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Global Temperature Report: November 2014

36 years of data show regional warming

Global climate trend since Nov. 16, 1978: +0.14 C per decade

November temperatures (preliminary)

Global composite temp.: +0.33 C (about 0.60 degrees Fahrenheit) above 30-year average for November.

Northern Hemisphere: +0.36 C (about 0.65 degrees Fahrenheit) above 30-year average for November.

Southern Hemisphere: +0.30 C (about 0.54 degrees Fahrenheit) above 30-year average for November.

Tropics: +0.25 C (about 0.45 degrees Fahrenheit) above 30-year average for November.

October temperatures (revised):

Global Composite: +0.37 C above 30-year average

Northern Hemisphere: +0.33 C above 30-year average

Southern Hemisphere: +0.40 C above 30-year average

Tropics: +0.19 C above 30-year average

(All temperature anomalies are based on a 30-year average (1981-2010) for the month reported.)

Notes on data released Dec. 2, 2014:

November 2014 was the second warmest November in the 36-year global satellite temperature record, according to Dr. John Christy, a professor of atmospheric science and director of the Earth System Science Center at The University of Alabama in Huntsville. With a global average temperature that was 0.33 C (about 0.60 degrees Fahrenheit) warmer than seasonal norms, November 2014 trailed only November 2009, which averaged 0.39 C (about 0.70 degrees Fahrenheit) warmer than seasonal norms.

The tropics slowly warmed through November in response to modest warming in the El Niño regions of the eastern tropical Pacific Ocean.

Warmest Novembers (1979-2014)
(Warmer than seasonal norms)

1.	2009	+0.39 C
2.	2014	+0.33 C
3.	2005	+0.32 C
4.	2012	+0.31 C
5.	2002	+0.25 C
6.	2010	+0.24 C
7.	2003	+0.21 C
8.	1990	+0.20 C
	2006	+0.20 C
10.	2008	+0.19 C
	2013	+0.19 C

Compared to seasonal norms, the coldest place in Earth's atmosphere in November was in northwestern Wisconsin, just outside the town of Cable, where temperatures were as much as 3.29 C (about 5.92 degrees Fahrenheit) colder than seasonal norms. Compared to seasonal norms, the warmest departure from average in November was in the Beaufort Sea off the northern coast of Alaska. Temperatures there were as much as 5.20 C (about 9.36 degrees Fahrenheit) warmer than seasonal norms.

This report represents the completion of 36 years (December 1978 through November 2014) of global temperature data collected by microwave sounding units on NOAA and NASA satellites. During that time the global atmosphere has warmed an average of 0.14 C per decade, or just over one-half degree C (0.91 degrees Fahrenheit) in 36 years.

That warming has not, however, been uniform around the globe. The fastest warming has been over the Arctic Ocean and the Arctic portions of the Atlantic

and Pacific oceans. Those areas have warmed at the rate of 0.49 C per decade, or more than 1.76 C (about 3.17 degrees Fahrenheit) in 36 years. The fastest warming spot is in Baffin Bay, where temperatures have risen 0.82 C per decade since 1978.

By comparison, the oceans surrounding the Antarctic are cooling at the rate of 0.02 C per decade, or 0.07 C since December 1978. The fastest cooling area is in East Antarctica near Dome C, where temperatures have been dropping at the rate of 0.50 C per decade.

Driven in part by those contrasting regions, the Northern Hemisphere is warming more than twice as fast as the Southern Hemisphere (0.19 C per decade vs. 0.09 C per decade).

The contiguous 48 U.S. states have an average warming rate of 0.22 C (almost 0.40 degrees Fahrenheit) per decade during the past 36 years. That means the average atmospheric temperature over the lower 48 has warmed by 0.79 C or about 1.43 degrees Fahrenheit during that time.

Archived color maps of local temperature anomalies are available on-line at:

http://nsstc.uah.edu/climate/

As part of an ongoing joint project between UAHuntsville, NOAA and NASA, Christy and Dr. Roy Spencer, an ESSC principal scientist, use data gathered by advanced microwave sounding units on NOAA and NASA satellites to get accurate temperature readings for almost all regions of the Earth. This includes remote desert, ocean and rain forest areas where reliable climate data are not otherwise available.

The satellite-based instruments measure the temperature of the atmosphere from the surface up to an altitude of about eight kilometers above sea level. Once the monthly temperature data is collected and processed, it is placed in a "public" computer file for immediate access by atmospheric scientists in the U.S. and abroad.

Neither Christy nor Spencer receives any research support or funding from oil, coal or industrial companies or organizations, or from any private or special interest groups. All of their climate research funding comes from federal and state grants or contracts.