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## **Global Temperature Report: November 2012**

### **34 years of satellite temperature data show global warming is on a plateau**

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

November temperatures (preliminary)

Global composite temp.: +0.28 C (about 0.50 degrees Fahrenheit) above 30-year average for November.

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

Southern Hemisphere: +0.26 C (about 0.47 degrees Fahrenheit) above 30-year average for November.

Tropics: +0.17 C (about 0.31 degrees Fahrenheit) above 30-

year average for November.

October temperatures (revised):

Global Composite: +0.33 C above 30-year average

Northern Hemisphere: +0.31 C above 30-year average

Southern Hemisphere: +0.36 C above 30-year average

Tropics: +0.11 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. 12, 2012:

The lowest level of the global atmosphere has warmed almost one half of a degree Celsius (0.48 C or 0.86 degrees Fahrenheit) during the 34 years since instruments aboard NOAA and NASA satellites started collecting data on global temperatures in late November 1978, 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. While the atmosphere has warmed over the full 34-year time span, it has not warmed noticeably since the major El Niño of 1997-98 — giving us about a decade and a half of generally stable temperatures.

Since 2002, there has been a plateau of relatively warmer temperatures with only 12 months when the global average temperature was cooler than the long-term seasonal norm. In fact, compared to the 30-year temperature baseline, the most recent five years (12/07-11/12) averaged only 0.003 C (0.173 to 0.176 above seasonal norms) warmer than the preceding five years (12/02-11/07).

Regionally, 34-year trends show the greatest warming in the north polar regions with a relative lack of warming in the tropics. Trends in some of the south polar areas and over portions of the Pacific Ocean are actually cooler, but globally, 86 percent of the Earth has seen a positive warming trend since December 1978.

The long term 0.14 C per decade warming trend measured by microwave sounding units on a series of satellites is consistent with the low-end of global climate change predictions made by some climate models; it is also within the potential range of natural climate variability, especially since most of the warming happened over such a short period of time.

“There are so many natural variations and oscillations that we just can’t say that this looks like a human fingerprint on the lower atmosphere’s climate,” said Christy. “We know that some human activities must have an impact on the climate system. But one has considerable difficulty in looking at what has happened over the past 34 years and reasonably or with scientific accuracy saying whether or by how much the change has been natural or caused by us.

“Changes of this amount over these time scales could be essentially natural. Such a hypothesis has not been proven false. Scientists would love to have these types of measurements from the past 2,000 years to see to what extent Mother Nature can cause changes over decades on her own. But the thorny question of how sensitive the climate is to extra greenhouse gases we are putting into the air is still up in the air.”

Compared to seasonal norms, over the past month the coldest area on the globe in November was southeastern coastal Greenland, where temperatures were as much as 3.37 C (about 6.1 degrees Fahrenheit) cooler than seasonal

norms. Most of Greenland was cooler than normal in November. The "warmest" area was in the eastern Siberian Sea, where temperatures averaged 5.80 C (about 10.4 degrees Fahrenheit) warmer than seasonal norms for November.

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

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

The processed temperature data is available on-line at:

[vortex.nsstc.uah.edu/data/msu/t2lt/uahncdc.lt](http://vortex.nsstc.uah.edu/data/msu/t2lt/uahncdc.lt)

As part of an ongoing joint project between UAHuntsville, NOAA and NASA, John Christy, a professor of atmospheric science and director of the Earth System Science Center (ESSC) at The University of Alabama in Huntsville, 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.