

No consensus on IPCC's level of ignorance



## VIEWPOINT

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As the Intergovernmental Panel on Climate Change (IPCC) puts the finishing touches to its final report of the year, two of its senior scientists look at what the panel is and how well it works. Here, a view from a leading researcher into temperature change.

The IPCC is a framework around which hundreds of scientists and other participants are organised to mine the panoply of climate change literature to produce a synthesis of the most important and relevant findings.

These findings are published every few years to help policymakers keep tabs on where the participants chosen for the IPCC believe the Earth's climate has been, where it is going, and what might be done to adapt to and/or even adjust the predicted outcome.

While most participants are scientists and bring the aura of objectivity, there are two things to note:

\* this is a political process to some extent (anytime governments are involved it ends up that way)

\* scientists are mere mortals casting their gaze on a system so complex we cannot precisely predict its future state even five days ahead

The political process begins with the selection of the Lead Authors because they are nominated by their own governments.

Thus at the outset, the political apparatus of the member nations has a role in pre-selecting the main participants.

But, it may go further.

Unsound bites

At an IPCC Lead Authors' meeting in New Zealand, I well remember a conversation over lunch with three Europeans, unknown to me but who served as authors on other chapters. I sat at their table because it was convenient.

After introducing myself, I sat in silence as their discussion continued, which boiled down to this: "We must write this report so strongly that it will convince the US to sign the Kyoto Protocol."

Politics, at least for a few of the Lead Authors, was very much part and parcel of the process.

And, while the 2001 report was being written, Dr Robert Watson, IPCC Chair at the time, testified to the US Senate in 2000 adamantly advocating on behalf of the Kyoto Protocol, which even the journal Nature now reports is a failure.

Follow the herd

As I said above - and this may come as a surprise - scientists are mere mortals.

The tendency to succumb to group-think and the herd-instinct (now formally called the "informational cascade") is perhaps as tempting among scientists as any group because we, by definition, must be the "ones who know" (from the Latin *sciere*, to know).

You dare not be thought of as "one who does not know"; hence we may succumb to the pressure to be perceived as "one who knows".

This leads, in my opinion, to an overstatement of confidence in the published findings and to a ready acceptance of the views of anointed authorities.

Scepticism, a hallmark of science, is frowned upon. (I suspect the IPCC bureaucracy cringes whenever I'm identified as an IPCC Lead Author.)

The signature statement of the 2007 IPCC report may be paraphrased as this: "We are 90% confident that most of the warming in the past 50 years is due to humans."

We are not told here that this assertion is based on computer model output, not direct observation. The simple fact is we don't have thermometers marked with "this much is human-caused" and "this much is natural".

So, I would have written this conclusion as "Our climate models are incapable of reproducing the last 50 years of surface temperatures without a push from how we think greenhouse gases influence the climate. Other processes may also account for much of this change."

Slim models

To me, the elevation of climate models to the status of definitive tools for prediction has led to the temptation to be over-confident.

Here is how this can work.

Computer models are the basic tools which are used to estimate the future climate. Many scientists (ie the mere mortals) have been captivated by an IPCC image in which the actual global surface temperature curve for the 20th Century is overlaid on a band of model simulations of temperature for the same period.

The observations seem to fit right in the middle of the model band, implying that models are formulated so capably and completely that they can reproduce the past very well.

Without knowing much about climate models, any group will be persuaded by this image to believe models are quite precise.

However, there is a fundamental flaw with this thinking.

You see, every modeller knew what the answer was ahead of time. (Those groans you just heard were the protestations of my colleagues in the modelling community - they know what's coming).

In my view, on the other hand, this persuasive image is not a scientific experiment at all. The agreement displayed is just as likely to do with clever software engineering as to the first principles of science.

The proper and objective experiment is to test model output against quantities not known ahead of time.

Complex world

Our group is one of the few that builds a variety of climate datasets from scratch for tests just like this.

Since we build the datasets here, we have an urge to be sceptical about arguments-from-authority in favour of the real, though imperfect, observations.

In these model vs data comparisons, we find gross inconsistencies - hence I am sceptical of our ability to claim cause and effect about both past and future climate states.

Mother Nature is incredibly complex, and to think we mortals are so clever and so perceptive that we can create computer code that accurately reproduces the millions of processes that determine climate is hubris (think of predicting the complexities of clouds).

Of all scientists, climate scientists should be the most humble. Our cousins in the one-to-five-day weather prediction business learned this long ago, partly because they were held accountable for their predictions every day.

Answering the question about how much warming has occurred because of increases in greenhouse gases and what we may expect in the future still holds enormous uncertainty, in my view.

### Explosive view

How could the situation be improved? At one time I stated that the IPCC-like process was the worst way to compile scientific knowledge, except for all the others.

Improvements have been adopted through the years, most notably the publication of the comments and responses. Bravo.

I would think a simple way to let the world know there are other opinions about various aspects emerging from the IPCC font would be to provide some quasi-official forum to allow those views to be expressed.

These alternative-view authors should be afforded the same protocol as the IPCC authors, ie they themselves are their own final reviewers and thus would have final say on what is published.

At that point, I suppose, the blogosphere would erupt and, amidst the fire and smoke, hopefully, enlightenment may appear.

I continue to participate in the IPCC (unless an IPCC functionary reads this missive and blackballs me) because I not only am able to contribute from my own research, but there are numerous opportunities to learn something new - to feed the curiosity that attends a scientist's soul.

I can live with the disagreements concerning nuances and subjective assertions as they simply remind me that all scientists are people, and do not prevent me from speaking my mind anyway.

### Wise teachings

Don't misunderstand me.

Atmospheric carbon dioxide continues to increase due to the undisputed benefits that carbon-based energy brings to humanity. This increase will have some climate impact through CO<sub>2</sub>'s radiation properties.

However, fundamental knowledge is meagre here, and our own research indicates that alarming changes in the key observations are not occurring.

The best advice regarding scientific knowledge, which certainly applies to climate, came to me from Mr Mallory, my high school physics teacher.

He proposed that we should always begin our scientific pronouncements with this statement: "At our present level of ignorance, we think we know..."

Good advice for the IPCC, and all of us.

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This week, ahead of the launch of the IPCC's synthesis report for 2007, the BBC News website is looking at various aspects of "climate scepticism" and "catastrophism". If you have something novel to say on climate change, please let us know - we will be publishing a selection of your comments on Friday.

