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**Global Temperature Report: May 2020**

Global climate trend since Dec. 1 1978: +0.14 C per decade

**May Temperatures (preliminary)**

Global composite temp.: +0.54 C (+0.97 °F) above seasonal average

Northern Hemisphere: +0.60 C (+1.08 °F) above seasonal average

Southern Hemisphere: +0.49 C (+0.88 °F) above seasonal average

Tropics: +0.66 C (+1.19°F) above seasonal average

**April Temperatures (Final)**

Global composite temp.: +0.38 C (+0.68 °F) above seasonal average

Northern Hemisphere: +0.43 C (+0.77 °F) above seasonal average

Southern Hemisphere: +0.34 C (+0.61 °F) above seasonal average

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

**Notes on data released June 2, 2020 (v6.0)**

May’s seasonally-adjusted global temperature of +0.54 °C (+0.97°F) popped back up from the dip in April to tie for the second warmest May in the 42-year record. The warmest was the El Niño-influenced May of 1998 at +0.64 °C (+1.15°F). Compared with other months, May does not exhibit variations from the average as large as they do. For example, February’s values have ranged from -0.48 °C to +0.86 °C since 1979 whereas May’s extremes were -0.32 °C to +0.64 °C, or 72% of February’s. So, though the anomaly of +0.54 °C is not remarkable in terms of departures seen in other months, for May, it was. If we look only at values in May, the global trend since 1979 is +0.12 °C (+0.22 °F) per decade.

The region with the warmest departure from average was a large hot spot in northern Russia centered over the Purovsky District at +5.4 °C (+9.7 °F) above average. As is usual, when it’s very warm in one place, there are usually a series of alternating cold and warm regions in the same latitude belt. Moving only 3,000 km westward from the warm peak in Russia we find the coldest spot over Levanger, Norway with a -2.6 °C (-4.8 °F) anomaly.

Besides northern Russia, it was warmer than average throughout western Europe, areas in the southern mid-latitudes, parts of Antarctica, the southwestern US and the Arctic. Cooler than average regions occurred in the far South Atlantic Ocean, Scandinavia, and northeastern North America with the adjacent ocean off Newfoundland.

The conterminous U.S. experienced near-average temperatures being only +0.17 C (+0.31 °F) above the norm. Alaska was warmer than average in May so that the 49-state mean temperature departure was a bit warmer than the 48-state value being +0.38 °C (+0.68 °F). [We don’t include Hawaii in the US results because its land area is less than that of a satellite grid square, so it would have virtually no impact on the overall national results.]

The remarkable warmth of the lower stratosphere that was linked to the aerosols from the Australian fires last year continues to diminish. The global departure from average for this layer was -0.44 °C in May, down from +0.00 °C last month. This places the global average very close to that of months preceding the fires.

**Spoiler Alert first published March 2019:** As noted over the past several months in this report, the drifting of satellites NOAA-18 and NOAA-19, whose temperature errors were somewhat compensating each other, will be addressed in this updated version of data released from March 2019 onward. As we normally do in these situations we have decided to terminate ingestion of NOAA-18 observations as of 1 Jan 2017 because the corrections for its significant drift were no longer applicable. We have also applied the drift corrections for NOAA-19 now that it has started to drift far enough from its previous rather stable orbit. These actions will eliminate extra warming from NOAA-18 and extra cooling from NOAA-19. The net effect is to introduce slight changes from 2009 forward (when NOAA-19 began) with the largest impact on annual, global anomalies in 2017 of 0.02 °C. The 2018 global anomaly changed by only 0.003°C, from +0.228°C to +0.225°C. These changes reduce the global trend by -0.0007 °C/decade (i.e. 7 ten-thousandths of a degree) and therefore does not affect the conclusions one might draw from the dataset. The v6.0 methodology is unchanged as we normally stop ingesting satellites as they age and apply the v6.0 diurnal corrections as they drift.

**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. As of now, the calibration equations applied by the agency have changed at least twice, so that the data stream contains inhomogeneities which obviously impact the type of measurements we seek. We are hoping this is resolved soon with a dataset that is built with a single, consistent set of calibration equations. 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.

As part of an ongoing joint project between UAH, NOAA and NASA, 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. Research Associate Rob Junod assists 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 eight 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/

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