GLOBAL WARMING


Having written about professional responsibilities in my small corner of the engineering world, I sometimes receive unkind comments in return. That comes with the territory, so I accept it. But I’ve never attempted to go above the radar with comments that remind engineers of their social accountabilities in a journal like Computer, with its circulation and potential audience.

If you receive any unkind responses to this essay, please know that Holmes has been successful in illuminating something that struck a nerve—that is, something that is very important—and also that there are many of us who agree with him.

Rick Schrenker
Boston, Mass.
raschrenker@partners.org

I enjoy The Profession column, which is usually the first thing I read in Computer. However, the nature of being engaged enough to send an e-mail message ensures that it is most likely to be opposed to the author's comments. My message about the February 2005 essay is also, but perhaps not in the expected way.

I will not try to dispute whether global warming is happening or that humans are causing it. Scientists are human, though, and they often make erroneous assumptions. The projections and warnings about global warming have this flaw. The assumption is that we can actually continue to pump large amounts of CO₂ into the environment if we choose to do so. That assumption depends on believing that there is enough fossil fuel to continue using it for the next 20, 40, or 100 years like we are today.

Holmes did not mention that fossil fuels are a nonrenewable resource. Just as he searched the Web and found many resources providing information about global warming, it is also possible to find information about fossil fuel reserves. A good topic to search on is “peak oil,” a subject that, in my opinion, will be the biggest news story in the next couple of years, maybe even this year.

Global warming might be a nonissue simply because the way we live right now is unsustainable, even for the near future. Most people are incredulous that fossil fuel reserves might actually be a near-future concern, but a little studying can pique interest in the possibility.

Given the fact that our entire way of life as we know it today depends on cheap, abundant energy, it seems that this issue would be of desperate importance. Indeed, I believe it will easily and quickly eclipse any concern over global warming in the next few years. Ironically, it might also “solve” global warming, although not in any comfortable way.

Neville Holmes responds:

What worries me is that there might be enough liquid oil in reserves to tip us into crisis before it’s used up, even if the Earth doesn’t become saturated and stop soaking up huge amounts of CO₂. In any case, the energy companies are moving more to “natural” gas, shale oil, and coal. Coal is already in heavy use, and there are huge reserves of it. And it’s not just that CO₂ is being put into the atmosphere—it’s that oxygen is being taken out.

What I hear the climate forecasters saying is that waiting for fossil fuel to run out is not an option. They’re worried, too.

Neville Holmes states that meteorological records “build a picture” of climate change caused by humans. Perhaps it’s just a poor choice of words, but building a picture doesn’t seem as solid as demonstrating, showing, or proving.

The picture is then “validated by scientific modeling.” Really? Does the model validate the data, or does the data validate the model? More importantly, does data—for example, clouds and solar output—that is not used to create the model also validate the model?

Holmes further asserts, “as professionals avowing rationality” we must not only accept his facts but “become familiar” with them and “be ready to promptly counter” any denials. Maybe if he published them in a little red book—I am taking this too far, or does Holmes see us as a bunch of Quincy, M.E. types, who after a few scary “facts” from a blonde social worker leave our corpses to Sam Fujiyama and dash off in self-assured pursuit of justice?

As someone practicing the profession in question, I simply don’t have time to become expert in climate change science. Call it rational ignorance.

However, I am interested in the intersection between computer science and climate change science. So how will the profession contribute to climate change modeling? Holmes tells us what he “suspects,” not what he knows. How will the profession contribute to climate change mitigation? By teaching math proficiency to schoolchildren, of course. By now I’m beginning to suspect the remainder of the essay will not add much light to all its heat.

In fairness to Mr. Holmes, fear as motivation is difficult to accomplish on the printed page, especially when it involves all of humanity centuries from now and requires readers to remember to turn to a lower numbered page to continue reading.
I would humbly suggest that Holmes’s tactic is unwarranted; computing professionals don’t need to be panicked (or ideologically pure) about climate change to be interested or involved. We, and perhaps Mr. Holmes most of all, should be prepared for the possibility that computer science can aid the skeptics, too.

David Nadle
New York, N.Y.
david@nadle.com

Neville Holmes responds:
A picture is a summary impression, not a fact except per se. The usual scientific procedure validates the modeling from which the picture derives: build a model from existing data, make a prediction, compare it with reality, refine the model, and so on.

The modeling involved is very complex, encompassing a host of aspects beyond cloud cover and insolation, and the data gathering is far from sufficient. But practicing climate scientists do not dispute the general picture of anthropogenic climate change. Although their collections of data are factual observations, they are prominently and irrationally denied, which is an interesting phenomenon in itself (www.theecologist.org/archive_article.html?article=282).

Computing professionals should make themselves familiar with the facts that the climate scientists provide and they should counter denials, such as Michael Crichton’s. I would not suggest that they should ignore debatable details.

The climate scientists need the help of all professionals to bring the facts and their implications to the public’s attention. Among the many specific suggestions I made was for computing professionals to use the Web and media as conduits for informing the public of the relevant facts and projections.

My reading on the subject tells me not only that our civilization’s effect on the Earth might already have made life “centuries from now” extremely difficult if not impossible, but also that side effects such as methane burps or changes in oceanic currents could do this within decades (www.tai.org.au/WhatsNew_Files/WhatsNew/pentagon_climate_change1.pdf).

The last thing that’s needed is panic. What’s needed most is a focus on and investment in scientific evaluation of possible abrupt climate change. Digital technology’s role in this, and thus the role of computing professionals, is clearly of vast importance.

I always look forward to reading The Profession column, and I often agree with Neville Holmes’s point of view. However, his essay in the February 2005 issue misses the mark in several important areas.

Predicting the weather is difficult, and predicting it over a long time horizon is all but impossible. “Simple projection” is not good enough. The computational aspects of the problem, although important, are the least significant part of the entire task.

Also, agreeing with the “relevant facts,” which I am more than prepared to do, does not imply that something can or should be done. The stock market, for which all of the relevant facts are known—at least in theory—cannot be predicted with even a moderate level of confidence over a week much less a yearly horizon.

In a 50- to 100-year projection, many things can and will happen that cannot be included in the model. The history of the Earth is replete with unplanned and often catastrophic events.

I do not consider global warming an issue that anyone concerned with our profession needs to get overly heated about. There are many other current issues that can certainly profit from our attention, including education, which Holmes did mention.

Charles R. Guarino
Gaithersburg, Md.
chas.r.guarino@bmco.com

Neville Holmes responds:
There is an essential distinction between weather forecasting, which is short term, and climate prediction, which is long term. Sadly, my amateurish outline of climate modeling somewhat confused the two.

The problems with climate prediction are that it isn’t local so it can too easily be dismissed as irrelevant; it’s probabilistic so it can be dismissed as uncertain, and catastrophes aside, it depends more on what decisions human society makes than on anything else. Nevertheless, climate prediction has been shown to work.

There is no doubt in the minds of the climate (and environmental) scientists that if things go on as they are, the world is in for severe trouble. However, there is a problem in working out just how much trouble and in moving society to lessen the likelihood of that trouble.

But the biggest and most worrying issue with regard to catastrophes is that we do not know the facts yet. Many relevant professionals are concerned that changing conditions could trigger an event, such as the release of gigantic amounts of sequestered methane, that will change the climate fatally within a mere few years.

Because climatic changes could be bringing about new, dangerous, and possibly irreversible effects, the relevant scientific professions need our political and professional support to find out as quickly as possible what will happen to the global climate under various contingencies.

The argument that there are more important things that need our attention is that of Bjorn Lomborg, which has been thoroughly refuted (www.tai.org.au/WhatsNew_Files/WhatsNew/lomborg.pdf; www.guardian.co.uk/print/0,3838,5043956110970,00.html).