Was 2014 the Warmest Year on Record? No, It Wasn’t...
Was 2014 the Warmest Year on Record?

No, It Wasn’t...

by Christopher Monckton of Brenchley | January 20, 2015

Nature trumpets “2014 was the hottest year on record,” citing the Japan Meteorological Agency, the World Meteorological Organization, and NOAA. However, NOAA and several other principal terrestrial temperature datasets – which are anyway subject to measurement, coverage and bias uncertainties and have been repeatedly revised in a questionable fashion over the past year to show ever greater warming rates – have not yet reported their December 2014 values.

The two satellite datasets – RSS and UAH – have both reported. Figure 1 shows the mean of the monthly anomalies on the two datasets since the beginning of the record in January 1979.

It is at once apparent from the graph that 2014 was not “the warmest year on record.” Several previous years had been warmer, including the El Niño years 1998 and 2010. In fact, some 70% of the years since the last Ice Age were warmer than today.

Figure 1 also shows that the rate of global warming since 1979 is the equivalent of just 1.3 Celsius degrees per century – hardly anything to worry about.

Since 1990, the year when the IPCC first predicted how temperatures would evolve in the short to medium term, the measured rate of global warming – this time taken as the mean of all five
principal global-temperature datasets – has been just under half of the warming the IPCC had predicted with “substantial confidence” that year (Fig. 2).

According to the RSS satellite data, there has been no global warming – at all – for 18 years 3 months, notwithstanding ever-more-rapid increases in CO$_2$ concentration (Fig. 3). The Nature article incorrectly states that the hiatus in global warming “began around 1998”. In fact, it began in 1996.
The *Nature* article also says “High temperatures in California in 2014 helped drive widespread drought there.” However, Hao *et al.* (2014) show a decline in the global land area under drought over the past 30 years (Fig. 4).

Figure 4. Percentage of the global land surface under drought conditions, 1983-2012. Based on Hao *et al.* (2014), Fig. 5.

The *Nature* article continues: “The warmth in 2014 is also notable for another reason: the absence of El Niño.” Here, too, *Nature* has it wrong. Weak but definite El Niño conditions prevailed in the last six months of 2014. One might more plausibly argue, therefore, that the absence of record temperatures in 2014 was startling given the El Niño conditions, the ever-rising CO₂ concentration, and the exaggerated predictions of the “consensus” climate models.

*Nature* admits, grudgingly, that there has been a “slowdown” in global warming over the past decade and a half, from the 1950-2012 average of 0.12 °C/decade to 0.05 °C/decade. However, *Nature* incorrectly attributes the “slowdown” to the notion that “the warming temperatures have been collecting in the bases of oceans instead.”

This notion, advanced by a small group of climate scientists each taking it in turn to be the lead author, so that the idea seems to be (but is not) widespread in the literature, can be verified in the simplest manner.
Though the 3500 automated ARGO bathythermograph buoys deployed throughout the oceans measure ocean temperature change directly, before publication the temperature change is converted into ocean heat content change in Joules, making the change seem larger.

Converting the ocean heat content change back to temperature change is highly revealing. It shows how little change has really been measured.

The increase in ocean heat content over the 94 ARGO months September 2005 to June 2013 was \(10 \times 10^{22} \text{ J} = 100 \text{ ZJ} = 100,000 \text{ XJ}\) (Fig. 5). Sounds big and alarming.

![Figure 5. Ocean heat content change, 1957-2013, from NODC Ocean Climate Laboratory: http://www.nodc.noaa.gov/OC5/3M_HEAT_CONTENT.](image)

There are 0.65 \(\text{Xm}^3\) in the upper 2000 m of the oceans. Each cubic meter of ocean water weighs 1.033 tonnes. To raise 1 tonne by 1 Kelvin requires 4 MJ of heat energy. Thus, to raise 0.65 \(\text{Xm}^3\) x 1.033 tonnes per cubic meter = 0.67145 \(\text{Xt}\)e of upper-ocean water by 4 MJ per tonne requires 2,685,800 \(\text{XJ}\). Then the 100,000 \(\text{XJ}\) of ocean heat content increase in the past 94 months represents a total ocean warming 0.037233 K, equivalent to less than 0.0475 K per decade.

Accordingly, even on the quite extreme NODC ocean heat content record (Fig. 5), the change in mean ocean temperature in the upper 2000 m in recent decades has been less than 0.05 K per decade – which is precisely the change in air temperature that *Nature* will concede has occurred in the past decade and a half. Therefore, there is no need to look any deeper than the upper or “mixed” 2000 m of the ocean. The abyssal layer – which has scarcely been measured – is in any event mostly very cold – often as little as 4 Celsius degrees.
The ARGO bathythermographs show much less warming than NOAA would like us to believe. Each buoy has to measure 300,000 km$^3$ of ocean – the equivalent of taking a single temperature and salinity measurement in the whole of Lake Superior less than once a year and expecting the results to be reliable.

The truth – not that any of this will ever be explained in Nature – is that we do not have a sufficiently-resolved record to know whether the ocean is warming at all: but the simplest guide to whether the ocean is warming is to study whether the air (1000 times less dense than the ocean) is warming. If the air is not warming, as it has not warmed for at least a decade, then the ocean is not warming either.

The Nature article says that the warming of 0.05 Celsius degrees in 2014 “should chasten climate sceptics who have used the past decade’s temperatures to deny that climate change is happening.” On the contrary, those who have repeatedly tampered with the terrestrial temperature record and have relied chiefly on the tampered results for their assertion that 2014 was “the warmest year on record” should be thoroughly ashamed of themselves.

But they won’t be. Their strategy is now clear: cut worldwide CO$_2$ emissions even though this is plainly unnecessary, and then – when temperature fails to rise as predicted – assert that the absence of global warming that would not have happened in any event is attributable to emissions cuts. On this daft basis, the world’s governments make policy at taxpayers’ expense.

Cover photo of a sunset on a really hot day by Dejan H. as posted to Wikimedia Commons under the Creative Commons Attribution 2.0 Generic license.