

A is a period of  
relatively little

[Environment](#), [Climate Change](#)



A global warming hiatus, also known as a global warming pause or slowdown, is a period of relatively little change in globally averaged surface temperatures; climate is classically averaged over a 30-year period. The apparent slowdown in the increasing global surface temperature is what it is referred to as a 'hiatus', including the changes also in radiative force, deep ocean heat uptake and atmospheric circulation changes.

The Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report concluded that the global surface temperature "has shown a much smaller increasing linear trend over the past 15 years in 2012 than over the past 30 to 60 years." It showed that between the years of 1998 and 2012, the surface of earth experienced very little warming. This recent decadal slowdown is unique in having occurred during a time of strongly increasing anthropogenic radiative forcing in our climate. Also the same time that political negotiations for preventing climate change occurred. This trend phenomenon, caused the public to doubt about how well anthropogenic climate change and natural variability were understood. This caused suspicion of residual data bias to mute global warming and possible thoughts of tampering with data shown to show most preferable results. The fifth report showing GMST in the 14 years after 1998 known as the 'hiatus', has cause discussion to the evidence proving if there was in fact a hiatus, depending on the period and definition.

Some of the main definitions used to characterize a hiatus are when the trend in Global Mean Surface Temperature (GMST) is zero, negative or not significantly positive and if the estimated trend shown in observations appears lower than that of the existing long-term warming trend and model

simulations. There have been many different perspectives on the hiatus which all have different techniques to collect datasets, each with variations as methods get updated with further knowledge and advanced technology. The reasons concerning the hiatus include factors such as; external drivers, the earth's climate response to CO<sub>2</sub> and other radiative forcing, and internal variability, all which affect the GMST. They explain both the magnitude of the GMST and its spatial pattern relative to what was projected from model simulations. The internal variability factor is affected by the choice of the hiatus's beginning with some observations starting in 1998, an extremely warm El Niño year. In the El Niño years, the sea surface temperatures (SST) in the tropical Pacific increase, leading to increased heat loss from the ocean to the atmosphere; the heat is transported to higher latitudes by the atmosphere, leaving a large surface area of the earth warmer than normal. This time period which the hiatus is measured in, experiences more heat entering the climate system than that leaving at the top of the atmosphere; suggesting the climate system has warmed as a whole and did not slowdown like the hiatus may suggest. Specifically in terms of a climate point of view, the two hottest years on record, 2015 and 2016, highlight the question if 'global warming has stopped', one that the scientific community has been facing for many years.

To confirm if there was a hiatus or global warming slowdown at some point is still in debate, with some arguing strongly for it. Warming in 2014 and the record temperature in 2015 illustrate the sensitivity of estimates and the choice of trend length. To better portray the trend defining the hiatus with set start and end dates, overlapping windows can be used and should be

selected based on the physical understanding of  $\Delta F$ , the estimate of anthropogenic radiative forcing involved. In the article in the 'ScienceMag', it portrays a strong view disagreeing with the data reported by the IPCC. It suggests that global surface temperature trends are higher than the reported in the IPCC fifth assessment report, particularly concentrating on the recent years gone, and the suggested estimate for the rate of warming during the first 15 years of the twenty first century which is as great as the last half of the twentieth century and has also been considerably less than the average simulated rate in the annual average anomaly. These results do not support evidence for a hiatus in the increasing of global surface temperature. Evidence for these conclusions sources from the argument that observation methods are always changing, as new methods and technologies advance, the data collection techniques will all differ, but these different methods are needed in different environments.

Addressing these particular issues shows how the measuring of global warming can be inaccurate and easily manipulated for preferred results due to the varying errors in different techniques; this has led to discussion on how accurate the data revealed is. Positive conclusions that resulted from the investigation into the hiatus; from the data collected by the IPCC, and independent research it can be seen that the GMST results correlate with previous findings of a reduced rate of surface warming during years, 2001–2014, a time period in which anthropogenic forcing increased at a relatively constant rate. Due to this, scientific research has more advanced understanding and better ability to explain temperature variations and the influence of uncertainty in ocean SSTs on decadal timescale GMST trends,

including those experienced during the early twenty first century. Contradictory conclusions stem from different definitions of 'hiatus' and from different datasets. There is much debate from multiple sources, whether the hiatus occurred or not is thought to depend on the time period considered, and which dataset and the hypothesis tested, including the changes in forcing, ocean heat uptake, natural variability and incomplete observational coverage. Consequently, the diverging conclusions do not need to be inconsistent and there is no strong contradiction between studies that claim that the hiatus did not occur and others that claim that it did.

To summarise, one of the challenges that arises for the scientific community is the pressure from the public, and to keep engaged in fast-paced communication, science requires time to analyse, test hypotheses and publish results for these situations. Investigation into the hiatus has been enabled mostly by prior research, and represents an important scientific effort to quantify the climate signals associated with natural external forcing, internal variability, and anthropogenic factors. This combined with recent stronger warming trends, it is a more confident opinion than ever that human influence is dominant in long-term warming.