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Global Temperature Report: May 2016

May 2016 was 2nd warmest May in satellite record

Global climate trend since Nov. 16, 1978: +0.12 C per decade

May temperatures (preliminary)

Global composite temp.: +0.55 C (about 0.99 degrees Fahrenheit) above
30-year average for May.

Northern Hemisphere: +0.65 C (about 1.17 degrees Fahrenheit) above 30-year
average for May.

Southern Hemisphere: +0.44 C (about 0.79 degrees Fahrenheit) above 30-year

average for May.

Tropics: +.72 C (about 1.30 degrees Fahrenheit) above 30-year average for
May.

April temperatures (revised):

Global Composite: +0.72 C above 30-year average

Northern Hemisphere: +0.85 C above 30-year average

Southern Hemisphere: +0.58 C above 30-year average

Tropics: +0.94 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 June 2, 2016:

When is an anomaly just an anomaly and not necessarily part of a larger trend? Perhaps, when the anomaly is a significant outlier that can be linked to a specific cause.

May 2016 was the second warmest May in the satellite temperature record, trailing only May 1998 by 0.11 C, according to Dr. John Christy, director of the Earth System Science Center at The University of Alabama in Huntsville. Compared to seasonal norms, May 2016 was the 8th warmest month overall since the satellite temperature dataset began in December 1978.

The 16 warmest months (and 21 of the warmest 25) on the record, however, all happened during one of three El Niño

Pacific Ocean warming events (1997-98, 2009-10 and 2015-16). The effect is especially noticeable when comparing temperatures from a specific month. In the May data, three El Niño Mays are warmer than the other 35 by an amount that is statistically significant.

May anomalies
(compared to 30-year May norm)

1998	+0.65 C
2016	+0.55 C
2010	+0.41 C
2015	+0.27 C
2002	+0.25 C
2014	+0.25 C
2003	+0.21 C
2001	+0.20 C
2007	+0.14 C
2005	+0.13 C

That effect is more pronounced when looking at May temperatures in the tropics:

May anomalies, tropics
(compared to 30-year May norm)

1998	+0.98 C
2010	+0.80 C
2016	+0.72 C
1983	+0.28 C
2002	+0.27 C
2015	+0.26 C
2003	+0.19 C
2014	+0.18 C
1988	+0.18 C
1991	+0.17 C

The upshot, said Christy, is that while there is a clear

warming signal in the satellite temperature data, caution should be used when trying to extrapolate long-term conclusions about climate change based on months and years whose temperatures are obvious outliers driven by El Niño warming events.

The 2015-16 El Niño appears to be fading fast. Sea surface temperatures in the east central Pacific have fallen below norms, and a La Niña Pacific Ocean cooling event may be on its way. It is a tiny sample, but 3-year La Niña cooling followed immediately after strong El Niño events in 1972-73 and 1997-98.

"We should expect continued, but erratic cooling through the end of the year," Christy said. "In comparing the current El Niño to the major 1997-98 event, we see that globally the last two months have fallen below the values seen in 1998. The 'race' for the hottest year is getting closer. Through May, 2016 (+0.67 C warmer than seasonal norms) is leading 1998 (+0.60 C). Annual anomalies, however, are accurate to only ± 0.1 C, so the two years are really in a statistical tie."

Compared to seasonal norms, the warmest average temperature anomaly on Earth in May was just off the western coast of the Antarctic Peninsula. May temperatures there averaged 4.10 C (about 7.38 degrees F) warmer than seasonal norms. Compared to seasonal norms, the coolest average temperature on Earth in May was near South Georgia and the South Sandwich Islands in the South Atlantic, where the average May 2016 temperature was 3.08 C (about 5.54 degrees F) cooler than normal for May.

The complete version 6 beta lower troposphere dataset is available here:

http://vortex.nsstc.uah.edu/data/msu/v6.0beta/tlt/uahncdc_lt_6.0beta5.txt

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 are collected and processed, they are placed in a "public" computer file for immediate access by atmospheric scientists in the U.S. and abroad.

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