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Global Temperature Report: May 2024

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

May Temperatures (preliminary)

Global composite temp: +0.90 C (+1.62°F) above the seasonal average

Northern Hemisphere: +0.97 C (+1.75°F) above seasonal average

Southern Hemisphere: +0.83 C (+1.49°F) above seasonal average

Tropics: +1.31 C (+2.36°F) above seasonal average

April Temperatures (final)

Global composite temp: +1.05 C (+1.89°F) above the seasonal average

Northern Hemisphere: +1.24 C (+2.23°F) above seasonal average

Southern Hemisphere: +0.85 C (+1.53°F) above seasonal average

Tropics: +1.26 C (+2.27°F) above seasonal average

Notes on data released June 24, 2024 (v6.0, with 1991-2020 reference base)

[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.]

May's global temperature anomaly fell from last month's record-setting value of +1.05°C to +0.90°C (+1.62 °F), perhaps heralding the demise of the 2023-24 El Niño's affect on the atmosphere. This warm phase of the tropical Pacific Ocean had a significant impact on the global temperature, but with the shift now to normal sea temperatures and soon to (anticipated) cooler

than normal (i.e., La Niña) we shall likely see a continued temperature decline. If April's global temperature peak remains the hottest, then the 2023-24 El Niño followed a typical pattern of reaching the warmest temperature in the Feb to Apr time frame. See more on NOAA's excellent weekly updates here.
https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/lanina/enso_evolution-status-fcsts-web.pdf.

The planet's warmest departure in May occurred over western Mongolia with a reading of +4.7°C (+8.4 °F) above the average. The tropics were mostly above average as were regions in the North Pacific, Central America, Northern Canada, Northern Europe, Southern Brazil, South Africa and parts of the Southern oceans.

With a reading of -3.6°C (-6.4 °F), the coolest departure from average was found over central Russia. A few areas of below average temperatures also appeared over Argentina, Greenland, and areas north of Hawaii.

The conterminous US was slightly above the 30-year average with an anomaly of +0.37°C (+0.68°F) with the NW cooler than average and the southern tier a bit warmer than average. It was cooler than that in Alaska, so the 49-state average came in at +0.20 °C (+0.36°F) or almost right on average for May. [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.

A note about the global temperature trend. For several years, the trend has been extremely close to +0.135 °C/decade. This past July, the threshold of 0.135 was crossed at +0.1352 °C/decade. With the significant spike in global temperature due to the 2023-24 El Niño, the trend is now +0.15 °C/decade.

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. 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.

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. Drs. Danny Braswell and Rob Junod assist 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 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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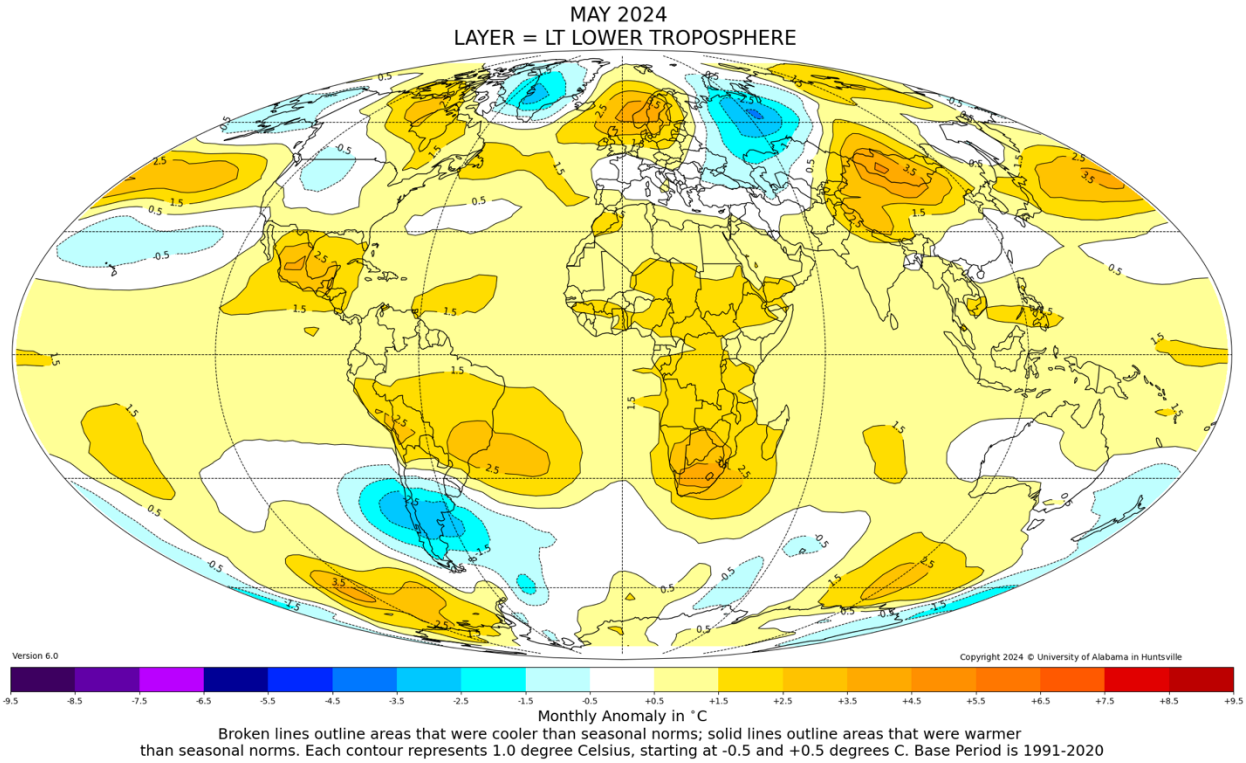

Figure. Lower tropospheric temperature anomalies for May 2024

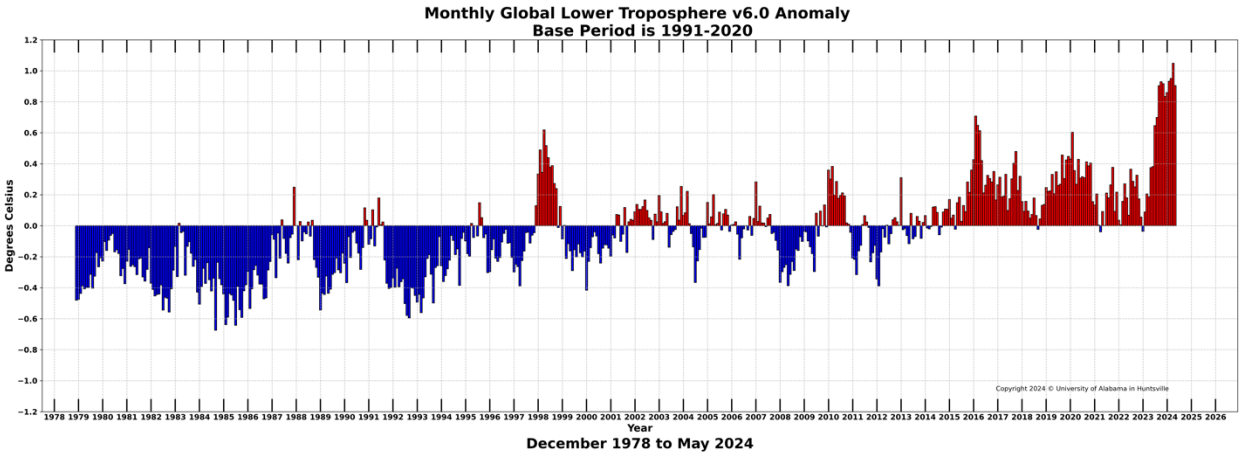

Figure. Bar chart of global monthly lower tropospheric temperature anomalies.