
Climate change: Greenhouse gas concentrations again break records

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Atmospheric concentrations of carbon dioxide and other greenhouse gases once again reached new highs in 2018.

The [World Meteorological Organization](#) (WMO) says the increase in CO₂ was just above the average rise recorded over the last decade.

Levels of other warming gases, such as methane and nitrous oxide, have also surged by above average amounts.

Since 1990 there's been an increase of 43% in the warming effect on the climate of long lived greenhouse gases.

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The WMO report looks at concentrations of warming gases in the atmosphere rather than just emissions.

The difference between the two is that emissions refer to the amount of gases that go up into the atmosphere from the use of fossil fuels, such as burning coal for electricity and from deforestation.

Concentrations are what's left in the air after a complex series of interactions between the atmosphere, the oceans, the forests and the land. About a quarter of all carbon emissions are absorbed by the seas, and a similar amount by land and trees.

Using data from monitoring stations in the Arctic and all over the world, researchers say that in 2018 concentrations of CO₂ reached 407.8 parts per million (ppm), up from 405.5ppm a year previously.

This increase was above the average for the last 10 years and is 147% of the "pre-industrial" level in 1750.

The WMO also records concentrations of other warming gases, including methane and nitrous oxide. About 40% of the methane emitted into the air comes from natural sources, such as wetlands, with 60% from human activities, including cattle farming, rice cultivation and landfill dumps.

Methane is now at 259% of the pre-industrial level and the increase seen over the past year was higher than both the previous annual rate and the average over the past 10 years.

Nitrous oxide is emitted from natural and human sources, including from the oceans and from fertiliser-use in farming. According to the WMO, it is now at 123% of the levels that existed in 1750.

Last year's increase in concentrations of the gas, which can also harm the ozone layer, was bigger than the previous 12 months and higher than the average of the past decade.

What concerns scientists is the overall warming impact of all these increasing concentrations. Known as total radiative forcing, this effect has increased by 43% since 1990, and is not showing any indication of stopping.



"There is no sign of a slowdown, let alone a decline, in greenhouse gases concentration in the atmosphere despite all the commitments under the Paris agreement on climate change," said WMO Secretary-General Petteri Taalas.

"We need to translate the commitments into action and increase the level of ambition for the sake of the future welfare of mankind," he added.

"It is worth recalling that the last time the Earth experienced a comparable concentration of CO₂ was three to five million years ago. Back then, the temperature was 2-3°C warmer, sea level was 10-20m higher than now," said Mr Taalas.

The UN Environment Programme will report shortly on the gap between what actions countries are taking to cut carbon and what needs to be done to keep under the temperature targets agreed in the Paris climate pact.

Preliminary findings from this study, published during the UN Secretary General's special climate summit last September, indicated that emissions continued to rise during 2018.

Both reports will help inform delegates from almost 200 countries who will meet in Madrid next week for COP25, the annual round of international climate talks.