

CLIMATEGATE: IS PEER-REVIEW IN NEED OF CHANGE?

by Chip Knappenberger



Science & Public Policy Institute
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SPPI COMMENTARY & ESSAY SERIES ♦ December 2, 2009

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In science, as in most disciplines, the process is as important as the product. The recent email/data release (aka [Climategate](#)) has exposed the process of scientific peer-review as failing. If the process is failing, it is reasonable to wonder what this implies about the product.

Several scientists have come forward to express their view on what light Climategate has shed on these issues. Judith Curry has some insightful views [here](#) and [here](#), along with associated comments and replies. Roger Pielke Jr. has an [opinion](#), as no doubt do many others.

Certainly a perfect process does not guarantee perfect results, and a flawed process does not guarantee flawed results, but the chances of a good result are much greater with the former than the latter. That's why the process was developed in the first place.

Briefly, the peer-review process is this; before results are published in the scientific literature and documented for posterity, they are reviewed by one or more scientists who have some working knowledge of the topic but who are not directly associated with the work under consideration. The reviewers are typically anonymous and basically read the paper to determine if it generally seems like a reasonable addition to the scientific knowledge base, and that the results seem reproducible given the described data and methodology.

Generally, reviewers do not “audit” the results—that is, spend a lot of effort untangling the details of the data and or methodologies to see if they are appropriate, or to try to reproduce the results for themselves. How much time and effort is put into a peer review varies greatly from case to case and reviewer to reviewer. On most occasions, the reviewers try to include constructive criticism that will help the authors improve their work—that is, the reviewers serve as another set of eyes and minds to look over and consider the research, eyes that are more removed from the research than the co-authors and can perhaps offer different insights and suggestions.

Science most often moves forwards in small increments (with a few notable exceptions) and the peer-review process is designed to keep it moving efficiently, with as little back-sliding or veering off course as possible.

It is not a perfect system, nor, do I think, was it ever intended to be.

The guys over at RealClimate like to [call peer-review](#) a “necessary but not sufficient condition.”

Certainly is it not sufficient. But increasingly, there are indications that its necessity is slipping—and the contents of the released Climategate emails are hastening that slide.

Personally, I am not applauding this decline. I think that the scientific literature (as populated through peer-review) provides an unparalleled documentation of the advance of science and that it should not be abandoned lightly. Thus, I am distressed by the general picture of a broken system that is portrayed in the Climategate emails.

Certainly there are improvements that could make the current peer-review system better, but many of these would be difficult to impose on a purely voluntary system.

Full audits of the research would make for better published results, but such a requirement is too burdensome on the reviewers, who generally are involved in their own research (among other activities) and would frown upon having to spend a lot of time to delve too deeply into the nitty-gritty details of someone else's research topic.

An easier improvement to implement would be a double-blind review process in which both the reviewers and the authors were unknown to each other. A few journals incorporate this double-blind review process, but the large majority does not. I am not sure why not. Such a process would go at least part of the way to avoiding pre-existing biases against some authors by some reviewers.

Another way around this would be to have a fully open review process, in which the reviewers and author responses were freely available and open for all to see, and perhaps contribute. A few journals in fact have instituted this type of system, but not the majority.

Nature magazine a few years ago hosted a web debate on the state of scientific peer-review and possible ways of improving it. It is worth looking at to see the wide range of views and reviews [assembled there](#).

As it now stands, a bias can exist in the current system. That it does exist is evident in the Climategate emails. By all appearances, it seems that some scientists are interested in keeping certain research (and particular researchers) out of the peer-review literature (and national and international assessments derived there from). While undoubtedly these scientists feel that they are acting in the best interest of science by trying to prevent too much backsliding and thereby keeping things moving forward efficiently, the way that they are apparently going about it is far from acceptable.

Instead of improving the process, it has nearly destroyed it.

If the practitioners of peer-review begin to act like members of an exclusive club controlling who and what gets published, the risk is run that the true course of science gets sidetracked. Even folks with the best intentions can be wrong. Having the process too tightly controlled can end up setting things back much further than a more loosely controlled process which is better at being self-correcting.

Certainly as a scientist, you want to see your particular branch of science move forward as quickly as possible, but pushing it forward, rather than letting it move on its own accord, can oftentimes prove embarrassing.

As it was meant to be, peer-review is a necessary, but not sufficient condition. As it has become, however, the necessity has been eroded. And blogs have arisen to fill this need.

In my opinion, blogs should serve as discussion places where ideas get worked out. The final results of which, should then be submitted to the peer-reviewed literature. To me, blogs are a 21st-century post-seminar beer outing, lunch discussion, or maybe even scientific conference. But they should not be an alternative to the scientific literature—a permanent documentation of the development of scientific ideas.

But, the rise of blogs as repositories of scientific knowledge will continue if the scientific literature becomes guarded and exclusive. I can only anticipate this as throwing the state of science and the quest for scientific understanding into disarray as we struggle to figure out how to incorporate blog content into the tested scientific knowledgebase. This seems a messy endeavor.

Instead, I think that the current peer-review system either needs to be re-established or redefined.

The single-blind review system seems to be an outdated one. With today's technology, a totally open process seems preferable and superior—as long as it can be constrained within reason. At the very least, double-blind reviews should be the default. Maybe even some type of an audit system could be considered by some journals or some organizations.

Perhaps some good will yet come out of this whole Climategate mess—a fairer system for the consideration of scientific contribution, one that could less easily be manipulated by a small group of influential, but perhaps misguided, individuals.

We can only hope.



Source: <http://www.masterresource.org/2009/12/climategate-is-peer-review-in-need-of-change/>.

Cover photo of peer-reviewed journals from the [University of Delaware](#) website.

