

From: Mike Hulme <m.hulme@uea.ac.uk>
To: scenarios@meto.gov.uk
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> 3. Use of simple climate models:
> 3.1 Simple models used only as tools for
> extrapolating/interpolating GCM results to estimate the effect of different
> scenarios or sensitivities?
> 3.2 Simple models used to offer independent climate
> predictions?
> 3.3 Depending on the answers to 3.1 and 3.2, where will
> the assessment of simple model results be located within the TAR (under the
> projections or the scenarios Chapter or under an Appendix?)
> 3.4 How many simple climate models are needed (again
> depending on 3.1 and 3.2)?

I wish to pick up on two of the points raised by Sarah Raper and Jonathan Gregory which, while not directly answering the questions posed above, need a clear position being taken upon by IPCC. These two points are:

>From Gregory

"The presentation of a wide range of scenarios and sensitivities (3.1) will be a very important output of the TAR. Tom Wigley argues that it would be inappropriate to relegate it to an Appendix. Nonetheless it is different from the discussion and assessment of models which produce the basic projections of climate change and sea-level. I think both climate change and sea-level chapters should have separate, final, sections devoted specifically to showing the full range of uncertainties and the best estimates - an appendix to each chapter. The figures given there will be brought together in the summary of the TAR."

This is a very important concern from the perspective of how Chapter 13 (climate scenarios) is written and how WGII will look over their shoulder to WGI. For many reasons which have been well-articulated elsewhere, it is too much to expect complete consistency from WGIII emissions, to WGI models and to WGII impacts - the lags in the knowledge creation and ratification are too great. However, bear in mind that most GCM results used for climate scenario construction will be 1% per annum forcing (plus a few with 0.5% forcing, stabilisation forcing or one or more of the new SRES forcings, but these latter GCM results are unlikely to feed forward into (much) impacts work in time). However, for much impacts work to be properly assessed and interpreted by IPCC it is necessary to have used a range of climate scenarios spanning a range of risk. This is difficult, nay impossible, without resorting to simple climate model results. If WGI can fast-track this generation of headline projections spanning a range of forcings and sensitivities, then this information may be made use of by climate scenario developers and impacts analysts. If not, then WGI (Chapters 9 and 11) will be saying one thing, and all the impacts work is in danger of saying something else (e.g. using IS92 forcings with the SAR Chapter 6 simple model projections). At worst, some careful post-hoc re-interpretation of WGII results may be necessary in light of WGI for the policymakers summary and most importantly for the Synthesis Report.

>From Raper

"It is a separate question as to whether the simple climate model results should subsequently be used as scaling factors for regional scenario development in the scenario chapter."

This is indeed a separate question and one on which Chapter 13 can and will 'assess' the science. Scaling of GCM results has been widely used by impacts/integrated assessors since CRU started using this methodology in the early 1990s. Whether or not to adopt/recommend scaling methods for the IPCC TAR was side-stepped by the TGCIA, although it was clearly stated within the TGCIA that basing all impacts work on 1% p.a. forced GCMs which represented a narrow range of climate sensitivities, would skew impacts results in a particular (and not altogether desirable) direction. Chapter 13 will also recognise this problem and will assess the pros and cons of

scaling based on simple models, but given the short length of Chapter 13, its remit now is not to convert any headline simple model results from Chapters 9 and 11 into scaled regional scenarios for impacts work - by mid-late 1999 it will be too late for that anyway. So, different impact studies will now adopt different approaches, and WGII can assess the resulting science, but what will help the writing of Chapter 13 and WGII will be as clear a statement of intent (and ideally some preliminary results) of the sort of exercises that Sarah and Jonathan refer to, preferably using the new SRES emissions scenarios.

Mike

Dr Mike Hulme
Reader in Climatology tel: +44 1603 593162
Climatic Research Unit fax: +44 1603 507784
School of Environmental Science email: m.hulme@uea.ac.uk
University of East Anglia web site: http://www.cru.uea.ac.uk/~mikeh/
Norwich NR4 7TJ

Mean temp. in Central England during 1998 is running
at about 1.05 deg C above the 1961-90 average

The global-mean surface air temperature anomaly estimate for the
first half of 1998 was about +0.60 deg C above the 1961-90 average,
the warmest such period yet recorded
