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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: August 2019

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

August Temperatures (preliminary)

Global composite temp.: +0.38 C (+0.68 °F) above seasonal average

Northern Hemisphere.: +0.33 C (+0.59 °F) above seasonal average

Southern Hemisphere.: +0.44 C (+0.79°F) above seasonal average

Tropics.: +0.45 C (+0.81 °F) above seasonal average

July Temperatures (final)

Global composite temp.: +0.38 C (+0.68 °F) above seasonal average

Northern Hemisphere.: +0.38 C (+0.68 °F) above seasonal average

Southern Hemisphere.: +0.39 C (+0.70°F) above seasonal average

Tropics.: +0.42 C (+0.76 °F) above seasonal average

Notes on data released September 3, 2019 (v6.0)

August's globally-averaged, bulk-layer atmospheric temperature anomaly of +0.38°C (+0.68°F) represented no change from the previous month. Since November 2017, global temperature anomalies have remained in a fairly narrow range between +0.13°C and +0.47°C – relatively odd as this period included a modest La Niña and a modest El Niño. This month's global temperature is the 4th warmest August, but may be considered nearly tied for the 2nd warmest of the last 41 Augusts, since it is only slightly below August of 2016

(+0.44°C) and 2017 (+0.42°C). August of 1998 still holds the top spot at +0.52°C. The lingering effects of the 2019 El Niño appear to be keeping the tropics, and thus the globe, on the warm side of zero.

The conterminous U.S. experienced a month close to its average temperature (+0.17 °C, +0.31 °F) with warm departures in the West and cooler temperatures in the North-central section. August of 1995 was the hottest lower-48 August as measured by our UAH dataset at +1.47 °C (+2.65 °F). As was the case last month, the warmer than average weather in Alaska pushed up the 49-state average to +0.25 °C (+0.45°F), but still well within the average range.

Globally, locations with sustained warmer-than-average temperatures for the month appeared over West Antarctica (largest local departure from average of +4.0 °C near Marie Byrd Land), as well as over a broad southern subtropical band that included South Africa and the South Pacific, and also other areas in northeast Canada and north-central Russia.

The planet's coldest departure from average this month was -3.6 °C (almost where it was last month) in the South Atlantic Ocean between Antarctica and South Africa centered in a broad area of cooler than average weather. Other cold areas generally appear between the hot areas described above; northern Canada, north Atlantic, northwest Pacific, and the south Pacific near the dateline.

Spoiler Alert first published March 2019: As noted over the past several months in this report, the drifting of satellites NOAA-18 and NOAA-19, whose temperature errors were somewhat compensating each other, will be addressed in this updated version of data released from March 2019 onward. As we normally do in these situations we have decided to terminate ingestion of NOAA-18 observations as of 1 Jan 2017 because the corrections for its significant drift were no longer applicable. We have also applied the drift corrections for NOAA-19 now that it has started to drift far enough from its previous rather stable orbit. These actions will eliminate extra warming from NOAA-18 and extra cooling from NOAA-19. The net effect is to introduce slight changes from 2009 forward (when NOAA-19 began) with the largest impact on annual, global anomalies in 2017 of 0.02 °C. The 2018 global anomaly changed by only 0.003°C, from +0.228°C to +0.225°C. These changes reduce the global trend by -0.0007 °C/decade (i.e. 7 ten-thousandths of a degree) and therefore does not affect the conclusions one might draw from the dataset. The v6.0 methodology is unchanged as we normally stop ingesting satellites as they age and apply the v6.0 diurnal corrections as they drift.

To-Do List: There has been a delay in our ability to utilize and merge the new generation of microwave sensors (ATMS) on the NPP and JPSS satellites. As of now, the calibration equations applied by the agency have changed at least twice, so that the data stream contains inhomogeneities which obviously impact the type of measurements we seek. We are hoping this is resolved soon with a dataset that is built with a single, consistent set of

calibration equations. In addition, the current non-drifting satellite operated by the Europeans, MetOP-B, has not yet been adjusted or “neutralized” for its seasonal peculiarities related to its unique equatorial crossing time (0930). 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.

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 produce 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. Research Associate Rob Junod assists in the preparation of these reports.

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/

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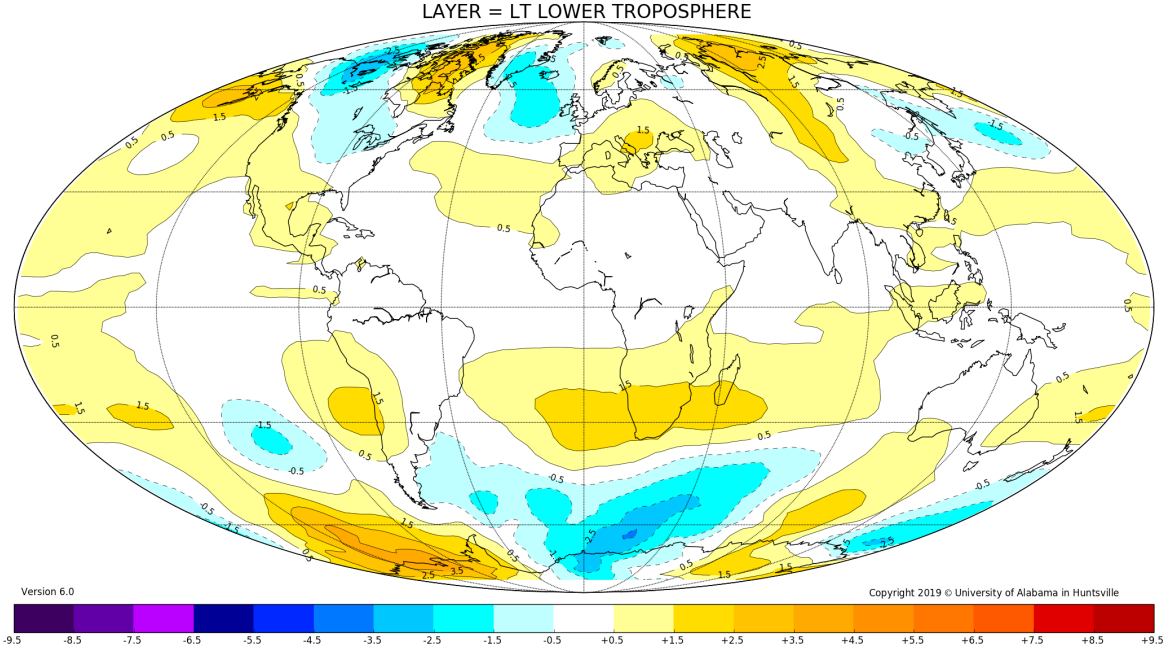
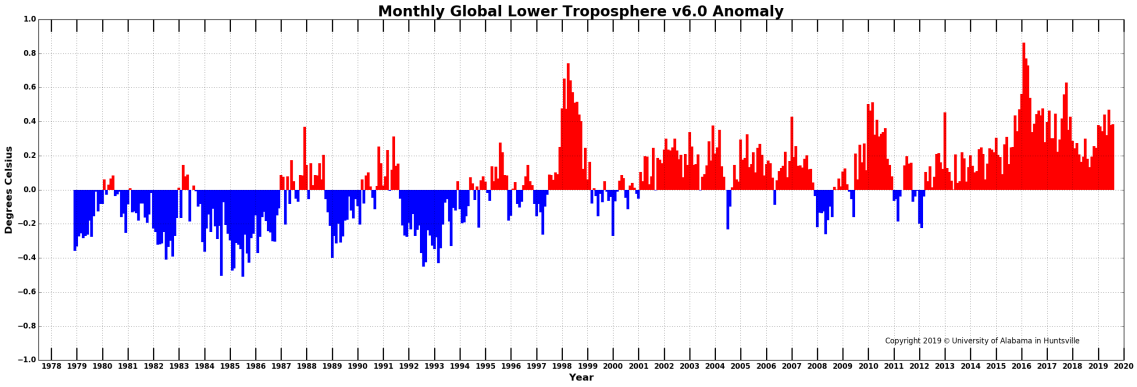
AUGUST 2019
LAYER = LT LOWER TROPOSPHERE



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.



December 1978 to August 2019