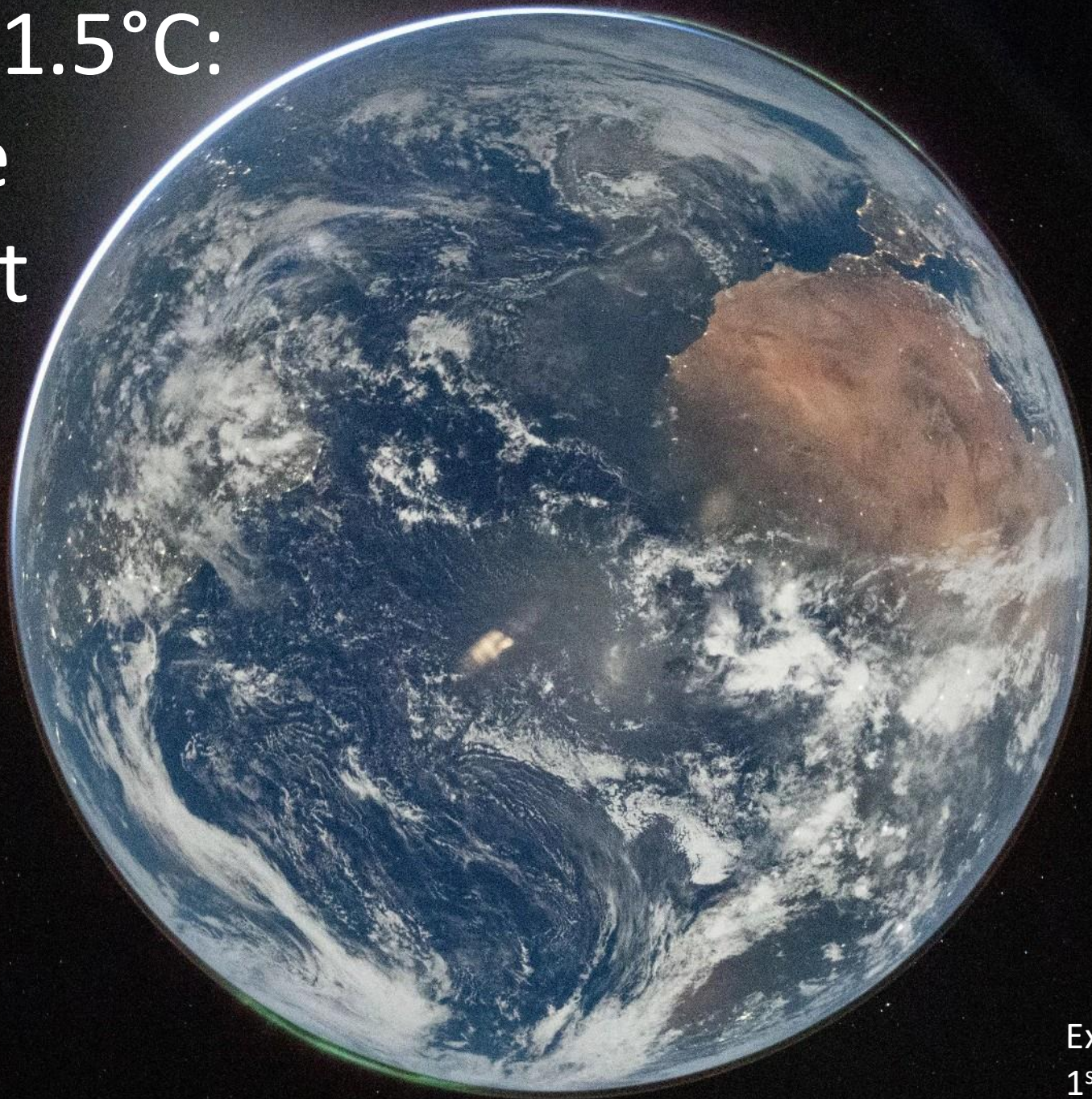


Welcome to 1.5°C:
what climate
impacts must
we now
deal with?



Richard Betts

Exeter Climate Conference
1st July 2026



Friday 26th June 2026

37.7

Lingwood, Norfolk

UK's hottest June Day on Record

LATEST FROM THE WORLD CUP 2026 HERE ➔

INYOURAREA FUNERAL NOTICES SHOP COMPETITIONS OFFERS

UK heatwave sees hospitals declare 'critical incidents' as sweltering wards hit 35C

Heatwave causes hospitals to declare critical incidents including Queen Alexandra Hospital and Norfolk and Norwich hospitals while over 1,000 schools close



Comments 1

WEATHER By **Martin Bagot** Health and Science Editor

12:02, 25 Jun 2026 | Updated 16:02, 25 Jun 2026



Friday 26th June 2026

EXMOUTH
JOURNAL

Record surge in 999 calls in Devon prompts ambulance service warning

Bobby Angelov

Fri, 26 June 2026 at 1:52 pm BST

2 min read



UK's hottest June Day on Record

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SHOP

COMPETITIONS

OFFERS

UK heatwave sees hospitals declare 'critical incidents' as sweltering wards hit 35C

Heatwave causes hospitals to declare critical incidents including Queen Alexandra Hospital and Norfolk and Norwich hospitals while over 1,000 schools close



 Comments 1

WEATHER

By **Martin Bagot** Health and Science Editor

12:02, 25 Jun 2026 | Updated 16:02, 25 Jun 2026





Clyst Valley, East Devon
27th January 2026



When the road is flooded
but you have work at 9am



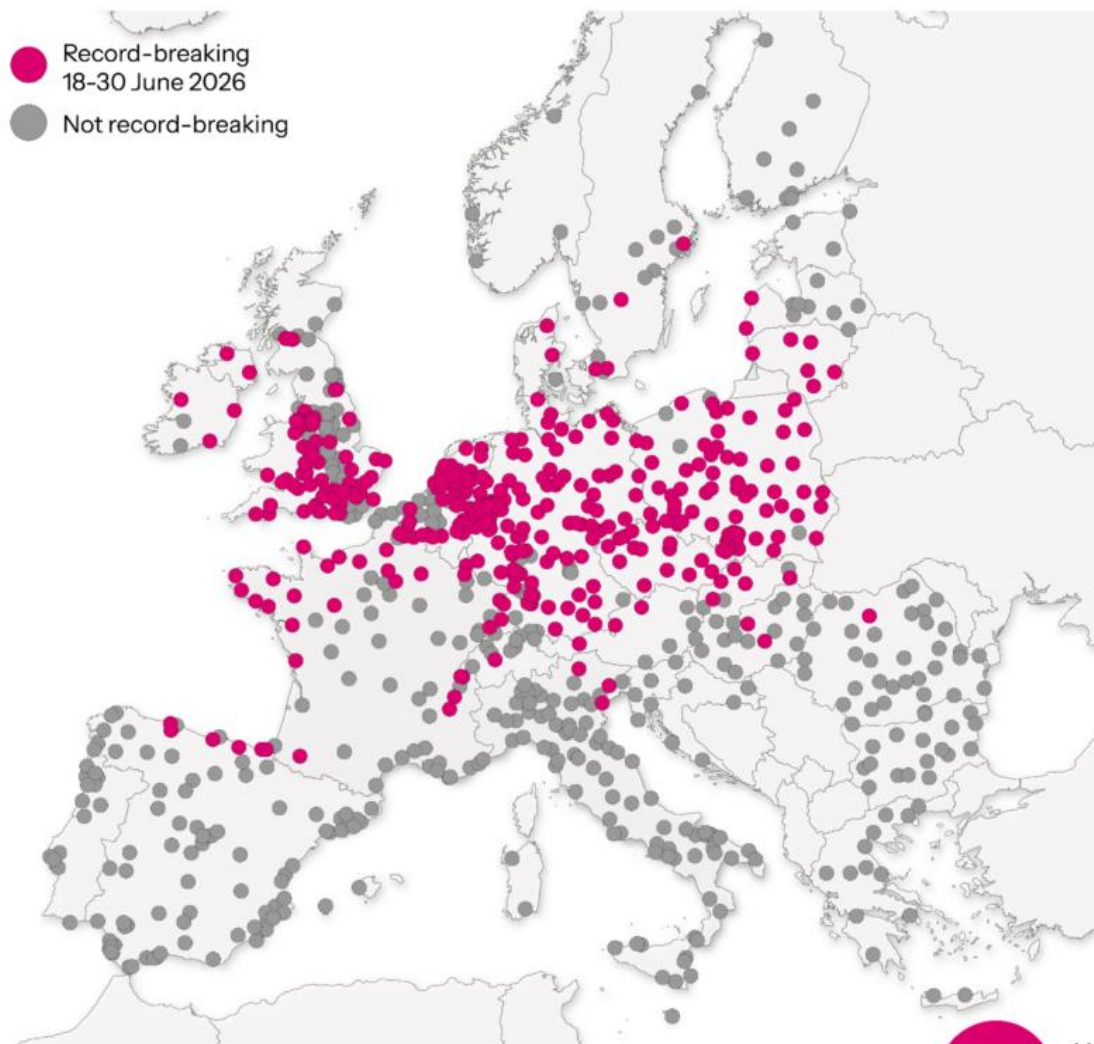
Darts Farm · Follow

🎵 Dolly Parton · 9 to 5

Today's commute 🇬🇧

Europe's historic week of heat stress

Data shows 45% of 854 cities analysed have broken – or are forecast to break – historic heat stress records (Wet Bulb Globe Temperature).



Europe's heatwave linked to 1,300 deaths, WHO says, as Germany hits record 41.7C



REUTERS

Poland recorded an all-time record temperature of 40.5C on Sunday as the heatwave move eastwards

**THAT WAS THE HOTTEST
JUNE DAY OF MY LIFE**

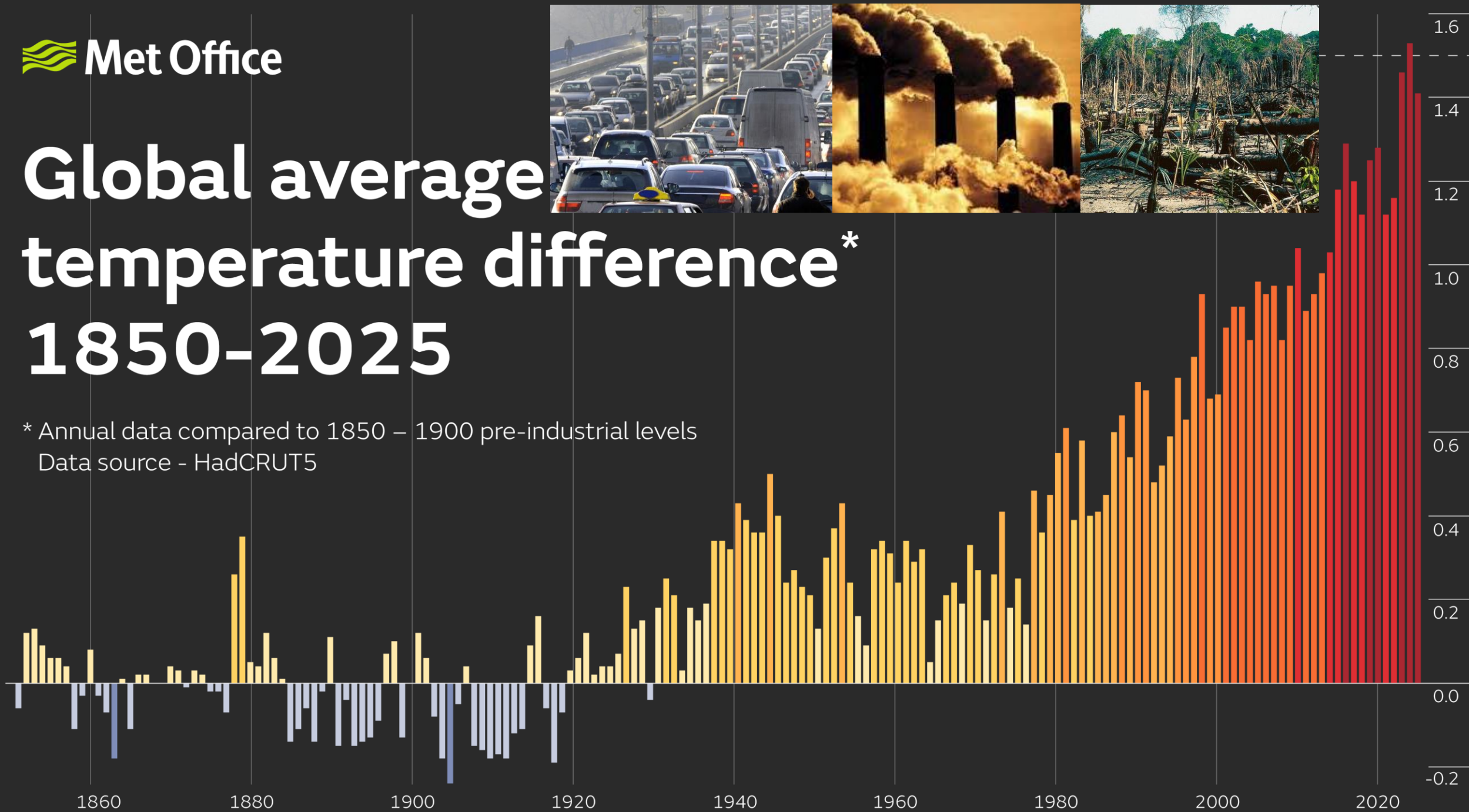


**THE HOTTEST JUNE
DAY OF YOUR LIFE SO FAR**



Global average temperature difference* 1850-2025

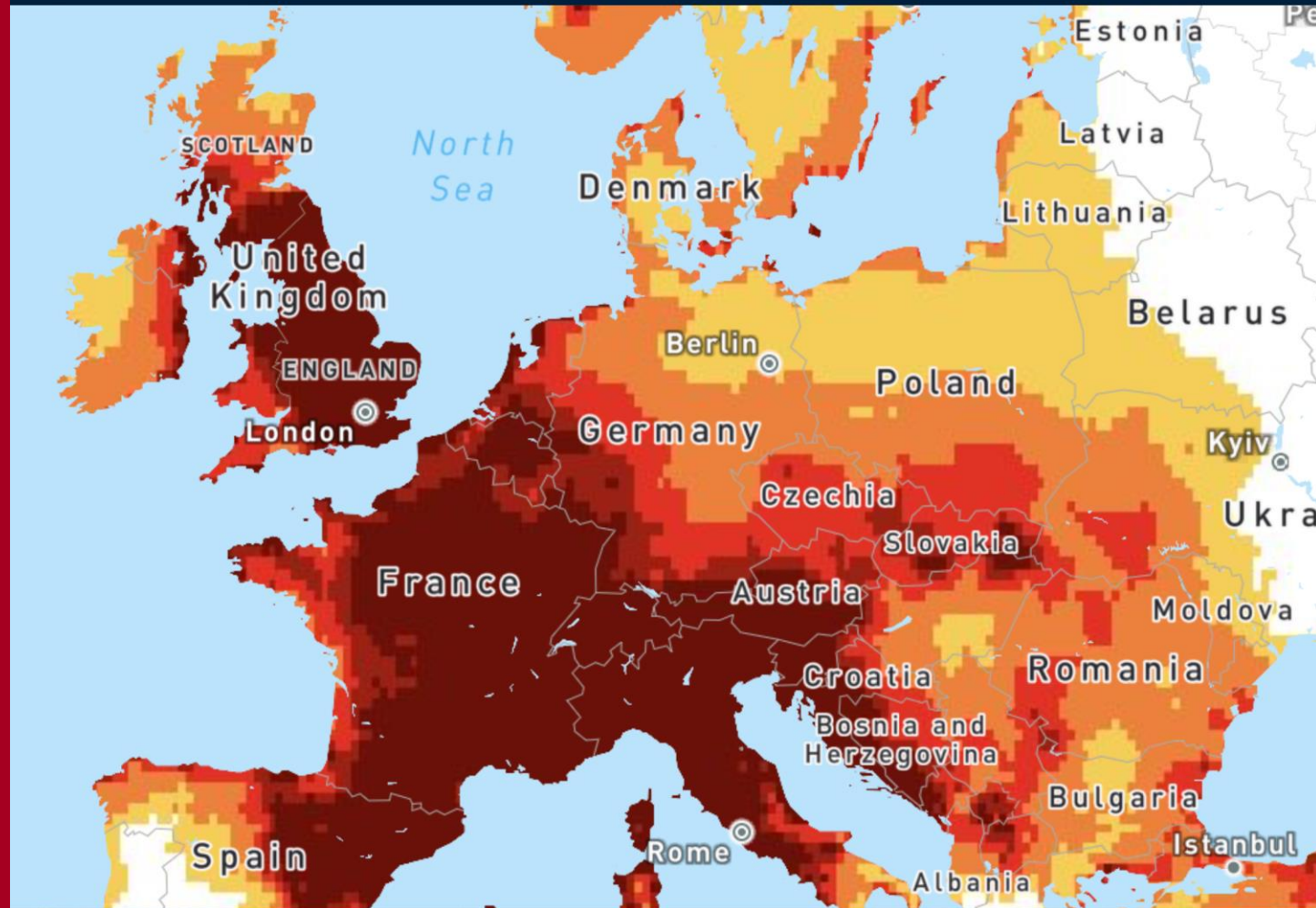
* Annual data compared to 1850 – 1900 pre-industrial levels
Data source - HadCRUT5



Climate Shift Index

Jun 26, 2026

Change in likelihood due to climate change



Climate Shift Index for average temperatures.
Based on NOAA GFS forecasts through 2026-06-27T18Z.

CLIMATE  CENTRAL

Wildfires rip through the UK amid record-breaking heatwave

HEATWAVE | WEATHER | ⌚ Tuesday 19 July 2022 at 10:41pm



Wennington grassland fire in East London destroyed 20 houses

London Fire Brigade had “busiest day since World War 2” (BBC, 2022)

24,316 wildfires in England June-August

Very high fire danger in UK in 2022 at least 6 times more likely due to human-caused climate change

Burton and co-authors, 2025
Environmental Research Letters

October 2022 – March 2024 wettest 18 months on record in England: major impact on farming



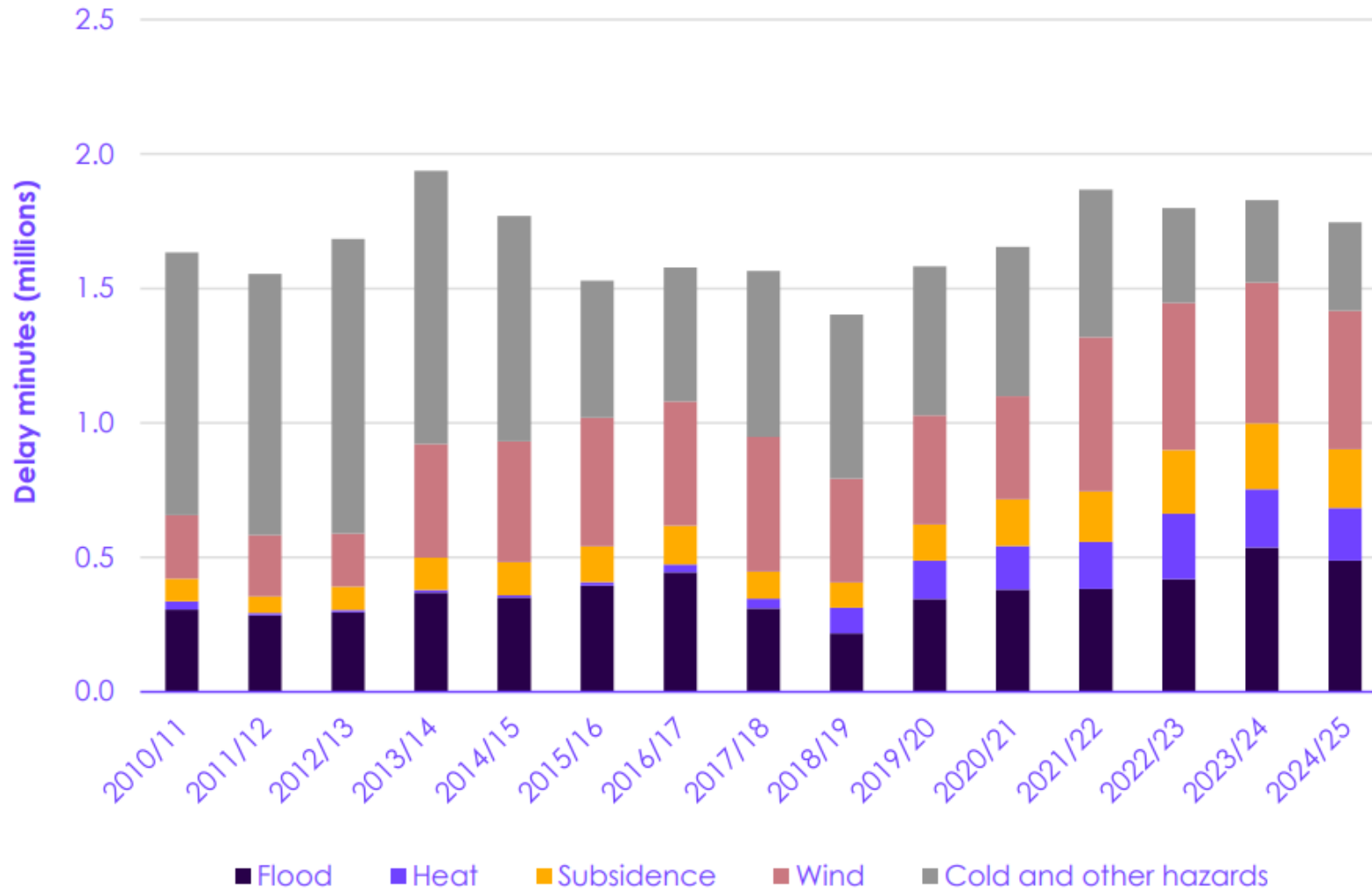
**Autumn and winter storm rainfall
in the UK and Ireland was made
about 20% heavier by human-
caused climate change**

Kew and co-authors, 2024
www.worldweatherattribution.org

**Total production of wheat, barley, oats and
oilseed rape contracted by 13% in 2024**

Agriculture and Horticulture Development Board, 2024

Weather-related rail delays



Description: Delays to rail in England, Scotland, and Wales from flood, heat, subsidence, and wind hazards have increased since 2010.

Source: Network Rail (2026) Unpublished.

Notes: (1) 'Other hazards' includes adhesion, fog, lightning, and snow. (2) The delay minutes represent a five-year rolling average.

(3) This data does not include rail delays in Northern Ireland.



Lines near Glasgow buckled due to heat, June 2018. Image credit: Network Rail



Photograph: Audrey Marcoux, SOPFEU

Wildfires cause deaths through air pollution

Wildfires in Canada in May-September 2023 burned 18 million hectares (larger than England)

Exposed more than 350 million people in North America and Europe to air pollution from PM_{2.5} (particulate matter less than 2.5 μm diameter)

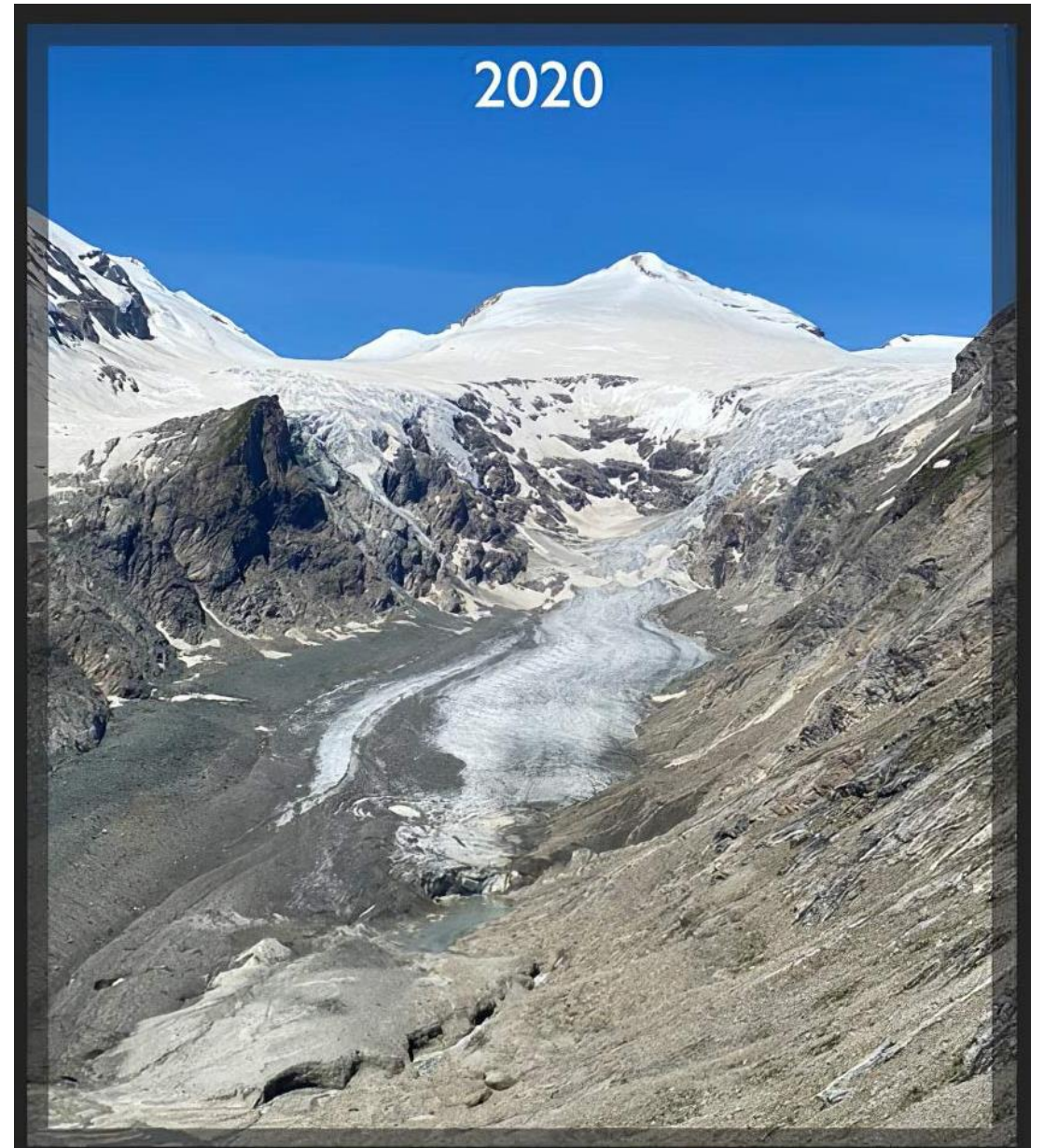
Carter Vigh (9)
Died July 2023
from asthma
attack
exacerbated
by wildfire
smoke in
British
Columbia,
Canada
Photograph:
Amber Vigh



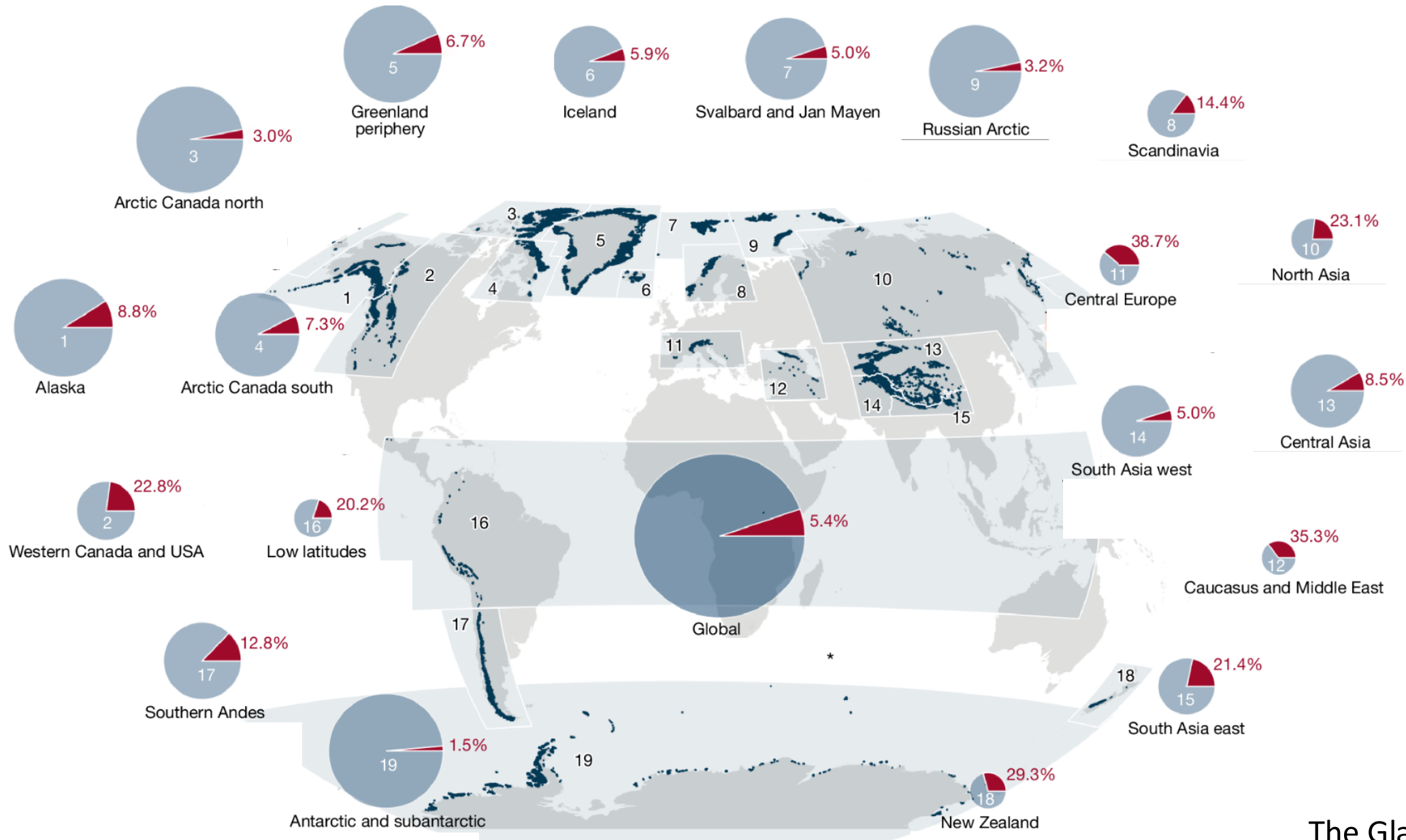
Over 82,000 deaths worldwide attributed to chronic exposure to PM_{2.5} from 2023 Canadian fires (Zhang et al, 2025, *Nature*)

Climate change more than doubled the likelihood of extreme fire weather conditions (Barnes et al., 2023, World Weather Attribution)

Glaciers are melting worldwide



Global glacier mass loss from 2000 to 2023



29th May 2025: Glacier collapse caused landslide that buried the Swiss village of Blatten





The Paris Agreement talks of “temperature increase” but does not actually define the period for this:

- One day?
- One year?
- One decade?
- Longer?

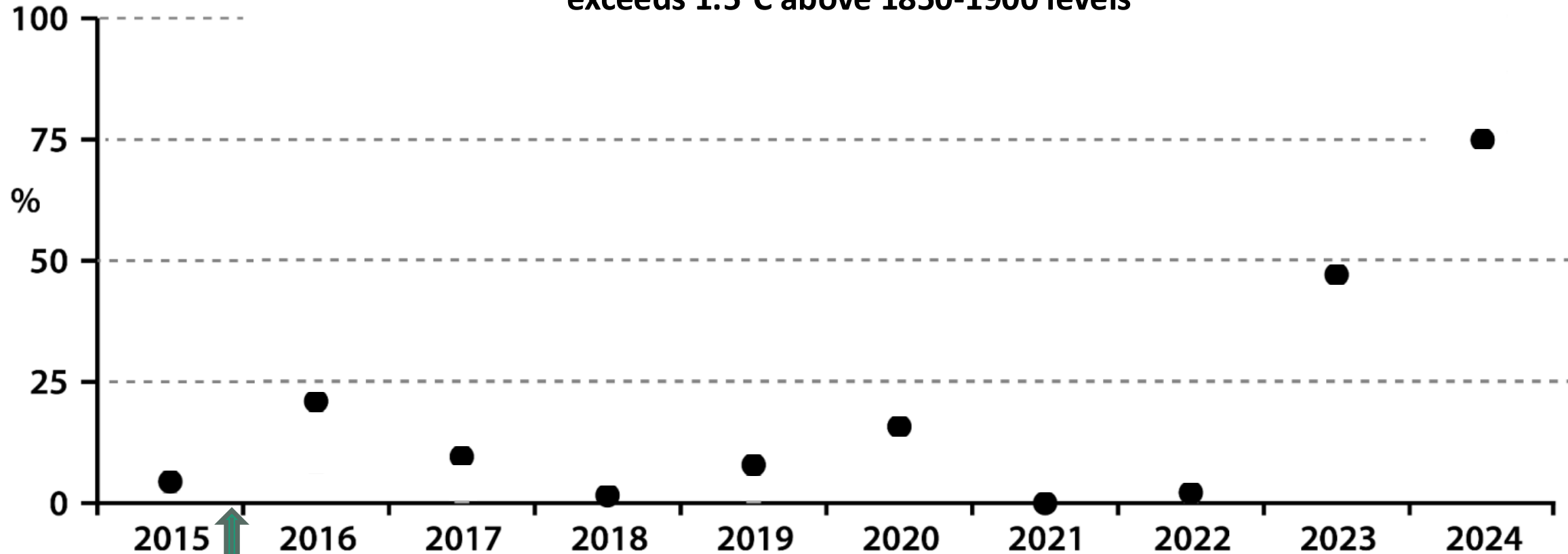
Article 2

1. This Agreement, in enhancing the implementation of the Convention, including its objective, aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by:

(a) Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change;

Global temperature anomaly exceeded 1.5°C for part of every year since 2015

Percentage of days each year when ERA5 global mean temperature exceeds 1.5°C above 1850-1900 levels



Thorne et al. (submitted)

IPCC AR6 defines Global Warming Levels (GWLs) using 20-year averages

Cross-Section Box TS.1, Table 1 | Assessment results for 20-year averaged change in global surface temperature based on multiple lines of evidence. The change is displayed in °C relative to the 1850–1900 reference period for selected time periods (first three rows), and as the first 20-year period during which the average global surface temperature change exceeds the specified level relative to the period 1850–1900 (last four rows). The entries give both the central estimate and, in parentheses, the *very likely* (5–95%) range. An entry n.c. means that the global warming level is not crossed during the period 2021–2100.

	SSP1-1.9	SSP1-2.6	SSP2-4.5	SSP3-7.0	SSP5-8.5
Near term, 2021–2040	1.5 [1.2 to 1.7]	1.5 [1.2 to 1.8]	1.5 [1.2 to 1.8]	1.5 [1.2 to 1.8]	1.6 [1.3 to 1.9]
Mid-term, 2041–2060	1.6 [1.2 to 2.0]	1.7 [1.3 to 2.2]	2.0 [1.6 to 2.5]	2.1 [1.7 to 2.6]	2.4 [1.9 to 3.0]
Long term, 2081–2100	1.4 [1.0 to 1.8]	1.8 [1.3 to 2.4]	2.7 [2.1 to 3.5]	3.6 [2.8 to 4.6]	4.4 [3.3 to 5.7]
1.5°C	2025–2044 [2013–2032 to n.c.]	2023–2042 [2012–2031 to n.c.]	2021–2040 [2012–2031 to 2037–2056]	2021–2040 [2013–2032 to 2033–2052]	2018–2037 [2011–2030 to 2029–2048]
2°C	n.c. [n.c. to n.c.]	n.c. [2031–2050 to n.c.]	2043–2062 [2028–2047 to 2075–2094]	2037–2056 [2026–2045 to 2053–2072]	2032–2051 [2023–2042 to 2044–2063]
3°C	n.c. [n.c. to n.c.]	n.c. [n.c. to n.c.]	n.c. [2061–2080 to n.c.]	2066–2085 [2050–2069 to n.c.]	2055–2074 [2042–2061 to 2074–2093]
4°C	n.c. [n.c. to n.c.]	n.c. [n.c. to n.c.]	n.c. [n.c. to n.c.]	n.c. [2070–2089 to n.c.]	2075–2094 [2058–2077 to n.c.]

Comment



People in Tokyo carried parasols for shade as temperatures exceeded 35 °C in the Japanese capital in July 2023.

Approaching 1.5 °C: how will we know we've reached this crucial warming mark?

Richard A. Betts, Stephen E. Belcher, Leon Hermanson, Albert Klein Tank, Jason A. Lowe, Chris D. Jones, Colin P. Morice, Nick A. Rayner, Adam A. Scaife & Peter A. Stott

Assessing global mean temperature rise using the average warming over the previous one or two decades will delay formal recognition of when Earth breaches the Paris agreement's 1.5 °C

The world is already more than 1 °C warmer on average than it was before industrial times, owing to greenhouse gases released from human activities. And that value is rising. The Intergovernmental Panel on Climate Change (IPCC) projects that there is at least a 50% chance that long-term global warming will overshoot 1.5 °C in the next decade, even with ambitious

of the observed impacts of exceeding 1.5 °C. It might come as a surprise, then, to hear that the Paris statement contains no formally agreed way of defining the present level of global warming. The pact does not even define 'temperature increase' explicitly and unambiguously. Without an agreed metric, there can be no consensus on when the 1.5 °C level has been reached. This is likely to result in distraction

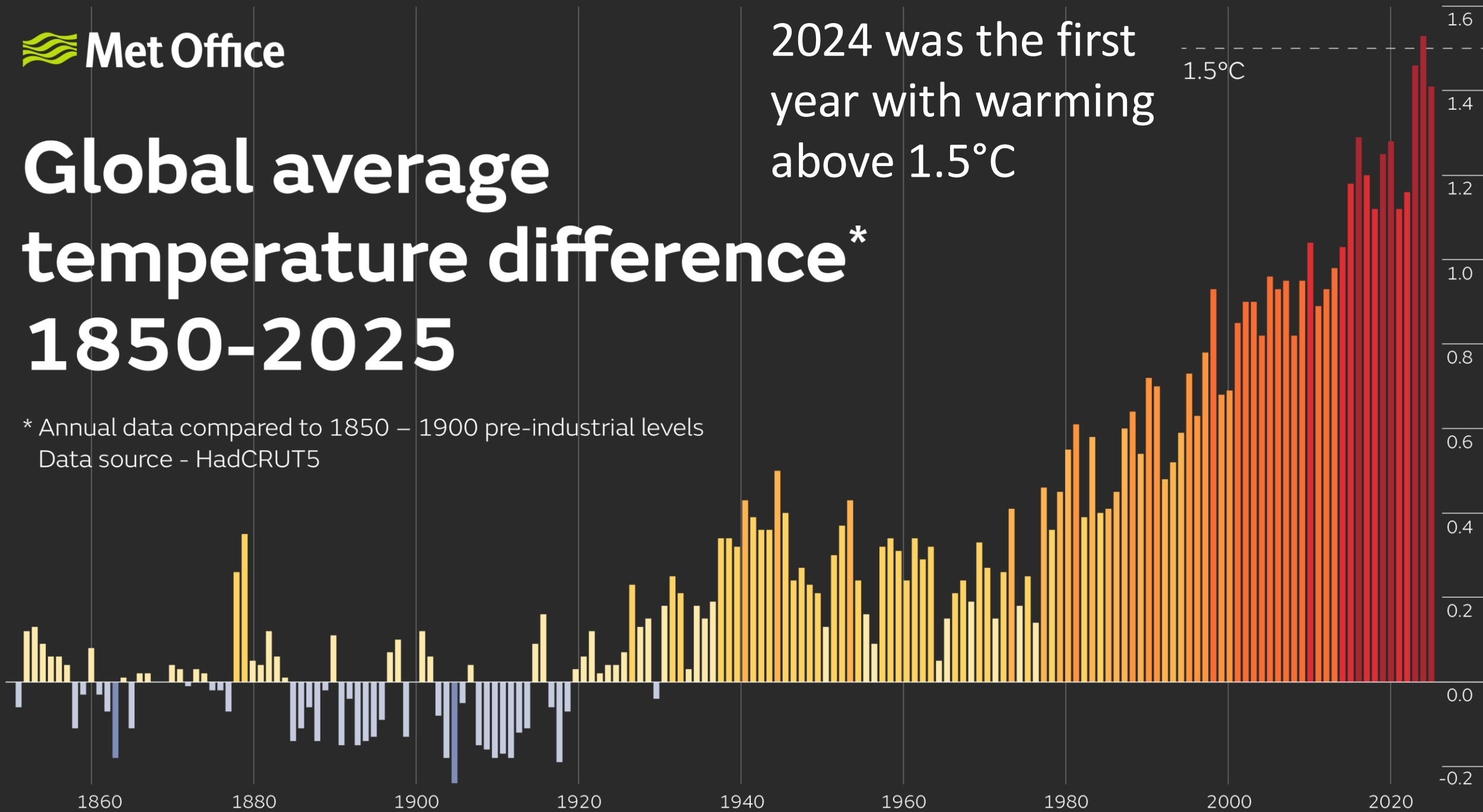
Crossing 1.5 °C will be marked by a series of milestones, eg:

- first year with a global temperature anomaly above 1.5 °C in one or more data sets
- exceedance of 1.5 °C using various instantaneous indicators
- a decade later, confirmation that 1.5 °C had been exceeded in the IPCC 20-year average.

Global average temperature difference* 1850-2025

* Annual data compared to 1850 – 1900 pre-industrial levels
Data source - HadCRUT5

2024 was the first
year with warming
above 1.5°C

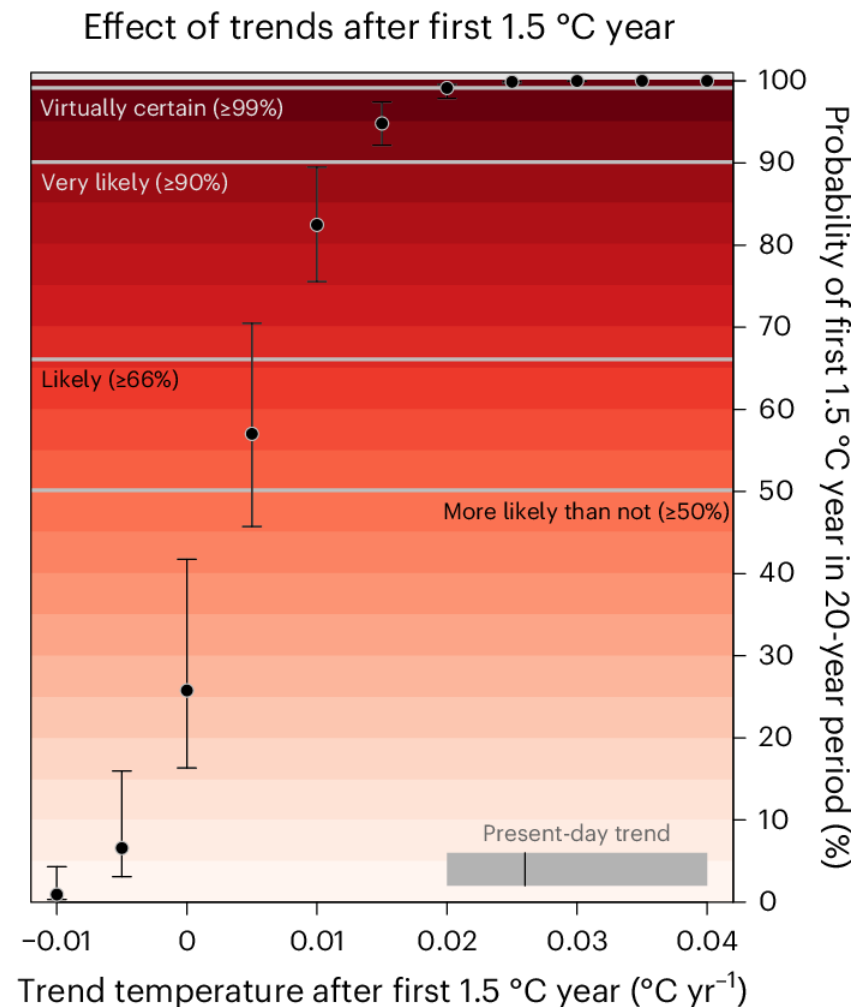
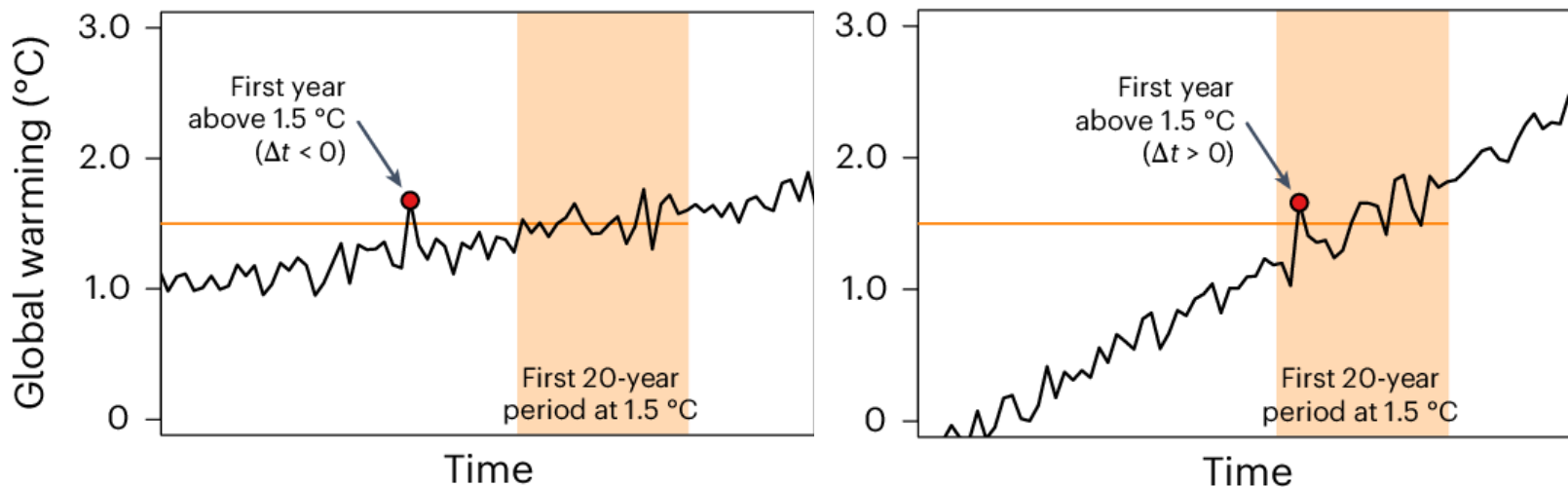


A year above 1.5 °C signals that Earth is most probably within the 20-year period that will reach the Paris Agreement limit

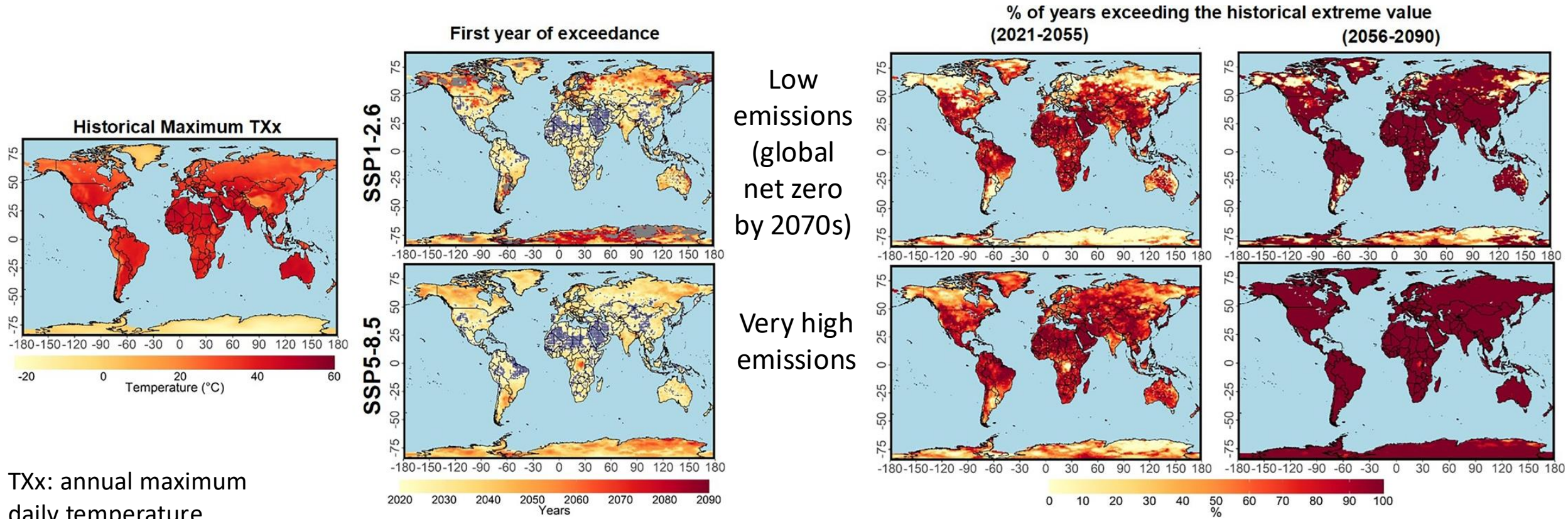
Received: 6 August 2024

Emanuele Bevacqua¹✉, Carl-Friedrich Schleussner^{2,3} & Jakob Zscheischler^{1,4}

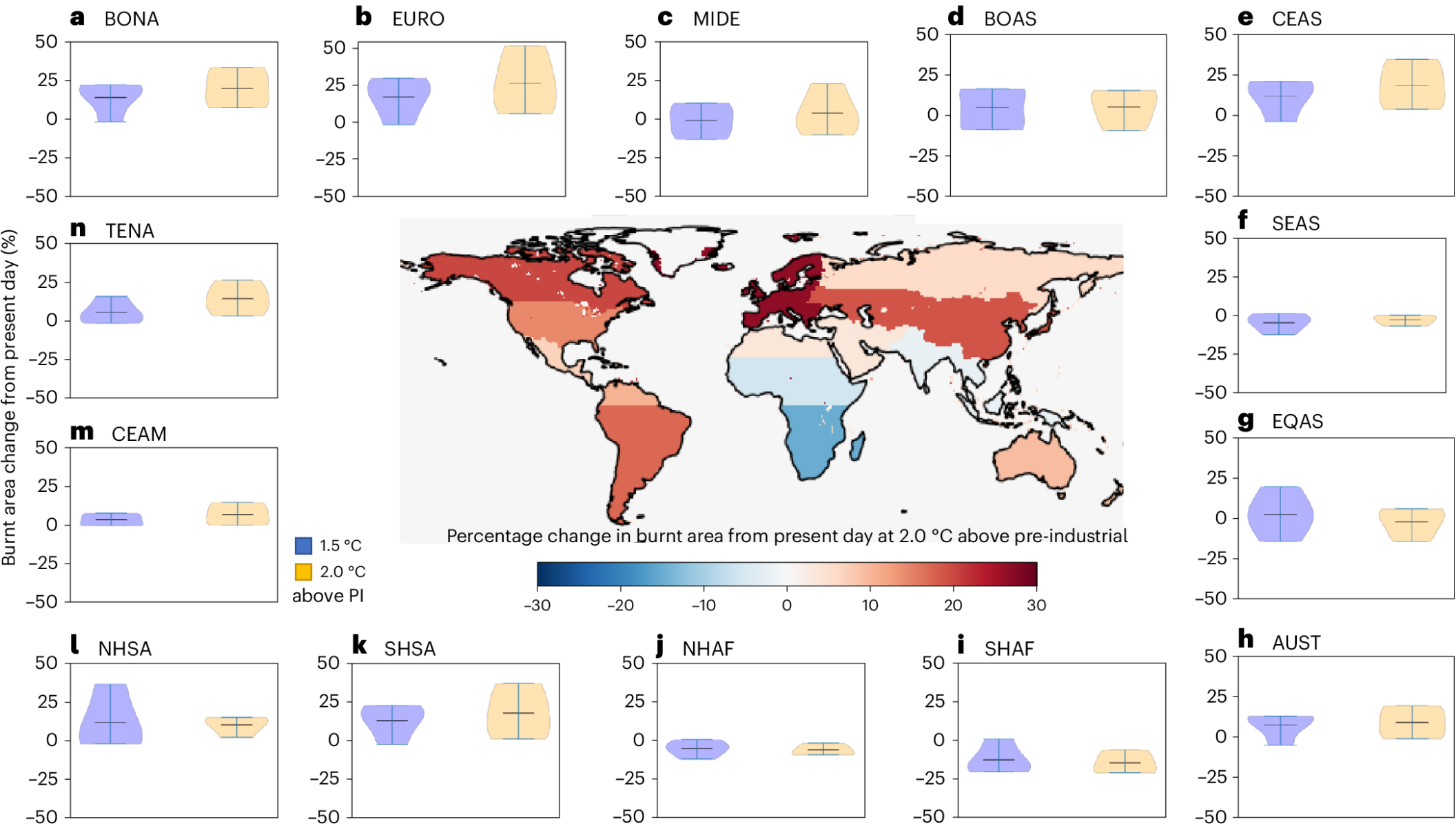
Accepted: 14 January 2025



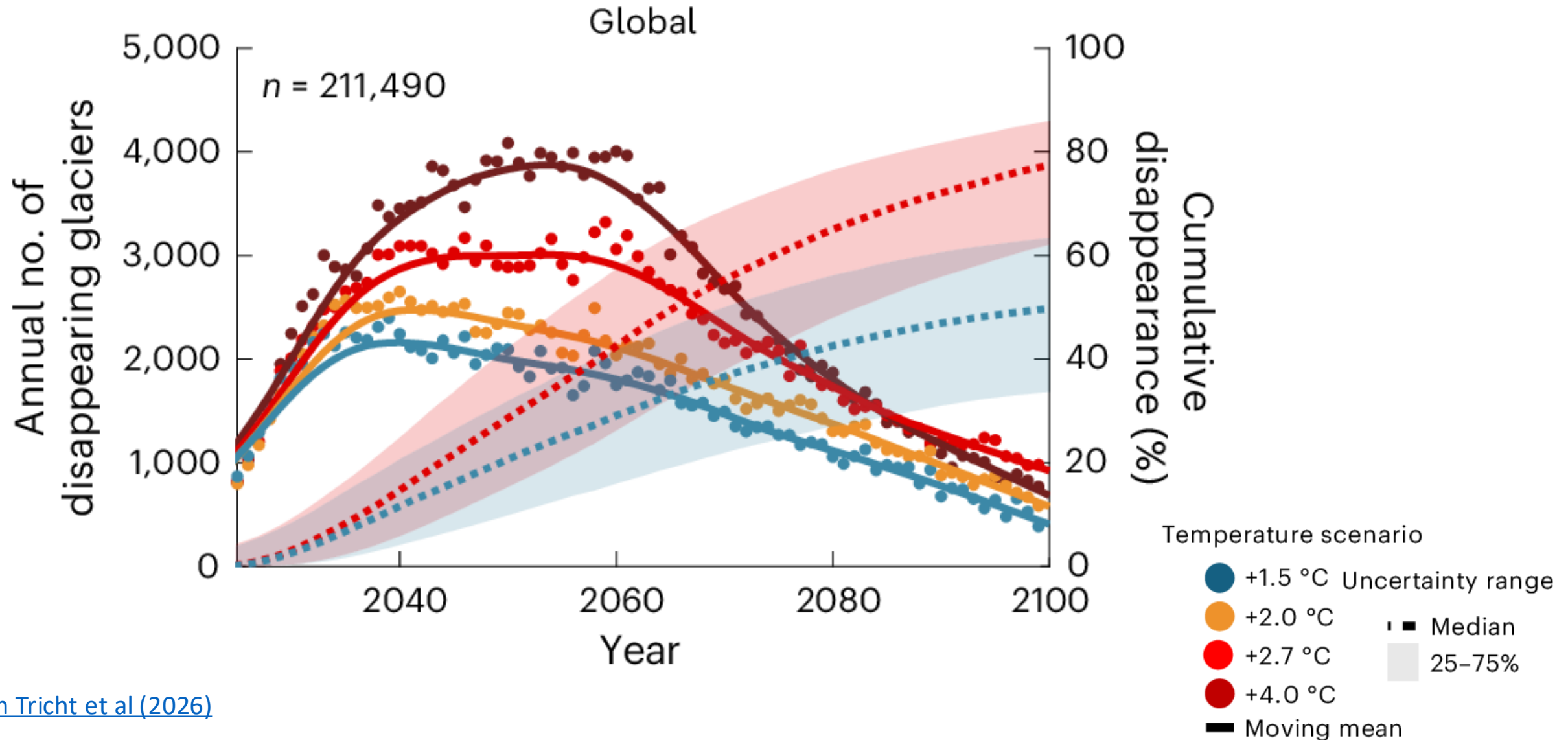
Temperatures will regularly exceed historical maxima in most regions, even with low emissions – but exceedance would be greater with higher emissions



Burned area is projected to increase more at 2°C than 1.5 °C in most regions



Thousands of glaciers will disappear even if warming is limited to 1.5°C
– and even more if not

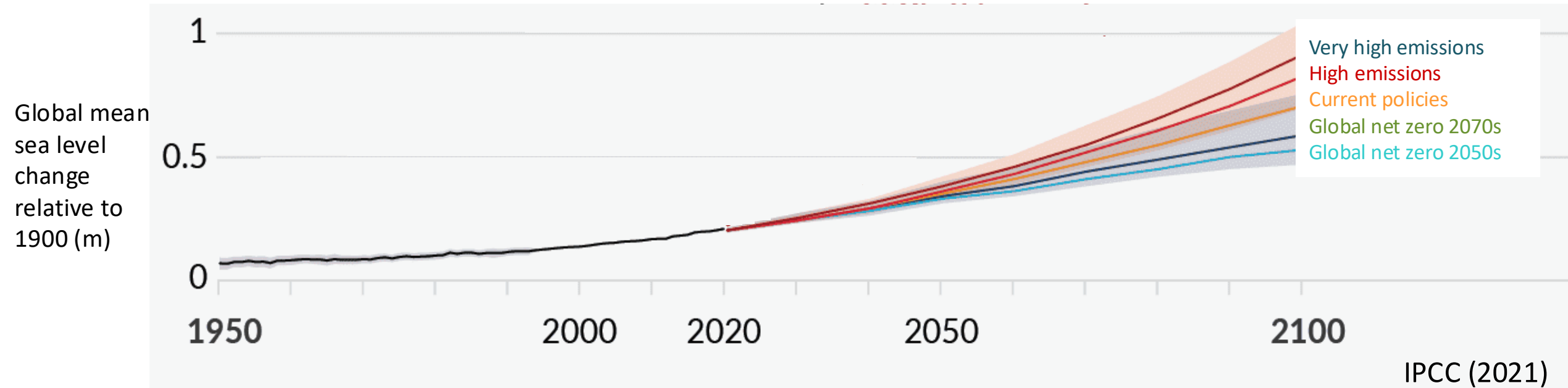


Projected sea level rise is similar in all scenarios until mid-century – but beyond that, lower emissions minimise the rise

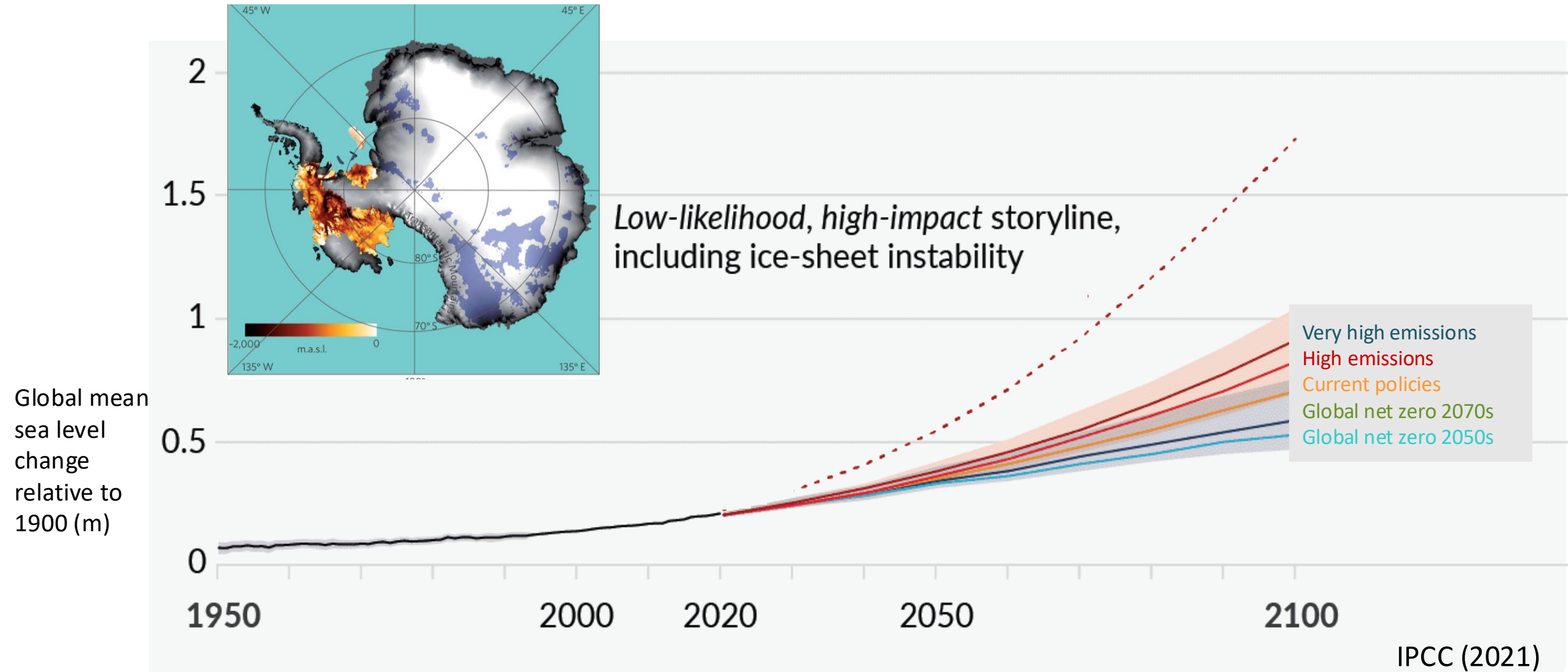


Flood risk

About a billion people in low-lying cities by the sea and on Small Islands at risk from sea level rise by mid-century.



Reducing emissions decreases the risk of major loss from ice sheets



Summary

- Many types of extreme weather are becoming more severe and/or more likely
- Global warming is close to 1.5°C – the next 20 years may average at that level
- Risks of extreme heat, wildfire, glacier loss and sea level rise will continue to increase in all scenarios, even with low emissions / low warming levels
- Urgent adaptation is therefore needed to deal with impacts already occurring or locked-in
- Higher emissions / warming levels lead to even more severe impacts
- Bringing emissions to net zero globally would limit the impacts of climate change