Global Temperature Record
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Global air temperature
2019 anomaly +0.74°C
(3rd warmest on record)
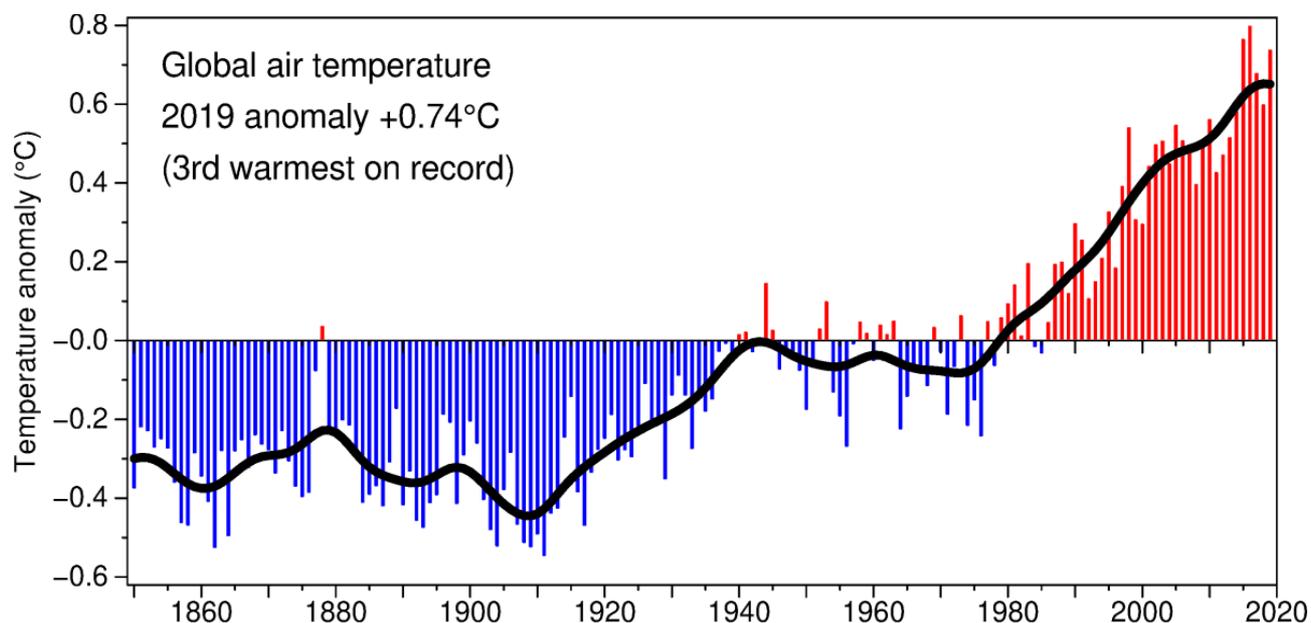
(this graph of HadCRUT4 is also available as Encapsulated PostScript and PDF suitable for publication and the data are available as Comma-Separated Values)

The time series shows the combined global land and marine surface temperature record from 1850 to 2019. Last year (2019) was the third warmest on record using our latest analysis, referred to as HadCRUT4.6 (Morice *et al.*, 2012).

Each decade since the 1980s has been warmer than all preceding decades in our record. The average global temperature during the 2010s (2010-2019) was 0.61(±0.05)°C above the 1961-1990 average, which is 0.93°C above the late nineteenth century average. The Earth's surface has warmed by about 0.17°C per decade since the 1970s. Not surprisingly, the last five years are the warmest five years in our record.

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

Increased concentrations of greenhouse gases in the atmosphere due to human activities are the dominant cause of the long-term warming observed since the 19th century. The warmth or coldness of individual years is strongly influenced by whether there was an El Niño or a La Niña event occurring in the equatorial Pacific Ocean.

The Intergovernmental Panel on Climate Change (IPCC) in its most recent assessment report in 2013 stated:

'Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, sea level has risen, and the concentrations of greenhouse gases have increased'

'Human influence on the climate system is clear. This is evident from the increasing greenhouse gas concentrations in the atmosphere, positive radiative forcing, observed warming, and understanding of the climate system'

'Human influence has been detected in warming of the atmosphere and the ocean, in changes in the global water cycle, in reductions in snow and ice, in global mean sea level rise, and in changes in some climate extremes. It is extremely likely that human influence has been the dominant cause of the observed warming since the mid-20th century'

Links

Global temperature anomaly datasets	http://www.cru.uea.ac.uk/cru/data/temperature/
Further graphs and maps of global temperature	https://crudata.uea.ac.uk/~timo/diag/tempdiag.htm
Central England Temperature (CET) data	http://hadobs.metoffice.com/hadcet/
IPCC: the Intergovernmental Panel on Climate Change	http://www.ipcc.ch/
Latest IPCC report from Working Group 1	http://www.ipcc.ch/report/ar5/wg1/

The key reference for this time series is:

Morice, C.P., Kennedy, J.J., Rayner, N.A. and Jones, P.D., 2012: Quantifying uncertainties in global and regional temperature change using an ensemble of observational estimates: the HadCRUT4 dataset. *Journal of Geophysical Research,* **117**, D08101, doi:10.1029/2011JD017187