Has global warming research misinterpreted cloud behavior?

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Climate experts agree that the seriousness of manmade global warming depends greatly upon how clouds in the climate system respond to the small warming tendency from the extra carbon dioxide mankind produces.

To figure that out, climate researchers usually examine natural, year-to-year fluctuations in clouds and temperature to estimate how clouds will respond to humanity[1]s production of greenhouse gases.

When researchers observe natural changes in clouds and temperature, they have traditionally assumed that the temperature change caused the clouds to change, and not the other way around. To the extent that the cloud changes actually cause temperature change, this can ultimately lead to overestimates of how sensitive Earth's climate is to our greenhouse gas emissions.

This seemingly simple mix-up between cause and effect is the basis of a new paper that will appear in the *Journal of Climate.* The paper's lead author, Dr. Roy W. Spencer, a principal research scientist at The University of Alabama in Huntsville, believes the work is the first step in demonstrating why climate models produce too much global warming.

Spencer and his co-author, principal research scientist William (Danny) Braswell, used a simple climate model to demonstrate that something as seemingly innocuous as daily random variations in cloud cover can cause year-to-year variation in ocean temperature that looks like -- but isn't --

"positive cloud feedback," a warmth-magnifying process that exists in all major climate models.

"Our paper is an important step toward validating a gut instinct that many meteorologists like myself have had over the years," said Spencer, "that the climate system is dominated by stabilizing processes, rather than destabilizing processes -- that is, negative feedback rather than positive feedback."

The paper doesn't disprove the theory that global warming is manmade.

Instead, it offers an alternative explanation for what we see in the climate system which has the potential for greatly reducing estimates of mankind's impact on Earth's climate.

"Since the cloud changes could conceivably be caused by known long-term modes of climate variability -- such as the Pacific Decadal Oscillation, or El Nino and La Nina -- some, or even most, of the global warming seen in the last century could simply be due to natural fluctuations in the climate system," Spencer said.

While the paper's two peer reviewers, both climate model experts, agreed that the issue is a legitimate one, Spencer knows the new paper will be controversial, with some claiming that the impact of the mix-up between cause and effect will be small.

"But we really won't know until much more work is done," Spencer said.

"Unfortunately, so far we have been unable to figure out a way to separate cause and effect when observing natural climate variability. That's why most climate experts don't like to think in terms of causality, and instead just examine how clouds and temperature vary together.

"Our work has convinced me that cause and effect really do matter. If we get the causation wrong, it can greatly impact our interpretation of what nature has been trying to tell us. Unfortunately, in the process it also makes the whole global warming problem much more difficult to figure out."

Source: University of Alabama