

The Disputed Science of Global Warming

Outlining in simple terms some of the reasons why many scientists are opposed to the common beliefs about Global Warming.

Version 1.3 - 4 October 2004

Introduction

In 1988 the United Nations created an organisation, known as the Intergovernmental Panel on Climate Change (or IPCC), to report on climate and changes to climate. The claims made in the 1996 IPCC report were the basis of the Kyoto Agreement. Almost all developed countries have signed that agreement and are working towards reducing their emissions of carbon dioxide.

The general impression may be that international scientific consensus about global warming has been reached and that all scientists accept its cause and consequences, but that is certainly not the case.

About twenty thousands scientists have publicly expressed their scepticism about the statements made by the IPCC and those by supporters of the notion of global warming. These sceptical scientists argue that the claims for warming are not matched by the observations and that certain variability is a natural part of the climate. Most fundamentally they argue that there is no proof that a rise in carbon dioxide levels is the cause of rising temperatures and if this is the case, then the principles underlying the Kyoto Agreement are without foundation and the money spent to reach the proscribed emission targets will return no benefits at all.

If the Kyoto Agreement is without foundation then the introduction of alternative energy sources is also meaningless if the principal aim is to reduce emissions of carbon dioxide.

This document was created in order that readers may ask informed questions of both those who support and refute the IPCC's statements about global warming notions and, by extension, those who support or refute the Kyoto Agreement.

It contains brief discussions of the issues and then provides references for further information. In most cases those references are to the original publications and not to reports which summarise the work. The references are, unless otherwise noted, to web pages or to documents created using Adobe Acrobat, otherwise known as PDF documents. (If the mathematics or concepts in these references are beyond your understanding then try reading their conclusions first.)

Readers who wish to quickly view the most critical sections of this document should read the following sections:

Summary	for a brief over-view of the most relevant points
3	for the discussion of long-term temperatures
7-10	in which the role of carbon dioxide is discussed
13	which discusses why carbon dioxide is blamed for warming
15	research into other climatic factors

John McLean

SUMMARY

1. Any current warming of the earth is small and is probably quite normal climate variability.
2. There is no noticeable increase in the frequency of extreme weather events.
3. Talk of rising sea levels is alarmist and not supported by data.
4. Despite claims to the contrary, research shows that temperatures and carbon dioxide levels have been higher than today.
5. The current level of carbon dioxide is no cause for alarm.
6. The Kyoto Agreement will achieve very little - but neither would a greater reduction in carbon dioxide emissions.
7. An increase in the level of carbon dioxide is not the cause of global warming.
8. Computer models of climate are inaccurate - the IPCC admits this - and have no credibility; neither do reports based on those models.
9. The mechanisms which dictate the climate are still under investigation and to assign warming to specific causes is premature. Researchers have shown that sun and water vapour play a significant role but there is still much to learn.

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FURTHER READING

1. Is the earth warming?

That's doubtful. Some regional surface temperatures are rising but probably not the entire earth.

According to the IPCC, the earth warmed from 1900 to 1940, cooled from 1941 to 1965 and has warmed since that time (see graph in reference 1.1).

The IPCC bases its statements on surface temperatures or temperatures measured very near the earth's surface. They indicate a warming since 1980 but satellite-based temperature measurements, taken across all of the earth's surface, including oceans and sparsely populated areas, indicate no measurable change in the last 30 years (see reference 1.2).

One reason for the apparent change in surface temperatures may be the "Urban Heat Island" (UHI) effect by which growing towns and cities generate and trap heat as well as create obstacles to winds. Many urban weather stations are located at airports and the recordings may be influenced by the increase in air traffic since the early 1970s.

Incidentally the IPCC's so-called evidence of man's impact was based on a 1996 paper by Santer et al that claimed that the impact could be observed in rising temperatures. That paper and conclusion has been discredited by researchers who show that the period of temperature data was carefully selected and that extending that period by a few years at each end reveals no global warming (see reference 1.3).

Temperatures in the stratosphere and troposphere have changed far less than the IPCC's models indicate they should be (see reference 1.4).

References

1.1 IPCC graph at <http://www.ipcc.ch/present/graphics/2001syr/small/05.16.jpg>

1.2 "Globally-Averaged Atmospheric Temperatures" at <http://www.ghcc.msfc.nasa.gov/MSU/msusci.html>

1.3 "A Discernible Human Influence ..." at <http://www.john-daly.com/sonde.htm>

1.4 "Images from "The Greenhouse Effect and Climate Change" at <http://www.bom.gov.au/info/climate/change/gallery/47.shtml>

On this web page, the temperature in the troposphere is shown in the bottom graph. Notice that the surface temperature (in blue) has usually been higher than the troposphere temperature (in red and black) over the last 15 years and that the temperature in the troposphere has varied little from the long-term average in the last 25 years.

Also...

1.5 "How Good are the Satellite Temperatures?" at http://www.co2andclimate.org/climate/previous_issues/vol2/v2n3/feature1.htm

1.6 "The Surface Temperature Record" at <http://www.john-daly.com/graytemp/surftemp.htm>

2. But there is a "global temperature", isn't there ?

No.

The concept of a global temperature is quite false. The IPCC attempts to derive an average temperature but the measuring devices are not consistently spaced across all of the earth's surface, nor are they maintained and read with similar care.

The variations in Australian temperatures for the last 100 years from the average across 1961-1990 shows a different pattern to the IPCC's so-called global temperature variation for the same period (see references 2.1 and 2.2). If temperatures were truly global we would see rises in Australian temperatures which correspond very well with rises in the IPCC's "global temperature" but we only see generalities, sometimes shifted by several years.

Temperature changes appear to be regional. Even the IPCC acknowledges that in recent times temperatures have risen in some locations but fallen in others (see reference 2.3).

References

- 2.1 IPCC graph at <http://www.ipcc.ch/present/graphics/2001syr/small/05.16.jpg>
(for a larger image change "small" to "large")
- 2.2 "Australian Annual Mean Temperature Anomalies" at
<http://www.bom.gov.au/climate/change/amtemp.shtml>
- 2.3 IPCC graph at <http://www.ipcc.ch/present/graphics/2001syr/small/05.19.jpg>
(for a larger image change "small" to "large")

3. Aren't we are having the warmest weather for the last 2000 years?

Probably not, although it will depend on where you live.

The often-quoted IPCC graph of "global" temperatures which showed current temperatures to be the highest (see reference 3.1) has been shown to be incorrect by at least three groups of researchers (see references 3.2, 3.3 and 3.4).

The IPCC graph did not show the warm period of about 1600, the earlier cool period of about 1400 or a very warm period from about 900 to 1050 when the temperatures in Europe were several degrees warmer than today. All of these periods are described in historical documentation and therefore it is surprising that they do not appear in the IPCC's report.

Of course if the earth was warmer at these times then it follows that the earth also cooled via some natural mechanisms, but the IPCC appears reluctant to either explain that cooling or concede that it existed.

References

- 3.1 IPCC graph at <http://www.ipcc.ch/present/graphics/2001syr/large/05.16.jpg>
- 3.2 "Hockey Stick vs. Wet Noodle" at
http://www.co2andclimate.org/climate/previous_issues/vol7/v7n15/feature1.htm
- 3.3 "Lessons and Limits of Climate History: Was the 20th Century Climate Unusual" at
<http://www.marshall.org/pdf/materials/136.pdf>
- 3.4 "Corrections to the Mann et. al (1998) Proxy Data base and Northern Hemispheric Average

4 But aren't we having more extreme weather more frequently?

No.

Comparisons with past events are difficult and neither the total number of people affected or the cost of repairs is a useful guide. Population growth means that more people are impacted by any natural disaster. The increased size of houses, growth in urban infrastructure and long-term inflation combine to dramatically increase the cost of repairs. The numerical frequencies of reports of extreme events are also a poor guide because such events are now widely reported due to increased awareness and interest.

Canadian and European statistical research has shown that extreme weather conditions are becoming less common, not more common (see references 4.1, 4.2 and 4.3) and in Australia, the annual number of tropical cyclones appears to be decreasing (see reference 4.4). The number of hurricanes in Florida this year may be the highest in recent decades but it is only a return to the frequency that was common from 1920 to 1960.

The IPCC admits that there is no evidence to claim that extreme weather has become more common.

One Canadian analysis even suggests that the number of extreme weather events may be cyclic (see references 4.5 and 4.6).

The heat wave in Europe in the summer of 2003 was caused by a stationary region of high pressure in the Atlantic, the same factor which caused similar heatwaves in 1947, 1959, 1976, 1983 and 1995. The major floods in Germany during August 2002 were caused by a jet stream in the upper atmosphere moving from its usual location in the north Atlantic and sweeping in a circle that took it across western Europe. No connection with either global warming or increased levels of carbon dioxide can be established for either of these recent extreme weather events.

References

- 4.1 "MYTH #5 - 'Extreme Weather Events are Expected to be More Common if the World Warms. This Has Already Started - Drought, Floods, Forest Fires, etc. are on the Rise as a Result of Our Greenhouse Gas Emissions.'" at <http://www.envirotruth.org/myth5.cfm>
- 4.2 "No upward trends in the occurrence of extreme floods in central Europe" at <http://www.uni-leipzig.de/~meteo/MUDELSEE/publ/pdf/flood.pdf>
- 4.3 "Floods in Central Europe Since 1300" at http://www.ccma.csic.es/dpts/suelos/hidro/images/chapter_14_phefra.pdf
- 4.4 "Images from 'The Greenhouse Effect and Climate Change'" at <http://www.bom.gov.au/info/climate/change/gallery/49.shtml>
- 4.5 "Figure 7." at http://www.msc-smc.ec.gc.ca/education/scienceofclimatechange/understanding/ccd/ccd_9801/sections/image-7_large_e.html
- 4.6 "Trends and Changes in Extreme Weather Events" at <http://www3.gov.ab.ca/env/climate/docs/TrendsAndChangesInExtremeWeatherEvents-April2003.pdf>

5. Sea-levels are rising though, and threaten many islands?

They are probably rising by fractions of a millimetre per year.

Researchers have found that sea levels are almost unchanged around the world.

The IPCC report of 2001 contained a graph showing very small changes in sea levels at 3 locations over a period of two hundred years (see reference 5.1). The same IPCC presented graphs showing rising temperature between 1900 and 1940 but no correlation could be made against change in sea levels.

In Australia, the National Tidal Facility produced a report into its 1998 study of sea level changes. That report stated "The results demonstrate that the overall average of the relative sea level trends is +0.3 mm per year, somewhat less than the IPCC estimated global average of 1-2 mm per year (IPCC, 1995)" (see reference 5.2).

In other instances of sea levels not rising in accordance with the IPCC's predictions, a groove cut into rock in Tasmania in 1840 to indicate average sea level is now above the water level (see reference 5.3) and sea levels around the Maldives are falling and not rising as some people have claimed (see references 5.4 and 5.5).

As a general rule caution must be used in regard to any claim about changing sea levels because geologists report that land masses are shifting very very slightly, some tilting and others rising or falling. Rather than the sea level rising, it may be that the land is sinking.

References

- 5.1 IPCC graph at <http://www.ipcc.ch/present/graphics/2001syr/small/04.17.jpg> (for a larger image change "small" to "large")
- 5.2 "Australian Mean Sea Level Survey" at <http://www.ntf.flinders.edu.au/TEXT/PRJS/BASE/meansea.html>
- 5.3 "Tasmanian Sea Levels: The 'Isle of the Dead' Revisited" at <http://www.john-daly.com/deadisle/index.htm>
- 5.4 "Global Warming and Sea Level Rise" at <http://www.ff.org/centers/csspp/pdf/13-CSPP-gwandsealevelrise.pdf>
- 5.5 "Don't Cry for Them: Maldives Islands are OK" at <http://mitosyfraudes.8k.com/Ingles3/Maldivas.html>

6. But what about carbon dioxide levels, aren't they the highest ever ?

No, probably not.

Our current carbon dioxide levels are about 385 parts per million by volume (ppmv) compared to a level of about 280ppmv in pre-industrial times. At least one researcher has shown that carbon dioxide levels are rising in proportion to global population growth but a definite causal link is yet to be established.

Despite the recent increase there are good reasons to believe that these levels were exceeded in the last 150 years and certainly in the last 50,000 years.

Firstly, a graph of mean value of atmospheric carbon dioxide measured in Europe, North America and Peru shows that in the period 1820 to 1880 levels between 350ppmv and 550 ppmv were relatively common place (see figure 2 of reference 6.1).

Secondly there are a number of reasons to doubt the accuracy of the measurement of the levels of carbon dioxide in the air bubbles in ice cores.

The first concern is the possible creation of calthrates in the ice (see references 6.1 and 6.2). Calthrates are formed by a chemical reaction which involves carbon dioxide and this reaction will therefore reduce the level of gas in the air bubbles. The common practice of crushing the ice to extract the air in the bubbles reportedly produces lower levels of carbon dioxide than does melting the ice to extract all the gases.

The second concern is that some results of analysis have been selectively omitted or manipulated. It is reported that researchers have been known to omit results that they believe are erroneous - supposedly in one case 43% of samples were rejected - and that the dating of the ice samples has been arbitrarily aligned with recent levels of carbon dioxide recorded by instruments. (see references 6.1 and part 5 of 6.2)

The third problem is that the date of the carbon dioxide levels is determined by finding the *average* age of another gas in that same air bubble trapped in the ice. These points are typically 40 to 120 metres above the ice of the same age and this vertical separation can represent several thousand years. Researchers cannot accurately determine the number of years used in the averaging, the respective gas concentrations in those years or how well the gases from each year were mixed. Was the concentration of carbon dioxide low in one year and high in another year within this period? We just don't know.

Working from another basis, the structure of ancient leaves, another research project has established that in the early Holocene period (i.e. about 10,000 years ago) carbon dioxide levels of about 360ppmv (i.e. very similar to today's level) were quite common and that levels of over 300ppmv "could have been the rule rather than the exception" (see reference 6.3) .

References

- 6.1 "Climate Change: Incorrect information on pre-industrial CO₂ " at <http://www.warwickhughes.com/icecore/>
- 6.2 "Carbon cycle modelling and the residence time of natural and anthropogenic atmospheric CO₂: on the construction of the "Greenhouse Effect Global Warming" dogma." at <http://folk.uio.no/tomvs/esef/ESEF3VO2.htm>
- 6.3 "Century-Scale Shifts in Early Holocene Atmospheric CO₂ Concentration" at <http://www.bio.uu.nl/~palaeo/Personeel/PDF/ScienceRike.pdf>

7. Carbon dioxide is the most significant greenhouse gas, isn't it?

No.

Water vapour is the most common and most significant greenhouse gas. It makes up about 3% of the atmosphere compared to carbon dioxide's 0.03% and it absorbs more radiant heat than carbon dioxide. Together these make water vapour at least 200 times more significant than carbon dioxide (see references 7.1, 7.2 and 7.3).

Interestingly the amount of water vapour in the air varies between about 1.5% and 3.5% and while concern is expressed about a 35% increase in the level of carbon dioxide, no-one pays attention to a 133% increase in the level of water vapour.

More than 95% of water vapour occurs naturally and it is often ignored in reports of global warming. Some climatologists who acknowledge that water vapour is the most important factor say that we should be addressing carbon dioxide because it is something that we can actively reduce, but their arguments are largely pointless when water vapour has such a dominant effect.

References

- 7.1 "Global Warming: A closer look at the numbers" at http://www.clearlight.com/~mhieb/WVFossils/greenhouse_data.html
- 7.2 "The Kyoto Protocol and Global Warming" at <http://www.lavoisier.com.au/papers/articles/Baliunas.pdf>
- 7.3 "Images from 'The Greenhouse Effect and Climate Change'" at <http://www.bom.gov.au/info/climate/change/gallery/4.shtml>

8. Does that mean that Man's carbon dioxide does very little?

That's correct if we are talking of warming.

Carbon dioxide is created naturally by decaying vegetation, by release from the oceans and from a variety of lesser sources such as volcanoes. It is absorbed naturally by living vegetation and the oceans.

Carbon dioxide levels in the atmosphere increase when more of the gas is created than can be absorbed. Anthropogenic (i.e. "man-made") carbon dioxide has increased in line with the increase in global population and it appears that the natural world is unable to absorb this additional gas.

But is this contributing to global warming?

Each year the natural emissions of carbon dioxide are far greater than the anthropogenic emissions and many researchers accept that anthropogenic emissions are only about 3% of the total. Given that current levels of carbon dioxide might contribute about 3% of the total warming (see reference 8.1 and 8.2), the anthropogenic carbon dioxide contribution to total warming is, at most, about 0.1%, or in other words, one one-thousandth.

References

- 8.1 "Global Warming: A closer look at the numbers" at http://www.clearlight.com/~mhieb/WVFossils/greenhouse_data.html
- 8.2 "Are observed changes in the concentration of carbon dioxide in the atmosphere really dangerous?" at http://www.cspg.org/deFreitas_climate.pdf

9. The Kyoto Agreement will have very little effect, won't it?

That's right.

The current level of carbon dioxide is about 385ppmv, which is about 100ppmv above pre-industrial levels. The Kyoto Agreement requires that developed nations reduce their carbon dioxide levels to 1990 levels but developing nations have no such constraints and can increase their emissions.

If we assume that the Kyoto Agreement will produce a 10% reduction in anthropogenic carbon dioxide then, based on the information in section 8, we will have addressed just one ten-thousandth of the total contribution to global warming.

Global warming sceptic, S Fred Singer says that the Kyoto Agreement would reduce the IPCC's calculated temperature rise by just 0.05C degrees (see reference 9.1). Another researcher, Sallie Baliunas, claims the reduction would be 0.06C degrees (see reference 9.2).

It is clear that the costs of complying with the Kyoto Agreement will be substantial and produce no

discernible benefit.

Mind you, all of these calculations are based on the generally accepted knowledge of carbon dioxide's ability to absorb heat and cause warming but this appears to be based on faulty research. The best we can say is that reducing the levels of carbon dioxide might cause a slight reduction in temperature.

References

- 9.1 "The Kyoto Protocol:A Post-Mortem" at <http://www.lavoisier.com.au/papers/articles/TheKyotoProtocol.pdf>
- 9.2 "The Kyoto Protocol and Global Warming" at <http://www.lavoisier.com.au/papers/articles/Baliunas.pdf>

10. Why you you say that reducing carbon dioxide *might* reduce temperatures?

It is still disputed whether carbon dioxide plays any part in global warming at all.

There are several sources that indicate that a rise in the level of carbon dioxide is caused by a rise in temperature and not the other way around. In the following extracts the underlining has been added to highlight these comments.

"Together these interannual modes exhibit a mean lag between tropical SSTs [sea surface temperatures] and CO2 variations of about 6-8 month, with SST leading." - Dettinger and Ghil (1997), (see reference 10.1)

"Combining this uncertainty with the uncertainty introduced by ice accumulation (800 x 0.2, i.e., 160 years), we obtain an overall uncertainty of ± 200 years, indicating that the increase in CO2 lags Antarctic warming by 800 ± 200 years, ..." - Nicolas Caillon et al (see reference 10.2). (This report goes on to say that recent warming is due to carbon dioxide but fails to provide good explanation of why they believe the sequence is now reversed.)

"CONCLUSIONS 1) There exist no or only weak correlations between surface temperature and atmospheric CO2 concentration. These data are inconsistent [sic] with the hypothesis that carbon dioxide concentration is the sole, or even a major, contributor to the increase in surface temperature. 2.) There appears to be a lag of 45 – 60 years between the increase in surface temperature and the increase of carbon dioxide concentration, with the temperature leading the CO2. These data are consistent [sic] with (but do not prove) the hypothesis of increased temperature driving the increase in atmospheric carbon dioxide." - Karl Glaser (see reference 10.3)

If sea temperatures do rise some of the dissolved carbon dioxide will be released from the water in a natural process.

"If we assume that the whole ocean (mean depth 3795 m) is in equilibrium with the atmosphere, a one degree celsius global warming will increase the atmospheric carbon dioxide concentration by 28 ppm." - Dr Jarl Ahlbeck (see reference 10.5).

If this is correct, and it certainly appears to be, according to the IPCC's arguments the carbon dioxide released from the oceans would cause more warming and this would cause an even greater release of carbon dioxide. Vegetation would decay from the increased heat and even more carbon dioxide would be released. The world would cook in its own gas.

As we saw earlier, temperatures have risen and fallen over thousands, even millions, of years. Scientists accept that carbon dioxide levels were far higher back in the time of the dinosaurs and obviously the world did not over-heat them. Nor is it now.

Current temperatures and levels of carbon dioxide neither confirm or deny this hypothesis of rising temperatures causing an increase in carbon dioxide because it is difficult to extract anthropogenic carbon dioxide from natural levels. What we can say is that temperatures have not risen in accordance with increases in carbon dioxide.

According to the IPCC, temperatures rose between 1900 and 1940, when carbon dioxide levels were almost constant. Temperatures fell gradually until about 1960 but carbon dioxide levels increased slightly in this same period. More recently temperatures are showing very little change while carbon dioxide levels have risen sharply (see reference 10.4).

If an increase in atmospheric carbon dioxide caused a rise in temperature then we would see a far better correlation of the changes.

References

- 10.1 "Seasonal and interannual variations of atmospheric CO₂ and climate" at <http://tenaya.ucsd.edu/~dettinge/co2.pdf>
- 10.2 "Timing of Atmospheric CO₂ and Antarctic Temperature Changes Across Termination III" at <http://icebubbles.ucsd.edu/CaillonTermIII.pdf>.
- 10.3 "Global Warming: Correlation Between Atmospheric Carbon Dioxide Concentration and Temperature" at <http://www.wuss.org/Conference/papers/DA09.pdf>
- 10.4 Carbon dioxide at <http://www.bom.gov.au/info/climate/change/gallery/25.shtml> and Temperature at <http://www.bom.gov.au/info/climate/change/gallery/40.shtml>
- 10.5 "Increase of the Atmospheric Carbon Dioxide Concentration due to Ocean Warming" at <http://www.john-daly.com/oceanco2/oceanco2.htm>.
- 10.6 "The Mysteries of Carbon Dioxide" at http://www.co2andclimate.org/climate/previous_issues/vol4/v4n15/cutting1.htm
- 10.7 "MYTH #3: The Buildup of Human Induced Greenhouse Gases, and Carbon Dioxide (CO₂) in Particular, Will Cause a Catastrophic Planetary Warming." at <http://www.envirotruth.org/myth3.cfm>

11. But everyone says that increasing carbon dioxide causes warming...

It causes only a negligible amount of warming.

Popular knowledge is based on work by Svante Arrhenius, a Swedish scientist whose theories about carbon dioxide are mentioned by many reports on global warming. Arrhenius estimated that a doubling of carbon dioxide in the atmosphere would raise temperatures 5 degrees C. In 1906 he changed his mind and, without explanation, said that the increase would be about 4 degrees (see reference 11.1).

According to modern science Arrhenius used incorrect data when determining carbon dioxide's absorption of heat in the infra-red part of the spectrum. Carbon dioxide does not absorb heat in the used infra-red range and Arrhenius inadvertently used data based on the absorption by water vapour. In other words, his numeric calculations on the influence of carbon dioxide on climate are based on infra-red absorption data that contains no carbon dioxide!

When the correct data is applied to the formulas of Arrhenius we find that a doubling of carbon dioxide will raise temperature by about 0.22 degrees (see reference 11.2).

The level of carbon dioxide prior to about 1800 is believed to be around 280 ppmv (which some sources regard as an under-estimate) and that level is now about 380 ppmv. The increase is about 35% and since this is a long way short of double, it follows that this increase could have caused less than 0.1 degrees of warming.

The earth has both warmed and cooled at various times in the last 200 years and it is clear that something other than carbon dioxide must be driving those changes.

References

- 11.1 "Global Warming Comments" at <http://hanserren.cwhoutwijk.nl/co2/index.html>
- 11.2 "Arrhenius was wrong..." at <http://hanserren.cwhoutwijk.nl/co2/arrhrev.htm>

12. But isn't an increase in carbon dioxide dangerous?

No, probably not.

Carbon dioxide is essential for plants and so an increase in its level is like a good fertiliser.

US research has suggested that rising carbon dioxide levels have improved the production of corn (see reference 12.1 and 12.2) but perhaps other factors such as fertilisers have also played a part. Other research has also shown the benefit of increased carbon dioxide (see reference 12.3).

This fertilisation of plants has a flow-on effect on the food chain because it means increased food for animals and humans and far from being dangerous, an increase in the level of carbon dioxide could be very beneficial.

If carbon dioxide has no discernible role in global warming and is beneficial for plants, then the reductions demanded by the Kyoto Agreement will work to the disadvantage of humanity and not its advantage, and that is even without considering the costs of compliance.

References

- 12.1 "Climate Corn-ography" at http://www.co2andclimate.org/climate/previous_issues/vol5/v5n20/hot1.htm
- 12.2 "Increasing carbon dioxide relieves drought stress in corn, researchers say" at <http://www.news.uiuc.edu/scitips/03/0725corn.html>
- 12.3 "Carbon Dioxide is Good for the Environment" at <http://www.nationalcenter.org/NPA334.html>

Also...

- 12.4 page 6 of "Environmental Effects of Increased Atmospheric Carbon Dioxide" at http://www.gps.caltech.edu/classes/ese148a/marshall_institute.pdf

13. So why is carbon dioxide blamed for the warming?

That is because scientists understood it better than other climatic factors.

Carbon dioxide was identified in the late 18th century and since that time has been studied very closely and its behaviour under different conditions is understood quite well. At least that was the assumption before the

research of Arrhenius was examined (see section 11).

The IPCC's mathematical models included plenty of information about carbon dioxide but far less about other climatic factors which had to be modelled crudely and with many assumptions.

The 2001 IPCC report acknowledges that knowledge of carbon dioxide was rated as "high", knowledge of ozone was rated as "medium", knowledge of sulphates as rated as "low" and the level of knowledge for eight other factors was "very low" (see reference 13.1).

It is no surprise that the output from these mathematical models of climate was found to be very dependent on the levels of carbon dioxide and it is no wonder that carbon dioxide was accused as being the driving force for any climate change.

In July of this year (2004) the IPCC held a workshop to discuss climate sensitivity to various factors and how the accuracy of models might be improved (see reference 13.2). This workshop was held several years after carbon dioxide was declared to be responsible for global warming and after extensive press and media coverage of this finding, so will a public admission be made if other factors are found to have a greater influence?

References

- 13.1 IPCC graph at <http://www.ipcc.ch/present/graphics/2001syr/small/06.01.jpg>
(If you would like a larger image change "small" to "large")
- 13.2 "IPCC Working Group 1 Workshop on Climate Sensitivity" at http://ipcc-wg1.ucar.edu/meeting/CSW/background/CSW_Program.pdf

14. But aren't the computer models generally correct?

No, not according to the evidence.

Mathematical models are already used to predict weather conditions a few days into the future but they are often wrong (see reference 14.1). If the long term climate models operate in a similar manner then there is little chance of accuracy.

The IPCC models have predicted that temperatures in 2100 would be between about 1.5 and 5.8 degrees warmer than today, or to put it another way, 3.6 degrees plus or minus 60%. This is an enormous difference in climatic terms and it would demand vastly different responses between those upper and lower limits. Accuracy is critical but is not being delivered.

As we saw in in section 13, these mathematical models do not properly model the action and influence of clouds, solar radiation and about five other known climatic factors because they are not properly understood. This lack of knowledge was acknowledged in the IPCC's 2001 report and has been supported more recently by a research paper (see reference 14.2) which claims that mathematical models of climate are accurate but admits that less than 20% of climate modellers believed that clouds were modelled well and only 30% believed that water vapour was modeled well.

The IPCC models predicted the temperatures for 2100 based on a lower concentration of carbon dioxide than exists today so, according to their general thinking on carbon dioxide and warming, the current levels of carbon dioxide should be already creating much higher temperatures than those being observed.

It is not only surface temperatures that contradicting the IPCC's climate models because there is little change in tropospheric and stratospheric temperatures when the IPCC indicates that cooling should be occurring (see reference 14.3).

This is only a brief summary of the major faults with these climate models. More information is available in the form of a scorecard of the models' prediction v. observations to date (see reference 14.4).

Computer programmers acknowledge that poor input data causes poor results in their saying "Garbage in, garbage out". In the case of climate models we can add that poor instructions within a computer program can cause the same "garbage out".

It is very clear that statements about past, present or future climates based on the output of computer models should be regarded with extreme scepticism.

References

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 - 14.3 Images from "The Greenhouse Effect and Climate Change" at <http://www.bom.gov.au/info/climate/change/gallery/47.shtml>
 - 14.4 Scorecard of prediction versus observations at <http://www.warwickhughes.com/hoyt/scorecard.htm>
- also
- 14.5 "Desperate Measures to Support a Dying Paradigm" at http://www.co2andclimate.org/climate/previous_issues/vol4/v4n15/feature1.htm

15. If it is not carbon dioxide that causes warming, then what does?

Research is continuing into many possible factors.

Some researchers regard water vapour as a significant cause of global warming. One team has suggested that condensation trails from aircraft can account for all the recent warming in the USA (see references 15.1, 15.2 and 15.3). High clouds are believed to trap heat and add to warming while low altitude clouds reflect heat and have a cooling effect but research is continuing to confirm this and to add details because thorough understanding of these actions is essential if they are to be properly modelled (see references 15.4 and 15.5).

Many countries with a long-term rise in mean temperatures have seen minimum temperatures rise more than maximum temperatures and it is the rising minimum that have increased the mean value. There is some evidence to suggest that increased cloud is to blame but again more research is required before we can properly understand the processes and model them.

Other researchers claim that the sun is to blame. Recent research has shown that the sun may influence our climate through cosmic rays, solar winds, magnetic fields and solar intensity (see reference 15.6, 15.7, 15.8 and 15.9). Many point to the correlation between peaks in sun spot activity and the occurrence of El Nino (see references 15.10 and 15.11) and suggest that the El Nino can influence Atlantic temperatures. Others show correlations between average temperatures and the length of the solar cycle (see reference 15.12). One UK company is successfully predicting weather based on emissions of solar particles.

In general our knowledge of the sun is still quite low and this needs to improve if we are to properly understand its influence on the earth's climate.

As with many aspects of climate, various factors sometimes work together to enhance some affect. A

correlation between solar activity and the amount of naturally produced carbon dioxide has been shown (see reference 15.13) and a possible correlation between cloud cover and cosmic rays has also been proposed (see reference 15.14), along with an interaction between solar winds and clouds (see reference 15.15).

Another writer has shown a link between sun-spot activity and the position of planets relative to the sun (see reference 15.16). The apparent link between sun-spots and El Nino (as mentioned above) makes this an intriguing notion.

Climate research is ongoing and much is still to be learned about the processes. We are still a long way from definitive statements about the influence and operation of the many possible factors and it is clear that any assertive statements about current and future climates should be regarded with scepticism.

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- 15.3 "Contrails and Aviation-induced Cirrus Clouds - Relation with Temperature (02)" at <http://www.contrails.nl/contrails%20research/Contrails%20Temperature%2002.htm>
- 15.4 "Do Clouds Warm or Cool the Climate?" at <http://www-das.uwyo.edu/~geerts/cwx/notes/chap09/rossow.html>
- 15.5 "Global Climate Change: Clouds and Climate" at <http://www.dnr.state.mo.us/energy/cc/cc3.htm>
- 15.6 "Geophysical, archaeological, and historical evidence support a solar-output model for climate change" at <http://www.pnas.org/cgi/reprint/97/23/12433.pdf>
- 15.7 "Solar activity over the last 1150 years: does it correlate with climate?" at http://www.hs.uni-hamburg.de/cs13/day1/03_Solanki.ppt (Powerpoint presentation)
- 15.8 "Sunspot activity hits 1,000-year high" at <http://www.swissinfo.org/sen/Swissinfo.html?siteSect=511&sid=5080155>
- 15.9 "The Milky Way and the Clouds of Earth" at http://www.co2andclimate.org/climate/previous_issues/vol3/v3n15/cutting1.htm
- 15.10 "Solar Activity Controls El Niño and La Niña" at <http://www.john-daly.com/sun-enso/sun-enso.htm>
- 15.11 "New ENSO Forecasts Based on Solar Model" at <http://www.john-daly.com/theodor/new-enso.htm>
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- 15.15 "Atmospheric Ionization and Clouds as Links Between Solar Activity and Climate" at http://www.utdallas.edu/dept/physics/Faculty/tinsley/Atmos_060302.pdf
- 15.16 "The 'Solar Jerk', The King-Hele Cycle, and the Challenge to Climate Science" at

16. What do scientists think of the Kyoto Agreement and the IPCC report on which it is based?

Many do not agree with the science and support is far less strong than some claim.

The IPCC report was signed by 2000 scientist of whom only about 100 are regarded as climatologists (see reference 16.1). In contrast about 18,000 scientists, among them about 2500 people who are meteorologists, climatologists, physicists, geophysicists, oceanographers or environmental scientists, have signed a document opposing Kyoto (see reference 16.2).

Some writers have extracted a few names and claimed them to be false because they are the same as well-known personalities but that is a red herring because someone, or several people, probably share your name. It would required detailed investigation before those 6 or 8 names can be considered false, and even then that would leave over 17,990 names on the document.

A list of 42 experts in relevant fields who oppose the science underlying the Kyoto Agreement is also available (see reference 16.3).

In June 2003 a group of 46 international scientists wrote to the Canadian Prime Minister, Paul Martin, to advise him that rigorous scientific examination of the basis for the Kyoto Accord should be undertaken (see reference 16.4). Fifty percent of this group were climatologists and the others had a mixture of backgrounds in physics, meteorology, environmental sciences, geography and mathematics.

But these comments about the lack of consensus are mere background because scientific matters are never settled by voting.

Author Michael Crichton made the situation clear in an address in January 2003 (see reference 16.5).

He said "Let's be clear: the work of science has nothing whatever to do with consensus. Consensus is the business of politics. Science, on the contrary, requires only one investigator who happens to be right, which means that he or she has results that are verifiable by reference to the real world. In science consensus is irrelevant. What is relevant is reproducible results. The greatest scientists in history are great precisely because they broke with the consensus.

"There is no such thing as consensus science. If it's consensus, it isn't science. If it's science, it isn't consensus. Period."

Sceptical scientists continue to question the integrity of the IPCC (see reference 16.6) and various magazines and journals which publish papers on the topic (see reference 16.7). Many of these scientists also attempt to correct comments by politicians and reports in the general media which make unsubstantiated claims about global warming (see reference 16.8).

While the general impression might be that there is consensus on the causes and science of global warming this is far from correct. Scientists, the people who are best placed to examine these things, are far more sceptical than the general population and it would be wise to follow their lead.

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- 16.3 "Some of the Many Experts Who Contest Kyoto's Scientific Foundation" at http://www.envirotruth.org/myth_experts.cfm
- 16.4 Letter to Paul Martin, Canadian Prime Minister, prior to his appointment at <http://www.lavoisier.com.au/papers/articles/lettertoPaulMartin.pdf>
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- ??? - "Myths and Envirotruth Regarding Climate Change" at <http://www.envirotruth.org/myths.cfm>
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