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**Global Temperature Report: December 2014**

# 2014 was third warmest, but barely

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

December temperatures (preliminary)

Global composite temp.: +0.32 C (about 0.58 degrees Fahrenheit) above 30-year average for December.

Northern Hemisphere: +0.46 C (about 0.83 degrees Fahrenheit) above 30-year average for December.

Southern Hemisphere: +0.18 C (about 0.32 degrees Fahrenheit) above 30-year average for December.

Tropics: +0.30 C (about 0.54 degrees Fahrenheit) above 30-year average for December.

November temperatures (revised):

Global Composite: +0.33 C above 30-year average

Northern Hemisphere: +0.35 C above 30-year average

Southern Hemisphere: +0.30 C above 30-year average

Tropics: +0.25 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 Jan. 3, 2015:**

2014 was the third warmest year in the 36-year global satellite temperature record, but by such a small margin (0.01 C) as to be statistically similar to other recent years, 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. "2014 was warm, but not special. The 0.01 C difference between 2014 and 2005, or the 0.02 difference with 2013 are not statistically different from zero. That might not be a very satisfying conclusion, but it is at least accurate."

The 2014 average temperature anomaly is also in keeping with temperatures since late 2001, when the global average temperature rose to a level that is generally warmer than the 30-year baseline average. The most recent 13 complete calendar years, from 2002 through 2014, have averaged 0.18 C (about 0.33 degrees Fahrenheit) warmer than the 30-year baseline average, while the global temperature trend during that span was a warming trend at the rate of +0.05 C per decade — which is also statistically insignificant.

Compared to seasonal norms, the coldest annual average temperature on Earth throughout 2014 was just south of Wilmar, Minnesota. The average 2014 temperature there was –1.27 C (about 2.29 degrees F) colder than normal. The 'warmest' place throughout 2014 was just south of the North Pole along the International Date Line. Temperatures there averaged 1.65 C (about 2.97 degrees F) warmer than normal for the year.

**Annual Global Temperature Anomalies, ranked**

| | | |
|---|---|---|
| 1. | 1998 | 0.42 |
| 2. | 2010 | 0.40 |
| 3. | **2014** | **0.27** |
| 4. | 2005 | 0.26 |
| 5. | 2013 | 0.24 |
| 6. | 2002 | 0.22 |
| 7. | 2009 | 0.21 |
| 8. | 2007 | 0.20 |
| 9. | 2003 | 0.19 |
| 10. | 2006 | 0.19 |
| 11. | 2012 | 0.17 |
| 12. | 2011 | 0.13 |
| 13. | 2004 | 0.11 |
| 14. | 2001 | 0.11 |
| 15. | 1991 | 0.02 |
| 16. | 1987 | 0.01 |
| 17. | 1995 | 0.01 |
| 18. | 1988 | 0.01 |
| 19. | 1980 | -0.01 |
| 20. | 2008 | -0.01 |

| | | |
|---|---|---|
| 21. | 1990 | -0.02 |
| 22. | 1981 | -0.05 |
| 23. | 1997 | -0.05 |
| 24. | 1999 | -0.06 |
| 25. | 1983 | -0.06 |
| 26. | 2000 | -0.06 |
| 27. | 1996 | -0.08 |
| 28. | 1994 | -0.11 |
| 29. | 1979 | -0.17 |
| 30. | 1989 | -0.21 |
| 31. | 1986 | -0.24 |
| 32. | 1993 | -0.25 |
| 33. | 1982 | -0.25 |
| 34. | 1992 | -0.29 |
| 36. | 1985 | -0.31 |
| 37. | 1984 | -0.35 |

With a global average temperature that was 0.32 C (about 0.58 degrees Fahrenheit) warmer than seasonal norms, December 2014 trailed only December 2003, which averaged 0.37 C (about 0.67 degrees Fahrenheit) warmer than seasonal norms, among the warmest Decembers in the satellite temperature record. While December 2014 ranked second warmest for both the globe and the Northern Hemisphere, it was only the sixth warmest December in the tropics despite an El Niño Pacific Ocean warming event that seems to be forming there.

**Warmest Decembers (1979-2014)**
*(Global average, warmer than seasonal norms)*

| | | |
|---|---|---|
| 1. | 2003 | +0.37 C |
| 2. | **2014** | **+0.32 C** |
| 3. | 1987 | +0.27 C |
| | 2013 | +0.27 C |
| 5. | 2009 | +0.24 C |
| 6. | 2012 | +0.23 C |
| 7. | 1997 | +0.22 C |
| | 2006 | +0.22 C |
| 9. | 1998 | +0.19 C |
| | 2005 | +0.19 C |

Compared to seasonal norms, the coldest place in Earth's atmosphere in December was in northwestern Greenland, where temperatures were as much as 2.70 C (about 4.86 degrees Fahrenheit) colder than seasonal norms. Compared to seasonal norms, the warmest departure from average in December was in central Russia, north of the town of Yeniseysk. Temperatures there were as much as 2.75 C (about 4.86 degrees Fahrenheit) warmer than seasonal norms.

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.

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