

*Those who have knowledge, don't predict. Those who predict, don't have knowledge" – Lao Tzu, 6<sup>th</sup> Century BC Chinese Poet*

## **Why No Dangerous Rise in Temperatures Threatens**

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### **Summary Points**

- There is no scientific consensus that urgent government action is needed to reduce greenhouse gas emissions to prevent dangerous increases in temperature arising from increasing use by humans of fossil fuels. Well over 30,000 scientists are sceptics or dissenters and Copenhagen and Climategate indicate it unlikely any binding global agreement will be reached to reduce emissions. Former influential CRU head (Jones) has now told the BBC the vast majority of scientists do not think the debate on climate change is over;
- Analyses of the situation by Ross Garnaut for all Australian Governments have many defects;
- Although agreeing there are **large** uncertainties in the science, Garnaut has wrongly accepted it and the application of the precautionary principle. Great uncertainties also about the possible timing/extent of temperature increases themselves rule that out;
- Analysis by Treasury/Garnaut of minimal adverse economic effects from mitigatory action to stabilise CO<sub>2</sub> concentration levels at 550ppm by 2050 contrast with other analyses suggesting large adverse effects;
- Analysis of the potential availability of fossil fuels, including reserves, suggests complete usage would leave concentration levels *below* 550ppm – so, no need for govt action to reduce emissions!;
- Garnaut's conclusion that Australian real GDP would be 700% higher in 2100 even if no mitigatory action is taken suggests the priority should be private sector adaptation rather than government action to handle temperature changes. New commercial technologies will become available to supply non-emission producing requirements;
- The IPCC undertakes no scientific research and appears to have been written mainly by those sympathetic to the warmist view. Its main advisers are of the same ilk. Peer reviews by members of the "club" are meaningless;
- Many individual scientists and groups of scientists, including contributors to IPCC reports, have in fact expressed scepticism of or dissent from the IPCC view. These include Australian scientists who (inter alia) audited responses to Climate Change Minister Wong's answers to Senator Fielding and concluded no warming since 1997; no strong evidence that CO<sub>2</sub> emissions are causing global warming; and no scientific consensus exists;
- The IPCC (and advisers) portray temperature changes by using decadal averages. These show warming trends which do not appear when annual averages are used and

they “hide” the increase of 0.6 of a degree in the mid 1970s (equal to 75% of the total increase over the past century) due to the Great Pacific Climate Shift. That event had no connection to fossil fuel emissions. In his BBC interview, the CRU’s Dr Jones overlooked (sic) this event as a *natural* influence on temperatures and also overlooked (sic) the flat or falling temperature periods over the last century;

- An examination of annual changes in temperature and in concentration levels of CO<sub>2</sub> over the past century shows no statistical relationship but includes two periods of *steady* temperatures when quite strong increases in concentration levels occurred;
- An examination of changes to Darwin temperatures by the Bureau of Meteorology suggest “adjustments” that have created a warming trend that did not occur;
- Claims that existing temperatures are at the highest level recorded or higher than in the past fail to take account of both the non-emissions caused rise from the Great Pacific Climate Shift and the strong (indirect) evidence that temperatures were higher in the Medieval and Roman periods. Dr Jones claimed in his BBC interview that there is insufficient evidence to determine what happened in the *Southern* Hemisphere during the Medieval period;
- Analyses of ice cores show that a long history of past temperatures increases *before* CO<sub>2</sub> concentration level increases;
- Analyses of changes in sea levels and in the extent of ice coverage in the Arctic and Antarctic suggest no potential substantive threats from abnormal floodings or increased meltings. Warnings that large numbers of houses are exposed to flooding are grossly exaggerated;
- The Great Barrier Reef has recovered from large bleachings that seemingly occur during El Ninos (which are not connected to emissions);
- Even if temperatures increase there is no sound basis for the modelling by Garnaut of adverse rainfall projections for the Murray Darling Basin or for expecting the Murray Darling Basin to cease agricultural production;
- The IPCC summary of various warming and cooling influences has such a wide range of possibilities that its selection of an average increase in radiation of 1.6 watts per square metre appears arbitrary and wide open to challenge;
- IPCC estimates of the greenhouse effect coming from the radiation back to earth from CO<sub>2</sub> concentration levels fail to allow for the accepted research showing no *linear* relationship between temperatures and CO<sub>2</sub> concentrations and that even a doubling of concentration levels would increase temperatures by only a very small proportion;
- IPCC modelling of temperature projections significantly understate the temperature reducing effects of evaporation from oceans (70% of the earth) that offset the initial temperature rising effect from the “greenhouse” radiation back from the concentrations in the atmosphere.
- The fundamental faults in IPCC analysis lead to the conclusion that the best policy is one based on adaptation by the private sector to temperature increases as and when they occur.

I thank the Society for agreeing to listen to what Nobel Prize winner Paul Krugman would doubtless characterise as “treason against the planet” (“Betraying the Planet”, NY Times, 29 June 09). As our own true believing economist Professor Ross Garnaut accepts in his Final Report that “there are ... **large** uncertainties in the science” (September 2008, page xvii, my emphasis) I assume even he would agree that Krugman is over the top. My own response to Krugmanites would be that the main treasonable acts are by those advocating policies designed to lay waste to coal, our country’s most valuable asset.

The political market for climate change is currently rather volatile. My assumption today is that, despite the fiasco in Copenhagen, so many politicians, scientists, public servants and even economists have so locked themselves into the supposed scientific consensus that there will be a continuation for some time of government policies to reduce greenhouse gas emissions. The media lock-in is also extensive as illustrated by the claim by Time and the New York Times that the record snow fall in Washington on 10 February reflected global warming because the warmer world creates more moisture and that can produce more snow. But such claims seem to have overlooked that the creation of snow depends on the air being cold enough.

I do however draw attention to the public exposure since Copenhagen of important flaws in IPCC science and the growing evidence from Climategate and other sources that temperature data has been manipulated to show a warming trend where none occurred. A number of inquiries are being undertaken overseas into these matters and Figures 1 and 2 in the circulated graphs, which have been compiled by an Australian expert on climate science, Bill Kininmonth, and Australian physicist, Dr Tom Quirk, suggest there has been manipulation. Figure 4 is also important because it has comparisons of changes in temperature and in concentration levels of CO<sub>2</sub> in the atmosphere from which there is radiation back to the earth’s surface. I will return to these shortly.

I would also refer Krugmanites to famous American theoretical physicist, Freeman Dyson, who accepts that warming causes problems but regards them as “grossly exaggerated”. Dyson co-signed a letter to the UN strongly criticising the IPCC and deploring the open contempt shown by the majority of scientists to the minority who reject IPCC views. “In the history of science”, he stated, “it has often happened that the majority was wrong and refused to listen to a minority that later turned out to be right.” Dyson is not the only scientist to have similar views and taken similar action.

The reality is that around the world well over 30,000 scientists have expressed sceptical or dissenting views on the dangerous global warming thesis. The former head of the Climate Research Unit at East Anglia, Dr Phil Jones, who has had considerable influence on the compilation of IPCC reports, told the BBC in an interview on 14 February (in which he seemed to have had advance notice of various questions) that he doesn’t believe the vast majority of scientists think the debate on climate change is over. This is signal of retreat from previous assertions by warmists and the comment just prior to that by the new British Chief Scientist that “there is fundamental uncertainty about climate change prediction that can’t be changed” (“The Times”, 27 Jan 10) suggests even the holder of this position is beginning to see the light. As pointed out in Christopher Booker’s *Scared to Death*, scientists are far from being gods and over time many have wrongly predicted disastrous consequences if governments fail to intervene to control human activity. Booker has recently published another book, *The Real Global Warming Disaster*, solely on global warming and suggesting “a small group of ‘global warming zealots’... have repeatedly rigged the evidence to support

their theory”. Australia’s professionally respected Productivity Commission has also pointed out that “uncertainty continues to pervade the science and geopolitics and, notwithstanding the Stern Report, the economics”. It added that “independent action by Australia to substantially reduce GHG emissions, in itself, would deliver barely discernible climate benefits, but could be nationally very costly”. It also describes the Stern report “as much an exercise in advocacy as it is an economic analysis of climate”.

Against this background, we have the two timing IPCC head, Pachauri, claiming that “the number of sceptics is going down rapidly” (7.30 report, 29/9). This is one of many examples of factual deception by that person and the body he runs. It is the more remarkable given that Pachauri is not a scientist and seems to spend a good part of his time writing about how to get sexual satisfaction!

Australian Governments have employed a more sober chief adviser on climate matters. But while economist Ross Garnaut has produced a major report and made many statements in support of government action to reduce emissions, in my view his analysis has many defects. For one thing he has dodged any attempt to assess the science, claiming that “the outsider to climate science has no rational choice but to accept that, on the balance of probabilities, the mainstream science is right in pointing to high risks from unmitigated climate change” (Final Report on Climate Change Review, September 2008). On this incorrect basis he has accepted that an externality exists requiring government intervention consistent with global action to stabilise CO2 concentrations to avoid further “dangerous” increases in temperatures. It is astonishing that he even supports the policy that both major political parties now espouse of Australia acting to reduce emissions without any binding global agreement – or any realistic prospect of such an agreement.

Let me just make it clear here that I am not a scientist. But my nearly 50 years experience as an economic analyst both in Treasury and outside provides a basis for assessing the credibility of data used to justify the dangerous warming thesis and for examining alternative explanations by sceptical scientists. Contrary to Garnaut’s assertion, qualified “outsiders” **must** pass judgement on science-based proposals –if they did not there would be a much bigger hole in government budgets!

My main conclusion is that the uncertainties about mainstream science and the extent of dissent are so large that any attempt to apply the so-called precautionary principle would defy common sense. Moreover, even if it were accepted that temperatures will increase, the enormous uncertainties about the timing of any such increases and about whether comprehensive mitigating action is required suggests no case has been established for governments to **start** an emissions reduction program. Some say it’s no different to insuring your home. But not all of the population does that and home insurance does not normally cover damage from certain irregular catastrophic events. There is a strong case for arguing that individuals should have the responsibility for dealing with most problems that may arise if temperatures happened to increase as the IPCC has projected.

### **Analysis of Economic Effects**

Although Garnaut acknowledges that a meaningful emissions reduction program would involve “a major change in the structure of our economy”, like many other expert economic analysts he concludes that, over time, the net effect of mitigatory action will be beneficial. This conclusion is based on a view that, in addition to preventing damage from higher

temperatures, Australian and other major economies have adaptive capacities that allow the transfer to low-emissions energy with relatively small initial adverse economic effects. As Ross Gittins has observed, economists “think all we’ve got to do is switch to low-carbon energy sources ... and the economy can go on growing as if nothing had happened” (The Age, 23 Sept).

The assumption that normal adaptive behaviour would readily make the necessary changes is seemingly reflected in the 2008 Treasury document on modelling of a “world **without** climate change” (“Climate change mitigation policy modelling, Summary of Assumptions and Data Sources”, 3 Oct 2008). That modelling publishes no error ranges and acknowledges that “many of the assumptions used ... are uncertain, especially over the long time horizons being examined”. And although it shows a sharp reduction in economic growth after the current and next decades, its projection of growth after 2030 has it running on steadily at about 2% pa per decade for the next 70 years. In a separate document, released in 2008 by Treasurer Swan and Climate Change Minister Wong (“Australia’s Low Pollution Future: The Economics of Climate Change Mitigation”, 30 Oct 08) Treasury examined various global scenarios and concluded that mitigatory action to achieve CO<sub>2</sub> concentration levels of 550 ppm by 2050 would reduce real GDP per capita growth by only 0.1-0.2 % pa. Looking at this from the other side, the experts’ view is that damage from global warming between now and 2100 would be miniscule.

It should be noted that no economic analysis has been published of Australia acting to reduce emissions in circumstances where major emitters do not participate, which Copenhagen suggests is most likely. Nor is there any analysis of what would happen to CO<sub>2</sub> concentration levels if the world used up all its fossil fuels. Estimates of potential supplies, including from reserves, published by physicist Dr Tom Quirk (Quadrant Online) suggest government action to stop emissions would not be needed because the usage of all available fossil fuel resources would not result in CO<sub>2</sub> concentration levels even reaching the desired stabilisation level of 550ppm. If this is correct, the whole intervention proposal is pointless right from the start.

Moving to Garnaut’s Final report of September 2008, although four types of costs of climate change are identified, only one type can apparently be modelled. Resort to assumptions, including even “speculative” ones, is acknowledged. However, in a remarkable selling point (sic) for today’s voters, I’m sure you will all be pleased to know that “the main costs ... and therefore the main benefits of mitigation, accrue in the 22nd and 23rd centuries and beyond”! (P249). While noting the potential for a “distorted” emissions trading scheme resulting from “political preferment” (p252), Garnaut makes no allowance for any adverse effects from the extensive rent seeking already happening and likely to increase further.

Like the Treasury, the Garnaut report takes the 550 ppm stabilisation objective by 2050 as a given and assumes that if no mitigatory action is taken temperatures will increase to 5 degrees by 2100, which is more than the upper end of the IPCC projection. However, the reports’ conclusion is that “Australian material living standards are likely to grow strongly through the 21st century, *with or without* mitigation” (p565, my emphasis). The modelling finds “mitigation cutting the growth rate over the next half century, lifting it somewhat in the last decades” and a GDP at the end of the century “higher with 550 mitigation than without” (p 245). The graphical presentation of the mitigated outcome shows GDP about 5 per cent higher than otherwise in 2100, without any error range (p 267).

So, the Garnaut modelling concludes that under a mitigatory policy the present generation would have lower growth for the next 40 or so years so that the next (and later) generations could (supposedly) benefit. Importantly, the modelling also concludes that the “saving” would be from a GDP that, at the end of the century, would otherwise be 700 per cent larger in real terms than today even after supposed damage from higher temperatures.

My assessment of the Treasury/Garnaut modelling is that it has the potential for substantive error given that normal adaptive behaviour is assumed despite the acknowledged major structural changes, and that no allowance is made for possible “shock” effects. By contrast, climate economist Richard Tol estimates that the cost of mitigatory action by 2100 will be about 40 times greater than the benefits (see “Climate folly before failure”, Alan Wood, *The Australian*, 1 Oct 09). The reality is that even mitigatory action between now and 2020 to achieve 20% lower emissions could have significantly greater adverse initial economic effects than implied by the modelling. Moreover, from a longer term perspective it seems to be accepted by Garnaut and Treasury that there would be no adverse effects from operating with less efficient capital and energy or from the major increase in government intervention in economic decision-making that would likely inhibit entrepreneurial activity outside the financial sector. In their pamphlet “Back to the 19th Century” some colleagues have, with former Finance Minister Peter Walsh, outlined the extensive potential for adverse influences.

This leads to three questions.

First, given that the Garnaut report effectively assumes that Australian living standards would increase progressively to ever higher levels even if there is also a large increase in temperatures, doesn't this suggest that a private sector that is getting wealthier and wealthier should be directly responsible for alleviating or suffering the main costs? That should mean a policy based mainly on adaptation rather than mitigatory action enforced by government.

Second, given the wide range already available of technological alternatives to fossil fuels, and the considerable research assistance already provided by governments, is it not very likely that over the next 25 years one of those technologies will become economically viable? Even if this doesn't eventuate, is there any substantive reason why nuclear power could not start to be used in Australia, perhaps initially on a subsidised basis, and then extended progressively if temperatures increases resume? It is surely contrary to the national interest to start now **forcing** reductions in CO2 emissions, let alone mandating resort to alternatives to supply 20 per cent of electricity by 2020.

It is relevant that one parameter in the Treasury modelling is that “carbon capture and storage technology combined with coal and gas electricity generation is assumed to be available on a **commercial** scale from 2020 in both Australia and the world” (emphasis added). Did the Government accept this assumption and, if so, why is it proceeding with an emissions reduction policy?

My third question is why is it necessary to “do a Stern” and look at what might happen beyond 2050 when temperatures are projected to reach an additional two degrees tipping point beyond which feedback will supposedly make it impossible to stop further increases? Even if existing alternative energy technologies do not become economically usable by then, history tells us that science would very likely have produced a new, but now unknown viable solution. It is nonsensical to argue for government intervention now to “save the planet” because no economically viable solution is currently available.

My assessment of the published economic modelling, and the potential availability of alternative technology, is that no substantive basis exists for urgent action to reduce greenhouse gas emissions. But, as Garnaut rightly says “Climate change policy must begin with the science”, (Garnaut Climate Change Review Interim Report, February 2008, p8) and we should assess the data used to justify the scientific basis.

### **Assessing the Science**

The IPCC itself undertakes no scientific research and its head, Rajendra Pachauri, is not a scientist. Moreover, although its key public document (“Summary for Policy Makers”) derives from submissions by scientists, the drafters have mainly been people sympathetic to the dangerous global warming view. Claims that peer reviews ensure accuracy are meaningless when reviewers are in the same club (and some important conclusions now appear not to have been peer reviewed). Also many scientists who made submissions have subsequently rejected or qualified analyses in IPCC reports, one being German Professor Latif, a leading climate modeller and a lead author to the last two reports. Professor Latif has reportedly told the UN World Climate Conference in September last year that, while remaining a believer, he now considers that following the absence of any warming for a decade there will likely be “one or even two decades during which temperatures cool”.

Similarly, one of the many scientific groups which have rejected or questioned IPCC analyses comprised more than 60 German scientists, including some who had made submissions to the IPCC. On 26 July last year this group sent a letter to Chancellor Merkel stating that “humans have had no measurable role on global warming through CO<sub>2</sub> emissions in temperature” and accusing the IPCC of completely ignoring facts of which it must have been aware.

Here in Australia in July last year four expert Australian scientists advised Senator Fielding on responses by Climate Change Minister Wong to Fielding’s questioning of her. They published an audit that concluded there has been no warming since 1998, there is no strong evidence that CO<sub>2</sub> emissions are causing global warming, and that no scientific consensus exists (see “Independent Due Diligence Report” at [http://www.stevefielding.com.au/climate\\_change](http://www.stevefielding.com.au/climate_change)). Various other developments, not the least being the change of leadership in the Opposition, suggest reducing acceptance by the general public of the dangerous global warming scare.

In India the Government has created its own IPCC because, it said, it cannot rely on the existing one and, even though the Indian PM has subsequently praised the existing IPCC, this is widely thought to be no more than a political gesture.

In the United States, although the passage of ETS legislation by the House of Representatives was secured by what amounted to bribery through the last minute use of special grants to Congressmen who otherwise would not have voted for it, it now seems unlikely that the Senate will pass the legislation. Public opinion polls in the United States have changed over the past year or so from showing sceptics as a minority to having them as a slight majority of the population. An announcement by President Obama earlier this month suggests he may abandon his proposal for an emissions trading scheme and concentrate on direct action to reduce emission.

Chapter 9 of the Fourth Assessment report of the IPCC sets out that body's basic science conclusion that "it is *very likely* that anthropogenic greenhouse gas increases caused most of the observed increase in global average temperatures since the mid-20<sup>th</sup> century" and its report portrays graphs of rising global and regional temperatures over the last 100 years. The IPCC's conclusion is that, as human activity and use of fossil fuels will continue to increase emissions of carbon dioxide, this will add to concentrations of CO<sub>2</sub> in the atmosphere and hence temperatures. However, while some of the emissions do stay in the atmosphere in a concentrated form and do reflect back to earth some of the heat radiated from the earth's surface, the IPCC's conclusion needs testing against relevant data and science.

## **Temperatures and CO<sub>2</sub> Concentrations**

I have already mentioned the very recent analysis by two Australian scientists of the portrayal of temperatures by the IPCC and its advisers. This analysis is shown in Figure 1 and in Figure 4 where changes in the annual average of global temperatures are compared with changes in concentration levels of CO<sub>2</sub>. The analysis also extends to the portrayal of Darwin temperatures by the Australian Bureau of Meteorology and that is shown in Figure 2. Solid lines, indicating annual increases, are linear least squares fits for Chow break tests.

Looking first at Figure 1, it can be seen that the decadal averages for the globe and Australia, which are the ones published in IPCC reports (see, for example, "IPCC Climate Change 2007: The Physical Science Basis Summary for Policy Makers", p6, Figure SPM-3) present a picture of an upward trend in temperatures whereas the annual averages show considerable variation and clear evidence of extensive periods when there was no change or even a slight downward trend. Note that, of the increase in temperatures of about 0.8 of a degree over the 100 years (slightly higher in Australia), about 0.6 or 75% reflects the Great Pacific Climate Shift in the mid 1970s. There is no dispute that this event had no connection with fossil fuel emissions but, astonishingly, in the interview the CRU's Dr Jones had with the BBC (already mentioned), he failed to identify that shift as one of the possible *natural* influences on temperatures. Moreover, when asked about rates of global warming, he omitted to mention that in the periods from 1939 to 1977 and from 1997 to 2009 temperatures were flat or falling slightly and, when asked about the fall since 2002, he dismissed it as "statistically insignificant".

Looking next at Figure 4, the table at the bottom summarises the changes in different periods of both temperatures and CO<sub>2</sub> concentration levels. What the table shows is that there were two periods, one from 1939 to 1977 and one from 1997 to the present, during which temperatures were relatively stable but CO<sub>2</sub> concentration levels increased quite strongly, particularly in the most recent period. It also shows that in the period when both temperatures and CO<sub>2</sub> concentration level increased (1977 to 1997) the increase in temperatures had nothing to do with emissions. In only the pre-World War II period might there be said to have been a close connection, although in that period usage of fossil fuels would have been relatively low. My assessment is that, on the basis of this analysis, there is absolutely no statistical relationship between changes in temperatures and changes in CO<sub>2</sub> concentration levels. I say this even without any questioning of the accuracy of the temperatures used by the IPCC and the Bureau of Meteorology.

Now, if we turn to Figure 2 we see reason to question the BOM's adjustments to temperatures for Darwin. Briefly, if we compare the two bottom graphs – c and d – we can see there is a marked difference between them for the period up to 1940. In both these graphs

temperatures collected at Darwin post office have been adjusted downwards to allow for the fact that in two overlapping years temperatures at the Darwin Airport, which took over collection of data after 1942, were higher. But guess what? Graph d, which has been constructed by Dr Tom Quirk, was adjusted downward by 0.8 of a degree to accord with the overlapping difference and shows little if any change in temperatures over the whole period from 1910 to 2010. But Graph c, which shows a very clear upward trend, was adjusted downward by 1.4 degrees by the BOM and is now part of what it describes as “high quality” data. And this extensive adjustment was made in concert with an Australian lead author of IPCC reports. There is reason to believe that similar downwards adjustments to some other early temperatures have been made by the BOM and comparisons between satellite and BOM temperature changes shown in Figure 3 suggests that there is even a small sign of BOM bias there.

However let us assume for a moment that the published temperature data is correct. One often-made claim is that temperatures are higher now than they were a century ago and that the last decade shows the highest temperatures “on record”. The Government’s Green paper of July 2008 even asserts that 12 of the last 13 years have been Australia’s warmest and doesn’t even add the qualification about “on record”. The IPCC has claimed that global temperatures in the last 50 years are likely to have been the highest in at least the last 1300 years. These claims have been made despite the publication in the IPCC’s 1990 report of a graph showing temperatures for the Medieval Warming Period (800 -1,100) higher than for the 20<sup>th</sup> century, a publication it did not repeat in subsequent reports but did not explain why. However, although Dr Jones quibbled in his BBC interview about evidence regarding temperatures in that period (he claimed there is insufficient evidence about temperatures then in the Southern Hemisphere), it is now widely acknowledged that there is strong evidence that temperatures were *higher* then and in the Greco-Roman warm period (600 BC - 200 AD). Moreover, it is not surprising that some warming has been experienced since the end of the Little Ice Age, which occurred around 1800 well before CO2 emissions became significant.

The IPCC adopted the same tactic of refusing to acknowledge a mistake after its publication of the so-called hockey stick analysis was shown to be flawed in a report commissioned by the US Congress from an expert statistician. This hockey stick thesis, based on analysis of tree rings, was that the only temperature rises have been since industrialisation.

Another test of the alleged link between increases in temperatures and CO2 concentration levels can be done by examining analyses of ice cores going back 130,000 years. This shows temperatures increased several hundred years *before* CO2 concentrations did (see Figure 7).

It seems difficult to avoid the conclusion that there is no policy significance in claims that we have temperatures that are the highest for some centuries. Once account is taken of rises over the past century due to the Great Pacific Climate Shift and likely manipulations of temperature data nor is there any policy significance in the claim that they are the highest ever recorded.

In summary, the temperature data as presented by the IPCC, by associated international research organisations, by department of environments and by various Australian authorities do not provide a basis for the alarmist conclusions that have been reached by governments. All these portrayals of temperature, along with other similar alarmist claims, certainly justify

a major independent inquiry before any government action is taken to reduce emissions of CO<sub>2</sub>. Even some contributors to IPCC reports are recognising that *natural* influences, such as ocean upwellings or variations in the earth's orbit around the sun or in sunspot activity may cause variations in temperatures. But if natural influences cause such variations from time to time, at the very least there is much less urgency to start reducing emissions. I conclude that the statistics analysis used by the IPCC and others to suggest a connection between temperature increases in the past century or so and increases in CO<sub>2</sub> concentrations is seriously defective and does not form any sound basis for the projection of an increase in temperatures to 2100 ranging from 2-4 degrees.

But what about other evidence?

### **Greenland, Antarctic and Arctic Ice Sheets -and the Reef**

If large ice sheets and glaciers started to melt, sea levels rose and low-lying land became more susceptible to flooding that could be evidence of warming.

The last IPCC report predicted an increase in sea levels to 2100 ranging between 18 and 59 cms (about 2 feet). However, a dispute amongst "experts" led the IPCC to announce it was not making any prediction, another indication of doubts about the analytical consensus of the supposed experts.

Satellite measurements of sea levels from 1994 show an average rate of increase close to the lower end of the IPCC's initial predicted range, but with a lower rate of increase in the last 5 years (See figure 12). Last year the Dutch Meteorological Institute stated that sea levels have risen 20 centimetres (about 8 inches) in the past century and there is "no evidence for accelerated sea-level rise". Suggestions (including by Prime Minister Rudd and the Federal Department of Climate Change) that IPCC analysis reveals potential threats to large numbers of houses close to the ocean are wrong and alarmist. Owners of such properties who are being stopped from development by such alarmism may be able to take legal action to reverse such measures.

As to the Arctic, while meltings did sharply reduce the extent of sea ice in 2007, that occurred when global temperatures were falling and during a period of cloudlessness in the area. Since 2007 the sea ice extent has returned to what it was in 2005. Although a downward trend remains (See Figure 13), more extensive Arctic meltings have occurred in the past when CO<sub>2</sub> emissions were very much lower and such meltings have no effect on sea levels because the ice is already in the sea.

As to the Antarctic, the total ice area has been increasing and has recently reached record levels (see Figure 13). Break offs of sections of the Antarctic ice sheet do occur but are normal and recent imaginative claims of a small increase in temperatures (from 50 degrees below) were based on data from the one or two weather stations that cover the vast area. Satellite data covering the past thirty years show a distinct cooling of the Antarctic region.

I cannot come to Queensland without mentioning the Great Barrier Reef, which is high on the Government's list of reasons for an emissions reduction scheme and has a Foundation that is concerned about possible bleaching caused by global warming. Any action by Australia to reduce emissions would not help unless there is an effective agreement by major emitters too, which is now unlikely. It should also be noted that most of the reef has recovered from the

bleachings of 1998 and 2002, which probably resulted from the temporary warming of sea water that occurs during the light winds that occur at the time of El Ninos and that limit the flow of cooler water across the reef. The Reef may have a stronger capacity to continue than is thought by some.

## **Droughts and Rainfall**

Although the Government's Green paper of July 2008 acknowledges that since the 1950s the NE of Australia has become wetter (it actually appears more to be in the NW), much attention has been given to below average rainfalls in other areas, particularly in the Murray-Darling Basin since 2000. Drawing on advice from the CSIRO and the BOM, Garnaut's modelling assumes that the projected higher temperatures will be accompanied by lower rainfall and, in the case of the MDB, "by mid-century it would lose half of its annual irrigated agricultural output ... and by the end of the century ... would no longer be a home to agriculture" (Final Report, p258).

There is no sound basis for such modelled projections. The variations in MDB annual rainfall clearly show no connection with levels or variations in Australia's average temperature (see Figures 10 and 11 and accompanying note). Indeed, there is no statistically significant change in MDB rainfall since 1900 and the above average temperatures in the 1980-2000 period, reflecting the Great Pacific Climate Shift, were accompanied by above average rainfall.

Past Australian droughts occurred when global temperatures were lower than now and wetter years occurred when such temperatures were rising. There is no reason to expect that to change.

## **The Science of Emission Concentrations**

The IPCC's 2001 report acknowledged that the climate is a "complex, non-linear, chaotic object" and that long-term prediction of climate states is "impossible". All such analytical qualifications have since disappeared seemingly because climate science has become politicised. Figures 8 and 9 from the 2007 report provide an example of how one possible interpretation of influences on temperatures has been turned into some kind of definitive warming outcome consistent with that politicisation. Figure 8 provides a summary of the various warming or cooling influences identified by the IPCC as producing radiative forcings, with an **average** increase of 1.6 watts per square metre. But the range around the average is enormous - from 0.6 to 2.4 square metres - and that in turn reflects the enormous ranges of radiative forcings for the various individual influences. My advice from scientific acquaintances is that the extent of estimation, as distinct from measurement, is also enormous.

This brushing aside of uncertainties has occurred despite the acceptance in IPCC reports of research that shows a progressive diminution in the temperature-increase effects from increases in CO<sub>2</sub> concentration levels (see Figures 5 and 6). This research shows a greenhouse effect coming from the radiation back to earth from CO<sub>2</sub> concentrations in the atmosphere. **But** it also shows this initial warming does not increase in line with the increase in CO<sub>2</sub> concentration levels.

Figures 5 and 6 are difficult for a non-scientist to explain. Figure 5 shows that, if CO<sub>2</sub> concentrations were to double from 400ppm to 800ppm, that would only increase radiation at

the earth's surface from about 29 watts per square metre to about 32 watts, or about 10%. Figure 6 shows that such an increase in radiation (shown on the bottom axis) would only increase temperatures by 0.3 of a degree. This analysis comes from an online calculator of energy in the atmosphere (MODTRANS) and is an international and IPCC accepted standard for atmospheric calculation. The IPCC's failure to recognise in its conclusions that there is no **linear** relationship between temperatures and CO2 concentrations is yet another deception – and a major one.

There is also very considerable doubt about the accuracy of the modelling used by the IPCC to project temperature increases. These models incorporate the positive feedbacks from water vapour that *increase* the radiation effects back to earth and oceans from increased CO2 concentrations (and hence cause some initial rise in temperatures).

However, the IPCC models fail to take adequate account of the temperature **reducing** effects from the negative feedback coming from the strong increase in evaporation from the ocean (which constitutes 70% of the earth's surface) that also occurs as surface temperatures rise. This means that the IPCC models significantly **understate** the temperature reducing effects that offset the initial increases. The modelled outcomes of larger CO2 concentrations by the IPCC thus produce a much larger increase in surface temperature than would actually occur.

## **Conclusion**

My view is that there are fundamental faults in the science used to justify comprehensive mitigatory action by governments; that claims of a consensus on the IPCC science have no credibility and that account is not taken of the long history of faulty analyses by scientists; that examination of the temperature and CO2 concentrations data indicates no causal connection between changes in the two; that there is no substantive evidence of threats from rising sea levels or meltings of sea ice in the Arctic or Antarctic; and that there is no evidence that droughts occur when temperatures increase. In conclusion, I submit that a policy based on adaptation by the private sector is the appropriate response to alarmist analyses proposing comprehensive mitigatory action to prevent supposed dangerous global warming.

# **An Almanac of the Atmosphere**

being

A random walk through observation, calculation and estimation of changes to the climate.

Compiled 11 February 2010

# Positive Proof of Global Warming



## HEALTHY POLAR BEARS TOO!

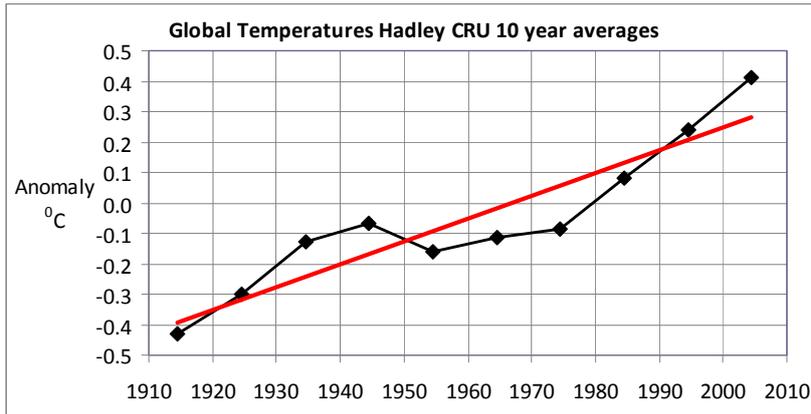


*A splendid example of a member of an expanding population of polar bears. Polar bears in Norway's remote Svalbard archipelago photographed by Steve Kaslowski.*

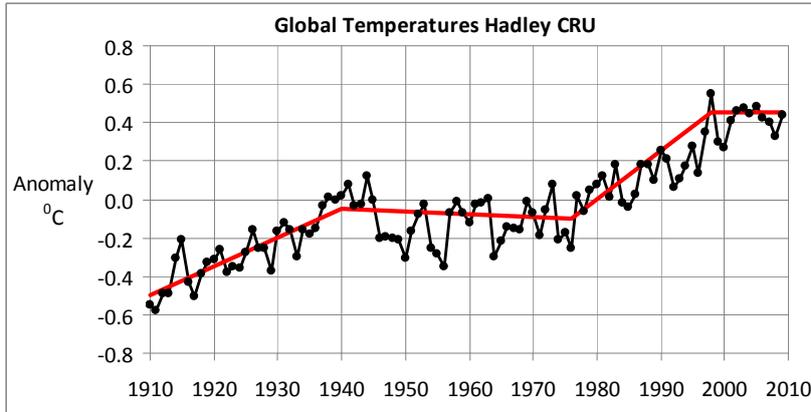


Canadians rallying against global warming.

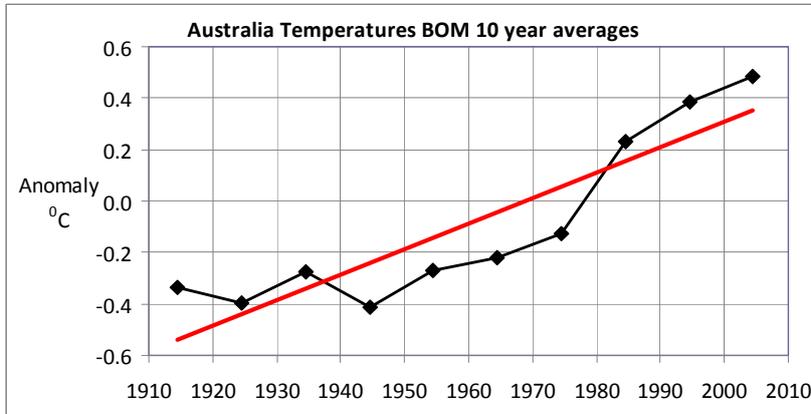
HOW THE IPCC PRESENTS GLOBAL TEMPERATURES (supplied by Hadley CRU)



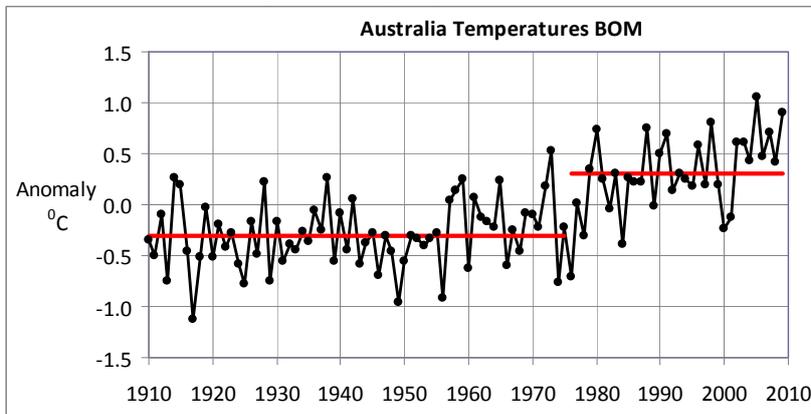
How the global annual temperatures really vary.



How the IPCC presents Australian temperature data (supplied by BOM via CRU)

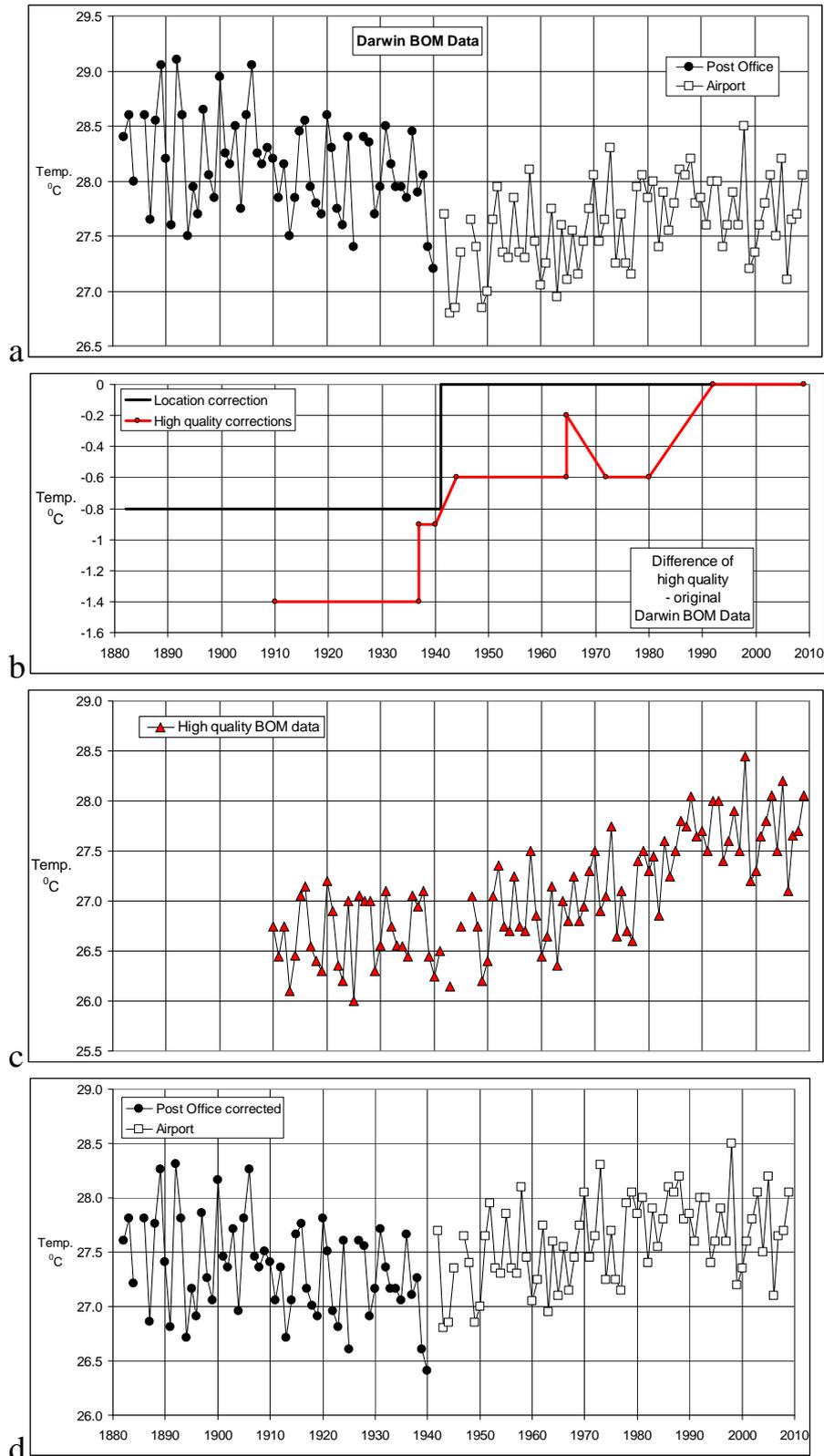


How the Australian annual temperatures really vary



**Figure 1** A strong feature of the annual data is the presence of the Great Pacific Climate Shift that occurred around 1976. In the Australian data the gap in the solid lines, a  $0.6^{\circ}\text{C}$  step, is at the time of the Great Pacific Climate Shift of 1976. This has no connection with fossil fuel emissions.

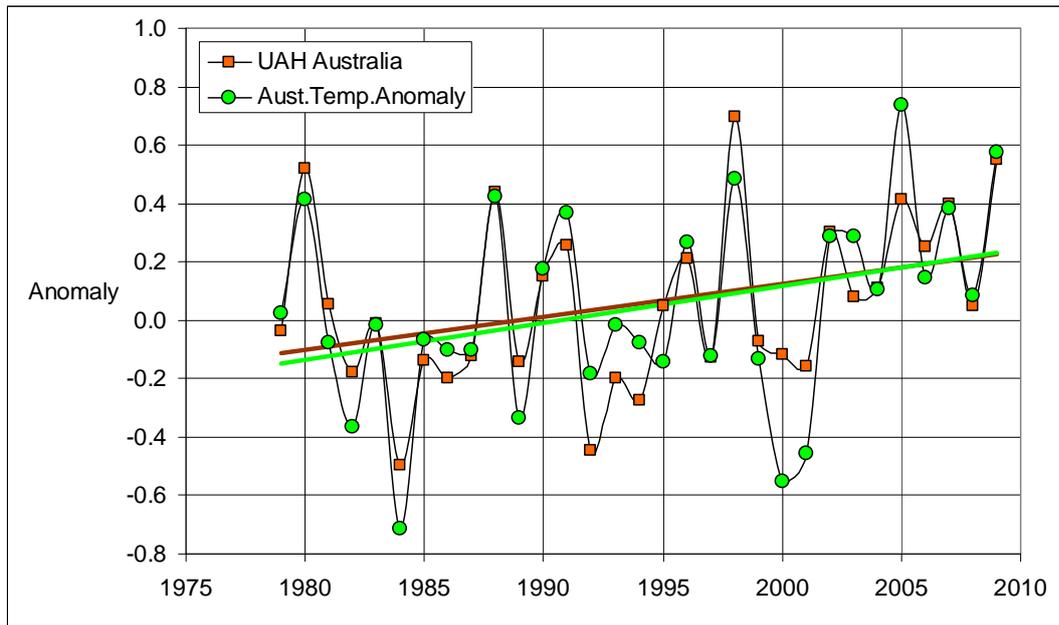
## TEMPERATURE MEASUREMENTS AND ADJUSTMENTS - DARWIN



**Figure 2** Bureau of Meteorology (BOM) measurements at Darwin. **a)** Initially the station was at the Post Office. In 1941 a second station was opened at the airport and the Post Office was bombed in 1942 so measurements ceased. **b)** Temperature adjustments. A one year overlap showed the temperature to be 0.8 °C cooler at the airport giving rise to simple correction (solid line). The BOM made further adjustments based on other considerations. **c)** shows the **now published** result of the BOM "high quality" adjustments while **d)** shows the simple adjustment for change of location. **This should be the preferred series unless faced with compelling evidence of the need for further adjustments.** The international temperature databases (CRU, NCDC and GISS) use the raw uncorrected data shown in **a).**

## AUSTRALIA LAND BASED AND SATELLITE MEASUREMENTS

Measurements supplied by John Christy of the University of Alabama at Huntsville (UAH)



**Figure 3** The BOM Australian temperature anomaly and the UAH Australian lower troposphere anomaly with straight line fits to the yearly values. The correlation coefficient of satellite to land based Australian data of 0.88 is better than the correlations of 0.63 to 0.73 found for similar analyses for global temperatures. This is a measure of the quality of the land based analysis where the density of land based sites is clearly important.

Straight line fits to the yearly data show that the satellite and ground based temperatures have a consistent trend with

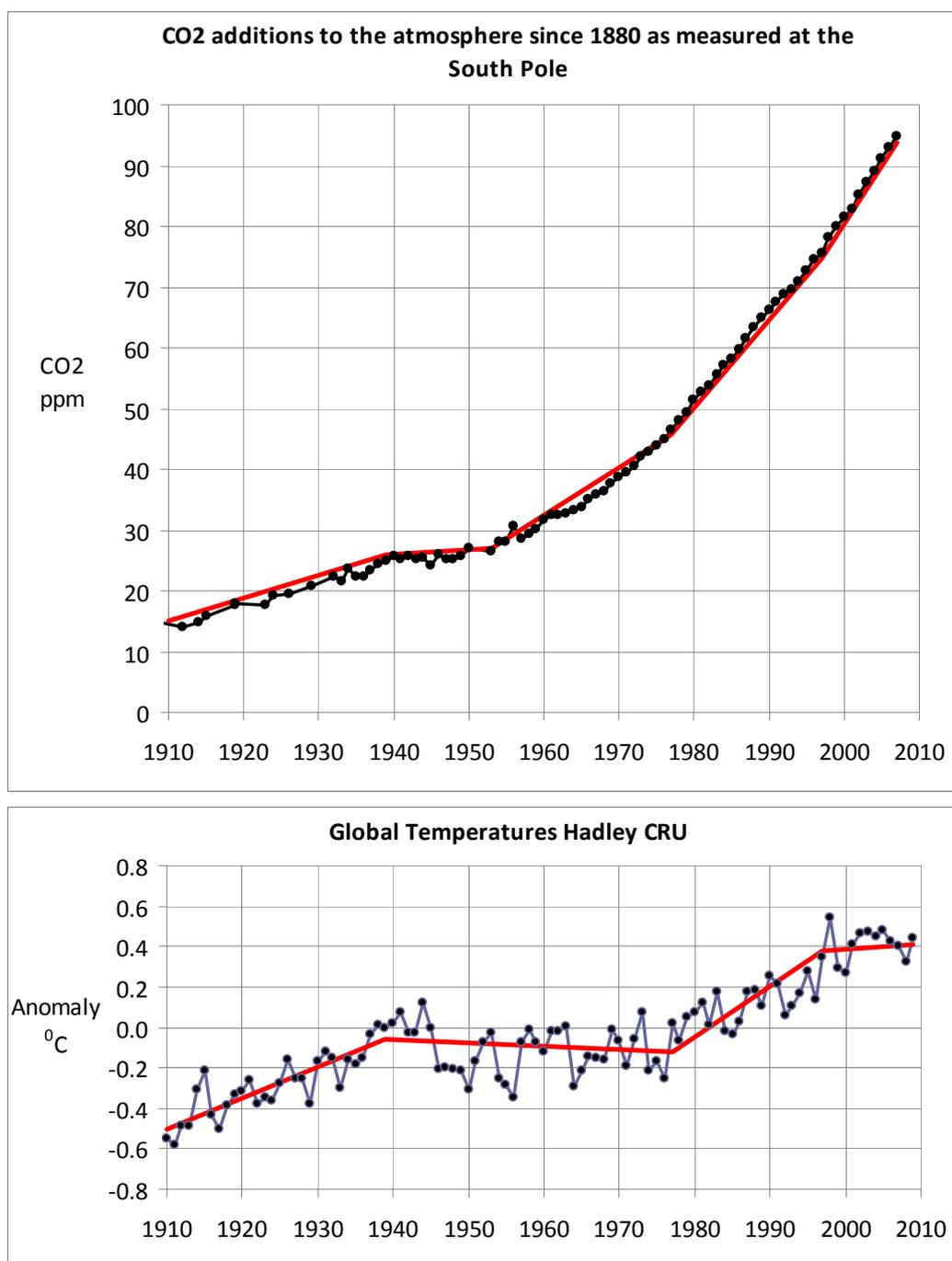
**$0.11 \pm 0.06$  °C per 10 years for the satellite Australian measurements and  
 $0.13 \pm 0.07$  °C per 10 years for the BOM temperature series for Australia.**

A fit to the difference shows that the BOM measurements have a **larger** increase for 1979 to 2009.

**$0.02 \pm 0.03$  °C per 10 years.**

This difference may be a reflection of systematic differences introduced by the BOM treatment of ground based measurement referred to in Figure 2.

## 100 YEARS OF ATMOSPHERIC MEASUREMENTS – 1910 TO 2010

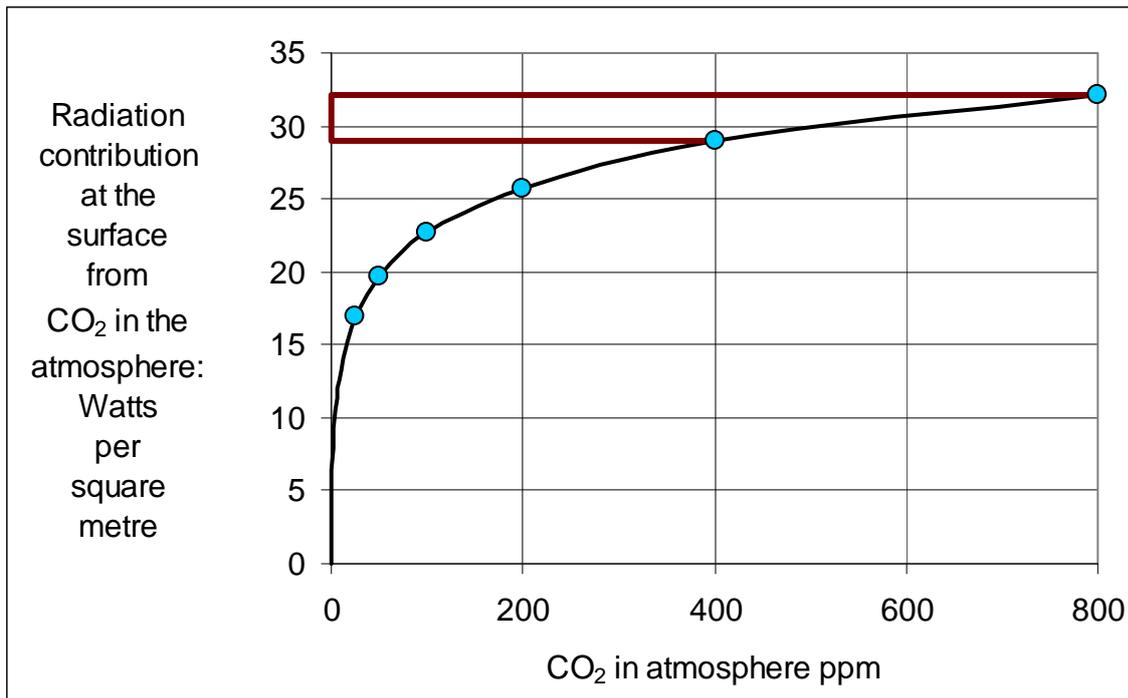


**Figure 4:** *Top* – Ice core and atmospheric measurements of CO<sub>2</sub> concentration levels in Antarctica and at the South Pole. The increase is measured against the ice core value of 286ppm for 1800 to 1880. In the 1940s and early 1950s there was no increase in CO<sub>2</sub>. Solid lines indicate annual increases. *Bottom* – Global temperatures estimated by the Hadley Centre of the UK Met Office. Solid lines indicate warming and cooling

<i>Period</i>	<i>CO2 at the South Pole Annual increase in ppm</i>	<i>Period</i>	<i>Global Temperature °C Increase per 10 years</i>
1910 - 1939	0.38 +/- 0.03	1910 - 1939	0.15 +/- 0.02
1939 - 1953	0.08 +/- 0.05	1939 - 1977	-0.02 +/- 0.03
1953 - 1977	0.77 +/- 0.03		
1977 - 1997	1.46 +/- 0.02	1977 - 1997	0.25 +/- 0.05
1997 - 2007	1.89 +/- 0.03	1997 - 2009	0.03 +/- 0.06

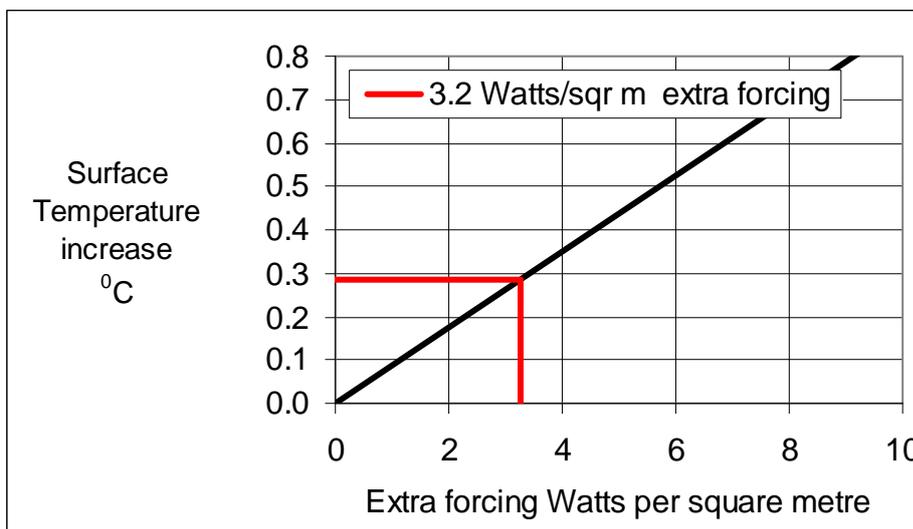
Temperature does not appear to have a strong relationship with CO<sub>2</sub> levels in the atmosphere.

## SURFACE ENERGY CHANGES FROM CO<sub>2</sub> IN THE ATMOSPHERE



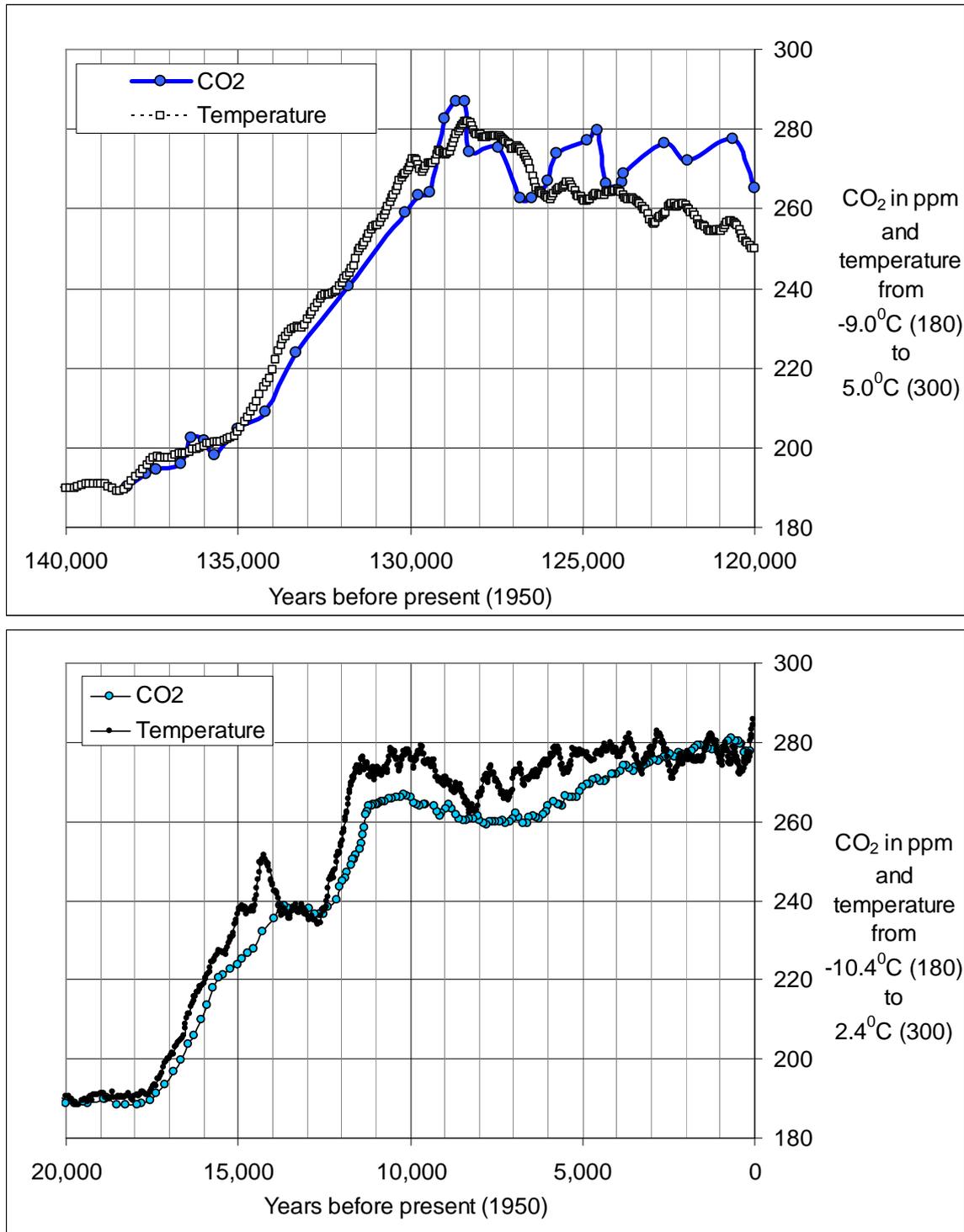
**Figure 5** As the concentration of CO<sub>2</sub> increases, there is increased radiation back to the surface of the earth (the greenhouse effect). This is measured in Watts per square metre (left axis). However the relationship is not linear. In fact doubling the concentration of CO<sub>2</sub> from 400 ppm to 800 ppm only increases the radiation from CO<sub>2</sub> at the surface by some 10% or 3.2 Watts per square metre. (Results derived for US standard atmosphere and cloudless sky from MODTRANS, a University of Chicago on-line calculator of energy in the atmosphere. MODTRANS is an international and IPCC accepted standard for atmospheric calculations).

## TEMPERATURE CHANGES AT THE SURFACE FROM CHANGES IN CO<sub>2</sub> CONCENTRATIONS



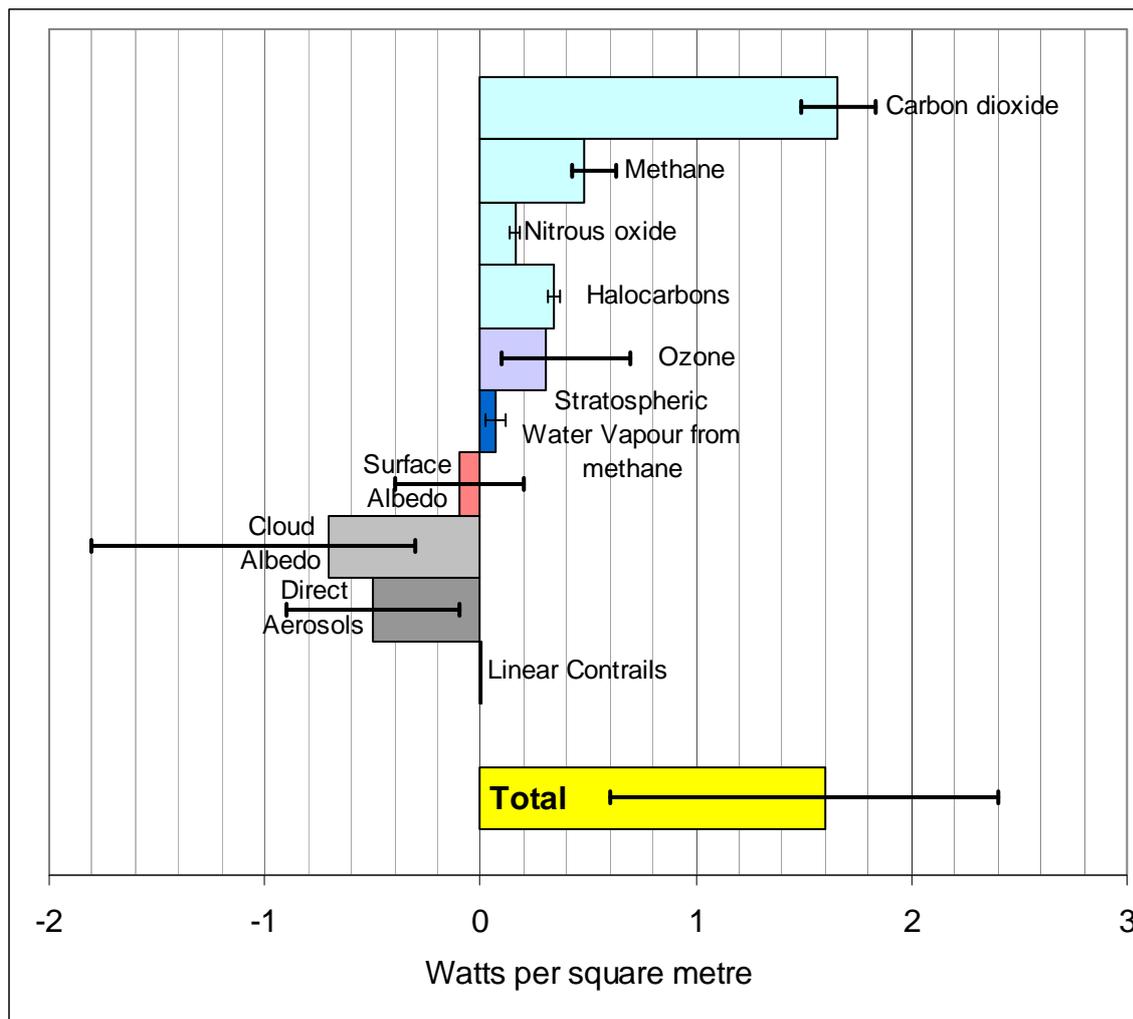
**Figure 6** Increased radiation forcing results in an increased surface temperature. However with 70% of the earth's surface as ocean, evaporation reduces the temperature increase by approximately a factor of two. Doubling the CO<sub>2</sub> concentration to 800 ppm with a 3.2 Watts per square metre radiation increase, gives a surface temperature increase of 0.3°C. IPCC modelling suggests that this level of CO<sub>2</sub> will be reached in 2100 with their "business-as-usual" projection.

## TEMPERATURES RISE BEFORE CO<sub>2</sub> CONCENTRATIONS AT THE END OF ICE AGES

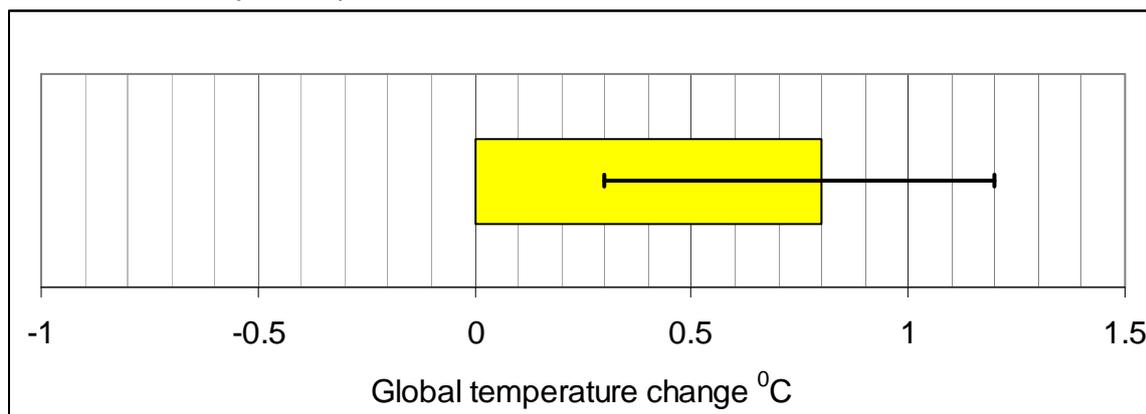


**Figure 7** Ice Core measurements at Vostok and EPICA in Antarctica. CO<sub>2</sub> measurements from air bubbles trapped in the ice. Temperatures estimated from changes in the oxygen and hydrogen isotope composition of the ice. **Temperature rises lead CO<sub>2</sub> increases by several hundred years.** **Top:** - End of the ice age 130,000 years before the present. Temperature increases by 6°C. Note that temperature and CO<sub>2</sub> do not follow the same track after the end of the ice age. Temperature is likely to vary more with local conditions than CO<sub>2</sub>. CO<sub>2</sub> levels come from a general sampling of the atmosphere. (Vostok measurements) **Bottom:** - End of the last ice age around 15,000 years before the present. Temperature increases by 8.5°C. (EPICA measurements)

## GLOBAL MEAN RADIATIVE FORCING

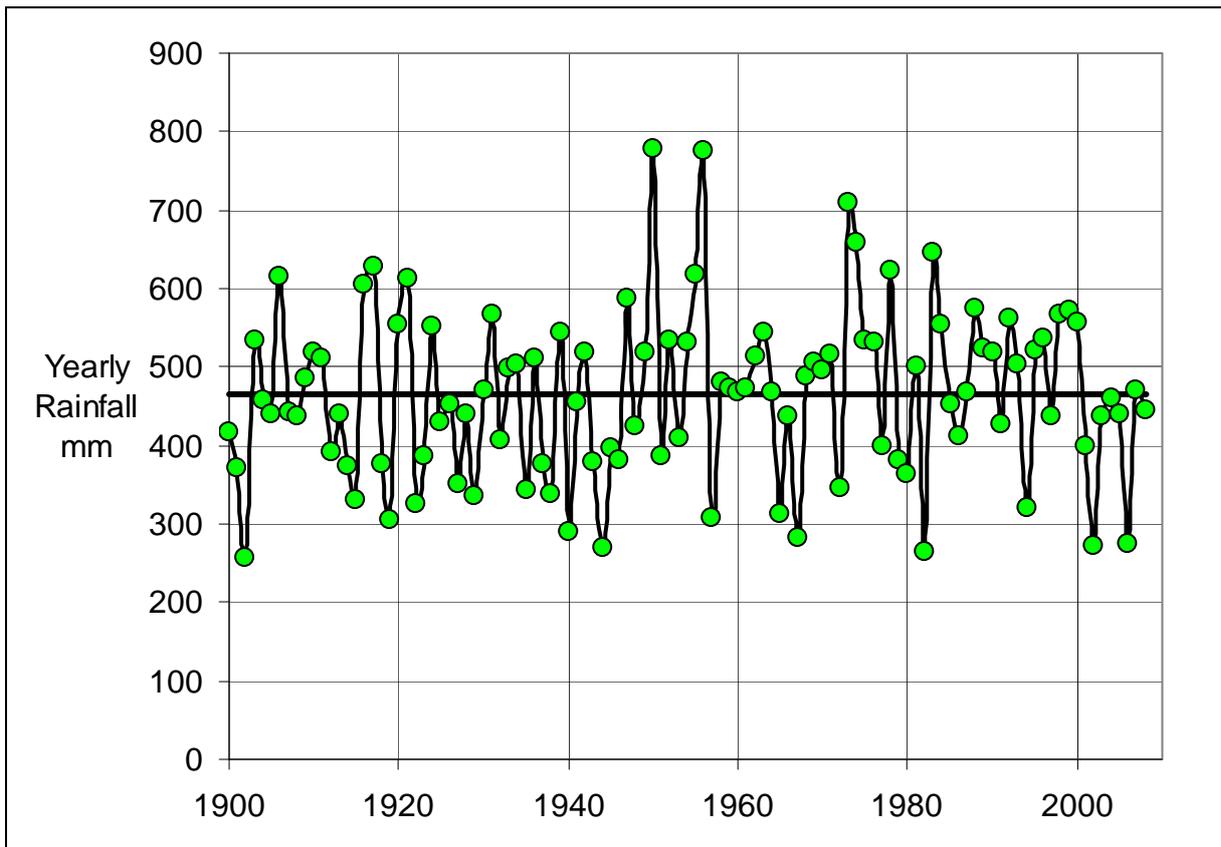


**Figure 8:** Radiative forcings from various anthropogenic sources. This is the IPCC summary of the contributions from components of the atmosphere “the global average net effect of human activities since 1750 has been one of warming, with a radiative forcing of +1.6 [+0.6 to +2.4] W m<sup>-2</sup> (see Figure SPM.2)”. [IPCC-AR4 2007 WG1 Fig SPM.2]. Note the large uncertainties for aerosol and albedo forcing, exceeding the values of greenhouse gas forcing. Some components have over 100% uncertainty and are most likely from expert opinion rather than measurements of uncertainty.

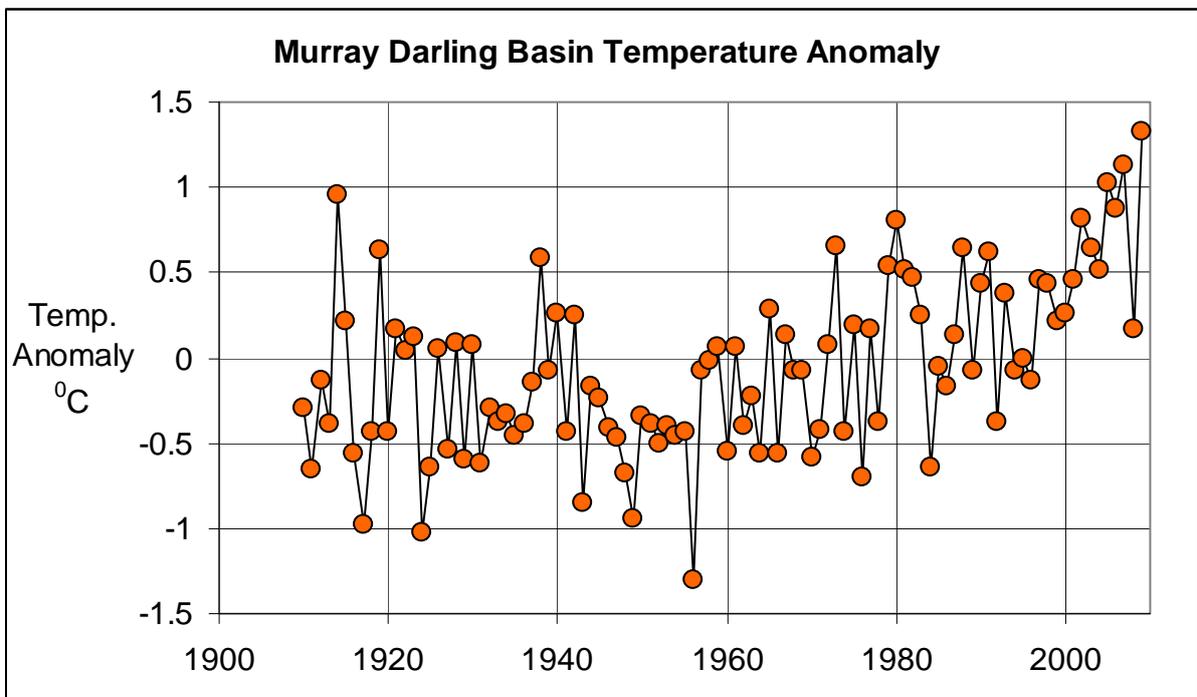


**Figure 9:** IPCC inferred temperature increase of 0.8°C since 1750. The temperature increase is the result of the 1.6 Watts per square metre estimated warming. Note the error bars that reflect the uncertainty in the temperature estimate are the compounded uncertainties of the radiation forcing where some components have over 100% uncertainty and are most likely from expert opinion rather than measurements of uncertainty.

## MURRAY-DARLING BASIN YEARLY RAINFALL 1900 TO 2008



**Figure 10:** Yearly rainfall in the Murray-Darling Basin. Mean value of 465 mm (solid line) and median 468 mm. There is no significant trend in rainfall through this period but with large variability- standard deviation of 106 mm with rainfall extremes of a minimum 257 mm and a maximum of 777 mm. It is therefore difficult to relate this to any temperature changes as shown in Figure 11.



**Figure 11-** Murray Darling Basin temperature anomaly estimated by the Bureau of Meteorology. As in Figure 1 the break to increasing temperatures starts at the time of the Great Pacific Climate Shift of 1976.

## **Extract from the Garnaut Climate Change Review Interim Report February 2008**

The Australian climate has changed notably over the past 50 years. **There is no evidence for this- see below**

Annual mean temperature in Australia has increased by up to 0.7°C since 1950. According to the IPCC, there is a greater than 90 per cent probability that the warming observed since the 1950s is due to human activities (IPCC, 2007c).

**The assignment of a probability has been made from a set of measurements and estimates that in part depend on expert opinion. That does not lend itself to an analysis of probability. A simple alternative explanation for Australia is most, that is 0.6°C, of the temperature increase occurred at the time of the Great Pacific Climate Shift in 1976.**

There has been a striking change in precipitation trends in Australia since the 1950s.

**There has been an average increase of 40 +/-14 mm in rainfall since 1950 with 470 mm average annual rainfall.**

**There is no statistically significant difference in the trend for rainfall over Australia for fifty years before and after 1950. The difference in trend is 11 +/- 9 mm per decade. So the claimed change must refer to a redistribution of rainfall within Australia.**

North-west Australia has seen an increase in annual rainfall of more than 30mm per decade, while decreases along parts of the east coast have exceeded 50mm.

**Two intense periods of activity in 1974-1976 and 1999-2001 have skewed the northern region rainfall record, With these years excluded there is an average increase of 29+/-17 mm and the trend in rainfall has increased by 16 +/-11 mm per decade with annual rainfall of 500mm. For eastern Australia the difference is 21+/-20 mm and the trend difference has been an 18 +/-12 mm per decade decline from before to after 1950, hardly a striking change with annual rainfall of 600 mm. The Murray-Darling Basin shows no statistically significant change over this time with an average increase of 30+/-20 mm and a trend difference of -9 +/-13 mm per decade on annual rainfall of 460 mm.**

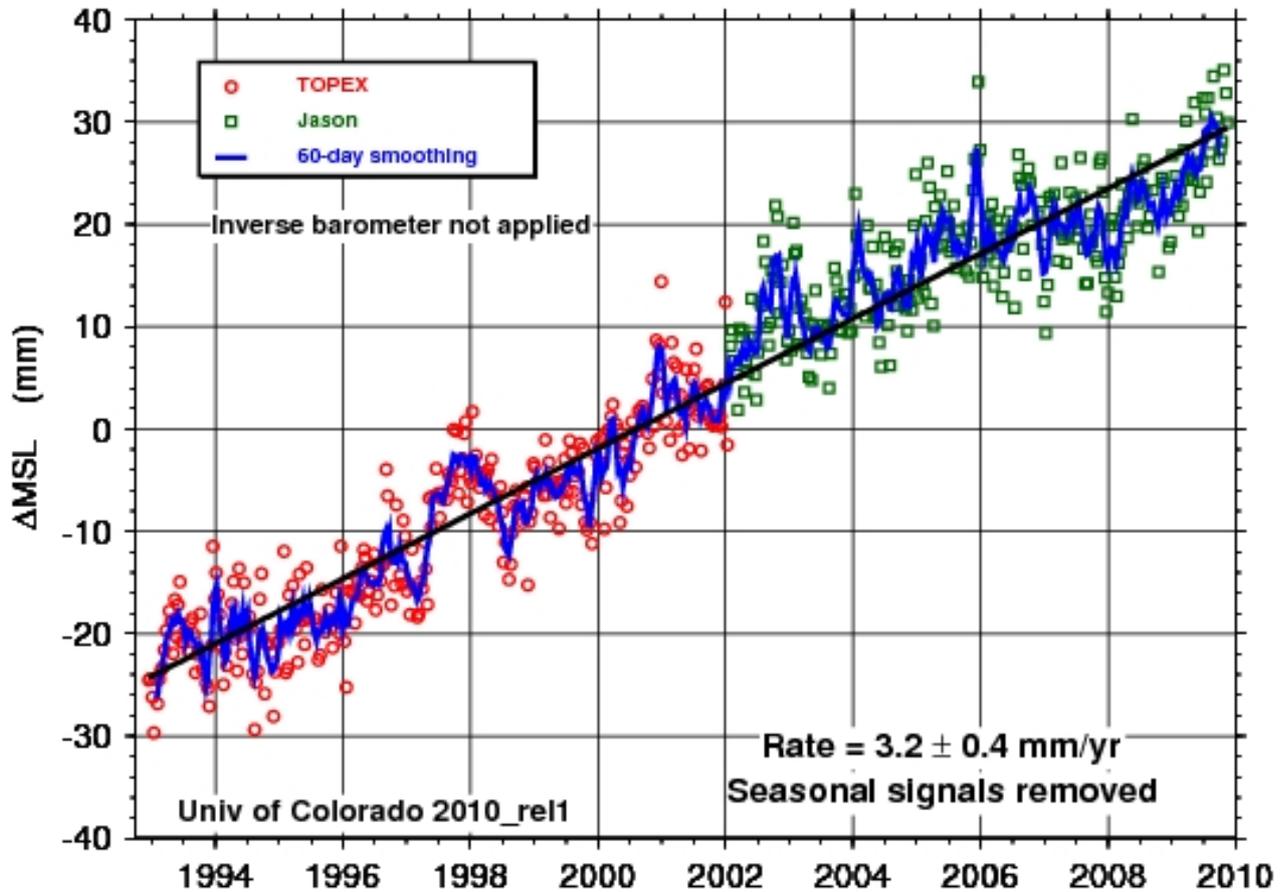
While it is not yet possible to attribute all the rainfall changes to anthropogenic climate change, some of the changes are likely to be at least partly due to increases in greenhouse gases (CSIRO and BOM, 2007).

**It is also possible that firstly there have been no significant changes in rainfall and second that the temperature increase is a symptom of ocean temperature changes.**

### **References**

- 1 Quirk, Tom, (2009) The Australian temperature anomaly, 1910 – 2000, Energy & Environment 20, pp 97-100
- 2 Time series on the Bureau of Meteorology website:  
<http://www.bom.gov.au/cgi-bin/climate/change/timeseries.cgi>

## GLOBAL SEA LEVEL CHANGES

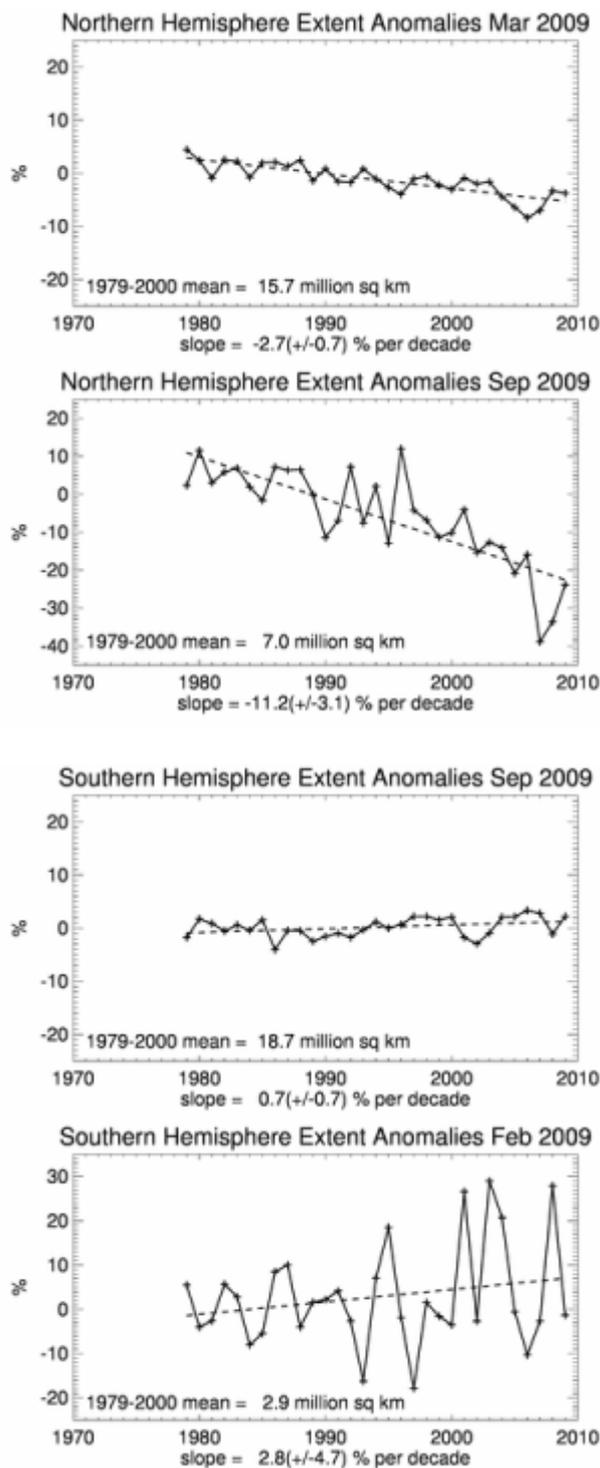


**Figure 12** The global mean sea level graph was made using satellite altimetry and processed by the University of Colorado at Boulder. Note that the rate of increase is  $3.2 \pm 0.4$  mm/year for 1992 to 2009 but falls to  $2.3 \pm 0.3$  mm/year for 2002-2009. These values are compatible with IPCC predictions to 2100 of 18-59cms in 2007 report.

Long-term mean sea level change is a variable of considerable interest in the studies of [global climate change](#). The measurement of long-term changes in global mean sea level can provide an important corroboration of predictions by climate models of global warming. Long term sea level variations are primarily determined with two different methods. Over the last century, global sea level change has typically been estimated from [tide gauge](#) measurements by long-term averaging. Alternatively, [satellite altimeter](#) measurements can be combined with precisely known spacecraft orbits to provide an improved measurement of global sea level change.

Since August 1992 the satellite altimeters have been measuring sea level on a global basis with unprecedented accuracy. The TOPEX/POSEIDON (T/P) satellite mission provided observations of sea level change from 1992 until 2005. Jason-1, launched in late 2001 as the successor to T/P, continues this record by providing an estimate of global mean sea level every 10 days with an uncertainty of 3-4 mm. The latest [mean sea level time series](#) and [maps of regional sea level change](#) can be found on this site. Concurrent [tide gauge calibrations](#) are used to estimate altimeter drift. Sea level measurements for specific locations can be obtained from our [Interactive Wizard](#). Details on how these results are computed can be found in the [documentation](#) and the [bibliography](#). Please [contact](#) for further information

## CHANGES IN SOUTHERN AND NORTHERN ICECAPS



**Figure 13** Arctic and Antarctica ice extent. The maximum extent occurs in March in the Northern Hemisphere and in September in the Southern Hemisphere; summer minima occur in September and February. The Northern Hemisphere ice extent is decreasing with reducing maximum and minimum extent. Note that the slopes for the fitted straight lines give the change per decade.

Data from National Snow and Ice Data Center: [http://nsidc.org/data/seaice\\_index/](http://nsidc.org/data/seaice_index/)