

July 15, 2005

The Honorable Joe Barton, Chairman
House Committee on Energy and Commerce
The Honorable Ed Whitfield, Chairman
Subcommittee on Oversight and Investigations
2125 Rayburn House Office Building
Washington, D.C. 20515

Dear Congressman Barton and Congressman Whitfield,

I am writing in response to your letter of June 23 2005. As I only returned from Europe July 4 weekend, I am only able to provide information that is readily available. You ask a number of questions about work^{1, 2} published by Professors Michael Mann, Ray Bradley and myself, and request a great deal of detailed information on the whole of my research career. Much of my work has had little if any bearing on the topic of global warming.

I would like to provide some accurate information about the papers published with Professors Mann and Bradley and their implications, the availability of the data we used, and the current status of this area of scientific inquiry.

I think you might find it helpful if I dealt briefly with three points first:

- You write that you “*understand that the Mann, Bradley, Hughes studies of temperature proxy records (tree rings, ice cores, corals, etc.) formed **the** (my emphasis, MKH) basis for a new finding in the 2001 United Nations Intergovernmental Panel on Climate Change (IPCC) Third Assessment Report (TAR). This finding [was] – that the increase in 20th century northern hemisphere temperatures is “likely to have been the largest of any century during the past 1000 years” and that the “1990s was the warmest decade and 1998 the warmest year”.* This finding did not rest solely on our work, as is made clear on page 133 in section 2.3.2.2 of the IPCC TAR volume – “*Climate Change 2001: The Scientific Basis*” which lists the several lines of evidence they used to reach their finding.
- Your letter states that “*information necessary to replicate the analyses in the studies has not been made fully available to researchers upon request*”. This too is mistaken. We have actively made the data and methods we used freely available. The proxy data (tree rings, coral bands,

¹ Mann, M.E., Bradley, R.S., Hughes, M.K. Global-Scale Temperature Patterns and Climate Forcing Over the Past Six Centuries, *Nature*, 392, 779-787 (1998)

² Mann, M.E., Bradley, R.S. and Hughes, M.K., Northern Hemisphere Temperatures During the Past Millennium: Inferences, Uncertainties, and Limitations. *Geophysical Research Letters*, 26, 759-762 (1999)

ice cores, etc) we used in the Mann, Bradley, Hughes 1998 and 1999 papers have been at a publicly-accessible ftp site since 2000, and these data, plus the instrumental data we used, and an amplification of certain details of our methods have been available at the website of the journal *Nature* since July 2004. In fact, the original papers and supplementary material published in 1998 and 1999 were sufficient for working scientists to replicate both our methods and results, as they have done.

- Of course there has been debate in the scientific literature about the climate history of recent millennia, and about the many papers published on this topic recently. Our work is no exception to this, and rightly so. The small selection of articles referred to in your letter is not representative of this growing literature. A series of recent papers in the peer-reviewed scientific literature, based on quite different data and methods, confirm our main findings. This is the best and strongest form of scientific confirmation.

Expanding on the question of data availability and repeatability, my peer-reviewed published papers have given sufficiently detailed information to satisfy the scientific editors of the journals concerned and their peer-review processes. The U.S. National Science Foundation has stated that I have “*complied with the policy guidelines set out by the US government, and the NSF in particular, regarding access to data from publicly funded research*”³. For specifically dendrochronological calculations I use the publicly available programs of the Dendrochronology Program Library <http://www.ltrr.arizona.edu/software.html>. In the case of the Mann, Bradley, Hughes work mentioned in your letter, the proxy dataset we assembled has been publicly available for several years, and since July 2004 in an even more accessible form, with the addition of the instrumental data we used, as *Nature* Supplementary Material at <http://www.nature.com/nature/journal/v430/n6995/supinfo/nature02478.html>. They may also be found at <ftp://holocene.evsc.virginia.edu/pub/MBH98>.

As a result, scientists at the National Center for Atmospheric Research are among those who have been able to reproduce our procedures and conclusions⁴. Further details of our work are given in our published papers⁵, and in a paper that has been accepted for

³ Email from Program Manager David Verardo 10 August 2004

⁴ <http://www.ucar.edu/news/releases/2005/ammann.shtml>

⁵ Mann, M.E., Bradley, R.S., Hughes, M.K. Global-Scale Temperature Patterns and Climate Forcing Over the Past Six Centuries, *Nature*, 392, 779-787 (1998)

Mann, M.E., Bradley, R.S. and Hughes, M.K., Northern Hemisphere Temperatures During the Past Millennium: Inferences, Uncertainties, and Limitations. *Geophysical Research Letters*, 26, 759-762 (1999)

Mann, M.E., Gille, E., Bradley, R.S., Hughes, M.K., Overpeck, J.T., Keimig, F.T., Gross, W. Global Temperature Patterns in Past Centuries: An interactive presentation, *Earth Interactions*, 4-4, 1-29, (2000), accessible online at: http://www.ncdc.noaa.gov/paleo/ei/ei_cover.html, and in particular note: http://www.ncdc.noaa.gov/paleo/ei/ei_nodendro.html

publication⁶. Any scientific issues arising from our work will be resolved in the scholarly literature over a period of years.

My role in the IPCC TAR was very small. I was one of 140 “Contributing authors” of Chapter 2 of the IPCC TAR Working Group 1 volume titled “*Climate Change 2001: The Scientific Basis*”. In practice this meant that I was sent a *.pdf of the whole draft report in late 1999 and was asked for my comments and suggestions. My comments related to Chapters 1 and 2. I returned these comments, which were limited to matters of which I have professional knowledge, to the IPCC Secretariat. That was the sum total of my involvement in that volume. In April 2001 I was one of a very large number of people asked to be expert reviewers on the first draft of the Synthesis Report of the IPCC TAR. Again, I returned my comments to the IPCC secretariat, that being the end of my involvement with the IPCC TAR. I attended no meetings, was not asked to revise anything I submitted, and have no knowledge of the writing assignments, duties or practices of the authors of the various sections.

Please find my *curriculum vitae* enclosed with this letter. It lists over 120 publications, most in the peer-reviewed scientific literature, that I have written, co-authored or edited on the basis of work done since 1965. It also contains a list of grants received for my research since coming to the US in 1986.

In summary, our work was definitely not the only line of evidence used by the IPCC to reach the conclusions you mention, but one of several. Our work has been independently replicated, proving that we made ample information available for this. Furthermore, a series of completely independent studies have arrived at similar conclusions using entirely different data and methods. The normal, time-tested, process of science is at work, and should be permitted to continue.

I hope you will find my comments to be of help. Our university is a major center of research on past environments and, should you ever have the opportunity to visit Tucson, we would be pleased to give you an introduction the wide and fascinating range of work being done here.

Sincerely,



Malcolm K. Hughes
Professor of Dendrochronology

⁶ Rutherford, S., Mann, M.E., Osborn, T.J., Bradley, R.S., Briffa, K.R., Hughes, M.K., Jones, P.D., [Proxy-based Northern Hemisphere Surface Temperature Reconstructions: Sensitivity to Methodology, Predictor Network, Target Season and Target Domain](#), *Journal of Climate*, in press, 2005.

