



This is the print version of the [Skeptical Science](http://sks.to/negspencer) article '[Roy Spencer finds negative feedback](http://sks.to/negspencer)', which can be found at <http://sks.to/negspencer>.

## Roy Spencer's paper on climate sensitivity

### What The Science Says:

Spencer's model is too simple, excluding important factors like ocean dynamics and treats cloud feedbacks as forcings. A subsequent study by Dessler (2011) found that Spencer's paper was not a test of climate sensitivity or feedbacks, and his assumptions do not match empirical observational data.

### Climate Myth: Roy Spencer finds negative feedback

"NASA satellite data from the years 2000 through 2011 show the Earth's atmosphere is allowing far more heat to be released into space than alarmist computer models have predicted, reports a new study in the peer-reviewed science journal *Remote Sensing*. The study indicates far less future global warming will occur than United Nations computer models have predicted, and supports prior studies indicating increases in atmospheric carbon dioxide trap far less heat than alarmists have claimed." ([James Taylor](#))

Climate scientists have identified a number of fundamental problems in [Spencer and Braswell's 2011 study](#) which wrongly concludes that the climate is not sensitive to human greenhouse gas emissions. One of the main problems with the paper is that it uses Roy Spencer's very

simple climate model which we've previously looked at in



### Debunked by Trenberth, Fasullo, and Abraham

[A commentary published in the same journal](#) (*Remote Sensing*) by Trenberth, Fasullo, and Abraham found that Spencer's simple model does not have a realistic representation of many key aspects of the Earth's climate system.

"Because the exchange of heat between the ocean and atmosphere is a key part of the ENSO cycle, SB11's simple model, which has no realistic ocean, no El Niño, and no hydrological cycle, and an inappropriate observational baseline, is unsuitable. Use of a reasonable heat capacity for the ocean is also crucial. Importantly, SB11 treated non-radiative energy exchange between the ocean and atmosphere as a series of random numbers, which neglects the non-random variations of this energy flow associated with the ENSO cycle...None of those processes are included in the SB11 model and its relevance to nature is thus highly suspect."

One key aspect in the Earth's temperature changes is the El Niño Southern Oscillation (ENSO), which is a cycle of the Pacific Ocean. Spencer's model does not include ENSO, and he assumes that ENSO responds to changes in cloud cover, when in reality [it's the other way around](#).

Trenberth et al. found some other key problems in the paper. It doesn't provide enough information for other scientists to repeat the study. However, when trying to replicate their results, Trenberth et al. found that the climate models which matched the observed data best were those with a climate **more** sensitive to greenhouse gases, which directly contradicts Spencer and Braswell's claims that the climate is not sensitive to greenhouse gases. However, the correlation between model sensitivity and regression strength is of marginal statistical significance. Thus they conclude that Spencer and Braswell fundamentally took the wrong approach:

"Consequently, bounding the response of models by selection of those with large

and small sensitivities is inappropriate for these model-observation comparisons."

Trenberth et al. conclude that Spencer and Braswell are not testing climate sensitivity at all, but rather how well climate models simulate El Niño.

It's also worth noting that *Remote Sensing* does not normally publish climate science research. This may explain how the paper made it through their peer-review system with so many problems. In the end, Trenberth et al. find that the Spencer and Braswell study has no merit.

- The model it uses is far too simple to accurately represent the Earth's climate
- The paper doesn't provide enough information to replicate their results
- Their results depend on using one particular data set
- They assume that ENSO responds to cloud cover changes, when in reality, the reverse is true
- The study's conclusions are incorrect and unsupported

### Editor-in-Chief Resigns

Wolfgang Wagner, editor-in-chief of the journal which published Spencer's study, has [stepped down from his position at Remote Sensing](#). Wagner concluded the Spencer's paper was "fundamentally flawed and therefore wrongly accepted by the journal". [More here...](#)

### Debunked by Dessler (2011)

In their paper, Spencer and Braswell analyzed 14 models, but they only plotted the 3 with highest and 3 with lowest equilibrium climate sensitivities. A paper by [Dessler \(2011\)](#) found that in the process, Spencer and Braswell excluded three of the climate model runs which best matched the observational data (Figure 1).

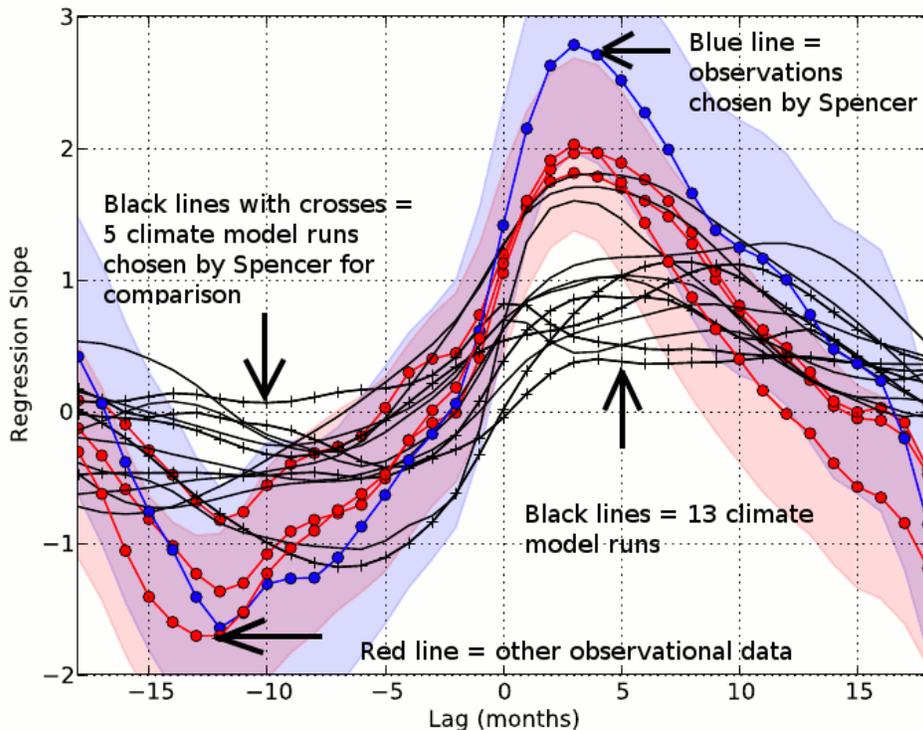


Figure 1: Dessler (2011) reconstruction of Spencer & Braswell's Figure 3, showing relationship between top-of-atmosphere (TOA) net flux and surface temperature, as a function of lag between them. The blue line is the observational data chosen by Spencer and Braswell. The red lines show other available observational data. The black lines show climate model results.

*The black lines with crosses show the climate model runs chosen by Spencer and Braswell in their paper.*

Dessler found that these three model runs excluded by Spencer which best matched the data were also among those which best simulate El Niño and La Niña, which is not surprising, given that much of the temperature change over 2000-2010 was due to the El Niño Southern Oscillation (ENSO). Thus Dessler concludes, like Trenberth et al., that

"since most of the climate variations over this period were due to ENSO, this suggests that the ability to reproduce ENSO is what's being tested here, not anything directly related to equilibrium climate sensitivity."

Spencer's claim of low sensitivity and negative feedbacks is based on this test, which is actually a test of models' ability to reproduce ENSO. Thus Spencer's claim of low sensitivity and negative feedbacks is not supported by the empirical observational data.

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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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