

2016: one of the warmest two years on record

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Provisional full-year figures for global average near-surface temperatures confirm that last year, 2016, was one of the warmest two years on record, nominally exceeding the record temperature of 2015.

When viewed alongside 2015, the two years are the warmest in an annual series of figures that starts in 1850.

Scientists at the Met Office Hadley Centre and the University of East Anglia's Climatic Research Unit produce the HadCRUT4 dataset, which is used to estimate global temperature. The global temperature series shows that 2016 was 0.77 ± 0.1 °C above the long-term (1961-1990) average, nominally a record since at least 1850. When compared with the 1850 to 1900 baseline – which is indicative of pre-industrial temperatures – the 2016 average global temperature anomaly was around 1.1 °C (see below). For comparison, 2015 was 0.76 ± 0.1 °C above the long-term (1961-1990) average.

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[Peter Stott](#) is Acting Director of the Met Office Hadley Centre. He said: “The final figures confirm that 2016 was yet another extremely warm year. In the HadCRUT4 dataset the temperature for last year was very close to the year before, temperatures for 2016 exceeding those for 2015 by a small margin. 2015 was remarkable for having stood out so clearly from previous years as the warmest year since 1850 and now 2016 turns out to have been just as warm.

“A particularly strong [El Niño](#) event contributed about 0.2C to the annual average for 2016, which was about 1.1C above the long term average from 1850 to 1900. However, the main contributor to warming over the last 150 years is human influence on climate from increasing greenhouse gases in the atmosphere.”

The estimated figure of 0.77°C ±0.1 °C above the long-term (1961-1990) average is within the predicted range from the [Met Office annual average global temperature forecast for 2016](#), which said ‘the global mean temperature for 2016 is expected to be between 0.72 °C and 0.96 °C above the long-term (1961-1990) average’. The 2016 forecast, made at the end of 2015, also correctly predicted that 2016 would be one of the warmest years in the record.

[Prof Tim Osborn](#) is the Director of Research at the University of East Anglia’s [Climatic Research Unit](#). He said: “Multiple lines of independent evidence confirm that the planet has warmed over the last 150 years: warmer oceans, warmer land, warmer lower atmosphere and melting ice. This long-term trend is the main cause for the record warmth of 2015 and 2016, surpassing all previous years – even ones with strong El Niño events – in the HadCRUT4 global temperature record.”

Updates to the [HadCRUT4](#) dataset are compiled from many thousands of temperature measurements taken across the globe, on land and at sea, each day.

Uncertainties arising from incomplete global coverage, particularly a lack of observations from polar regions, and limitations of the measurements used to produce the data sets, have been included in the calculations. Peter Stott added: “Remaining uncertainties are much smaller than the overall warming since pre-industrial times.”

[NASA](#) and [NOAA](#) have also published their global mean temperature estimates for 2016 at 3.30pm today. Differences between the various estimates arise largely from the way that the data-sparse polar regions are handled.

Global temperatures compared to pre-industrial (1850-1900)



The table below provides the temperature increase (anomaly) for each year between 2000 and 2016, relative to the long-term average of the period 1961 to 1990.

Year	Anomaly	95% confidence range
	(°C relative to 1961-1990)	(°C relative to 1961-1990)
2016	0.77	[0.69 to 0.87]
2015	0.76	[0.67 to 0.85]
2014	0.58	[0.49 to 0.67]
2013	0.51	[0.42 to 0.60]
2012	0.47	[0.38 to 0.56]
2011	0.42	[0.33 to 0.51]
2010	0.56	[0.47 to 0.65]
2009	0.51	[0.42 to 0.60]
2008	0.39	[0.31 to 0.48]
2007	0.49	[0.41 to 0.58]
2006	0.51	[0.42 to 0.60]
2005	0.54	[0.45 to 0.64]

2004	0.45	[0.36 to 0.54]
2003	0.51	[0.42 to 0.60]
2002	0.50	[0.41 to 0.59]
2001	0.44	[0.35 to 0.53]
2000	0.29	[0.21 to 0.39]