

# **IS THE HYPOTHESIS OF ANTHROPOGENIC CLIMATE CHANGE CORRECT? A PERSONAL VIEW.**

**D C Edmeades**

*AgKnowledge Ltd, PO Box 9147, Hamilton, 3240, New Zealand  
Agricultural Spokesman for the New Zealand Climate Science Coalition.*

## **INTRODUCTION**

Climate change, or more specifically anthropogenic global warming (AGW), is arguably the major contemporary scientific issue confronting society. It is based on the hypothesis that increasing concentrations of greenhouse gases (GHG) in the atmosphere, and specifically carbon dioxide, as a result of man's activities, increase global temperature. Based on this hypothesis the New Zealand government has developed a policy to mitigate GHG emissions by essentially imposing a cost on GHG emissions, called the Emissions Trading Scheme (ETS). This legislation is due to come into force in July 2010. New Zealand's ETS is unique among the OECD countries because it includes agriculture and it is for this reason that there is considerable research in progress in New Zealand to develop technologies and management practices to reduce GHG emissions from agriculture.

It appears that many agricultural scientists accept the hypothesis of AGW without consideration of its scientific validity, excusing themselves on the reasonable grounds that they are not specialist in this field and therefore must defer to those who are. The so called "consensus" that "the science is settled" prevails.

Climate science is very complex and covers many disciplines, from basic physics and chemistry through to geology, oceanography and meteorology. It is doubtful that there is any one person who has a complete grasp of all the detail across so many disciplines. This means that it is very difficult for those who are not "climate scientists" to come to their own conclusion about the veracity of the AGW hypothesis.

An alternative and simpler approach to the question of AGW is to apply the normal scientific process of proposing a hypothesis and testing it against the evidence. In this case the hypothesis is: do increasing concentrations of GHGs, and in particular carbon dioxide, from human activities, results in an increase in global temperatures. The question then becomes: what is the evidence to accept or reject this hypothesis? This is the approach adopted in this paper and six reasons are advanced which collectively lead to rejecting the AGW hypothesis. These reasons are not developed from a personal knowledge of the primary scientific literature, but arise mainly from material available in reviews on this topic. Also this is a personal view point in the sense that others, adopting the same approach, may choose other reasons or place different priorities and/or emphasis on the various reasons offered.

## REASON ONE: Relative Importance of GHGs.

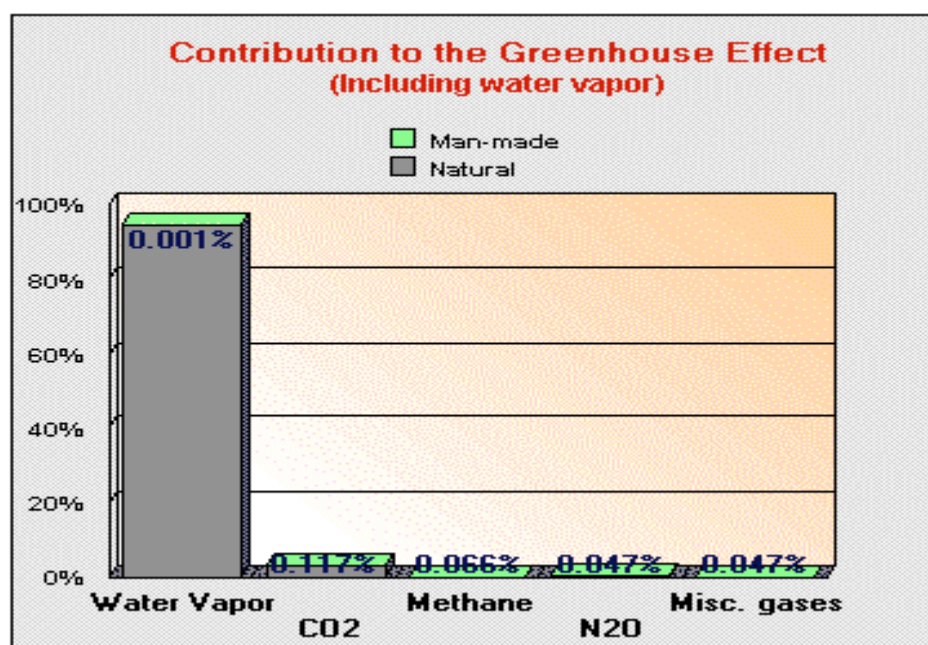
The relative importance of the major GHGs is shown in Figure 1. Others have reported slightly different numbers, but the fact remains that water, as in water vapour and clouds, is by far the most important GHG, in terms of its effect on global temperature. Despite its importance the effects of atmospheric water on global temperature is not well understood. Of the 8 factors (“forcings” to use the climate science terminology) listed by the Intergovernmental Panel on Climate Change (IPCC) which affect global temperature, atmospheric water has the highest degree of uncertainty (Singer 2008). Indeed it is not clear whether water has a positive or negative effect on global warming (see <http://www.appinsy.com/Water.Vapor.htm>).

The IPCC believe that atmospheric water has a positive effect on global temperatures. Thus, it is argued that as global temperatures increase due to an increase in carbon dioxide concentration, this in turn will increase the amount of atmospheric water and hence exacerbate the warming. This logic gives rise to the notion of reaching a “tipping point” or “runaway warming” The fact that “runaway warming” has never occurred in the geological past (see Figure 3, 4 and 6) does not support this notion and is, indeed, evidence to suggest that atmospheric water has a net cooling effect. This is possibly one of the reasons why the IPCC “predictions” of global warming are inconsistent with the empirical observations (see Reason 6).

The other seemingly innocuous question which arises from the relative importance of atmospheric water is this: why are the mitigation options for minimising global warming, such as the ETS, focussed on carbon dioxide and methane when the major factor affecting global warming is water?

The points made above are not in themselves fatal to the AGW hypothesis but they do lead to some awkward questions about the purpose and effects of the ETS.

Figure 1: The relative importance of the major green house gases (GHG)  
([http://www.geocraft.com/WVFossils/greenhouse\\_data.html](http://www.geocraft.com/WVFossils/greenhouse_data.html))



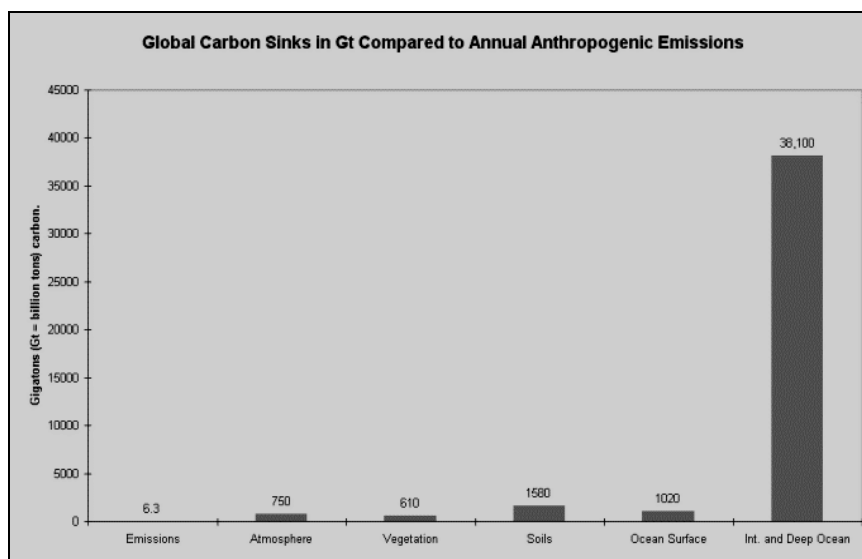
## REASON TWO: Relative Size of Carbon Dioxide Sinks and Sources.

The relative size of the major sources and sinks of atmospheric carbon dioxide are shown in Figure 2. Once again the question must be posed: if governments are determined to control carbon dioxide concentration in the atmosphere, then surely these other much larger sinks, the land and the oceans, must be considered. Putting it differently, if there is an equilibrium between all these sinks then surely the land and the oceans have a very large capacity to mitigate man's proportionately small emissions of carbon dioxide? Once again this is not fatal to the hypothesis of AGW but questions the policy options being adopted to minimise global warming assuming the carbon dioxide is the cause.

There is also another obvious point to make about carbon dioxide. It is a colourless, odourless gas which is essential to all life on the planet. Indeed, if you were arguing the case to increase the world's food production, enhancing the carbon dioxide concentration in the atmosphere would be a good strategy. It is estimated that doubling in the atmospheric carbon dioxide concentration, as is projected by IPCC, would increase plant production by about 30% (Bast and Bast 2009).

In this same context it is worth noting that the IPCC projections based on the climate models (see Reason 6 later) is that the global temperature will increase by 2-4 °C by 2100 due to an increase on carbon dioxide. In an agricultural setting this increase in temperature is similar to the difference in average temperature of the regions Waikato and Southland. They are equally productive agricultural regions. This general point is well made by Lawson (2009) who goes on to argue that if the AGW hypothesis is true then the best policy is not mitigation but adaptation, something that all forms of life achieve with excellence.

Figure 2: The relative size of the main sinks and sources of carbon dioxide (<http://www.warwickhughes.com/climate/green.htm>)



### REASON THREE: Climate Has Always Changed.

The third reason to be sceptical about the AGW hypothesis, now frequently referred to as climate change, is that the climate on earth has always changed, both in the positive and negative sense (Carter, 2008; Plimer, 2009). Prior to the mid 19<sup>th</sup> century direct measurements of temperature were not possible hence the historical temperature record must be inferred using proxy measurements, noting that in case, the expansion of alcohol or mercury as used in standard thermometers is also a proxy for temperature.

Figure 3. Changes in the global temperatures over the last 500m years as determined using oxygen isotopes as the proxy for temperature (from [http://www.globalwarmingart/wiki/Temperature\\_Gallery](http://www.globalwarmingart/wiki/Temperature_Gallery)).

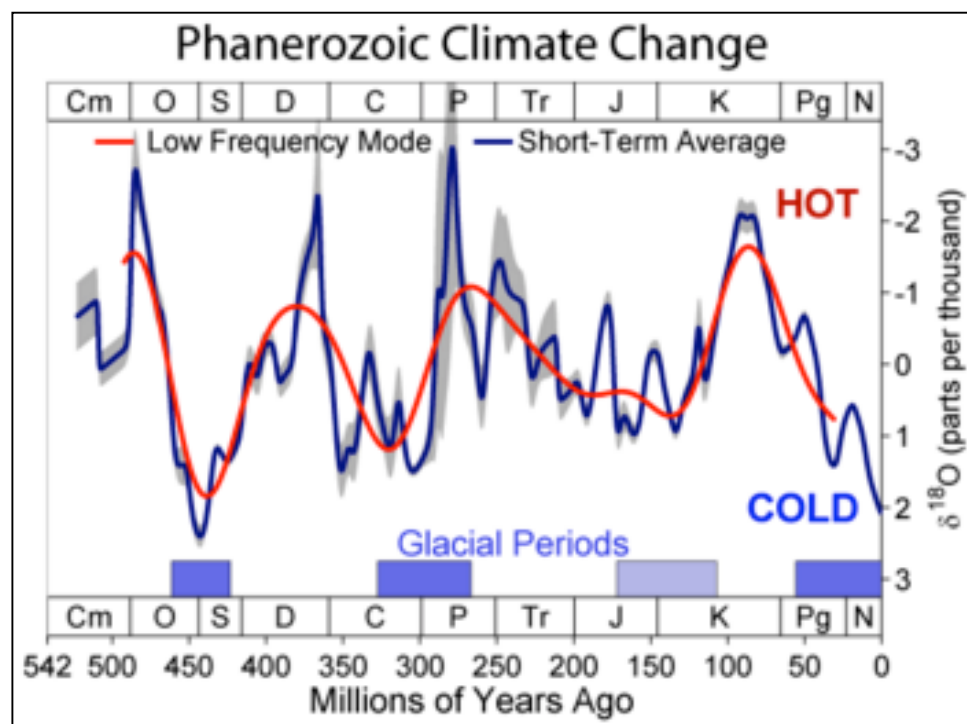
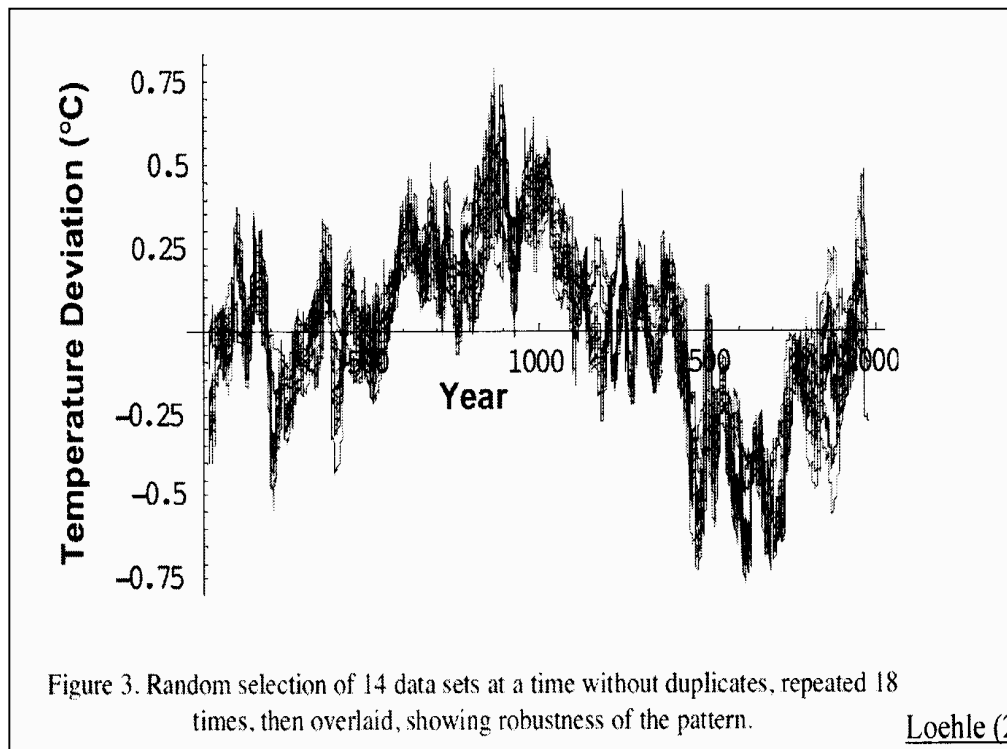


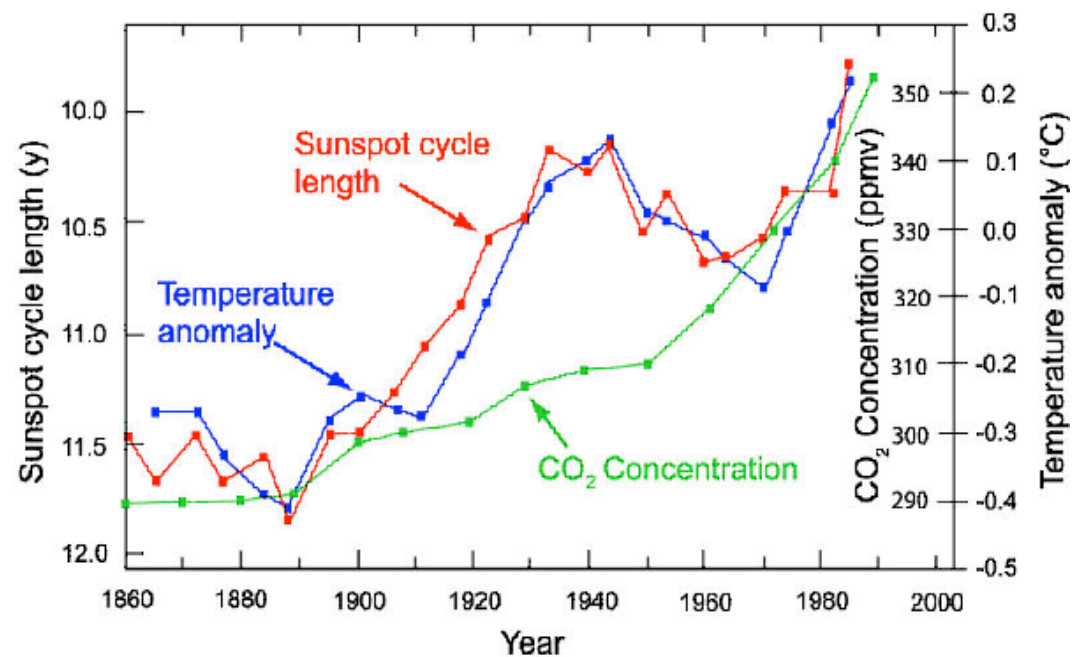
Figure 3 shows the changes in global temperature on a large geological scale (500M years) and Figure 4 shows the temperature record in more recent times (2000 yrs), derived from a range of different proxies not including tree-ring data.

Figure 4: Changes in global temperatures over the last 2000 year showing the Medieval Warming Period and the Little Ice Age (Loehle 2007).



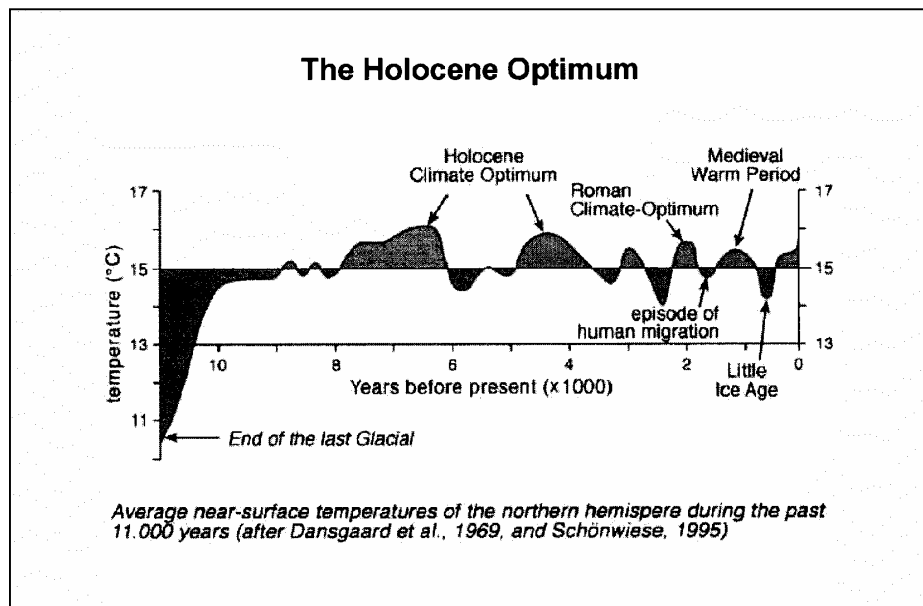
There are two points to be made about this paleoclimate evidence. These fluctuations in global temperature occurred well before man evolved on earth and certainly well before man's discovery and use of fossil fuels. Also, these historical changes are large, relative to the global warming predicted by the IPCC of between 2-4 °C by 2100 (see discussion of this point by Lawson 2009). These facts alone do not disprove the AGW hypothesis, but they strongly suggest that there is another mechanism (or mechanisms) that controls the global temperature, which is more important than GHGs. One plausible candidate is the activity of the sun (Figure 5 and Svensmark and Calder 2008). McLean et. al. (2009) suggest that temperatures could be linked to the El Nino-Southern Oscillation.

Figure 5. Relationship between temperature anomaly, carbon dioxide concentration and sunspot cycle length in the northern hemisphere. (<http://www.tcsdaily.com/article.aspx?id=010405>)



Importantly, the paleoclimate record is corroborated by independent historical evidence. Figure 6 depicts the global temperatures since the last glaciation (about 10,000 years ago), covering the historical period when mankind evolved from hunter-gatherers by developing agriculture and in time, civilisations. During this period there have been times when the earth has been warmer than the present (e.g. the Holocene, Roman and Medieval periods) and it is known for the historical record that these were times of greater prosperity, more food and better health (Plimer 2009). As both Plimer (2009) and Lawson (2009) have noted a planet warmer than today is not something to be feared.

Figure 6. Changes in Northern Hemisphere near-surface temperature since the last glacial showing three periods when the temperature was warmer than the present: Holocene, Roman and Medieval warm periods.



#### REASON FOUR: Recent Global History Predictable

Ockham's Razor (see discussion in Magee, 1998) still has merit. Ockham reasoned that if there was more than one explanation for a given phenomenon then the simplest one, consistent with the facts, is likely to be closer to the truth. Applying this to global warming it has been noted (Figure 6) that the earth has been emerging, since about 1850, from the "Little Ice Age." It is understandable that, as the planet has warmed, ice has melted, glaciers have shrunk (Figure 7) and the sea level has risen (Figure 8), at least at the global level, noting that these phenomena can vary at a regional level.

Importantly, as shown in Figures 7 and 8, the rate of change of glacier shrinkage and sea level rise does not appear to alter post 1940 despite large increases in the use of fossil fuels. In other words the recent (150 years) global history is entirely predictable, based on the paleoclimate record without the need to invoke the AGW hypothesis. Indeed the lack of change in the rates of glacial shrinkage and sea level rise over the last half of 20<sup>th</sup> century appears to contradict the AGW hypothesis.

Figure 7. Changes in normalised glacier length over time in relationship to fossil fuel use (Robinson et. al. 2007)

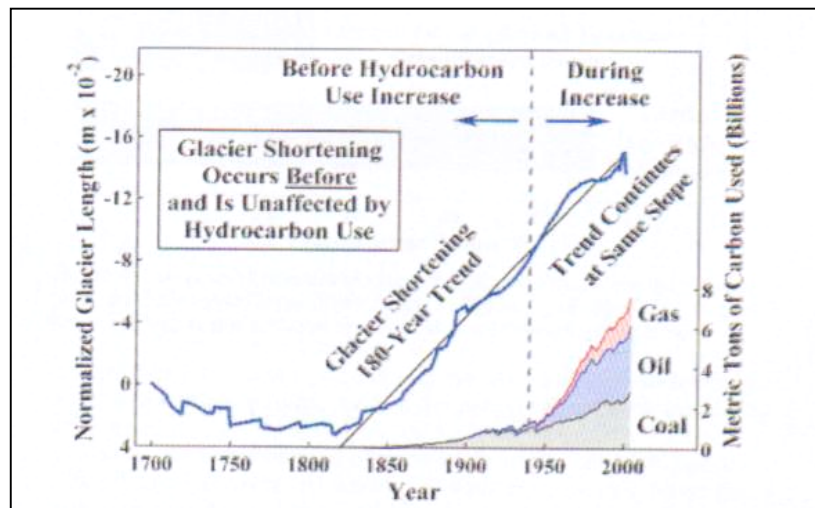
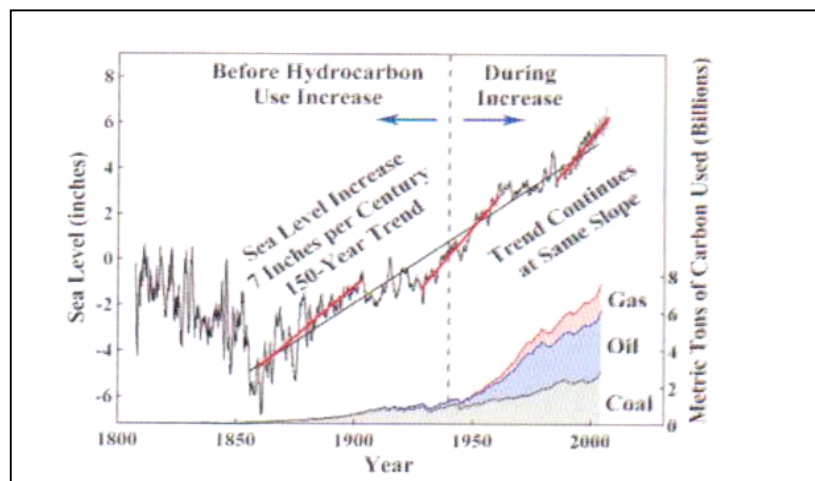


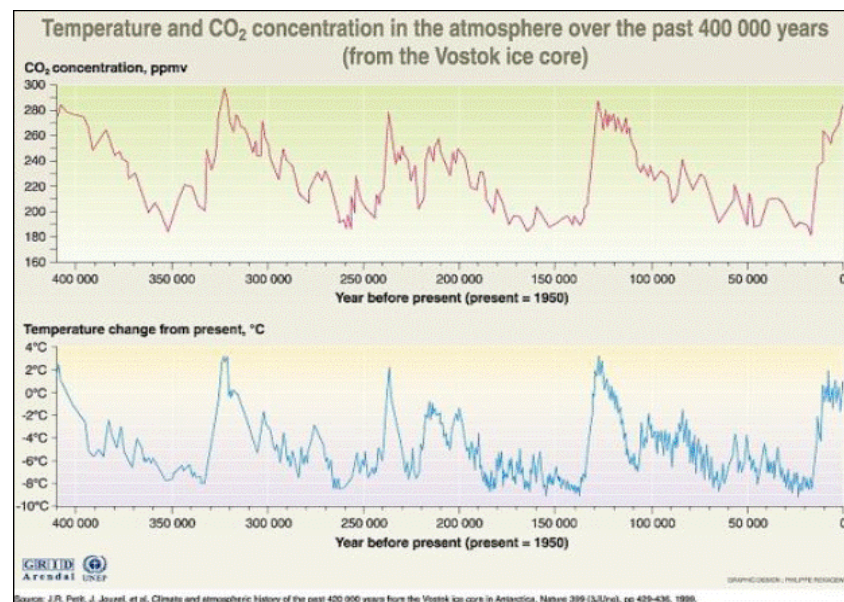
Figure 8. Changes in sea level over time in relationship to fossil fuel use (Robinson et. al. 2007)



## REASON FIVE: Cause and Effect

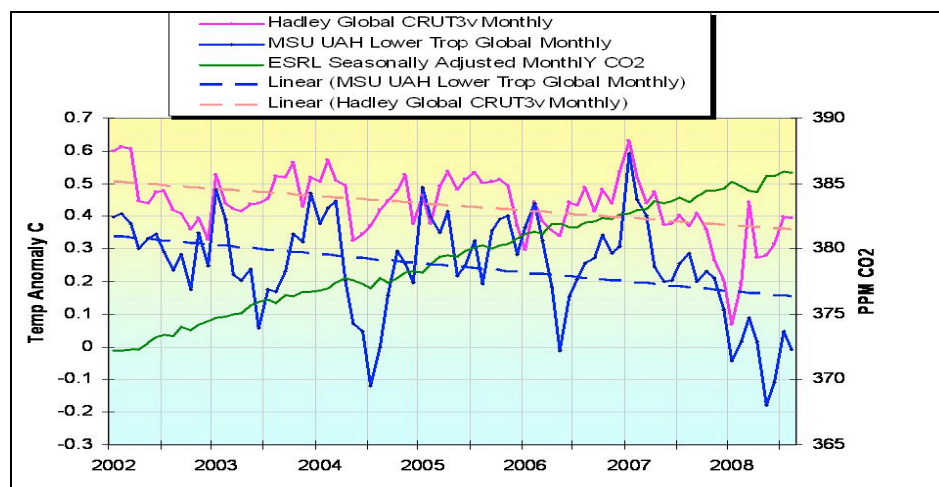
Another important scientific principle is that of cause and effect: things do not happen by chance – if there is an effect there is a cause. If the hypothesis of AGW is true it requires that the atmospheric carbon dioxide concentration must determine (drive) global temperature. It has now been shown that this is not the case. Ice core studies (Figure 9) indicate that carbon dioxide concentrations and temperature are correlated but this of course does not establish cause and effect. Detailed analysis of this data shows that the changes in carbon dioxide concentrations follow the temperature changes by about 700-800 years. ([www.appinsys.com/globalwarming/GW\\_Part1\\_PrehistoricalRecord\\_files/imag](http://www.appinsys.com/globalwarming/GW_Part1_PrehistoricalRecord_files/imag)). a point accepted by the IPCC. This is consistent with the land and ocean emitting carbon dioxide as they warm and establishing a new ‘equilibrium’.

Figure 9. Temperature and carbon dioxide concentration in the atmosphere over Antarctica.  
([www.appinsys.com/globalwarming/GW\\_Part1\\_PrehistoricalRecord\\_files/imag](http://www.appinsys.com/globalwarming/GW_Part1_PrehistoricalRecord_files/imag))



This lack of cause and effect is more obviously seen in recent data (Figure 10) which shows that the global temperatures appear to be declining in the last decade despite an increase in carbon dioxide concentration. This evidence is fatal to the AGW hypothesis.

Figure 10. Estimated global lower troposphere (bottom line) ground surface (top line) temperature records over the last 6 years in relation to monthly carbon dioxide concentrations.  
(<http://www.appinsys.com/globalwarming/>)



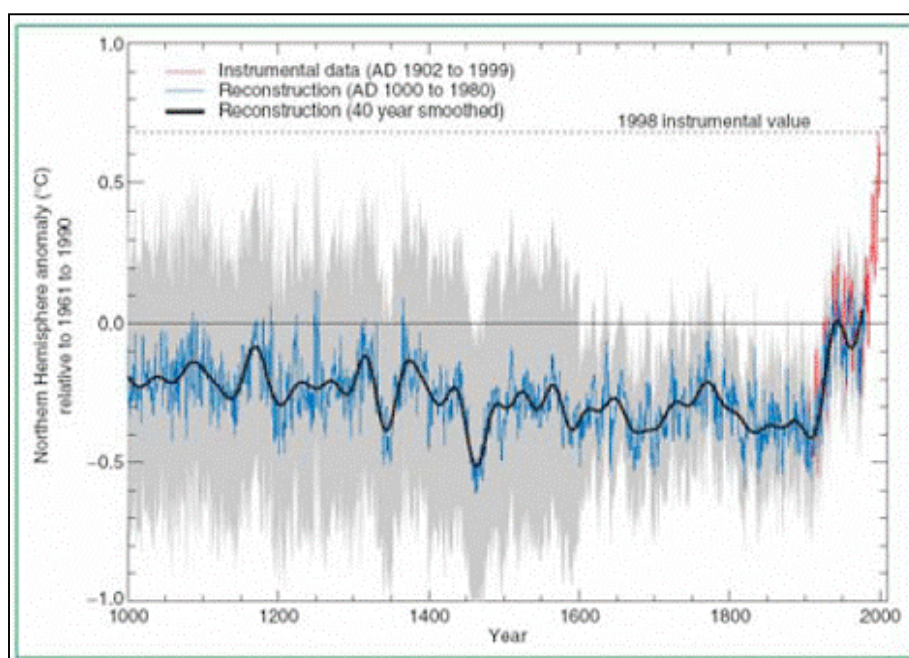
Some argue that this recent period of apparent cooling could be followed by another period of warming - that may be the case - but equally it can be argued that the period of warming since about 1850, post the Little Ice Age, is at an end and that future temperatures could be lower than in the first decade of the 21<sup>st</sup> century. It is in this

context that recent statements made in support of AGW such as: the last decade is the warmest in recorded history (e.g. since 1850) have no meaning except to create alarm.

## REASON SIX: IPCC Credibility

My sixth reason for scepticism derives from the credibility of the IPCC and the science upon which it relies. The IPCC report of 2001 claimed that the warming in the late 20<sup>th</sup> century was unprecedented and that it was most likely to be due to anthropogenic GHGs. Central to this conclusion was the infamous ‘hockey stick’ graph published by Mann et al (see for example [http://www.appinsys.com/globalwarming/GW\\_Part1\\_PrehistoricalRecord.htm](http://www.appinsys.com/globalwarming/GW_Part1_PrehistoricalRecord.htm)) They used tree rings as the proxy for temperature and reported that the global temperature changed very little over the past 2000 years but increased markedly in the late 20<sup>th</sup> century (Figure 12). This graph has been exposed as a mathematical fabrication, (see <http://www.climateaudit.org/multiproxy-pdf>). More obviously, this graph contradicts the existence of the Medieval Warm Period and the Little Ice Age for which there is ample global evidence (Plimer 2009).

Figure 12. The Mann et. Al. “Hockey Stick” graph derived from tree-ring proxies (from Singer 2008).



This graph was removed from the 2007, IPCC report and replaced by another series of graphs which are equally dubious (see: <http://www.climateaudit.org/multiproxy-pdf> and <http://www.climateaudit.info/mcintyre.scitech.pdf> and [http://www.appinsys.com/globalwarming/GW\\_Part1\\_PrehistoricalRecord.htm](http://www.appinsys.com/globalwarming/GW_Part1_PrehistoricalRecord.htm)). Surprisingly these machinations have had little impact on the IPCC's commitment to the AGW hypothesis.

Based on climate models developed by several teams around the world, the IPCC have made projections of the likely global temperatures in 2100 for a set of global population and economic scenarios. They predict that the average global temperature will increase by between 2-4°C, depending on which scenario is chosen. Lawson (2009) provides an interesting perspective on the validity of these scenarios, but leaving that aside, these temperature projections are inconsistent with the empirical data (Figure 12). Under normal circumstances such models would be either modified or discarded. In their defence, the IPCC states that they only make projections, not predictions, but faced with the obvious conclusion from Figure 11, such semantics appear worthless.

Figure12. Projected and observed global temperatures (<http://www.scienceandpublicpolicy.com>)



Much has been made by the IPCC that there is a “consensus” and that the “science is settled”. This would appear to be borne out by the numbers that the IPCC produce; they say that their reports are the work of many scientists and claim that 4000 scientists support the AGW hypothesis. An analysis of this claim (McLean 2009) reveals that only about 60 scientists contributing to IPCC’s AR 4 in 2007, explicitly support the AGW hypothesis. In contrast (Table 1) hundreds of scientists have signed petitions explicitly rejecting AGW. Monckton (2007) also discusses the fallacy of the AGW consensus.

---

Table 1: List of petitions and letters including people who disagree with the AGW hypothesis.

---

31,478 US scientists including 9000 PhDs

<http://www.petitionproject.org/>

Manhattan Declaration - now over 1100 endorsers

[http://www.climatescienceinternational.org/index.php?option=com\\_content&task=view&id=37&Itemid=54](http://www.climatescienceinternational.org/index.php?option=com_content&task=view&id=37&Itemid=54)

Letter signed by 103 scientists to UN Secretary-General

<http://www.nationalpost.com/news/story.html?id=164002>

Over 650 scientists dissent from AGW consensus

<http://epw.senate.gov/public/index.cfm?FuseAction=Minority.SenateReport>

60 German dissenters

<http://www.climatedepot.com/a/2282/Consensus-Takes-Another-Hit-More-than-60-German-Scientists-Dissent-Over-Global-Warming-Claims-Call-Climate-Fears-Pseudo-Religion-Urge-Chancellor-to-reconsider-views>

---

Finally the IPCC have attempted to give their reports and conclusions credibility by claiming that they have only relied on peer reviewed papers in the scientific literature. This appears not to be the case, with recent revelations that some of the IPCC claims were based on anecdotal evidence (<http://www.telegraph.co.uk/earth/environment/climatechange/7177230/New-eros-in>). Such is the concern that IPCC has announced an independent review of their procedures and processes.

## CONCLUSION

The complex issue of climate change can be approached as an exercise in hypothesis testing with  $H_0$  being; Do increasing concentrations of GHG, and in particular carbon dioxide, from man's activities, result in an increase in global temperatures? It is concluded that this hypothesis can be rejected solely on the evidence that global temperatures are not determined by atmospheric carbon dioxide concentrations. In addition the paleoclimate record is consistent with this conclusion; changes in global temperature both positive and negative have occurred long before the advent of man and the use of carbon-based energy. The changes in global temperature, sea levels and glacier shrinkage, since the mid 19<sup>th</sup> century, can be explained without invoking the hypothesis of AGW.

The other reasons discussed in this paper are not fatal to the hypothesis of AGW but arise because the hypothesis of AGW is incorrect. They provide collateral support to reject the AGW hypothesis.

It is concluded therefore that the hypothesis of man-induced global warming should be treated with scepticism. This conclusion will be reviewed as further evidence is forthcoming.

## References

Bast, Joseph, L. and Bast, Diane Carol. [Eds]. Climate Change Reconsidered. Report of the Nongovernmental International Panel on Climate Change (NIPCC). Chicago, IL. The Heartland Institute, 2009.

Carter, Robert M. 2008. Knock, Knock: Where is the Evidence for Dangerous Human-Caused global Warming? Economic Analysis and Policy 38, No 2, September 2008.

Dansgaard, W., Johnsen, S.j., Moller, J., 1969. One thousand centuries of climate record from Camp Century on the Greenland Ice Sheet. Science 166: 377-381.

Lawson, N. 2009. An Appeal to Reason: A Cool Look at Global Warming. Duckworth Overlook, London.

Loehle, C 2007. A 2000 Year Global Temperature Reconstruction on Non-Treering Proxy Data. Energy and Environment 18: 1049-1058.

Magee, B. 1998. The Story of Philosophy. Dorling Kindersley, London.

McLean, John. 2009. The IPCC can't count its "expert scientists": - Author and reviewer numbers are wrong. [http://www.mclean.ch/climate/docs/IPCC\\_numbers.pdf](http://www.mclean.ch/climate/docs/IPCC_numbers.pdf)

McLean, J., de Freitas, C.R., Carter, R.M. 2009. Influence of the Southern Oscillation on tropospheric temperature. Journal of Geophysical Research 114, D14104, doi:10.1029/2008JD011637.

Monckton. 2007. <http://www.scienceandpublicpolicy.org/images/stories/papers/monkton/consensus.pdf>

Plimer, I. Heaven and Earth, Global Warming; The Missing Science. Taylor Trade Publishing, Victoria Australia, 2009.

Robinson, Arthur. B., Robinson, Noah. E., and Soon, Willie. 2007. Environmental Effects of Increased Atmospheric Carbon Dioxide. Journal of American Physicians and Surgeons. 12, 79-90.

Schonwiese, C., 1995. Klimaänderungen: Daten, Analysen, Prognosen. Springer, Heidelberg

Singer, S. Fred. [Ed.]. Nature, Not Human Activity, Rules Climate Change. Summary for Policy Makers of the Report of the Nongovernmental International Panel on Climate Change, Chicago, IL: The Heartland Institute, 2008.

Svensmark, Hendrik and Calder, Nigel. The Chilling Stars, A Cosmic View of Climate Change. Icon Books Ltd, Britain. 2008.