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For Additional Information:
Dr. John Christy, (256) 961-7763
christy@nsstc.uah.edu
Dr. Roy Spencer, (256) 961-7960
spencer@nsstc.uah.edu

Global Temperature Report: October 2018

Global climate trend since Dec. 1 1978: +0.13 C per decade

October Temperatures (preliminary)

Global composite temp.: +0.22 C (+0.40 °F) above seasonal average

Northern Hemisphere.: +0.31 C (+0.56°F) above seasonal average

Southern Hemisphere.: +0.12 C (+0.22 °F) above seasonal average

Tropics.: +0.34 C (+0.61 °F) above seasonal average

September Temperatures (final)

Global composite temp.: +0.14 C (+0.25 °F) above seasonal average

Northern Hemisphere.: +0.15 C (+0.27°F) above seasonal average

Southern Hemisphere.: +0.14 C (+0.25 °F) above seasonal average

Tropics.: +0.24 C (+0.43 °F) above seasonal average

Notes on data released November 1, 2018 (v6.0)

The global average bulk-layer atmospheric temperature rose slightly in October to +0.22°C (+0.40°F) led by warming in the tropics and NH high-latitude areas. High latitudes of the SH were below average. Once again the greatest contrast in temperatures occurred in the high northern latitudes with the warmest seasonally-adjusted temperature in the Arctic Ocean north of the Beaufort Sea (+5.1°C, +9.2°F) and the coolest over western Greenland at -3.9 °C (-6.9 °F).

Northern Russia was well above average while to its south temperatures were below average from the Arabian Peninsula eastward to the East China Sea. Europe was warmer than average. The conterminous US was slightly above average (+0.25°C, +0.45°F) thanks to a warm Southeast that more than balanced the cooler than average Southwest and northern Plains.

The evidence for an approaching warm phase of El Niño continues to get stronger according to NOAA, as the equatorial Pacific sea temperatures, both surface and deeper down, are now well above average. A good portion of this extra heat should make its way to the atmosphere in the coming months. If this occurs, we should see considerable tropical warming in the atmospheric layer the satellites monitor. We already see large regions in the Pacific with above average atmospheric temperatures on either side of the Equator – the normal signal of an El Niño.

Spoiler Alert: Well, the time is once again approaching when new changes are required for the currently operating satellites as their performance changes with age. NOAA-18 has been operating for 13 years and is now past its time frame for accurate diurnal adjustments based on initial drifting, meaning the adjustments are adding spurious warming to the time series. On the other hand, NOAA-19 has also drifted so far that it too is introducing an error, but given its direction of drift, these errors are of the opposite sign. The two satellites are almost compensating for each other, but not to our satisfaction. In addition, the current non-drifting satellite operated by the Europeans, MetOP-B, has not yet been adjusted or "neutralized" for it's seasonal peculiarities related to the diurnal cycle. While these MetOP-B peculiarities do not affect the long-term global trend, they do introduce error within a particular year in specific locations over land. So, all in all, we anticipate generating new adjustments for NOAA-18 and NOAA-19 to account for their behavior of late and shall also modify MetOP-B to account for it's unique seasonal cycle. This will be part of a coordinated plan to eventually merge NOAA's new microwave sensor (ATMS) carried on Suomi NPP and the new NOAA series JPSS. We are hoping that NOAA-19 will be the last spacecraft for which drifting adjustments will be required as the newer satellites (MetOP, NPP, JPSS) have on-board propulsion to keep them in stable orbits. With so many new items to test and then incorporate, we are waiting until we are confident that these adjustments/additions are appropriately stable before moving to the next version. In the meantime, we shall continue to produce v6.0.

As part of an ongoing joint project between UAH, NOAA and NASA, Christy and Dr. Roy Spencer, an ESSC principal scientist, use data gathered by advanced microwave sounding units on NOAA, NASA and European 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.

The complete version 6 lower troposphere dataset is available here:

http://www.nsstc.uah.edu/data/msu/v6.0/tlt/uahncdc_lt_6.0.txt

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

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

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.

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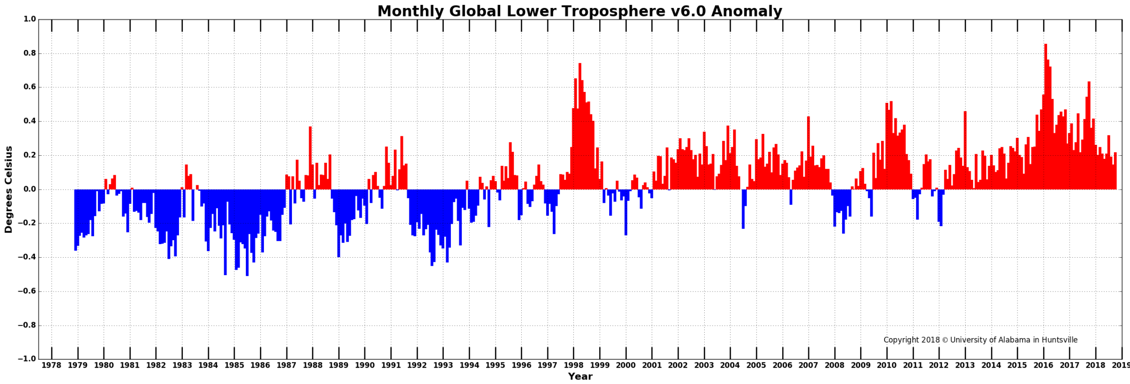
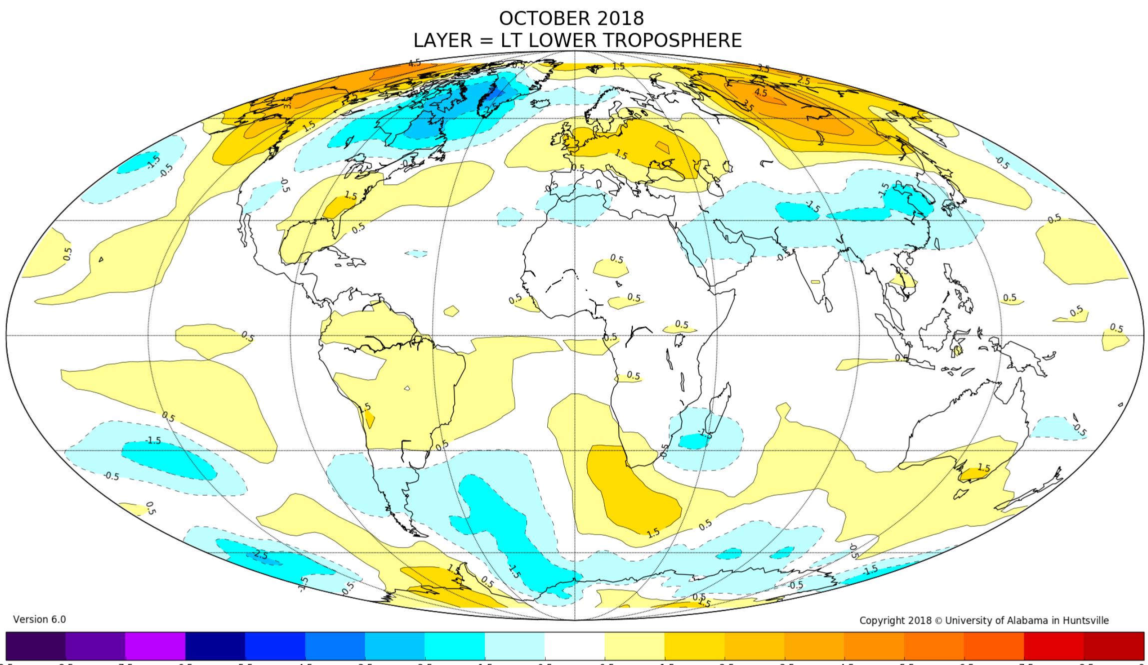


December 1978 to October 2018



Monthly Anomaly in °C

Broken lines outline areas that were cooler than seasonal norms; solid lines outline areas that were warmer than seasonal norms. Each contour represents one degree Celsius, starting at -0.5 and +0.5 degrees C.