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Global Temperature Report: November 2024 with Version 6.1

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

November Temperatures v6.1 (preliminary)

Global composite temp: +0.64 C (+1.15°F) above the seasonal average

Northern Hemisphere: +0.88 C (+1.58 °F) above seasonal average

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

Tropics: +0.54 C (+0.97°F) above seasonal average

October Temperatures v6.1 (final)

Global composite temp: +0.75 C (+1.35°F) above the seasonal average

Northern Hemisphere: +0.89 C (+1.60°F) above seasonal average

Southern Hemisphere: +0.61 C (+1.10°F) above seasonal average

Tropics: +0.64 C (+1.15°F) above seasonal average

Notes on data released December 4, 2024 Updated New Version 6.1

[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.]

There have been some very slight changes to v6.1 which we distributed last month as we now have incorporated the European METOP-C satellite to support METOP-B data, giving us two satellites again. (We had to retroactively terminate data from NOAA-19 in 2021 -see last month's

report.) The global temperature anomaly in November fell to +0.64 °C (+1.15 °F). This is a relatively late decline in temperatures from the El Niño peak in April 2024 (+0.94 °C) indicating the Earth is maintaining very warm temperatures. This will assure that 2024 will be the warmest calendar year since satellite measurements began in late 1978 (an educated guess is +0.76 °C for all of 2024, well ahead of 2023 at +0.43 °C).

As mentioned in the past few reports, the El Niño of 2023-24 has faded and La Niña conditions are almost present, but the NH continues to be very warm, keeping the global temperature anomaly well above average. It appears that the La Niña, if it is declared, will be very weak indeed as neutral conditions may simply continue. To see the latest on NOAA's La Niña Watch 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 November occurred over Hudson Bay in Northern Ontario at +4.6 °C (+8.2 °F) as part of a warm feature that stretches there southward to Mexico. Warmer-than-average conditions were also observed in the Middle East, China, eastern Russia, central South America, northern Pacific Ocean and the southern Indian Ocean.

With a reading of -3.5 °C (-6.3°F), the coolest departure from average was found over western Antarctica near the Ross Ice Shelf which was part of a continental-wide cool region. Western North America and the adjacent Pacific Ocean and areas in the south Pacific were also cooler than average.

The conterminous US in November averaged +1.12 °C (+2.02°F). The warmth was centered over the eastern half of the country. It was about the same in Alaska, so the 49-state October average came in at +1.10 °C (+1.98°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 inclusion 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 intend to add 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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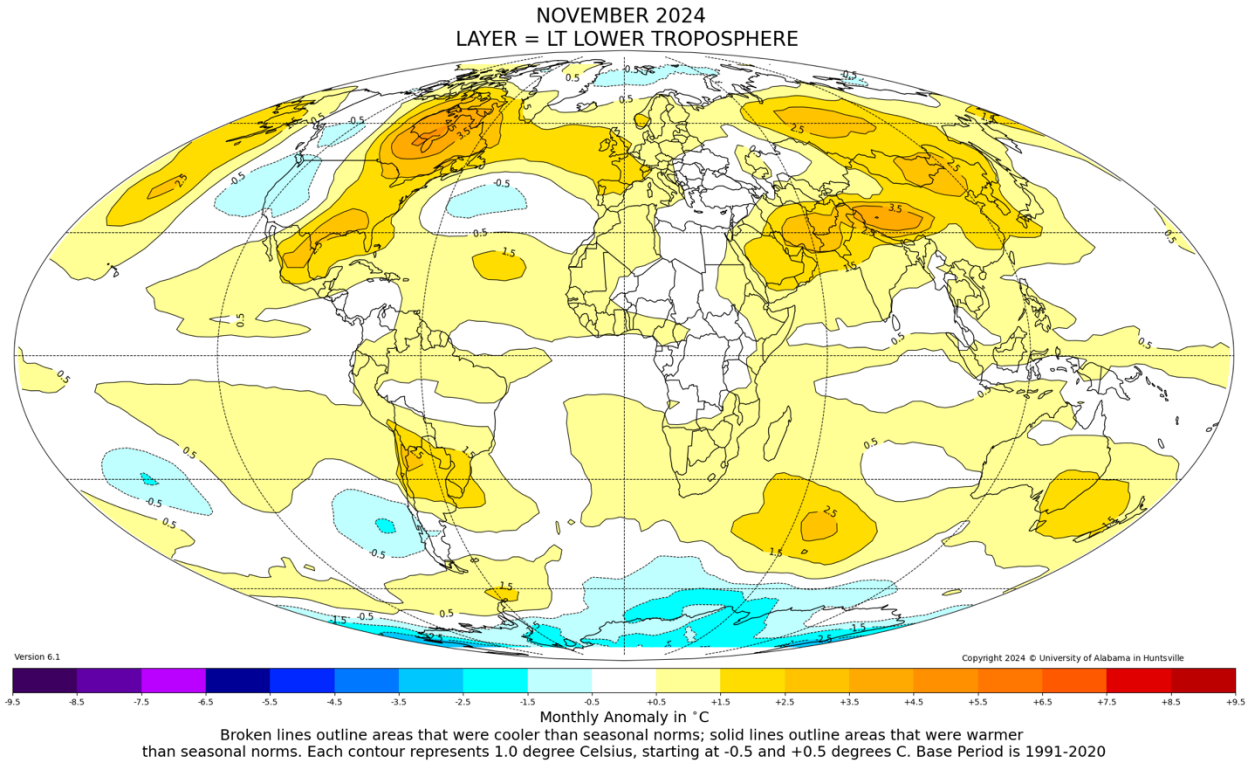

Figure. Lower tropospheric temperature anomalies for November 2024.

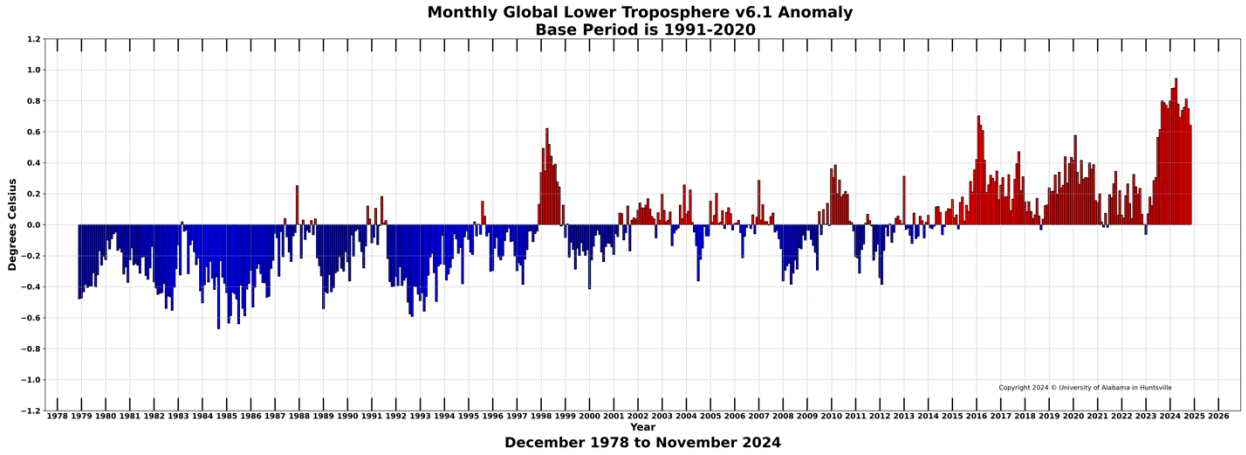

Figure. Bar chart of global monthly lower tropospheric temperature anomalies.