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

Dear Congressman Barton and Congressman Whitfield,

It is good to know that your committee is keenly interested in understanding the basis for President George Bush's recent statement: "...*the surface of the earth is warmer and [that] an increase in greenhouse gases caused by humans is contributing to the problem*". My work has made minor contributions to this issue, which has been the focus of intense international scientific research in recent decades. There is now very little doubt that President Bush is correct; this is the view held by almost every person who has carefully studied the problem. Greenhouse gas concentrations in the atmosphere are now higher than at any time in *at least* the last 750,000 years (more than three times the length of time that our species, *homo sapiens* has been on earth). It took over 10,000 years for carbon dioxide levels at the end of the last ice age to rise by 100 parts per million (to 280ppmv) but it has taken only ~150 years for concentrations to increase by another 100ppmv. Indeed, about half of that increase has taken place within the last ~40 years, so the rate of increase is unprecedented, and accelerating. At the same time, global temperatures have risen to levels higher than at any time since records began. Our research, and that of many others, suggests that mean temperature in the northern hemisphere is, in fact, higher than at any time in *at least* the last 1000 years. These conclusions are consistent with theoretical studies dealing with the expected consequences of increased greenhouse gases. That is, theory--supported by modeling studies--predict that certain changes would be expected if greenhouse gas levels increase as they have done, and these predictions are similar to what we have observed in instrumental records, and in natural archives that are affected by climate changes. It is this very large body of work that led the Inter-Governmental Panel on Climate Change (IPCC) to draw the conclusion in its last report that, "The balance of evidence suggests a discernible influence on global climate". You are quite mistaken in thinking that this conclusion rests largely on the work of Bradley, Hughes or Mann, or on the three of us together. The IPCC Report (Climate Change 2001: The Scientific Basis", published by Cambridge University Press) is 881 pages in length. It weighs 5.5 pounds and contains over 200 figures and 80 Tables. It would be absurd to think that the weight of

its conclusions rests on any one figure or Table; rather it paints a convincing picture in the totality of its science, as noted succinctly in its title.

You mention that there have been several papers published that disagree with the conclusions of papers published by Mann, Bradley and Hughes. This should come as no surprise. That is the nature of scientific activity. We publish a paper, and others may point out why its conclusions or methods might be wrong. We publish the results of additional studies that may argue with those critics, and provide data that might support or modify our original conclusions. That's normal. Scientific developments generally take place incrementally, one or two steps forward, perhaps one or two back...or perhaps a little to the side. But as time goes on, robust results generally become accepted as other studies come to similar conclusions using perhaps different data, different approaches, different starting points. That is where we now stand with respect to our conclusion that the recent warming is unprecedented within the context of (at least) the last 1000 years. Others re-examined our methods and our data and came to the same conclusions that we did. Others have used different data and different methods, but also reached the same conclusion. This scientific approach, following well-established procedures involving the courteous exchange of views, both informally in scientific meetings and formally in the scientific literature, is what moves science forward. It does not move forward through editorials or articles in the *Wall Street Journal* or *USA Today*; it does not advance through *ad hominem* attacks on individual scientists in the Congress of the United States; it does not move forward through novelists deciding that they can sort the problem out by fleeting references to scientific papers within the pages of fiction. The problem of climate change will be documented through patient and careful analysis, carried out by those with the scientific background necessary to understand the problem.

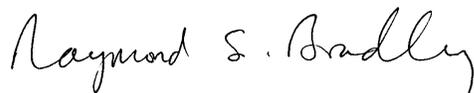
My responses to your specific questions are as follows:

1. My curriculum vitae is enclosed. It lists over 140 papers and 11 books that I have written, co-authored or edited over the past ~30 years. Where appropriate, the source of funding for the research underlying the various papers can be found in the Acknowledgements section of each paper.
2. A list of grants received for my research can be found in my curriculum vitae.
3. I have been a P.I. on awards made to the University of Massachusetts. I refer you to the Director of the Office of Grants and Contract Administration at the University for details of "agreements, adjustments, exceptions" etc, of which they have records.
4. Some of the data used in my research is archived at the World Data Center for Paleoclimatology (WDC-A), Boulder, Colorado. Other data are also available to the general public at NOAA or in other national data depositories around the world. When I, or my students, have generated data sets they are generally sent to the WDC-A once the results have been published. This is the normal procedure followed in my field. If somebody is interested in specific data or procedures used, they generally write to me requesting that information. Data related to the Mann et al. (1998) paper are available at:
<ftp://holocene.evsc.virginia.edu/pub/MBH98>

5. I get somewhere between 30,000 and 35,000 emails a year. These include many inquiries about my research ranging from schoolchildren doing projects, to college students and scientists carrying out their own research, to religious fundamentalists who wish to convince me that the end is nigh. I do not have time to respond to all requests but try to respond to as many inquiries as I can.
6. McIntyre and McKittrick have criticized our work, claiming to have “audited” and “corrected” what we did. In fact, they did neither. Had their article been subjected to an appropriate scientific review, it is unlikely that it would have been published. They then submitted their criticisms to *Nature*; we responded to these through extensive correspondence with *Nature*. After reviewing their claims, *Nature* chose not to publish them. They then submitted essentially the same criticisms to *Geophysical Research Letters*. The editors of this journal made an error by not requesting comments on the article from us (as *Nature* did). This is the normal procedure when the work of any author is directly criticized; then (if recommended by reviewers) both the criticism and the response are jointly published for all to judge who is right; this procedure was not followed. If it had been, once again I believe the criticisms of McIntyre and McKittrick would probably not have been published. There is a very good guide to the issues involved at this web site: <http://www.realclimate.org/index.php?p=121>
This shows why their criticisms are erroneous and irrelevant to our basic conclusion that the recent warming is unprecedented in the context of the last 1000 years.
7. I had a very minor role in the last IPCC assessment, limited to reading draft sections of Chapter 2 and providing comments.

Let me conclude by pointing out that the paper which seems to be the focus of so much of your attention (Mann et al, 1999) was entitled, *Northern Hemisphere temperatures during the past millennium: inferences, uncertainties, and limitations*. In fact, a major point of the paper—which both you and others seem to have overlooked—is that we were at pains in this paper to point out the difficulties of drawing conclusions about the climate of the past millennium. We recognize and estimate the uncertainties involved in such paleoclimatic reconstructions. If others choose to ignore those caveats, there’s not much we can do about it. Nevertheless, the estimates that we provided have proven to be quite robust and the “working hypothesis” that we presented is now quite well supported by numerous other studies.

Sincerely,



Raymond S. Bradley
University Distinguished Professor