

**PUBLIC MISPERCEPTIONS OF HUMAN-CAUSED CLIMATE CHANGE:
THE ROLE OF THE MEDIA**

Testimony of

**Dr. Robert M. Carter
James Cook University, Townsville, Australia**

before the

Committee on Environment and Public Works

United States Senate

Room 406, Dirksen Senate Office Building

9.30 a.m., December 6, 2006

Opinions, findings and conclusions expressed in this testimony are those of the author, and are not attributable to either his organization (James Cook University) or research fund provider (Australian Research Council).

Biographical Notes

I am an Adjunct Research Professor at James Cook University (Queensland). I have 35 years training and experience as a palaeontologist, stratigrapher, marine geologist and environmental scientist, and hold degrees from the University of Otago (New Zealand; BSc Hons) and the University of Cambridge (England; PhD). During my career I have held tenured academic staff positions at the University of Otago (Dunedin) and James Cook University (Townsville), where I was Professor and Head of School of Earth Sciences between 1981 and 1999.

I have wide experience in research management and administration, including service as Chair of the Earth Sciences Discipline Panel of the Australian Research Council, Chair of the national Marine Science and Technologies Committee, Director of the Australian Office of the Ocean Drilling Program, member of the international Planning and Technical Operations Committees, and Co-Chief Scientist on ODP Leg 181 (Southwest Pacific Gateways).

My current research on climate change, sea-level change and stratigraphy is based on field studies of Cenozoic sediments (last 65 million years) from the Southwest Pacific Ocean region, especially the Great Barrier Reef and offshore eastern New Zealand, and includes the analysis of marine sediment cores collected during ODP Leg 181. I am involved in helping to plan future IODP drilling legs to collect high-resolution climate data from the Pacific Ocean.

Throughout my career, my research has been supported by grants from competitive public research agencies, especially the Australian Research Council (ARC). I have received no research funding from special interest organisations such as environmental groups, energy companies or government departments.

I am the author of more than 100 papers in refereed scientific journals. I also contribute regular letters, opinion pieces and interviews to newspapers, national magazines and other media, and regularly engage in public speaking on matters related to my research knowledge. In 2005 I was appointed by the Australian Minister of the Environment to the judging panel for the Eureka Prize in Environmental Journalism, awarded annually by the Australian Museum, Sydney.

Abstract

There is a strong conflict between current public alarm regarding human-caused climate change and the science justification for that alarm. The media serve to convey to the public the facts and hypotheses of climate change as provided by individual scientists, government and international research agencies and NGO lobby groups. In general, the media have propagated an alarmist cause for climate change, and they have certainly failed to convey to the public both the degree of uncertainty that is characteristic of climate science and many essential facts that are relevant to considerations of human causation. Ways in which the public debate is directed along alarmist lines are discussed. It is concluded that natural climate change is a hazard that - like other similar natural hazards - should be dealt with by adaptation. Attempting to mitigate human-caused climate change is an expensive exercise in futility.

Introduction – the three realities of climate change

Climate change knows three realities. *Science reality*, which is what working scientists deal with on a daily basis. *Virtual reality*, which is the wholly imaginary world inside computer climate models. And *public reality*, which is the socio-political system within which politicians, business people and the general citizenry work.

The *science reality* is that climate is a complex, dynamic, natural system that no one wholly comprehends, though many scientists understand different small parts. Science provides no unambiguous empirical data that dangerous or even measurable human-caused global warming is occurring (e.g. Khilyuk & Chilingar, 2006). Second, the *virtual reality* is that deterministic computer models predict future climate according to the assumptions that are programmed into them. There is no “Theory of Climate”, and the potential output of all realistic GCMs therefore encompasses a range of both future warmings and coolings. The difference between these outputs can be changed at will, simply by adjusting such poorly known parameters as the effects of cloud cover. And third, *public reality* in 2006 is that there exists a widespread but erroneous belief amongst citizens, businessmen and politicians that dangerous global warming is occurring and that it has human causation.

Three main agents have driven the public to believe in dangerous global warming. They are reports from the Intergovernmental Panel on Climate Change (IPCC), incessant lobbying by environmental NGOs and allied political groups, and the obliging conveyance of selectively alarmist information by the media. Alarmist writing displays two invariable characteristics. First, it is mostly concerned with the minutiae of meteorological measurements and trends over the last 150 years and the absence of a proper geological context. Second, there is an over-reliance on the outputs of unvalidated computer model scenarios and attribution studies, i.e. virtual reality is favoured over empirical testing.

I summarise first several arguments against the conventional IPCC view that dangerous warming is occurring. I then comment on ancient temperature records, greenhouse theory

and computer modeling, and conclude by discussing the role of the media in relaying science information about global warming to the public.

Four arguments against dangerous human-caused global warming

IPCC concentrates its analyses on climate over the last few hundred years, and fails to give proper weight to the geological context of modern climate change. The following facts, most of which draw on geological data, all militate against the IPCC argument that dangerous greenhouse warming is being caused by the accumulation of industrial carbon dioxide in the atmosphere:

1. As recorded in Antarctic ice cores, changes in temperature precede parallel changes in carbon dioxide by many hundred years or more (Mudelsee, 2001).
2. As recorded in the Greenland GRIP core (Grootes et al., 1993), the late 20th century warm period corresponds to a cyclic warming peak within a ~1500 year periodicity of probable solar origin (Bond et al., 2001), and was cooler than the preceding Minoan and Mediaeval Warm Periods.
3. In Antarctica, the late 20th century warming is as much as 5 deg. C cooler than were recent interglacial climate optimums (e.g., Watanabe et al., 2003).
4. As compared with high quality site-specific datasets such as GRIP (Grootes et al., 1993), neither the rate of temperature change nor the magnitude of the peak reached at the end of the 20th century lies outside the limits of recent natural climate change (Davis & Bohling, 2001).
5. Using the global average surface temperature record compiled by the Climate Research Unit of the U.K. Hadley Centre from thermometer measurements, temperature at the Earth's surface has flatlined since 1998 (Fig. 1). Temperature in the troposphere is virtually unchanged since 1979 once El Ninos and volcanic eruptions are taken into account (Fig. 2) (Gray, 2006).

The importance of ancient temperature records

The modern radiosonde and satellite MSU data provide an accurate, truly global temperature statistic. But to compare the late 20th century warm period with earlier geological warm events requires the use of local proxy data, for no truly global temperature statistics are available pre-1958 (or perhaps pre-1860, if you wish to trust the earlier parts of the surface thermometer record). Meaningful comparative judgements about climate change cannot be made on the basis of the trivially-short, 150-yr-long thermometer surface temperature record, much less on the 26-year-long satellite tropospheric record, for long-term climate change occurs over spans of many thousands to millions of years.

One of the highest resolution proxy datasets that extends over an adequate period of time to record natural climate change is the oxygen isotope record from the Greenland ice core (Grootes et al., 1993). These data show, first, that the 1-2 deg. C/century rate of late 20th century warming in Greenland falls well within the Holocene envelope of rates of temperature change between -2.5 and +2.5 deg. C/century (Fig. 3). And, second (Fig. 4), that in Greenland the late 20th century warm period was cooler than the Mediaeval and Roman warm periods, and reflects a regular millennial solar temperature cycle. In addition, ice cores from Antarctica (Watanabe et al., 2003) show also that late 20th century temperature is up to 5 deg. C cooler there than temperature highs associated with earlier but geologically recent interglacial periods (Fig. 5).

Prompted by the invalidation of the Mann et al. hockey stick study, there has been much dispute over statements like “*The rate and magnitude of 20th century warming is unprecedented for at least the past 1,000 years*”. A recent report by the National Academy of Sciences was able to conclude only that the 20th century warming was the greatest for several hundred years, a scarcely surprising conclusion.

In summary, as judged against ice core and other high resolution geological proxy records, the late 20th century warming (which as yet has not continued into the 21st century) is unusual in neither rate nor magnitude.

Greenhouse theory

Carbon dioxide is a colorless, odorless gas that has been present in earth's atmosphere through time in trace amounts ranging from a few hundred to a few thousand parts per million (ppm). Together with oxygen, it is the staff of life for earth's biosphere because the metabolism of plants depends upon its absorption. Increasing carbon dioxide in the range of about 200-1000 ppm has repeatedly been shown to be beneficial for plant growth, and to increase the efficiency of water use. Atmospheric carbon dioxide is therefore a benefice.

The currently favoured hypothesis of dangerous global warming includes the presumption that the warming is caused mainly by human emissions of the greenhouse gas carbon dioxide. This theory has failed the three main tests that it has been subjected to. Namely:

- late 20th century rates of temperature change and magnitude do not exceed previously known natural limits;
- no close relationship exists between the 20th century pattern of increasing carbon dioxide and changing temperature; and
- computer models using greenhouse radiation theory have proved unable to predict the course of temperature change 1990-2005, let alone to 2100.

Nonetheless, it is the case that carbon dioxide absorbs space-bound infrared radiation, thereby increasing the energy available at Earth's surface for warming or increased evaporation. This physical theory accepted, there are four problems with turning a human-driven increase in atmospheric carbon dioxide into global warming alarmism. They are as follows.

- The relationship between increasing carbon dioxide and increasing temperature is logarithmic, which lessens the forcing effect of each successive increment of carbon dioxide (Fig. 6).
- In increasing from perhaps 280 ppm in pre-industrial times to 380 ppm now, carbon dioxide has already produced 75% of the theoretical warming of about 1 deg. C that would be caused by a doubling to 560 ppm; as we move from 380 to 560 ppm, at most a few tenths of a degree of warming remain in the system; claims of greater warming, such as those of the IPCC, are based upon arbitrary adjustments to the lambda value in the Stefan-Boltzmann equation, and untested assumptions about positive feedbacks.
- The ice core data show conclusively that, during natural climate cycling, changes in temperature precede changes in carbon dioxide by several hundred to a thousand or so years (Mudelsee, 2001).
- In contrast to the 280 ppm levels indicated by averaged ice-core results, measurements of fossil plant stomata indicate that natural, pre-industrial carbon dioxide levels reached 350 ppm or higher during the Holocene (Kouwenberg et al., 2005).

So, yes, there is agreement that carbon dioxide increases will probably cause gentle feedback warming, but opinion remains strongly divided as to how great the warming will be for a real world doubling, and also whether any such warming is likely, on balance, to be beneficial or harmful.

Computer models

General circulation computer models (GCMs) are deterministic. Because many climate processes occur at a scale below that of the modelling grid, these processes have to be parameterized within the model. The modellers themselves acknowledge that they are unable to predict future climate, preferring the term "scenario" to describe the output of their experiments. Individual models differ widely in their output under an imposed regime of doubled carbon dioxide. In 2001, the IPCC cited a range of 1.8-5.6 deg. C warming by 2100 for the model outputs that they favoured, but this range can be further varied to even include negative outputs (i.e. cooling) by minor adjustment of some of the model parameters.

A second use of computer modelling is in climate attribution studies, whereby the known 20th century meteorological record is simulated using models fed with known or

presumed forcings, such as increasing carbon dioxide, volcanic eruptions and other aerosols. After many years of trials, the IPCC in 2001 reported simulations that mimicked the historic temperature record if and only if human emissions were included in the forcings. These results have later been widely misrepresented as being evidence for human-caused global warming. They are, of course, evidence only that a curve matching exercise involving many degrees of freedom has plausibly mimicked the 20th century temperature curve. They are exercises in virtual reality, and not evidence of any type.

A major problem with all GCMs is that they rest upon the Kelvin fallacy, i.e. the assumption that the physics of the system is fully known. Though computer modelling and attribution studies are valuable heuristic tools, GCMs are not suitable for use as predictive tools for climate policy.

In contrast with GCMs, other empirical computer models have been trained using elapsed data up to the present. Such models have been constructed using the 150 year-long surface temperature record (Klyashtorin & Lyubushin, 2003), 3,500 year-long proxy records from a Sargasso Sea marine core and a South African speleothem (Loehle, 2004), and the 10,000 year-long Holocene proxy record from the GRIP ice core (Kotov, 2001). Virtually all forward projections using these fitted models project cooling during the early decades of the 21st century (e.g., Fig. 7).

The role of the media

Given the many uncertainties and inadequacies in our understanding of climate science, some of which are outlined above, and the lack of empirical evidence for human causation, how has it come about that public opinion in western nations is convinced that dangerous human-caused warming is occurring? The answer is that the public have been conditioned by the relentless repetition of alarmist climate messages through the media, to whose role I now turn.

The media play a primary role in reporting the results of scientific research to the general public. They do this today against the following background:

1. A rapidly changing media landscape. Formerly, there were three neatly separated categories of print, radio and television. With the late 20th century development of the world wide web there has been a dramatic rise in the number of professional websites and blog sites, and the development of parallel printed/web newspaper editions plus interactive discussion sites.

With such a miasma of sources of information now competing for public attention, the inevitable result has been an increasing shrillness and a loss of nuanced expression across all media. This does not serve science reporting well.

2. Because of the lack of legal libel restraint over blog sites in particular, character assassination and ad hominem attacks on so-called climate skeptics have become common. In the climate science area, sites such as Exxon's Secrets, Source Watch

and De Smog Blog have developed such denigration into an art form, and apparently a well funded art form at that.

3. Over roughly the same time period as the internet developed, western countries have seen the emergence of the public relations (PR) industry as a powerful force in society. It has been estimated that in the 1990s the USA had 130,000 media reporters and 150,000 PR personnel. The job of these PR people is to ensure that their employers' activities figure in the news in a positive way; a polite name for them is spinmeisters, and Prime Minister Tony Blair's Alistair Campbell was their acknowledged crown prince.

At the same time that they now employ PR professionals, large scientific employers often exert further control over the message that reaches the public by forbidding individual scientists to talk to the press and requiring that all comment be channeled through chosen PR representatives. Thus *Nature's* correspondent in Australia, Peter Pockley, reported (Australasian Science, Dec. 2004, p. 45):

"CSIRO's marine scientists have been "constrained" on the scientific advice and interoperation they can provide to the government's conservation plans for Australia's oceans. Likewise, climate scientists have been told not to engage in (public) debate on climate change and never to mention the Kyoto Accord on greenhouse gas emissions."

Morrison (2006) reports a survey showing, not surprisingly, that science stories provided with hyperbole rated 20% higher in terms of news-worthiness compared with factual reports on what had actually been achieved, and suggested that a Code of Conduct was needed to help guide science communicators.

4. It was learned by all media proprietors long ago that sensational or alarmist news sells. As one of Australia's most experienced science journalists has remarked (Julian Cribb, Australasian Science, August 2002, p. 38):

"The publication of 'bad news' is not a journalistic vice. It's a clear instruction from the market. It's what consumers, on average, demand. ... As a newspaper editor I knew, as most editors know, that if you print a lot of good news, people stop buying your paper. Conversely, if you publish the correct mix of doom, gloom and disaster, your circulation swells. I have done the experiment."

It is a rare day that any metropolitan newspaper now fails to carry one or more alarmist stories on climate change and other like environmental causes.

5. A belief that good reporting is "balanced" reporting, and that the balance is discharged by providing "both" sides of any particular story.

Unfortunately, though taught in every journalism school, this technique is a travesty when applied to matters of science - which deals with testable hypotheses

not “balance”. First, because there are not two but usually a multiplicity of sides to any complex scientific debate, such as that regarding global warming. Second, because - as practised - such journalistic balancing quickly becomes an excuse for not exercising personal knowledge and judgement about complex topics. “He says, she says” substitutes for “I, the reporter, judge that the data best support”.

6. A belief that environmental reporting is different from science reporting. Nearly all major media sources today employ an environmental reporter, but only a handful have a science reporter as well.

A little thought shows that there is a critical difference between the jobs of these two types of reporters. It goes without saying that a science reporter is charged with narrating the science truth, so far as that can be identified. But what is the primary role of an environmental reporter? Judging from their giddy effusions in the daily press, one might infer that their job description reads: “*identify the baddies (alleged polluters or desecrators), and support the goodies (office-bearers in environmental NGOs) in pursuit of ever stricter public environmental regulation of all types*”.

It is my experience that the typical environmental reporter is marked less by her scientific expertise and more by her zeal for politically correct environmental causes. That is not a good recipe for objective reporting.

The result of this media landscape is that, with some exceptions, science reports in the news often lean heavily on PR copy provided by the employing agency of the scientists. Busy journalists are understandably pleased when they receive an interesting and well-written story on a topic identified as of public importance. The outcome – which I term frisbee science – is that the results delivered to the public carry a strong spin which, in the case of global warming, is invariably alarmist in nature.

Playing the man and not the ball

The means by which the public has been convinced that dangerous global warming is occurring are therefore not subtle. Indeed, the combined alarmist activities of the IPCC, crusading environmental NGOs, some individual leading climate scientists and many science academies can only be termed a propaganda campaign. But because all of these interest groups communicate with the public primarily through the press, it is the press that carries the prime gatekeeper responsibility for the unbalanced state of the current public view.

When doubts are raised about the legitimacy of a particular piece of climate alarmism - say that Tuvalu is being swamped by a rising sea-level - it is vanishingly rare for any ensuing press discussion to be primarily about the science question at issue. Rather, rhetorical devices are used to negate the doubts or the doubter. Assertions commonly

made about skeptics or their views include the following.

1. *“The science is settled”; or, there is a “consensus” on the issue.*

A typical recent statement of this type by Governor Schwarzenegger, on Sunday Meet the Press, reads: *“The science is in, we know the facts, there’s not any more debate as to global warming or not”*.

The Governor is deluding himself, because the science of climate change has never been more uncertain. Furthermore, science is about facts, experiments and testing hypotheses, not consensus; and science is never “settled”.

As Margaret Thatcher famously observed (*“The Downing Street Years”*, p. 167):

“Consensus is the process of abandoning all beliefs, principles, values and policies in search of something in which no one believes, but to which no one objects; the process of avoiding the very issues that have to be solved, merely because you cannot (otherwise) get agreement on the way ahead”.

2. *He is paid by the fossil fuel industry, and is merely repeating their desired story.*

An idea is not responsible for those who believe in it, and neither is the validity of an scientific hypothesis determined by the character or beliefs of the person who funded the research. Science discussions are determined on their merits, by using tests against empirical or experimental data. Who paid for the data to be gathered and assessed is simply irrelevant.

3. *She works for a left wing/right wing think tank, so her work is tainted.*

Think tanks serve an invaluable function in our society. On all sides of politics they are the source of much excellent policy analysis. They provide extended discussion and commentary on matters of public interest, and have made many fine contributions towards balancing the public debate on climate change. To be associated with a high-quality think tank, as I am with the Melbourne Institute of Public Affairs, is a privilege and a matter for pride, not shame.

That think tanks receive funding from industry sources is an indication that those that survive are delivering value for money, and does not impugn their integrity.

4. *He is just a climate sceptic, a contrarian, a denialist.*

These terms are used routinely as denigratory badges. The first two are amusingly silly.

First, because most people termed climate “skeptics” are in fact climate “agnostics”, they have no particular axe to grind as to whether or not humans are

having a dangerous influence on global climate. However, they prefer not to raise unnecessary alarms about dangerous climate change unless and until there is some solid empirical evidence in support. And, second, because all good scientists are skeptics: that is their professional job. To not be a skeptic of the hypothesis that you are testing is the rudest of scientific errors, for it means that you are committed to a particular outcome: that's faith, not science.

Introduction of the term "denialist" into the public climate debate, with its deliberate connotations with holocaust denial, serves only to cheapen those who have practiced the custom.

5. *"Six Nobel Prize winners, and seven members of the National Academy of Sciences say*".

Argument from authority is the antithesis of the scientific method. That earlier this year the Royal Society of London tried to restrict the public debate on climate change through intimidation of Esso U.K. is a complete betrayal of all that the Society stands for. As John Daly commented on his website regarding a 2001 U.S. National Academy of Sciences report on global warming:

"The (2001) NAS committee made many assertions, none of which they chose to justify or explain other than to state it was "their view" - as if their mere authority as representing the National Academy of Science were enough to prevail in the argument.

Well it isn't. The days when mere 'authority' could win an argument or debate are long gone. Such deference is more characteristic of a mediaeval priesthood, not a modern science where every important claim must be justified and explained. Only evidence counts in this modern world."

6. *The "precautionary principle" says that we should limit human carbon dioxide emissions because of the risk that the emissions will cause dangerous warming. Thus the science argument should be subservient to the risk argument.*

The precautionary principle is intended to assist governments and peoples with risk analysis of environmental issues. First formulated at a United Nations environment conference at Rio de Janeiro in 1992, it stated that *"Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation"*.

In order to take precautions, it is necessary to understand what one is taking them against. But at the moment global average temperature is flat-lining, and empirical predictions are for cooling. As Dick Lindzen recently pointed out in an article in the U.K. Telegraph: *"After all, like hurricane frequency or the price of oil, global mean temperature is as likely to go down as up"*.

The precautionary principle is oftentimes a moral precept masquerading under a scientific cloak. True scientific principles acknowledge the supremacy of experiment and observation, and do not bow to untestable moral propositions. Adhering to a moral principle through thick and thin is certainly a part of the precautionary principle as practiced by many environmentalists, and as such it is a principle of the wrong type to be used for the formulation of public environmental policy.

After comprehensive analysis, the Science and Technology Committee of the U.K. House of Commons recently came to a similar conclusion, commenting that *“we can confirm our initial view that the term “precautionary principle” should not be used, and recommend that it cease to be included in policy guidance”*. The committee added that *“In our view, the terms “precautionary principle” and “precautionary approach” in isolation from clarification have been the subject of such confusion and different interpretations as to be devalued and of little practical help, particularly in public debate”*.

7. *The Kyoto protocol is only a small first step towards a more comprehensive carbon emission regimen.*

This argument has always been ridiculous. To expend trillions of dollars on measures that are predicted only to delay by six years a small fraction of a degree rise in hypothetical temperature is irrational behaviour. If it is a step, it is a step in the wrong direction, for - as Bjorn Lomborg never tires from pointing out - the same monies could be applied with much greater effect to other pressing environmental problems. The futility of the Kyoto approach has recently been underlined by the complete failure of the COP-13 talks at Nairobi to make progress towards a post-Kyoto carbon emissions agreement.

8. *It is irresponsible of the press to be playing up the views of a small handful of contrarian scientists. In searching for formulaic “balance”, the press overemphasizes the views of a few maverick scientists, and thereby delays the public acceptance of essential mitigation measures.*

Quite to the contrary. Not only are there thousands of such “mavericks”, including many of high scientific ability, but press coverage of climate change is generally dominated by one-sided alarmist reports which pay little or no attention to contrary views.

The small handful of quality newspapers that provide balanced coverage of the climate change issue include the U.S. Wall Street Journal, the U.K. Telegraph and the Australian. These publications are playing both a responsible and an essential role in keeping the public informed.

Other techniques used to influence the public debate

Most of the matters just discussed relate to the denigration or neutralization of arguments from climate skeptics. In addition to these techniques, environmental writers and editors have developed their own armoury of weapons for influencing the public debate on climate change. These weapons include the following.

1. *Couldism, mightism and perhapsism, fuelled by computer modelling*

If, could, may, might, probably, perhaps, likely, expected, projected

Wonderful words. So wonderful, in fact, that environmental writers scatter them through their articles on climate change like confetti. The reason is that – in the absence of empirical evidence for damaging human-caused climate change – public attention is best captured by making assertions about “possible” change. And, of course, using the output of computer models in support, virtually any type of climatic hazard can be asserted as a possible future change.

As an example, a 2005 Queensland State Government report on climate change used these words more than 50 times in 32 pages. That's a rate of almost twice a page. A typical "could probably" run in this report asserts that Queensland's climate could be more variable and extreme in the future "*with more droughts, heatwaves and heavy rainfall*" and probably with "*maximum temperatures and heavy downpours beyond our current experiences*".

Reading further into the report reveals that these statements are all "*climate change projections ... developed from a range of computer-based models of global climate, and scenarios of future global greenhouse gas emissions*".

In another similar example from Australia, Dr Penny Whetton, Leader of the Climate Impacts Group, was quoted in a CSIRO press release as saying "*By 2070 Victoria is likely to be 0.7 to 5.0 degrees Celsius warmer, compared to 1990 Climate change in Victoria is likely to lead to more hot days, fewer frosts, more heavy rainfall and drier conditions leading to greater bushfire risk.*"

All this might be well and good if it had been established that the models being used possessed actual skill in predicting regional changes. That that is not the case is confirmed by the disclaimer that the CSIRO puts in all their climate modeling reports (e.g. "*Climate Change in Queensland Under Enhanced Greenhouse Conditions*" Final Report 1997-2002, 84 pp.).

"This report relates to climate change scenarios based on computer modelling. Models involve simplifications of the real processes that are not fully understood. Accordingly, no responsibility will be accepted by CSIRO or the QLD government for the accuracy of forecasts or predictions inferred from this report or for any person's interpretations, deductions, conclusions or actions in reliance on this report."

Needless to say, despite such caveats the press treat the outputs of modeling exercises as firm predictions of future climate. In truth, they are exercises only in virtual reality.

2. *Data that are judged to be harmful to the global warming cause are simply ignored.*

From amongst many possible examples, I note the two that I have discussed in more detail earlier. They are (i) that ice core data from Greenland show that neither the magnitude nor the rate of late 20th century warming falls outside previous natural limits; and (ii) that in ice cores generally, changes in temperature lead their parallel changes in carbon dioxide by at least several hundred years.

3. *Enthusiastic reporting is undertaken of new science with alarmist implications, and no reporting of counter arguments.*

In 2005, in a paper in *Nature*, Bryden and co-authors reported observations of flow-speeds in the Overturning Meridional Circulation in the North Atlantic ocean, and inferred a significant slowdown of the overturning circulation. The paper received wide publicity in the press, with much attention to the alarmist possibilities that it opened up. This year, papers by Schott et al. (2006) and Meinen et al. (2006) have described in more detail some of the natural fluctuations in flow strength of the Atlantic DWBC system, and Schott et al. conclude that their results “do not support suggestions of a basin-wide “slowdown” of the Atlantic Meridional Overturning Circulation”. This revision of interpretation, not raising any alarm, was predictably largely ignored by the press.

A second recent example of press selectivity is provided by the enormous press coverage accorded to North Atlantic storms in 2005 - a year which saw 15 hurricanes develop, including Katrina, accompanied by a tremendous amount of alarmist speculation that human-caused global warming was the cause. In contrast, 2006, with only 5 hurricanes, turned out to be a quiet year both for hurricanes and for press speculation about global warming being their cause.

4. *Award winning journalists or public celebrities, mostly with no expertise in science, write ignorant polemics that are designed to encourage public alarm on climate change.*

For example, Ian Henschke, a current affairs journalist with the Australian Broadcasting Corporation, and holder of a Reuters Fellowship to study global warming at Oxford University in 1999, wrote recently (*Adelaide Review*, March 2004, p. 7):

“The long-term effects of global warming are just beginning to become evident....

The impact of global warming means a warmer, wilder, wetter world where there will be winners and losers. We are carrying out an unauthorized experiment with the planet's weather system that is and will continue to bleach and kill the Great Barrier Reef and gives us even bigger El Nino events that saw our national capital's suburbs ablaze last year. The rest of the world will also have its own chaotic response, from increasing heat waves in Europe to worse snow storms in Texas. Australia has become a pariah on this issue. Along with the US we are seen as coming out with incoherent and inconsistent policies that make us part of the problem, not part of the solution."

This farrago of nonsense, which has been customized to stir particular local environmental fears, is of a genre that can be read in newspapers or watched on television around the world. Such pieces are presented by reporters whose political correctness and moral pretension greatly outstrips their scientific understanding.

5. *Discrimination is exercised by both the popular and specialist scientific press against articles on climate change that are written from a balanced, rationalist or skeptical point of view.*

Most long-standing climate skeptics have experienced this type of discrimination, and there are many examples listed on the internet.

Particularly worrisome is that two leading general science publications, *Science* and *Nature*, have developed a habit of not accepting short papers that are critical of earlier (demonstrably unsound) environmental papers that they have published. Three more popular and very widely distributed magazines, namely *National Geographic*, *New Scientist* and *Scientific American*, also display a great lack of balance in the material that they publish on climate change issues.

Discussion and conclusions

I have discussed briefly above a number of arguments and practices that are applied widely throughout the public media in order to influence the public debate on climate towards alarmism. These techniques are used most often by doctrinaire persons who are bereft of scientific support for their strong personal belief that damaging, human-caused warming is occurring.

With some rare exceptions, the performance of the media, and especially the scientific press, on the global warming issue has been lamentable. Editors need to resist the daily temptation for alarmism, greatly improve their vigilance over publishing such weak rhetorical arguments as those outlined above, and insist that their reporters assess mainly the science issues at hand.

Driven by their addiction to alarmism, and a false belief that the causes of climate change are understood, environmental lobby groups worldwide urge the adoption of the

precautionary principle to solve the “global warming problem”. They argue that the world needs to move to a “post-carbon” economy as soon as possible, in order to curtail drastically the carbon dioxide emissions that they allege are causing warming. Yet it is only unvalidated computer models that suggest dangerous warming will occur, the observable facts being quite implacable that additional carbon dioxide brings mild warming only, most of which has already occurred because of the logarithmic nature of the relationship between increased carbon dioxide and increasing temperature.

Environmental campaigners for the mitigation of human greenhouse emissions appear to be blind to facts such as:

- that no amount of precaution is going stop natural climate change;
- that there is a 100% risk of damage from natural climate events, which happen every day;
- that we cannot measure, much less isolate, any presumed human climate signal globally;
- that extra atmospheric carbon dioxide causes mild warming only, and given its other properties is at least as likely to be beneficial as harmful; and
- that the causes of climate change are many, various and very incompletely understood.

It is a remarkable fact that despite the worldwide expenditure of perhaps US\$50 billion since 1990, and the efforts of tens of thousands of scientists worldwide, no human climate signal has yet been detected that is unambiguously distinct from natural variation. After the discrediting of the iconic “hockey stick” curve of recent temperature change, the IPCC’s alarmist case for dangerous human climate change now rests not on empirical data of any sort but on misunderstood computer attribution models, failed greenhouse theory, and anecdotal accounts of climate changes - such as glaciers melting - that may well be of wholly or largely natural origin.

A goal to “stabilise world climate” is misplaced, not to mention unattainable. Climate is a dynamic system within which extreme events and dramatic changes will always occur, irrespective of human actions or preferences. Witness hurricane Katrina. The real danger of the current public global warming hysteria is that it is distracting attention and resources away from the need to develop a sound policy of adaptation to future natural climate vicissitudes.

Climate change is as much a geological as it is a meteorological issue. Geological hazards are mostly dealt with by providing civil defense authorities and the public with accurate, evidence-based information regarding events such as earthquakes, volcanic eruptions, tsunamis and floods, and by adaptation to the effects when an event occurs.

As for other major natural disasters, the appropriate preparation for extreme climate events is to mitigate and manage the negative effects when they occur. Careful planning will be needed to identify when a dangerous weather or climate event is imminent (or has started), and to foster ongoing research for the development of predictive tools for both sudden and long term climatic coolings and warmings. Climate impacts are generally slower to appear than those of other “instantaneous” disasters like earthquakes, tsunamis, storms, volcanic eruptions, landslides or bushfires. This difference is not one of kind, and neither should be our response plans.

References

Bond, G., Kromer, B., Beer, J., Muscheler, R., Evans, M.N., Showers, W., Hoffmann, S., Lotti-Bond, R., Hajdas, I. & Bonani, G. 2001 Persistent solar influence on North Atlantic climate during the Holocene. *Science* 294, 2130-2136.

Davis, J.C. & Bohling, G.C. 2001 The search for patterns in ice-core temperature curves. *In: Gerhard, L.C. et al. (eds.), Geological Perspectives of Global Climate Change, American Association of Petroleum Geologists, Studies in Geology* 47, 213-229.

Gray, V. 2006 Temperature trends in the lower atmosphere. *Energy & Environment* 17, 707-714.

Grotes, P.M., Stuiver, M., White, J.W.C., Johnsen, S. & Jouzel, J. 1993 Comparison of oxygen isotope records from the GISP2 and GRIP Greenland ice cores. *Nature* 366, 552-554.

Khilyuk, L.F. & Chilingar, G.V. 2006 On global forces of nature driving the Earth's climate. Are humans involved? *Environmental Geology* 50, 899-910.

Klyashtorin, L.B. & Lyubushin, A.A. 2003 On the coherence between dynamics of the world fuel consumption & global temperature anomaly. *Energy & Environment* 14, 733-782.

Kouwenberg, L., Wagner, R., Kurschner, W. & Visscher, H. 2005 Atmospheric CO₂ fluctuations during the last millennium reconstructed by stomatal frequency analysis of *Tsuga heterophylla* needles. *Geology* 33, 33-36.

Loehle, C. 2004 Climate change: detection and attribution of trends from long-term geologic data. *Ecological Modelling* 171, 433-450.

Meinen, C.S., Baringer, M.O. & Garzoli, S.L. 2005 Variability in Deep Western Boundary Current transports. Preliminary results from 26.5 N in the Atlantic. *Geophysical Research Letters* 33, L17610, doi:10.1029/2006GL026965.

Morrison, R. 2005 Does CRC R&D spell PR? *Australasian Science*, May, p. 40-42.

Mudelsee, M. 2001 The phase relations among atmospheric CO₂ content, temperature & global ice volume over the past 420 ka. *Quaternary Science Reviews* 20, 583-589.

New Zealand Climate Science Coalition 2006 Response of the New Zealand Climate Science Coalition to comments by Dr. David Wratt. Attachment B: Inadequacies and criticisms of the Intergovernmental Panel on Climate Change. <http://www.climatescience.org.nz/assets/2006930201100.ResponseToRSNZ.pdf>

Schott, F.A., Fischer, J., Dengler, M. & Zantopp, R. 2006 Variability of the Deep Western Boundary Current east of the Grand Banks. *Geophysical Research Letters* 33, L21S07, doi:10.1029/2006GL026563.

US Climate Change Science Program, 2006 Temperature Trends in the Lower Atmosphere: Steps for Understanding and Reconciling Differences.

Watanabe, O., Jouzel, J., Johnsen, S., Parrenin, F., Shoji, H. & Yoshida, N. 2003 Homogeneous climate variability across East Antarctic over the past three glacial cycles. *Nature* 422, 509-512.