

Record growth in atmospheric CO₂ despite stable anthropogenic emissions due to weaker sinks

November 15 2016



Credit: Max Planck Society

In spite of almost no growth in emissions, the growth in atmospheric CO₂ concentration was at a record-high in 2015 and could be a record high again in 2016, at 23 and 25 Gt CO₂ per year, respectively, compared to an average of 16 Gt CO₂ per year in the previous decade. Atmospheric CO₂ levels have exceeded 400 parts per million (ppm) in 2015, 44 percent above pre-industrial levels [data NOAA/ESRL]. This is the highest level in at least the last 800,000 years.

The high growth in atmospheric CO₂ was mainly caused by a smaller uptake of [carbon](#) in the terrestrial biosphere in response to warm and dry

conditions over tropical land. These unusual conditions were caused by the recent El Niño event that lasted from May 2015 to June 2016. In 2015, the land sink was smaller than usual at 7 [4 to 10] Gt CO₂ per year, only 60 percent of its average intensity during the previous decade.

"What we see here is the response of land ecosystems to large interannual climate variability", explains Dr. Sönke Zaehle from the Max Planck Institute for Biogeochemistry in Jena, Germany, who contributed model simulations to the study. He continues, "on average, the land biosphere takes up carbon and slows the growth rate of atmospheric CO₂, and will probably continue to do so for the next years. However, years like 2015 with a strong El Niño event should remind us that climatic swings with warmer temperatures and more drought have a strong effect on the land carbon storage."

The high in the atmospheric growth rate occurred despite the fact that [global carbon emissions](#) did not increase much any more for the third year in a row. CO₂ [emissions](#) from fossil fuels and industry did not grow in 2015 (at 36.3 Gt C per year), with world-average emissions per person at 4.9 t CO₂ per year. Professor Corinne Le Quéré, Director of the Tyndall Centre at University of East Anglia, UK, who led the data analysis, said: "This third year of almost no growth in emissions is unprecedented at a time of strong economic growth, and it is possible that the trajectory of global emissions has permanently deviated from the long-term [growth](#) trend."

Verification of reported emissions cannot yet be done with independent data because of uncertainties in our capacity to account for carbon fluxes in the natural environment. The implication is that, at the moment, it could take 5-10 years before a peak in global CO₂ emissions is confirmed with independent data.

More information: Corinne Le Quéré et al. Global Carbon Budget

2016, *Earth System Science Data* (2016). [DOI: 10.5194/essd-8-605-2016](https://doi.org/10.5194/essd-8-605-2016)

Provided by Max Planck Society

Citation: Record growth in atmospheric CO₂ despite stable anthropogenic emissions due to weaker sinks (2016, November 15) retrieved 27 April 2024 from <https://phys.org/news/2016-11-growth-atmospheric-co2-stable-anthropogenic.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.