

## Geology: A Key To Interpreting Climate Change

I read, with interest, the letters to the editor by Gareth Cooper and Cedric Griffiths (*PESA News Resources*, December/January 2010/11), and wish to comment on some of their assertions regarding climate change.

Gareth Cooper maintains that climate change is now occurring at a rate that is "several orders of magnitude faster" than during past climatic regimes. That claim is entirely incorrect. For example, at the peak of the last glacial period, some 18,000 years ago, sea level was about 130 m lower than it is today. Then global temperatures increased rapidly, causing the continental ice sheets to melt and global sea level to rise at an average rate of nearly 11 mm per year, reaching its present level about 6000

years ago. That rate is five times faster than today's average rate of about 2 mm per year.

Cedric Griffiths maintains that in relation to climate change "all the geological community seems capable of is a load of arm waving". He questions why geologists seem unable to make "testable predictions of value to society" on topics such as: global sea levels in 2050 or 2100; future temperatures and storm frequencies; how far south cyclones will impact on Australian coastal communities and offshore infrastructure; and the frequency and magnitude of river floods. If he is the Cedric Griffiths who is CSIRO's 'Research Group Leader for Predictive Geoscience' ([www.csiro.au/people/Cedric.Griffiths](http://www.csiro.au/people/Cedric.Griffiths)) he might be expected to have already come up with such predictions. On the other hand, he may have

concluded that being a member of the 'geological community' he can do no more than 'arm waving' in making such predictions.

Griffiths asserts that if "geology's going to move out of the 18th century 'stamp collector' mode and become a science it needs to practice the time-honoured scientific process of observation, deduction, and prediction". Why did Griffiths make such a foolish statement? Those actions describe what geologists do every day. Surely he must know that mineral and petroleum exploration by geologists and geophysicists is entirely based on 'observation, deduction, and prediction'. The same applies to other fields of geoscience, including hydrogeology, engineering geology, geological mapping, etc.

The anthropogenic global warming (AGW) debate is centred on the degree to which rising atmospheric levels of CO<sub>2</sub> have contributed to global warming. While there is no doubt that CO<sub>2</sub> is one of the greenhouse gases, there is also no doubt that water vapour is overwhelmingly dominant among those gases, and CO<sub>2</sub> is relatively minor. Many geologists and other scientists have concluded that rising levels of anthropogenic CO<sub>2</sub> have had little effect on global warming. They consider that the warming and cooling episodes experienced over the past 150 years, like earlier episodes, must have had natural causes, linked with changing levels of radiation from the sun. We know that global temperatures have risen by a little less than 1°C since the end of the Little Ice Age in about 1850. Temperatures peaked in 1998, and on average in the 12 years since then they have declined slightly, despite continuing rising levels of atmospheric CO<sub>2</sub>. Similarly, average global temperatures declined for more than 30 years from 1945 to 1979 while CO<sub>2</sub> levels continued to rise.

In October, 2010 the UK Met Office, using modelling with its supercomputer, predicted that there was a 60% to more than 80% chance that warmer than average temperatures would be experienced in the UK during the winter of 2010-2011 ([wattsupwiththat.com/2010/12/22/red-faces-at-the-met-office](http://wattsupwiththat.com/2010/12/22/red-faces-at-the-met-office)). In fact, this winter has proved to be very severe in the UK and elsewhere in the northern hemisphere.

How can AGW proponents assert, based on computer models, that unless drastic countermeasures are taken to reduce CO<sub>2</sub> emissions, global temperatures will continue rising for many decades ahead, despite the fact that monthly forecasts, also based on computer modelling, have proved to be so unreliable?

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