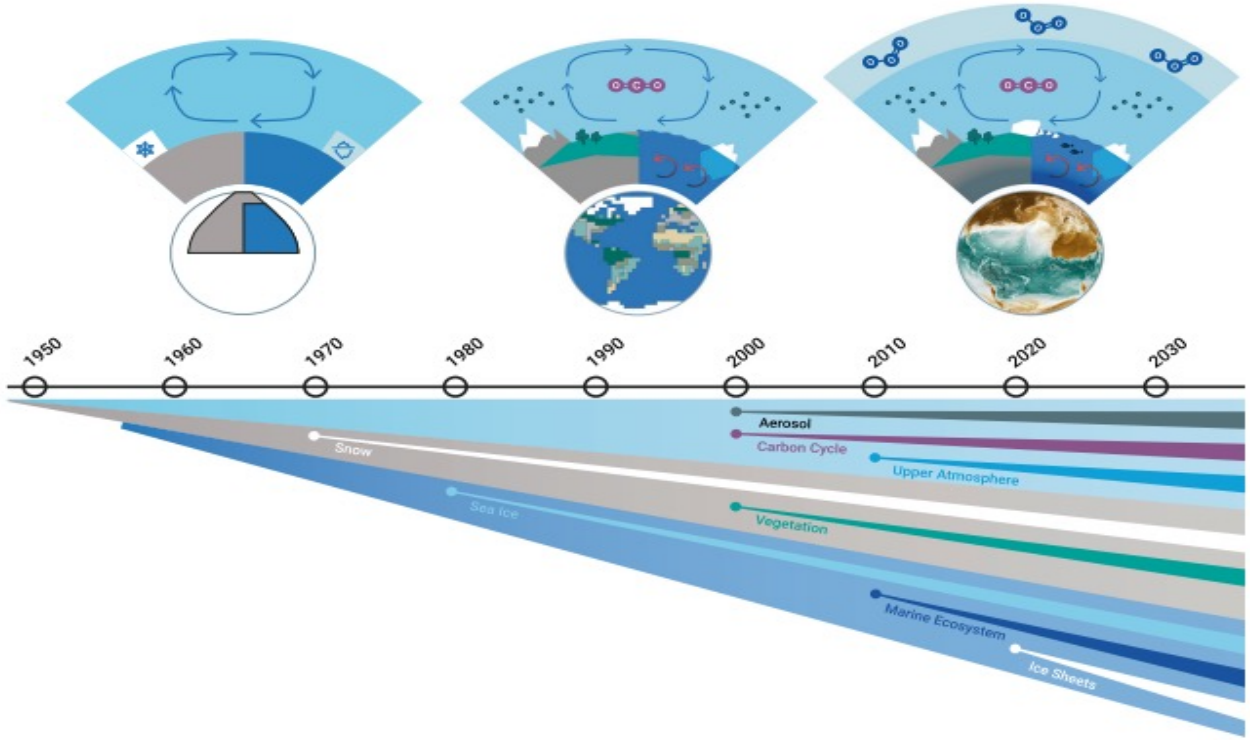
… AND IN CLIMATE MODELING

Climate models are very sensitive to **aerosol–cloud interactions**. Clouds reflect sunlight and trap heat, while aerosols scatter light and cool the Earth. However, their interactions remain uncertain. EarthCare and PACE satellites (launched in 2024) aim to clarify how clouds and aerosols reflect solar radiation. Better understanding of **ocean and ice** dynamics is also needed. The AMOC, a key Atlantic current system, is crucial for regulating climate, especially in the Northern Hemisphere.

Climate NGOs worldwide are deeply concerned by the **drastic budget** cuts applied by the **US administration**, regarding **scientific climate institutions**. A striking example is the National Oceanic and Atmospheric Administration (NOAA), which faces a **$1.3 billion cut** — representing 27% of its funding — including a 74% reduction for its Oceanic and Atmospheric Research division. These cuts jeopardize NOAA's global climate modeling, which relies on billions of data points and benefits countries worldwide.

This calls for continuous investment in earth system data capture, sharing and climate modelling

Timeline of climate model complexity [1950-2030E]



Source: Nature

Who we are

LES ATELIERS
DU FUTUR

ATELIERS DU FUTUR, AN NGO OF EXECUTIVES WHO ACT TO ENHANCE BUSINESS MOBILIZATION FOR THE CLIMATE

Our purpose

In response to the interconnected challenges of climate change and biodiversity loss, our **mission** is to **act for the Climate**

Who we are ?

A multidisciplinary group of business executives and senior managers
All volunteers, we are **experts in modeling** (trained in climatology), engineers focused on **energy** and **green technologies**, or **finance specialists**
Our experience facilitates their mastery of business climate strategies

Our strategy

A focus on the **Climate**
An international vocation, as key governance for the normative framework of businesses and citizens is at global and regional levels
An orientation towards corporations, as they alone meet the key conditions to successfully decarbonize our activities: Ability to do, know-how, and, to some extent, willingness to do

Our actions

Raising awareness - policy makers and governing bodies (public or private)
Challenging corporate strategies and public policies with a constructive, optimistic yet ambitious mindset.
Training future generations through Universities/Schools

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