

Climate change: CSIRO realigns after groupthink fails

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Cuts to the government-funded climate change program at the CSIRO coincide with a powerful critique of climate models by John Christy in a US congressional committee hearing.

While it is a matter for regret to see any research program truncated, and it is a difficult time for staff, redirection of CSIRO priorities into mitigation and adaptation is well justified. Christy, a distinguished professor of atmospheric science and the Alabama state climatologist, presented a graph showing the remarkable failure of a set of 102 predictions via climate models, as created by groups around the world, to provide a model trend matching observed warming of the global atmosphere across the past 20 years.

Observed data from two independent datasets (weather balloons and satellites) shows a rate of warming for 1995-2015 that is a factor of 2.5 lower than the averaged predictions from those of 102 modelling groups scattered around the globe. A model contributed by the CSIRO, incidentally, is close to the average; seems that (with apologies to Gilbert and Sullivan) on this little list, they'd none of them be missed.

Observations show a slight decreasing trend

Christy's testimony also included a caution on the use of climate models at a regional level for prediction of extreme events. One example was the number of hot days (above 100F, or 37.8C) observed in the US each year; all models predict an upward trend in the number of such hot days with time, but observations show a slight decreasing trend. Describing a peer-reviewed study on his home state, Christy commented, "not one of 76 models used came close to predicting what actually happened in Alabama's climate in the past 120 years. I would not trust model projections on which all policy is based right now because it just don't match facts right now." Australians who have paid about \$10 billion for three mothballed desalination plants on the east coast, commissioned largely on the basis that climate predictions during the great drought of 1995-2007 said that "the dams may never fill again", will resonate with Christy's conclusion.

The dominant assumptions must be flawed

Why do the combined brains of so many climate modelling groups get it so wrong? It is stating the obvious to say the dominant assumptions related to carbon dioxide as the driver of change must be flawed in their present form. Nobody doubts the physical principle that CO₂ is a greenhouse gas, but the models also demand complex assumptions about the sensitivity of global temperature to interactions and feedback processes of CO₂, water vapour, cloud cover and ice cover.

Superimposed on the warming effect of changes in atmospheric CO₂ are natural variations associated with cyclic changes in the sun, the Earth's orbit, and ocean and atmospheric circulation. Nobody doubts that changes in the Earth's orbit during the past million years caused the past eight ice ages. Nobody doubts that decadal variations in ocean currents in the Pacific cause the El Nino/La Nina climate variations that are associated in eastern Australia with dominant droughts and cool wet summers respectively.

Natural climate cycles poorly studied

However, the large number of natural climate cycles in the range of hundreds to thousands of years are comparatively poorly studied and frequently dismissed as having minor influence. Where such phenomena have been studied in detail, evidence is emerging that they may account for a significant part of past historic and prehistoric climate change. If we accept such evidence we have no choice but to conclude that the settings in models of CO₂ and water vapour feedbacks are too high. This provides us with a hypothesis as to why models are predicting temperature increases too high by Christy's factor of 2.5.

As Judith Curry, then chairwoman of the school of earth and atmospheric sciences at the Georgia Institute of Technology in the US, put it in evidence to an earlier congressional committee: "Until we understand natural climate variability better, we cannot reliably infer sensitivity to greenhouse gas forcing or understand its role in influencing extreme weather events."

It is my hope the new terms of reference for CSIRO's contributions to climate change will include study and quantification of natural climate variability; if we can quantify these and use them for forward predictions, their value for planning mitigation measures is obvious.

Enormous groupthink pressures

Cabinet Secretary Arthur Sinodinos told the Senate "we'll continue to spend about \$83 million a year on climate change mitigation adaptation research". This is a considerable sum that we must hope will facilitate an orderly realignment of climate-science priorities in the CSIRO. However, it will require effort. Having been part of the climate science debate for seven years I have observed enormous groupthink pressures towards the conclusions of the climate science establishment in the Western world. CSIRO chief executive Larry Marshall is experiencing this, as evidenced by his comments on the intense emotion associated with the debate.

Natural climate cycles research

I notice in publications demonstrating the significance of natural climate cycles that research groups in Asia and Russia have a strong representation. Possibly it is significant that the single group that produced a global temperature model that does match observed data in Christy's graph is from a Russian institute. Just as Australia has developed close links into Asia through its commodity and education exports, perhaps increased scientific links into Asia will present opportunities for the new climate mitigation and adaptation studies.

Australia needs research into mitigation of climate-related disasters; sequences of droughts and flooding rains (and fires) are part of our history. Whether such events are part of long-term cycles, and exacerbated by climate change, or by intensive settlement and land use, or both, is secondary to the imperative that we plan for them. The new CSIRO policy aimed in this direction, as distinct from attempts at climate prediction, is to be welcomed.

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