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For Additional Information:

Dr. Robert Junod, (256) 961-7743

rob.junod@uah.edu

Dr. John Christy, (256) 961-7763

christy@nsstc.uah.edu

Dr. Roy Spencer, (256) 961-7960

spencer@nsstc.uah.edu

Global Temperature Report: September 2025 with Version 6.1

Global climate trend since Dec. 1 1978: +0.16 C per decade

September Temperatures v6.1 (preliminary)

Global composite temp: +0.53°C (+0.95°F) above the seasonal average

Northern Hemisphere: +0.56°C (+1.01 °F) above seasonal average

Southern Hemisphere: +0.49°C (+0.89°F) above seasonal average

Tropics: +0.35°C (+0.64°F) above seasonal average

August Temperatures v6.1 (final)

Global composite temp: +0.39 C (+0.70°F) above the seasonal average

Northern Hemisphere: +0.39 C (+0.71 °F) above seasonal average

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

Tropics: +0.16 C (+0.29°F) above seasonal average

Notes on data released Oct 13, 2025

[Please note that we provide these data out of our own initiative, and are only able to produce these updates at times convenient to our working schedules.]

The global mean September temperature departure from the seasonal average rose slightly to +0.53°C (+0.95°F) from +0.39°C (+0.65°F) in August. The increase was driven primarily by warming in Antarctica and the Northern Hemisphere extratropics. The 46+ year trend is currently at

+0.156°C/decade, but is rounded up to +0.16°C/decade. We estimate the error range of this trend over 46+ years at $\pm 0.03^\circ\text{C}/\text{decade}$, which renders the third decimal inconsequential.

The tropical Pacific is still in “neutral” conditions. While the general trend in global temperature has been a decline since the peak in April 2024 (+0.94°C), the decline has not been steady. Interestingly, the NOAA forecast for the coming NH fall and winter has moved toward a likelihood of cool “La Niña” conditions. For the latest in the El Niño/La Niña situation, see: https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/lanina/enso_evolution-status-fcsts-web.pdf.

The planet’s warmest atmospheric temperature departure in September occurred in southern Nunavut near Griffin Lake at +4.3°C (+7.8°F). Other warm areas appeared over Finland, Western China, Afghanistan, Pakistan, Tajikistan, the North Pacific, and an area from southern South America and southern Africa to Antarctica.

With a reading of -2.7°C (-4.9°F), the coolest departure from average was found in the Laptev Sea just off the northern coast of Russia. Colder than average temperatures were also found over the southeast United States, the North Atlantic Ocean, and an area from southern Australia to Antarctica.

The conterminous US in August was above average at +0.38°C (+0.68°F) above the seasonal mean. The southeastern US saw below-average temperatures, while the northwestern and High Plains regions were above average. It was slightly cooler in Alaska, so the 49-state average came in at +0.37°C (+0.67°F). [We don’t include Hawaii in the US results because its land area is less than that of one satellite grid square, so it would have virtually no impact on the overall national results.]

Background notes.

New v6.1 due to termination of NOAA-19 in 2021 and adding METOP-C.

<https://www.drroyspencer.com/2024/11/uah-global-temperature-update-for-october-2024-truncation-of-the-noaa-19-satellite-record/>

New Reference Base Jan 2021 and forward. As noted in the Jan 2021 GTR, the situation comes around every 10 years when the reference period or “30-year normal” that we use to calculate the departures is redefined. With that, we have averaged the absolute temperatures over the period 1991-2020, in accordance with the World Meteorological Organization’s guidelines, and use this as the new base period. This allows the anomalies to relate more closely to the experience of the average person, i.e. the climate of the last 30 years. Due to the rising trend of global and regional temperatures, the new normals are a little warmer than before, i.e. the global average temperature for Januaries for 1991-2020 is 0.14 °C warmer than the average for Januaries during 1981-2010. So, the new departures from this now warmer average will appear to be cooler, but this is an artifact of simply applying a new base period. It is important to

remember that changes over time periods, such as a trend value or the relative difference of one year to the next, will not change. Think about it this way, all we've done is to take the *entire* time series and shifted it down a little.

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, but we are renewing our efforts as Dr. Braswell is now focused on this task. The delay is due to the incredibly slow rate at which the data may be accessed. 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. We have now added MetOP-C to replace the truncated data from NOAA-19.

Dr. 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. Dr. Danny Braswell has reconstituted the code which converts the satellite radiances to temperature values and Dr. Robert Junod prepares the monthly reports as of October 2025.

The satellite-based instruments measure the temperature of the atmosphere from the surface up to an altitude of about nine 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 6.1 lower troposphere dataset is available here:

http://www.nsstc.uah.edu/data/msu/v6.1/tlt/uahncdc_lt_6.1.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.

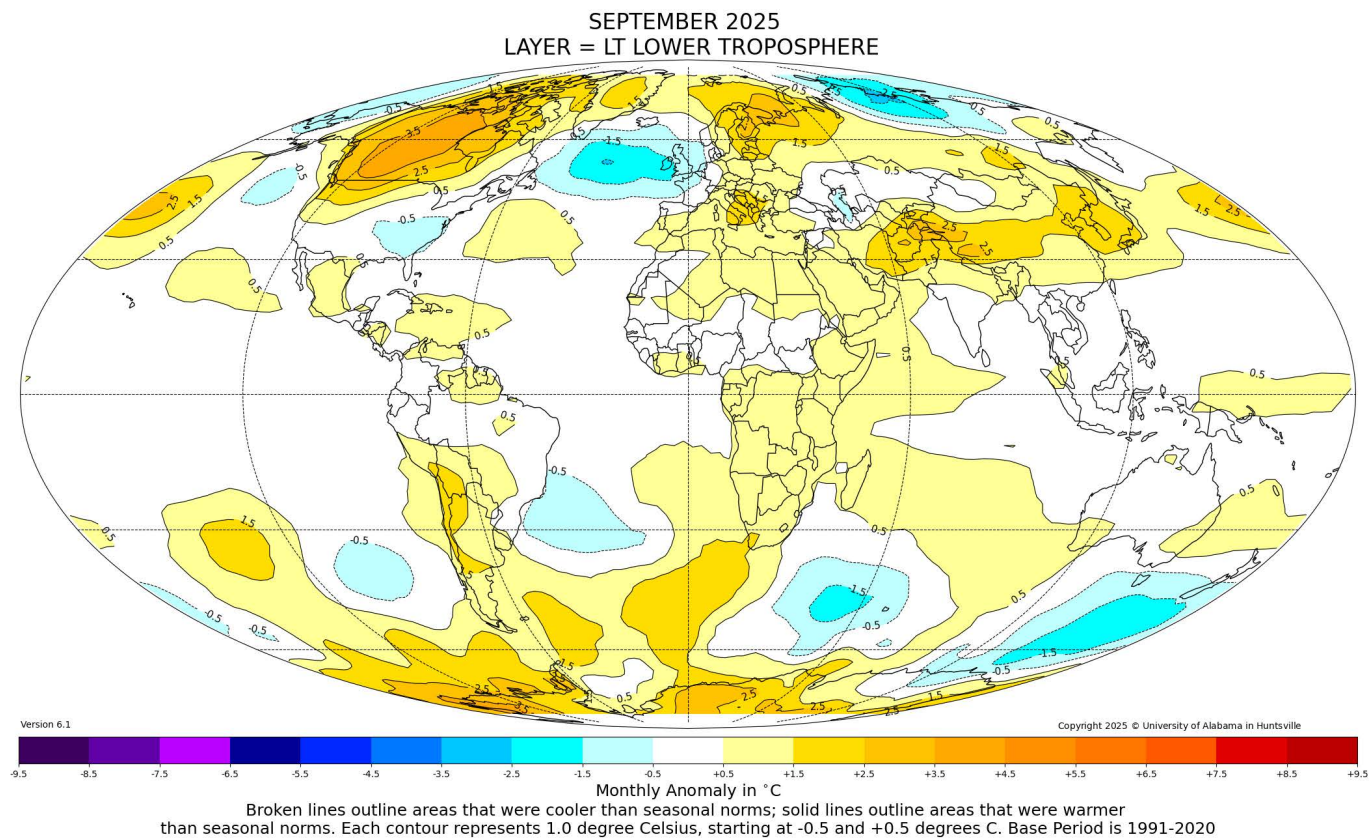


Figure 1. Lower tropospheric temperature anomalies for September 2025. Contour interval 1.0°C

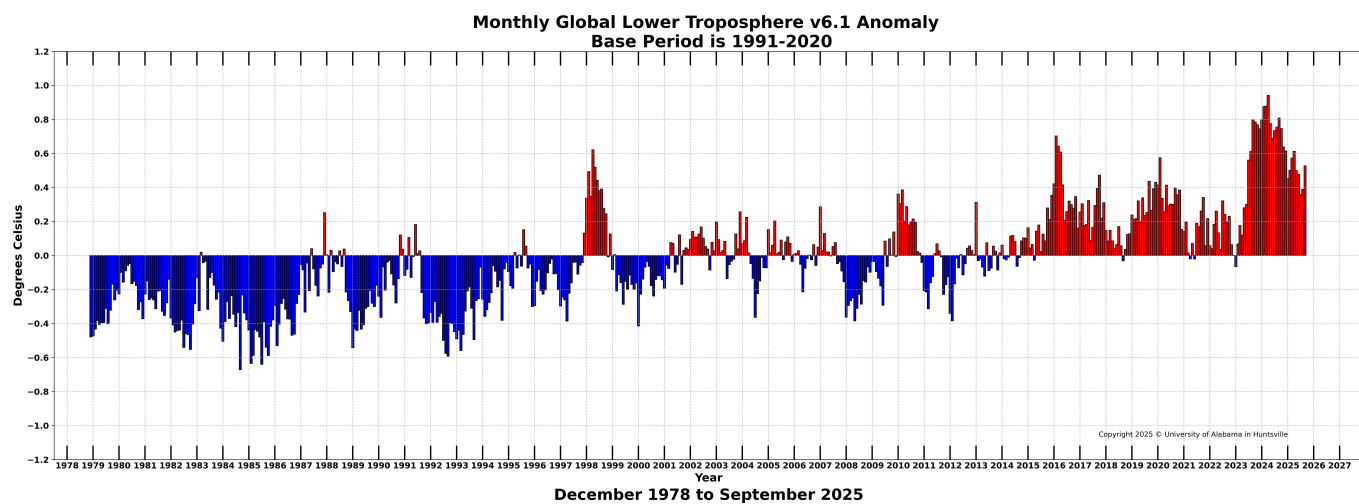


Figure 2. Bar chart of global monthly lower tropospheric temperature anomalies