

# Forests 'held their breath' during global warming hiatus, research shows

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Credit: Wikipedia.

Global forest ecosystems, widely considered to act as the lungs of the planet, 'held their breath' during the most recent occurrence of a warming hiatus, new research has shown.

The international study examined the full extent to which these vital ecosystems performed as a [carbon sink](#) from 1998-2012 - the most

recent recorded period of global warming slowdown.

The researchers, including Professor Pierre Friedlingstein from the University of Exeter, demonstrated that the global carbon sink—where [carbon dioxide](#) is removed from the atmosphere and stored in the natural environment - was particularly robust during this 14 year period.

The study shows that, during extended period of slower warming, worldwide forests 'breathe in' carbon dioxide through photosynthesis, but reduced the rate at which they 'breathe out'—or release the gas back to the atmosphere.

The team believes the crucial study offers a significant breakthrough for future climate modelling, which is used to predict just how different ecosystems will respond to rising global temperatures.

The pioneering study is published in leading science journal, *Nature Climate Change*, on Monday, January 23 2017.

Professor Friedlingstein, Chair of the Mathematical Modelling of Climate Systems research group at the University of Exeter said: "Disentangling the feedback between global warming and the carbon cycle is critical for us to anticipate future [climate change](#). In this study, we analysed what happened during the recent period of reduced warming, the so-called hiatus, highlighting the importance of ecosystem respiration as a key control of land carbon sinks."

The Earth's vast ecosystems, such as forests and oceans, are known to counteract the adverse climate impacts of fossil fuel consumption by removing carbon dioxide from the atmosphere by acting as a carbon sink.

However, uncertainties remain about how these ecosystems will respond

to future climate change, whether by consuming more carbon or, conversely, releasing greater volumes of carbon back into the atmosphere.

The study focused on Earth's natural carbon cycle responded during both periods of rapid, and less rapid, warming that would normally be expected.

It revealed that the total amount of carbon taken up by land ecosystems slowed during periods of rapid warming, and sped up during periods of slower warming.

More significantly, the team demonstrated that while rates of photosynthesis remained constant during the periods of slower warming, the forests released less carbon back into the atmosphere - meaning the Earth is storing much more carbon during these warming hiatuses.

"The global carbon sink has been surprisingly strong during the period from 1998 to 2012, and we now begin to understand the causal mechanisms", says Ashley Ballantyne of University of Montana, and lead author of the new research. Pekka Kauppi a forest ecologist from Helsinki University and co-author added the results were "As if forests have been holding their breath".

'Accelerating net terrestrial [carbon](#) uptake during the [warming](#) hiatus due to reduced respiration' will be published online in *Nature Climate Change* on Monday, Jan. 23 2017.

**More information:** Accelerating net terrestrial carbon uptake during the warming hiatus due to reduced respiration, *Nature Climate Change*, [nature.com/articles/doi:10.1038/nclimate3204](http://nature.com/articles/doi:10.1038/nclimate3204)

Provided by University of Exeter

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