



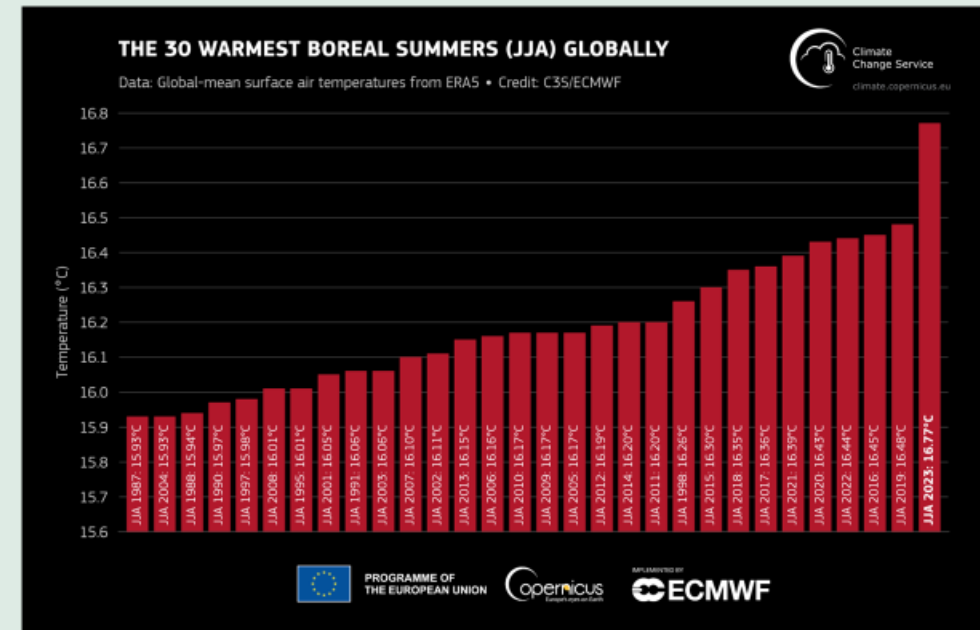
“We breathe climate change”
– health risks from heat and air pollution in Europe

EXHAUSTION Policy conference Nov 15. 2023, Norway House, Brussels

Kristin Aunan (CICERO)

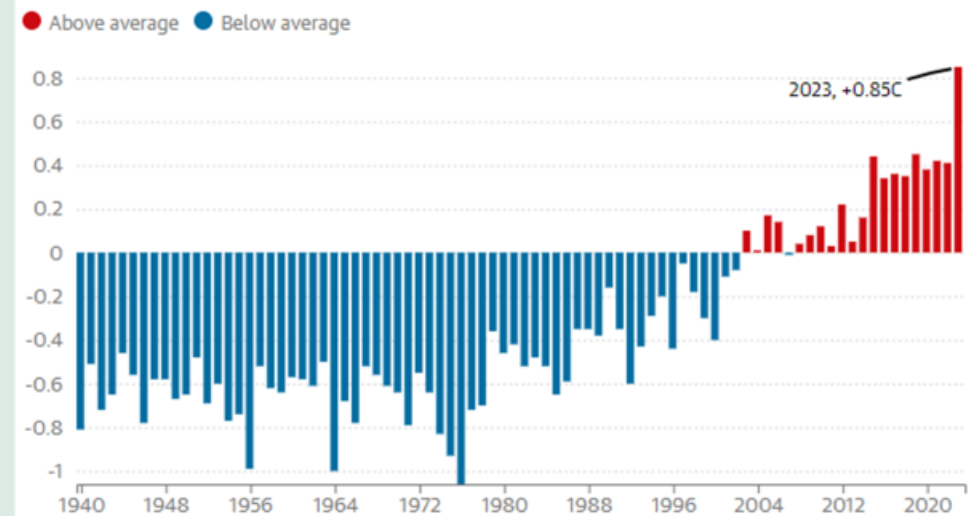
Prepare for exceeding 1.5 degrees

- Samantha Burgess, deputy director of EU's Copernicus Climate Change Service: We can say with near certainty that 2023 will be the warmest year on record, and is currently 1.43°C above the pre-industrial average
- World Meteorological Organization (2023): For the first-time it is *more likely than not* that global surface temperature will exceed pre-industrial levels by 1.5 degrees in at least one of the next five years
- NB: IPCC uses 10 and 20 years' periods to determine whether the 1.5 degree Paris Agreement target is exceeded



October 2023 was the warmest October on record

Showing the global surface air temperature anomaly for each October from 1940 to 2023. The temperature anomaly is the difference between the temperature for a given month and the average from 1991 to 2020



Europe - a heatwave hotspot

Accelerated western European heatwave trends linked to more-persistent double jets over Eurasia

Efi Rousi^{1,2}, Kai Kornhuber^{1,2,3}, Goratz Beobide-Arsuaga^{4,5}, Fei Luo^{6,7} & Dim Coumou^{1,6,7}

Persistent heat extremes can have severe impacts on ecosystems and societies, including excess mortality, wildfires, and harvest failures. Here we identify **Europe as a heatwave hotspot, exhibiting upward trends that are three-to-four times faster compared to the rest of the northern midlatitudes over the past 42 years.** This accelerated trend is linked to atmospheric dynamical changes via an increase in the frequency and persistence of double jet stream states over Eurasia. We find that double jet occurrences are particularly important for

Rousi et al., 2022. Nat Commun.,



world weather attribution

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Without human-caused climate change temperatures of 40°C in the UK would have been extremely unlikely

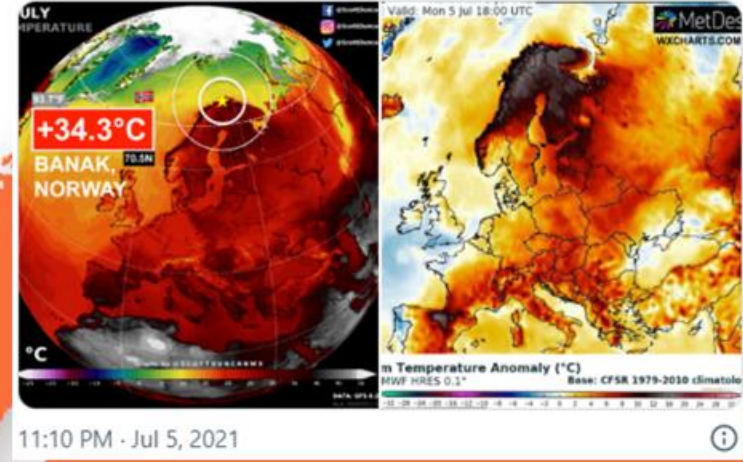


On Monday and Tuesday, 18 & 19 July 2022, an exceptional heatwave affected large parts of the UK. It was the first time that temperatures of 40°C and above have been forecast in the UK.

28 July, 2022 | HEATWAVE | EUROPE

Ageing populations:

Cardiovascular diseases causes 60% of deaths in East Europe; 52% in Central Europe; 34% in West Europe



Europe faces deadly, record-breaking heat wave



BritishRedCross
Europe heatwave 2023: extreme heat spirals into wildfires
Southern Europe has been at the centre of sustained and unprecedented heatwaves for more than two weeks.

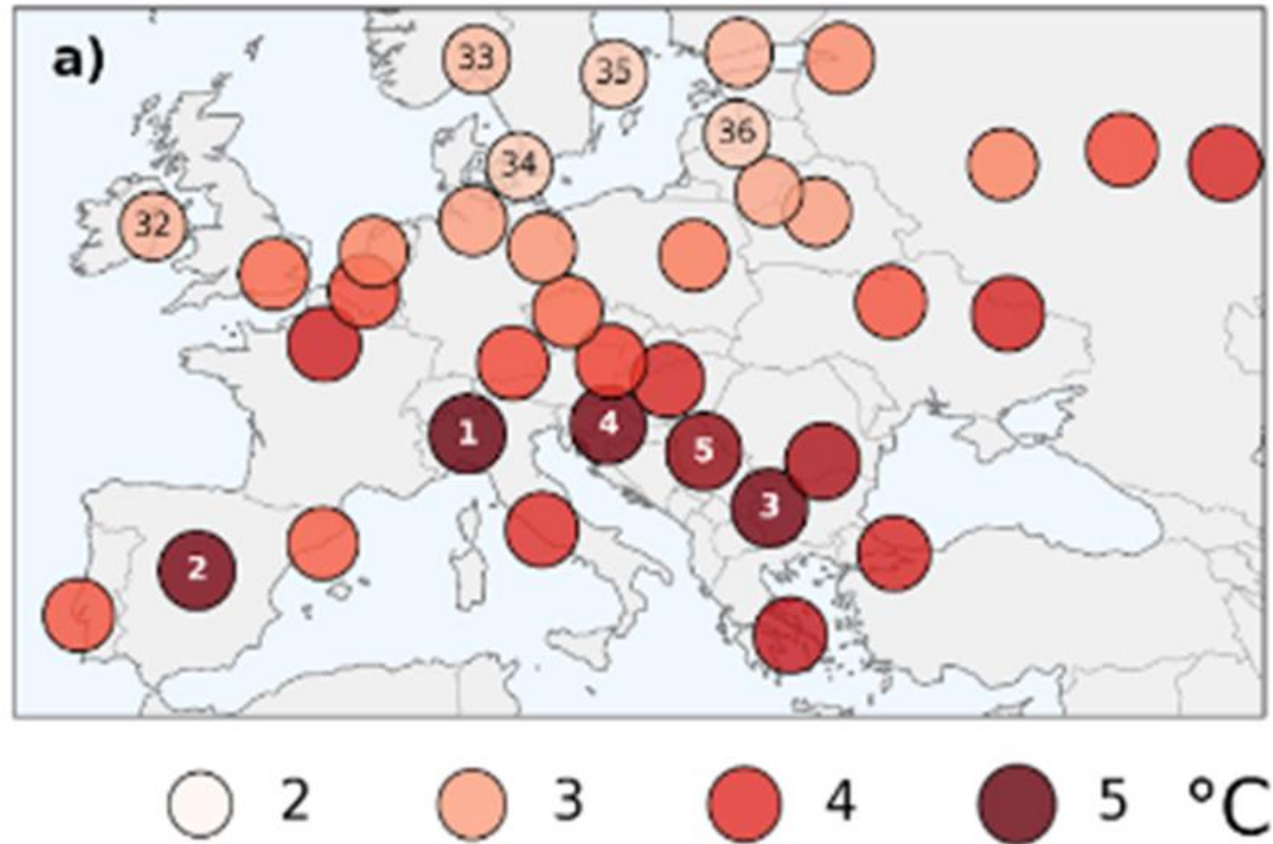
Met Office @metoffice
Today has provisionally seen the highest #temperature ever recorded in #Italy 🇮🇹 🚨
SIAS have confirmed that Siracusa in #Sicily reached 48.8°C earlier this afternoon and if verified by @WMO, it will become a new European temperature record 🇪🇺 🚨

48.8
Siracusa
New European Temperature Record (provisional)
Wednesday
363K views
7:25 PM · Aug 11, 2021
2.6K 202 Share this Tweet

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Cities are expected to increasingly become climate hotspots due to their high population density and (often) unfortunate layout enhancing local heat

Change in yearly maximum temperature (TXx) between 1981-2010 at 3 °C European warming,



Extreme heat and air pollution are both deadly –
and in combination things get worse

The double 'climate penalty':

- Global warming can worsen air quality through several mechanisms making it more difficult to reach air quality targets
- Concurrent exposure to heat and air pollution amplifies the health risks (especially for heart and lung disease)



What do the trends in heat and air pollution mean for the health of Europeans?

- What is the relationship between ambient temperatures and cardiovascular and respiratory death and disease in Europe (exposure-response relationship)?
- How does air pollution modify the relationship?
- Can we identify contextual and individual vulnerability factors and use the findings to project the future health burden and design climate policies?
- How will ambient temperatures and air pollution concentrations develop in Europe given different emission scenarios?
- What is the current and future health burden from heat stress and air pollution and what is the socio-economic costs and consequences of the health burden across the continent?

Topics covered in the conference

1. Projected warming and air pollution developments in Europe
 2. Health effects of interaction between heat and air pollution
 3. Current and projected temperature-related health burden in Europe
 4. Socio-economic costs of climate change and benefits of climate action
- Relevance of findings for EU policy making (mitigation and adaptation)
 - We welcome inputs as EXHAUSTION is finetuning our final recommendations





Thank you!

<https://exhaustion.eu>

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