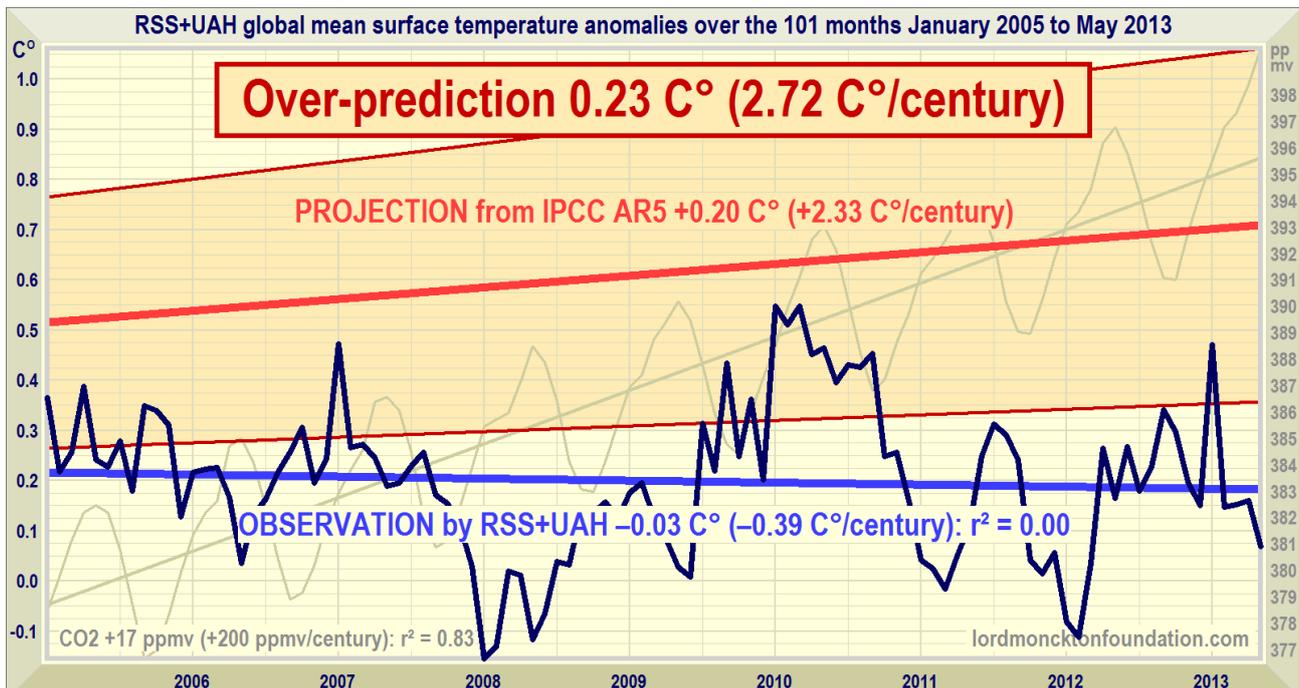
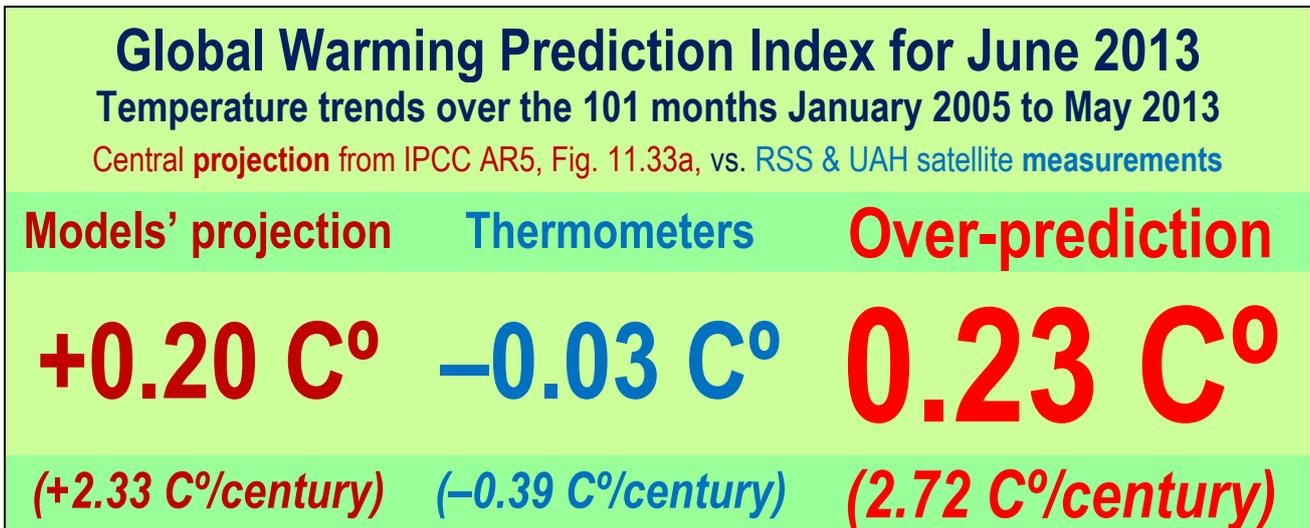


The Global Warming Prediction Index: a new monthly reality check on models' forecasts

Is the world warming faster than predicted? Just as predicted? Or at all? Or is it cooling?
For the first time ever, the LMF monthly prediction index and graph compare the latest official IPCC projections of global warming with real-world temperature change measured by satellites.

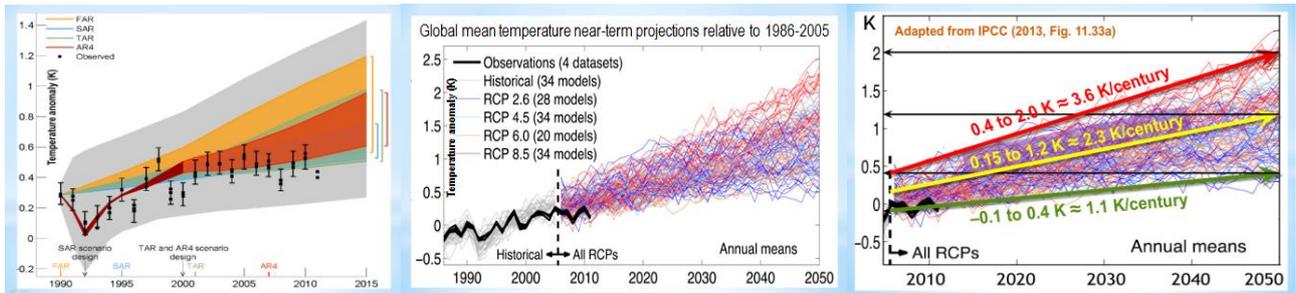


The monthly comparison graph shows 34 models' projections of global warming since January 2005 in the IPCC's forthcoming *Fifth Assessment Report* (AR5: Fig. 11.33a) as an orange region. The central projection, the thick red line, is that the world should have warmed by 0.20 C° since January 2005, at a rate equivalent to +2.33 C°/century. Yet the mean of the RSS and UAH satellite measurements, the dark blue spline-curve over a bright blue trend-line, shows global cooling of 0.03 C° over the 101 months, equivalent to -0.39 C°/century. Since 2005 the models have thus over-predicted warming by 0.23 C°, equivalent to +2.72 C°/century. The correlation coefficient is zero and the period of study is short, but warming since 2005 is nothing like as rapid as predicted. The mismatch between the significant increase of 17 ppmv (200 ppmv/century) in the gray dogtooth curve of CO2 concentration and the insignificant cooling since 2005 is striking.

How the monthly graph is compiled

The IPCC's forthcoming *Fifth Assessment Report* (AR5, 2013, in press) reveals that all four previous *Assessment Reports* have over-projected global warming (AR5, Fig. 1.4: left panel below).

The *Fifth Assessment Report* backcasts to 2005 its plots of the combined global-warming projections made by up to 34 climate models on each of four radiative-forcing scenarios (AR5, Fig. 11.33a: center panel).



The 34 models' high, central and low projections of global warming since 2005, derived from the IPCC's Figure 11.33a as shown in the right panel above, are represented by the orange region of the monthly comparison graph (overleaf).

During the training period from 2005-2013, most of the models' backcast projections fall appreciably above the observed temperature record, shown in black in the center panel above. The central projection is 0.3 C° above observation at January 2005. This unusual relationship between the starting-points of the models' global-warming projections and of observed temperature change since January 2005 is reproduced exactly in the monthly comparison graph.

The graph benchmarks the IPCC's official projections of global warming, shown in red, against satellite-measured temperature change, the dark blue spline-curve overlying a bright blue least-squares linear-regression trend-line.

Linear regression was preferred because higher-order polynomial fits are not suitable where – as here – the combined uncertainties arising from measurement and sampling errors, bias, and incomplete coverage are substantial.

The temperature values represented in dark blue in the comparison graph are the arithmetic mean of the latest monthly global mean surface temperature anomalies from Remote Sensing Systems, Inc., and the University of Alabama at Huntsville. To obtain absolute values, add 14 °C. The CO2 concentration record is from Mauna Loa, Hawaii.

Results to date compared with January 2005

Months	Jan '05 to	CO ₂ conc.	/century	Predicted	C°/century	Observed	C°/century	Variance	C°/century
1	Jan 2005	378 µatm		14.52 C°		14.22 C°		0.30 C°	
100	Apr 2013	+16 µatm	+197 µatm	+0.19 C°	+2.33 C°	-0.03 C°	-0.31 C°	+0.22 C°	+2.64 C°
101	May 2013	+17 µatm	+200 µatm	+0.20 C°	+2.33 C°	-0.03 C°	-0.39 C°	+0.23 C°	+2.72 C°

Data sources

Intergovernmental Panel on Climate Change, 2013 [in press], *Fifth Assessment Report*, Fig. 11.33a.

National Oceanographic and Atmospheric Administration, 2013, Monthly mean CO₂ concentration at Mauna Loa, Hawaii, since March 1958, downloadable from http://ftp.cmdl.noaa.gov/ccg/co2/trends/co2_mm_mlo.txt.

Remote Sensing Systems, Inc., 2013, Monthly global mean lower-troposphere temperature anomalies, downloadable from remss.com/data/msu/monthly_time_series/RSS_Monthly_MSU_AMSU_Channel_TLT_Anomalies_Land_and_Ocean_v03_3.txt.

University of Alabama at Huntsville, 2013, Monthly global mean lower-troposphere temperature anomalies, downloadable from vortex.nsstc.uah.edu/data/msu/t2lt/uahncdc.lt.