
**HAMILTON RODDIS
MEMORIAL LECTURE SERIES**

No. 12

**Global Warming:
Science, Economics, Ethics**

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August 18, 2009

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GLOBAL WARMING: SCIENCE, ECONOMICS, ETHICS

By Iain Murray

(This is a condensed version of the actual lecture, which was delivered extemporaneously with the aid of a PowerPoint presentation.)

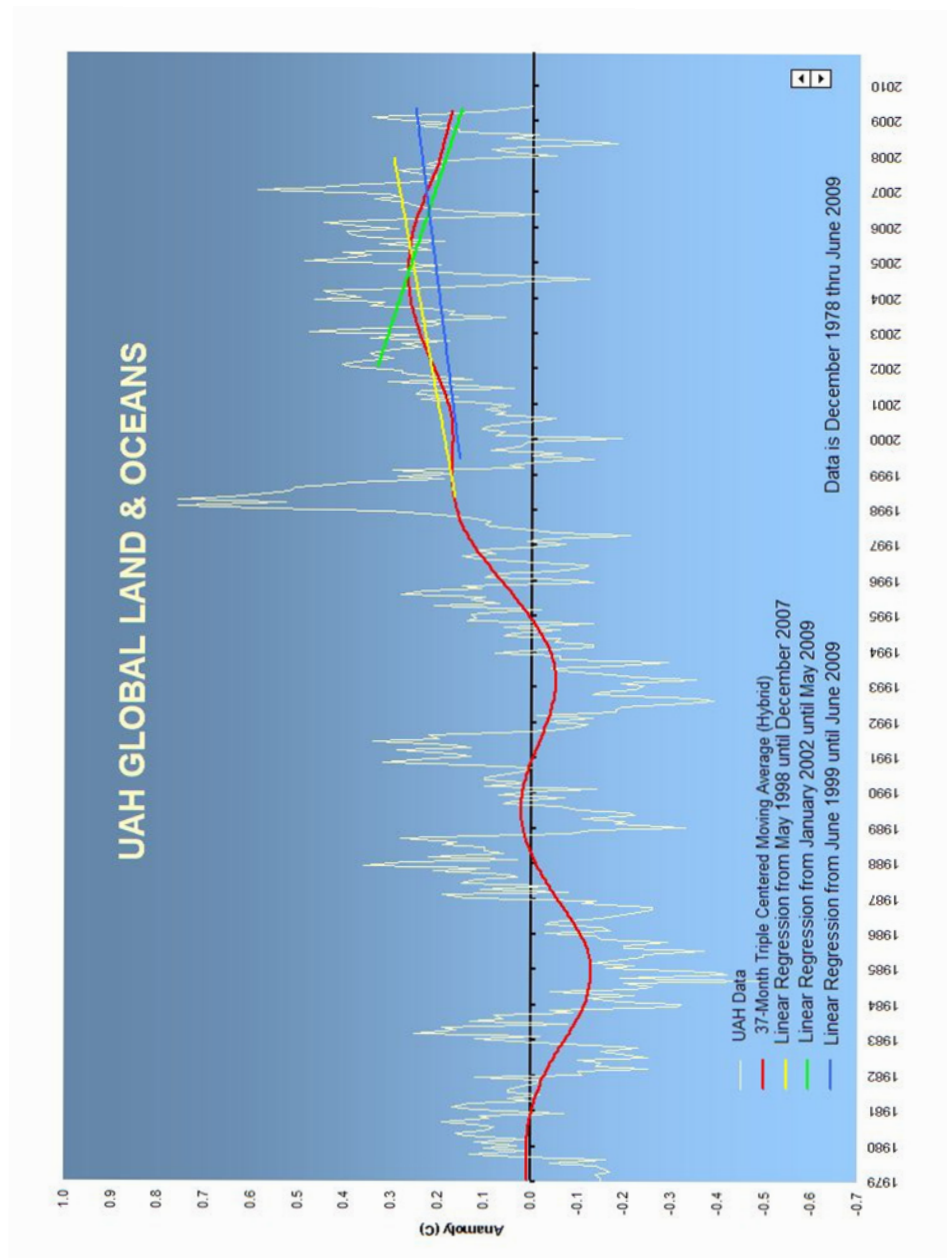
When discussing the vexed question of global warming, we must be clear what the question actually is. We are often told that global warming is a purely scientific question. If it is, we need to examine what the scientific evidence is telling us, and ask whether we are actually hearing that. However, there are non-scientific aspects as well. The question is also about economics: we must ask how much action to prevent global warming will cost, and whether the benefits of such action outweigh the costs. It's also an ethical question. We must ask whether the effect of such action on the world's poorest people will be good or bad, and also ask who benefits most from such action. These additional considerations mean that global warming is not a scientific question, but a policy question.

THE SCIENCE

The first thing we have to know is whether the globe has actually been warming in the recent past, as people say it has. The surface temperature record is inadequate for this purpose. Much of the world's surface is water, where permanent temperature stations do not exist. Other stations have been closed down in droves in recent years, particularly since the collapse of the Soviet Union. Stations which have persisted have experienced considerable change, such as those stations that were once in rural areas but are now surrounded by heat-trapping asphalt.

To get a true look at the recent temperature picture, we therefore need to look at the records from microwave sounding satellites, which have been measuring the global temperature since 1979, administered by the University of Alabama at Huntsville (Figure 1). They show a temperature that has risen about 0.2 degrees Celsius since that date. However, the rise is not uniform. There have been colder periods and warmer periods, with a massive spike caused by the strong El Nino in 1998. Closer examination reveals a rise since 1998 and 1999, but a decrease since 2002. Clearly, temperature is not moving upwards in a steady, linear progression.

Figure 1. Temperature anomalies as measured by microwave sounding satellites, 1978-2009.



What does this mean? Is the Earth currently warming? Is the recent warming unusual? And – most crucial for policy purposes – can we clearly identify a role for humans, and specifically his emissions of Carbon Dioxide, in this?

Let's look at the Arctic first (Figure 2). The Arctic is, many claim, the “canary in the coal mine” that shows whether global warming is occurring. The satellite readings tell us that the Arctic temperature has varied little since 1979, but that there has been a small rise in temperature over the past decade.

The sea ice records tell us that sea ice extent has remained within the normal range for the past decade (Figure 3). Although it has been at historically low levels in recent years, NASA has attributed that decline to unusual Northward movement of heat transported by currents and winds. Indeed, measurements of sea ice extent show considerable volatility, with 2008 showing over 700,000 more square kilometers of sea ice than in 2007 (Figure 4).

Many people point to polar bears being in dire straits. However, according to an investigation of Arctic temperatures by Polyakov et al., while the Arctic is now warmer than it was in 1880 (Figure 5), it is colder than it was in 1934 (Figure 6). Indeed, measurements from ice cores extracted from central Greenland suggest that the Arctic was considerably warmer during the Middle Ages (when the Vikings colonized Greenland), during the time of the Roman Empire, during the Late Bronze Age and during a period known as the “Postglacial Optimum,” around 8000 years ago, than it is now (Figure 7). Polar bears survived all those warm periods.

As for the globe, the warming rate for the past few decades works out to around 1.5 degrees Centigrade per century (Figure 8a). There has been no statistically significant warming since 1995 (Figure 8b), and there has even been a cooling trend for the last seven and a half years (Figure 8c). That cooling trend, if continued, would reduce temperatures by 2.4 degrees C by 2100, although that is highly unlikely.

Given this data, we have to ask the question whether this recent warming is at all unusual. Interestingly, the New York Times was worried about global warming over 80 years ago. In 1923 it reported, “The Arctic seems to be warming up. Reports from fishermen, seal hunters and explorers...all point to a radical change in climatic conditions, and hitherto unheard of temperatures in that part of the earth. Old glaciers have disappeared and land once covered with field ice is bare.” A few years later in 1930 it expressed further concern about glaciers disappearing: “Word comes from Switzerland that the Alpine glaciers are in full retreat. Out of 102 glaciers observed...more than two thirds have been found to be shrinking.”

Figure 2. Arctic temperature anomalies as measured by microwave sounding satellites.

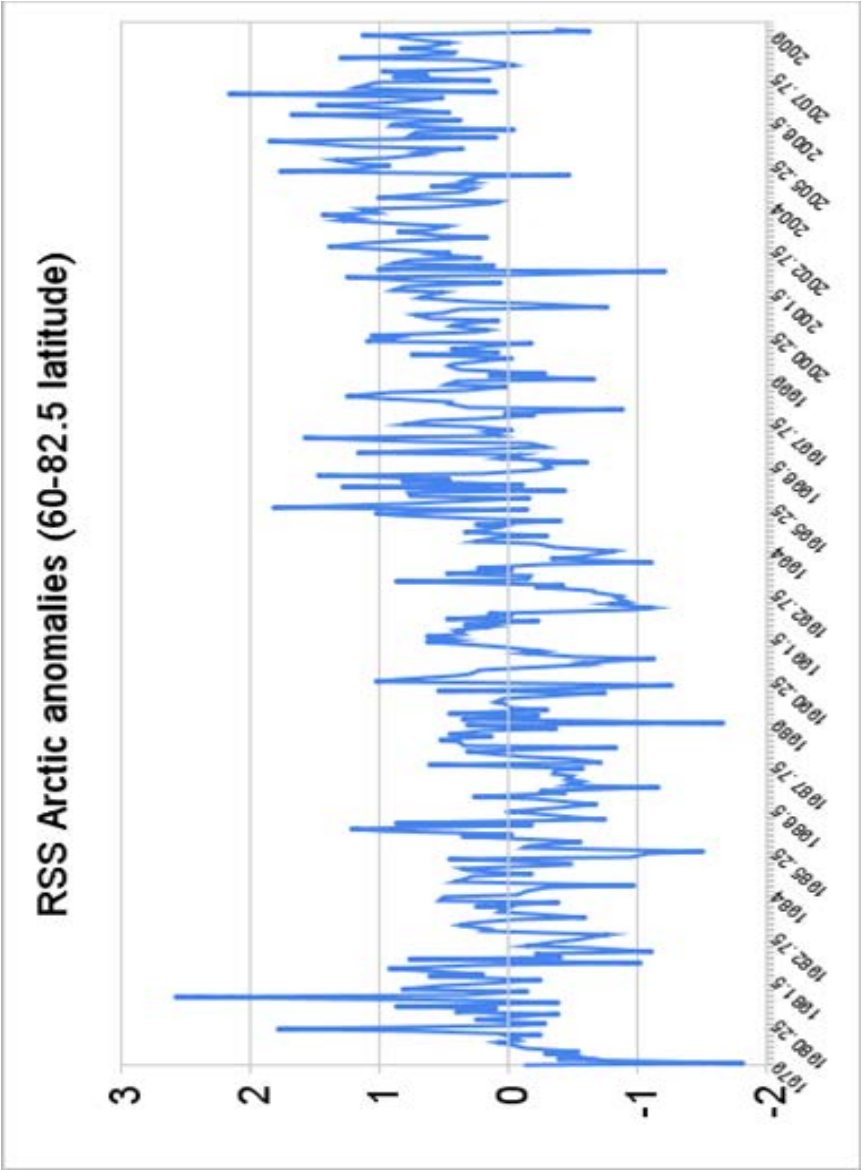


Figure 3. A comparison of Arctic sea ice extents, 2002-2009.

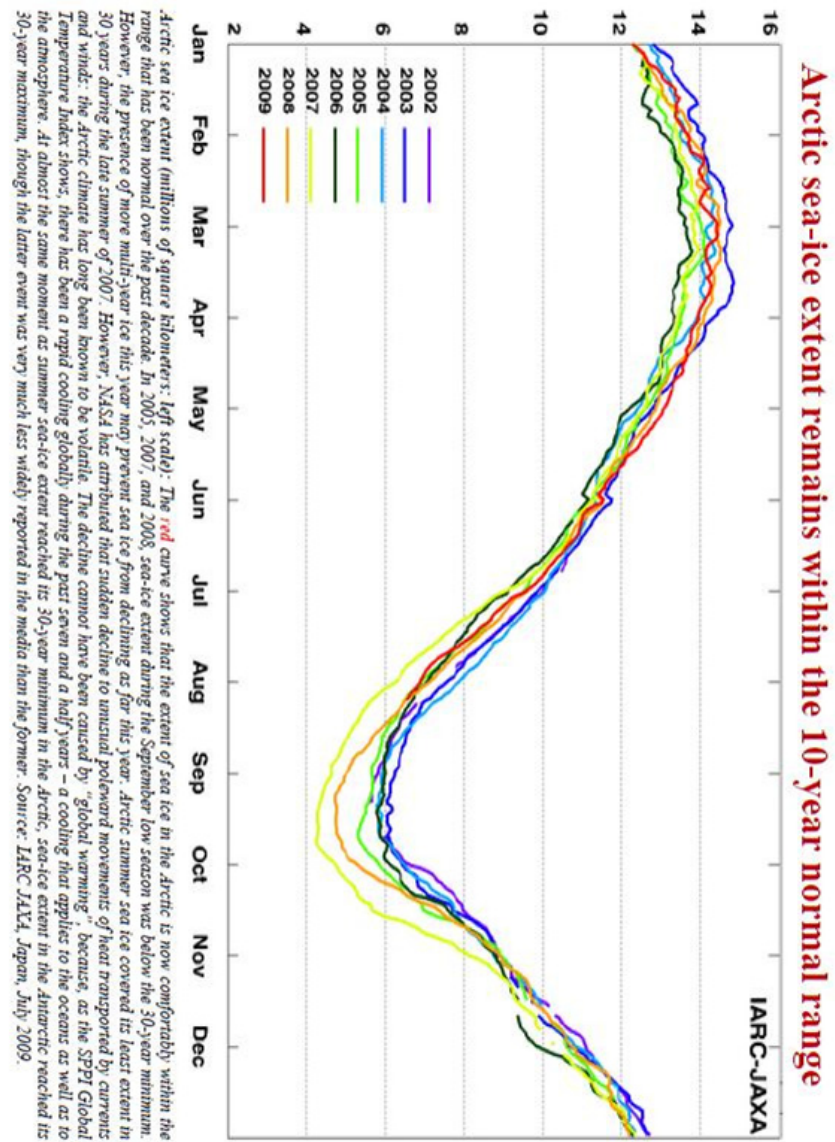


Figure 4. Geographic distribution of Arctic sea ice, 2007 (top map) and 2008 (bottom map).

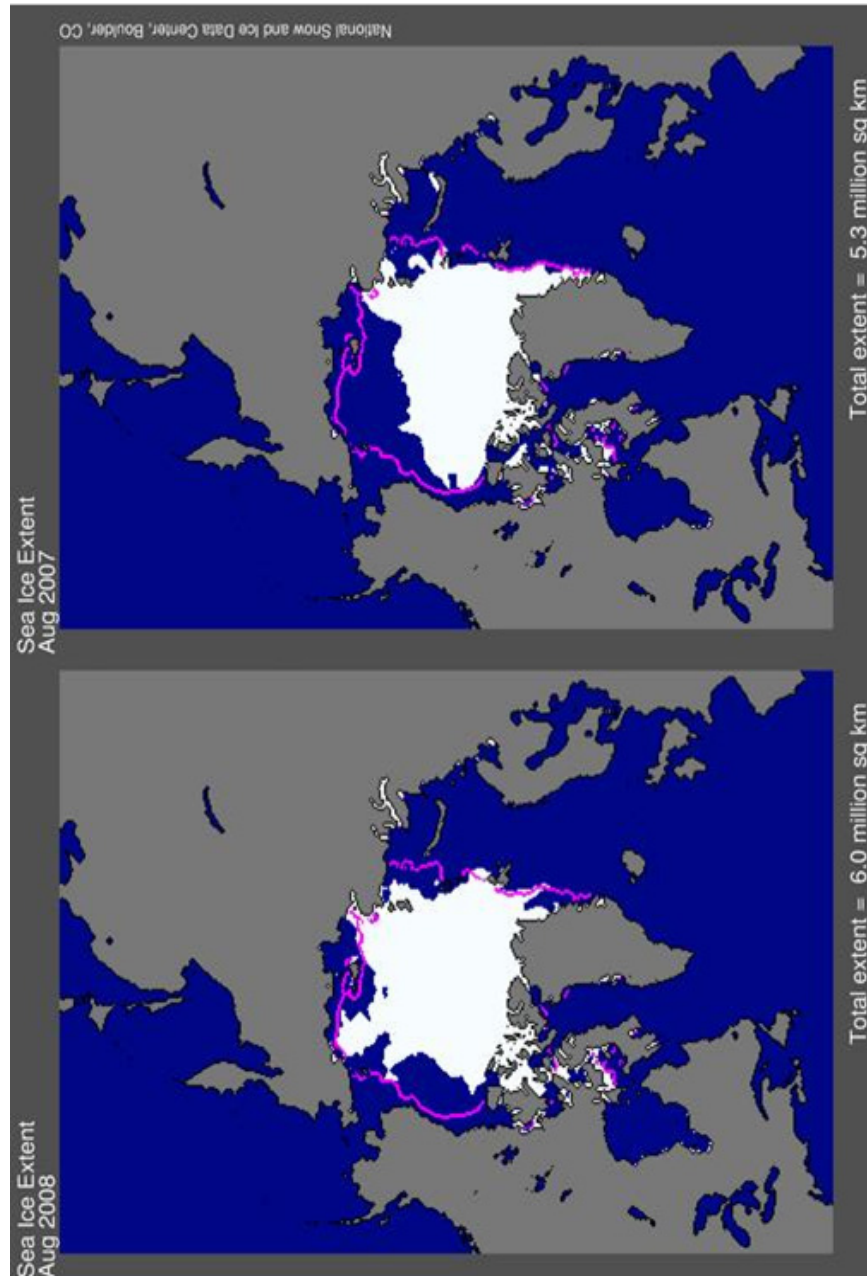


Figure 5. Arctic temperature anomalies, 1880-2003.

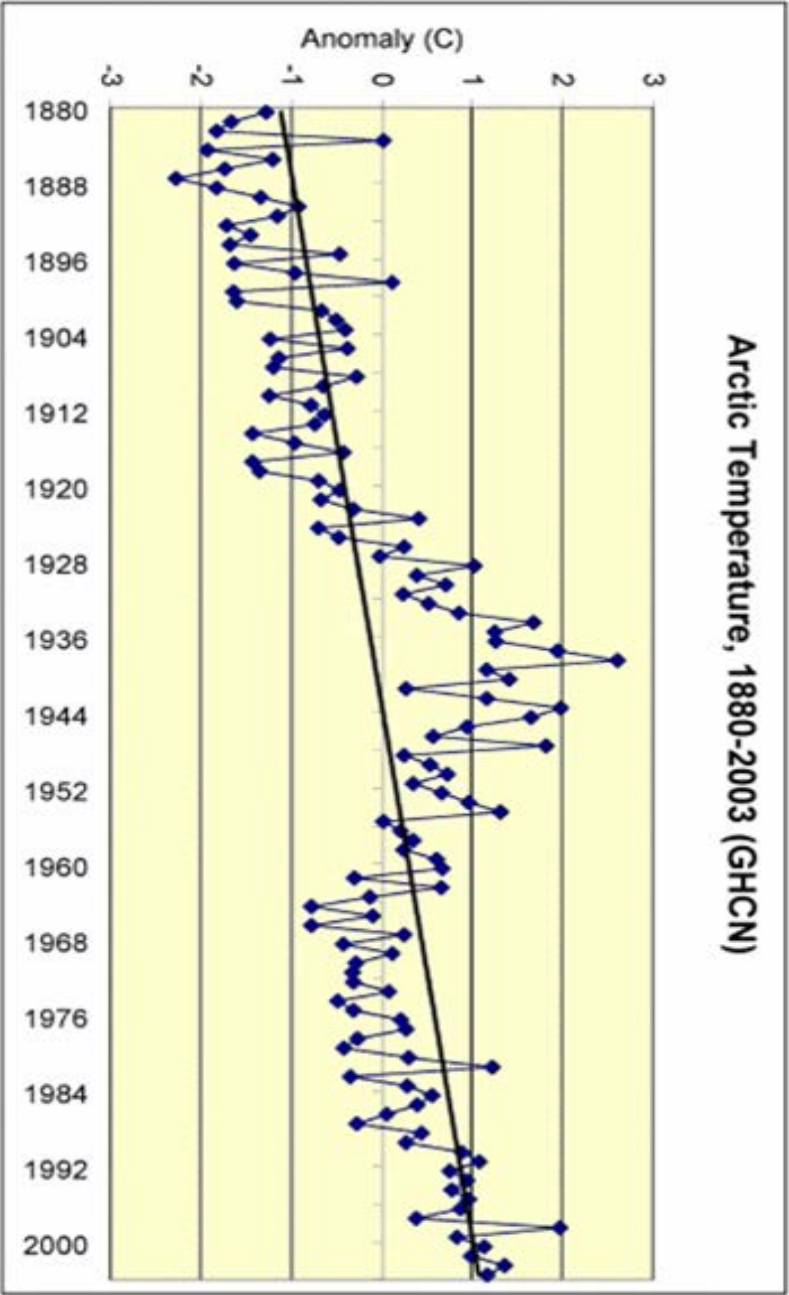


Figure 6. Arctic temperature anomalies, 1934-2003

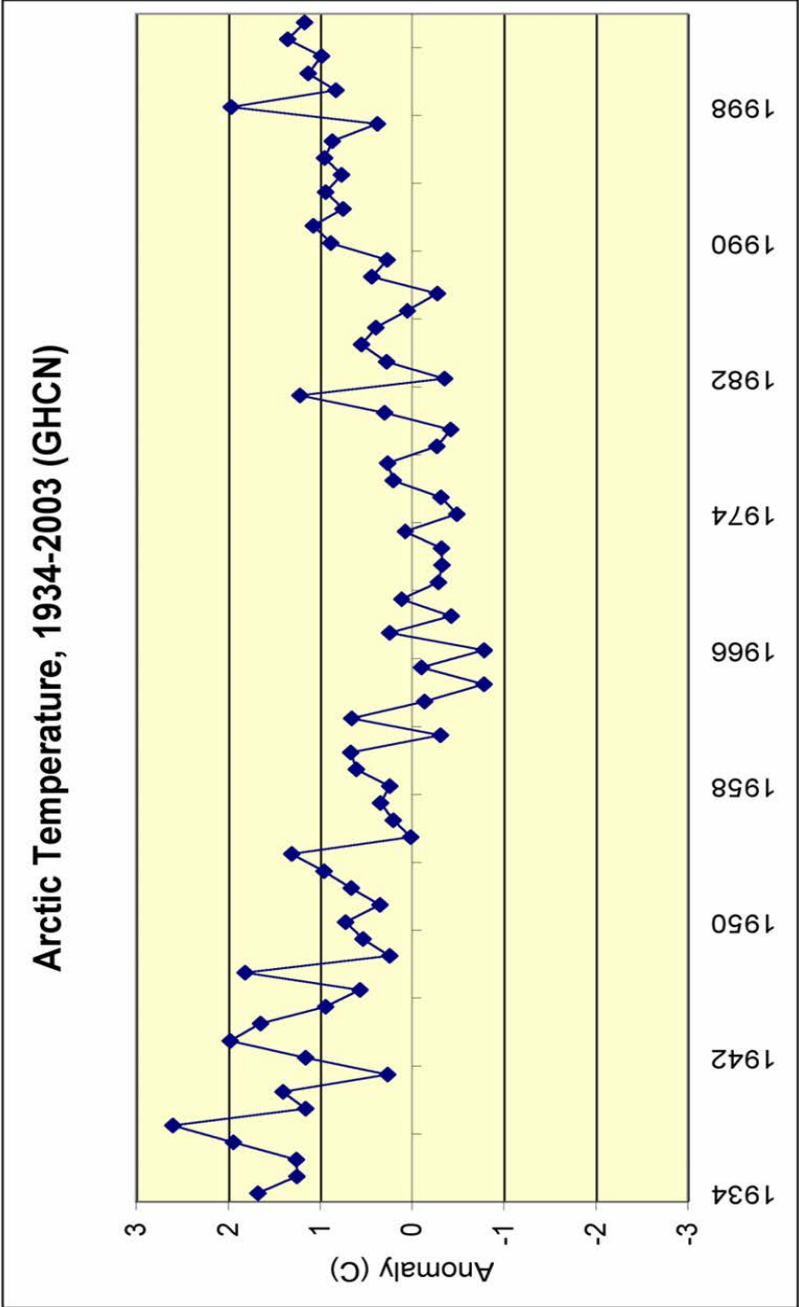
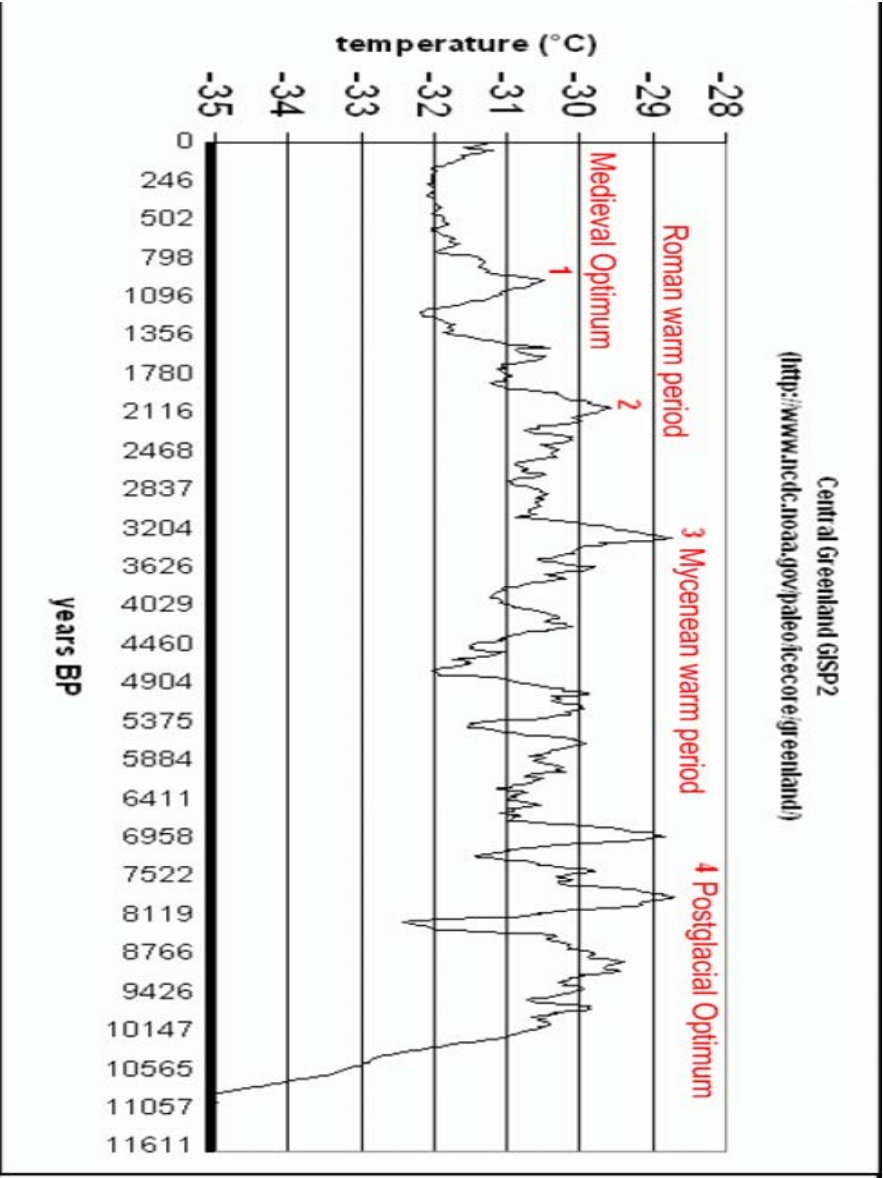


Figure 7. Ice core data from Greenland glacier over the last 10,000 years.



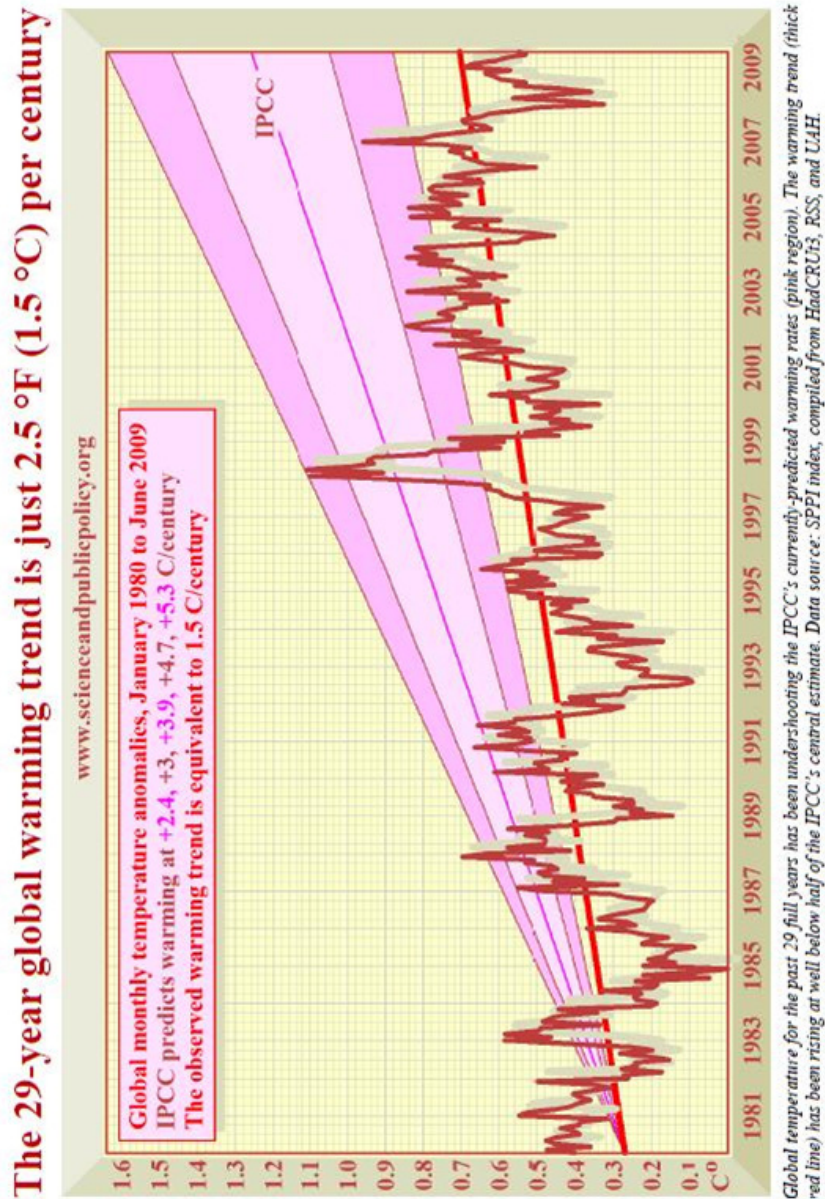
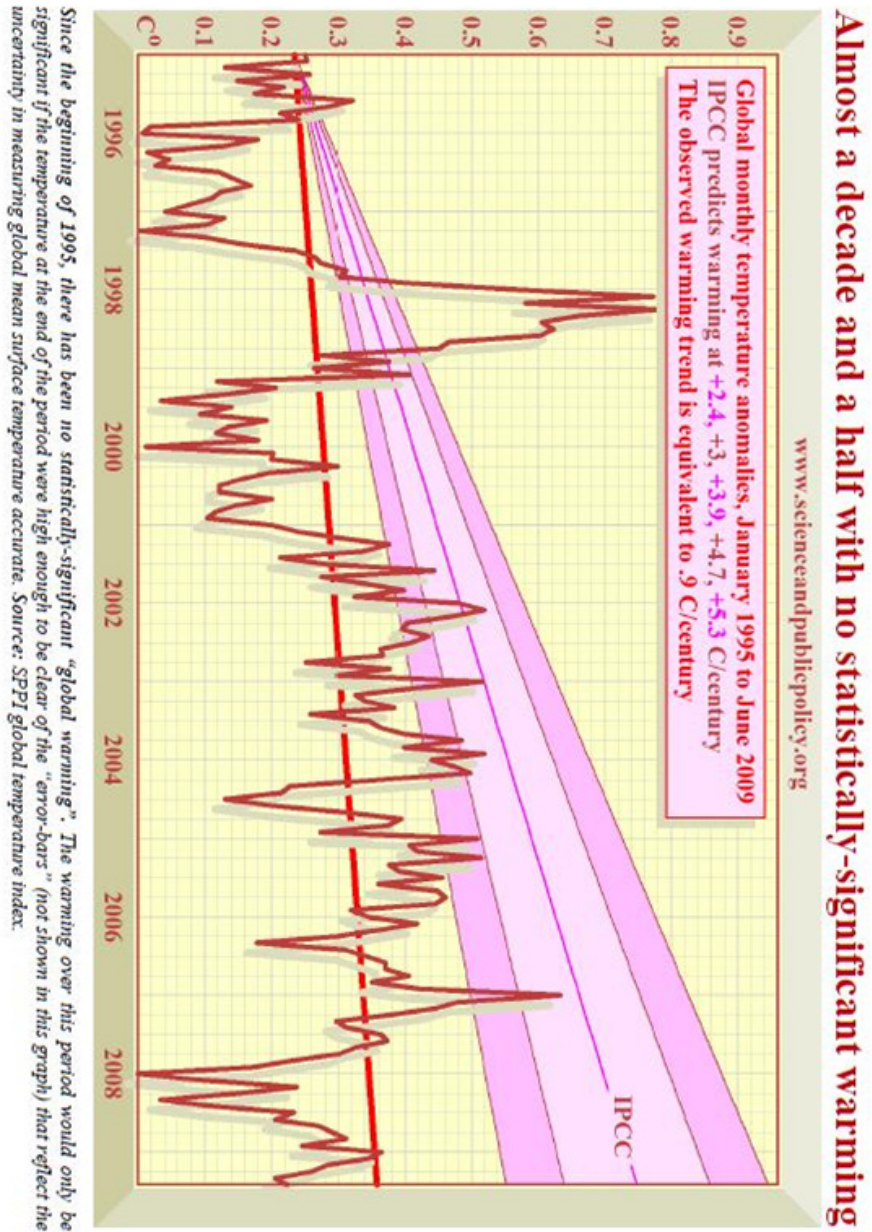


Figure 8b. Global monthly temperature anomalies, January 1995 to June 2009.



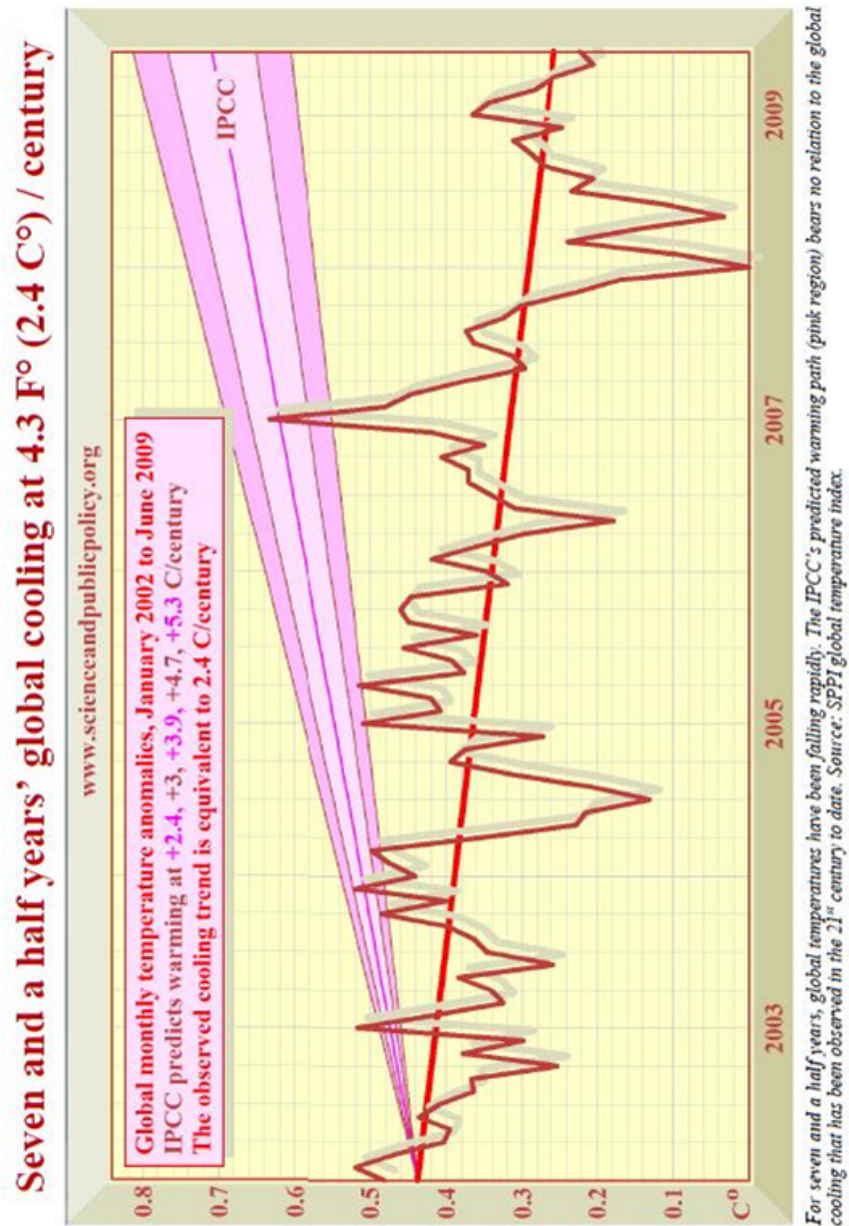


Figure 8c. Global monthly temperature anomalies, January 2002 to June 2009.

Indeed, when we look at the retreat of glaciers in, for example, the Fritz Range (Figure 9a) or Glacier Bay (Figure 9b), we see that there had already been significant retreat between the 1860s and 1907. Glaciers, it is apparent, have been retreating since the end of the last cold period in the early 1800s, not since the advent of the SUV.

In fact, we can learn a lot from the last cold period, or the Little Ice Age, as it is known. It was a time of extreme cold and misery. When we look at the Dutch Masters and their contemporaries of the 16th and 17th centuries, we see their paintings dominated by frozen rivers, even in the heart of conurbations like Antwerp (Figure 10) and London. Indeed, 1683 was known as the Year of the Great Frost in London, with a great fair held on the frozen river (Figure 11). Breughel's paintings clearly show dovecotes and bird traps, which were used as the main source of protein during those dark winters when the rivers were frozen and fish was inaccessible (Figure 12). Hunger was a worse enemy even than the cold. *[Editor's note: A dovecote or dovecot is a building intended to house pigeons or doves, which were an important food source in history. Dovecotes may be square or circular, or even built into the end of a house or barn and generally contain pigeonholes where the birds nest. The birds were kept both for their eggs and flesh.]*

The Little Ice Age began to thaw in the late 18th century, when Thomas Jefferson wrote, in his Notes on the State of Virginia, "Snows are less frequent and less deep. They do not often lie, below the mountains, more than one, two, or three days, and very rarely a week. They are remembered to have been formerly frequent, deep, and of long continuance. The elderly inform me the earth used to be covered with snow about three months in every year. The rivers, which then seldom failed to freeze over in the course of the winter, scarcely ever do so now..."

So it is clear that the climate has been changing for some time. That's what historical evidence tells us loud and clear. This was reflected in the first report of the Intergovernmental Panel on Climate Change (IPCC) in 1995, which contained a graph that showed us a Medieval Warm Period, the Little Ice Age and modern warming (Figure 13). In 2001, however, the IPCC jettisoned all that in favor of a graph that showed little temperature variation for a thousand years, followed by a spike the represented modern warming (Figure 14). Because it looked like the shaft and blade of a hockey stick, it became known as "The Hockey Stick," and it was used around the world to promote the idea that global warming was extremely unusual and that action was needed immediately.

However, there were significant problems with the way the data had been manipulated. The statistical methods used to develop the graph were unusual

Figure 9a. Fritz Range glacier retreat since 1865.

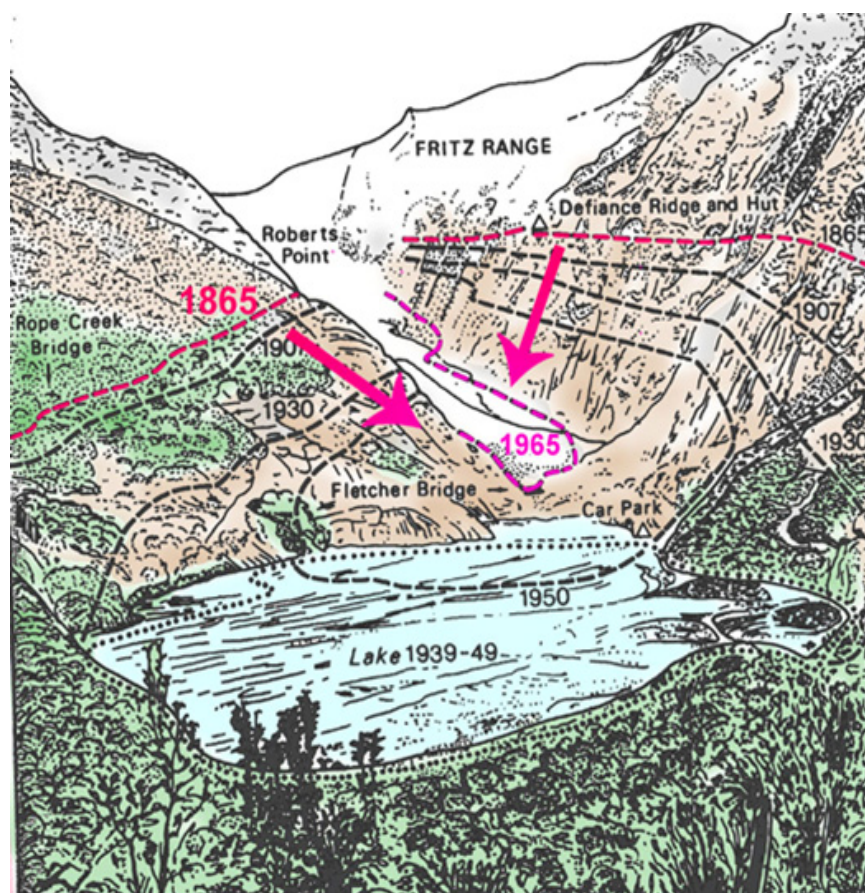


Figure 9b. Glacial Bay glacial retreat since 1860.

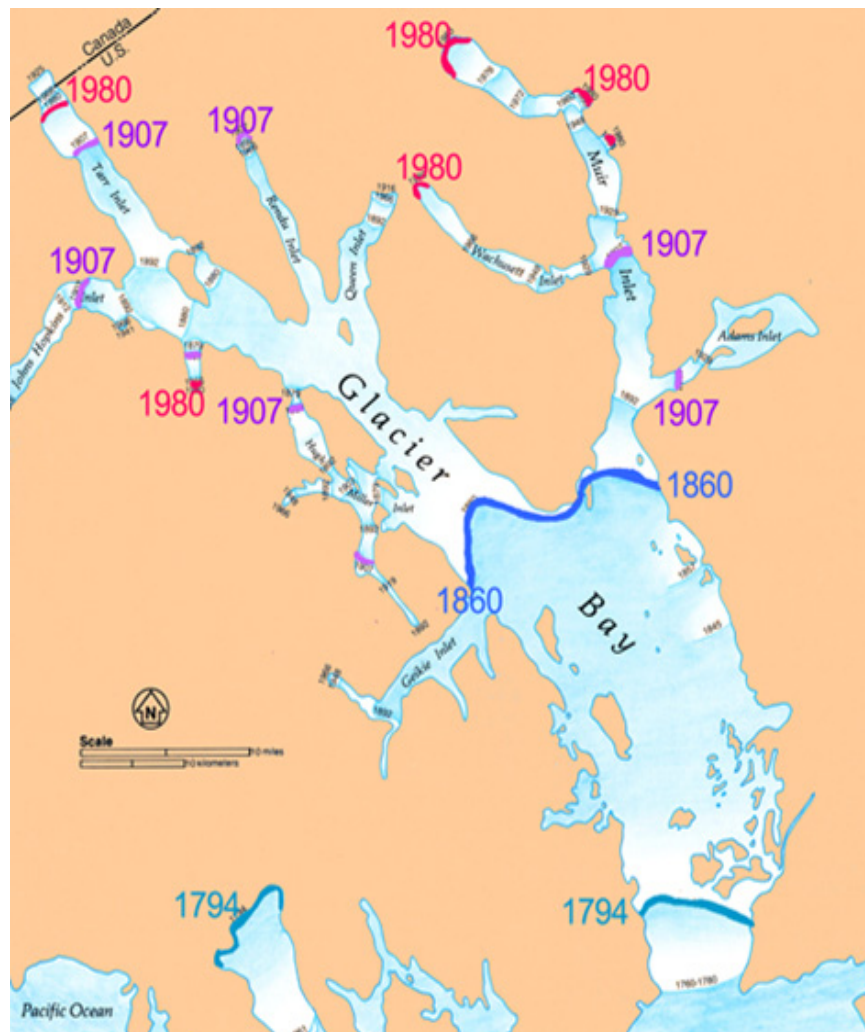


Figure 10. Winter Landscape with Snowfall near Antwerp, Lucas van Valckenborch, 1575.



Figure 11. A depiction of the river fair in London, by Jan Griffier, the Elder, 1683.



Figure 12. Winter Landscape with a Bird Trap, Pieter Breughel, the Elder, 1565.

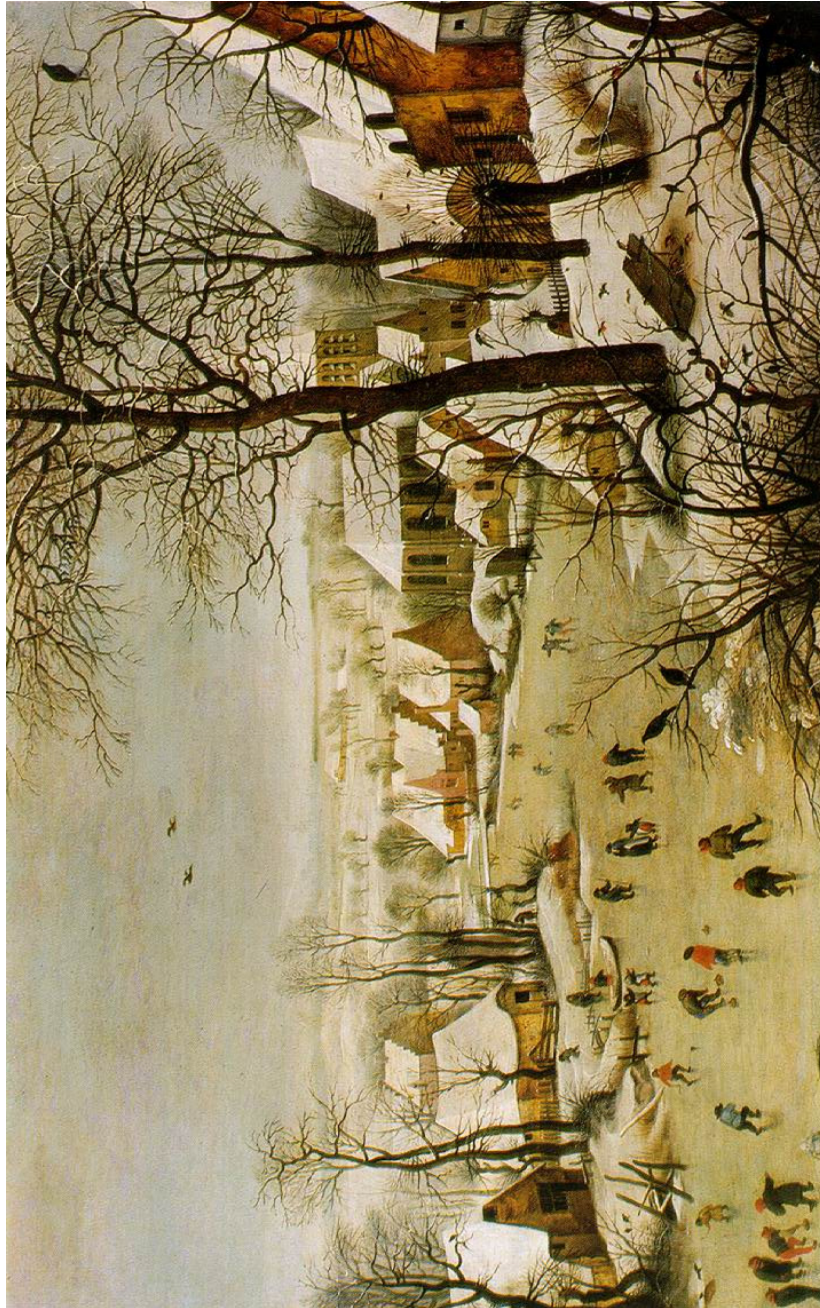


Figure 13. The last 1,000 years of earth temperatures from tree rings, ice cores, and thermometers, IPCC, 1995.

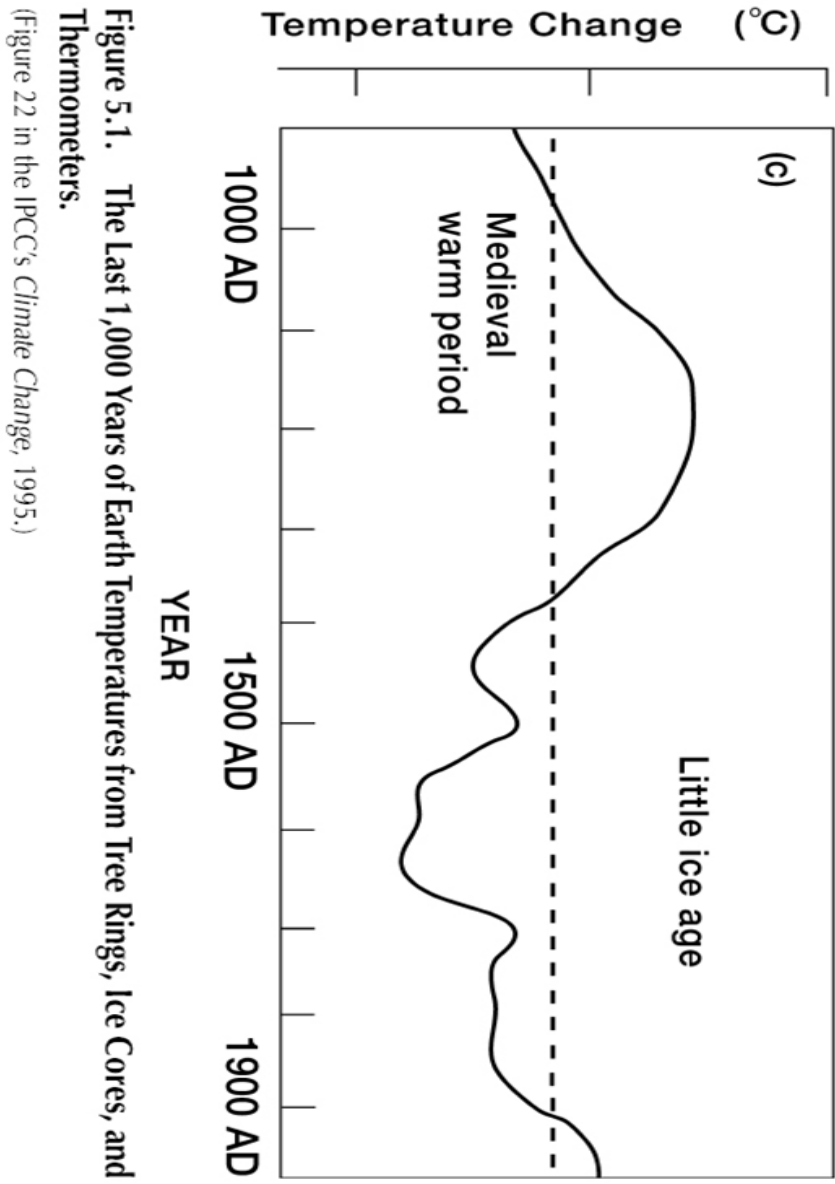
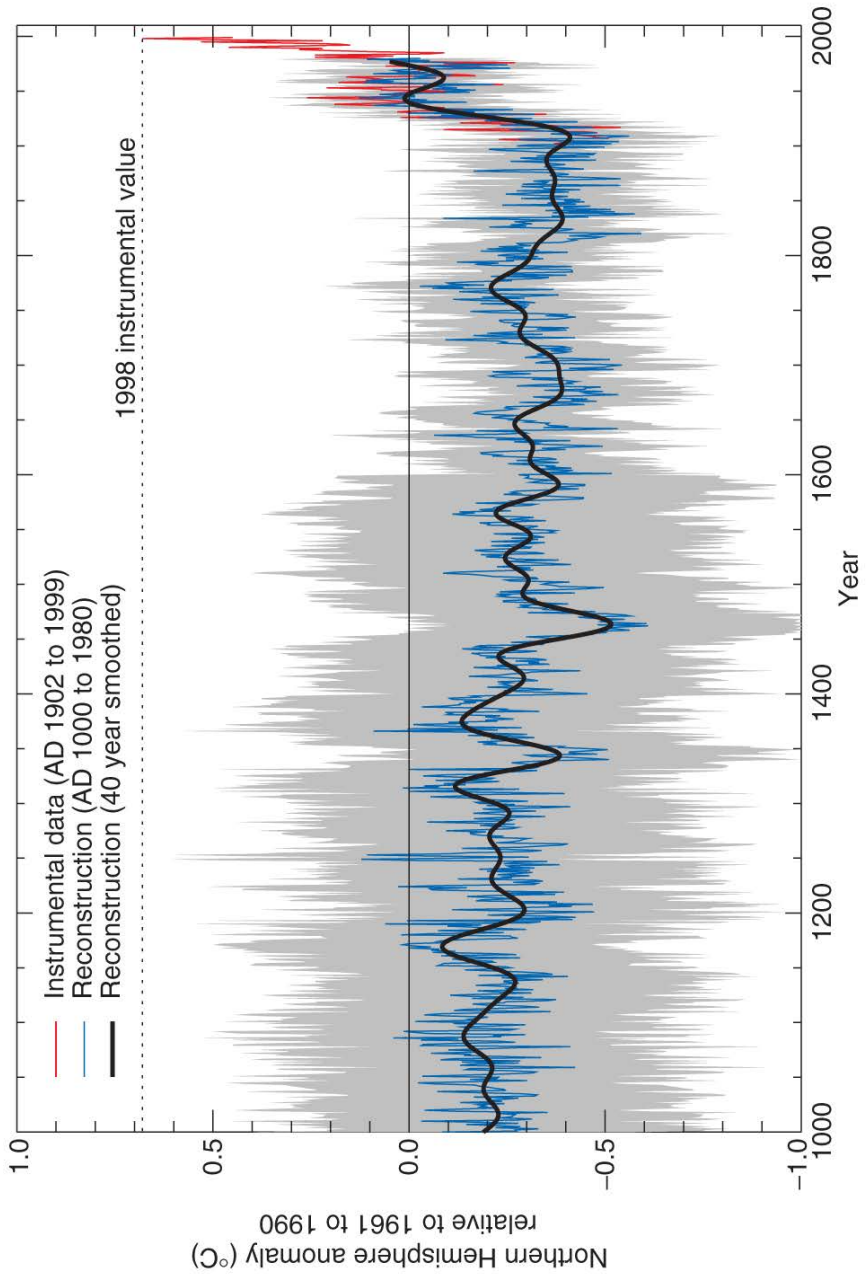


Figure 14. Temperature change over the last 1,000 years, Intergovernmental Panel on Climate Change (IPCC), 2001.



and in many ways inappropriate. There have been some suggestions that the method used produces a hockey stick shape whatever the data input. Re-analyses of the data suggest a much more variable history (Figure 15), and the National Academy of Sciences reported that temperature reconstructions going back beyond 1600 would be much less reliable than more recent analyses.

This is important. If the hockey stick is in fact broken, then there are significant implications. Jan Esper et al., paleoclimatologists, said in 2005, “[E]nhanced variability during pre-industrial times would result in a redistribution of weight towards the role of natural factors in forcing temperature changes, thereby relatively devaluing the impact of anthropogenic emissions and affecting future predicted scenarios. If that turns out to be the case, agreements such as the Kyoto protocol that intend to reduce emissions of anthropogenic greenhouse gases, would be less effective than thought.” In other words, without the hockey stick, much of the foundation for the scary projections of future temperature rise would be built on sand.

We should also look at some other metrics, beyond atmospheric temperature: sea level rise, ocean temperature, Antarctic sea ice extent, and hurricane activity. All of them, at one point or another, have been pointed to as “proof” that humans were interfering dangerously with the climate.

Sea level rise is particularly worrisome to island nations in the Pacific and Indian Oceans. However, the actual data over the past 15 years or so from Pacific islands shows that the rate of rise is small and steady, not accelerating. For each island the trend settles after a few years’ recording (Figure 16).

As for ocean temperature, evidence from the Argo system of bathythermograph buoys since 2003 shows a slight cooling of the oceans over the past five years (Figure 17). This contradicts the theory that heat “missing” from the atmosphere would show up in the oceans. Meanwhile, Antarctic sea ice extent has actually been rising over the past 30 years, even as the Arctic sea ice extent has been falling (Figure 18).

Finally, we all remember the “And then came Katrina” moment in Al Gore’s “An Inconvenient Truth.” The movie’s poster showed a hurricane emanating from a power station smoke stack. The centerpiece of the movie was a claim that global warming has caused an increase in hurricane activity that devastated New Orleans, and that things were only going to get worse. In fact the inconvenient truth for Al Gore is that hurricane activity has decreased considerably since 2005 and in fact is now at its lowest since satellite monitoring began (Figure 19). Indeed, even in 2005, hurricane activity did not reach the peaks seen in the 1990s.

Figure 15. Temperature change from 1600 to 1990's, Burger & Cubasch, 2005.

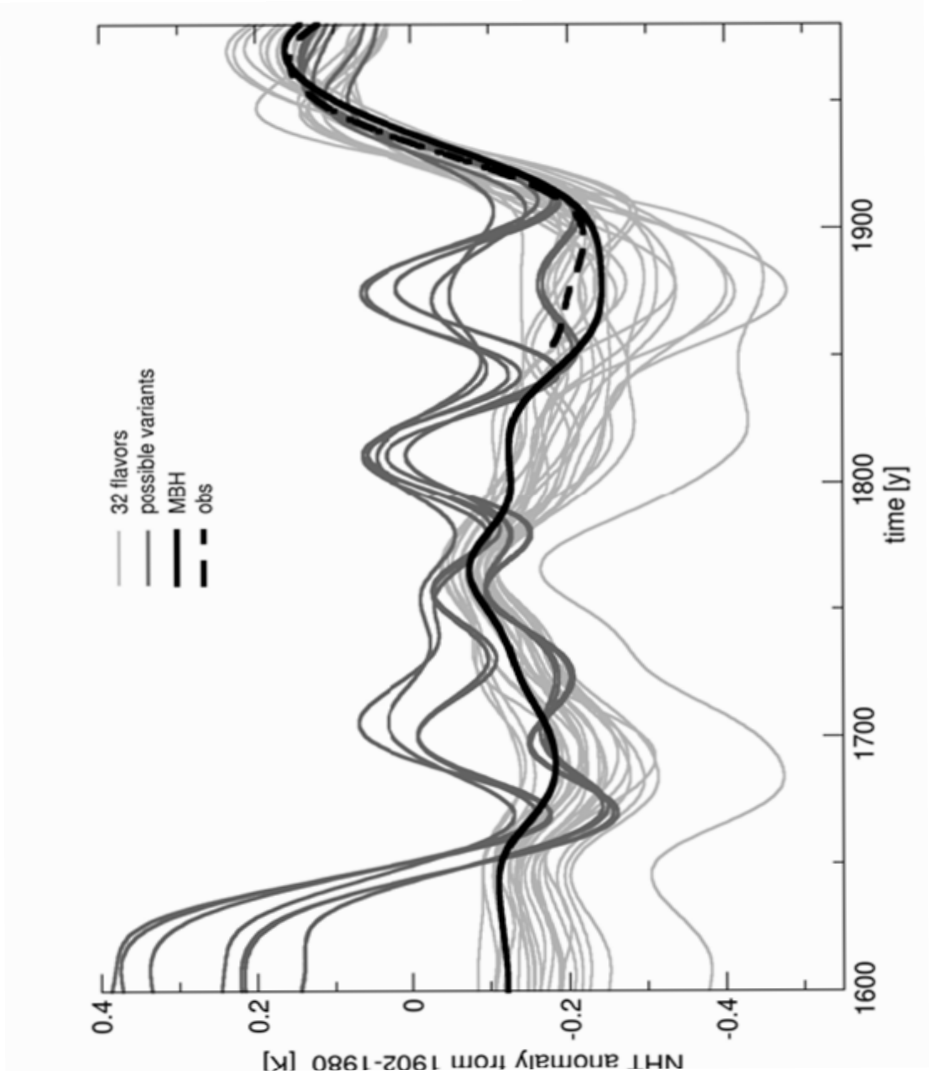
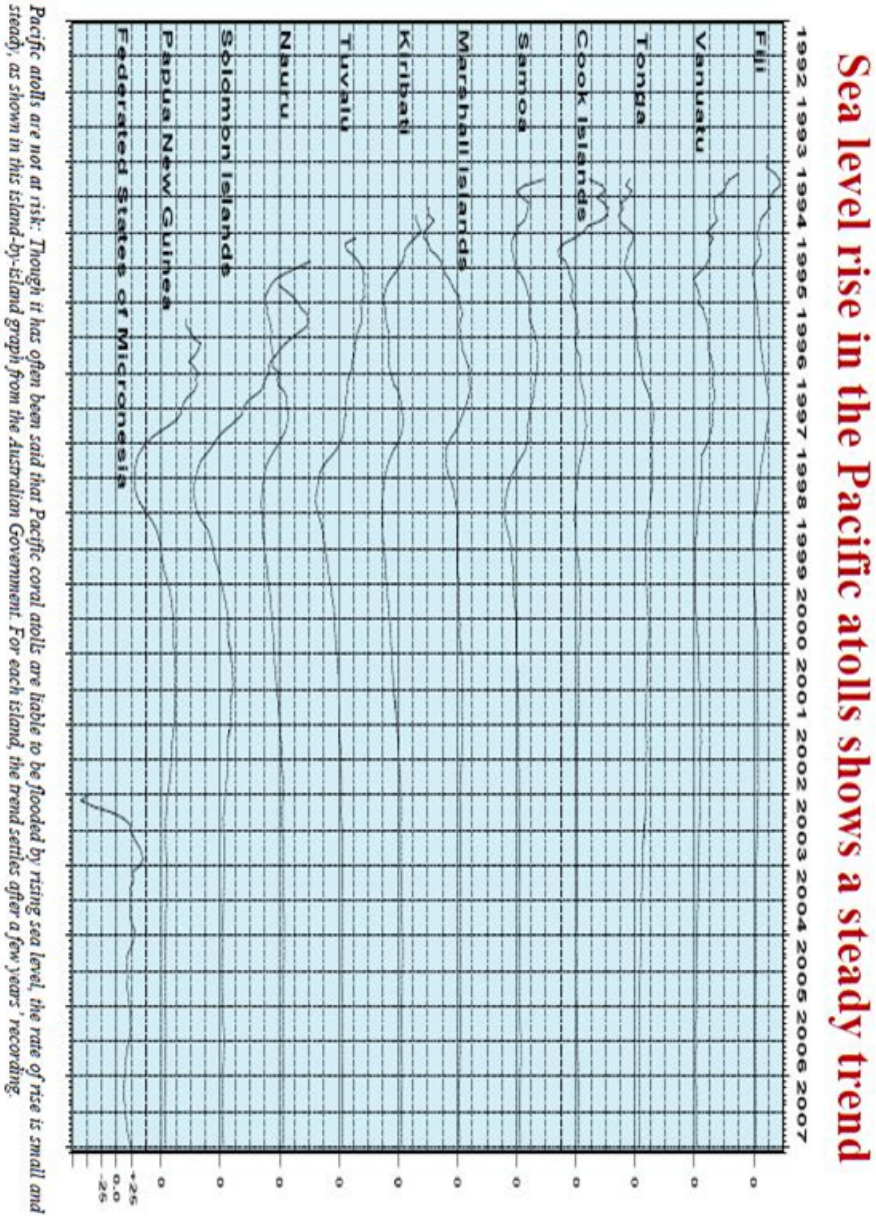


Figure 16. Sea level rise in the Pacific atolls, 1992 - 2007, Source: Australian Government.



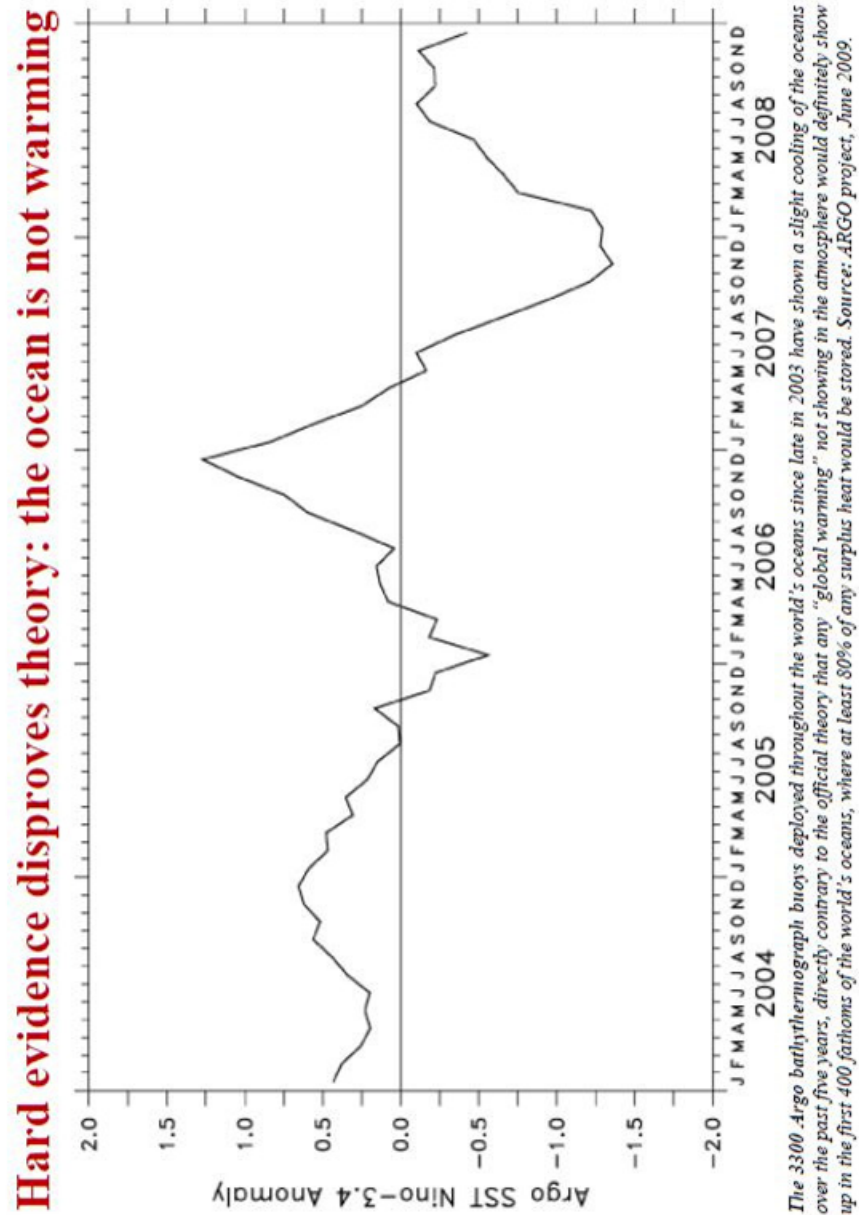


Figure 17. Changes in ocean temperatures, 2004-2008.

Figure 18. Changes in Antarctic sea-ice extent, 1979-2009.

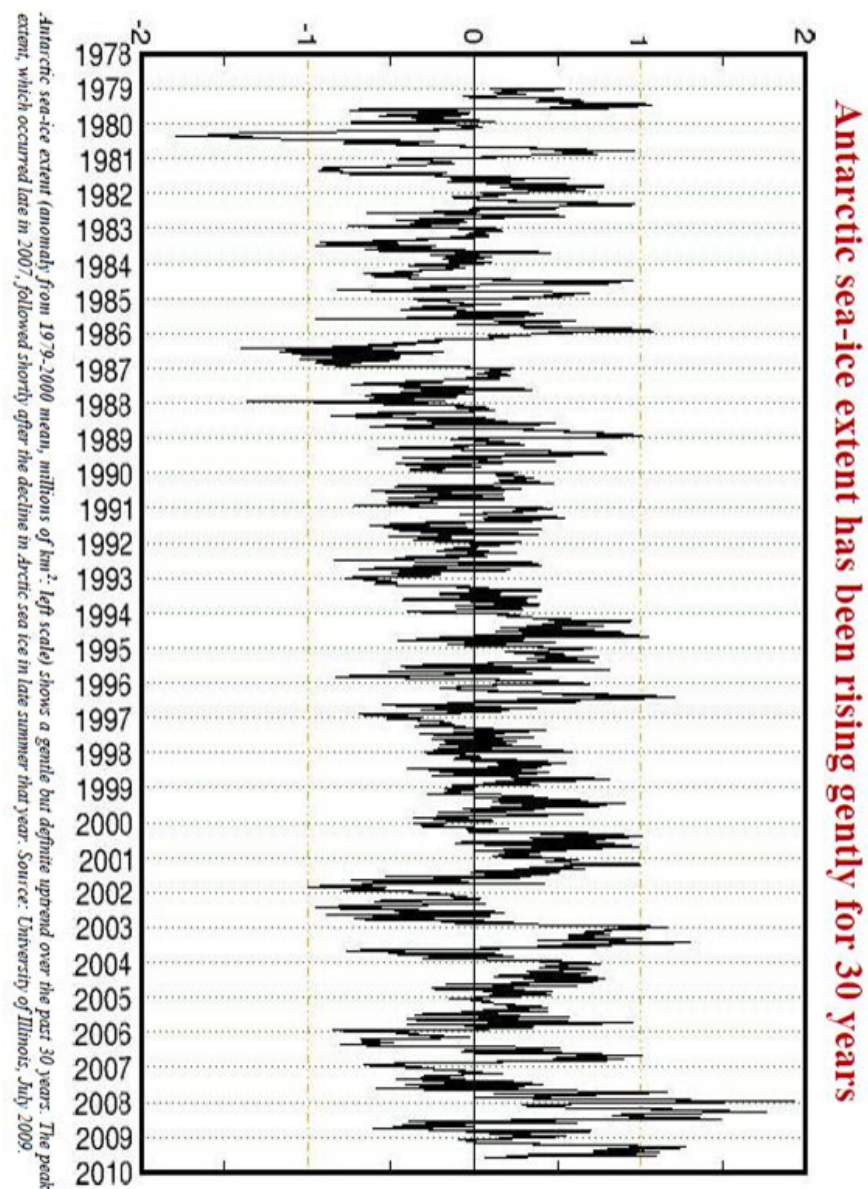
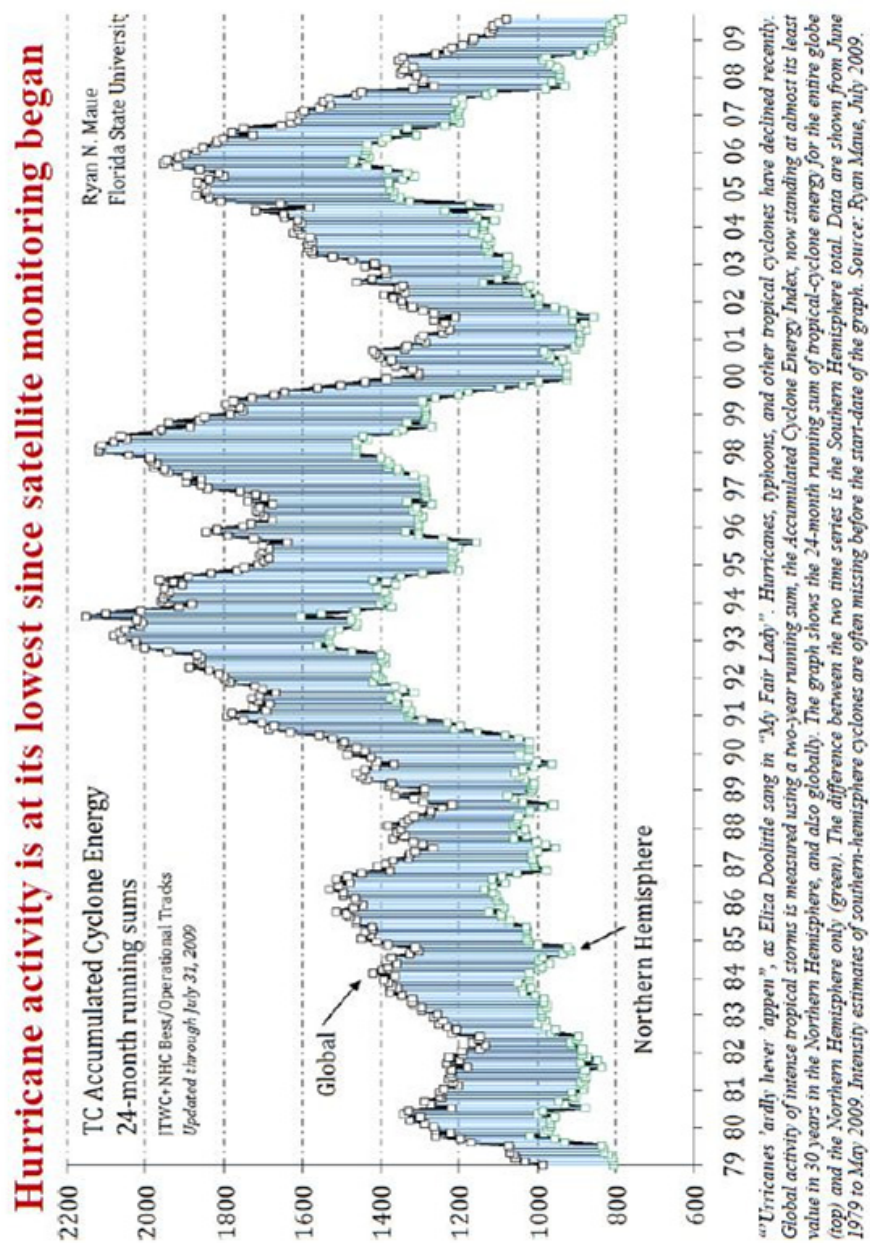


Figure 19. Changes in hurricane activity, 1979-2009



Given all this, what are we to make of the assertion that there is an indisputable link between carbon dioxide emissions and atmospheric warming? As P.G. Wodehouse might put it, the answer to the assertion is “Up to a point, Lord Copper!” (meaning “no”). Basic physics does indeed imply that, all other things being equal, the more CO₂ and other greenhouse gases in the atmosphere, the warmer it will get. But are all other things equal?

In fact, our level of scientific understanding in regards to the effect of various agents on the atmosphere is much lower than you might think. The only agents we truly understand are long-lived greenhouse gases like carbon dioxide and halocarbons. Our level of understanding of the other agents (ozone, water vapor, surface albedo, aerosols, contrails, and solar irradiance) is medium to low, as the IPCC admits. Moreover, of all the greenhouse gases in the atmosphere, only 3.62% are CO₂ and of that, only 3.4% is caused by human activity (Figure 20). So our energy-related emissions account for a change in atmospheric composition of 0.1%, which is an extremely low number to suggest such a large projected change.

Moreover, the IPCC projections are predicated on a rapid, exponential growth in CO₂ emissions that is simply not occurring. The IPCC’s trends imply possible growths in atmospheric CO₂ of 362, 468 or 652 parts per million (ppm) this century. The observed trend implies a growth of only 204 ppm by 2111, far below the lowest IPCC assumption (Figure 21).

This implies strongly that even if we take as read the IPCC’s assumption of the effect of CO₂ on climate, the IPCC’s lowest projection of temperature increase is exaggerated. We know that the climate models project an essentially linear growth in CO₂ once it has started. Given the current trends in CO₂ emission growth, the line that temperature will follow suggests a temperature change of 2 degrees C this century, not the 3-6 degrees claimed by global warming alarmists.

We can also test the theory that CO₂ has a major effect on climate by examining how well earlier claims have held up. The first person to provide models projecting CO₂’s effect on climate was NASA’s Dr. James Hansen, who presented them in a sweltering Congressional hearing room (a hot day, with the windows closed and heating turned up for maximum effect) in August 1988. He presented three scenarios, with varying effects on temperature. Temperatures have in fact tracked fairly closely to the lowest temperature scenario, far below the other two. It should be noted, however, that this does not represent a victory for Dr. Hansen, as his “Scenario C” assumed a drastic reduction in emissions in the 1990s, which did not actually happen. When we examine the later projections of the IPCC, we see that their 1990 projection grossly exaggerated temperature rises in the next decade. Subsequent projections have largely been exercises in curve fitting,

Figure 20. Illustration of how human activity affects greenhouse gases, Source: National Center for Policy Analysis

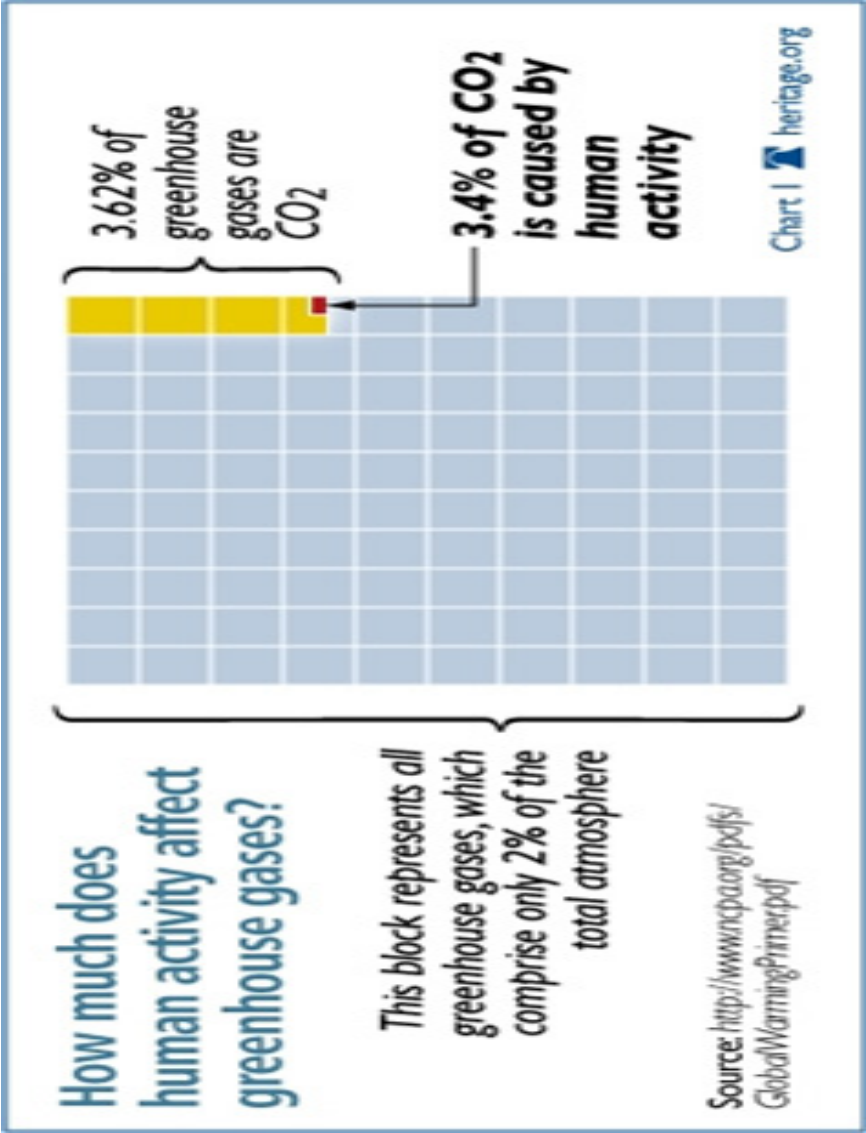
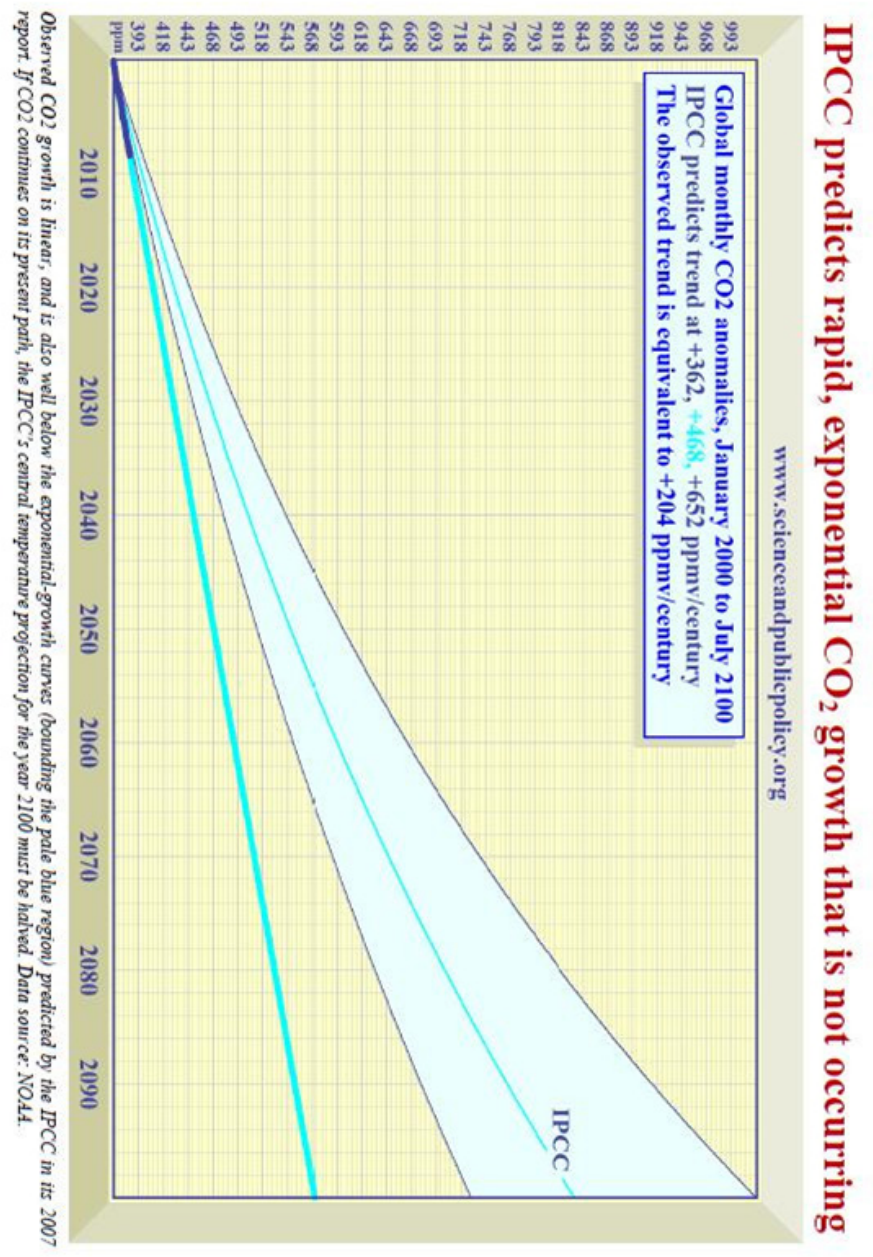


Figure 21. IPCC predictions of rapid, exponential CO₂ growth versus observed CO₂ trend, Data source: National Oceanic Atmospheric Administration.



attempting to make the projections fit the observed data, before leaving the observed data behind as we have already noted.

Finally, MIT's Dr. Richard Lindzen has recently performed an important test on the accuracy of computer projections. The IPCC's models all assume that outgoing long-wave radiation would not escape into space, but be trapped by the famous "greenhouse effect." In fact, the net flux of such radiation, as measured by satellites, has been increasing. This strongly suggests that the effect of CO₂ on climate has indeed been exaggerated. Using Dr. Lindzen's figures, if the atmospheric CO₂ concentration doubles, global temperature will rise not by 6 degrees Fahrenheit or more, but by only 1 degree this century (Figure 22).

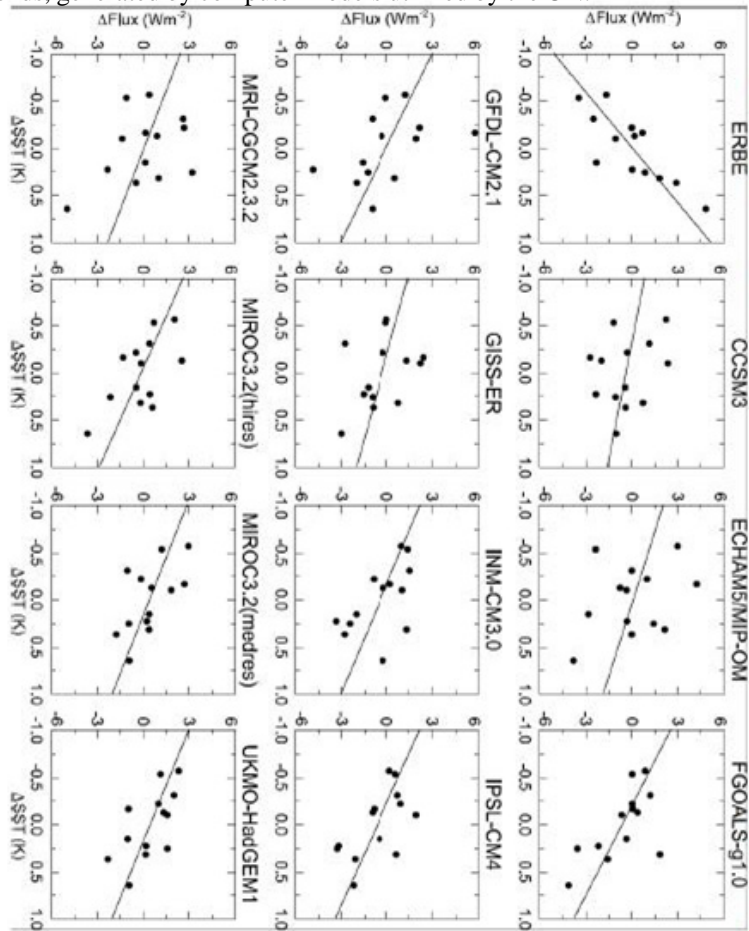
But what do we hear about the science? As the cartoonists Cox and Forkum put it, we hear the high priest of global warming preaching, "Repent! Reuse! Recycle! Lest ye burn!"



We hear regularly that there are no peer-reviewed articles that show global warming is not a problem or is exaggerated. Yet there is remarkably little scientific backing for this position. As the scientists Craig and Sherwood Idso demonstrate regularly at CO₂science.org, there are plenty of papers being published that find

Outgoing long-wave radiation is not being trapped as predicted

Figure 22. Upper-left scatter plot shows actual 15-year data, net flux of outgoing long-wave radiation (measured by satellite of the Earth Radiation Budget Experiment, ERBE). Compare to the other 11 scatter plots predicting future trends, generated by computer models utilized by the UN.



Observed reality vs. erroneous computer predictions: Scatter-plots of net flux of outgoing long-wave radiation, as measured by the satellites of the Earth Radiation Budget Experiment over a 15-year period (upper left panel) and as predicted by 11 of the computer models relied upon by the UN (all other panels), against anomalies in global mean sea surface temperature over the period.

The mismatch between reality and prediction is entirely clear. It is this astonishing graph that provides the final evidence that the UN has absurdly exaggerated the effect not only of CO₂ but of all greenhouse gases on global mean surface temperature.

What it means: If the atmospheric CO₂ concentration doubles, global temperature will rise not by the 6 F imagined by the UN's climate panel, but by a harmless 1 F.

Source: Lindzen & Choi (2009).

little or no evidence of ill effects from global warming, which show that the earth has been warmer in the past.

Then there is the assertion that it has been proved that CO₂ causes climatic warming. One of the dramatic moments in “An Inconvenient Truth” comes when former Vice President Gore shows what appears to be a strong correlation between CO₂ levels in the atmosphere and global temperature. This correlation derives from the Vostok Ice Cores, and does indeed exist (Figure 23). However, closer examination of the data shows that the temperature rise actually precedes CO₂ rise by around 400 years.

This is one of the reasons why the UK High Court found 9 areas of material error in “An Inconvenient Truth” and instructed the British Secretary of State for Education to issue a series of corrections to teachers before it could be used in British classrooms. Those corrections were:

- Polar bears are not drowning as a result of global warming
- Pacific Island nations are not evacuating their citizens
- Shutdown of the thermohaline “ocean conveyor belt” is a scientific impossibility
- Greenland’s ice melt is not likely to cause an enormous, immediate sea level rise
- The Antarctic is not losing ice mass, but gaining it
- Neither the melting of Mount Kilimanjaro’s glaciers nor the drying of Lake Chad can be attributed to global warming
- There is no evidence that atmospheric warming is causing coral bleaching or species loss
- There is no evidence that atmospheric warming caused hurricane Katrina
- The linkage presented between warming and CO₂ has the premise backward.

So the High Court essentially threw out not just all of the movie’s “money” claims, but even its most basic premise.

What does this all mean about our knowledge of the science? The great British communicator of science, Dr. Magnus Pyke (whom you may remember from Thomas Dolby’s video, “She Blinded Me with Science”) once said that the correct answer to virtually any scientific question is, “We don’t really know.” That is certainly the case with climate science. There is significant room to doubt that there is a strong, linear causal connection between CO₂ and increased

Figure 23. Climate and atmospheric history of the past 420,000 years from the Vostok ice core in Antarctica, as constructed by the United Nations Environmental Program. J.R. Petit, J. Jouzel, et al.



temperatures. The IPCC's temperature projections are so uncertain that they are meaningless for policy purposes. And claims of certain catastrophe from a warming world are overblown.

THE ECONOMICS

Turning now to the question of the economic effects of action intended to stop global warming, we must ask what emissions reduction – the only game in town when it comes to policy – would cost the United States and the world. Emissions reduction is intimately connected to affordable energy use. And as one observer once wisely said, “Energy is an indispensable ingredient of material prosperity....Where and when energy is in short supply or too expensive, people suffer from lack of direct energy services (such as cooking, heating, lighting, and transport) and from inflation, unemployment, and reduced economic output.”

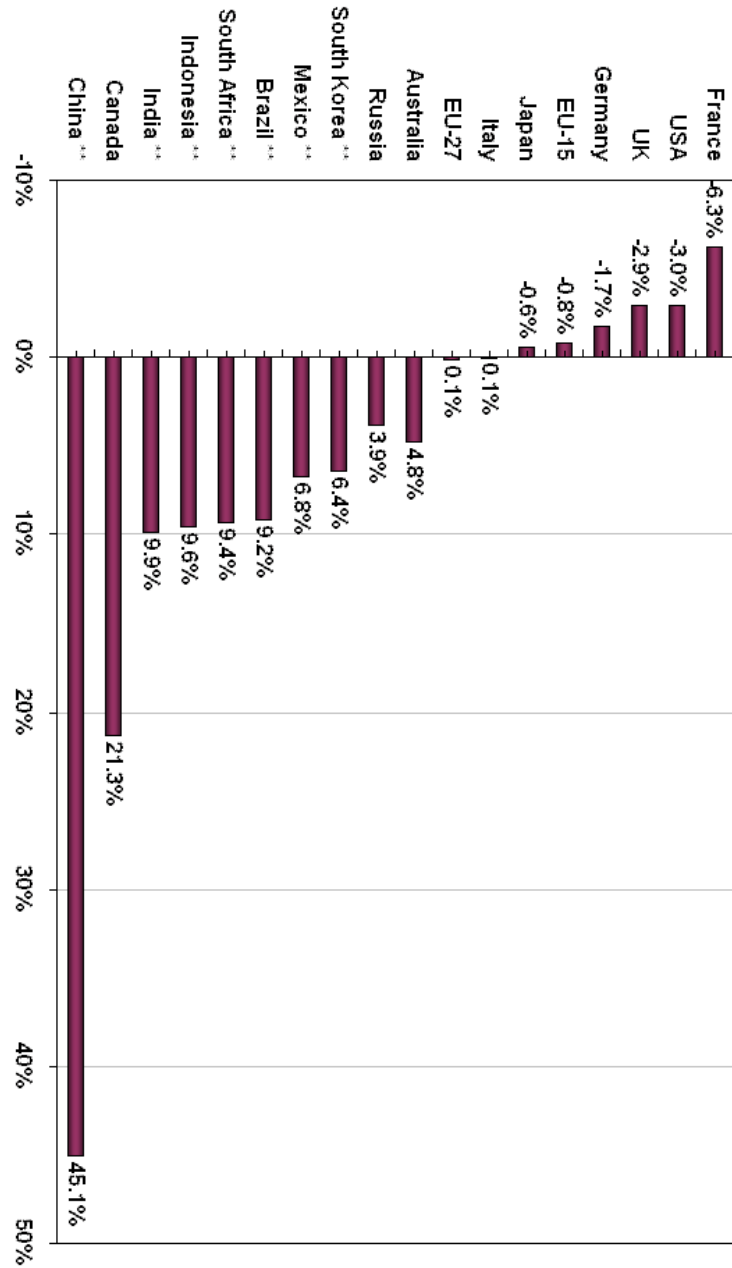
That observer was Dr. John Holdren, now the President's chief adviser on science and one of the strongest proponents of restricting emissions.

Here are the basic facts about the economics of emissions reduction. We know from experience that replacing high-emissions fuel with low-emissions energy generation is expensive. We know that higher energy prices mean less energy is used. For example, gas demand fell by 3% nationwide when gas prices reached \$4. This means that the burden of emissions reduction falls mostly on the poor, who can no longer afford the energy they need. Until such time as low emissions energy sources become more affordable than higher emissions sources, this will continue to be the case. Government subsidy of low emissions sources just shifts the problem around and costs the poor indirectly instead.

That is not to say that emissions reduction is impossible. There is a natural reduction in emissions as a result of efficiency, but it cannot supply the emissions reductions needed. For instance, while it is often alleged or implied that the USA has been increasing its emissions while the rest of the world is decreasing them, the reverse is the case. Between 2000 and 2006, the USA reduced its emissions by 3%, bettered only by France among major economies (a reduction of 6%). The UK reduced its emissions by 2.9% and Western Europe by just under 1 percent. Japan, Italy and Europe as a whole remained about the same. However, Australia, Russia, South Korea, Mexico, Brazil, South Africa, Indonesia and India all increased emissions output by up to 10%. Canada increased its emissions by over 21% and China by a staggering 45% (Figure 24).

So when people say that America was remiss for not abiding by the Kyoto Treaty to reduce emissions, we should recognize that most other countries did not do so either. From 1997, when Kyoto was signed, until 2005, the US increased emis-

Figure 24. Changes in net greenhouse gas emissions¹ 2000-2006 from 17 major economies. Sources: UNFCCC, 2008 National Inventory Reports and Common Reporting Formats and IEA Online Energy Services.



¹ Includes emissions of carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons, and perfluorocarbons, as well as emissions and removals of carbon dioxide, methane, and nitrous oxide from land-use, land-use change and forestry activities.

** No UNFCCC data available for time period; 2001 through 2005 IEA data used.

sions by 105%. The world at large increased its emissions by 116%, and the Kyoto signatories – those who actually promised to reduce emissions – increased them by 120% (Figure 25).

This is because reducing emissions is expensive. It is also difficult to square emissions reduction with rapid economic growth, which is the main aim of most countries. Indeed, valuing emissions reduction highly means foregoing economic growth, with the result that people are kept in poverty. That comes with its own economic and, indeed, environmental costs.

When we take this into account, we discover that the cost of emissions reduction far outweighs the cost of even unchecked global warming, using all the IPCC's assumptions of damage caused. William Nordhaus of Yale is the doyen of climate change economics, having been estimating the cost of climate change since the 1970s, when the worry was global cooling, not warming. According to his calculations, unabated global warming at the mid-range of the IPCC estimates (around 3 degrees Celsius), would cost the world \$22 trillion in damages (Figure 26). That's a lot of money and represents a lot of misery.

However, he also calculated the cost of two alternative plans. The first was that of Sir Nicholas Stern, whose report into the economics of climate change for the British government suggested that action on climate was essential to avoid significant economic damage. Sir Nicholas' plan, Nordhaus found, would indeed reduce the cost of climate change by \$13 trillion, to \$9 trillion (some global warming will happen anyway, the IPCC finds). However, it does so at a cost of \$26 trillion, representing lost economic benefits.

Nordhaus also examined Al Gore's plan, which would not be as effective as Sir Nicholas', reducing global warming costs to \$10 trillion. It would, however, be extremely expensive, costing \$34 trillion. This means that the total cost to the world of following Al Gore's advice would be \$44 trillion – twice as much as unabated global warming. If global warming is a disaster, what do we call the Gore plan?

This shows that environmentalist energy goals are fantasy. Massive effort is required to cut emissions. The "approved" environmental fuels are simply unable to meet the world's energy demands, and so require conventional back-up, operating less efficiently than they do today. Moreover, because of the value of rapid economic growth, the developing world is not going to comply with emission reduction targets, even if we in the developed world completely eliminate our emissions.

When I say massive effort, I mean it. The cumulative global emissions reductions

Figure 25. Changes in greenhouse gas emissions by region, 1997-2004.

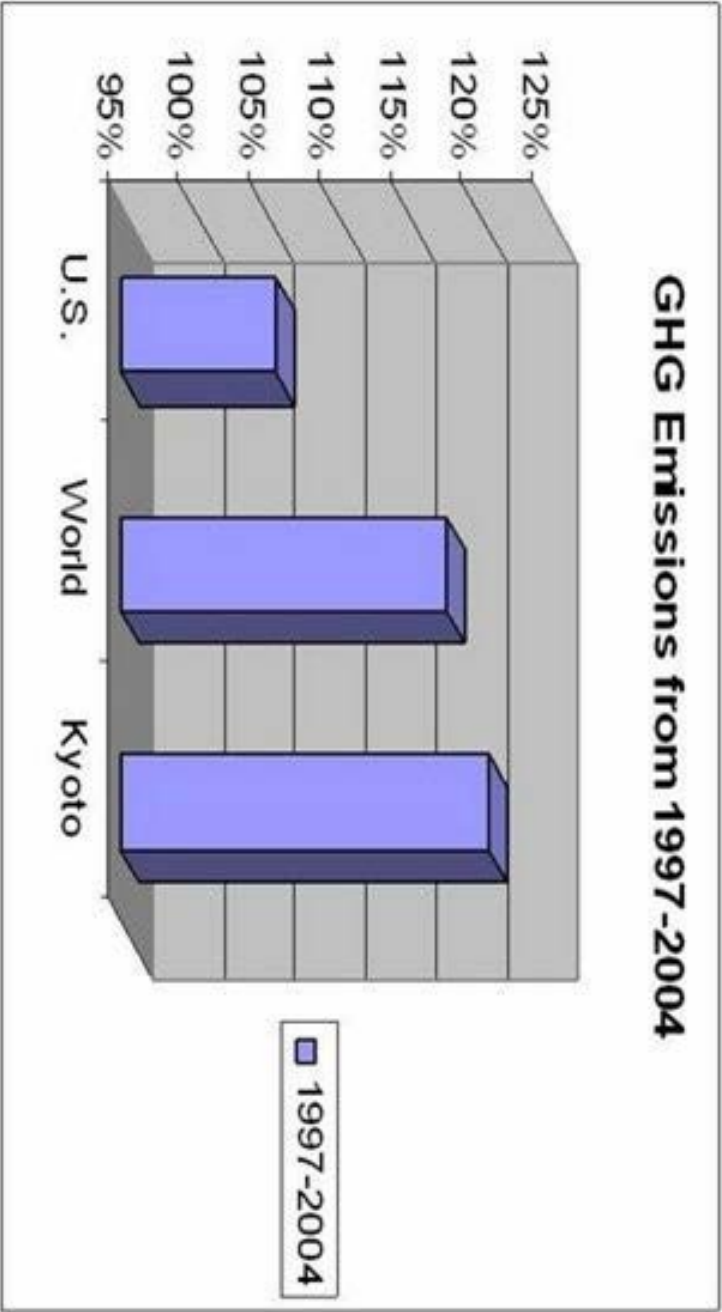
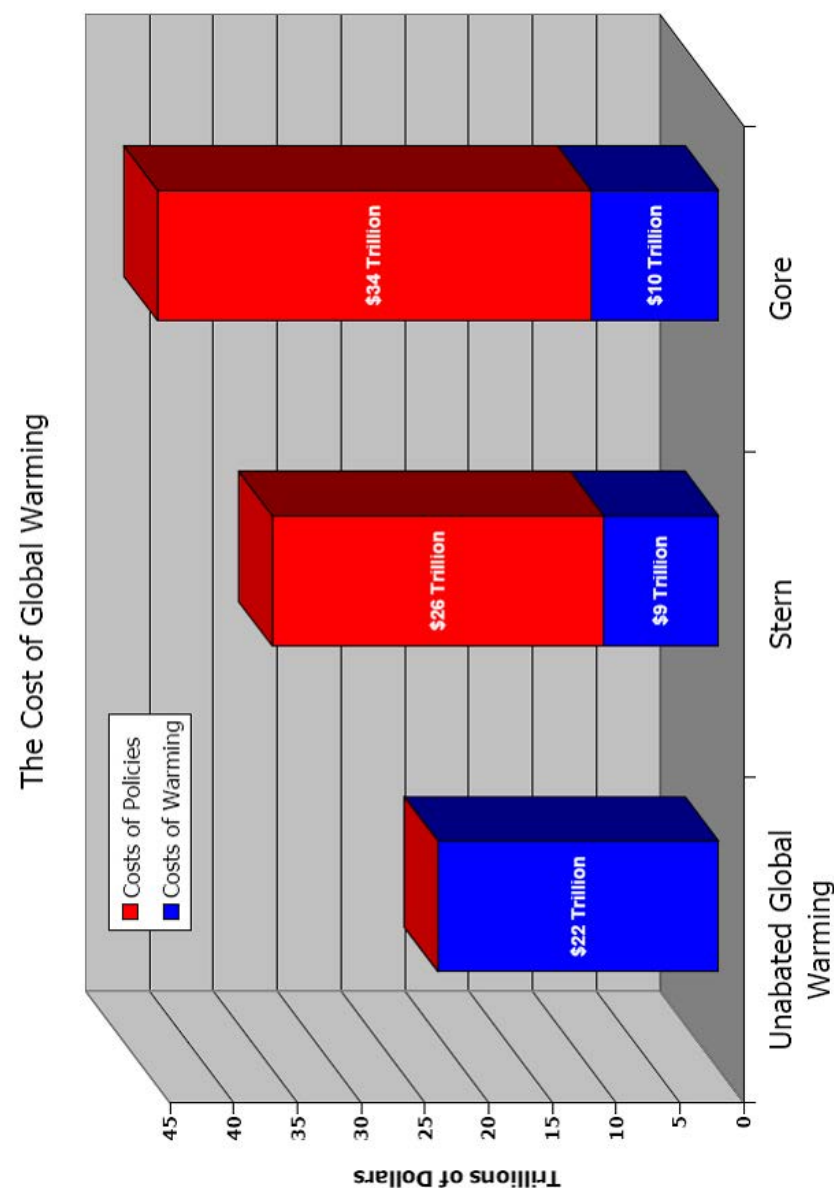


Figure 26. The estimated costs of global warming and two mitigation strategies.



needed to meet a target of 450 ppm of greenhouse gases in the atmosphere is around 3,700 gigatons of CO₂ equivalent. How much effort is needed to reduce emissions by one gigaton a year? Here are a few examples:

- Build 136 new nuclear plants of 1 Gigawatt (GW) capacity, replacing coal-fired plants. That's equivalent to one third of existing capacity worldwide (375 GW).
- Deploy 273 million new cars each year with a fuel efficiency of 40 mpg instead of 20 mpg.
- Install wind power capacity to produce 14 times the current global wind generation – equivalent to 1 million more 1 MW wind turbines.
- Install solar power capacity to produce 273 times the current global solar capacity.
- Convert a barren area twice the size of the United Kingdom to biomass production.
- Convert a barren area the size of Germany and France combined to new forest to sequester (soak up) carbon dioxide.

Each one of these would be a massive undertaking. If we managed to do one of them every year between 2010 and 2050, we'd only reach 820 GT of emissions avoided. To get enough of them to reach 3,700 GT reduction by 2050 would require a global effort that dwarfed any project mankind has engaged in so far.

Moreover, because by far the biggest increase in emissions in coming years is projected to come from developing countries, they are going to have to reduce their emissions more than we do. The thing is, the emissions they currently put out represent their level of poverty. Yet we are going to have to ask them to reduce their emissions from their current paltry level. This is equivalent to putting a starving man on a reduced calorie diet.

The math is clear. If the developed world is somehow to reduce its emissions to zero percent by 2050, to meet a global target of 50% total emissions reduction, the developing world will have to reduce its projected emissions by 62%. If the developed world manages only an 80% reduction, the developing world will have to reduce its emissions by 71%, representing a decrease on present emissions. If the developed world only reduces emissions by 50%, by far the most likely scenario of the three (even if still far-fetched), the developing world would need to reduce its emissions by 85%, representing a near halving of current levels.

So the costs of emissions reduction to international development are clear – they are devastating. What about the cost to the United States? For this we'll analyze

the Waxman-Markey Bill currently before Congress. We should note first that the Waxman-Markey bill would not do anything to reduce the effects of global warming, again assuming that the IPCC's claims about its effects are accurate. For instance, between 2050 and 2100, the bill would reduce sea level rise by only 1.1 cm, out of a projected total rise of about 35 cm (Figure 27).

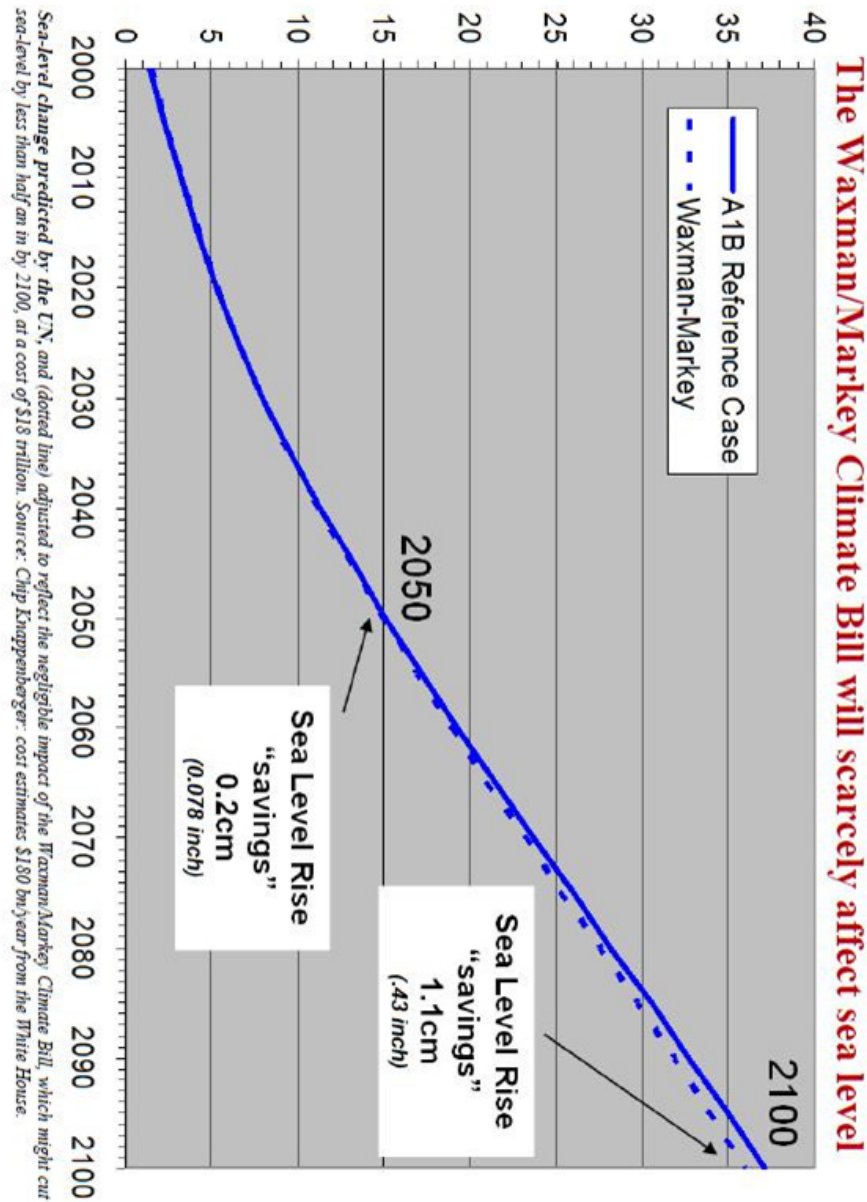
The bill would, however, come at a significant cost. According to the Heritage Foundation's analysis of the bill:

- Gasoline prices will rise by 58% (\$1.38 at current prices)
- Natural gas prices will rise 55%
- Heating oil prices will rise 56%
- Electricity prices will rise 90%
- A family of four can expect its per-year energy costs to rise by \$1,241
- Including taxes, a family of four will pay an extra \$4,609 each year
- A family of four will reduce its consumption of goods and services by up to \$3,000 per year, as its income and savings fall
- Aggregate GDP losses over the period studied will be \$9.4 trillion
- Aggregate cap-and-trade energy taxes will be \$5.7 trillion
- Job losses will rise by nearly 2.5 million and
- The national debt will rise by an additional \$12,803 per person, which makes \$51,212 per family of four.

But hang on, doesn't the President say the bill will cost us just a postage stamp a day? The trouble is that he gets that figure from an EPA study that is flawed on several counts. First, it discounts from the future actual costs to the amount we would have to put in the bank today to pay for those future counts, and that's after accounting for inflation. So while the President says it will cost the average household just \$140 a year, the actual, real out-of-pocket expenses will be \$1,287. Moreover, this figure is too small. It measures simply lost consumption not lost income. As such, it misses 60% of the real cost of the bill. Finally, the EPA measures costs per household of 2.6 people, rather than the cost for a family of four, which is much larger. The burden falls much more on families than on single people or couples.

So what does this all mean? We can conclude that reducing emissions is extremely expensive, that even reducing emissions slightly is still extremely expensive, and that attempts to "do something" about global warming are all economic pain for little to no climate gain.

Figure 27. Projected rise in sea levels with and without implementation of the Waxman/Markley climate bill.



THE ETHICAL ISSUES

Finally, we need to examine the ethical issues. Who stands to suffer – and who stands to gain – from climate policies?

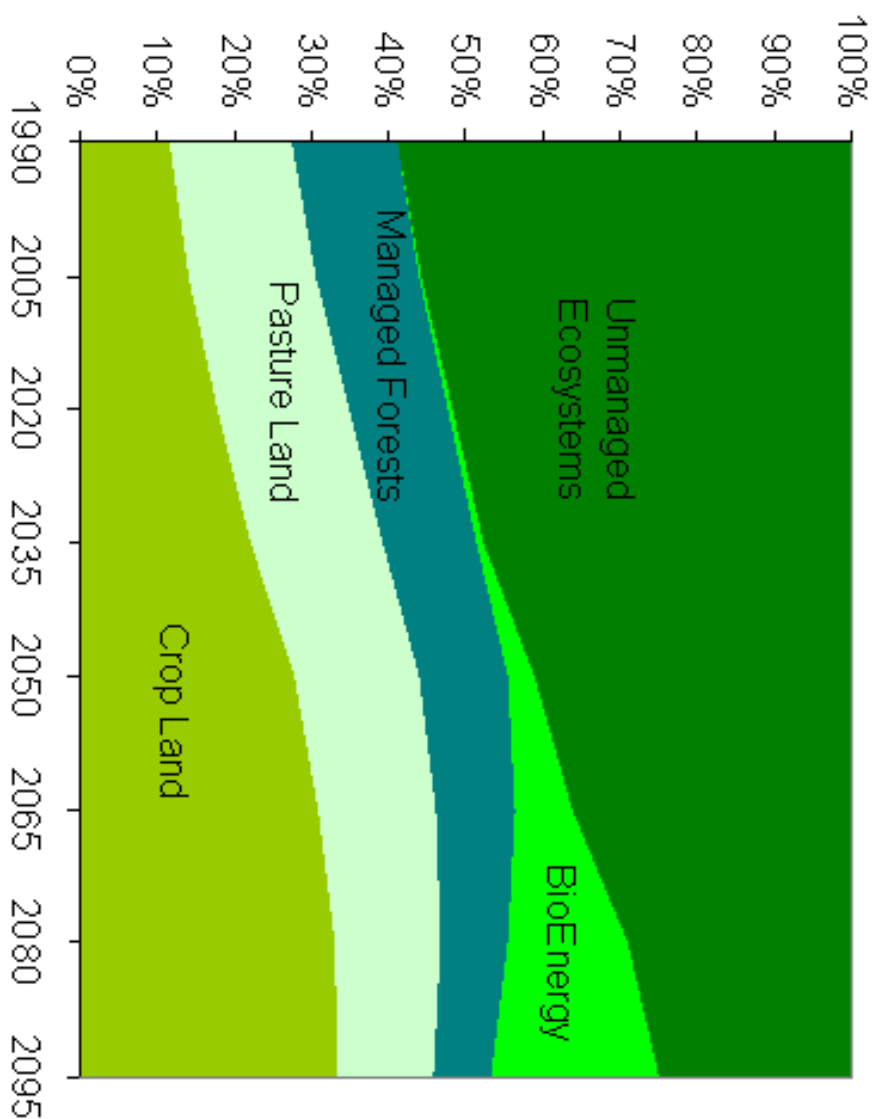
Let's return to the effects of emissions reduction on developing nations. We know that about 80 to 90 percent of the expected increase in greenhouse gas emissions between now and 2050 will come from developing countries, especially China, India and South East Asia. Most of the developing countries are also growing rapidly in population. This means that to reach a 50% reduction in global CO₂ emissions by 2050, the developing countries are going to have to cut per capita emissions by significant amounts, from what we have already established are starvation levels currently.

We looked earlier at how much total developing world emissions would have to reduce to meet the 50% target in different scenarios. The reductions are even more startling when you look at them on a per capita basis. By 2050, the developing world will probably, with no restrictions, have increased per capita emissions to just over a third of the current per capita use in developed countries (and remember, emissions represent energy use – the basis of prosperity). If the developed world completely eliminates its emissions, the developing world would have to reduce that amount by 62%. If the developed world reduces by 50%, then the per capita reduction will be 85 percent. The developing world would then be emitting only about a third of the CO₂ it currently emits per person. Barring some incredible breakthrough in technology, this represents significantly reduced access to energy for the poorest people in the world.

Meanwhile, we should also remember that there is a significant environmental cost to emissions reduction. Currently, the world farms and manages about 45% of the world's ecosystems. The rest is unmanaged. With population growth, that will grow to about 50%, reducing wilderness by about 10 percent of the world's surface. However, everyone knows that biomass is a necessary part of the emissions reduction equation – turning corn into ethanol now and using other forms, from switchgrass to algae, in the future as technology develops. We will need land for this, above and beyond the land we use to feed ourselves. By 2050, we can expect to use 4-5% of the earth's surface for bioenergy purposes. By 2095, however, that figure will grow on current projections to 20%, meaning that only 30% of the earth's surface is left with unmanaged ecosystems. That represents a significant reduction in wilderness (Figure 28).

The developing world knows all of these impacts. In 2009, Jairam Ramesh was quoted as telling Secretary of State Clinton that, "there is simply no case for the pressure that we, who have among the lowest emissions per capita, face to

Figure 28. Projected changes in land use resulting from population growth and climate change mitigation strategies.



actually reduce emissions.” He also accused the US of threatening to impose “carbon tariffs” on Indian exports if it failed to sign up to international reduction targets.

Developing world reluctance to reduce per capita emissions should not be surprising. John Christy, the University of Alabama at Huntsville scientist who maintains the satellite temperature records, used to be a missionary in Kenya. He often points out that the average Kenyan’s energy source is the local forest. His method of energy transmission is not power lines or gas stations, but the labor of women and children, who venture to the forest to pick up firewood and animal dung. His energy use is not turning on a light bulb or running a car, but burning the biomass in his hut. That is the reality of energy poverty.

So when it comes to economic growth and carbon emissions, we are left with a simple ethical choice between the two. As Tim Harford, author of *The Undercover Economist*, says, “If we are honest, then, the argument that trade leads to economic growth, which leads to climate change, leads us then to a stark conclusion: we should cut our trade links to make sure that the Chinese, Indians and Africans stay poor. The question is whether any environmental catastrophe, even severe climate change, could possibly inflict the same terrible human cost as keeping three or four billion people in poverty. To ask that question is to answer it.”

So if the world’s poor will suffer rather than benefit from climate change policies, we must ask who really benefits from them. The answer is an unholy alliance of rent-seeking businesses, politicians and environmental ideologues.

To see how businesses planned to profit from climate policies, we need look no further than Enron. In December 1997 one John Palmissano wrote an internal memo to Enron head Ken Lay about the recently-signed Kyoto Treaty. Enron had bet heavily on replacing coal with gas and renewables like wind. He said that Kyoto was “exactly what I have been lobbying for... This agreement will be good for Enron stock!!” He went on to say, “if implemented, this agreement will do more to promote Enron’s business than will almost any other regulatory initiative outside of restructuring of the energy and natural gas industries in Europe and the United States... Enron now has excellent credentials with many ‘green’ interests including Greenpeace, [World Wildlife Fund], [Natural Resources Defense Council], German Watch, the U.S. Climate Action Network, the European Climate Action Network, Ozone Action, WRI, and Worldwatch...” This position should be increasingly cultivated and capitalized on (monetized).”

As for politicians, “cap and trade” like that enshrined in the Waxman-Markey bill provides considerable benefits. It imposes a rationing scheme under which the

State decides how much, e.g., gasoline or electricity from disfavored sources such as coal the private sector can use, imposing a ration (e.g., WWII gas rationing). This gives the politician significant patronage power.

Cap and trade also brings in revenue. It raises the price of energy, diverting significant amounts of that revenue to the government, but it does so in a disguised form. It therefore allows a politician to increase costs to the consumer without taking the painful vote on a less costly direct tax. In other words, price hikes are not some side effect they're working to fix. As Sen. Benjamin Cardin (D-MD) said in April, cap-and-trade rationing is "the most significant revenue-generating proposal of our time."

Then there are the ideologues. Since the 1960s, environmental zealots have been looking for ways to stop the hitherto relentless progress of the human race. In the 1970s, they tried warning about the consequences of the "population bomb." Foremost among the doomsayers was the oddly-named Club of Rome. The "population bomb" turned out to be a new squib, so they looked around for a new target. In their 1991 book, "The First Global Revolution," the Club admitted, "New enemies therefore have to be identified. New strategies imagined, new weapons devised...In searching for a new enemy to unite us, we came up with the idea that pollution, the threat of global warming, water shortages, famine and the like would fit the bill." In other words, global warming was pushed in order to support the anti-growth agenda. The anti-growth agenda emphatically did not originate with the hypothesis that man was warming the planet.

So, we can conclude several things from this survey of the reality surrounding global warming. First, the science is much less certain than it is being portrayed. Secondly, the economics clearly shows that emissions reduction is vastly more expensive than the benefits gained. Thirdly, the developing world cannot afford further energy starvation and, finally, there are powerful vested interests that will benefit while everyone else suffers.

I'd like to leave you with a final thought. When you are asked to give up a vital aspect of civilization, and are told that it will provide massive benefits if you do, remember this suggestion made tongue-in-cheek by Catherine Bennett in the leftist British newspaper The Guardian: "In short, if we can rise to the challenge, the permanent abolition of the wheel would have the marvelously synergistic effect of creating thousands of new jobs - as blacksmiths, farriers, grooms and so on - at the same time as it conserved energy and saved the planet from otherwise inevitable devastation."

Thank you.