



This is the print version of the [Skeptical Science](http://sks.to/sensitivity) article '[Climate sensitivity is low](http://sks.to/sensitivity)', which can be found at <http://sks.to/sensitivity>.

How sensitive is our climate?

What The Science Says:

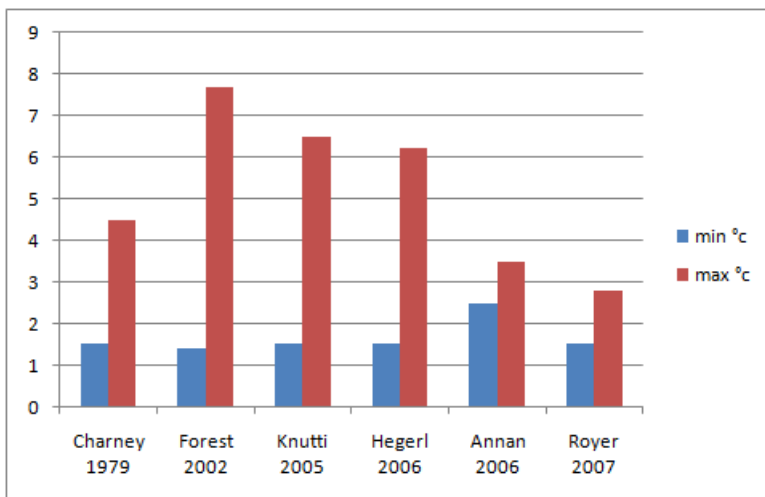
Net positive feedback is confirmed by many different lines of evidence.

Climate Myth: Climate sensitivity is low

"His [Dr Spencer's] latest research demonstrates that – in the short term, at any rate – the temperature feedbacks that the IPCC imagines will greatly amplify any initial warming caused by CO₂ are net-negative, attenuating the warming they are supposed to enhance. His best estimate is that the warming in response to a doubling of CO₂ concentration, which may happen this century unless the usual suspects get away with shutting down the economies of the West, will be a harmless 1 Fahrenheit degree, not the 6 F predicted by the IPCC." ([Christopher Monckton](#))

Climate sensitivity is the estimate of how much the earth's climate will warm in response to the increased greenhouse effect if we double the amount of carbon dioxide in the atmosphere. This includes feedbacks which can either amplify or dampen that warming. This is very important because if it is low, as some climate 'skeptics' argue, then the planet will warm slowly and we will have more time to react and adapt. If sensitivity is high, then we could be in for a very bad time indeed.

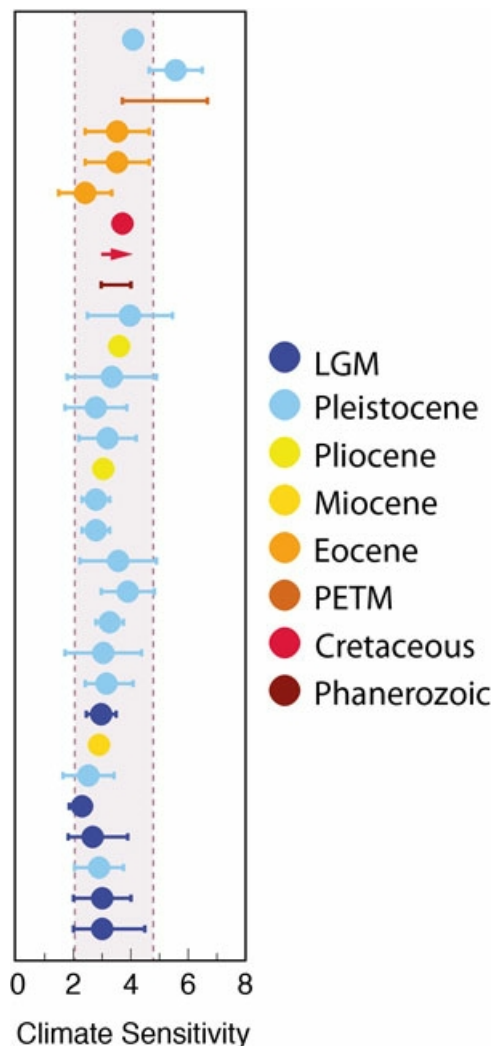
There are two ways of working out what climate sensitivity is. The first method is by modelling:



Temperature increase ranges calculated by climate sensitivity models

Climate models have predicted the least temperature rise would be on average 1.65°C (2.97°F), but upper estimates vary a lot, averaging 5.2°C (9.36°F). Current best estimates are for a rise of around 3°C (5.4°F), with a likely maximum of 4.5°C (8.1°F).

The second method calculates climate sensitivity directly from physical evidence, by looking at climate changes in the distant past:



Various paleoclimate-based equilibrium climate sensitivity estimates from a range of geologic eras. Adapted from [PALEOSENS \(2012\)](#) Figure 3a by John Cook.

These calculations use data from sources like ice cores to work out how much additional heat the doubling of greenhouse gases will produce. These estimates are very consistent, finding between 2 and 4.5°C global surface warming in response to doubled carbon dioxide.

It's all a matter of degree

All the models and evidence confirm a minimum warming close to 2°C for a doubling of atmospheric CO₂ with a most likely value of 3°C and the potential to warm 4.5°C or even more. Even such a small rise would signal many damaging and highly disruptive changes to the environment. In this light, the arguments against reducing greenhouse gas emissions because of climate sensitivity are a form of gambling. A minority claim the climate is less sensitive than we think, the implication being we don't need to do anything much about it. Others suggest that because we can't tell for sure, we should wait and see.

In truth, nobody knows for sure quite how much the temperature will rise, but rise it will. Inaction or complacency heightens risk, gambling with the entire ecology of the planet, and the welfare of everyone on it.

Basic rebuttal written by [GPWayne](#)

Update July 2015:

Here is the relevant lecture-video from [Denial101x - Making Sense of Climate Science Denial](#)

[see video at [this link](#).]



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Skeptical Science explains the science of global warming and examines climate misinformation through the lens of peer-reviewed research. The website won the Australian Museum 2011 Eureka Prize for the Advancement of Climate Change Knowledge. Members of the Skeptical Science team have authored peer-reviewed papers, a [college textbook on climate change](#) and the book [Climate Change Denial: Heads in the Sand](#). Skeptical Science content has been used in university courses, textbooks, government reports on climate change, television documentaries and numerous books.



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