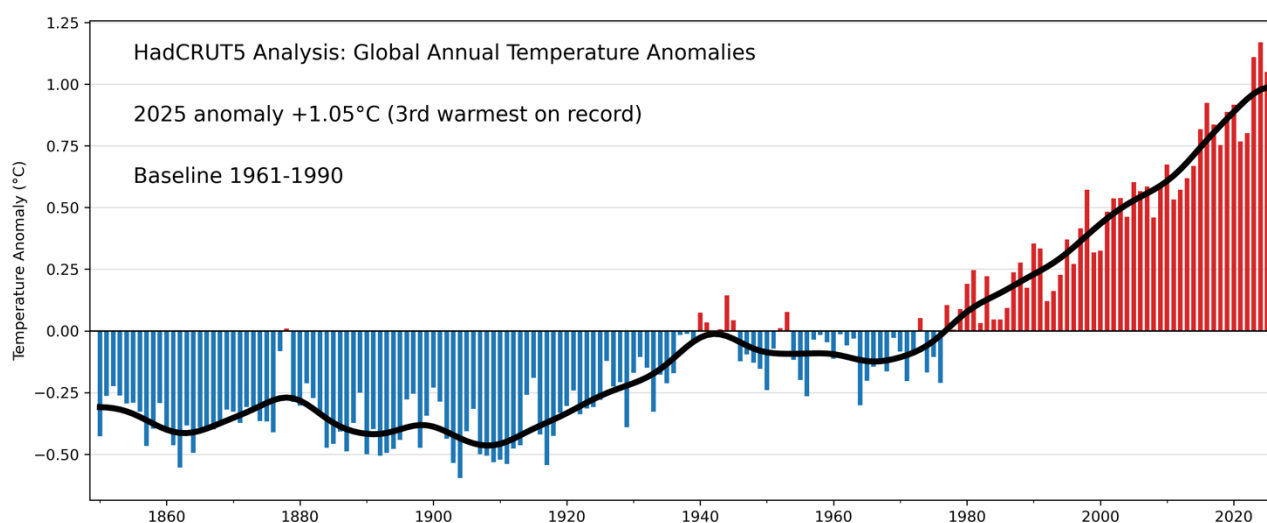


Global Temperature Record

Tim Osborn & Phil Jones



(this graph of HadCRUT5 Analysis temperature anomalies relative to the 1961-1990 baseline is also available as [PNG](#) and [PDF](#) suitable for publication and the data are available as [Comma-Separated Values](#))

The time series shows the combined global land and marine surface temperature record from 1850 to 2025.

Recent years and records. The last three years were the warmest three on record using our latest HadCRUT5 Analysis (Morice *et al.*, 2021) and they were also the warmest three on record in all other global near-surface temperature datasets. In all these datasets, 2024 was the warmest individual year on record. In our HadCRUT5 dataset, 2024 was 1.53°C (uncertainty range 1.44 to 1.61°C) above the 1850 to 1900 baseline, commonly used as the pre-industrial level. The latest complete year, 2025, was third warmest, at 1.41°C (uncertainty range 1.32 to 1.49°C) above the 1850 to 1900 baseline.

Short-term variability. A natural climate variation in the Pacific Ocean, known as the El Niño-Southern Oscillation, temporarily added about 0.1°C to the global temperature in 2023 and 2024. This natural influence weakened by 2025 and therefore the global temperature we observed in 2025 provides a clearer picture of the underlying warming (i.e. about 1.4°C above pre-industrial levels, but with an uncertainty of about 0.1°C arising mostly from uncertainty in the nineteenth century data).

Long-term warming. The long-term underlying warming, indicated by the smoothed black line in the figure above, is now about 1.4°C (uncertainty range 1.3 to 1.5°C) above its pre-1900 average.

Considering individual years, 2025 was also the twelfth year in succession that has equalled or exceeded 1.0°C above the pre-industrial baseline, and the third year in succession that it exceeded 1.4°C.

Each decade since the 1980s has been warmer than all preceding decades in our record. The average global temperature during the last 10 years (2016-2025) was $0.92(\pm 0.03)$ °C above the 1961-1990 average and $1.28(\pm 0.10)$ °C above the late nineteenth century average. The Earth's surface has warmed by about 0.2 °C per decade since the 1970s.

The HadCRUT5 time series is compiled jointly by the Climatic Research Unit at UEA and by the Met Office Hadley Centre. The UEA work is undertaken under the auspices of the UK's National Centre for Atmospheric Science (NCAS) funded by the Natural Environment Research Council.

The dominant cause of the long-term warming observed since the 19th century is clear: it is the increased concentrations of greenhouse gases in the atmosphere due to human activities.

The Intergovernmental Panel on Climate Change (IPCC) used our HadCRUT5 global temperature record in its most recent assessment published in 2021. Their assessment stated:

‘It is unequivocal that human influence has warmed the atmosphere, ocean and land. Widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred.’

‘Each of the last four decades has been successively warmer than any decade that preceded it since 1850. Human influence has warmed the climate at a rate that is unprecedented in at least the last 2000 years.’

Links

Global temperature datasets	https://crudata.uea.ac.uk/cru/data/temperature/
Further graphs and maps of global temperature	https://crudata.uea.ac.uk/~timo/diag/tempdiag.htm
Climatic Research Unit 2024 global temperature report	https://crudata.uea.ac.uk/cru/data/t2024/
Central England Temperature (CET) data	https://www.metoffice.gov.uk/hadobs/hadcet/
IPCC: Intergovernmental Panel on Climate Change	http://www.ipcc.ch/
Latest IPCC report from Working Group 1	http://www.ipcc.ch/report/ar6/wg1/

The reference for this global temperature time series is:

Morice, C.P., Kennedy, J.J., Rayner, Winn, J.P., Hogan, E., Killick, R.E., Dunn, R.J.H., Osborn, T.J., Jones, P.D., and Simpson, I.R., 2021: An updated assessment of near-surface temperature change from 1850: the HadCRUT5 dataset. *Journal of Geophysical Research*, **126**, e2019JD032361 <https://doi.org/10.1029/2019JD032361>

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