The Human Cause of Climate Change: Where Does the Burden of Proof Lie?

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Dr Kevin Trenberth Advocates Reversing the 'Null Hypothesis'

The debate may largely be drawn along political lines, but the human role in climate change remains one of the most controversial questions in 21st century science. Writing in WIREs Climate Change Dr Kevin Trenberth, from the National Center for Atmospheric Research, argues that the evidence for anthropogenic climate change is now so clear that the burden of proof should lie with research which seeks to disprove the human role.

In response to Trenberth's argument a second review, by Dr Judith Curry, focuses on the concept of a null hypothesis' the default position which is taken when research is carried out. Currently the null hypothesis for climate change attribution research is that humans have no influence. "Humans are changing our climate. There is no doubt whatsoever," said Trenberth. "Questions remain as to the extent of our collective contribution, but it is clear that the effects are not small and have emerged from the noise of natural variability. So why does the science community continue to do attribution studies and assume that humans have no influence as a null hypothesis?" To show precedent for his position Trenberth cites the 2007 report by the Intergovernmental Panel on Climate Change which states that global warming is "unequivocal", and is "very likely" due to human activities.

Trenberth also focused on climate attribution studies which claim the lack of a human component, and suggested that the assumptions distort results in the direction of finding no human influence, resulting in misleading statements about the causes of climate change that can serve to grossly underestimate the role of humans in climate events. "Scientists must challenge misconceptions in the difference between weather and climate while attribution studies must include a human component," concluded Trenberth. "The question should no longer be is there a human component, but what is it?"

In a second paper Dr Judith Curry, from the Georgia Institute of Technology, questions this position, but argues that the discussion on the null hypothesis serves to highlight fuzziness surrounding the many hypotheses related to dangerous climate change. "Regarding attribution studies, rather than trying to reject either hypothesis regardless of which is the null, there should be a debate over the significance of anthropogenic warming relative to forced and unforced natural climate variability," said Curry.

Curry also suggested that the desire to reverse the null hypothesis may have the goal of seeking to marginalise the climate sceptic movement, a vocal group who have challenged the scientific orthodoxy on climate change. "The proponents of reversing the null hypothesis should be careful of what they wish for," concluded Curry. "One consequence may be that the scientific focus, and therefore funding,

would also reverse to attempting to disprove dangerous anthropogenic climate change, which has been a position of many sceptics."

"I doubt Trenberth's suggestion will find much support in the scientific community," said Professor Myles Allen from Oxford University, "but Curry's counter proposal to abandon hypothesis tests is worse. We still have plenty of interesting hypotheses to test: did human influence on climate increase the risk of this event at all? Did it increase it by more than a factor of two?"

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