

Manmade Global Warming: Science or Religion?

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1. Introduction

Global warming is probably the most feared potential environmental threat we face. Mankind's emissions of greenhouse gases, primarily carbon dioxide from burning of fossil fuels, are believed by a majority of climate scientists to have caused most of our recent global warmth. And if that is true, then there is little doubt that warming will continue into the future -- at least until new sources of energy are developed that can substantially replace carbon-based fuels.

But what is the evidence that mankind is responsible for our present warmth, and is that warmth necessarily a bad thing? Could the warmth have a natural explanation? And would a loving God give us an Earth that is so sensitive that our use of the fuels He has provided us could so easily alter the climate system?

I hope this paper will help you to better understand, contrary to what you might have heard from various media outlets, that the scientific theory of manmade global warming is based upon faith as much as it is upon the scientific evidence.

2. Global Warming During the Instrumental Record

One problem with the determination of the significance of our present warmth is the fact that our instrumental record from thermometers is little more than 100 years long. During that relatively short record, there are only three main features: warming from the late 1800's to about 1940; slight cooling from 1940 to the 1970's; and then warming again since the 1970's. When there are so few features ("degrees of freedom") to explain in the data, it becomes that much easier to find potential explanations.

The truth is that we do not understand natural climate variability on these multi-decadal time scales. For instance, there is considerable uncertainty regarding the causes of the first two features: warming until 1940, then cooling for 30 years afterward. The first feature is generally referred to as the end of the Little Ice Age of the previous several centuries. But this really doesn't explain anything because we have no idea why the

Little Ice Age occurred, or why it ended. Then cooling from 1940's to the 1970's occurred despite rapidly increasing greenhouse gases from industrialization. One theory is that manmade aerosol pollution during that time caused more reflection of sunlight back to outer space, overwhelming the greenhouse warming.

But note that, since we do not understand natural climate variability, we are only left with mankind as a potential cause. As a result, climate modelers are limited to addressing the possibility of only manmade influences, while natural climate variability is swept under the rug.

3. Is Our Current Warmth Unprecedented?

There are a handful of influential scientists that claim that we are warmer now than anytime during the last 1 million years. But the fact is that before the 1900's we really don't know how many 30-year periods could have been warmer than today. Certainly the Medieval Warm Period around 1000 A.D. was at least as warm. Vikings were farming Greenland for hundreds of years before the weather gradually turned colder and more icebergs presented greater hazards to their ships. Finally, all farms were abandoned.

What caused this period of unusual warmth? No one knows. But what we do know is that the complexity of the climate system, combined with the huge heat carrying capacity of the world's oceans, has the potential to cause substantial changes in global climate from internal variability alone. For instance, in research we have submitted for publication in the Journal of Climate, we found that substantial 30-year trends in temperature can occur simply due to daily *random variability* in low cloudiness. This is not a new idea, as a few previous authors have also pointed out how easy it would be for the Earth's climate to go through substantial changes – without any help from mankind.

4. Global Warming Theory

The Earth's relatively constant average surface temperature (to within 1 deg F or so) is believed to be the result of the 'energy balance' between (1) absorbed solar energy, and (2) infrared energy emitted back to outer space. Sunlight is always heating one half of the Earth, while infrared cooling occurs over the whole Earth continuously. The

reason the temperature cools off at night is because infrared cooling to space is operating in the absence of any sunlight to offset it. Then, during most of the day it warms up because the absorbed sunlight exceeds the amount of infrared loss.

Global warming theory has to do with the fact that carbon dioxide, which is released by the burning of fossil fuels, is a ‘greenhouse’ gas; that is, it traps some of the infrared energy in the lower atmosphere, warming it up. But CO₂ is a relatively minor player in the Earth’s greenhouse: out of every 100,000 molecules of air, only 38 of them are carbon dioxide, and it takes five years of emissions by mankind to increase that number by one molecule, to 39 out of 100,000.

The largest greenhouse players by far are water vapor and clouds, which account for over 90% of the greenhouse warming the Earth experiences naturally. And it is the behavior of those greenhouse components which we ultimately need to understand in order to predict manmade global warming.

5. Water Vapor and Clouds: Wildcards in the Climate System

Most people don’t realize that the direct warming effect of a doubling of the pre-industrial atmospheric concentration of carbon dioxide (likely to occur by the end of this century) is pretty weak: only about 1 deg. F. That is a theoretical calculation where a computer-modeled climate system is forced to remain unchanged while only the carbon dioxide is increased.

But in the real world, other elements of the climate system *will* respond to that slight warming tendency from the extra CO₂. The big question is, will those elements respond in ways that amplify the warming, or reduce it?

Those responses are called ‘feedbacks’, and current computerized climate models suggest that the feedbacks in the climate system are mostly positive, amplifying the CO₂-only warming. The most important feedbacks are likely to be those due to water vapor and clouds, both feedbacks of which are substantially positive in climate models.

But I believe the models are wrong.

5.1 Water Vapor

Water vapor is supposedly the best understood feedback in the climate system. Its increase with warming is always explained by pointing out that warming from the extra

CO₂ will cause more evaporation from the surface of the Earth, and since water vapor is also a greenhouse gas, that will amplify the warming.

But what isn't mentioned (and not even realized by many climate modelers, who often have no training in meteorology) is that the evaporation rate is *not* what determines how much water vapor exists, on average, in the atmosphere. It is the balance between evaporation (the source of the vapor), and precipitation (the only sink of the vapor). While we understand evaporation pretty well, the controls on precipitation are much less well understood. Precipitation systems could, theoretically, allow much higher levels of vapor (and therefore temperature) in the atmosphere than they currently do. But they don't. Why is that? We don't know – and until we understand why the present average amount of water vapor is preferred, we can't understand water vapor feedback.

What we really need to know is how the efficiency with which rain systems remove water vapor varies with temperature. We already know that tropical precipitation systems are more efficient than their high-latitude cousins, but beyond that, we don't know enough about precipitation processes to understand how a small amount of warming will change their efficiency.

And what we don't understand, we can't put into a computer model! Therefore, the scientists that believe climate model predictions of substantial – even catastrophic – global warming and climate change have *faith* that the models are sufficiently sophisticated to be used for climate predictions.

As an example of this issue, climate models have a long history of spurious “drift”; they were too sensitive to small changes, which would then push them unrealistically away from equilibrium. In nature, we see much more stability in the climate system. The point is that it takes a *higher level of understanding* to be able to include all of the checks and balances that occur in nature. The more primitive your understanding, the more likely that your computer model will be too sensitive to small perturbations, like mankind's emissions of greenhouse gases.

5.2 Clouds

Even the climate modelers admit that the feedback effects of clouds are uncertain.

But when they say uncertain, they mean that they don't know whether clouds will provide a weakly positive feedback, or a strongly positive feedback. The possibility of negative cloud feedbacks is largely discounted by climate modelers.

But once again, I will claim that there is still a very real possibility that this feedback is negative. I have two lines of evidence to support that contention.

First is our publication in *Geophysical Research Letters* (August 9, 2007) of evidence for negative cloud feedbacks from six years of satellite measurements. We found very clear evidence in support for the 'Infrared Iris' theory of natural climate stabilization. Developed about ten years ago by Prof. Richard Lindzen of MIT, this theory predicts that as the surface and atmosphere warm, precipitation systems will produce less cirrus cloudiness flowing out their tops. And since most cirrus clouds have a strong greenhouse warming effect, a reduction in cirrus cloud cover with warming would be a negative feedback.

Lindzen's original paper on the Infrared Iris hypothesis was quickly condemned by other investigators, who used satellite data to 'show' that evidence in support of the theory was, at best, weak. For our study, we used a much longer period of time, and a much larger portion of the Earth, and so we consider our results to be much more definitive. It is interesting that, despite our publication and an accompanying press release, no reporters called to do a story on this work.

A second piece of evidence which suggests that climate modelers have overestimated a positive cloud feedback is related to interpreting cause and effect in the current climate system. When climate researchers analyze the measured behavior of our climate system, they usually see that an extended period of unusual warmth is associated with a change in clouds that suggests a positive feedback. Unfortunately, they do not consider the possibility that the change in clouds might have *caused* the change in temperature, rather than the other way around. To the extent that a change in clouds causes a change in temperature, this relationship will always look like a positive feedback – even in the presence of real, negative cloud feedbacks! We analyzed the size of this “false positive” contamination of diagnosed feedbacks, and have submitted it to the *Journal of Climate* for publication.

6. Manmade Global Warming: Pending Catastrophe, or Unfounded Fear?

I hope I have convinced you that there are still large uncertainties associated with the theory that mankind's greenhouse gas emissions have a substantial effect on climate. Recent pronouncements that "all scientists agree" and "the debate is over" have no basis in fact; they have instead become urban legends which are endlessly repeated by politicians and members of the media.

Ultimately, the climate modeler's claim that global warming is a serious threat is based upon his *faith* in our current understanding of what controls climate variability. The believer in a creator God is more likely to believe that the climate system is resilient. In contrast, the atheist is more likely to believe that – since the Earth and its inhabitants are just a cosmic accident – the climate system, biosphere, and humanity itself could be standing at the precipice of a great disaster.

Indeed, we are in a grand climate experiment. But unlike other 'hard science' disciplines, this experiment can not be tested in the laboratory. This puts global warming predictions outside the realm of testable science. Therefore, the reasons why so many climate scientists are so sure of their global warming predictions must be sought outside of the realm of 'evidence'. I believe that those reasons are more likely to be found in the scientists' worldviews, religious beliefs, political leanings, professional interactions with other scientists, career and financial interests, misunderstandings about basic economics and policy, and their search for significance as part of a movement that is trying to "Save the Earth".

Finally, it needs to be understood that science has nothing to say about what should be done about global warming, or any other environmental problem. It can only attempt to understand and describe how the natural world operates.