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Climate science in the spotlight may not be such a bad thing

The recent scandals demonstrate a wide misunderstanding of climate science, and of science more generally

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Climate science is in the spotlight, from hacked emails to shifting weather stations to tree rings. Photograph: Junos/Corbis

So climate change is in the news. But now the media is discussing stolen emails, hacking, the shifting Chinese weather stations, how to extract and draw graphs of temperatures from tree ring studies, and how, how on earth, you get hundreds of authors to agree on almost 3,000 pages of reports.

Climate science in the spotlight may not be a bad thing. Though as a climate scientist, the lights seem pretty bright and rather dazzling. I'm relieved they've not yet been on me. So what on earth possessed me to write this piece?

I get worried when I hear news presenters asking other news presenters whether these controversies should affect political efforts to achieve greenhouse gas emission reductions. Such a question demonstrates a misunderstanding of climate science, and of science more generally.

Perhaps people's perception of science originates from what they were taught at school. This "school science" is the source of solid facts and reliable understanding. Some of that science may be wrong, in the sense that it doesn't give the whole picture. Newton's laws of motion and gravity fit into that category; Einstein explained situations in which they fail. Yet even in such cases there is another sense in which they are right, or at least sufficiently accurate, because they help us understand and predict the particular thing we are studying. They are known to be "fit for purpose".

Such school science is very different to "research science". The former is about communicating what we already understand, the latter about developing and expanding our understanding. In research science new results and interpretations are continually developed. Disagreements and debate are common. Indeed they should be encouraged. And over time there is a shift of science from one to the other.

Climate change science is only unusual in this context because it has such huge significance for the world's societies. The public, the media, the politicians are all looking for answers from the science. Yet the understanding that drives the need for

reducing greenhouse gas emissions has changed little over the past twenty years or so. I would argue that it has already moved from research science to school science.

It is rarely discussed by research scientists because it is so well understood. The chain of connections is a little too long to cover properly here. But fundamentally the properties of greenhouse gases means that increasing them traps more energy in the lower atmosphere. Putting more energy in warms things up. Even small changes in temperature have the potential to change the climate significantly; the last ice age may have been only five or six degrees colder than now when averaged across the globe. And of course global averages can hide large regional variations. Consequently we know we face increasing risks of everything from coastal inundation to changing water availability, changing ecosystems and knock-on effects to geopolitical stresses and security.

Maybe this sounds woolly. It is. There are still substantial uncertainties, even unknowns, regarding what will happen at any particular place and how it will affect the societies in which we live. These topics are still very much the domain of research. And believe me, the arguments among researchers about how to provide reliable predictions at local scales are lively and heated.

But such uncertainties are irrelevant to whether we need to reduce greenhouse gas emissions dramatically as soon as possible. There is no uncertainty that the consequences of climate change will be severe for global society, and therefore for us as members of that global society. The consequences for any individual may come through the direct effect of changes in local climate or it may come through changes to the working of, and stability of, global economic systems. Whatever the case, climate change represents a future of much increased risk. We would do well to act now to minimise those risks.

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