Could Climate Science Survive a Legal Cross Examination?

Review by Bill DiPuccio

Could the global warming hypothesis meet the rigorous evidentiary standards of a legal trial? The answer, according to Jason Scott Johnston, is clearly negative.

Johnston is the Robert G. Fuller, Jr. Professor of Law, and Director of the Program on Law, Environment and Economy of the University of Pennsylvania Law School. His 79 page essay, Global Warming Advocacy Science: A Cross Examination, published by the Institute of Law and Economics, examines a broad range of evidence both for and against the conclusions drawn by the United Nation's Intergovernmental Panel on Climate Change (IPCC).

After a comprehensive examination of the peer-reviewed literature, the author concludes that there is a tendentious use of evidence by the IPCC, revealing "a systematic tendency of the climate establishment to engage in a variety of stylized rhetorical techniques that seem to oversell what is actually known about climate change while concealing fundamental uncertainties and open questions regarding many of the key processes involved in climate change" (1).

Johnston is not attempting to arrive at a scientific conclusion regarding the global warming hypothesis. Rather, he is cross examining the "established climate story" by asking "very tough questions, questions that force the expert to clarify the basis for his or her opinion, to explain her interpretation of the literature, and to account for any apparently conflicting literature that is not discussed in the expert report" (6).

This approach raises some fundamental questions about the role of non-specialists in critiquing science. Scientists would like to believe that their disagreements can be settled by evidence alone. However, the reality is that science possesses an underlying grammar which includes the rigorous use of opposing evidence, critical thinking, mathematics, logic, and internal consistency. Most of these elements are shared by other fields, including—and especially—the legal profession.

Anyone who is competent in these areas may weigh-in on their proper, or improper, use without a full understanding of the scientific facts. When I first read the IPCC's Fourth Assessment (2007) I had very little background in climate science, though I had worked in operational meteorology. Yet, it became fast apparent to me that the supporting evidence for the IPCC's projections did not warrant the high level (90%-95%) of confidence expressed by its authors. Indeed, it was the authors themselves who raised fundamental doubts about our scientific understanding of radiative forcing agents and climate change, both past and present. As Johnston concludes, these projections are not reliable enough to make public policy decisions.

After pouring over years of mainstream literature, Johnston discovered numerous scientific uncertainties "which are rarely if ever even mentioned in the climate change law and policy literature" (8-9):

- "There seem to be significant problems with the measurement of global surface temperatures over both the relatively short run – late 20th century – and longer run – past millennium – problems that systematically tend to cause an overestimation of late 20th century temperature increases relative to the past;
- Continuing scientific dispute exists over whether observations are confirming or disconfirming key short-run predictions of climate models – such as an increase in tropospheric water vapor and an increase in tropical tropospheric surface temperatures relative to tropical surface temperatures;
- Climate model projections of increases of global average surface temperature (due to a doubling of atmospheric CO_2) above about 1 degree centigrade arise only because of positive feedback effects presumed by climate models;

- Yet there is evidence that both particular feedbacks -- such as that from clouds – and feedbacks in total may be negative, not positive;
- Confidence in climate models based on their ability to causally relate 20th century temperature trends to trends in CO_2 may well be misplaced, because such models do not agree on the sensitivity of global climate to increases in CO_2 and are able to explain 20th century temperature trends only by making arbitrary and widely varying assumptions about the net cooling impact of atmospheric aerosols;
- Similar reason for questioning climate models is provided by continuing scientific dispute over whether late 20th century warming may have been simply a natural climate cycle, or have been caused by solar variation, versus being caused by anthropogenic increases in atmospheric CO_2;
- The scientific ability to predict what are perhaps the most widely publicized adverse impacts of global warming – sea level rise and species loss – is much less than generally perceived, and in the case of species loss, predictions are based on a methodology that a large number of biologists have severely criticized as invalid and as almost certain to lead to an overestimate of species loss due to global warming;
- Finally, many of the ongoing disputes in climate science boil down to disputes over the relative validity and reliability of different observational datasets, suggesting that the very new field of climate science does not yet have standardized observational datasets that would allow for definitive testing of theories and models against observations."

Johnston cross examines and juxtaposes conclusions from numerous scientists to reveal "a *rhetoric of persuasion, of advocacy* that prevails throughout establishment climate science" (9). Complexities and uncertainties that might shake the confidence of policymakers are often concealed. For example, there is no mention of water vapor feedbacks in the IPCC AR4 "Climate Science" documents intended to influence the public and the media – the Policymaker Summary and Technical Summary (24).

By oversimplifying the climate story, it appears that the IPCC's projections are just straightforward physics: The 2°C to 6°C projected rise in global average temperature is the direct, linear result of increasing CO2. But in reality, the IPCC claims that CO2, acting alone, will result in only a 1.2°C rise in temperature. The rest depends on whether the climate amplifies (positive feedback) or diminishes (negative feedback) CO2 forcing.

As Johnston demonstrates from the scientific literature, the complex and chaotic processes underlying these mechanisms, especially as they relate to cloud formation and precipitation, constitute anything but straightforward physics. The issue of feedbacks and climate sensitivity is probably the greatest question facing climate science. But policymakers are left blissfully ignorant of these controversies.

Johnston concludes by calling for a change in climate science practices and funding. Since one of the major sources of disagreement between scientists lies in the use of different datasets, he recommends that "public funding for climate science should be concentrated on the development of better, standardized observational datasets that achieve close to universal acceptance as valid and reliable." On the other hand, the continued development of "fine-grained climate models," in the absence reliable data, only perpetuates "faith-based climate policy" (77-79).

Johnston's essay echoes the experience of many reputable scientists whose work has been marginalized or rejected by IPCC gatekeepers. As we learned from the 'Climategate' emails, there was indeed a concerted effort behind the scenes to insure that only one side of the story was heard. If the climate science community is serious about transparency, then they need to abandon their "tidy story" and provide a *bone fide* forum for opposing views. These views should be incorporated as an alternative report in both IPCC and governmental

publications, including the summaries for policymakers. With so much hanging in the balance, decision makers need to hear both sides of the debate.

Special thanks to Roger Pielke Sr. for finding Johnston's article.

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