

Study suggests three periods of global warming slowdown since 1891 due to natural temporary causes

June 7 2018, by Bob Yirka



Plinian column of the eruption of Sarychev (Russia) on 12 June 2009. Credit: NASA

A team of researchers from the U.K., Sweden and Australia has found that three periods of global warming slowdown since 1891 were likely due to natural causes rather than disruptions to the factors causing global warming. In their paper published on the open access site *Science Advances*, the group describes their study of global mean surface temperatures (GST) since the late 19th century and what they found.

In this new effort, the researchers looked at GST as registered by multiple sources around the globe over the past 127 years, noting the slow march of [temperature](#) increases. More specifically, they noted the three previously identified slowdowns in GST increases—the time periods from 1896 to 1910, from 1941 to 1975, and then from 1998 to 2013. They then looked at factors that could have contributed to these slowdowns and found natural causes for each.

The team first reports that their study showed results similar to others regarding GST increases—they have been slowly increasing overall for more than a century. They then offer possible explanations for the three main observed slowdowns in GST increase. For the first slowdown, they found evidence of El Niño and La Niña weather patterns that likely reduced heating by producing more cloud cover. For the second slowdown, they found evidence of increased volcanism—smoke and ashes from volcanoes can block sunlight. The team asserts that the third slowdown, which is also the one on which many global [warming](#) skeptics rely, was likely caused by a combination of La Niña events and volcanism. They further note that the third slowdown was not a stopping point—temperatures continued to rise, they just did so at a slower pace.

The researchers also looked at data from studies of the sun and found that there was a slowdown in energy output from 2001 to 2010, which was also a likely contributor to the third [slowdown](#).

More information: Chris K. Folland et al. Causes of irregularities in

trends of global mean surface temperature since the late 19th century, *Science Advances* (2018). [DOI: 10.1126/sciadv.aao5297](https://doi.org/10.1126/sciadv.aao5297)

Abstract

The time series of monthly global mean surface temperature (GST) since 1891 is successfully reconstructed from known natural and anthropogenic forcing factors, including internal climate variability, using a multiple regression technique. Comparisons are made with the performance of 40 CMIP5 models in predicting GST. The relative contributions of the various forcing factors to GST changes vary in time, but most of the warming since 1891 is found to be attributable to the net influence of increasing greenhouse gases and anthropogenic aerosols. Separate statistically independent analyses are also carried out for three periods of GST slowdown (1896–1910, 1941–1975, and 1998–2013 and subperiods); two periods of strong warming (1911–1940 and 1976–1997) are also analyzed. A reduction in total incident solar radiation forcing played a significant cooling role over 2001–2010. The only serious disagreements between the reconstructions and observations occur during the Second World War, especially in the period 1944–1945, when observed near-worldwide sea surface temperatures (SSTs) may be significantly warm-biased. In contrast, reconstructions of near-worldwide SSTs were rather warmer than those observed between about 1907 and 1910. However, the generally high reconstruction accuracy shows that known external and internal forcing factors explain all the main variations in GST between 1891 and 2015, allowing for our current understanding of their uncertainties. Accordingly, no important additional factors are needed to explain the two main warming and three main slowdown periods during this epoch.

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