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Global Temperature Report: Mar 2025 with Version 6.1

Global climate trend since Dec. 1 1978: +0.15 C per decade

March Temperatures v6.1 (preliminary)

Global composite temp: +0.58 C (+1.04°F) above the seasonal average

Northern Hemisphere: +0.74 C (+1.33 °F) above seasonal average

Southern Hemisphere: +0.41 C (+0.74°F) above seasonal average

Tropics: +0.40 C (+0.72°F) above seasonal average

February Temperatures v6.1 (final)

Global composite temp: +0.50 C (+0.90°F) above the seasonal average

Northern Hemisphere: +0.55 C (+0.99 °F) above seasonal average

Southern Hemisphere: +0.45 C (+0.81°F) above seasonal average

Tropics: +0.26 C (+0.47°F) above seasonal average

Notes on data released April 4, 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 temperature departure from the seasonal average rose slightly in March to +0.58 C (+1.04) from +0.50 C (+0.90 °F) in February. The bulk of the temperature change occurred in the NH land areas which were up to +1.07 C (+1.93 °F) from February's NH value of +0.56 C

(+1.01 °F). The tropics warmed somewhat while the SH cooled slightly from February. The 46+ year trend remains at +0.15 C/decade, but we note the value is +0.154 C/decade and likely will tip up to +0.155 C/decade, thereby rounding up to +0.16 C/decade, with only modest positive monthly anomalies in the next few months. We estimate the error range of this trend over 46+ years at ±0.03 C/decade.

Cool La Niña conditions are now present in the tropical Pacific. 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, with temporary warm peaks in Sep 2024 (+0.81 C) and now Mar 2025 (+0.58 C). 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 March occurred over Baffin Bay with a value of +4.8°C (+8.6°F). Warm areas included Arctic Canada and Greenland southeastward to the Black Sea and from there southwestward to the Sahara. Southern Australia and adjacent ocean areas, central US, northern India were also warm.

With a reading of -1.9°C (-3.5°F), the coolest departure from average was found over eastern Russia north of the Sea of Okhotsk. Patches of cooler than average temperatures were found over Canada, Iberian Peninsula, far NE Russia and coastal Antarctica.

The conterminous US in March averaged +1.25 C (+2.25 °F). It was about the same in Alaska, so the 49-state March average came in at +1.28 C (+2.30 °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. Rob Junod assists with visuals 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 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.

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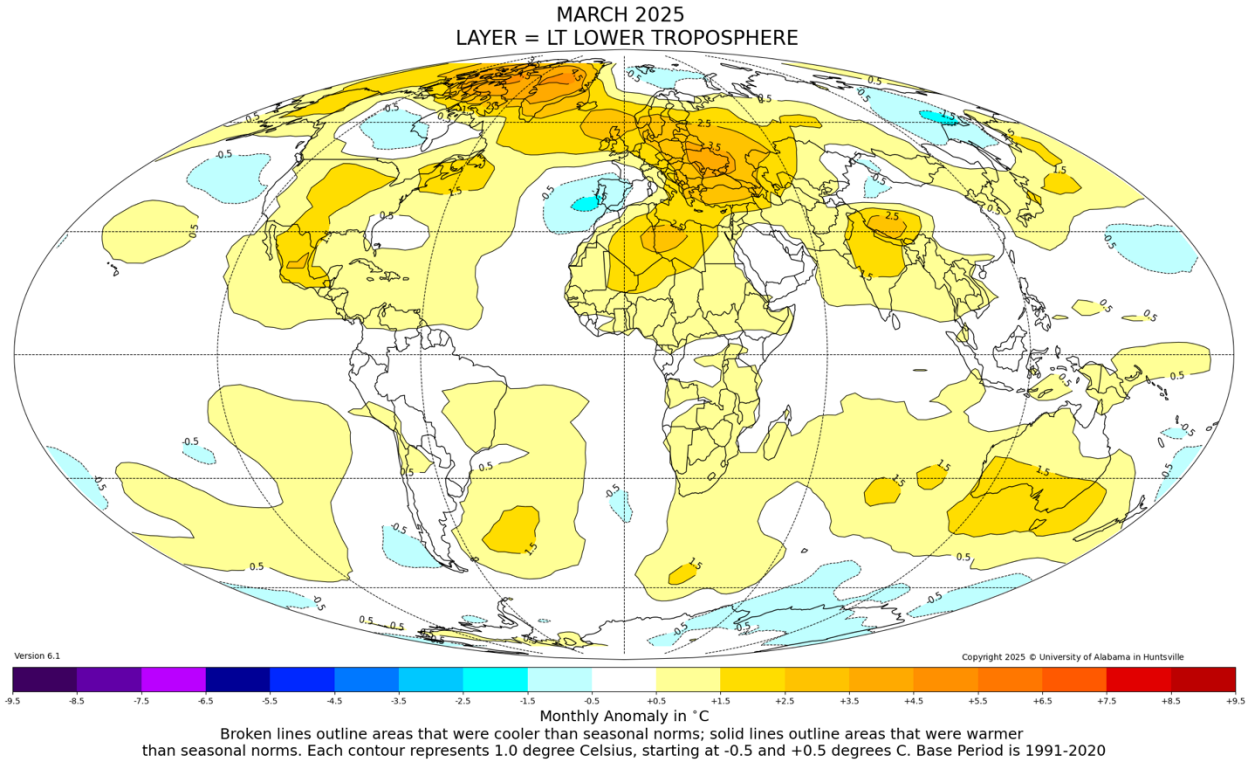

Figure. Lower tropospheric temperature anomalies for March 2025. Contour interval 1.0 °C.

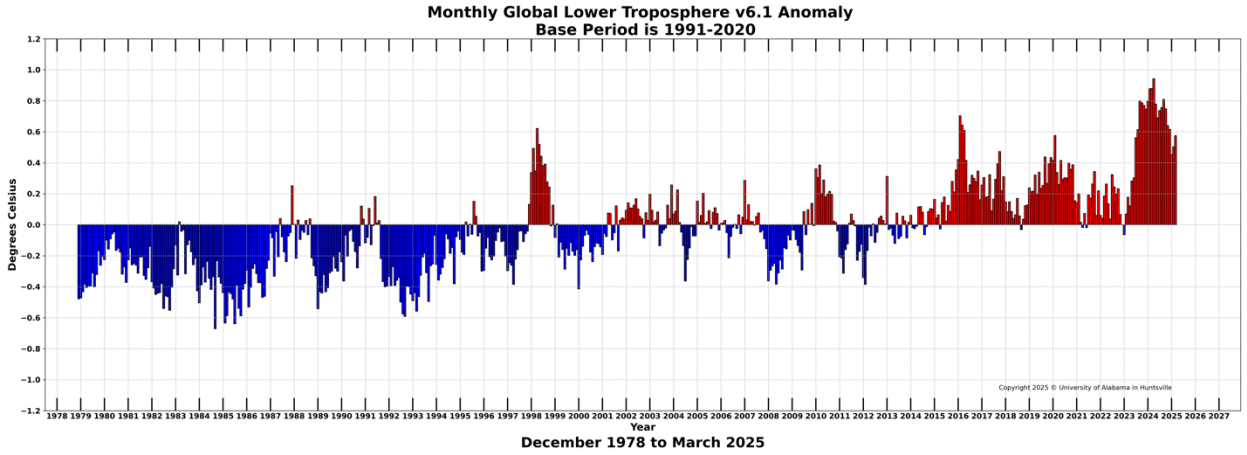

Figure. Bar chart of global monthly lower tropospheric temperature anomalies.