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# Arctic CO<sub>2</sub> levels growing at an 'unprecedented rate', say scientists

Figures from a measuring station in northern Norway show that CO<sub>2</sub> levels are increasing by 2-3 parts per million every year

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**John Vidal** in Ny Alesund, Svalbard  
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The concentration of carbon dioxide in [the atmosphere](#) has reached a record high, according to the latest figures released by an internationally regarded measuring station in the [Arctic](#).

The measurements suggest that the main greenhouse gas is continuing to increase in the atmosphere at an alarming rate [despite the downturn in dip in the rate of increase of the global economy](#).

Levels of the gas at the Zeppelin research station on Svalbard, northern Norway, last week peaked at over 397 parts per million (ppm), an increase of more than 2.5ppm on 2008. They have since begun to reduce and today stand at 393.7ppm. Prior to the industrial revolution, CO<sub>2</sub> levels were around 280ppm.

CO<sub>2</sub> levels recorded in Svalbard tend to be higher than the global average, but scientists said the CO<sub>2</sub> level they had measured was unprecedented even for that location. "These are the highest figures collected in 50m years," said Johan Strom, professor of atmospheric physics at the government-funded Norwegian Polar Institute, which collected the data.

"It is not the level of CO<sub>2</sub> that is the problem, because the earth will adapt. What is very worrying is the speed of change. Levels [here] are now increasing 2-3ppm a year.

"The rate of increase is much faster than only 10-20 years ago. You can almost see the changes taking place. Never before have CO<sub>2</sub> levels increased so fast," he said.

The global annual mean growth rate for 2007 was 2.14ppm – the fourth year in the past six to see an annual rise greater than 2ppm. From 1970 to 2000, the concentration rose by about 1.5ppm each year, but [since 2000 it has risen to an average 2.1ppm](#).

"There can be week-to-week or day-to-day variability," said Thomas Conway, research chemist at US National Oceanic and Atmospheric Administration's (NOAA) Earth Systems research lab in Boulder, Colorado. But he said a 2.5ppm annual increase was "on the high end".

"This is part of an overall pattern of CO<sub>2</sub> increasing in the atmosphere. Unless the burning of [fossil fuels](#) decreases, then the CO<sub>2</sub> will not decrease. And if the rate of fossil fuel burning increases, so will the rate of CO<sub>2</sub> increases," he added.

"These are quite large numbers. It sounds like this is an Arctic phenomenon," said [Dr Vicky Pope](#), head of [climate change](#) advice at the Met Office Hadley Centre in Exeter. "It fits with the general increase in emissions. You would expect the concentrations of CO<sub>2</sub> to grow."

Last week, NOAA [released preliminary figures for its annual greenhouse gas index](#),

which incorporates data from 60 sites around the world – including Zeppelin. Total global CO<sub>2</sub> concentration topped 386ppm. In 2008 the global average increased by 2.1ppm, slightly less than the 2.2ppm increase in 2007. NOAA's primary CO<sub>2</sub> measurement station is [Mauna Loa Observatory in Hawaii](#).

CO<sub>2</sub> levels are typically higher in the Arctic than the global average because there is more landmass and human activity in the northern hemisphere. As a result, human emissions from factories and transport tend to lead to higher CO<sub>2</sub> levels here.

The figures will concern policy-makers ahead of global talks on a successor to the Kyoto Protocol in December. Climate scientists advise that the world must prevent CO<sub>2</sub> levels from rising higher than around 450ppm CO<sub>2</sub> equivalent (a measure of global warming potential that incorporates other gasses such as methane and is higher than the measured CO<sub>2</sub> levels) to avoid a 2C increase on preindustrial global average temperature.

The Zeppelin research station is situated on a mountain top approximately 1100km from the North Pole. The closest town, Ny Alesund, is the northernmost human settlement in the world, mainly inhabited by research scientists. Although the research station is far from major sources of human pollution, atmospheric circulation brings air from Europe and North America into the Arctic region.

"There is less human influence here and most of the pollution comes straight here at this time of the year. From now on levels will reduce until the end of August when they will pick back up," said Strom.

"It is clearly the effect of human activity. Even if we stopped emitting now, we would have to live with this ... we will have to live with it for thousands of years, but that does not mean we should do nothing."

The figures come as [Al Gore](#) hosts a conference in Tromso, northern Norway, on melting arctic ice. Last week he told the US senate committee on energy and commerce that the arctic is now melting at an "unprecedented" rate.

"The most recent 11 summers have all experienced melting greater than the average 35 year time series," he said.

He is expected to warn ministers in [polar regions](#) that the arctic ice cap may totally disappear in as little as five years if nothing is done to curb greenhouse emissions.

Earlier this month, US scientists reported that annually forming sea in the Arctic region covered roughly the same area as in previous years, but had significantly thinned.

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