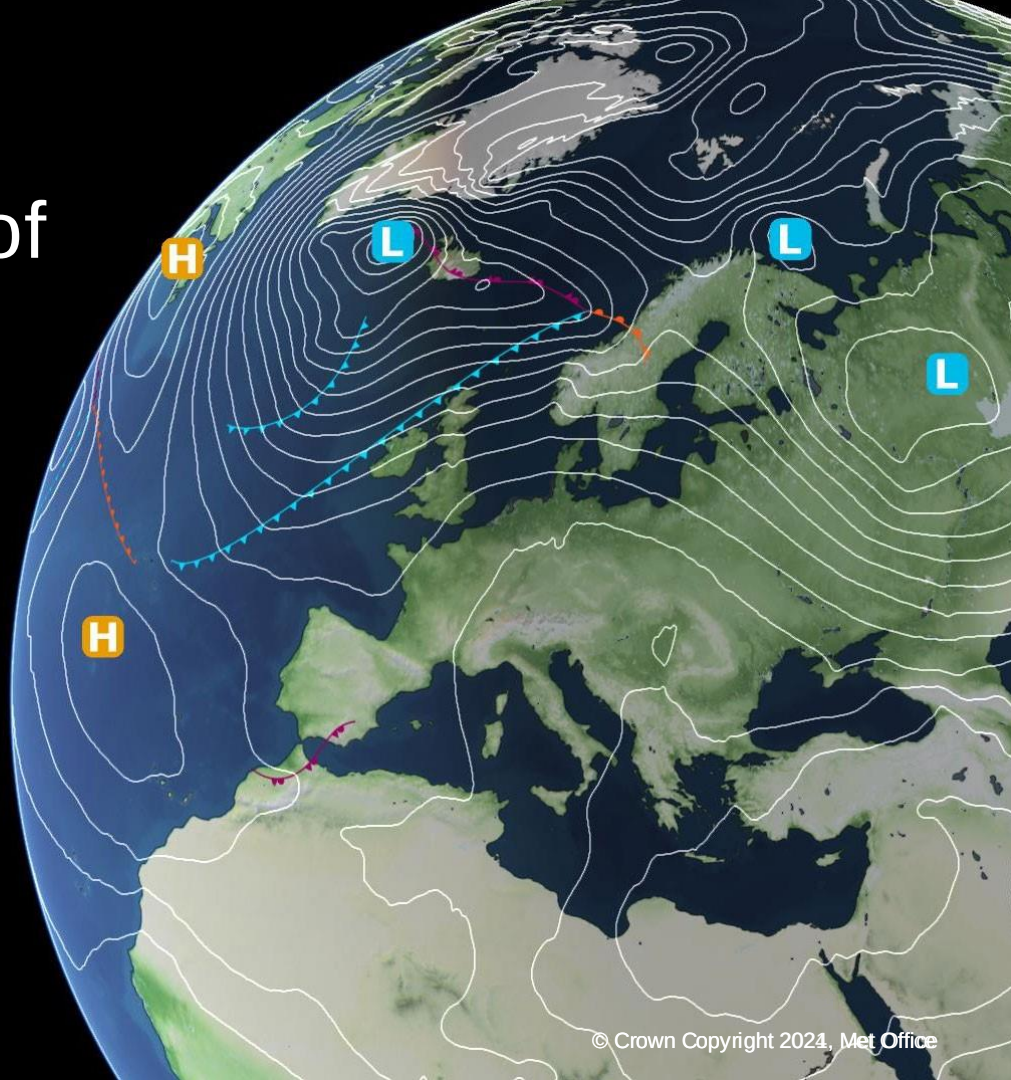
Current understanding of climate change science

Dr Deborah Hemming

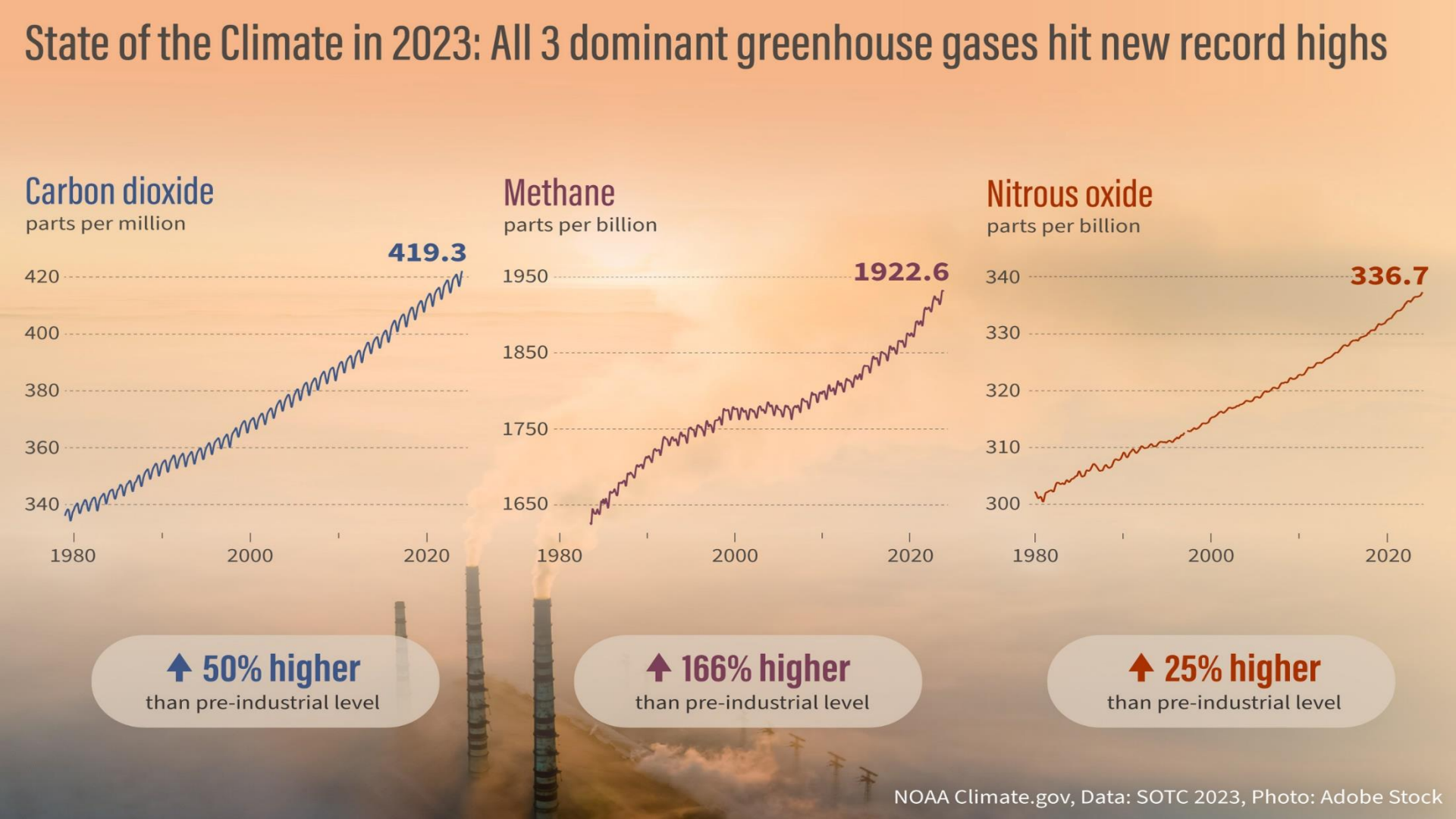
debbie.hemming@metoffice.gov.uk

Scientific Manager,
Vegetation-Climate Interactions group
Met Office Hadley Centre. UK
and
Honorary Senior Research Fellow
Birmingham Institute of Forest Research. UK

Definitions:
Climate refers to all meteorological time scales
e.g., from weather events to multi-decadal climate trends.



State of the Climate in 2023: All 3 dominant greenhouse gases hit new record highs



NOAA Climate.gov, Data: SOTC 2023, Photo: Adobe Stock

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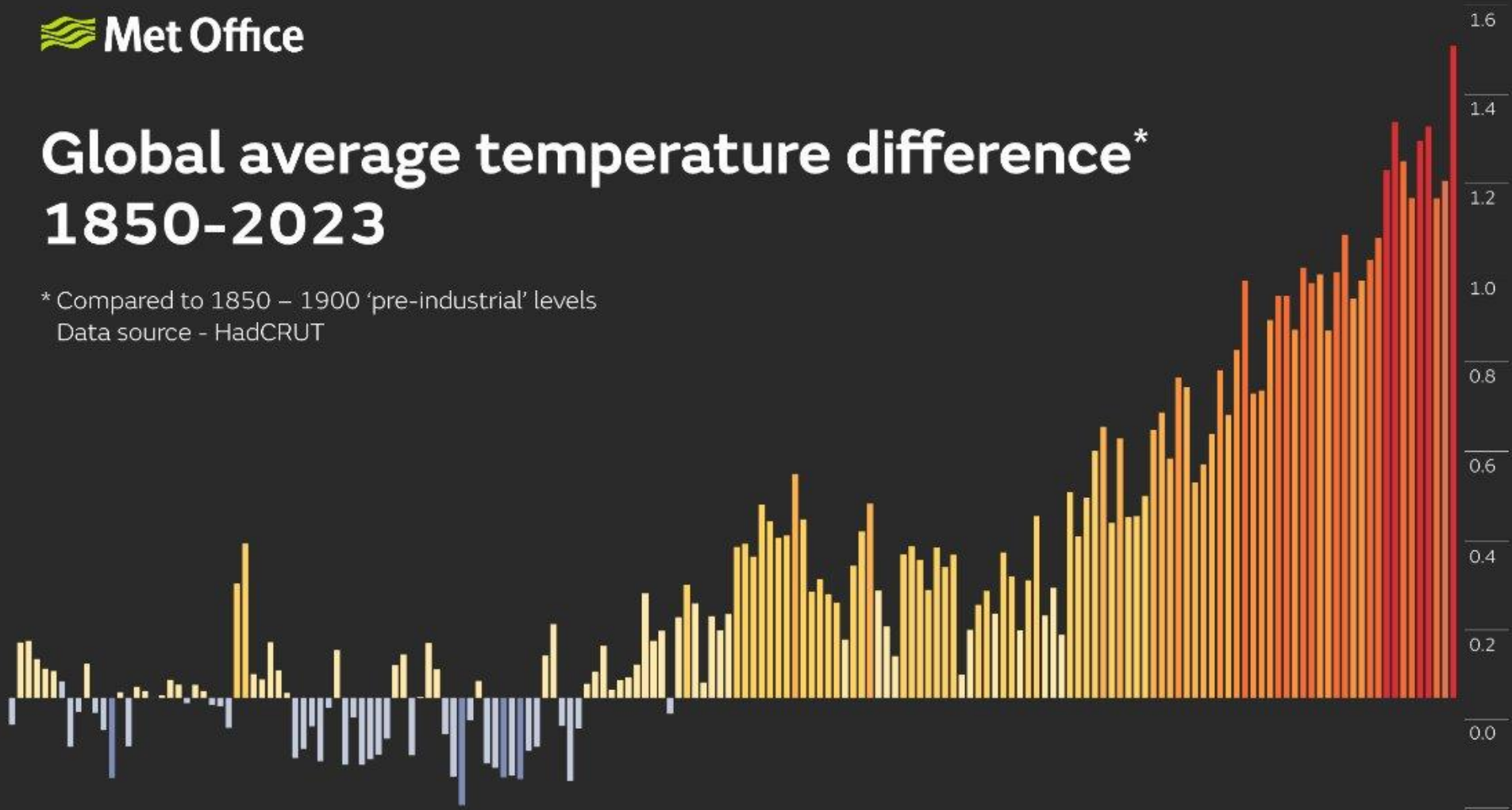
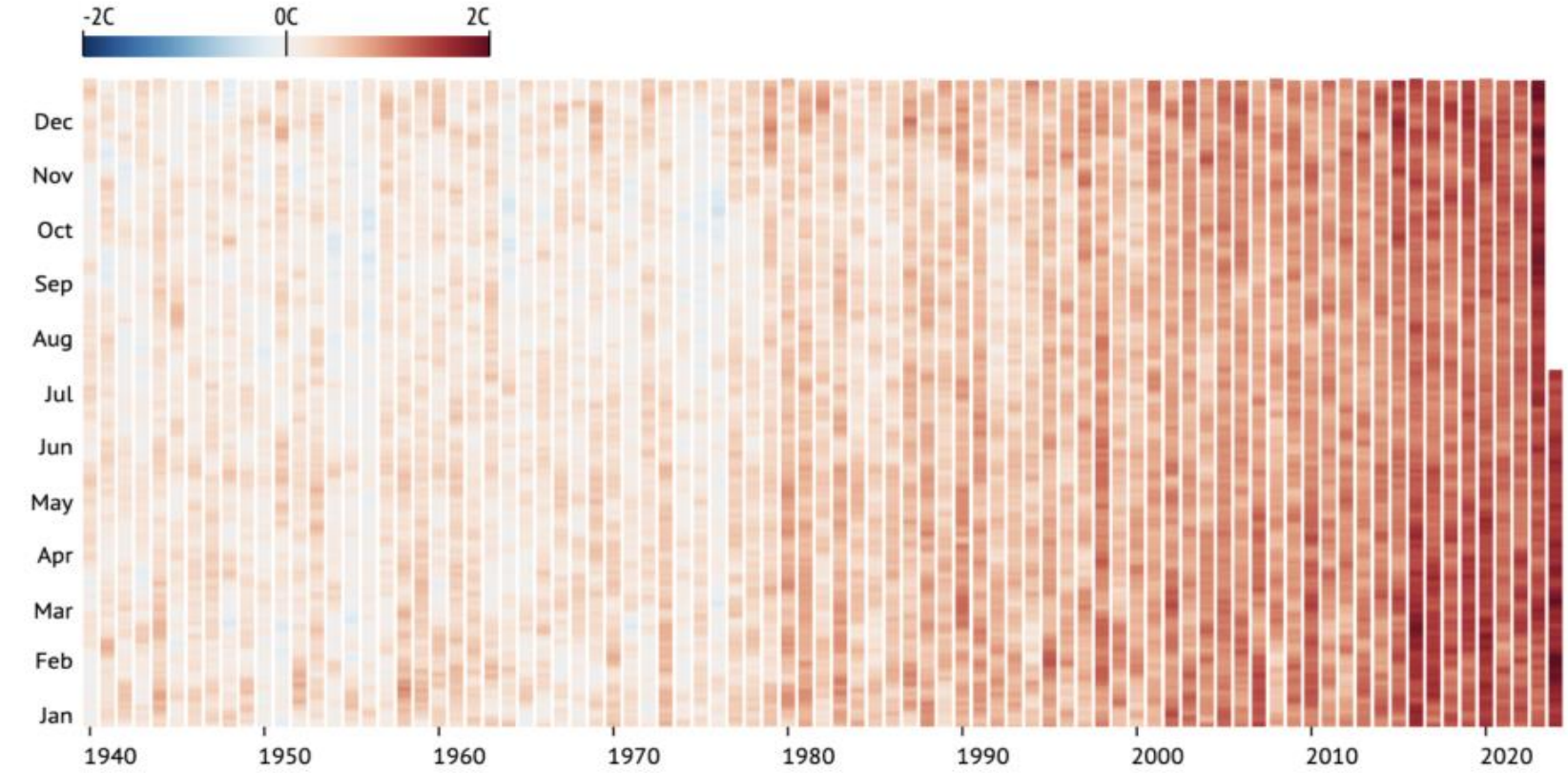
Global average temperature difference* 1850-2023

* Compared to 1850 – 1900 ‘pre-industrial’ levels
Data source - HadCRUT



How daily average global temperatures have warmed since 1940

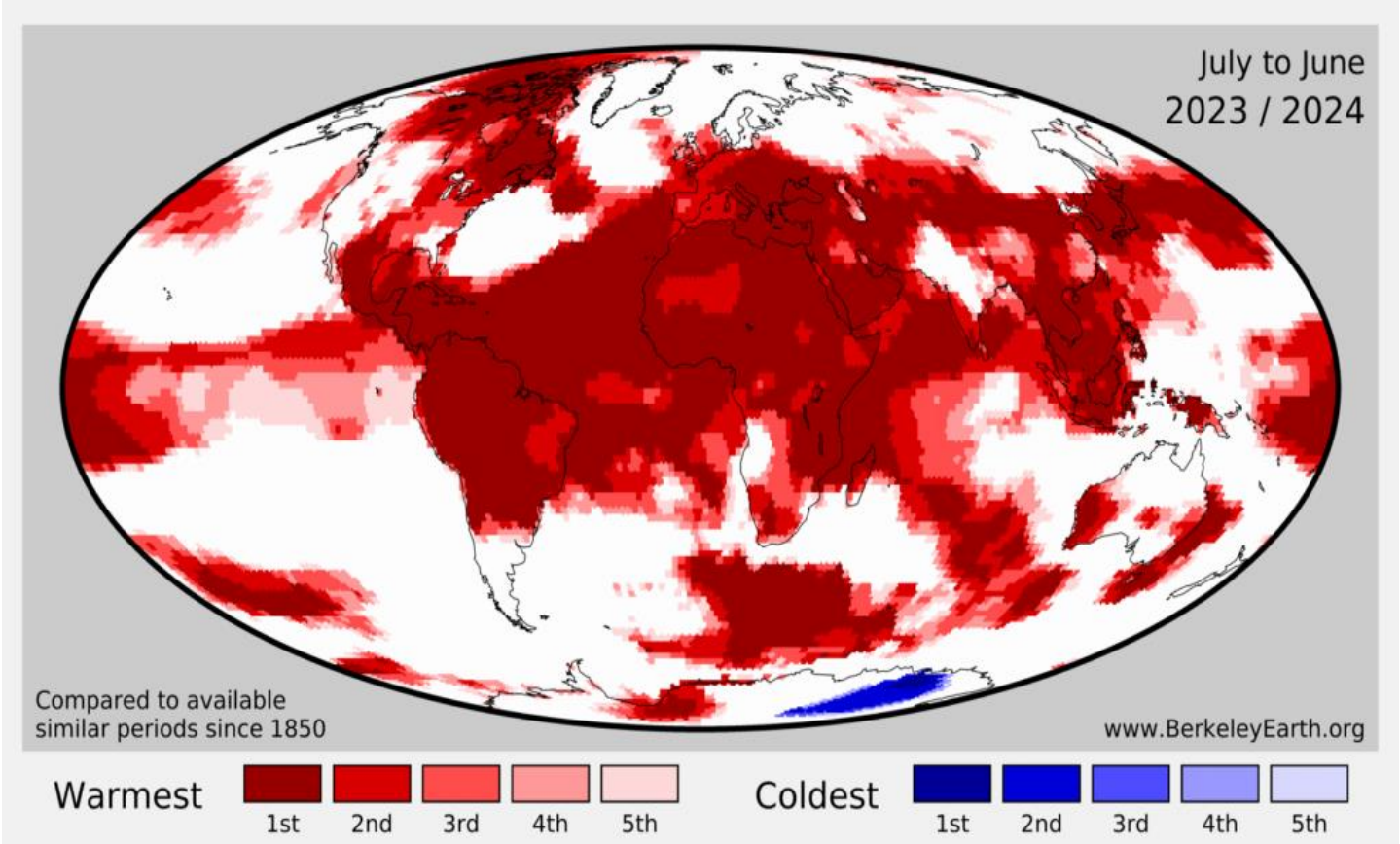
Compared to 1850-1900 average



Source: ERA5

2023-2024 - Many areas experienced the warmest year on record.

Boosted by the start of an *El Nino* event in 2023.



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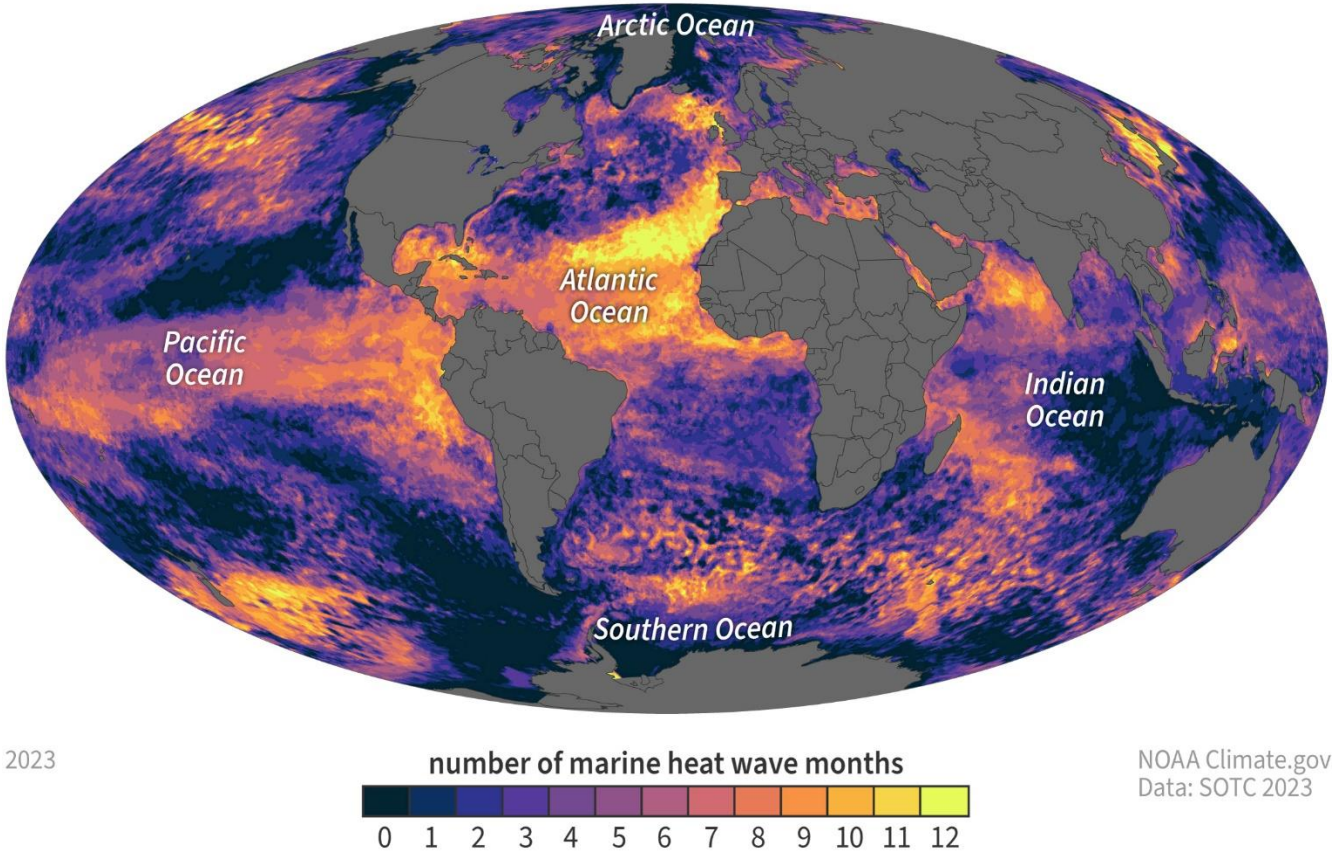
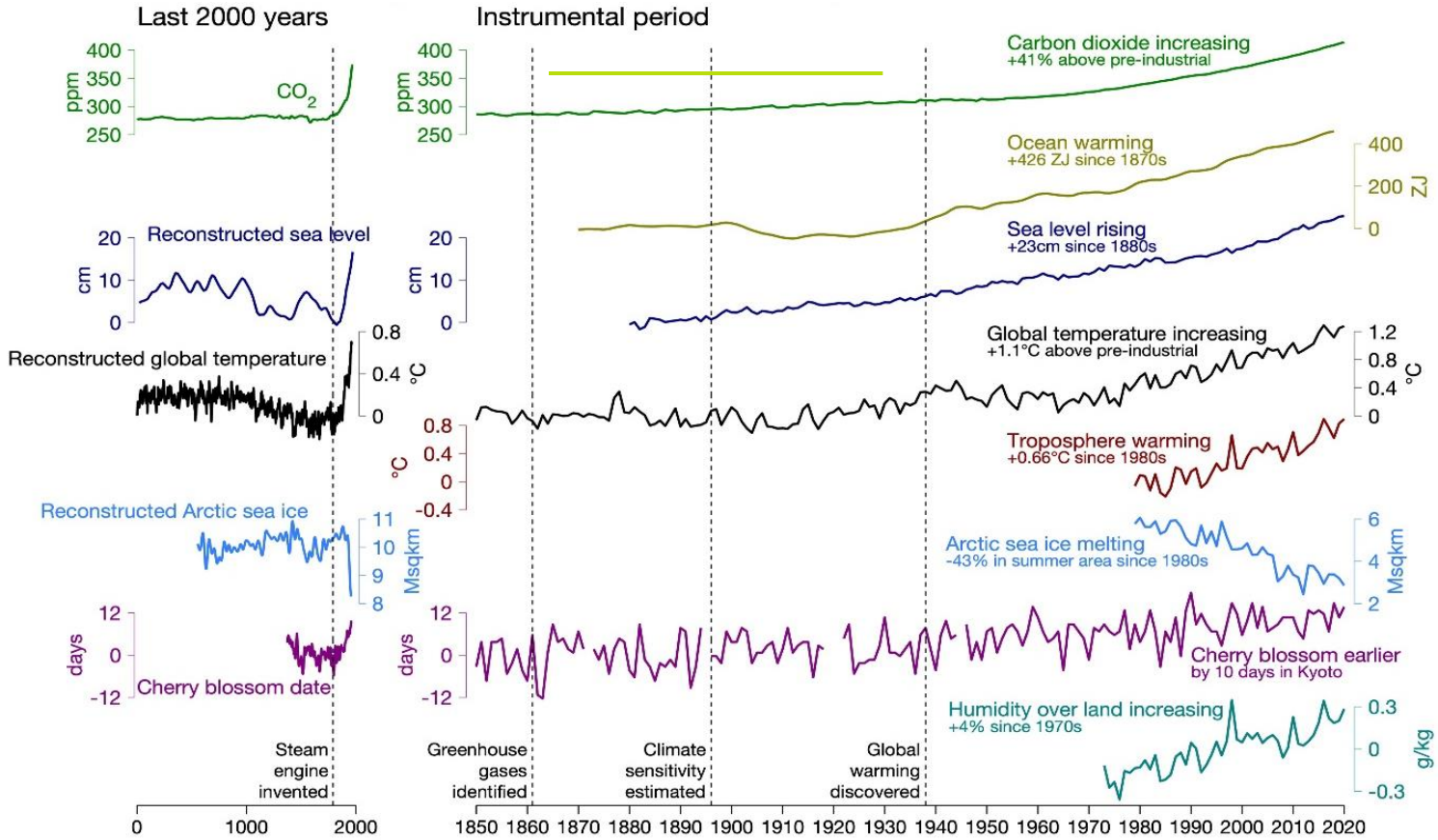
State of the Climate in 2023: Ocean heat waves set records for length and intensity

Relatively large swaths of the eastern North Atlantic & Pacific experienced heat wave conditions virtually all year (bright yellow).

Boosted by the start of an *El Nino* event in 2023.



Changes emerging across the natural environment



Source: Climate Lab Book, 2021

Climate change is already enhancing extreme weather

Siberian heatwave

- Widespread, prolonged event over the first 6 months of 2020 resulting in **wildfires** and **loss of permafrost**
- Event was **600 times more likely** due to climate change

European flooding and heatwave

- July 2021 **heavy rainfall event** resulted in extreme impacts, and led to over **200 deaths**
- Event was **1.2 to 9 times more likely** and **rainfall intensity 3-19% higher** due to climate change

West African drought leads to record global cocoa prices

- 2024 Global cocoa prices hit new high due to **droughts causing poor harvests in W Africa** which is main global supply.
- **Cocoa price has doubled** from 2023-2024.

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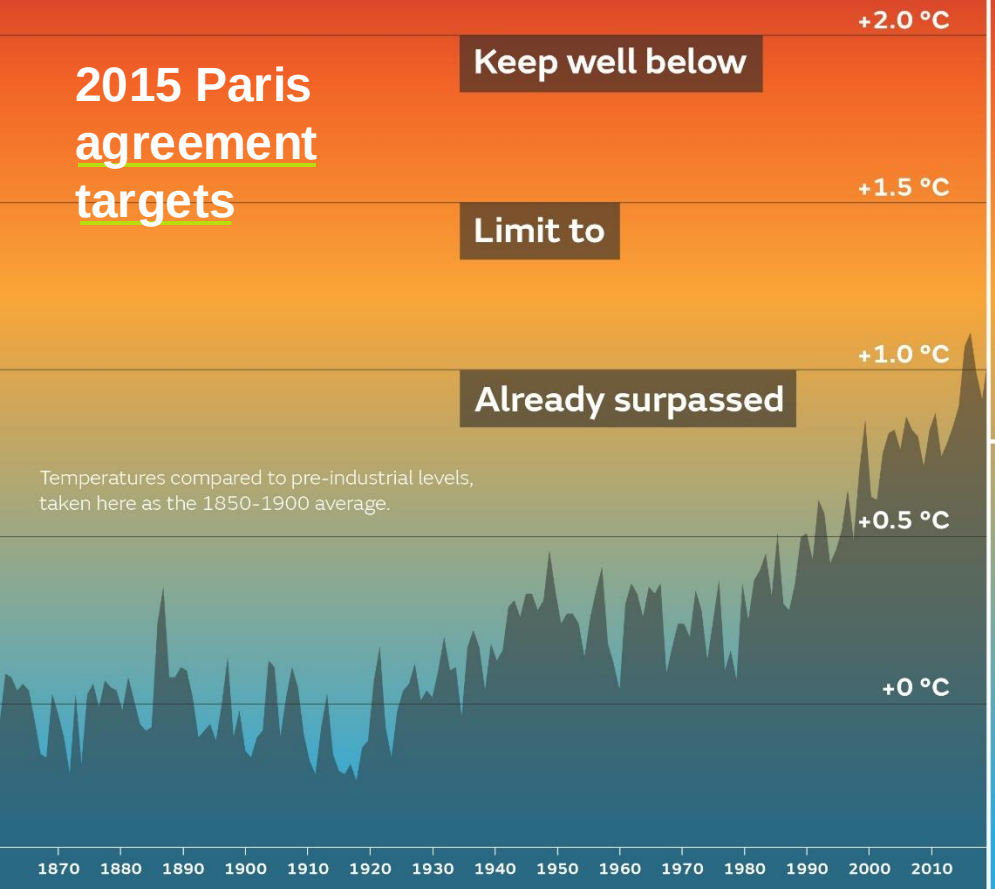
2015 Paris agreement targets



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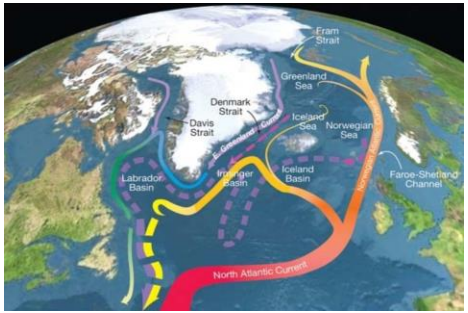
Long term aim to reach **zero net emissions** by 2050

Aim for **greenhouse emissions** to peak as soon as possible

High-Impact, Low-Likelihood (HILL) events, such as ice sheet collapse and abrupt ocean circulation changes cannot be ruled out and are part of risk assessment

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