

Carbon dioxide forecast for 2017

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12:00 (UTC) on Fri 3 Mar 2017

The Met Office forecast for the concentration of atmospheric carbon dioxide in 2017 suggests that the increase in atmospheric carbon dioxide over the year will be smaller than the rise seen in 2016 – which was the largest annual i

However, carbon dioxide levels are still expected to rise by more than the average for the last decade.

The forecast applies specifically to the [Mauna Loa Observatory](#) in Hawaii, and follows a successful forecast of 2016 CO2 concentrations produced by the Met Office Hadley Centre, in conjunction with the [Scripps Institution of Oceanography](#), which has been measuring CO2 at Mauna Loa routinely since 1958.

The Met Office's [Professor Richard Betts](#), who leads the production of the CO2 forecast, said: “The rise in atmospheric carbon dioxide last year was the largest seen in the 50-year Mauna Loa record. Our [forecast](#) correctly predicted that 2016 would also be the first year in the record where the concentration of atmospheric carbon dioxide wouldn't dip below 400 parts per million (ppm).

“For 2017 we are forecasting a rise of around 2.5 ppm, smaller than the 3.4 ppm rise between 2015 and 2016, but this is still a higher figure than the average over the last decade.”

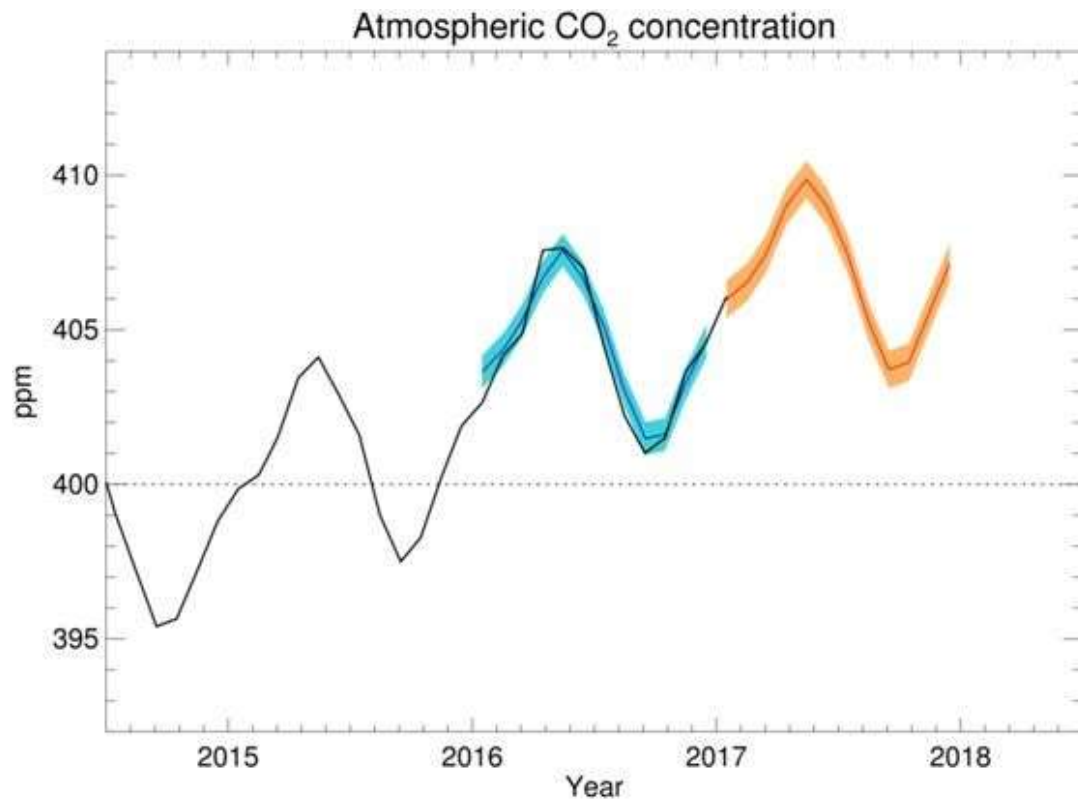


Figure 1: Observed and forecast CO₂ concentrations. The Met Office atmospheric carbon dioxide forecast and uncertainty range for 2016 is shown in blue (Betts et al., 2016). The new 2017 forecast is shown in orange. The black line represents the observations.

Carbon dioxide concentrations are rising every year because of emissions from burning fossil fuels, deforestation and cement production. Global vegetation and oceans absorb some of the excess carbon dioxide, so the rise seen in the atmosphere is only about half of the rate of emissions. The larger rise in 2015-2016 was due to the El Niño event, which shifted weather patterns causing tropical regions to be warmer and drier. Ecosystems temporarily absorbed less carbon dioxide, allowing more to remain in the atmosphere.

Commenting on the reasons for the [2017 forecast](#) being higher than the average rise seen over the last ten years, Prof Betts said: “Global CO₂ emissions have increased, so the build-up in the atmosphere is faster now than ten years ago. Before the recent [El Niño](#), concentrations rose steadily for a few years instead of accelerating, possibly because global average surface temperatures were rising more slowly at that time. It seems this allowed natural carbon sinks to temporarily strengthen. The sinks then weakened when the El Niño occurred. These feedbacks between climate and the carbon cycle may be crucial for future carbon dioxide concentrations, and may strongly affect the feasibility of limiting global warming to well below 2 °C as required by the [Paris Agreement](#).”