

# Carbon dioxide levels rose at record pace for 2nd straight year

13 March 2017



Credit: NOAA Headquarters

Carbon dioxide levels measured at NOAA's Mauna Loa Baseline Atmospheric Observatory rose by three parts per million to 405.1 parts per million (ppm) in 2016, an increase that matched the record jump observed in 2015.

The two-year, 6-ppm surge in the [greenhouse gas](#) between 2015 and 2017 is unprecedented in the observatory's 59-year record. And, it was a record fifth consecutive year that [carbon dioxide](#) (CO<sub>2</sub>) rose by 2 ppm or greater, said Pieter Tans, lead scientist of NOAA's Global Greenhouse Gas Reference Network.

"The rate of CO<sub>2</sub> growth over the last decade is 100 to 200 times faster than what the Earth experienced during the transition from the last Ice Age," Tans said. "This is a real shock to the atmosphere."

Globally averaged CO<sub>2</sub> levels passed 400 ppm in 2015—a 43-percent increase over pre-industrial levels. In February 2017, CO<sub>2</sub> levels at Mauna Loa had already climbed to 406.42 ppm.

## Measurements are independently validated

NOAA has measured CO<sub>2</sub> on site at the Mauna

Loa observatory since 1974. To ensure accuracy, air samples from the mountaintop research site in Hawaii are shipped to NOAA's Earth System Research Laboratory in Boulder, Colorado, for verification. The Scripps Institution of Oceanography, which first began sampling CO<sub>2</sub> at Mauna Loa in 1956, also takes independent measurements onsite.

Emissions from fossil-fuel consumption have remained at historically high levels since 2011 and are the primary reason atmospheric CO<sub>2</sub> levels are increasing at a dramatic rate, Tans said. This high growth rate of CO<sub>2</sub> is also being observed at some 40 other sites in NOAA's Global Greenhouse Gas Reference Network.

## The greenhouse effect, explained

Carbon dioxide is one of several gases that are primarily responsible for trapping heat in the atmosphere. This "[greenhouse effect](#)" maintains temperatures suitable for life on Earth. Increasing CO<sub>2</sub> [levels](#) trap additional heat in the atmosphere and the oceans, contributing to rising global average temperatures.

Atmospheric CO<sub>2</sub> averaged about 280 ppm between about 10,000 years ago and the start of the Industrial Revolution around 1760.

Provided by NOAA Headquarters

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