THE
GLOBAL
WARMING
SCAM

BY

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APRIL 2008
(Revised October 2008)

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ABSTRACT

The Global Warming Scam has been perpetrated in order to support the Environmentalist belief that the earth is being harmed by the emission of greenhouse gases from the combustion of fossil fuels.

The Intergovernmental Panel on Climate Change (IPCC) was set up to provide evidence for this belief. They have published four major Reports which are widely considered to have proved it to be true. This paper examines the evidence in detail and shows that none of the evidence presented confirms a relationship between emissions of greenhouse gases and any harmful effect on the climate. It is the result of 18 years of scrutiny and comment on IPCC Reports and of a study of the scientific literature associated with it.

In order to establish a relationship between human emissions of greenhouse gases and any influence on the climate, it is necessary to solve three problems

- To determine the average temperature of the earth and show that it is increasing

- To measure the concentrations of greenhouse gases everywhere in the atmosphere

- To reliably predict changes in future climate

None of these problems has been solved.

It is impossible to measure the average surface temperature of the earth, yet the IPCC scientists try to claim that it is possible to measure "anomalies" of this unknown quantity. An assessment of all the temperature data available, largely ignored by the IPCC, shows no evidence for overall warming, but the existence of cyclic behaviour. Recent warming was last recorded around 1950. An absence of warming for 10 years and a current downturn suggest that the cool part of the cycle is imminent.

The chief greenhouse gas, water vapour, is irregularly distributed, with most of it over the tropics and very little over the poles. Yet the IPCC tries to pretend it is uniformly distributed, so that its "anomalies" can be treated as "feedback" to the global temperature models.

Carbon dioxide is only measured in extremely restricted circumstances in order to pretend that it is "well-mixed". No general measurements are reported and 90,000 early measurements which show great variability have been suppressed.

Methane is mostly recycled plant material, unrelated to fossil fuels, yet it is used to penalise farmers for animal recycling, when the larger emissions from wetlands are exempt.

Although weather cannot be predicted more than a week or so ahead, the claim is made that "climate" can be predicted 100 years ahead. The claim is based on the development of computer models based on the "flat earth" theory of the climate which assumes it is possible to model the climate from "balanced" average energy quantities This assumption is absurd since all the quantities have skewed distributions with no acceptable average. No resulting model has ever been tested for its ability to predict the future. This is even admitted as the model outputs are mere "projections". Since the projections are far into the future, nobody living is able to check their validity.

Since no model has been validated, they are "evaluated" based on "simulations", which are mere correlations, often obtained by adjusting the many poorly characterized parameters to give a "fudged fit". Several such attempts fail to agree with observations. Future "projections", which combine the untested models and exaggerated "scenarios",

are graded for their "likelihood" from the unsupported opinion of those paid to produce the models. A spurious "probability" attached to these opinions is without mathematical or scientific justification.

Humans affect climate by changes in urban development and land use, but there is no evidence that greenhouse gas emissions are involved, except in enhancing plant growth.

1. INTRODUCTION

1.1. THE ENVIRONMENTAL RELIGION

The global warming scam is the result of the widespread belief in a new religion, based on the deification of a nebulous entity, "The Environment".

'"The Environment" is an extension of the concept of "Nature* which was held sacred by the Romantics, but it is a much more demanding deity, requiring constant and increasing sacrifices from humans.

Environmentalism is just the latest attempt to find a substitute for the theory of evolution and it is paradoxical that it can be so widespread when next year (2009) is the 200th birthday of Charles Darwin and the 150th anniversary of the publication of his major work "The Origin of Species as the Result of Natural Selection".

All of the basic beliefs of Environmentalism are in direct conflict with contemporary understanding of the principles of Darwinism. Despite this fact, many scientists are supporters of Environmentalist dogmas and some are prepared to claim that they are compatible with Darwinism.

1.2. HUMANS ARE DESTROYING THE PLANET

The religious belief (from Genesis Chapter 1, verse 20) that humans have "dominion" over the earth is now extended so that humans take over the function of God and are responsible for all other creatures. Human influence is purely negative and destructive. The other creatures would be better off without us. We are destroying the planet. As this proposition is absurd, desperate attempts must be made to find evidence to support it.

Campaigns have been conducted against the human use of chemical pesticides ("Silent Spring"), of "Depletion" of "Resources" ("Club of Rome"), and against the "Population Bomb" (Ehrlich) and even against plastic bags and baby's bottles. The latest and most successful campaign is the claim that the earth is being dangerously warmed by human emissions of greenhouse gases. The widespread restrictions on "emissions" that have followed have led to the collapse of the world energy industry, with soaring prices of oil and electric power and deliberate promotion of world poverty by the use of agriculture to produce "biofuels" instead of food.

1.3. THE GREENHOUSE EFFECT

A greenhouse enables higher temperatures within it because it prevents release of the rising warmer air caused by solar radiation. This is quite different from the claimed "greenhouse effect"; the absorption of infra red radiation from the earth by some of the components of the earth's atmosphere, called "greenhouse gases". This absorption heats the atmosphere and causes "global warming". The whole question is, by how much, and does it matter?

The claim that human emissions of greenhouse gases are dangerously warming the earth was first made by the Swedish chemist Arrhenius (1865 and see Wikipedia 2008). The claim was criticised at the time, and as global temperatures fell for the subsequent 15 years, followed by the First World War and an economic crisis, the claim lost urgency. It was, however, revived in 1938 by Callendar who selected atmospheric carbon dioxide results to suit his theory from the many available. He suffered a similar fate to Arrhenius, since global temperatures fell for the following 38 years. During this period confident predictions were made of the coming ice age, some by the same scientists (such as Rasool and Schneider 1971) now predicting future warming.

1.4. RECENT REVIVAL

Since temperatures seemed to be rising once again, the claim that human-emitted greenhouse gases are warming the earth was taken up by the environmental movement in the late 1970s as yet another example of their belief that humans are harming the earth. In order to prove this proposition they were faced with three insoluble problems.

- It is not possible to measure the average temperature of the earth's surface. To do so would involve placing thermometers or other measuring equipment in a random and representative fashion over all parts of the surface, including the 71% that is ocean. Since this is currently impossible, it is equally impossible to find if the average temperature is increasing.

- It is not possible to measure the average greenhouse gas concentration over all parts of the earth's atmosphere by placing measuring equipment randomly throughout.

- Since weather cannot be predicted reliably more than a week or so ahead, it is impossible to provide reliable forecasts any further ahead than this.

None of these problems has been solved, but environmentalists have succeeded in persuading many people that they have provided scientifically acceptable solutions.

This paper examines the "evidence" that has been presented so far, and shows that all of it is scientifically unsound.

2. AVERAGE GLOBAL TEMPERATURE

2.1. THE MEAN GLOBAL SURFACE TEMPERATURE ANOMALY

2.1.1. HANSEN'S SOLUTION

In an address to the US Congress on June 23rd 1988 James Hansen of the Goddard Institute of Space Studies in New York suggested a solution to the global average temperature problem which made use of temperature measurements from weather stations. The history of this suggestion has been reviewed by the IPCC (Solomon et al. 2007). The world would be divided into latitude/longitude squares. The average monthly temperature would be obtained from qualifying stations in each square and compared with the average for a reference period. The difference would be a monthly, and then annual temperature anomaly, which appeared from his calculations to be increasing. The increase was very small (less than one degree Celsius per century), was intermittent, highly irregular, largely took place at night and mainly happened before significant increases in greenhouse gas emissions had taken place, but it was considered enough to assist the environmentalist campaign to blame the increase on carbon dioxide emissions.

Hansen, (2008a) has, however, clearly expressed his doubts on the reliability of such weather-station temperature measurements, as follows:

"GISS Surface Temperature Analysis

The Elusive Absolute Surface Air Temperature   (SAT)

Q. What exactly do you mean by SAT?

A. I doubt that there is a general agreement how to answer this question. Even at the same location, the temperature near the ground may be very different from the temperature 5 ft above the ground and different again from 10ft or 50ft above the ground. Particularly in the presence of vegetation (say in a rain forest) the temperature above the vegetation may be very different from the temperature below the top of the vegetation. A reasonable suggestion might be to use the average temperature of the first 50ft of air either above ground or on top of the vegetation. To measure SAT we have to agree on what it is and, as far as I know, no such standard has been adopted. I cannot imagine that a weather station would build a 50ft stack of thermometers to be able to find the true SAT at its location.

Q. What do we mean by daily SAT?

A. Again, there is no universally accepted correct answer. Should we note the temperature every 6 hours and report the mean, should we do it every two hours, hourly, have a machine record it every second, or simply take the average of the highest and lowest temperature of the day? On some days the various methods may lead to drastically different results.

Q. What SAT do the local media report?

A. The media report the reading of one particular thermometer of a nearby weather station. This temperature may be very different from the true SAT even at that location and has certainly nothing to do with the true regional SAT. To measure the true regional SAT we would have to use many 50ft stacks of thermometers distributed evenly over the whole region, an obvious practical impossibility."

Having stated that there is no agreed way to measure the surface air temperature, he talks about the "true" value which nobody agrees to; Essex et al (2007) argue that "there is no physically meaningful global temperature". There are theoretical reasons why the average temperature of the earth's surface cannot be measured. Because of the fact that the sun does not shine for half the time, its variability is non linear. It is impossible to simulate it with any of the mathematical functions used by statisticians and even if this were possible there is a variety of possible averages, such as the arithmetic mean, geometric mean, or the harmonic mean.

Hansen (2008a) goes on to say that even when you cannot agree on how to measure SAT you can measure the "anomalies" by using models and guesswork!

He even attempts to "guess" the average temperature of the earth as "anywhere between 55º and 58ºF" (12.8ºC to 14.4ºC) for which he gives an unconvincing "global mean" of "roughly 14ºC", apparently emanating from models. He has no actual evidence.

A recent version of this "Mean Annual Global Temperature Anomaly" is shown in Figure 1. (Brohan et al.2006). The 'error bars' cannot be justified mathematically.
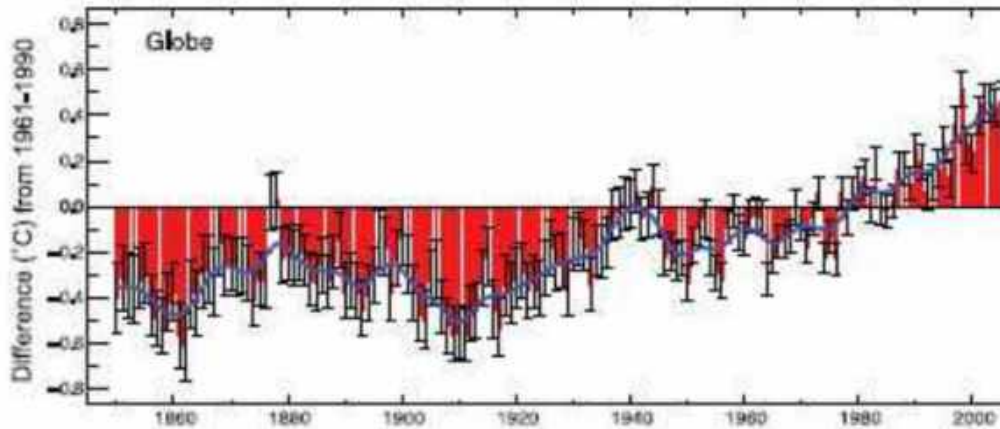
Figure1. Mean Annual Global Surface Temperature Anomaly (Brohan et al 2006) showing 95% confidence levels.

There are many reasons why this record is unreliable, some of which have already been pointed out by Hansen (2008a.

2.1.2. UNREPRESENTATIVE SAMPLES

Weather stations are not distributed uniformly and representatively over the earth's surface.

You cannot obtain a plausible average unless you start with a representative sample (see Wunsch et al 2008).

Those conducting public opinion polls know very well that their results are meaningless unless they have a sample which covers the whole population in a random and representative fashion. Similarly, the television authorities need to have some way of setting rates for advertisers. Unless they do so the rates will be unfair and they lose money. They go to a lot of trouble in finding a representative sample population upon whose TV sets they can put their set boxes which determine their rates.

The whole point of these examples is that their mistakes are soon apparent. Climate "projections" and even "predictions" are always so far ahead that nobody can check on them, so they can never be checked for validity. Weather stations cannot supply a representative sample. They are nearly all near cities or airports and do not include most of the earth's surface. There are no measurements from farms, pastures, forests, deserts, glaciers, or icecaps. 71% of the earth's surface is ocean but measurements there are even less representative, with very poor quality control.

2.1.3. NO LOCAL AVERAGE

If you want a "global average anomaly" you must surely start with a "local average anomaly" derived from a local average. No actual measurement of a local average temperature are ever made or at least published. Since temperatures are irregular, it is not even clear what the term "average" may mean. Since there is no sunlight at night, the distribution is skewed, so it cannot be modelled by a symmetrical function. Even if it is possible to find an acceptable mathematical model, there would be several possible alternative "averages", such as mean, median, geometric, harmonic etc.

At most weather stations there is only one temperature measurement a day. If there is a maximum and minimum thermometer a daily maximum and a daily minimum can be recorded. It seems to be assumed that the mean of these quantities represents some sort of average, but Hansen (2008a) denies its value. Gray (2007a) showed that if you compare this average with the average of the 24 hourly readings from one midnight to another, you get a large bias, which for the average of 24 New Zealand weather stations was +0.5ºC for a typical summer day with a range of +2.6ºC to -0.4ºC and an average of +0.9ºC with a range of +1.9ºC to -0.9ºC for a typical winter day. The positive bias of the max/min average over the mean hourly value can thus be larger than the claimed effects of

greenhouse warming. Yet this unsatisfactory "average" is used to derive a "mean global average temperature anomaly."

Then there is the question of how do they calculate each "anomaly"? The following explanation appears on the NCDC website (2008):

"NOTE: From February 2006 through April 14, 2006, the anomalies provided from the links below were inadvertently provided as departures from the 1961-1990 average. Anomalies are now provided as departures from the 20th century average (1901-2000)."

Now, maybe they were able to calculate an average for the year 2000 from 1,600 stations and 500 gridboxes available and in the year 1901 they had 1,600 stations and 300 gridboxes (See Figure 2)

It sounds comparable; but the world was a very different place in the year1901 from the year 2000. The total number of possible 5ºx5º gridboxes is 2592, so, even today, they only cover 20% of the earth, and mostly near cities. It was actually better in the year 1985 when there were 6000 stations and nearly 900 gridboxes. Many have been closed down since then, mostly in rural areas where the results are less contaminated by urban heating.

In the year 1901, Antarctica, Central Africa and South America, and most of Siberia had no weather stations. Figures for the oceans were minimal and most of the stations were in the Northern Hemisphere. It might be mentioned that there have never been readings near the North Pole because the Arctic is an ocean. Yet they keep telling us it is getting warmer without supporting observations.

In 1901 thermometers were graduated in intervals of one degree Fahrenheit and the standards of the equipment, shelters and supervision were very different from today.

2.1.4. THE TIME OF OBSERVATION BIAS

The "Mean Daily Temperature" which is obtained by one reading per day of the maximum and minimum temperature for the past 24 hours is taken to be the average of these two figures. However, the actual 24 hours for which it applies is the previous 24 hours of the time of measurement, not the actual daily 24 hours. The measurement of Max and Min is made at different times in different places and it also changes over time and from one place and one country to another.

This bias in "mean daily temperature" is called the "Time of Observation Bias" (TOB) by the Americans and together with all the other inaccuracies in their measurements, they make a gallant effort to try and "correct" for it. These efforts are described by Vose et al. (2003). There is some very interesting information in this paper. We learn, for example, that "the majority of the US Cooperative observing Network is staffed by volunteers". I wonder what their qualifications are, or who checks up on them and what situations apply in other countries?

They also say "When the observation day differs from the calendar day a "carry over" bias of up to 2.0ºC is introduced into monthly mean temperatures.

Also "Non-calendar day observations also result in a "drift" bias of up to 1.5ºC in monthly mean" because there is a carry over from the previous month. If the day is different, then so are the month and the year.

They state that there has been a systematic change in the preferred observation time in the US, requiring a large correction they recorded near sunset before the 1940s and switched to mornings after that, giving a "slight" warm bias to the later readings.

A diagram showing the distribution of time of observation now for the USHCN (United States Historical Climatology Network) stations shows a wide level of variability. They make a "correction" for the US, which may not apply elsewhere. It is doubtful whether knowledge of conditions 100 years ago is very reliable.

2.1.5. URBAN HEATING AND LAND USE CHANGE

The unrepresentative meteorological temperatures are often measured in places of increasing population, more buildings, more concrete, growing vegetation, more cars, more heating and therefore subject to a positive bias. The evidence that this is happening is overwhelming. It is the only authenticated "anthropogenic" effect on the climate (Gray 2000, McKitrick and Michaels 2004, 2008).

The IPCC have repeatedly quoted the paper by Jones et al. (1991) as evidence that urban heating is negligible. These authors examined an "extensive" set of rural station temperature data for three regions of the world -

European parts of the Soviet Union, Western Australia and Eastern China. When combined with similar analyses for the contiguous United States, the results are claimed to be representative of 20% of the land area of the Northern Hemisphere and 10% of the Southern Hemisphere

They worked out the linear slope of temperature anomalies for the rural series in each case and compared it with the same slope for several gridded series. For the Western USSR, it covered the period 1901-1987 and 1930-1987, for Eastern Australia it was 1930-1988 compared with 1930-1997, for Eastern China it was 1954-1983 and for the contiguous United States it was 1901-1984 The differences between urban and rural slopes were only significant at the 5% level for Eastern Australia and for one set of Eastern China

They concluded "It is unlikely that the remaining unsampled areas of the developing countries in tropical climates, or other highly populated parts of Europe, could significantly increase the overall urban bias above 0.05ºC during the twentieth century"

It is unclear whether this small correction has been made for the most recent version of the Jones et al. global temperature series (Figure1).

There are several things wrong with the Jones et al. (1991) paper.

- The quality of the data is even worse than usual. They admit "It is unfortunate that separate maximum and minimum temperature data are not more widely available."

- The qualification for a "rural" site is a population below 10,000 for Western Soviet Union, below 35,000 for Eastern Australia, and below 100,000 for Eastern China. There is ample evidence (Gray 2000) that urban effects exist in such places.

- They have chosen countries with a continuous record of effective scientific supervision. These are not representative of the rest of the world, where changes of country and adequate supervision are far less common.

Even these countries raise doubts. Russia had a tyrannical regime where statistics were frequently manipulated for political purposes. China had a major famine from the "Great Leap Forward" between 1958 and 1959 and also a manipulation of statistics.

Two of the countries, the contiguous USA and China have such reliable records that, when corrected, they show no global warming, or residual urban influence (see Figures 3 and 4), but these two well monitored countries cannot be regarded as "typical" of the rest of the world.

In the very same year there appeared in Geophysical Research Letters another paper which included two of the authors of the previous paper, Wang and Karl (Wang et al. 1991).

The abstract of this paper reads

"We used 1954-1983 surface temperature from 42 Chinese urban (average population 1.7 million) and rural (average population 150,000) station pairs to study the urban heat island effects. Despite the fact that the rural stations are not true rural stations, the magnitude of the heat islands was calculated to average 0.23ºC over the thirty year period, with a minimum value (0.19ºC) during the 1964-1973 decade and maximum (0.28ºC) during the most recent decades."

This study appears to have used the same stations that were claimed to have no urban bias in the first paper and now there is an urban bias even if "rural" now includes places with population as high as 150,000.

The early paper (Jones et al. 1991) states, of Eastern China, "The stations were selected on the basis of station history: We chose those with few, if any, changes in instrumentation, location or observation times".

Wang et al. (1991) says "They were chosen based on station histories. We chose those without any changes in instrumentation, location, or observation times".

Both papers were written at the same time and different conclusions made from the same data. Recently, Keenan (2007) has shown that many of the Chinese stations moved several times over the period in question, in one case 15 km and he accuses Wang of outright fraud, as he must have known this at the time.

Confirmation of continuing urban warming in China has been documented by Ren et al (2008) who, from 282 weather stations in Northern China from 1960 to 2000, that there was an urban bias of 0.16ºC per decade for cities over 500,000 population, down to 0.07ºC per decade for small cities (100,000 to 300,000). The National bias was estimated at 0.11ºC per decade, However, these were all by comparison with "rural" measurements, which were assumed to be immune from urban heating.

Another paper used by the IPCC (Solomon et al. 2007) as evidence that urban warming is negligible is by Peterson (2000) "Assessment of Urban Versus Rural In-Situ Surface Temperatures in the Contiguous United States: No Difference Found".

This paper supplies much more information on the observation process and its snags than has appeared before. The IPCC has chosen to consider the phrase "No Difference Found" as implying that it is evidence that no difference exists. The text shows that this untrue. Peterson merely found that his sample size was insufficient to obtain a statistically significant figure.

He studied only three years of data, 1989-91, so he was unable to study "trends". His excuse is rather startling. "A longer period would increase the problem of missing data". The problem of missing data is not otherwise mentioned, but it must be important if it has an influence after only three years in the USA. The data are not given and the problem must be even worse outside the USA.

He chose for study 40 clusters of stations, well distributed over the country; a total of 289 stations, 85 "rural", 191 "urban" and 13 "suburban.

It was surprising to learn that in the Unites States there are several different types of instrument and shelter. There were 106.9 maximum and minimum liquid-in-glass thermometers in a Cotton Region Shield (CRS, resembles a Stevenson Screen), 142.8 thermistor based instruments in a MMTS shield, 35 hygro-thermometers in an HO-83 housing and 2.3 hygro-thermographs. (The fractions are from changes during the three years). There are photographs of these three types. If the Americans have several different instruments what kinds are used elsewhere?

Corrections had to be made for urban/rural location, elevation, Time of Observation Bias, instrumentation and siting. The total remaining overall urban/rural bias before the others were applied was +0.31ºC. This is half the amount claimed to be caused by greenhouse gases since 1900. However, when the other corrections were applied, together with their inaccuracy levels, the urban/rural bias was reduced to +0.04ºC. .

The Time of Observation Bias was the largest, accounting for a correction of -0.17ºC. This was because rural stations had a higher proportion of morning readers. Differences in elevation accounted for a correction of -0.11ºC because rural stations in the USA are usually higher up than the cities. Differences in instrumentation accounted for a bias of 0.05ºC because rural stations had a higher proportion of hygro-thermometers that had a warm bias over the period and latitude changes gave a negative bias, -0.06ºC, as urban stations tended to be a little further north than the rural stations.

The fully adjusted urban/rural bias of +0.04ºC was regarded by Peterson as equivalent to zero because it was not significant at the 90% level. But this does not mean that the bias does not exist, as assumed by the IPCC. It merely means that Peterson's sample size was not large enough to give a result with a higher level of significance. It is simply not true to claim "No Difference Found"

In most other countries the complex correction procedures carried out by Peterson are impossible as they do not possess the numbers of sites for comparison, or the supervision or the scientific expertise. Corrections for Time of Observation Bias, Elevation, and Instrument Change may be impossible, so the first, unadjusted result of Peterson's, an urban/rural bias of +0.31 ºC could be the best estimate.

Two recent papers by Parker (2004, 2006) seek to show that urban warming does not happen. He argues that because daily mean, Maximum or Minimum Temperatures are not influenced by windy conditions, therefore urban heating is negligible. But the "day" that gives average wind conditions is usually a different "day" from that used for the daily mean, the Maximum and Minimum. In the second paper he seems to have realised this after he wrote the paper, so he puts the problem in Appendix A, where some "private communications" helped him out, but he does not list the ones which did not. The idea that urban heating should be influenced only by the strength of the wind and not its direction, and that there are no other factors involved, is simply a gross oversimplification of a complex issue.

As is shown by Figure 3 the fully adjusted US data, although still incomplete, do not indicate evidence of a consistent warming trend, so there is no evidence for the presence of the greenhouse effect for the contiguous United States.

The only other country that has attempted a similar correction exercise is China and they also show no evidence of greenhouse warming (Figure 2.1.4).

Jin et al. (2005) used measurements with a MODIS spectrometer on NASA satellites to measure the urbanisation effect globally and over several selected cities. In July 2001, for night time and daytime temperatures, urban areas between 30 and 60 degrees north are eight degrees Celsius above a surrounding forest by day and two degrees

above at night. These are much greater than the "corrections" that are made to the surface record. There were also large differences between urban surfaces and cropland and for selected cities.

They make the following comment, which is relevant to the Peterson paper and to the IPCC approach

"Urban areas have generally been determined from satellite data from the night time lighting. Such a measure is more an index of electricity use than of urban features that are significant for climate study".

McKitrick and Michaels (2004, 2008) showed that the surface anomalies for 1979 to 2000 were significantly biased by rises in population, energy usage, sample defects and GDP. Removal of these effects reduced the average temperature trend by about half.

Pepin and Lundquist (2008) chose temperature records from high altitude weather stations and plotted the average trend over recent years, which is slightly downwards, as are the general trends. Only a few urban stations show a rise. So the glaciers are unlikely to be receding because of "warming" after all.

2.1.6. QUALITY CONTROL

There is no quality control on meteorological stations. Nobody knows how many sites are close to towns, buildings, central heating pipes; what instruments are used, who measures, how often.

Some years ago the Australians published pictures of their weather stations. They were withdrawn hurriedly as most could be seen to be subject to bias. They have re-emerged recently with a new set of photos (BOM 2008), all of which look satisfactory, although the Melbourne station, in a busy city intersection, still seems to be used.

Detailed information about the location of weather stations is not readily available. A recent "Google" search for photographs of weather stations provided very few outside the USA or Canada and very few appeared to be free from urban effects, or were from official sources. An exception was the Oklahoma Climatological Survey, which gave a wide range of pictures of its sites, from each compass direction. They supplied a paper (Martinez et al. 2007) which lists all the information they record regularly for each site. It should be obvious that this information cannot be obtained from a remote office and it cannot be extrapolated into the past.

There seems to be an improvement taking place as a result of the publicity that is being given to unsuitable stations such as those by Davey et al. (2005) and Pielke et al. (2007) who showed that many of the US Global Historic Climatology Network (GHCN) locations are unsuitable. Perhaps these improvements are partially responsible for the fact that the surface and satellite records now show a measure of agreement, and both show no recent warming,

2.1.7. STATION NUMBERS

Another factor that has influenced the weather station record is the variable number of stations available. Figure.2 (Hansen 2008) shows how station numbers and available grids have varied. The large increase after 1950 was mainly an increase in rural stations and of stations at airports and it partly accounts for the fall in the combined temperature from 1950 to 1975 shown in Figure 1. The wholesale closure of mainly rural stations in 1989, combined with the increased energy release at airports partly accounts for the increase in the combined temperature record shown in Figure 1 since 1989.
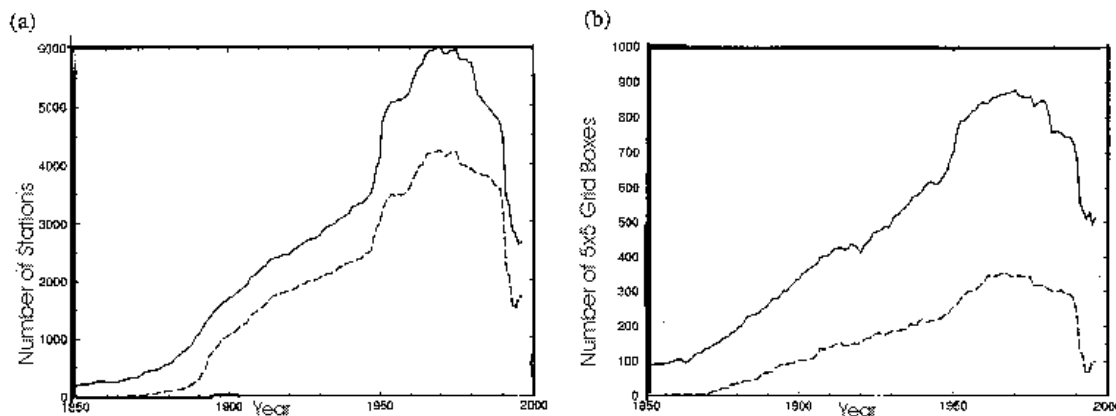

Figure 2 Numbers, of available global weather stations for Northern and Southern Hemispheres, (a) and numbers of grid boxes available (b) from a theoretical total of 2,592 5º/5º latitude/longitude boxes (Hansen 2008).

2.1.8. CORRECTION OF UNCERTAINTIES

The principles which have guided the correction of the Hadley climate data are given in Brohan et al. (2006). They say under "Uncertainties":

"A definitive assessment of uncertainties is impossible because it is always possible that some unknown error has contaminated the data and no quantitative allowance can be made for such unknowns. There are, however, several known limitations in the data and estimates of the likely effects of these limitations can be made" (Defense secretary Rumsfeld, press conference June 6, 2002, London)

It is touching that the famous poem of Donald Rumsfeld is now inspiring climate scientists. It is worth quoting.

"THE UNKNOWN

As we know
There are known knowns
There are the things we know we know
We also know
There are known unknowns
That is to say
We know there are some things
We do not know
But there are also unknown unknowns
The ones we don't know
We don't know".

Runnalls and Oke (2006) showed that the recorded temperature in meteorological stations can be influenced by "changes in vegetation, development (buildings, paving), irrigation, cropping and even the maintenance of the site and its instruments".

2.1.9. CORRECTED COUNTRY FIGURES

The corrected temperature record for the contiguous United States is shown in Figure 3 (Hansen 2008b). After correction, the highest temperature ever recorded in the USA since 1880 was in 1934. The current temperature is higher than in 1880, but there is no steady rise, as is predicted from a greenhouse gas theory, but evidence of a periodic oscillation of about 70 years, with a previous peak in around 1935. The most likely future is a fall to another trough.

Plotted below is the behaviour of the Pacific Decadal Oscillation (Mantua 2007) over the same period which follows the same periodic behaviour.
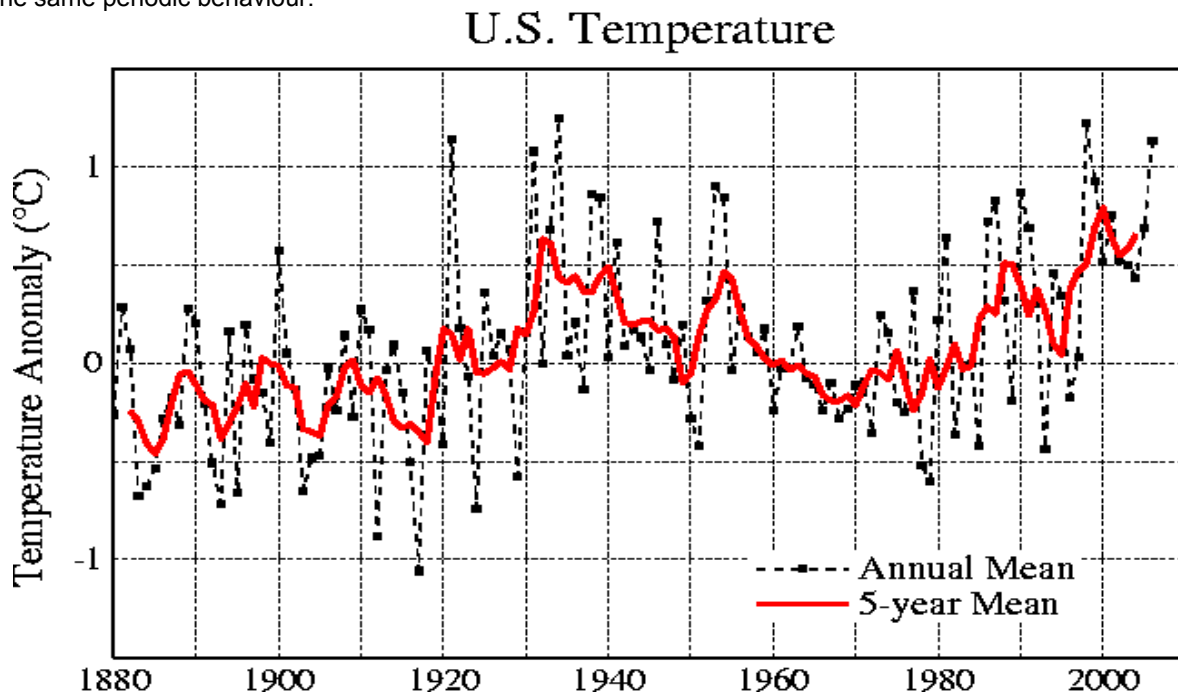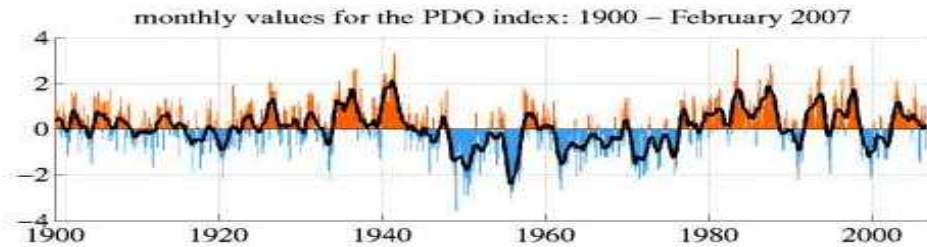
Figure 3. Corrected mean annual temperature anomaly record for the contiguous United States (Hansen 2008b) compared with the Pacific Decadal Oscillation Index (Mantua 2007).

A corrected temperature record for China is shown in Figure 4 (Zhao et al. 2005). It is very similar to the corrected record for the contiguous USA (Figure 1.3). It incorporates the earlier records from Wang and Gong (2000) and others and also shows a "China" subset of an early version of Figure 1 as the bold line graph PJO8SCN. (Jones personal communication which suggests that this rise is a result of the use of inferior records from elsewhere.)
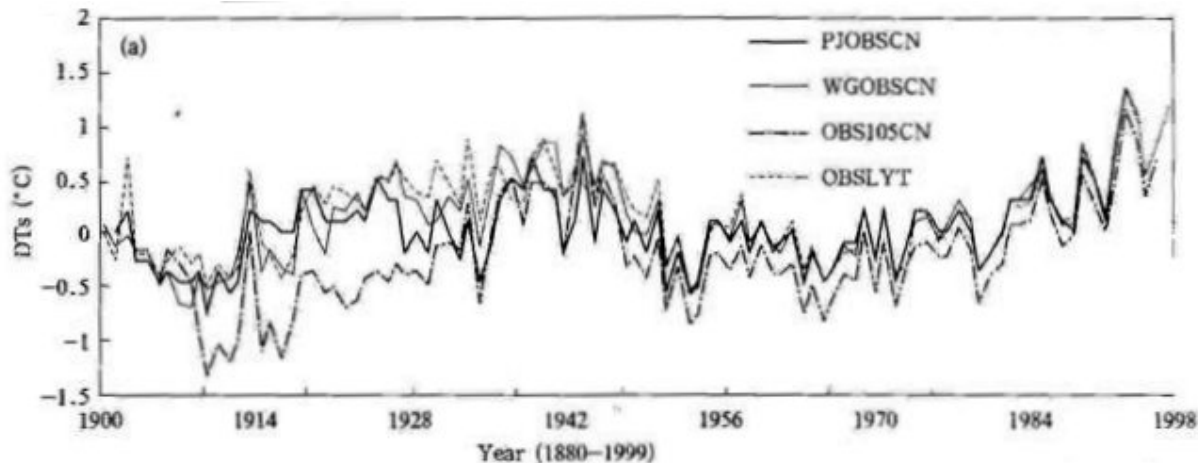
Figure 4 Temperature anomaly record for China (Zhao et al. 2005).

Figure 4 also has an excellent correlation with the Pacific Decadal ocean oscillation. It also shows no evidence of the warming of Figure1.

2.1.10. SEA SURFACE TEMPERATURE

An average global temperature anomaly needs to include the 71% of the earth's surface that is ocean. There are many temperature measurements made from ships, but the quality control is much worse than on the land and even then whole regions have no figures. Folland and Parker (1995) have claimed to have found a way of incorporating the data. One difficulty is that many early measurements were from buckets drawn from the sea and it is sometimes uncertain whether the buckets were metal or wood. During the First World War measurements could not be made on deck. Also some measurements are from a weather station on board, often beneath the funnel.

Both American temperature compilers, the Goddard Institute of Space Studies (GISS) and The Global Historical Climatology Network (GHCN) have never accepted the use of the sea surface measurements for a global average and they have to resort to a whole host of dubious devices to claim that their figures are "global". They use recent satellite measurements for the ocean (Reynolds et al. 2002) and extrapolate them into the past. It is very suspicious that incorporating the sea surface measurements seems to make little difference

Although only 29% of the earth's surface is land, it is remarkable that, according to Figure 1, the peak number of 5º x 5º grid-boxes from land-based weather stations was 880 in 1980, which includes 34% of the earth's surface. This has been achieved because there are many stations on small islands surrounded by ocean where the land temperature is assumed to be typical of the surrounding ocean. Also a proportion of sea surface measurements is from fixed buoys and weather ships. These and the land stations measure above the surface, whereas current sea surface measurements are made from ship's engine intake, which is below the surface.

2.1.11. TEMPERATURE OSCILLATION

The IPCC (Solomon et al. 2008) does not seem to envisage that global temperatures might fluctuate or oscillate, perhaps accompanied by oscillating energy "imbalances" something Hansen et al. (2005) cannot believe in either.

Schlesinger and Ramankutty (1994) applied a statistical technique called "singular spectrum analysis" to four global-mean surface temperature records which had been de-trended by means of a simple climate/ocean model based on the supposed radiative forcing due the increase in atmospheric greenhouse gas concentration. The result of this exercise as applied to the surface temperature record reported by Folland et al. (1992) is given in Figure 5.
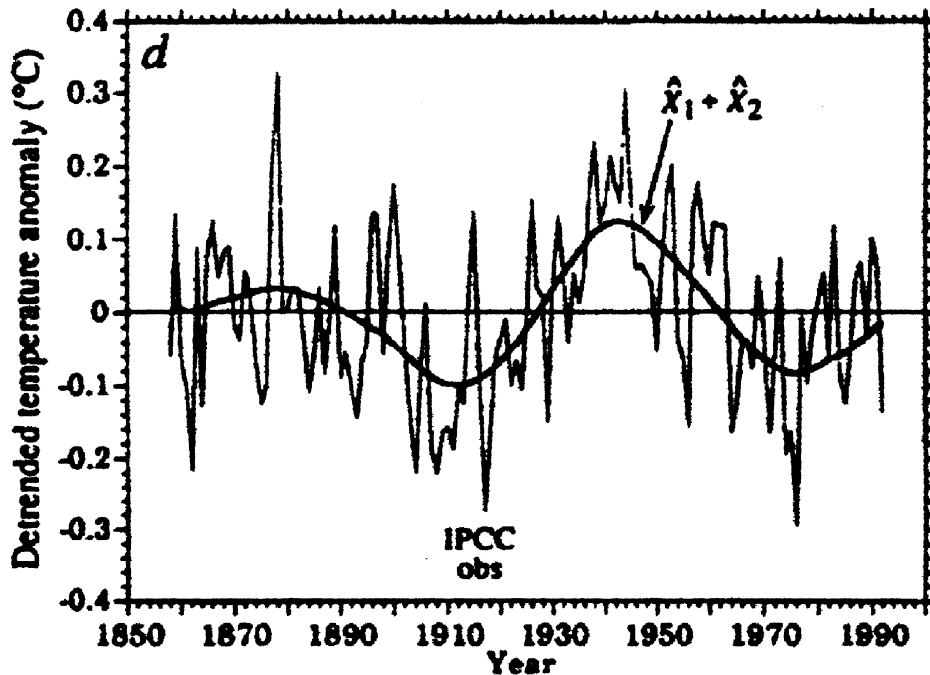

Figure 5 Global temperature oscillation identified by Schlesinger and Ramankutty (1994)

Three global-mean surface temperature records (Jones, Hansen, Vinnikov 1992) de-trended by a simple climate/ocean model were compared with singular spectrum analysis of the same data.

The mean length of the oscillation identified was estimated as 65, 66, 70 and 69 years for the four temperature records studied.

They also applied the technique to 11 geographical subsets of the data of Jones et al. (1991). Similar results were obtained for all regions, with the best agreement shown by North Atlantic, North America, and Eurasia.

In a later paper Andronova and Schlesinger (2000) removed the modelled effects of the supposed anthropogenic warming, volcanoes and the sun from the updated record of Jones (1999) and confirmed the presence and further progress of the previously identified oscillation shown in Figure 1.5 to 1999.

Klyashtorin and Lyubishin (2003) have recently independently confirmed this "quasi-cyclic fluctuation" with about a 60 year period in the surface record of Jones et al. (2001) and they have demonstrated the existence of a variation of 50-60 years interval in reconstructed temperatures for the past 1000 years.

The oscillation identified by Schlesinger and Ramankutty (1994) can be seen in a range of temperature records, global, regional and local. In many of these the postulated anthropogenic contribution is not evident.

The updated surface temperature record of Figure 1.1 (Brohan et al. 2006) confirms the 65-70 year oscillation for the more recent measurements where the expected peak of the oscillation seems now to have been reached and thereafter would be expected to decline in the next few years. The steady temperature increase supposedly due to anthropogenic causes seems to have ceased since 2002.

The mean global surface temperature anomaly record (Figure 1) shows a temperature increase imposed on the oscillation, which is not present in most other records, such as those shown below, so it is an artefact of the methods used in the collection and processing of the surface temperature data rather than an indication of warming from increases in anthropogenic greenhouse gases.

The oscillatory behaviour often appears to be discontinuous. For example, Trenberth (1990) identified a "climate shift" in the Northern Hemisphere between 1976 and 1977. Karl et al. (2000) found climate shifts in 1912, 1945 as well as the 1976 shift. All of these features are apparent in Figure 1.1 and it is a matter of opinion whether they should be considered sudden or part of a more regular oscillation.

2.1.12. OCEAN OSCILLATIONS

Schlesinger and Ramankutty (1994) and Andronova and Schlesinger (2000) ignored the important climatic effects of the various ocean oscillations.

Trenberth et al. (2000) focused on the most important one, the El Niño Southern Oscillation of the Pacific and derived a linear equation which was used to remove El Niño from the surface record of Figure 1.1. This corrected record removed most of the oscillation of Figure 1.1 but not the very large El Niño of 1998 or for subsequent years.

Tsonis et al. (2007) have shown that synchronous behaviour of the various ocean oscillations can provide an explanation for this 65-70 year global and local oscillation in temperature. The various climate shifts can be related to particular changes in the he El Niño Southern Oscillation (ENSO), the North Atlantic Oscillation (NAO), the Pacific Decadal Oscillation (PDO) and the North Pacific Oscillation (NPO).

The Pacific Decadal Oscillation, which has a period of about 30 years, shows a fairly close correlation with Figures 1, 3, 5, 6, 7, and 12.

Figure 7 shows little temperature change from its inception in 1979 until the large temperature anomaly caused by the El Niño ocean oscillation event of 1998. The period since then appears to correspond with the expected final peak of the oscillation depicted in Figure 5. There was a "climate shift" in 2001 after which steady temperatures have persisted until the present. Again, this record shows no evidence of a long-term upwards temperature trend which could be attributed to anthropogenic greenhouse gas forcing

2.2 LOWER TROPOSPHERE TEMPERATURE ANOMALY

2.2.1. RADIOSONDE RECORDS

There are no global instrumental records besides the mean global surface temperature anomaly (Figure 1) that extend as far back as 1850. The only alternative record going back to 1958 is that from radiosonde measurements in the lower troposphere. Figure 6 shows the radiosonde record from Thorne et al. (2004) which also give error bars.
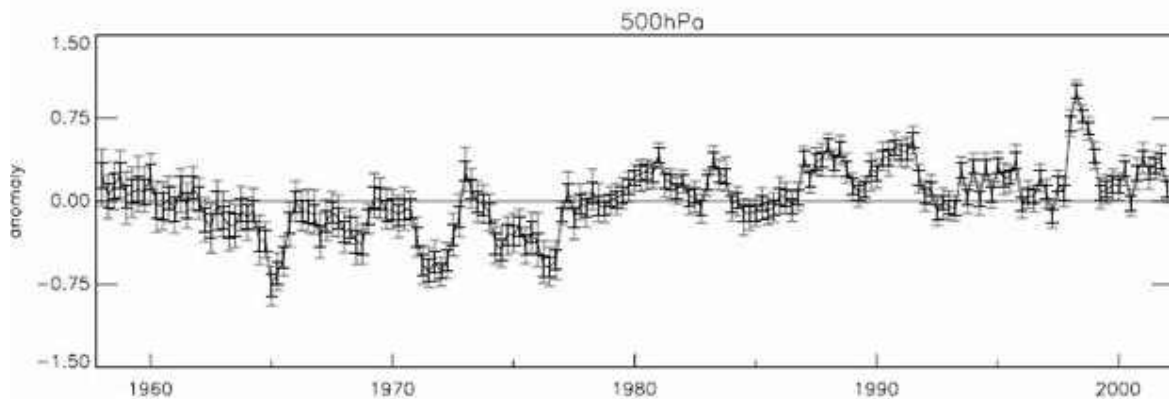

Figure 6 Global mean temperature record in the lower troposphere (500hPg) indicating 95% confidence levels (Thorne et al 2004)

Figure 6 agrees fairly well to that part of Figure.4 since 1958 and confirms that the expected peak global temperature anomaly may already have been reached. It shows a "climate shift" in 1976. It does not display evidence of an additional steady rise over the period which could be attributed to anthropogenic greenhouse gas forcing.

2.2.2 THE MSU

The most reliable and most accurate comparatively recent measure of globally averaged temperature anomalies is from the measurements at several levels in the atmosphere by Microwave Sounder Units (MSUs) on NASA satellites since 1978, which derive temperature from the microwave spectrum of oxygen in the atmosphere. (MSU 2007) The monthly global anomaly record for the lower troposphere is shown in Figure 7. This temperature record has persistently disagreed with the mean global surface temperature anomaly (Figure 1), (Gray 2007b).

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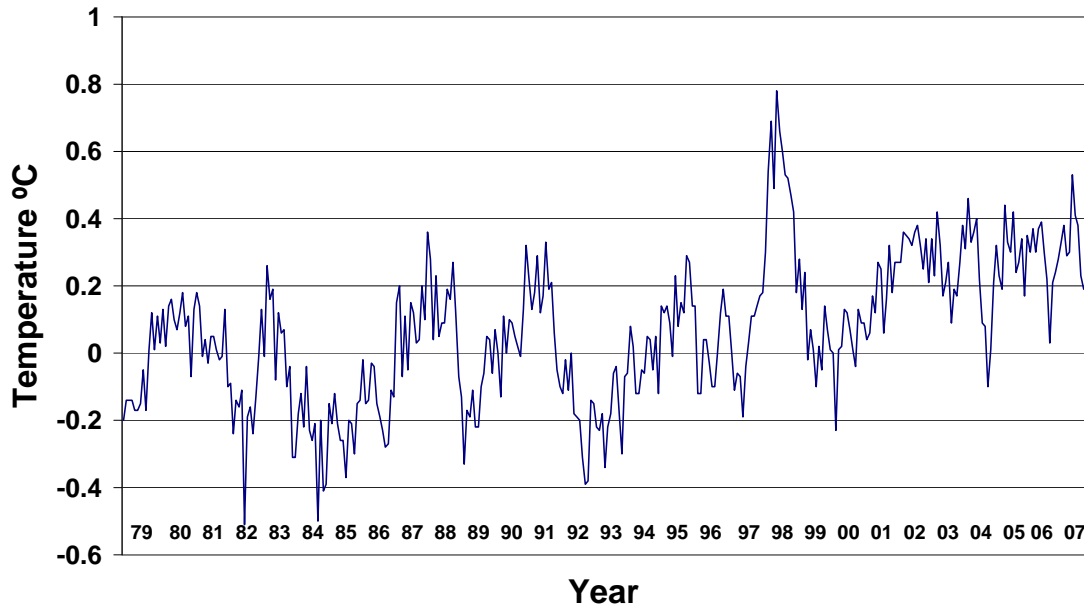
Figure 7 MSU (satellite) monthly global temperature anomaly record since 1979 for the lower troposphere (MSU 2007).

The MSU record faithfully shows temperature anomalies from observed volcanic events (El Chichon 1982, Pinatubo 1991) and from ocean oscillations (particularly El Niño 1998), but it does not show the rise in temperature of the surface record, which is attributed to "global warming" from greenhouse gas emissions between 1979 and 1999 and between 2001 and 2007. The temperature shift of about 0.3ºC for the period 2001-2007 is already beginning to decline.

As adequate "corrections" for the surface record are impossible, extreme efforts have been made to try and prove that the MSU results are faulty. This has culminated in a claim by a paper from the NOAA (CSSP Report), Karl et al. (2006), published only on the internet, that the mean annual global surface temperature anomaly (Figure 1.1) and the MSU record (Figure 1.6.) have been reconciled, as the MSU results show the same "trend" as the surface record, attributed, of course, to greenhouse gases. This is because the temperature peak in 1998 caused by the El Niño ocean event of that year is more prominent in the lower troposphere. If this event is ignored, the two records are very different.

I have recently shown (Gray 2007b) that the claim of "reconciliation" is untrue. For the major periods of the record, 1978-1997 and 2001-2007, the MSU record shows no temperature change. The rise in the surface record from 1976-1997 cannot therefore be attributed to greenhouse gas increases, since it is not evident in the lower atmosphere where it should be most prominent. Both records show no change over the second period, 2001 to 2007, which is itself convincing evidence that increases in greenhouse gases are not influencing global temperatures, however these are measured.

2.3 LOCAL TEMPERATURES

There are a few long-lived individual local temperature records where the local bias may have remained fairly steady and which give records that show the oscillation identified in Figure 24. This effect is particularly evident in land regions in the Arctic where the last warm period was around 1940. The current clamour about melting in the Arctic is just a repeat of the situation in 1940 and is likely to decline in the same way. A number of these more reliable long-term local records are available on John Daly's (2007) and Hansen's (2007) websites.
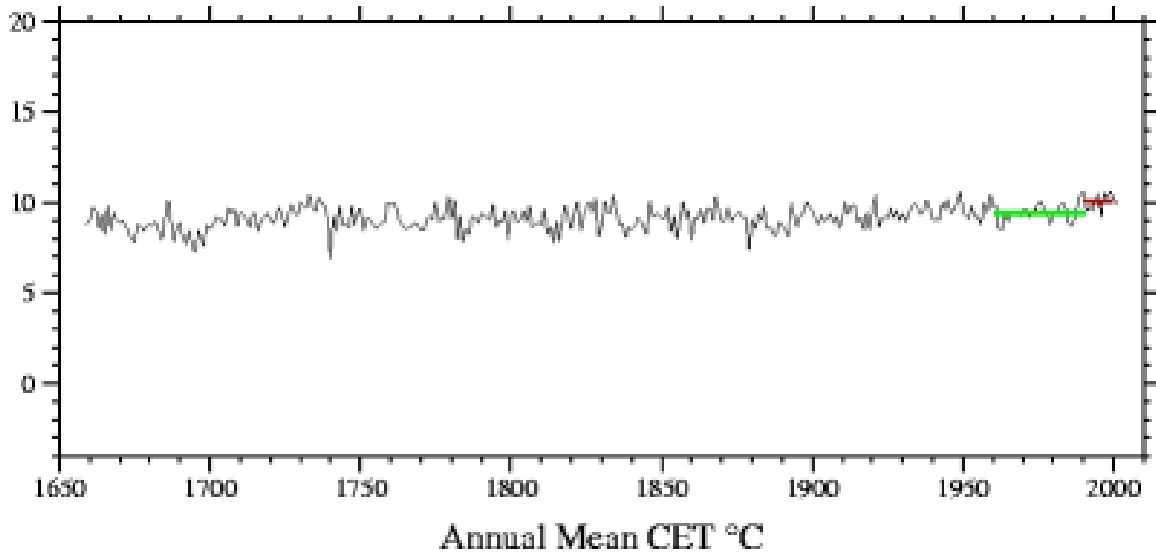
Figure 8 Temperature record for Central England since 1650.

Figure 8 gives the well-known temperature record for Central England since 1650. Oscillations have almost disappeared. A small recent rise is almost certainly due to urban heating.

Figure 9, for Alice Springs, Australia shows the influence of the Pacific Decadal Oscillation, but no overall warming.
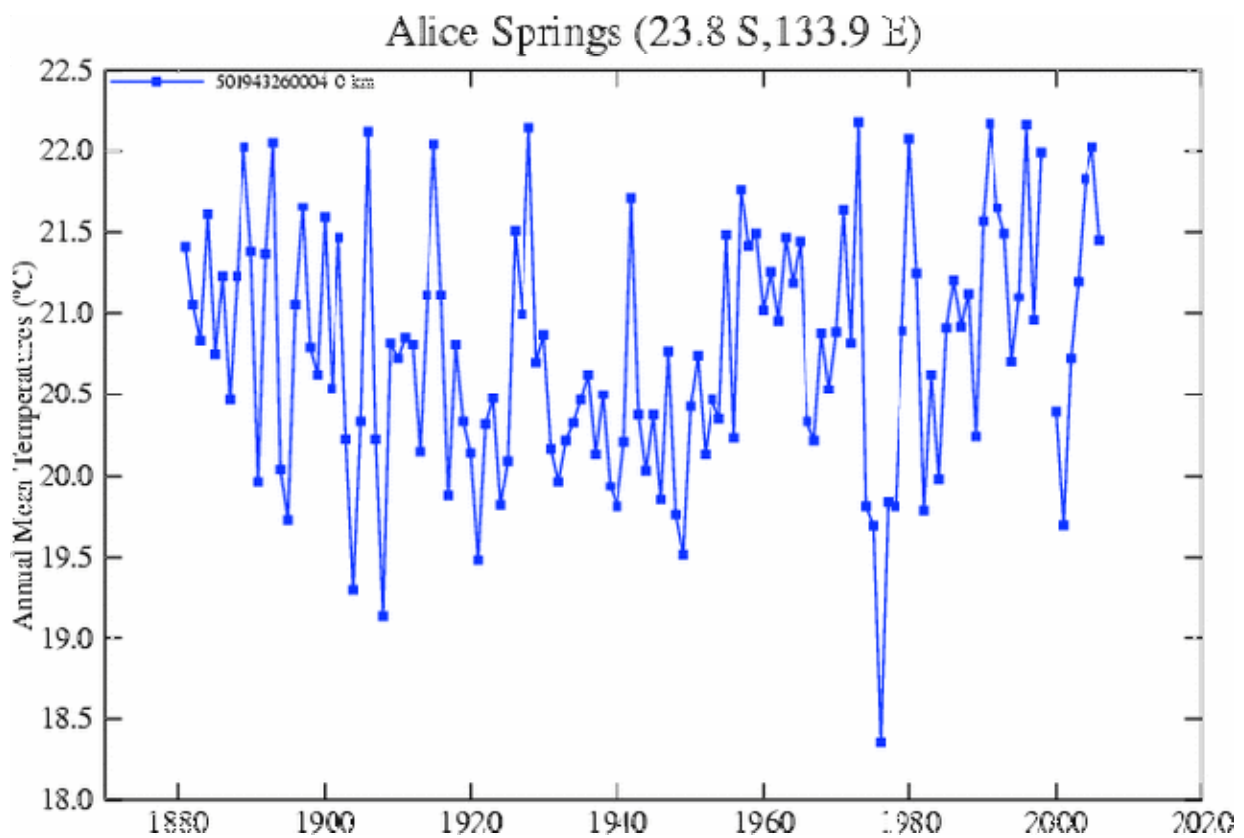
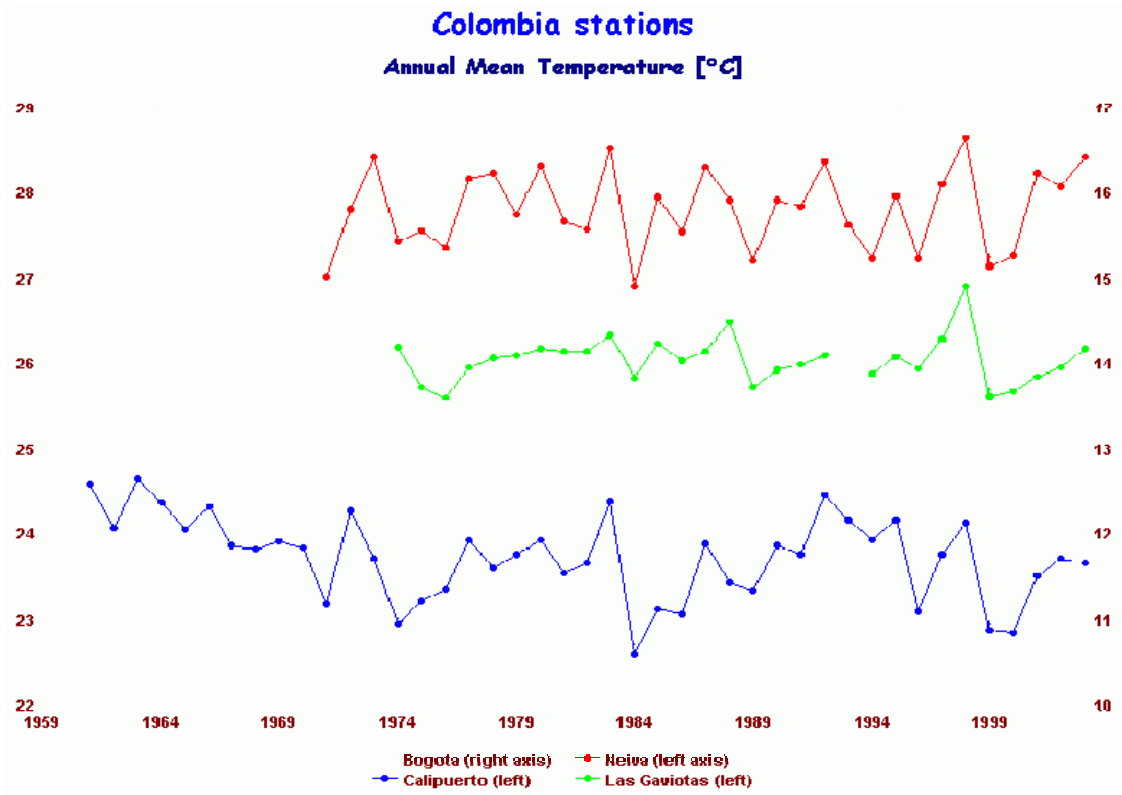**Figure 9 Temperature Record for Alice Springs, Australia, (Hansen 2008)**

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Figure 10 Temperature records from Columbia.

Figure 10 gives three records from Columbia. Two show no overall change. The third shows a decline.
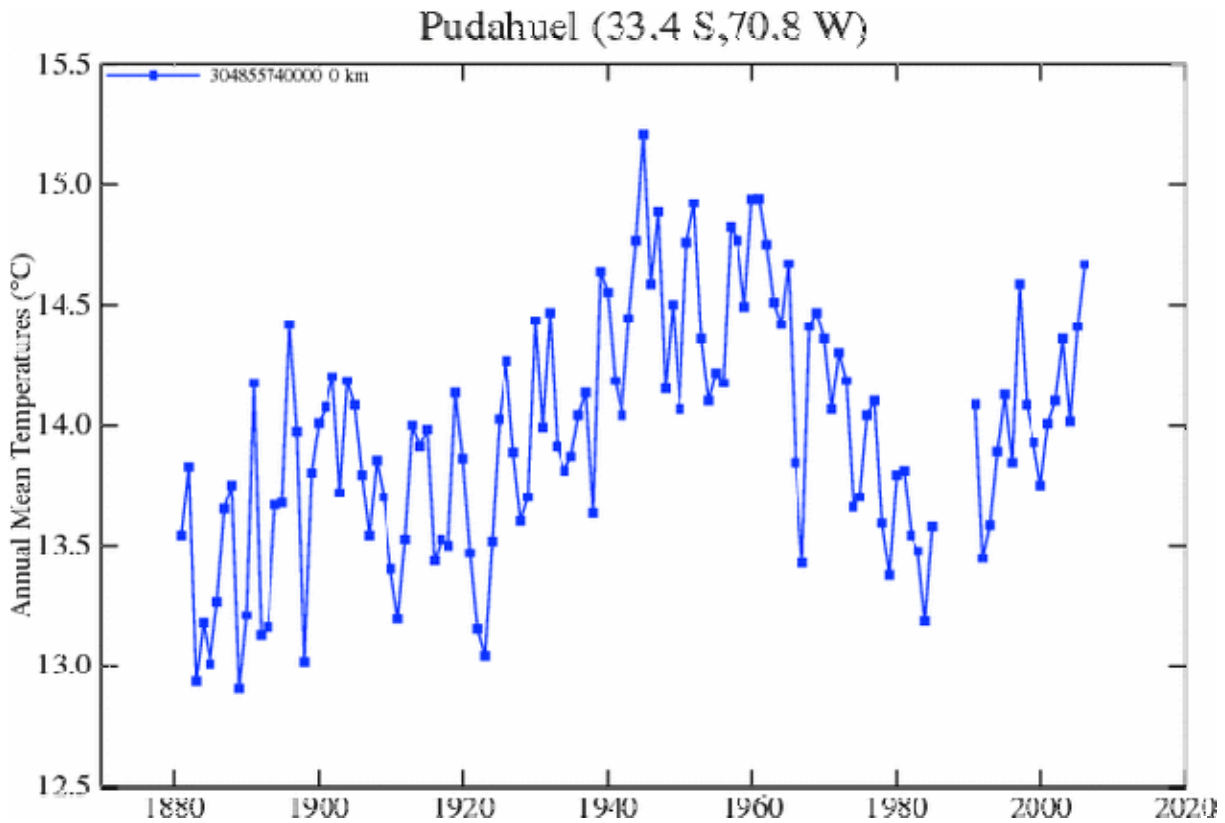

Figure 11 Temperature Record for Pudahuel (Andes mountains)

Figure 11 is a temperature record for Pudahuel in the Andes. The oscillation, correlating with the Pacific Decadal Oscillation is marked.

2.4. POLAR TEMPERATURES

Because water vapour is lowest at the poles the computer models predict that the increases in greenhouse gases have the greatest effects at the poles. This prediction is spectacularly wrong at the South Pole (Figure 12).
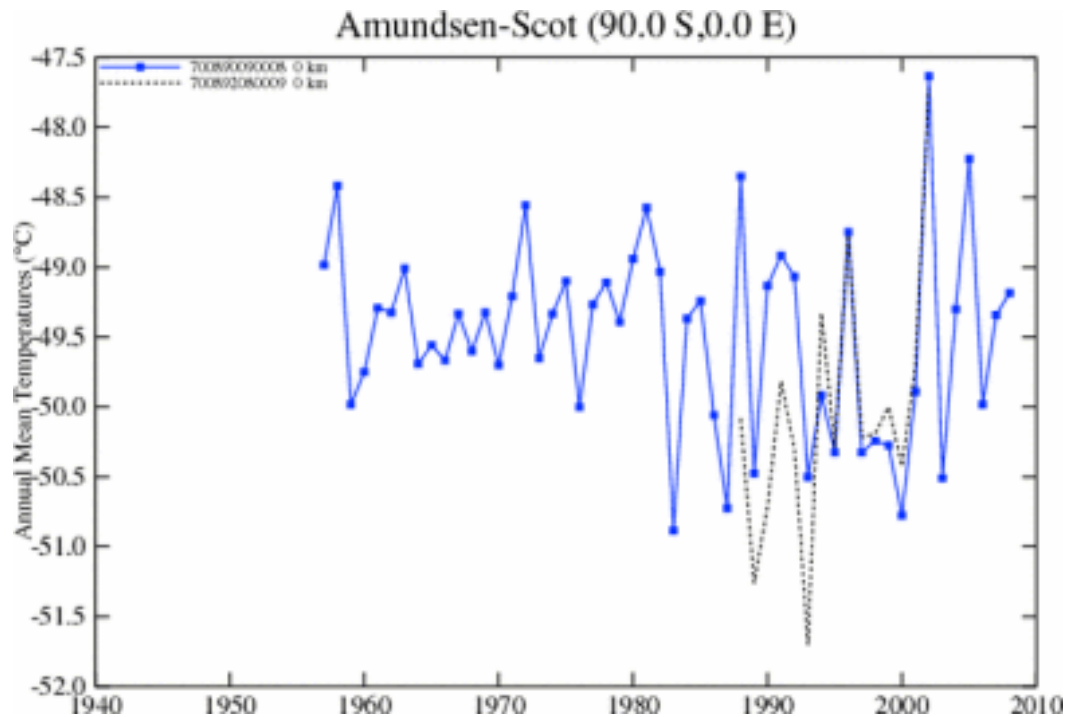

FIGURE 12   Temperature record for the South Pole (Hansen 2008)

The North Pole, by contrast, is situated on an ocean, for which there are no temperature records, but eager claims that temperatures are rising. Figures 13 and 14 show typical temperature records from land surfaces in the Arctic.
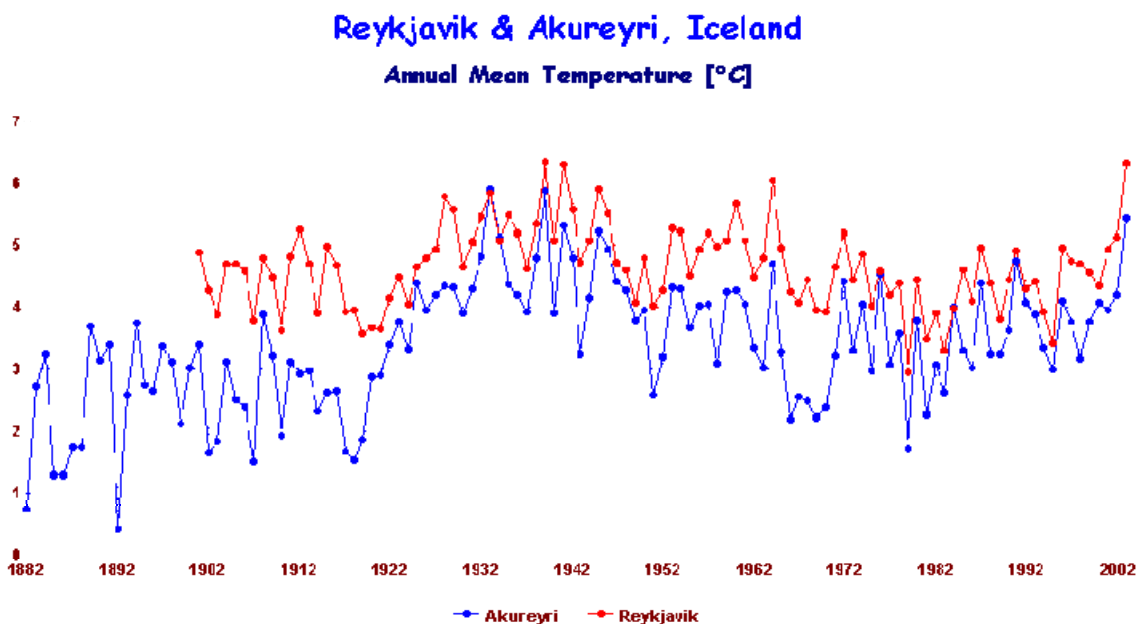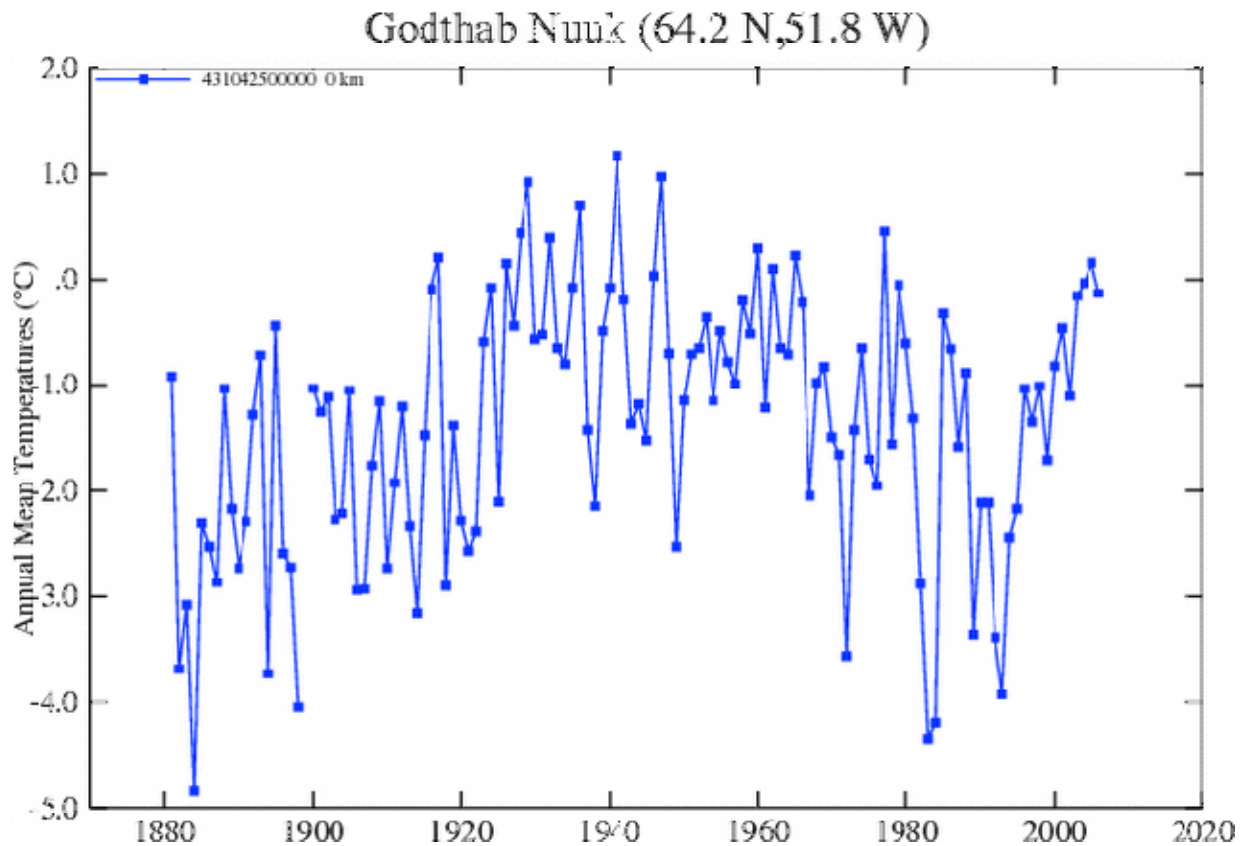

Figure 13 Temperature records for Reykjavik and Akureyri, Iceland

**Figure 14 Temperature Record for Godthab Nuuk, Greenland (Hansen 2008)**

These are just samples of the many records from the Arctic which display a temperature cycle which is correlated with the North Atlantic Oscillation (NAO). The peak temperatures were around 1940 and 2007, and the low temperatures were around 1976-1980. There is recent evidence that the peak has now started to decline, as can be seen from the maps of sea ice for the past two years (Figure 15).
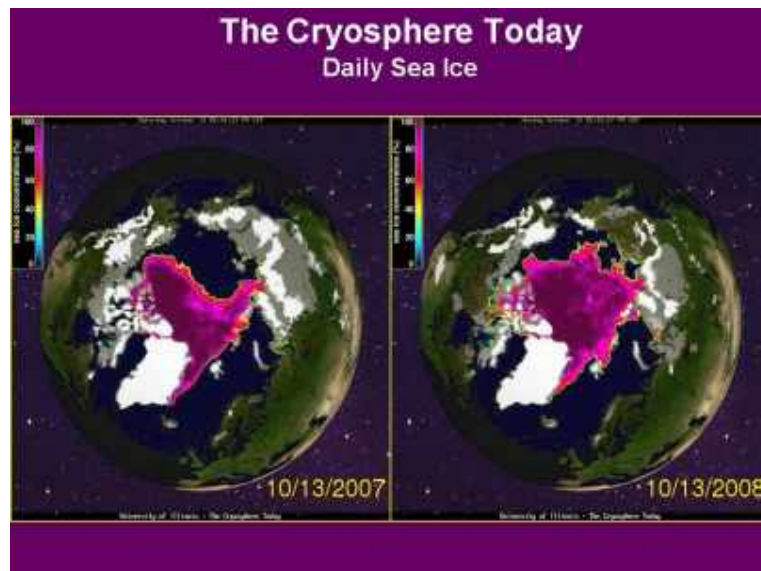
FIGURE 15 Recent decreases in Arctic Sea Ice (Labohm 2008)

2.5. THE HOCKEY STICK

The central "evidence" for global warming presented by the IPCC in their Third Report (Houghton et al. 2001) is the "hockey stick" graph (Figure 16) which is supposed to prove that current globally averaged surface temperatures are "unprecedented" for the past 1000 years. The original graph was published in two papers by Mann, Bradley and Hughes (1998, 1999)
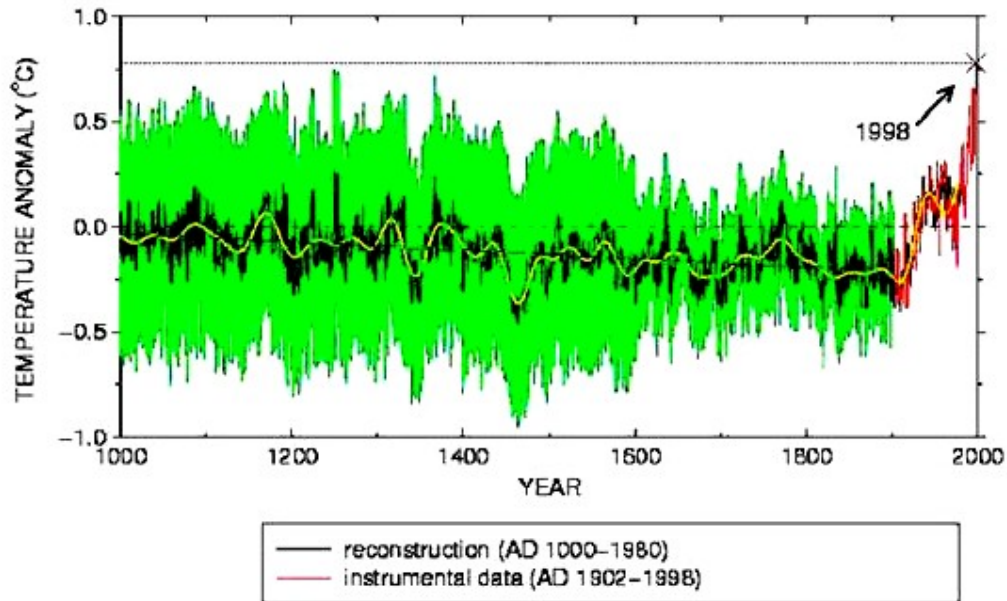
Figure 16 The "Hockey Stick" comparison for the Northern Hemisphere between past proxy temperature estimates and the recent Mean Annual Global Surface Temperature Record. (Houghton et al. 2001).

It purports to show globally averaged temperature anomalies for the Northern Hemisphere for the years 1000 to 1998. Since widespread thermometer measurements are only available since 1860 most of the graph consists of averaged "proxy" measurements, based on tree rings, sediments, corals, ice cores and other indicators of past temperature change. The supposed 95% accuracy is shown in the graph, so that one can deduce that the temperature in 1998 was above previous levels, to that level of probability.

This graph contradicted the opinions expressed in the first IPCC report (Houghton et al. 1990) which claimed that there were higher global temperatures than those shown today during the "medieval warm period" from about 1100 to 1250 AD and that there was a "little ice age" from about 1550 to 1700 AD. The opinion was expressed that the temperature rise shown from 1870 to 1940 may have been a delayed recovery from this Little Ice Age.

A number of published papers disagree with the "hockey stick" presentation. There are many, from all over the world, which assert that the medieval warm period really did exist. There were vineyards in Kent. There was a viable colony in Greenland. The little ice age also was undoubtedly felt widely. There are well-known famous paintings showing it. There was an ice fair on the River Thames.

Soon and Baliunas (2003a, 2003b) gathered together many "proxies" and listed them. They concluded, firstly, that the coverage of data, even for the Northern Hemisphere, was not sufficiently representative to justify the deriving of an "average" which could be considered as reliable. Their second conclusion was that both the medieval warm period and the little ice age were sufficiently frequent in the observations that they must have existed. Also, there was evidence that temperatures during the medieval warm period were frequently higher than those found today.

Von Storch (2004) questioned the assumptions on "variability" used for the proxy measurements in the hockey stick. He showed that the low accuracy of the proxy measurements implies a much larger amount of "noise" which meant much higher figures for inaccuracy.

The most devastating attack on the "hockey stick" comes from papers by McIntyre and McKitrick (2003, 2005). They set out to see whether they could recalculate the Mann/Bradley data and were initially surprised to find that the data were not available and had not even been supplied to the journals publishing the work, so that the papers had been published, and believed, without any check on their validity. After a long period of wrangling they managed to get hold of most of the original data. When they carried out the calculations however, they found serious errors which, when corrected, changed the whole conclusion that had been attributed to them. They found that they got a higher temperature in the year 1400 than is claimed for today. They found that the shape of the curve had been automatically predetermined. The small number of actual data before 1550 led to the excessive use, including extrapolation, of several measurements which are not considered reliable by others. Holland (2007) has documented the determined resistance of the IPCC to its acceptance of these facts.

Loehle (2007) questioned the reliability of tree-ring measurements, which apply only to summer and are influenced by precipitation. Increased temperature lowers soil moisture and the rings get thinner rather than thicker. When he used all the proxies except tree rings he got a modified record (Figure 17) which restored both the medieval warm period, the little ice age, and the lack of "unprecedented" character of recent temperatures.
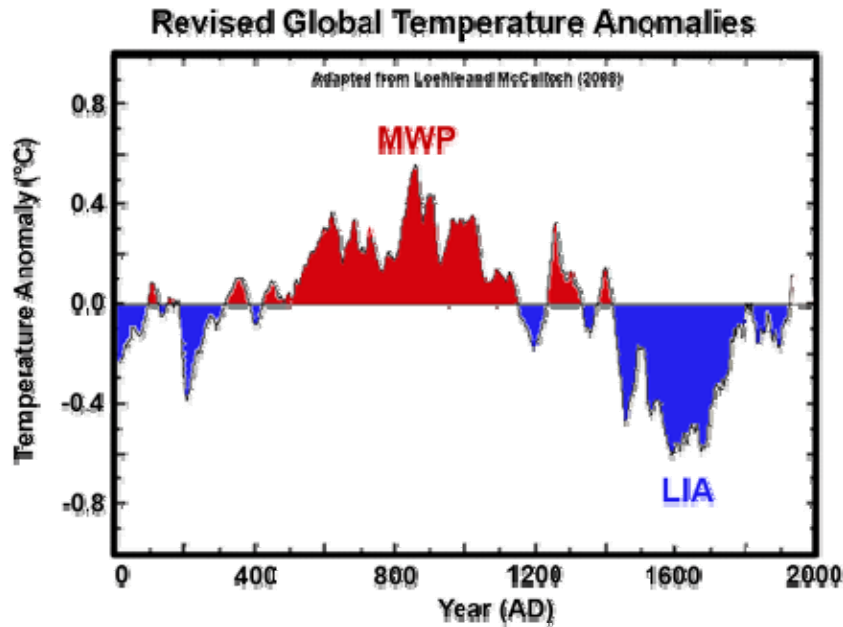
Figure 17 Proxy temperatures for the past 100 years ignoring tree rings (Loehle and McCulloch 2008)

The recent IPCC Report (Solomon et al 2007) has abandoned the "Hockey Stick": graph, but they still will not accept all this criticism of it.

2.6. CONCLUSION: GLOBAL TEMPERATURE

Despite the inadequacy of all the data, there is general agreement from all of it except the "mean global surface temperature anomaly" that there is no overall warming of the climate, but in several cases evidence of cyclic or intermittent behaviour, indicating temperature peaks and troughs some 65 years apart. These fluctuations are influenced by changes in solar activity, cosmic rays, and volcanic eruptions, but especially by ocean/atmosphere oscillations.

The "mean global surface temperature anomaly" is undoubtedly biased by urban and land-use changes, but this is the only observable "anthropogenic" effect.

2.6. SEA LEVEL

The supposed warming of the earth's surface is expected to cause a steady rise of sea level as a result of thermal expansion of the oceans and melting of land-based ice. Some increase is also expected as a delayed influence of the disappearance of the last ice age.

The IPCC (Solomon et al. Chapter 5, page 410) estimates global average sea level rise as 1.7 ± 0.5 mm/yr for the 20th Century and 1.8 ± 0.6 mm/yr from 1961-2003 based on tide-gauge data.

As has been pointed out by John Daly (2000), these figures are obtained after an attempt to correct the tide gauge figures for various forms of geological disturbance, using a model derived from Northern Hemisphere experience, which is probably not universally applicable. In addition no corrections are made for possible subsidence due to removal of groundwater or minerals, or of the weight of buildings. Tide gauge equipment is difficult to keep level as it is subject to constant battering by the sea. It is noteworthy that many of the published records have levelled out in the last 50 years particularly after satellite levelling equipment has been installed.

Satellite measurements of globally averaged sea level (Solomon et al. 2007 Chapter 5, page 411), started in 1992, have shown a rise from 1993 to 2003 of 3.1 ± 0.7mm/yr but it has levelled off since then. Wunsch et al (2008) have questioned the accuracy and reliability of the data because they do not include important oceans.

There are regional variations, one of which is the Western Pacific. The widespread belief that the island of Tuvalu and other Pacific islands are sinking in the ocean appears to be untrue. Since local tide-gauge measurements showed no such change, a research study was set up in 1991 at Flinders University, Adelaide, with the firm belief that Tuvalu would prove to be sinking. The team replaced the tide-gauges of 12 Pacific Islands with the most modern equipment and have now been going for 13 years

All the 12 stations show no tendency for their sea level to rise in 13 years. There was a hurricane in the Pacific in 1988 which caused a depression in all of the tide-gauges. When the authors ran a linear regression, they were able

to claim a small rise since the depression caused by the 1998 hurricane. Tuvalu actually rose in 2005. The results are shown in Figure 18 (Hall 2007).
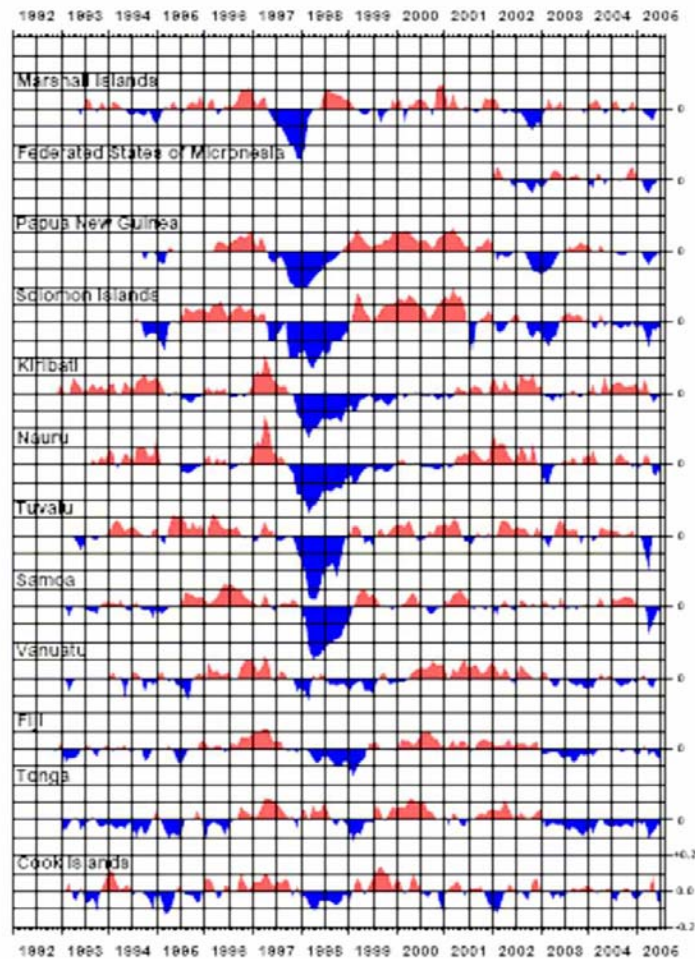

Figure 18 Sea Level records from 12 Pacific islands (Hall 2007).

2.9. SOLAR ACTIVITY

There is a long and rather confusing literature on the relationship between the activity of the sun and the climate. It is obvious to us all that our climate is ultimately dependent on the sun and it has long been known that changes in the sun are an important climate influence.

Several studies have shown a statistical correlation between solar radiation, sunspot numbers, cosmic radiation or frequency of solar flares on the "global surface temperature record". On the other hand it is argued that the actual measured changes in solar radiation or cosmic rays are insufficient to explain such effects. "Feedback" effects such as the influence on clouds, which are so frequently applied to greenhouse gases, are inadequately considered. Solar influence is difficult to disentangle from other climate influences and as it is currently unpredictable the best evidence for its importance influence has to come from an unsatisfactory correlation.

Scafetta and West (2005, 2006a, 2006b) used a "wavelet decomposition methodology" from the ACRIM total solar irradiance satellite composite of Wilson and Mordvinov. They regard this method as superior to the PMOD method which is favoured by the IPCC and which ends up finding a negligible solar influence.

Their first paper estimates that solar change may have contributed between 10 and 30% of the "global warming" shown by the "global mean surface temperature record" between 1980 and 2002.

Their reply to criticism makes the point that climate is not a linear system, so the wholesale use of linear regression equations is inappropriate.

The second paper divides the global surface temperature into four periods - 1900-2000, 1900-1950, 1950-2000 and 1980-2000 - using a sun-climate coupling model. They estimate that the sun contributed as much as 45-50% of

the 1900-2000 global warming and 25-35% of the 1980-2000 global warming, showing that the contribution is decreasing. But I would say rather that improved human comfort is the reason, not carbon dioxide emissions.

The third paper used a recent proxy temperature reconstruction and three alternative proxy solar irradiance reconstructions and their climate sensitivity model. They effectively simulate the Maunder Minimum (1645-1715) and the Dalton Minimum (1795-1825). This confirms the validity of their calculation that 50% of the global warming between 1900 and 2000 was contributed by the sun.

Abrussamatov (2005) has recently shown that the sunspot cycle is about to enter a cool phase. Figure 19 is his graph showing the variation of the sunspot number with time from 1700 to 2005 (1-11 year variation and 2- secular variation of sunspot numbers). He gives the following explanation:

"The century component also is found in variations of "solar constant". We suppose that the observable long-term identical variations of activity, radius and irradiance are a result of the same processes occurring deeply inside and are coordinated by a global variation of the entire Sun which is caused by cyclic changes of temperature in the Sun's core. As this takes place, the long-term global variations of the whole Sun can serve as the catalyst of the generation of solar cycles. We predict the approach of the following sufficiently deep minimum of activity, irradiance and radius of the 200-year cycle of the Sun near the year of 2040 ±10. The minimum will be close to the level of the Maunder Minimum".
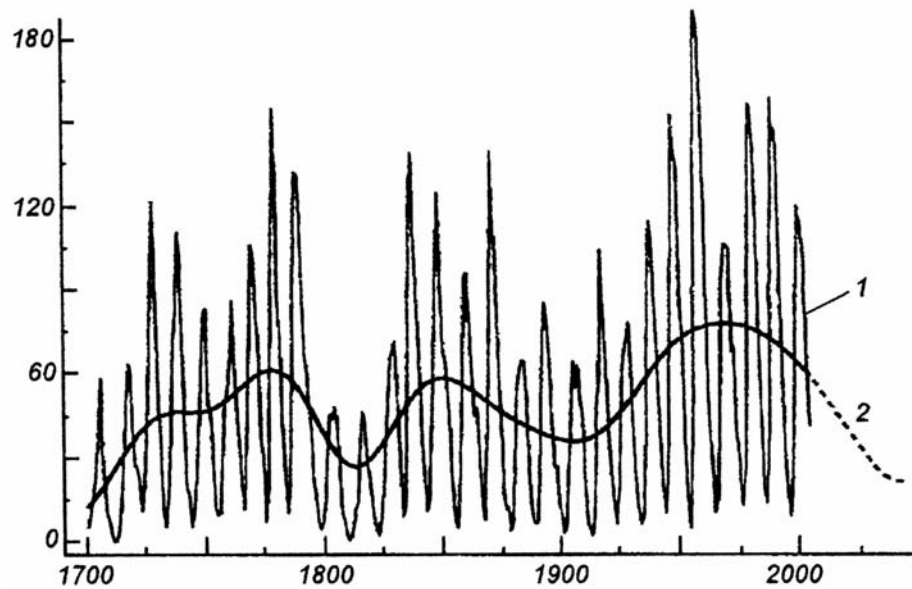

Figure 19 Record of Sunspot size (Abrussamatov 2005)

There are a number of more indirect solar influences on the climate.

Niroma (2007) identified a 60 year period in solar activity which can influence the periodicity of ocean oscillations which, in turn, influence the temperature oscillation.

A number of papers by the late Theodore Landscheidt (1988, 2000) have related the El Niño oscillation to the irregular orbit of the sun caused by the varying gravitational attractions of the four major planets. Bailey (2007) has calculated these effects to relate them to changes in climate and even to sunspots, which he claims are due to the periodic extreme disturbance of the sun's interior by external gravitation. This periodic change means a periodicity in the radiation from the sun, and even regional and hemispheric differences.

Nordemann et al. (2005) found evidence of solar activity and El Niño events in tree ring sequences in Brazil.

Soon (2005) found a relationship between solar irradiance and temperature variations in the Arctic over the past 130 years.

There are many other examples which contradict the IPCC belief that solar changes have a negligible effect on the climate.

2.6. COSMIC RAYS

There is also a long literature on cosmic rays which are thought to influence the degree of cloudiness in our atmosphere.

The recent work of Svensmark et al. (2007) is a demonstration that this particular climate influence does exist.

3. GREENHOUSE GASES

3.1 WATER VAPOUR

Tyndall (1865) showed that the chief greenhouse gas is water vapour. In order to find whether the influence of greenhouse gases is changing, it is necessary to have a record of water vapour concentrations everywhere in the earth's atmosphere for a past period. No such knowledge is possible, so no attempt to calculate its effects is possible. The attempt to study water vapour was therefore abandoned in favour of the next most important greenhouse gas, carbon dioxide. It reminds one of the story of the man who lost his wallet on a dark night and was found looking under the street lamp "because that's where the light is".

The contribution of water vapour to the total greenhouse effect is difficult to assess because the infrared absorption bands of water vapour overlap those of carbon dioxide. Kiehl and Trenberth (1997) obtain a figure of approximately 60% of the total, but provide no uncertainty figures.

The concentration of water vapour in the atmosphere is said to range between 0 and 4% but actual figures or even estimates are elusive. Humphreys (1942) gives the following
Equator   2.63%
50ºN   0.92%
70ºN   0.22%

NASA satellites have been able to measure the total water (measured in millimetres) over the entire atmosphere (Randel et al. 2004). Results for January 2003 is given in Figure 20 (Encyclopaedia of Earth 2008)
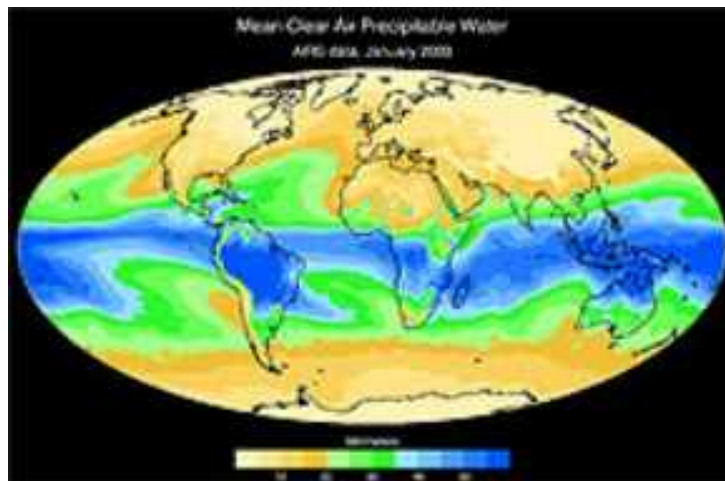
Figure 20 Total water vapour in the atmosphere for the month of January 2003, measured in mm.
High value over 50mm low to zero (Encyclopaedia of Earth 2008)

The scale ranges from zero (pale) to 50mm (blue). Most of the water vapour is over the tropics and it becomes zero over the poles. In July the concentration rises slightly over the Northern oceans, but there is little change in the South.

The very large difference in concentration of water vapour between the tropics and the poles, its variability diurnally, with the seasons, and with night and day, means that any change in its radiative influence will be very different for all these different circumstances.

The IPCC global models assume that its influence can be treated as a global "feedback" to a temperature change assuming that the influence can be regarded as uniform.

Because water vapour is so low at the poles it means that .the positive "feedback is high, so the models project a larger warming. The recent warming in the Arctic is therefore regarded as evidence for the greenhouse theory, despite the absence of warming in the Antarctic.

The IPCC conceal the very large difference between atmospheric water vapour concentration of the tropics and the poles and only publish "trends" and "anomalies" (Houghton et al. 2001, pages 146-148 and Solomon et al. 2007, pages 273-275). Figure 21, from Figure 3.20, page 372 of Solomon et al. (2007) shows monthly global anomalies and is used by them to justify their belief that the water vapour "feedback", thought to be positive, is increasing. This graph shows a remarkable resemblance to the lower troposphere temperature anomaly graphs of Figures 6 and 7. It shows that average water vapour is closely correlated with global temperature. It also shows that the lower

troposphere temperature records are correct, and that the mean global surface temperature record is upwardly biased. It also shows how the IPCC use "linear trends to conceal the truth. There was no "trend" whatsoever between 1988 and 1997, in agreement with lower troposphere temperatures. Then there was the El Niño event of 1998 which the IPCC recruit to claim an overall warming. There was another irregular warming event after 2001 which has now subsided. There is no evidence here for a steady "trend". The concealment of the very large differences in water vapour with latitude means that the "feedback" is very far from uniform.
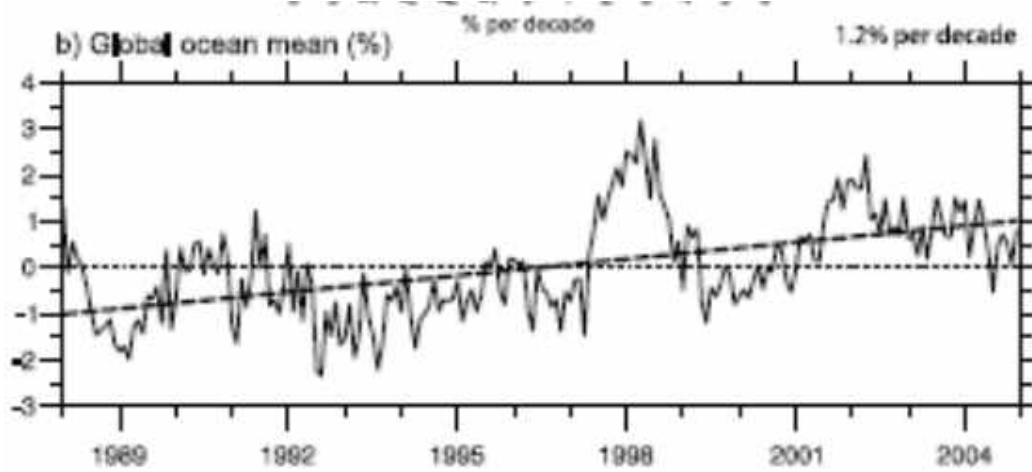

Figure 21 Plot of mean global monthly column water vapour anomalies SINCE 1987. (from Figure 3.20 of page 372 of Solomon et al 2007), showing spurious "trend".

.According to the IPCC (.Solomon et al page 832):

"The radiative effect of absorption by water vapour is roughly proportional to the logarithm of its concentration, so it is the fractional change in water vapour concentration, not the absolute change, that governs its strength as a feedback mechanism. Calculations with GCMs suggest that water vapour remains at an approximately constant fraction of its saturated value (close to unchanged relative humidity (RH)) under global-scale warming"

Although equations are given for carbon dioxide and other greenhouse gases, no equation for calculating the radiative forcing of water vapour is supplied by the IPCC.
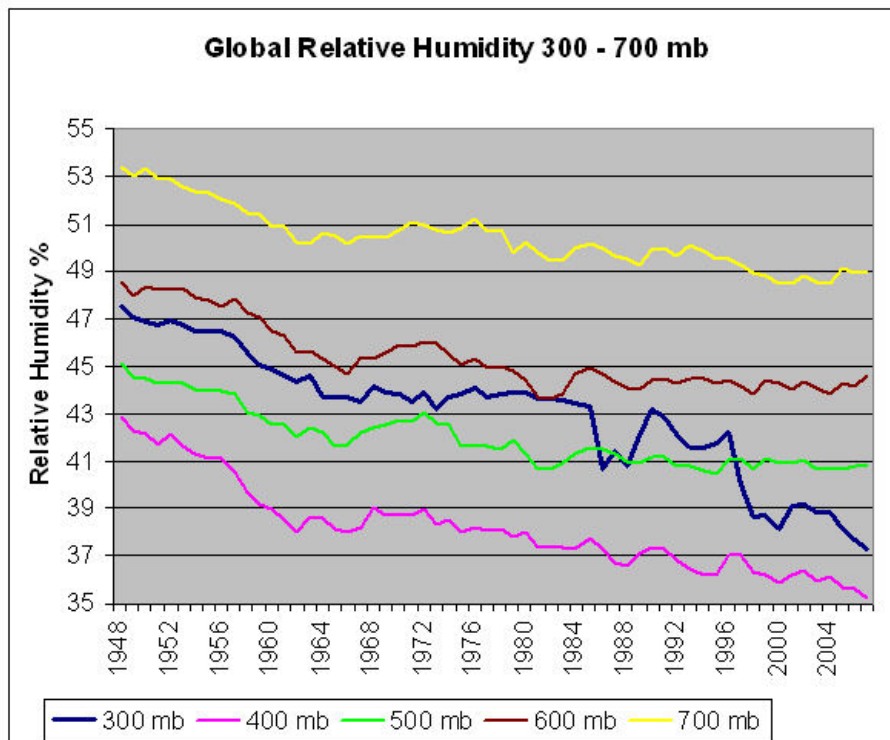

Figure 22 Global trends in relative humidity at different heights (Gregory 2007)

Gregory (2007) (Figure 22) has shown that the global relative humidity is steadily falling, whatever the IPCC likes to say. This means that water vapour is counteracting possible effects from increases in carbon dioxide.

3.2. CARBON DIOXIDE.

Climate scientists think that by tucking the problem of water vapour under the carpet as a "feedback" it then releases them to place all their emphasis on the minor greenhouse gas, carbon dioxide. They immediately run into a similar problem to water vapour, as the concentration is variable, but its variability cannot be measured.

Beck (2007) has documented some 90,000 measurements of atmospheric carbon dioxide, which have been made using chemical methods, since 1812. All of these were in respectable, peer-reviewed scientific journals and some of the authors were Nobel prize winners. They indicate that the concentration is highly variable. Trying to calculate "greenhouse forcing" from such a poorly characterised distribution is impossible. Figure 23 gives an example of atmospheric carbon dioxide measurements between 1800 and 1960 (Beck 2007)
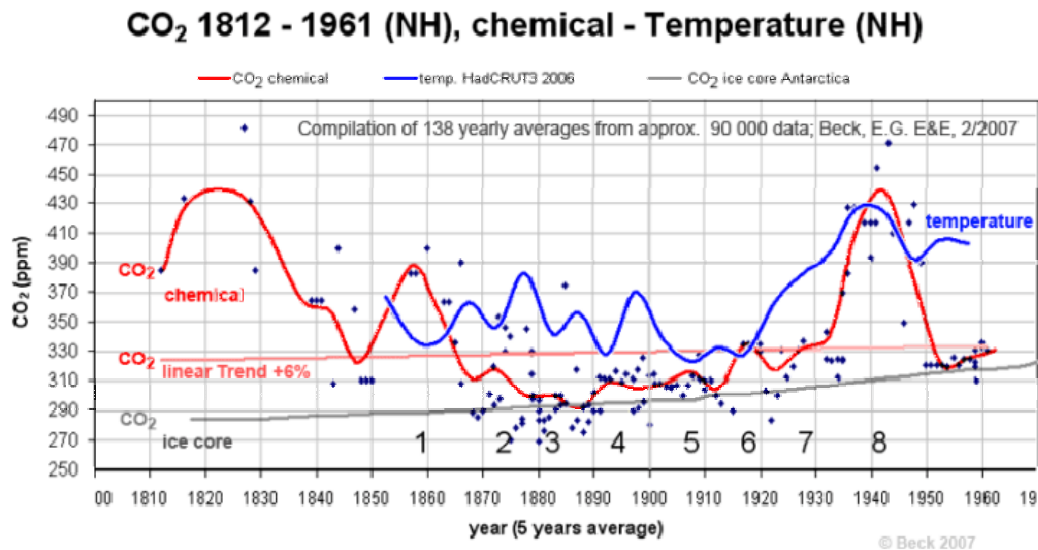
Figure 23 Atmospheric carbon dioxide measurements documented by Beck (2007)

The IPCC has chosen to suppress all observations between those of Arrhenius (1865) and 1958. Solomon et al. (2007) has a Chapter 1 entitled "Historical Overview of Climate Change Science" without mentioning the existence of all the early material. It was found by Keeling (1989) that if measurements are strictly confined to only a few marine sites, restricted to constant wind conditions, they can claim that this is a "background" figure which can be claimed to show that the gas is "well-mixed". The procedure is described by Manning et al. (1994) as follows:

"A baseline event is normally defined as one in which the local wind direction is from the South and the standard deviation of minute-by-minute CO_2 concentrations is <0.1ppm for 6 or more hours"

This means that most measurements are rejected and only a small proportion selected. The great majority of the measurements are rejected and never published. They are simply suppressed to support the impression that carbon dioxide is "well-mixed" in the atmosphere.

Hardly any measurements are made, or admitted, anywhere else, by sea or land. These measurements are claimed to be "contaminated" by "noise". "Noise" might be described as "unwelcome data". The only published measurements of carbon dioxide concentration in the atmosphere over land surfaces are from the South Pole and Wankie Peak in Bavaria. The nations of the world, who are engaged in trying to limit carbon dioxide emissions, do not know, or even want to know, whether their efforts are successful over their country. The IPCC 4th Report Solomon et al. 2007) has as its first Chapter "Historical Overview of Climate Change Science" without mentioning all this early work, which has now been publicly documented by Beck (2007).

All this suppression of information seems to have been made to cover up the fact that the concentration of carbon dioxide in the atmosphere is very far from being "well-mixed". Beck (2007) showed that the concentration of carbon dioxide in the atmosphere can vary between 280 ppmv and 400pmmv, or even more, depending on the time, place and wind direction but is highly variable (Figure 18)

The few recent measurements over land indicate that the concentration of carbon dioxide in the atmosphere tends to be higher over industrial and urban areas and lower over forests and pastures. In this way and by a process of "smoothing", "seasonally adjusting" and "annually averaging", the illusion is created that carbon dioxide

concentration in the atmosphere is a constant, so the "radiative forcing" can be calculated from its increase by use of a non linear empirical equation.

The relationship between the additional radiation at the top of the atmosphere (the radiative forcing) F, in W/sqm and the additional concentration of carbon dioxide C in parts per million by volume, over the reference level Co, is given by the formula (Houghton et al. 2001).

$$F = 5.35 \ln C/Co$$

Where *ln* is the logarithm to the base e

The actual value of F which should be based on the entire distribution of concentration values is skewed in the direction of the lower values of C, those below the arithmetical average, because of the logarithmic relationship. This means that calculation of "radiative forcing" from the supposed "constant" or "well-mixed" average can be guaranteed to give an incorrectly high figure. A scientifically acceptable value is certainly much lower.

 A recent survey (Robinson et al. 2007) has shown that increased atmospheric carbon dioxide has no adverse environmental effects.

The main evidence presented by the IPCC that carbon dioxide from combustion of fossil fuels is the cause of the measured increases of carbon dioxide in the atmosphere is the measured decreases in the ratio of the C13 isotope to the Ci4. This ratio (Delta13C) is given relative to the ratio in a standard Cretaceous geological formation in North Carolina which is 0.0112372. Ratios greater than this have a positive Delta13 X. Below it Delta13C is negative.

So-called C3 and C4 plants discriminate between the two isotopes to a different extent. The mean value of terrestrial organic matter has a Delta13C of -26%. The ratio for carbon dioxide in the atmosphere is Delta13C of -6%. Coal has Delta13C of -24.1. Petroleum is Delta13C of -26.5. and Natural Gas is 44.0 (Blasing et al 2004).

Although the situation is complicated by the recycling of carbon dioxide from the various sinks, the result of emissions of combustion from fossil fuels is a slight fall in the Delta13C of the atmosphere over time. A typical plot is as follows (Figure 20)
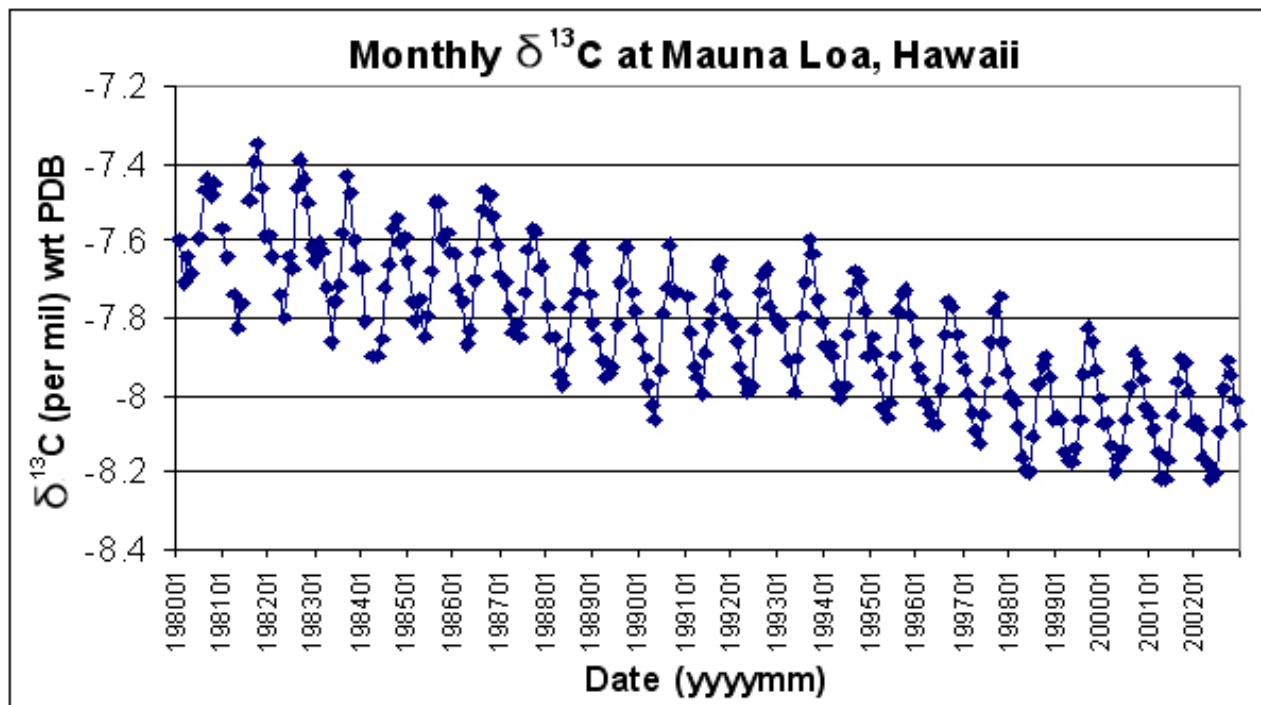
Figure 24 Variation in Delta13C ratio at Mauna Loa (Keeling et al 2004).

The seasonal variability is explained by the seasonal changes in the Northern Hemisphere, with absorption of carbon dioxide from the atmosphere by plants. Keeling et al (2004) consider that this takes from six to twelve months to happen in the Southern Hemisphere. This is prima facie evidence that carbon dioxide in the atmosphere is not "well-mixed".

Quirk (2008) has recently pointed out that there is another intermittent behaviour on these plots, Figure 24 shows no change for most of the time, with sudden jumps downwards, associated with El Niño events. Since carbon dioxide is increasing steadily, this means that for much of the period the Deta13C ratio of this batch of the

atmosphere has no decrease associated with the emissions, which must therefore come from over land surfaces, where it is displaced by the emissions. The sudden jump downwards is associated with the better nixing available. They are therefore additional evidence that carbon dioxide is not "well-mixed". Since most of the emissions come from a narrow range of latitude, they take time to change the overall Delta23C ratio of the atmosphere, and imply higher carbon dioxide concentrations in their vicinity.

The claim that carbon dioxide concentrations in the atmosphere have increased is based not only on suppression of all early measurements, but also on the claim that carbon dioxide concentrations in ice cores show lower concentrations than today.

Jaworowski (2007) has questioned these claims. He has shown that there is a small residual solubility of carbon dioxide in ice, so that the ice cores show an apparent increase over long time periods. He has also shown that the supposed steady increase shown from the Siple ice core is dependent of an arbitrary decision on how long it takes for accumulated ice ("firn") to form solid ice (Figure 25).

FIGURE 2(a) and (b)

Mother of All CO₂ Hockey Curves

Source: Adapted from Friedli et al. 1986 and Neftel et al. 1985.

Concentration of CO₂ in air bubbles from the pre-industrial ice from Siple, Antarctica (open squares), and in the 1958-1986 atmosphere a Mauna Loa, Hawaii (solid line). In (a), the original Siple data are given without assuming an 83-year-younger age of air than the age of the enclosing ice. In (b), the same data are shown after an arbitrary correction of the age of air.
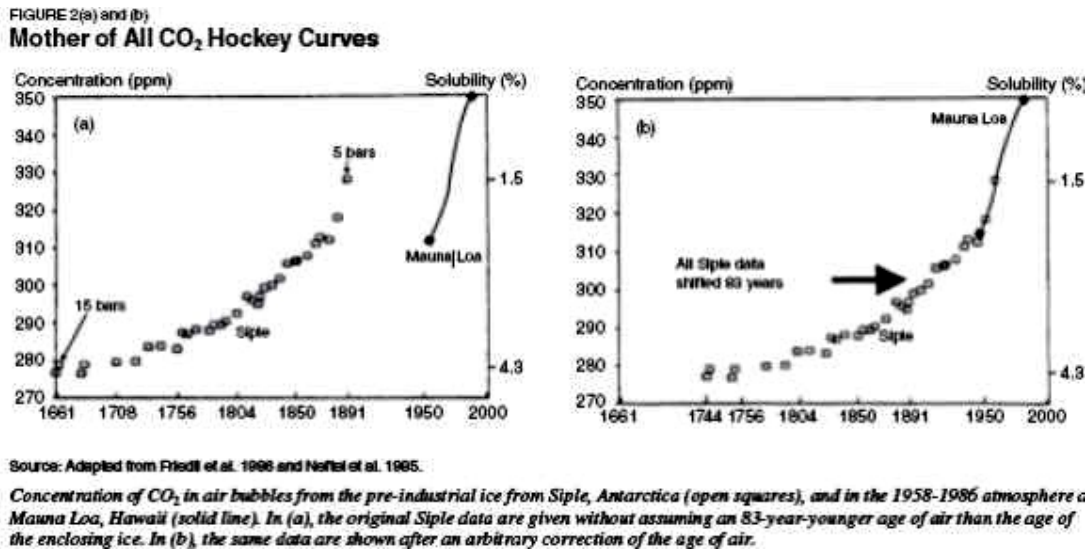
Figure 25 Siple Ice core carbon dioxide record, showing displacement of the progression to suit the arbitrary period necessary for the conversion of "firn" into ice. (Jaworowski 2007)
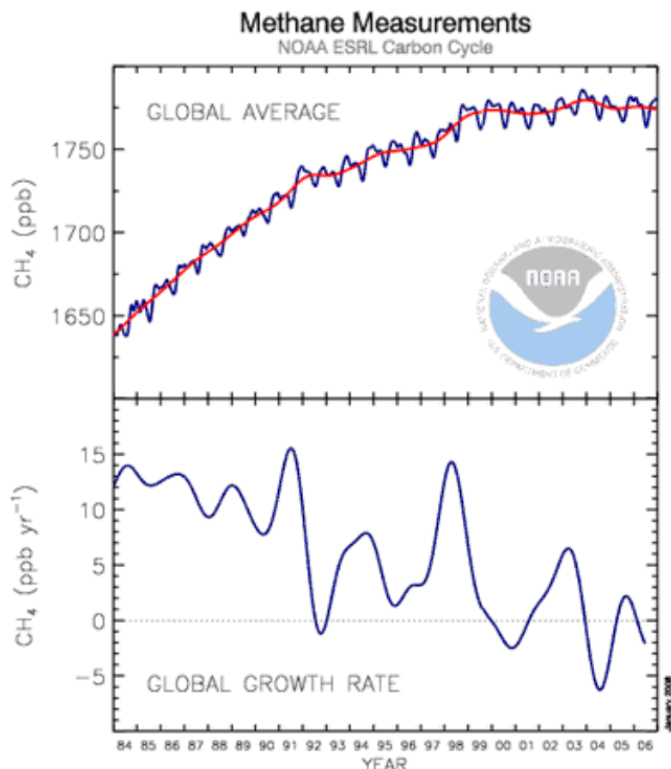

Figure 25 Annual Mean atmospheric methane concentration (parts per billion) ; NOAA 2008.

3.3 METHANE

Although methane is a "greenhouse gas" and is more powerful in that respect, it is difficult to understand why it is regarded as a target for control as it is not a product of combustion of fossil fuels and, apart from leakage from natural gas, is almost entirely a result of recycling of plant material. Methane, unlike carbon dioxide, has only a short life in the atmosphere, as it is converted to carbon dioxide. The measured concentration thus represents only recent additions. The concentration of methane in the atmosphere undoubtedly increased between 1984 and 1998 and perhaps this is one reason that it was thought to represent a source of increase in greenhouse gases but it has been at a decreasing rate, suggesting cyclic behaviour rather than a steady change. The concentration has been almost constant since 1998 and is likely to fall further than to rise.

Emissions of methane are very poorly known, partly because, as with carbon dioxide, the concentrations are only measured over the ocean, under restricted conditions. Almost all emissions are the result of recycling of atmospheric carbon dioxide. The most abundant, and the least well characterised, are the emissions from wetlands; which convert plant material back to carbon dioxide via methane. .It is possible that the decline in increase of methane may be due to the draining of wetlands, but as this is considered to be environmentally unacceptable the presumed benefits of reducing greenhouse gases are ignored.

It remains incomprehensible that farm animals, which convert carbon in grass to the relatively permanent products meat, wool and milk, are instead, penalised for the small amount of methane they recycle to the atmosphere, whereas wetlands, with emissions entirely consisting of the greenhouse gas, methane, must be prevented from doing so, but logic seems to be absent from environmental thinking.

3.3. CONCLUSION: GREENHOUSE GASES

Greenhouse gases are not "well-mixed" and the attempt to pretend that they are means that all calculations based on this assumption are unreliable.

The variability of water vapour in the atmosphere means it cannot be treated as a uniform "feedback" to climate models.

The distribution of carbon dioxide in the atmosphere is unknown, so its general or local effects cannot be assessed.

Atmospheric methane is almost exclusively the result of the recycling of plant material, and its concentration in the atmosphere is constant, and possibly falling. It is a mystery why it is thought desirable to place restrictions on it, or to penalise farm animals, who recycle greenhouse gases rather than emit them.

4. FORECASTING THE FUTURE

4.1. DISHONEST STATEMENT

The most dishonest statement in the 4th Science Report of the IPCC (Solomon et al. 2007), is to be found in the "Frequently Asked Question" on page 104:

"A common confusion between weather and climate arises when scientists are asked how they can predict climate 50 years from now when they cannot predict the weather a few weeks from now. The chaotic nature of weather makes it unpredictable beyond a few days. Projecting changes in climate (i.e., long-term average weather) due to changes in atmospheric composition or other factors is a very different and much more manageable issue. As an analogy, while it is impossible to predict the age at which any particular man will die, we can say with high confidence that the average age of death for men in industrialised countries is about 75."

This statement makes no logical sense. If "the chaotic nature" of "weather" makes it "unpredictable" then how can changing its name to "climate" suddenly make it "a more manageable issue"? The question is supposed to be about forecasting, yet we are given an example suggesting that an "average" has "high confidence" when an individual figure is not; a completely irrelevant proposition. There is no guide on how future "averages" or individual figures for the age of death might be forecast. If the suggestion that future "climate" can be forecast when future "weather" cannot were true, one might ask why weather forecasters seem to be unable to find a way of suddenly removing all the "chaos". The "analogy" is ridiculous. There is no suggestion that we can predict either the average age of death or that of an individual by any known method.

There is no evidence whatsoever that the "chaos" associated with the weather has been eliminated or made "more manageable" merely because they changed the name to "climate".

4.2. THE FLAT EARTH THEORY

The following diagram, Figure 26, (originally from Kiehl and Trenberth 1997), illustrates "frequently Asked Question No 1.1 (Page 96) in Solomon et al. (2007).
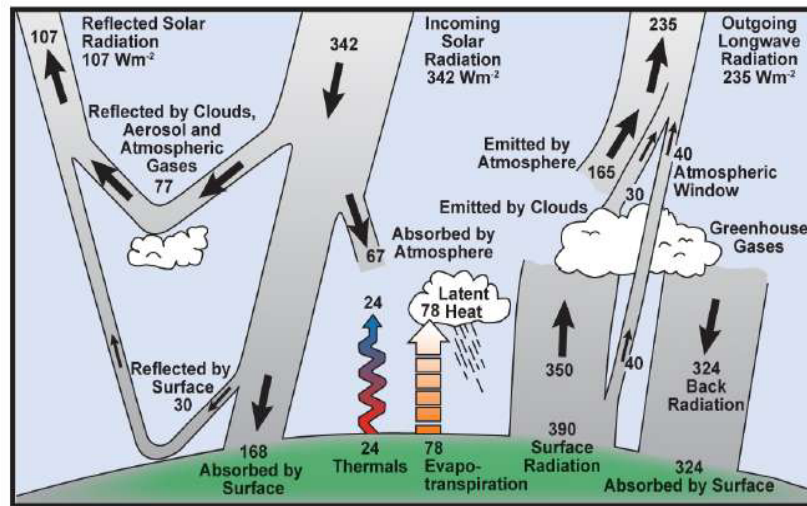
Figure 26 Earth's Annual Global Mean Energy Budget, as envisaged by Kiehl and Trenberth (1997) and published in "Climate Change 2007"

This diagram enshrines the fundamental belief of the global warming theory that the earth is in a system of energy "balance" which has been disturbed by human emissions of greenhouse gases.

The diagram assumes that the earth can be considered to be flat with average quantities providing input and output of energy. The apparent curvature of the earth in the diagram is illusory, as all quantities operate strictly up and down.

Every single one of the assumptions in this diagram is absurd.

No part of the earth ever has an energy "balance". There is excess energy in daytime and in the summer and a deficit at night and in the winter. The imbalance can change with every breath of wind, every cloud and every change of weather. The earth has a large thermal capacity, so it could possibly absorb surplus energy or lose it for very long periods. Geologists know that this has happened many times in the past. The periodicity can be short or long.

Most of the averages are either unknown or not known to a satisfactory level of accuracy. The distribution curve of each quantity is even less known. The impossibility of measuring the average temperature of the earth's surface has already been mentioned, but almost all of the others are equally unknown or uncertain. Kiehl and Trenberth (1997) claim they know the average radiative intensity of the sun, but the accuracy of current measurement is low and the future is unpredictable.

All the quantities have skewed distribution curves, making an averaging exercise impossible. The diurnal cycle, where the sun disappears at night, influences almost everything else. The diagram cannot cope with seasons, or local or regional changes. The computer models do, however, claim to provide for latitudinal differences.

Most calculations used in models have to use non-linear equations which cannot be applied to arithmetical averages, only to distribution curves which are unknown.

An example is the figure shown above for the radiant energy emitted by the earth, which is given as 390 W/sqm

If the earth is assumed to be "black body" then the radiation intensity from the earth, E, in W/sqm is related to the absolute temperature T in K by the Stefan-Boltzmann equation:

$$E = \sigma\ T^4$$

σ = 5.67x 10^{-8} W/sqm/K, is the Stefan-Boltzmann constant.

The average temperature of the earth is thought by Kiehl and Trenberth (1997) to be 288K (15ºC) (although there is no reliable evidence that this is so). If you put 288 into the Stefan-Boltzmann equation, you get 390 W/sqm., the amount shown in Figure 20. This means that Kiehl and Trenberth have assumed that the earth is an ideal black body with a constant temperature of 288K (15ºC). Such an assumption is absurd.

The average of the fourth power of the temperature is not the same as the fourth power of the average temperature. The distribution curve of T to the fourth power is skewed towards higher temperatures. The radiation from the earth is very much greater from warmer regions than from cooler ones because of the fourth power dependency, so that temperatures above average have a much greater influence than temperatures below average.

Let us assume, just as an example, that the earth can be divided into four temperature zones, 313K (40ºC) 293K (20ºC), 283 (10ºC) and 263 (-10ºC) Average 288K (15C).

The energy of emission figures from each zone, by Stefan-Boltzmann are 544.2, 417.9, 363.7 and 271.3 W/sqm; average, 399.2W/sqm., 9.2W/sqm different from using the overall average.

This error is much greater than the claimed effects of additional greenhouse gases since 1750 which are only around 1.6W/sqm.

The application to the emission equation of the highly variable albedo of different parts of the earth's surface would complicate matters still further.

Since the distribution of the various climate parameters behind the calculations in Figure 3.1 is unknown, so it is not possible to derive a scientifically acceptable estimate of total emission and absorption of energy by the earth or to study its variability or overall change.

Yet this assumption is the basis of every one of the computer climate models.

Trenberth et al. (2002) admit that there are "Inter-annual variations" in their "atmospheric heat budget" and they give details of local and temporal variability, dependent on changes in Sea Surface Temperature and ENSO events. The variability, as well as the errors, seems to frequently exceed the supposed perturbations of greenhouse gas emissions. The diagram and the models also assume other inappropriate averages, such as the supposed "well-mixed" concentrations of all the greenhouse gases, where distribution curves are actually necessary.

Fasullo and Trenberth (2008) have extended the model to cover changes in latitude and in seasons and the difference between land and ocean. It still remains an unrealistic static concept, unable to cope with the fact that half of the earth at any one time has no solar radiation at all, and that equilibrium and "balance" are never established.

There is an admission by the IPCC, from geological evidence, that energy fluctuations have been sometimes regular and sometimes irregular in the past, but it is argued that the relatively short term changes supposed to be induced by greenhouse gas emissions are unusual if not "unprecedented". Short term changes are not capable of detection on the geological scale, so there is no evidence for this belief. Short term climate changes and fluctuations obviously do happen, as a result of volcanic eruptions and ocean oscillation events as well as from changes in the sun and cosmic rays so why should changes in greenhouse gases be so different.

4.3. VALIDATION OF COMPUTER MODELS

In the face of all the insuperable difficulties it is most important that any computer model of the climate should be thoroughly tested before it can claim to represent a future climate. The process for such testing is called "validation" by computer engineers and it must involve a proven ability to forecast to a known level of accuracy all circumstances for which the model may be used. It is simply not enough to attempt to simulate the past.

The first IPCC Report (Houghton et al. 1990) had a Chapter "Validation of Computer Models". When the same title appeared in the first draft of the next Report this author (and possibly others) commented that since no computer climate model has ever been validated the word was wrong. They forthwith changed it for the next draft to "Evaluate" no less that fifty times and they have never since claimed to have validated any model. They have not even provided a discussion on how this process should be carried out.

They have also abandoned all attempts to pretend that the models are capable of forecasting future climate. They use, instead, the word "project".

So, how have the general public and many governments come to believe that these models are capable of forecasting future climate?

The answer to this is rather surprising. They seek the opinion of the very people who have been paid to produce the models and classify these opinions as various levels of "likelihood". They then apply spurious probabilities to these levels. In this way they present the opinion of "experts" with a conflict of interest as an alternative to a scientifically tested forecast.

They ensure that none of their "projections" can ever be tested by always giving "estimates" which are so far ahead that nobody alive will ever know that they are wrong. The usual period is one hundred years, but there are some for fifty years.

4.4. SIMULATION

Since validation is not made, "evaluation" has had to depend on simulating past or present climate.

The only serious attempt has been the simulation of the "mean global temperature record".

Some success has been achieved by suitable adjustment of the many little known parameters in the models and by adding even less-known effects from solar changes and volcanic events. The results will not be shown here as they can be dismissed for the reason that the most important climate influences over the period have been omitted. One of these, discussed in the first section, is urbanization and other positive biases; the other is the ocean oscillation events, particularly El Niño, which are so obviously present.

The other major attempt was to simulate the temperature distribution in the atmosphere as a function of height. As shown in Figure 27, this attempt has been a complete failure. Temperature measurements are very far from those predicted by the models.

This demonstration alone is sufficient to reject all the models so far provided as a potential guide to future climate.
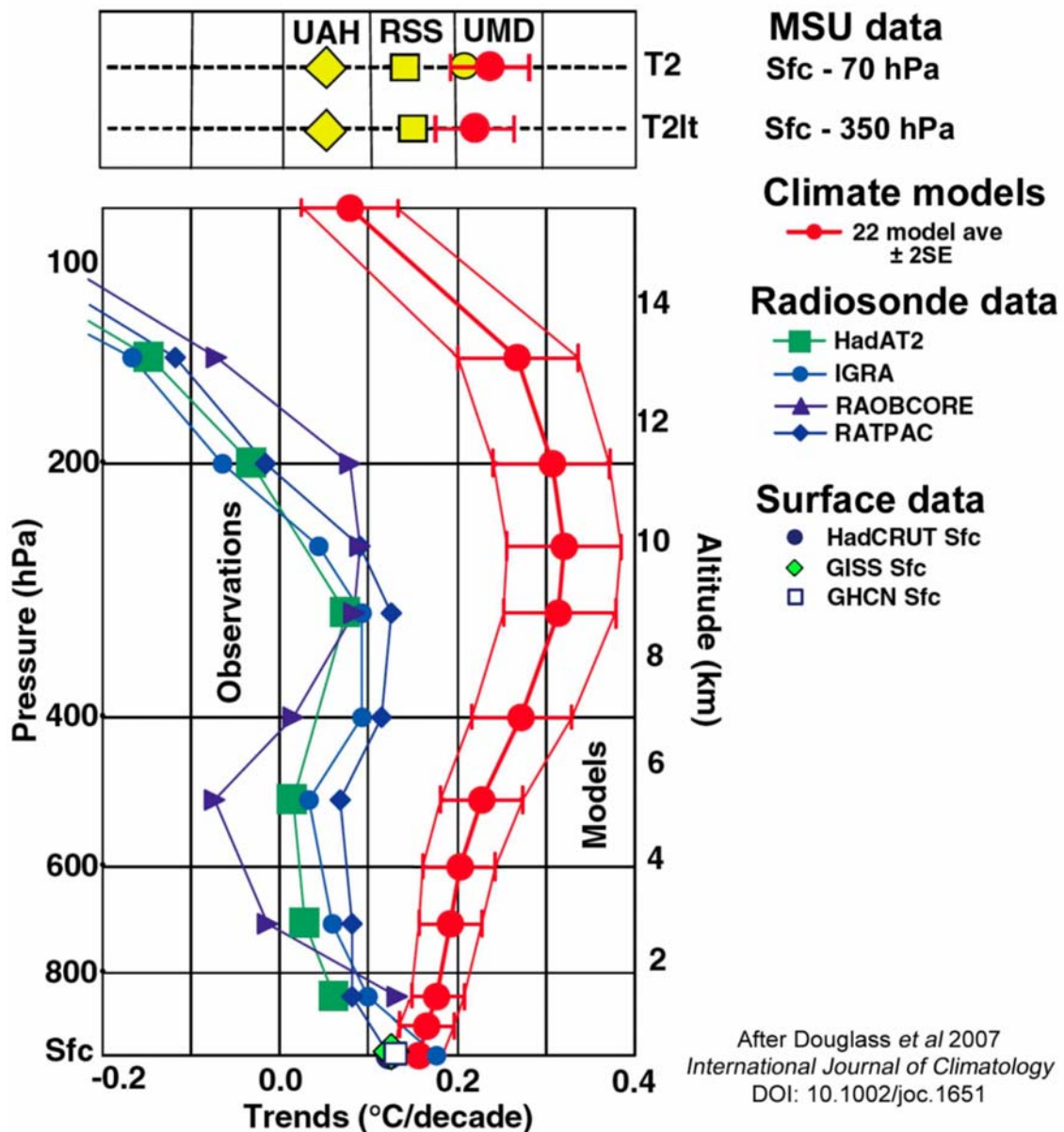

Figure 27 Comparison between model predictions and actual measurements of temperature change with height in the atmosphere (Douglass et al 2007)

4.5. CAUSE AND EFFECT

The IPCC have taken full advantage of the ignorance of the public and of many scientists, of the extent to which correlation can establish causation. Although a correlation, however convincing, does not prove a cause and effect relationship, the IPCC persistently violates this principle by calling it "Detection and Attribution", which are defined as follows in the Glossary to Solomon et al. (2007):

"**Detection and attribution**. Climate varies continually on all time scales. Detection of climate change is the process of demonstrating that climate has changed in some defined statistical sense, without providing a reason for that change. Attribution of causes of climate change is the process of establishing the most likely causes for the detected change with some defined level of confidence."

However, Solomon et al. (2007) state:

"As noted in the SAR (Houghton et al. 1996) and the TAR (Houghton et al. 2001), unequivocal attribution would require controlled experimentation with the climate system. Since that is not possible …"

So, claims that IPCC statements are "unequivocal" are not endorsed by the first volume of "Climate Change 2007".

"Attribution" therefore means that a correlation can be given a statistical probability of showing cause and effect to a level of confidence, in contrast to "correlation" which cannot.

The IPCC applies this principle by assuming that all climate sequences which remotely resemble "projections" of models possess a defined, numerical level of confidence that they represent as cause and effect.

At the present time, any climate event, whether it is a flood, drought, wildfire, heatwave, frost, or ice melt, is routinely "attributed" to "climate change" with usually high levels of "confidence" as a result of the application of this principle, which violates one of the most ancient of firm logical principles, that a correlation does not prove causation, even when it is called "attribution" or "fingerprint".

4.6. SCENARIOS

The IPCC (Nakicenovic et al. 2000) has developed several series of "Emissions Scenarios" which they combine with their "evaluated" models to provide future estimates of the behaviour of the climate.

They have, however, resolutely refused to check whether any of their scenarios actually comply with the future climate as it evolves. They even deny that this is possible:

"Since scenarios deal with the future they cannot be compared with observations." (Houghton et al. 1995)

A study I made (Gray 1998) showed that none of the early scenarios agreed with emerging reality and the later scenarios were no better (Gray 2002). They include a "projection" that the world coal industry production will increase 12.2 times by 2100 and another that the per capita income of South Africa will be four times greater than that of the USA by that date (Castles and Henderson 2003).

4.7. PREDICTIONS AND PROJECTIONS

Forecasting requires the combination of a properly validated model with a plausible and frequently updated system of futures scenarios.

The IPCC admit that they are unable to do this when they say:

"Scenarios are not predictions of the future and should not be used as such" (Houghton et al 1992).

They have, as a result, refused to make any "predictions" throughout their reports. Instead they make "projections", defined as follows (Solomon et al. 2007. Glossary):

"**Projections** are distinguished from predictions in order to emphasize that projections involve assumptions concerning, for example, future socio-economic and technological developments that may or may not be realised and are therefore subject to substantial uncertainty."

So here is an admission of the substantial uncertainty of all their "projections", which is compounded by the fact that they do not attempt to check whether any of them correspond with the actual emerging behaviour of the climate.

5 GENERAL CONCLUSION

All climate data are currently defective. Distributions are unknown, so that plausible averages do not exist. Statistical rigour has largely been abandoned, as has been recently pointed out by Wunsch et al (2009)

Studies of global and local temperature records supply no evidence of a steady increase that could be attributed to increases in human-produced greenhouse gases. Instead, the observed oscillations and fluctuations can all be explained by a combination of natural influences, such as the sun and cosmic rays, ocean oscillations, and volcanic eruptions.

Surface measurements are, however, influenced by urban and land-use changes, not evident in corrected country records, many of the more reliable local records and in the lower atmosphere.

The best statement of the reality of our current knowledge of the temperature changes of the climate was made in Chapter 1 of Houghton et al. (2001):

"The fact that the global mean temperature has increased since the late 19th century and that other trends have been observed does not necessarily mean that an anthropogenic effect on the climate has been identified. Climate has always varied on all time-scales, so the observed change may be natural."

The authors of this true statement have been punished in "Climate Change 2007" (Solomon et al. 2007), as the entire first Chapter has been replaced with a "Historical Overview of Climate Change Science", which is little more than a publicity document for the IPCC.

Computer models of the climate are all based on assumptions that the earth can be considered to be flat and influenced only by average energy components. Variability of all of these components and in the concentration of the main greenhouse gases is also assumed to be non existent, contrary to all the evidence.

No computer climate model has ever satisfactorily predicted any future climate sequence, so none are suitable for forecasting. This is even admitted by the IPCC, so they assess the value of their "projections" entirely from the opinions of those paid to develop them.

With such a conflict of interest, these assessments are worthless and should be ignored.

There are no plausible scientific arguments currently available which support the view that human greenhouse gas emissions are having a detectable influence on the climate.

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