

## Rising CO2 levels in the atmosphere 'significant but not alarming'



Alarmist projections of how sensitive Earth's climate is to rising levels of carbon dioxide in the atmosphere have been proved wrong by new research Picture: thinkstock

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Alarmist projections of how sensitive Earth's climate is to rising levels of carbon dioxide in the atmosphere have been proved wrong by new research published today in Nature.

Climate sensitivity is still higher than the most optimistic forecasts, however; left unchecked, greenhouse gas emissions will result in significant warming by the end of the century.

The paper said there was a less than one-in-40 chance of climate sensitivity being greater than 4C, renewing hope it would be possible to avoid global warming exceeding the Paris target of 2C.

Climate sensitivity, the amount of warming caused by a doubling of carbon dioxide in the atmosphere, is hotly contested. The Intergovernmental Panel on Climate Change has published estimates ranging from 1.5C to 4.5C.

Other scientists have said climate sensitivity could be as low as 1C because other factors had played a greater role in recent warming than had been acknowledged by climate models.

Scientists in Britain said they had used new techniques to narrow the range to between 2.2C and 3.4C.

The latest Nature paper found the most likely outcome would be 2.8C, with 66 per cent confidence limits. The findings are consistent with the IPCC “likely” range of 2.2C-3.4C.

Announcing the results, Nature said “analysis suggests that extremely high estimates of this sensitivity can be ruled out”. So, too, could estimates below 1.5C.

Peter Cox from the College of Engineering, Mathematics and Physical Science at the University of Exeter used a new method to calculate climate sensitivity based on the observed historical variability in temperature rather than the warming trend itself.

Earlier attempts had focused on the historical warming record or reconstructions of past climates. “We use an ensemble of climate models to define an emergent relationship between ECS (equilibrium climate sensitivity) and a theoretically informed metric of global temperature variability,” the new paper said.

“This metric of variability can also be calculated from observational records of global warming, which enables tighter constraints to be placed on ECS,” it said.

The new methodology reduced the probability of equilibrium climate sensitivity being less than 1.5C to less than 3 per cent, and the probability of it exceeding 4.5C to less than 1 per cent.

The Nature paper said ECS remained one of the most important unknowns in climate change science.

ECS is defined as the global mean warming that would occur if the atmospheric carbon dioxide concentration were instantly doubled and the climate were then brought to equilibrium with that new level of CO<sub>2</sub>.

Estimates of ECS play an important role in global agreements to combat climate change.