

David R.B. Stockwell Ph.D

April 12, 2008

Prof. Ross Garnaut, Submissions
Garnaut Climate Change Review
Level 2, 1 Treasury Place
Melbourne VIC 3002

Re: The Garnaut Climate Change Review Interim Report

I wish to express my concerns with the level of statistical diligence in your report. Your approach is defended in the rather frank admission on page 8:

Be that as it may, the Review is in no position to adjudicate on the relative merits of various expert scientific opinions. The Review has neither the time nor the resources to do so.

Consideration should be given to increasing the level of review of the statistical validity of research you rely on, else you open the report to errors and abrogate a duty of due diligence. I provide one specific (not necessarily isolated) example where this has already occurred in the Interim Report.

While I do not believe that the Review would knowingly rely on flawed or biased research, the Interim Report places excessive reliance on one seriously flawed study in Section 2.4 Consequences of Climate Change, Observed Climate Change, for one of its major conclusions.

”Developments in mainstream scientific opinion on the relationship between emissions accumulations and climate outcomes, and the Review’s own work on future business-as-usual global emissions, suggest that the world is moving towards high risks of dangerous climate change more rapidly than has generally been understood.”

As evidence to support my view, I attach comments on Rahmstorf et al. (2007). Rahmstorf et al. (Science Brevia, 4 May 2007, p709) report that the trend of the global mean surface temperature lies in the upper range projected by the IPCC. However, there is no statistical support for their claims.

Even without the flaws identified by myself and others, Rahmstorf et al. (2007) acknowledge their speculation based on a short time frame. If I might speculate also, judging from the timing of its release, just prior to the release of AR4, it could more adequately be described as an outlet by a subset of IPCC contributors who found the final IPCC report too conservative. Sources such as Rahmstorf et al. (2007) should not occupy such a prominent place in the report, or in the formulation of policy.

Other studies, which are more soundly based, do not suggest that 'the climate system may be responding more quickly than climate models indicate' (quite the contrary).

One way the Review may find the "time and resources" for statistical diligence has been suggested by Prof. Ian Castles. I draw your attention to a statement by David Henderson in 'SRES, IPCC and the Treatment of Economic Issues', Energy & Environment, vol. 16, nos 3 & 4, 2005: 549-78:

As to the statistical offices, the possibility of their joining in was raised in Canberra in July 2002 at a meeting with Dr Pachauri, where it was well received by those present. In December of that year, in writing to Dr Pachauri, Castles referred to the idea, and added:

"In this connection, I should mention that Mr Dennis Trewin, the Australian Statistician - who is currently President of the International Statistical Institute - has advised me that the Australian Bureau of Statistics would be very willing to participate in this way. I have no doubt that many other national statistical offices would also welcome the opportunity to contribute their expertise to relevant aspects of the work of the IPCC" (p. 568).

I invite you to seek independent verification of the flaws with Rahmstorf et al. (2007), and would provide contacts to qualified statisticians if requested.

Thank you for your time.

Sincerely,

David R.B. Stockwell Ph.D

Comment on Recent Climate Observations Compared to Projections, Rahmstorf et al. (2007)

Rahmstorf et al. (Science Brevia, 4 May 2007, p709) report that the trend of the global mean surface temperature lies in the upper range projected by the IPCC. There is no statistical support for their claims that the IPCC projections of global warming are conservative due to:

- technical flaws
- enlarged confidence limits of the trend line
- recent trends in climate since publication

Beginning April 3, 2008, I exchanged views with Prof. Rahmstorf in a discussion recorded at Niche Modeling (see <http://landshape.org/enm/rahmstorf-et-al-2007-ipcc-error/>) and at the RealClimate.org website (see <http://www.realclimate.org/index.php/archives/2008/04/model-data-comparison-lesson-2/>).

It is clear from the discussion that the various sources of uncertainty introduced by their approach were not fully appreciated, as expanded on both at Niche Modeling (<http://landshape.org/enm/examples-of-simple-smoothers/>) and at The Blackboard (<http://rankexploits.com/musings/2008/comment-on-the-slide-and-eyeball-method/>).

Similar concerns with the methodology in Rahmstorf et al. (2007) were also raised in the article "Sceptics will have their day" by Mark Lawson of the Australian Financial Review, which was published by the Australian e-journal "On Line Opinion" on 17/14/2008 (<http://www.onlineopinion.com.au/view.asp?article=7244>).

Remarkably, for a publication that has figured so prominently, Rahmstorf et al. (2007) present no statistical tests of significance in support of their claims. Perhaps this is because statistical tests would *not* show significant climatic trends greater than the IPCC projection. Other independent sources of evidence are actually starting to show temporary respite from of global warming: *declining* sea levels and temperatures, *declining* upper tropospheric temperatures and stable stratospheric temperatures (see <http://landshape.org/enm/more-evidence-of-climate-stabilization/>).

On sea level rises, Rahmstorf et al. (2007) misrepresent the views expressed in the TAR and AR4 reports. The assessment of the divergence between the rate of increase of sea levels and IPCC models was noted in the TAR and was not modified in the AR4. This appears to be because the chapter team recognized large uncertainties in sea level estimates, and certainly could not be reasonably interpreted as a team that was committed to a rate of increase and then found the system is responding more quickly than they thought. Rather, they have been aware of the divergence and have believed, based on statistical tests, that

the data are biased and the divergence is insignificant.

TAR: (http://www.grida.no/climate/IPCC_tar/wg1/409.htm)

”... consistent with observational finding of no acceleration in sea level rise during the 20th century.”

AR4: (http://ipcc-wg1.ucar.edu/wg1/Report/AR4WG1_Print_Ch05.pdf)

”Since it is unlikely that the land ice contributions of 1993 to 2003 were exceeded in earlier decades (Figure 4.14 and Section 4.6.2.2), we conclude that the maximum 10-year rates of global sea level rise are likely overestimated from tide gauges, indicating that the estimated variability is excessive. For 1993 to 2003, thermal expansion is much larger and land ice contributes $1.2 \pm 0.4 \text{ mmyr}^{-1}$. These increases may partly reflect decadal variability rather than an acceleration (Section 5.5.3; attribution of changes in rates and comparison with model results are discussed in Section 9.5.2). The sum is still less than the observed trend but the discrepancy of $0.3 \pm 1.0 \text{ mmyr}^{-1}$ is consistent with zero.”

It is apparent from these discussions that Prof. Rahmstorf had little understanding of the methodology he employed, and that the view expressed in Rahmstorf et al. (2007) that:

The data available for the period since 1990 raise concerns that the climate system, in particular sea level, may be responding more quickly to climate change than our current generation of models indicates.

is based in flawed and biased research.

Reference

Rahmstorf, S., A. Cazenave, J.A. Church, J.E. Hansen, R.F. Keeling, D.E. Parker, and R.C.J. Somerville, 2007: Recent climate observations compared to projections. *Science*, 316, 709, doi:10.1126/science.1136843.