

February 3, 2010

To the Members of the Utah State Legislature:

It has come to our attention that Rep. Kerry W. Gibson (R-Ogden) has submitted H.J.R. 12 (“Climate Change Joint Resolution”) for consideration in the 2010 general session. The resolution urges the U.S. Environmental Protection Agency not to attempt to regulate carbon dioxide emissions “until climate data and global warming science are substantiated.” There may be good reasons to urge the EPA not to regulate carbon dioxide emissions, and in fact, some (albeit not all) of us do not believe they should. Unfortunately, good reasons are hard to find in H.J.R. 12. Therefore, as Earth and Life scientists and concerned Utah citizens, we urge the Legislature to table this resolution.

In the following paragraphs we will briefly explain why several of the claims made in H.J.R. 12 are problematic.

1. *H.J.R. 12 claims that the EPA’s Endangerment Finding regarding carbon dioxide is based on “flawed climate data,” and that it is flawed because of a “well organized and ongoing effort to manipulate and incorporate ‘tricks’ related to global temperature data in order to produce a global warming outcome.” This organized effort was uncovered when criminals hacked the e-mail system of the Climate Research Unit of the University of East Anglia.*

This is truly a case of a mountain made from a molehill. Scientists often use terms like “trick” in personal conversations to describe creative problem-solving strategies. In this case, the scientists in question were discussing a method to combine recent instrumental temperature readings (from satellites and thermometers on the ground or in the ocean) with temperature proxy data derived from tree rings to cover a longer time interval. The wood density in tree rings does correlate with temperature, but since trees are biological organisms, other factors also affect it. Therefore, scientists have to use multiple sources of information as a check on proxy temperature data from tree rings, and sometimes it turns out that the tree ring data are unreliable in certain localities or during certain time periods. In 1998, Briffa and coworkers (*Nature*, 391, 678-682) showed that, since about 1960, tree ring density has become increasingly insensitive to temperature, and so they recommended not using tree ring temperature proxy data after 1960. When Phil Jones of the Climate Research Unit talked about using the “trick” of adding recent instrumental data (which is more reliable) to the end of a series of proxy data to “hide the decline,” he was simply saying that he was substituting reliable data in place of unreliable data. Perhaps Jones’s language was unfortunate, but he wasn’t preparing his comments for public consumption, and there is no evidence that he did anything unethical with his temperature data.

With regard to the entire “Climategate” issue, if investigation reveals that serious scientific misconduct occurred, we expect that appropriate actions will be taken. However, the influence of increasing greenhouse gas concentrations on global climate is well substantiated by careful research outside the Climate Research Unit. It is unwise for the Legislature to disregard the work of these scientists on the basis of allegations made against unrelated workers.

2. *H.J.R. 12 claims “global temperatures have been level and declining in some areas over the past 12 years,” and that “climate alarmists’ carbon dioxide-related global warming hypothesis is unable to account for the current downturn in global temperatures.”*

This claim belies a serious misconception about climate research. Scientists refer to “weather” as the short-term swings in temperature, precipitation, etc., and it depends on so many random factors that it is very difficult to accurately predict over long periods. “Climate” is the long-term average of weather, and is much easier to assess. Even on a year-to-year time scale, however, the weather deviates somewhat randomly from the average. That is why, when discussing trends in global average temperature, climate scientists typically average each data point over the surrounding 30-year period. Therefore, if temperatures have leveled off over the past few years, that fact is statistically meaningless in a discussion of long-term trends.

It is also important to ask how the authors of H.J.R. 12 know that global average temperature has leveled off over the past few years. There are multiple global average temperature estimates available that utilize somewhat different data sources and statistical methods, and so there are minor differences between them. The only one that pegs 1998 (12 years ago) as the warmest year so far is the HadCRUT data set, produced in part by the Climate Research Unit of the University of East Anglia. And yet, H.J.R. 12 implies that the CRU researchers have falsified their data set. If we cannot trust the data, it seems odd to draw sweeping conclusions from it.

3. H.J.R. 12 claims “there is a statistically more direct correlation between twentieth century temperature rise and Chlorofluorocarbons (CFCs) in the atmosphere than CO₂.” It also claims that atmospheric CFC concentrations “began to decline at approximately the same time as global temperatures began to decline.” The clear implication is that CFCs affect climate much more strongly than carbon dioxide.

CFCs are indeed very powerful greenhouse gases, and scientists can easily measure how well they absorb radiation. The same can be said for carbon dioxide and given its much, much higher concentration carbon dioxide is clearly a much larger contributor to recent warming than CFCs. Unless CFCs contribute to warming by some mechanism nobody has yet discovered, this assertion is physically impossible.

This claim seems to originate from a single paper, recently published by Quing-Bin Lu in the Dec. 3, 2009 issue of *Physics Reports*. This paper offers no new mechanisms by which CFCs might affect climate, and there has been no time for any other scientists to publish critical analyses of Professor Lu’s findings. So it appears that the authors of H.J.R. 12 are willing to brush off thousands of scientific publications over several decades because of a few comments taken out of context from some stolen e-mails. But if a single paper is published that contradicts the consensus position on the causes of recent climate change, they immediately put it forward as proof that the consensus is wrong. This is as illogical as it is irresponsible.

4. H.J.R. 12 claims “Earth’s climate is constantly changing with recent warming potentially an indication of a return to more normal temperatures following a prolonged cooling period from 1250 to 1860 called the “Little Ice Age.”

After claiming that CFCs (a class of man-made chemicals) are clearly to blame for recent warming, the authors of H.J.R. 12 seem now to be claiming that the trend is simply due to natural variations. The fact is that climate does vary naturally, and climate models can reproduce most of the past variation pretty well by considering natural factors. (See Ch. 9 of the Working Group I volume of the 2007 IPCC Report for references.) These models cannot reproduce the recent warming trend, however, without including the effects of increased greenhouse gas concentrations caused by human activities. Given statistical analyses of the model results and their inherent uncertainties, it is very improbable that the recent warming trend is solely due to natural causes.

5. H.J.R. 12 claims that “the ‘hockey stick’ global warming assertion has been discredited and climate alarmists’ carbon dioxide-related global warming hypothesis is unable to account for the current downturn in global temperatures.”

The famous “hockey stick” graph, produced by Michael Mann and coworkers, shows that the recent global warming trend is alarmingly strong in comparison to the last 1-2 millennia. It is based on instrumental records over the past 150 years, and proxy temperature records (such as those derived from tree rings) before that. Although the “hockey stick” has been challenged, it certainly has not been discredited. In fact, it has been essentially reproduced almost a dozen times by several independent groups, using a number of different types of proxy data. For compilations of the data from a number of studies, see papers by Mann and coworkers (2003, *Eos*, 84, 256-258) and Jones and Mann (2004, *Reviews of Geophysics* 42, doi: 10.1029/2003RG000143).

6. H.J.R. 12 claims “there has been a concerted effort by climate change alarmists to marginalize those in the scientific community who are skeptical of global warming by manipulating or pressuring peer-reviewed publications to keep contrary or competing scientific viewpoints and findings on global warming from being reviewed and published.”

Science, like many other fields, can be contentious. Personal biases may play a role, and it is sometimes easy to treat opponents in a debate unfairly. However, it is equally true that when your paper is rejected it is sometimes easier to ascribe the rejection to others’ personal biases than to carefully consider potential flaws pointed out by the reviewers. In our experience, many of the positions taken by so-called “climate skeptics” have had serious flaws.

As we noted at the beginning of this letter, we are not objecting to H.J.R. 12 because it urges the EPA not to regulate carbon dioxide emissions. Sound scientific investigation, over many years and by many scientists, strongly supports the idea that emitting large amounts of greenhouse gases into the atmosphere poses considerable risk to humans and their environment. This conclusion does not, however, mandate any particular political solution. And even if all the political solutions proposed so far are flawed, this does not justify politicians in attacking the science that indicates there is almost certainly a serious problem.

We also note that we are not writing this letter in an attempt to squelch scientific or political debate about climate change issues. Debate is healthy, but since science never brings absolute certainty, debate about complex issues like climate change will likely never end. It is, therefore, irresponsible to expect absolute agreement among all climate scientists before addressing the risks that have been identified. And whatever society decides about how to address those risks, the decisions should be based on the most reliable information available, unlike H.J.R. 12.

The contents of this letter represent our personal views, and not the position of our sponsoring institution, Brigham Young University.

Signed¹,

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¹ This document is being electronically distributed so handwritten signatures were not collected. The scientists listed here indicated their willingness to sign this document via e-mail or personal conversations with B.R. Bickmore.