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Global Temperature Report: June 2024

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

June Temperatures (preliminary)

Global composite temp: +0.80 C (+1.44°F) above the seasonal average

Northern Hemisphere: +0.96 C (+1.73°F) above seasonal average

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

Tropics: +0.93 C (+1.67°F) above seasonal average

May Temperatures (final)

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

Northern Hemisphere: +0.98 C (+1.76°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

Notes on data released July 2, 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.]

June's global temperature anomaly fell to +0.80°C (+1.44 °F), the coolest anomaly since Aug 2023, further signaling the demise of the 2023-24 El Niño's powerful impact on the global atmosphere. In two months, the global temperature has fallen a full quarter of a degree, but this is not unprecedented as in 2021, for example, the globe cooled by -0.29 °C in just one month from Oct

to Nov. An indication of the record strength of the now-finished 2023-24 El Niño is that its residual heat claimed this month, June 2024, as the warmest June recorded since satellite records began in Dec 1978.

The tropics cooled significantly between May and Jun as the anomaly temperature fell -0.38 °C. Though much smaller in terms of area, the South Polar region fell from +0.63 °C to -0.02 °C, the only major region on the planet with below average temperatures. We should expect to see a continued, though not necessarily steady, decline in global temperatures in the months ahead. See more on NOAA's excellent weekly updates of the El Niño/La Niña situation here. https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/lanina/enso_evolution-status-fcsts-web.pdf.

The planet's warmest departure in June occurred over northern Chile at +3.6 °C (+6.6 °F) which was centered in a broad area of much warmer than average temperatures from Peru to Argentina. The western US, North Atlantic, Southeastern Europe and portions of the easter Arctic were well above average too.

With a reading of -2.8 °C (-5.0°F), the coolest departure from average was found over Eastern Russia near Okhotsk. It was cooler than average over western Canada, the far South Atlantic, and portions of Antarctica as well.

The conterminous US achieved its warmest anomaly of +1.65 °C (+2.97 °F) since May 2018 when the lower-48 averaged +1.81 °C (+3.26 °F). The warmest departure from average was +2.33 °C (+4.19 °F) in Mar 2012. It was again cooler in Alaska, so the 49-state Jun average came in at +1.51 °C (+2.72 °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.

A note about the global temperature trend. For several years, the trend has been extremely close to +0.135 °C/decade. In July 2023, 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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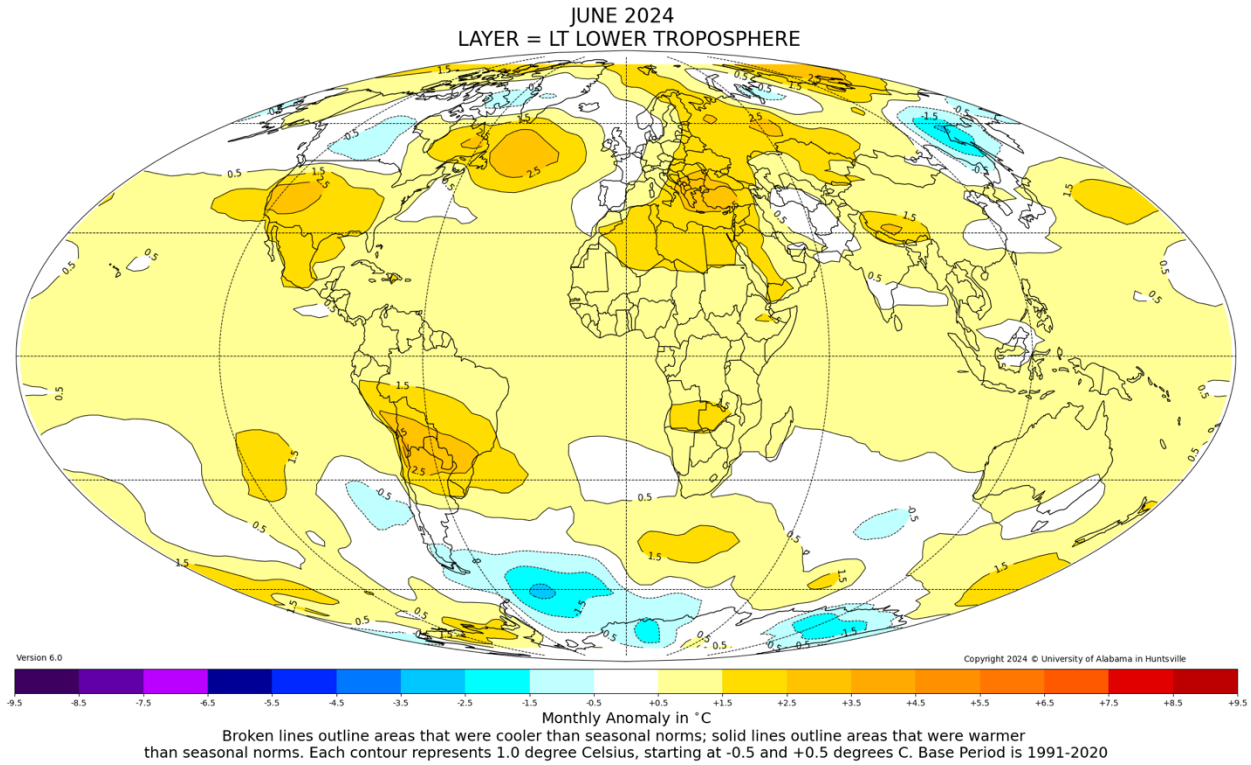

Figure. Lower tropospheric temperature anomalies for Jun 2024

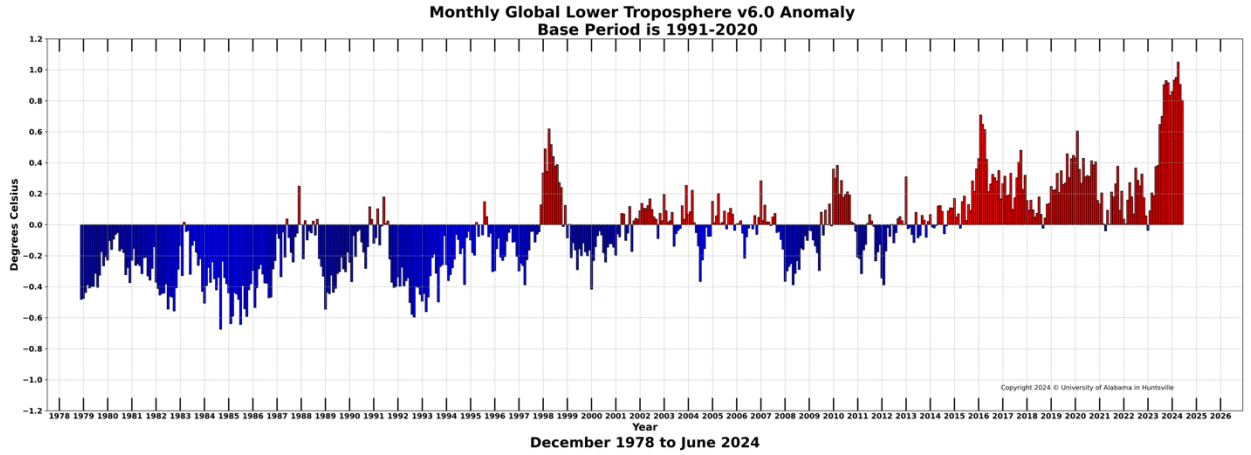

Figure. Bar chart of global monthly lower tropospheric temperature anomalies.