



NASA

Atmospheric carbon last year reached levels not seen in 800,000 years

By [Elizabeth Gamillo](#) Aug. 2, 2018 , 5:30 PM

The concentration of carbon dioxide (CO₂) in Earth's atmosphere reached 405 parts per million (ppm) last year, a level not seen in 800,000 years, according to a new report. It was also the hottest year on record that did not feature the global weather pattern known as El Niño, which is driven by warmer than usual ocean waters in the Pacific Ocean, concludes the *State of the Climate in 2017*, the 28th edition of an annual compilation published by the National Oceanic and Atmospheric Administration (NOAA). Overall, 2017 ranked as the second or third warmest year, depending on which measure is used, since researchers began keeping robust records in the mid-1800s.

Even if humanity “stopped the greenhouse gasses at their current concentrations today, the atmosphere would still continue to warm for next couple decades to maybe a century,” said Greg Johnson, an oceanographer at NOAA's Pacific Marine Environmental Laboratory in Seattle, Washington, during a press call yesterday about the report.

The hefty document includes data compiled by 524 scientists working in 65 countries. A few highlights:

- Atmospheric concentrations of CO₂—the primary planetary warming gas—last year rose by 2.2 ppm over 2016. Similar levels were last reached at least 800,000 years ago, according to data obtained from air bubbles trapped in ancient ice cores.
- Atmospheric concentrations of methane and nitrous oxide—both potent warming gases—were the highest on record. Levels of methane increased in 2017 by 6.9 parts per billion (ppb), to 1849.7 ppb, compared with 2016. Nitrous oxide levels increased by 0.9 ppb, to 329.8 ppb.
- Last year also marked the end of a world-wide coral bleaching event that lasted 3 years. Coral bleaching occurs when seawater warms, causing corals to release algae living within their tissues, turning the coral white and sometimes resulting in the death of the coral. It was the longest documented bleaching event.
- Global precipitation in 2017 was above the long-term average. Russia had its second wettest year since 1900. Parts of Venezuela, Nigeria, and India also experienced heavier than usual rainfall and flooding.
- Warmer temperatures contributed to wildfire outbreaks around the world. The United States suffered an extreme wildfire season that burned 4 million hectares and caused more than \$18 billion in damages. The Amazon region experienced some 272,000 wildfires.
- In Alaska, record high permafrost temperatures were reported at five of six permafrost observatories. When thawed, permafrost releases CO₂ and methane into the atmosphere and can contribute to global warming.
- Arctic sea ice took a hit. The extent of sea ice hit a 38-year low, and was 8% below the mean extent reported for 1981 to 2010. Spring snow cover in the Arctic, however, was greater than the 1981 to 2010 average, and the Greenland Ice Sheet recovered from a record low mass reported in 2016. 2017 was also the second warmest year on record for the Arctic.
- Many countries reported setting high-temperature records, including Argentina, Uruguay, Spain, Bulgaria, and Mexico.