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**Global Temperature Report: August 2020**

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

**August Temperatures (preliminary)**

Global composite temp.: +0.43C (+0.77 °F) above seasonal average

Northern Hemisphere: +0.47 C (+0.85 °F) above seasonal average

Southern Hemisphere: +0.38 C (+0.68 °F) above seasonal average

Tropics: +0.59 C (+1.06 °F) above seasonal average

**July Temperatures (final)**

Global composite temp.: +0.44 C (+0.79 °F) above seasonal average

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

Southern Hemisphere: +0.42 C (+0.76 °F) above seasonal average

Tropics: +0.46 C (+0.83°F) above seasonal average

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

August’s seasonally-adjusted, large-scale temperature averages were almost identical to those observed in June and July. In fact, since January 2019, the global temperature has varied in a narrow range between +0.32 °C and +0.61 °C except for the El Niño-boosted value of +0.75 °C last February.

The global average temperature in August dipped an insignificant -0.01 °C to +0.43 °C (+0.77 °F) relative to July. This was essentially tied for 3rd place as the warmest August value behind +0.52 °C observed in August of 1998. Compared with July, the tropics warmed slightly (+0.13 °C) thanks to warmth in the Atlantic sector while the air over the Southern Hemisphere outside of the tropics cooled by the same amount. Taking the tropics only, August 2020 was the warmest August in the 42-year record.

If you’ve been watching the situation in the tropical Pacific Ocean you will note that sea surface temperatures there have continued to decline since mid-April. One of the key indicators of La Niña formation (a pattern that brings cooler global temperatures) is NOAA’s Multivariate ENSO Index (MEI) which for June-July slipped further into the moderately negative or “La Niña” territory. Another NOAA index using 3-months of data, the Oceanic Niño Index (ONI), fell into negative territory too for May-June-July. NOAA’s forecast group is indicating a 60% chance of a La Niña event this winter and have issued a La Niña Watch. Stay tuned on that front but see the latest here.

https://www.cpc.ncep.noaa.gov/products/analysis\_monitoring/lanina/enso\_evolution-status-fcsts-web.pdf

As we’ve seen in the past, it is often the case that the globe’s warmest and coolest temperatures are near each other, representing the peak and trough of an atmospheric wave pattern that was fairly stationary. Heading down to the ocean off the shores of East Antarctica we have the warmest spot this month (+3.1 °C, +5.6 °F) about 2,000 km north of Casey Station. Less than 3,000 km to the south and east, the coolest spot appears at -3.7 °C (-6.6 °F) near the Balleny Islands.

Warm features this month are found in NW Russia, the Canadian Arctic, Madagascar and a band that stretches from the SE Pacific stretching northwestward to Australia. Regions experiencing cooler than average weather included a patch from NE Russia to the Gulf of Alaska, the Caspian Sea and sections of the oceans off of Antarctica.

Overall, the conterminous U.S. experienced slightly above-average temperatures at +0.41 °C (+0.74 °F) with the western half above average and the eastern half near to below average. Alaska was cooler than normal in August so that the 49-state mean temperature departure was a bit lower than the 48-state value at +0.30 °C (+0.54 °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.]

**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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