



This is the print version of the [Skeptical Science](http://sks.to/hansen1988) article '[Hansen's 1988 prediction was wrong](http://sks.to/hansen1988)', which can be found at <http://sks.to/hansen1988>.

What do we learn from James Hansen's 1988 prediction?

What The Science Says:

Hansen's 1988 results are evidence that the actual climate sensitivity is about 3°C for a doubling of atmospheric CO₂.

Climate Myth: Hansen's 1988 prediction was wrong

'On June 23, 1988, NASA scientist James Hansen testified before the House of Representatives that there was a strong "cause and effect relationship" between observed temperatures and human emissions into the atmosphere. At that time, Hansen also produced a model of the future behavior of the globe's temperature, which he had turned into a video movie that was heavily shopped in Congress. That model predicted that global temperature between 1988 and 1997 would rise by 0.45°C (Figure 1). Ground-based temperatures from the IPCC show a rise of 0.11°C, or more than four times less than Hansen predicted. The forecast made in 1988 was an astounding failure, and IPCC's 1990 statement about the realistic nature of these projections was simply wrong.' ([Pat Michaels](#))

In 1988, James Hansen [projected future warming trends](#). He used 3 different scenarios, identified as A, B, and C. Each represented different levels of greenhouse gas emissions. Scenario A assumed greenhouse gas emissions would continue to accelerate. Scenario B assumed a slowing and eventually constant rate of growth. Scenario C assumed a rapid decline in greenhouse gas emissions around the year 2000. The actual greenhouse gas emissions since 1988 have been closest to Scenario B. As shown below, the actual warming has been less than Scenario B.

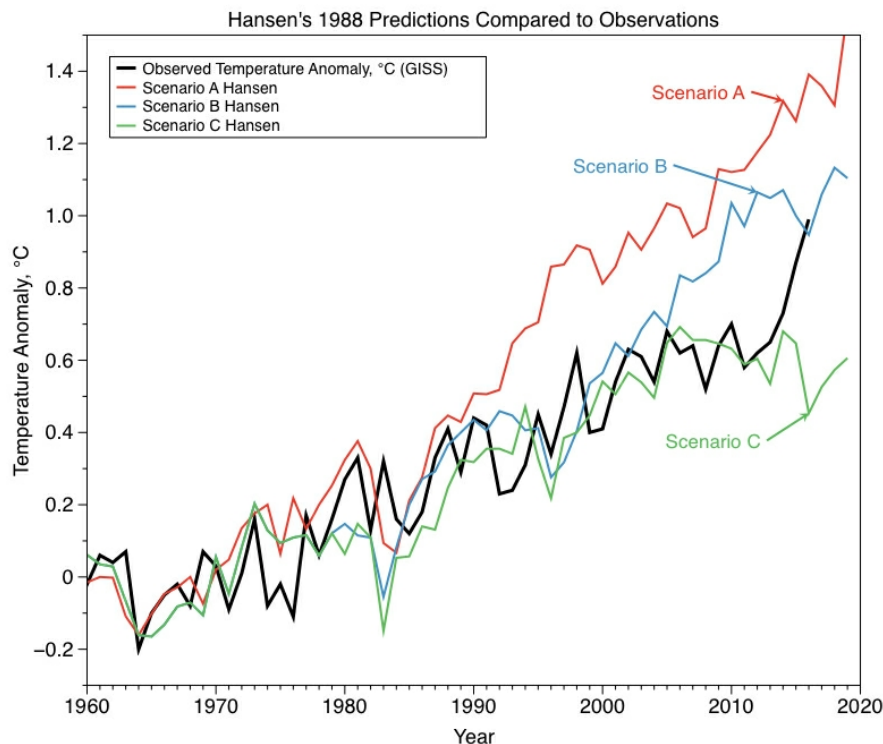


Figure 1: Global surface temperature computed for scenarios A, B, and C, compared with observational data

As climate scientist [John Christy noted](#), "this demonstrates that the old NASA [global climate model] was considerably more sensitive to GHGs than is the real atmosphere." However, Dr. Christy did not investigate **why** the climate model was too sensitive. There are two main reasons for Hansen's overestimate:

1. Scenario B, which was the closest to reality, slightly overestimated how much the atmospheric greenhouse gases would increase. This isn't just carbon dioxide. It also includes methane and chlorofluorocarbons (CFCs).
2. Hansen's climate model had a rather high climate sensitivity parameter. [Climate sensitivity](#) describes how sensitive the global climate is to a change in the amount of energy reaching the Earth's surface and lower atmosphere.

If we take into account the lower atmospheric greenhouse gas increases, we can compare the observed versus projected global temperature warming rates, as shown in the [Advanced version](#) of this rebuttal. To accurately predict the global warming of the past 22 years, Hansen's climate model would have needed a climate sensitivity of about 3.4°C for a doubling of atmospheric CO₂. This is within the likely range of [climate sensitivity values](#) listed as 2-4.5°C by the IPCC for a doubling of CO₂. It is even a bit higher than the most likely value currently widely accepted as 3°C.

In short, the main reason Hansen's 1988 warming projections were too high is that he used a climate model with a high climate sensitivity. His results are actually evidence that the true climate sensitivity parameter is within the range accepted by the IPCC.

Basic rebuttal written by John Cook

Nov. 13, 2017 - updated graphic with data through 2016 (BaerbelW)

Update July 2015:

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

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



The Skeptical Science website by [Skeptical Science](#) is licensed under a [Creative Commons Attribution 3.0 Unported License](#).

 [SkepticalScience.com](#)



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.



The [Skeptical Science](#) website by Skeptical Science is licensed under a Creative Commons [Attribution 3.0 Unported License](#).