

Draft

North Pacific Research

Global Climate Change

Editors Note: This paper is a review of recent scientific papers on climate change; it is being released in draft form because of the importance of this issue. As more data is analyzed, it will be periodically update.

Interim Report rev 2.00

(An Unfunded, Independent Review of the Science Surrounding the Global Warming Issue)

Executive Summary

Is global warming happening? A majority of scientist and Al Gore think so. Does that make it so? Probably not! First of all, **science is not a democratic process. Truth has the only vote in Science.** Certainly successfully landing a man on the moon was not based on opinion, scientific or otherwise. Likewise, major decisions cannot be based on theory in progress, especially decisions, which alter natural laws that have been in existence successfully for over 4 billion years. One thousand years ago it was the common scientific opinion that the earth was flat and the center of the universe. Those who disagreed were treated severely. Second, it is not a majority of scientists that says so, but only a majority of the scientists belonging to the Climatology group of National academy of science. The NAS is an elite group of 2000 scientist involved in 31 disciplines. That would mean that about 65 scientists per group. Thus, the majority's opinion referred to here is in fact just the opinion of 33 people. Lastly, opinion is often far from the truth and is often strongly affected by morale principles. For example, Galileo recanted his conclusions on a sun center universe because of his person moral convictions.

Al Gore was a newspaper reporter and is now a politician. Both of these professions have little to do with the truth. Since the 1930's, the "media" has been proven a powerful tool to sway public opinion. How else could an entire nation be convinced that it was a super race and that all Jews, Gypsy, handicapped and homosexual people must be eliminated. The world not exposed to this overpower media blitz saw

what that propaganda produced far earlier than those exposed to the propaganda. Making decisions based on a media blitz and an aroused population is called mob rule and seldom leads to the correct path. If global warming is as important as claimed, then it behooves the human species not to make rash decisions based on propaganda or shoot from the hip, but to take time to seek the truth.

An informed decision requires examination of the science behind the headlines. This paper takes a critical look at some of the major studies on climate change that have been performed over the last few years. This paper is essentially an independent review of these papers to see that the authors used correct scientific methods arriving at their conclusions. The paper examines the assumptions, data, and conclusions to look for inconsistencies, errors, weak conclusion, and propose alternative conclusions. Our focus is not in so much on the science, but on the scientific process. By throwing light in dark places, we hope to improve the chances of the experts examining all factors that bear on the subject and arriving at a correct conclusion.

MELTING OF THE GLACIERS

The evidence for the glacial melting in Greenland has received considerable media attention. *“Measurements over the last few years shows that Greenland has experienced increased melt, thinning at the margins and increased discharge from many outlet glaciers. At the same time, the ice sheet has been growing in its interior.”*¹ The shrinking was pointed out by Al Gore, but not the growth in the center. The fact that some regions are shedding mass dramatically, whereas others are not, indicates a clear need for measurements that allow assessment of the total glacier behavior; is obvious and was a conclusion reached by the authors of the report.

Historical data

We know that glaciers have formed and melted many times in the past. It is also known that 33.5 million years ago the earth had no polar ice caps at all.² Certainly, the rate of melting of the edges of Greenland glaciers is rapid, however, there is no evidence that the present rate is atypical. To simply assume this is the only time in the 4 billion plus years of earth's history that this has occurred or that it will produce the end of life on this planet is irrational. We know from history that when Greenland was discovered and colonized about 1000 years ago by Norwegian cattle farmers large amounts of land were available for grazing. There is no scientific evidence of the extent of the glaciers 1000 years ago, but it seems highly unlikely that Norwegian cattle farmers would settle Greenland if they could not produce food. History also indicates that the colony flourished for 400 years before the ice returned and drove them off the land in 1400. Near the end of this period the colonist were subsisting on seafood. This indirect evidence indicates that at least once in the past, **the ice fields of Greenland had undergone considerable rapid melting without producing severe global warming.** This information is not conclusive proof of anything, but it does caution against emotional reactions. Those who ignore history are doomed to repeat their mistakes.

¹ Luthcke, S. B. et al. Recent Greenland Ice Mass Loss by Drainage System from Satellite Gravity Observations. Science vol 314, Nov 24, 2006, pg 1286

² Editorial Nature Magazine, Vol 446, 8 march 2007, page ix.

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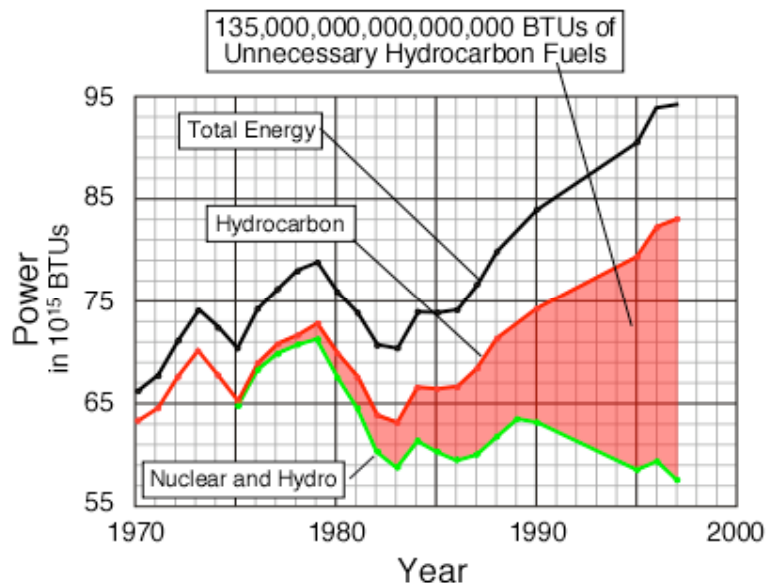
There is little doubt that interaction between glaciers and global temperature is not fully understood. “*Researchers don’t understand why the massive ice sheets are proving so sensitive to as-yet-modest warming of air and ocean water.*”³ The modest warming referred to in this statement is about 2/10’s of a degree C. What we know is that melting of the glaciers draws large amounts of heat out of the atmosphere and dumps large volumes of cold fresh water into the oceans. The effect of these two processes on the global temperature is unknown. We also know that around 10,000 years ago an apparent temporary diversion of glacial melt-water from the Mississippi River to the St. Lawrence drainage system (the Younger-Dryas event) dumped massive amounts of cold fresh water into the Atlantic disrupting the ocean circulation system and produced a sharp cooling of the temperature in the northern hemisphere. This event resulted in the advance of the ice sheet that covered most of the northern hemisphere prior to the introduction agriculture. Thus, if past is any indication of the future, the melting of the glaciers may be an indication of global warming but also may ultimately result in global cooling.

EMOTIONAL DECISIONS

Emotional decision-making generally results in failure. Global warming is obviously an emotional issue. The review of the research on this issue indicates considerable influence of emotion and environmental religious beliefs on important scientific research. Forty years ago, we made another decision based on an aroused public complete with mob demonstrations and media driven hysteria. The result of that hysteria was the decision to ban the building of nuclear power plant. As a result, we burned billions of tons of coal producing massive releases of CO₂.

The very same CO₂ we are trying to eliminate today. See Figure 1. The green curve is the amount of the power generated by the nuclear and Hydropower. Note how it falls away from the red curve. If we had not abandon nuclear and hydropower, the curve would have followed the red line.

The red shaded area is the amount of unnecessary CO₂ producing hydrocarbon fuel burned because of that poorly thought out decision. Emotion does not think ahead. The probability is that another hip shot decision is likely to only exacerbate any global climate problems.



CARBON DIOXIDE CONTENT OF THE AIR

Because Carbon dioxide is considered a “greenhouse gas,” the rise of a few parts per million of carbon dioxide content in the air is generally considered as the cause of the

³ News staff, Breakthrough of the year, Science vol 314, Dec 22, 2006, pg 1850

measured short-term rise in temperature. The case for human-induced warming seems to be growing. The preferred culprit is human industrialization and energy needs, but CO₂ is produced in many ways other than burning. For example, metabolism the basic energy exchange process for all animal life also produces CO₂. A short calculation shows the problem is more complex than what the environmental activists are touting. For example, as short calculation based on the following facts shows a different side to the problem;

1. The average human breathes about 30 times per minute.
2. That the human lung exchanges about 4.5 liters of air each breath.
3. The carbon content of the average exhaled air is about 5.5% carbon dioxide⁴.
4. Carbon dioxide weighs 1.8 grams per liter
5. World population is 7 billion people
6. World industrial CO₂ is 6,000 million metric tons

Using these data, a series of short calculation shows that a single human exhales about 7 metric tons of CO₂ per year. Since there are about 7 billion humans on the planet, the breathing of the human population produces about 49,000 million metric tons (MMT) of carbon dioxide per year. Compare this with the 27,000 MMT produced by all global industrial activities. Thus, population growth appears to be 180% larger factor affecting the increase in atmospheric CO₂ than industrial activities including the burning of fossil fuels. This factor cannot be ignored if global warming is to be stopped. Pulling on this string unravels a whole host of alarming conclusions.

For example, there are considerably more than 7 billion other animals that metabolize on this planet. The combined CO₂ produced by those animals is estimated to be at least an order of magnitude higher, i.e. 50,000 MMT. If global warming is such a critical problem, is it wise to exclude the major producer. Has the dramatic increase in the world population of wild animals in the last 40 years partially to blame for the increase in CO₂? The reality is that when it comes to the earth's environment things are not simple. The common notion that the earth has an infinite food and energy supply is false.

METHANE AND GOING OVER TO THE DARK SIDE

Unfortunately, CO₂ is not the only greenhouse gas. A recent article on methane's contribution to global warming was prefaced with the following statement, "*What do you do as a scientist when you discover something that clearly contradicts the textbooks?*"⁵ That a scientist should ask this question is in itself an expression of the sad state that science finds itself today. The results obtained by the research team that produced this paper obviously caused considerable dread to the authors. Why? Science is supposed to be a search for truth. The paper is a good paper but throws considerable doubt on the mainstream environmental religion sect that controls much of the research in the world. Their soul searching was real and expressed in the text of the document, and maybe

⁴ Fuks, Leonardo; Prediction and Measurements of Exhaled Air effects in the pitch of wind instruments, Proceedings of the Institute of Acoustics Vol. 19 part 5, book 2, page 373 to 378

⁵ Keppler and Rockmann, Methane, Plants, and Climate Change, Scientific American, February 2002, page 53.

rightly so, because their work showed that green plants make methane and in major quantities.

According to their article, 600 million metric tons (MMT) are produced by the world's forest and rise into the atmosphere each year, this is about 1/10 of the CO₂ produced by industry each year as shown above. That is the good news; the bad news is that methane warms the atmosphere 23 times greater than CO₂. The result is that the methane in carbon equivalents is equal to 13,800 MMT of CO₂, or over twice the pollution effects of industry. These facts clearly indicate that both forests and swamplands are contributing to global warming, the same forests and wetlands that have been greatly expanded by environmental groups in the last 40 years. This does indeed clearly contradict textbooks, and raise the question, which strikes at the heart of a generation that felt they could control evolution on this planet better than Mother Nature. The assumption that old growth forest and wetlands have no negative effects on the environment is false.

Methane and Wetlands

Another article on methane production, also indicated methane as a serious contributor to global warming. This article was centered on a controversy surrounding the Balbina dam in Brazil.⁶ The author, not a scientist, reports that a 2,500 Km² reservoir emits between 23 and 122 million metric tons of methane per year. That is quite a spread in estimates. A possible reason for this spread in data is that the methane production is dependant on the amount of vegetation left behind the dam. Since methane production destroys the vegetation, the maximum release of methane would occur shortly after the reservoir is flooded (122 MMT). As the vegetation is consumed by the methane-producing bacteria, the methane released into the atmosphere is reduced (23 MMT). Since the methane is reportedly produced from the debris and trees left in the reservoir. A question not answered in the article was, why the trees were left in the reservoir. Dam reservoirs are normally cleared of debris and trees.

The article is accompanied by a picture of trees partially submerged in water. The interesting thing is that the picture is not of the 2,500 Square kilometer reservoir, but of the Pantanal a 100,000 Square Kilometer flood plain, which is in effect a natural recurring reservoir on one of the tributaries of the Amazon. What seemed to slip the mind of the author is that this natural reservoir produces 40 times more methane than the Balbina dam and unlike the dam the supply of methane producing debris is renewed each year. Further this points to other large swamps and wetlands as important contributors to global warming. There are 20,000 square kilometers of swampland in the southeastern part of the United States. Satellite images show this area to be producing large amounts of greenhouse gas. **If global warming is a serious issue and needs to be resolved, can we afford to ignore nature's overwhelming contribution to the problem?**

PROBLEMS WITH THE HOCKEY STICK CURVE

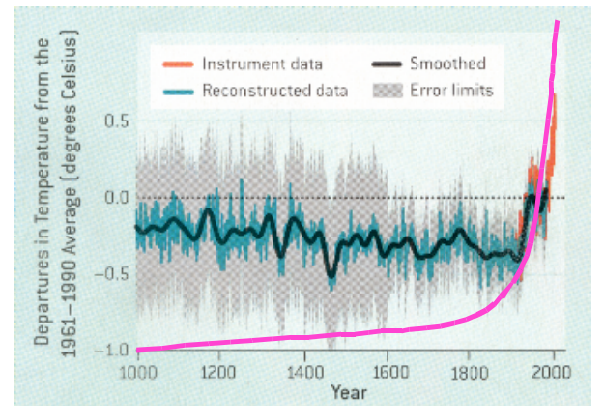
The hockey stick plot is often used to show graphically that global warming is occurring at a rapid rate. The science behind this paper is questionable. For example, the famous curve was constructed using two entirely distinct sets of data. The data for the blade is taken from urban thermometer measurements, while the data for the handle is

⁶ Giles, Jim; Methane Quashes Green Credentials of Hydropower, Nature, Nov 30, 2006, pg 524

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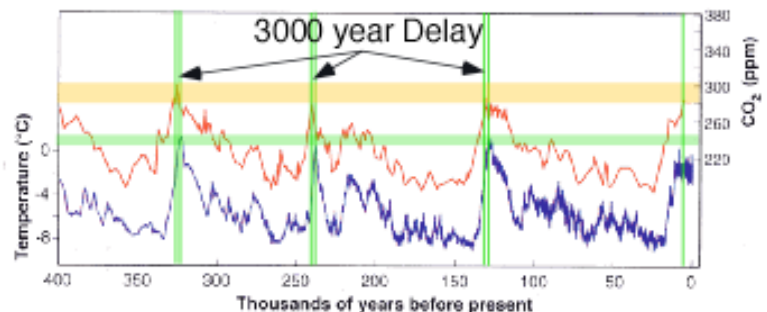
derived from tree ring data from wooded areas. The joining of these two different data sets in the year 1900 gives the plot its distinct shape. The validity of this connection without a mathematical adjustment of the data is questionable.

It is a fact that temperature in wooded areas are often as much as 5 degrees cooler than temperatures taken in a nearby urban area. Cities have concrete and asphalt that stores heat and air conditioners belching hot air. In the woods, the trees expel moisture, which cools the atmosphere. This connection therefore cannot be made unless there is a factor included that would adjust the forest temperature upward or the urban temperature downward. This adjustment would cause the handle to move up or the blade to move down and completely reverse the conclusion of this pivotal research. If this connection point were off even by one degree, the hockey stick would predict global cooling. There are many other problems with this paper, which will be discussed later. This paper claims that the industrialization of the world that began in 1800 is the obvious cause of this problem. Here is that curve with population growth over the same time period (the magenta curve) overlaid. Do you suppose that fit is a coincidence?



HISTORIC GLOBAL WARMTH

History does not support global warming; history predicts global cooling. The Four hundred thousand years of glacial data, shown in Figure 2 indicates that once the CO₂ reaches the level indicated by the orange band (± 20 ppm) a climate change will occur. However, the temperature seems to continue to rise for 3000 years (the left side of the vertical green bar) and then the earth plunges into an ice age (the right side of the green bar). This has happened at least four times in the last 420,000 years. Why should the earth reverse its behavior today? Also, notice the horizontal green band, which indicates the temperature sensitivity to this change is about 1 ° C. Finally, there is an anomaly shown in the temperature curve that occurred about 5,000 years ago. The CO₂ content passed into the orange band and for the first time in 420,000 years the temperature did not plunge but leveled off. According to history, we should be 2000 years into an ice age. The cause of this radical temperature variation needs to be examined, because if we arbitrarily cool the earth today through human tampering we may upset nature's process of temperature control and plunge ourselves into an ice age.



Introduction

Global warming is the current magic phrase that immediately attracts attention to your work, produces notoriety and garners large grants for research. Two hundred years ago, research was the pastime of the idle rich. Today research is a business and like all businesses, it must make money. This goes for both private and public research facilities. Next to income derived from sports, colleges survive on income from grants. The term publish or perish is based on that fact. If you imagine that college research is done by people who ride out on a white charger seeking truth, there is some property in Florida I would like to show you. College research is also done under the control of an absolute dictator, whose reputation is built on the efforts of others. Get out of line and your career is over. The influence of the graduate professor spreads far beyond the college campus. To disagree with or even question Einstein was the end of your career in research.

A recent paper was introduced by the statement, "What do you do as a scientist when you discover something that clearly contradicts the textbooks?" They knew the establishment would come down hard on their work. They published the work, but included numerous statements that were designed to diminish the retribution from the establishment.

The money for research comes from both private and public grants. In order for a research institution to get grants, it must have a good reputation and support the beliefs of their clients. Both of these requirements place controls on what can be expressed in a research paper. For example, if you have a grant from the Audubon Society and one of your conclusions is that, there are too many Canadian Geese in our cities; that will be the last grant you obtain from that organization. Special interest groups are not interested in truth only advancing their special interest. Greed is not restricted to corporations.

RESEARCH

In theory, good science starts with sound assumptions and moves to a logical conclusion based on observed facts and examination of all possible hypotheses. Not all sciences are created equal. Mathematics can be quite exact, followed by physics and chemistry. Biology as a science is much less exact. This lack of precision is partly due to the indistinct variables and the difficulty of controlling all the variables in any given problem. One reason for this is the complexity of the system being analyzed. For example, in climatology sometimes it is very difficult to identify let alone control all the variables. Not all scientists are created equal either.

The classical scientist should remain detached from the results of his research. However, that is not always so. We have all read of how corporate greed can supposedly affect the results of research. If a scientist does not favor global warming, the press off connects the researcher to having done research in the past from oil companies. But, corporate greed is not the only source of bias in the research field other large funding sources like the Sierra club and the Audubon society have axes to grind and sponsors research the supports their beliefs. Special interest groups are notoriously one sided in

⁷ Keppler and Rockmann, Methane, Plants, and Climate Change, Scientific American, February 2002, page 53.

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their opinion. University research departments are the last bastions for true dictators. Last but not least, religion plays a major roll in adding bias to conclusions. The environmental fervor has risen to religious levels in research organizations. It is not a joke when a fellow research has been labeled as going over to the dark side (non classic environmental doctrine). This is a severe career limiting decision.

Research as a Process

A research project is composed of several phases; set up, gather data, analysis, and conclusions. Research starts with a theory as to how the system works. The experiment can then be set up to prove that theory right or prove it wrong. Most research is set up to prove theories right. However, greater opportunity to remain detached exists if the experiment is set up to prove the theory wrong. If the theory cannot be proved wrong, it must be right. This factor plays directly into the lack of objectivity discussed above.

When setting up the experiment the researcher has considerable control over what will be studied and measured which strongly effects the expected outcome. For instance, it is not too difficult to set up an experiment to prove that fish prefer cool water. There may be many reasons why fish would inhabit cool water other than just the temperature. Food supplies, concealment, upwelling of ground water are just a few. By not gather data on these issues, the researcher excludes their impact on the results.

Conversely, while gathering data the researcher follows strict requirements. Data must be recorded completely and accurately. During the analysis portion of the work, again there exists considerable latitude. The researcher is not obligated to subject the data to every possible analysis. Presentation of the data is also commonly manipulated. For example, coordinates for a graph can give the impression of large change by simply selecting a scale where one variable is much larger than the other. Finally, the researcher is under no obligation to include all conclusions. One conclusion you will usually find in a report is “more research on this subject is required.” Interpretation: send more money. **One conclusion you will almost never find in a report is one that makes the client angry.** Regardless of who supplies the funds an advocacy group or industry.

Reading Research

Most people read the conclusions, a few will look at graphs and even less will look at the analysis and the data. This is unfortunate because the one area which can be manipulated the least is the data. This independent and unfunded review examines the conclusion, analysis and the data first to see that they are consistent, and then we look for other analysis and conclusions that can be made from the same data.

Research results take a torturous path to utilization. Consider that it normally takes two years from the onset of data gathering to publication of the report. It generally takes several more years before the report is accepted by general body of the science. Then it passes from into the hands of the regulators where it spends several more years before regulations are written and several more before the regulations are approved. Thus, regulations are based on ten-year-old science, which is out of date before the regulations become operational.

However, the alternative to this approach is mob rule and an attitude from the sixty's, “Do something even if it is wrong.” This technique is to get people in the streets, carrying banners proclaiming action now. Humans are fascinated with Doom. The world has been faced with eminent doom for the last 2000 years at least. Nuclear power will

kill us all it must be stopped. No more Nucs! Mob rule prevailed. We stopped building nuclear and hydro power-plants 30 years ago, both methods which do not pollute the atmosphere, and began burning billions of tons of coal and oil. Mob rule thirty years ago has put us into the situation we find ourselves in today. If you do not pay attention to history, you are doomed to repeat your mistakes.

The salmon issue was another emotional issue. At one time scientific opinion felt that hatcheries alone would solve the problem. Then scientific opinion added harvest control to the mix and assured us again that this would solve the problem. Then with no improvement and a little more study, scientific opinion decided that river habitat was the new reason for the decline. Clean all the debris out of the rivers and we will have salmon – no, put it all back and we will have salmon. Then water quality became the real answer, clean up the water – no put rotten fish back into the water. Isn't it about time we stop guessing, using opinions and incomplete science? Opinions, even a majority opinion is at best an educated guess and history shows that more often than not guesses are wrong. Major decisions should be made on fact,

North Pacific Research's review shows some serious questions on the research that supports the theory of global warming, and that global temperature change is caused by increases in CO₂ content of the air. It also shows that the conclusions are based on a body of science that while large, is incomplete, contains numerous opinions and untested assumptions, lacks objectivity, and seems to focus mostly on human activities.

Incomplete Research

If we are going to understand the global warming puzzle, sufficiently enough to predict the outcome of our meddling, we need to identify all the pieces and connect them correctly. There are still many unanswered questions concerning the atmosphere, the oceans, the land and the biosphere and their effect on global conditions. In truth, we are trying to make sense out of a puzzle that has 90% of the pieces missing. We are rushing at drawing conclusions on the trend of weather over millennium based on data from a few years research. The Greenland glaciers that spewed large amounts of melt water into the sea so drastically in 2004 and 2005 are now less than two years later very near their original outflow.⁸

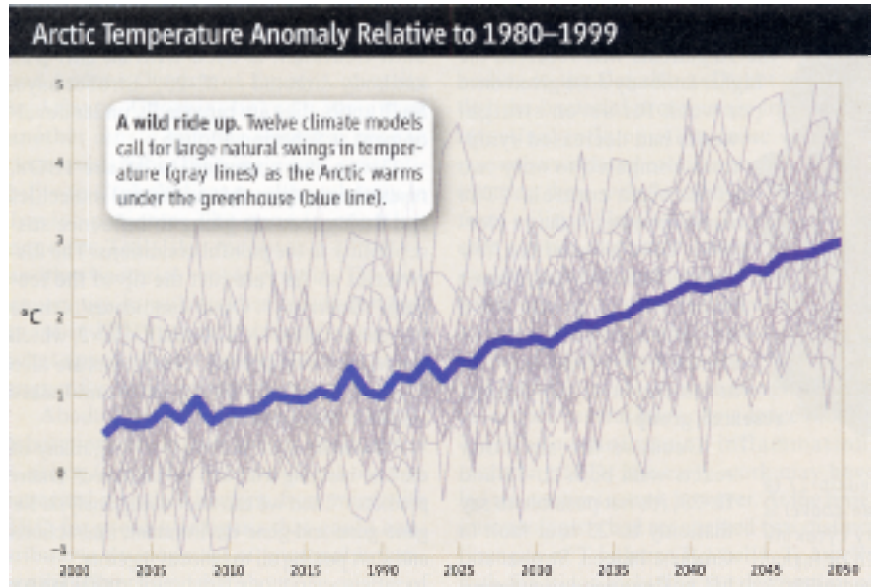
Models

Too many of the conclusions of global change research relies on models. Models are notorious from proving anything the modeler wants to prove. If a model is to be used in credible research, it must be complete, verified and validated. While some verification, (checking of the code to see that it reflects the intent of the model), has taken place; incomplete validation, (checking to see that the model reflects what is actually occurring in nature), has been done. Now Al Gore can believe in a model if he chooses, but scientists should be interested in truth.

Recently, an article studied 22 climate models to see if they predict the future accurately. The article was written to warn people that the recent warming trend that has stirred the public interest may vanish for at least a few years. In this article they admit that the Arctic temperature has swung widely from decade to decade through out the 20th century. Ten of these models were not used or discussed in the article. The remaining 12

⁸ Reported in Science Express; Feb 9, 2007 the online journal of the American Association for the advancement of Science

models were modified by adding a human factor. The plot at the right shows the results of the 12 models, (the light gray lines).⁹ Notice there is as much as a 5° C variation in temperature between these models. As a result of these models a 0.5° C temperature rise is predicted. The author tossed out 10 of these models that have been used in the past, because none of them predicted the sharp temperature swings from decade to decade during the 20th century. The remaining 12 though somewhat better, they do not predict the conditions currently occurring in the Arctic. The author suggests modifying these models mathematically by the addition of two more fudge factors to account for natural and human warming. Modifying the facts to fit a preconceived notion is not science



Opinions are not Science

Reports, scientific or otherwise, that contain words like “possibly,” “we think,” “in our opinion,” “could be,” “may be,” and so on are typical of research that is still incomplete. At best, it could be said that these words indicate a theory in progress. In reality, they often express what the researcher wants to believe. Remember that anything is possible; the probability that it will occur may just be remote. It is possible that you could win the lottery; or successfully adjusting nature’s pattern without complete understanding but the probability of either being true is remote. Science to remain science needs to deal primarily in facts.

Lack of Objectivity

Lack of objectivity appears in the type of studies performed and the lack of looking at alternative, valid explanations. There are numerous studies that support the idea that human activities cause global warming and few support the idea that other than human activities cause global warming. To simply assume there are none is not good science. The real world problems are not black and white but many shades of gray.

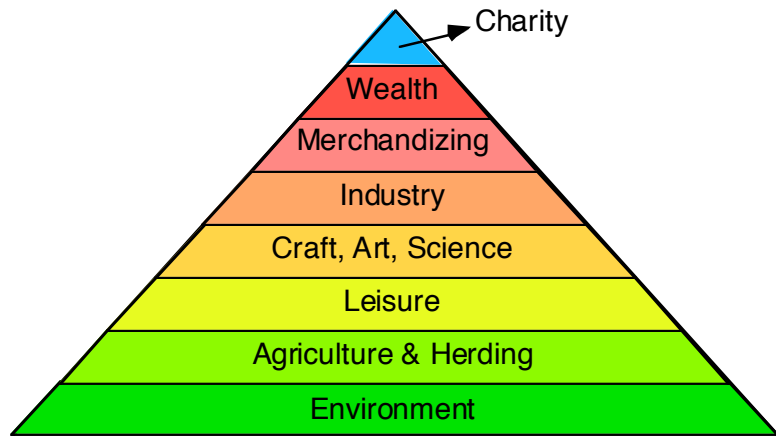
THE ECONOMIC PYRAMID

What we don’t know does hurt us. About 50 years ago, we had an information explosion, which has grown larger. An obvious result of this explosion is the complexity of our present social system. A not so obvious result of this explosion is the specialization of science and the training time necessary to acquire that knowledge base.

⁹ Overland, J. & Wang, M; Could Mother Nature give the warming Arctic a Reprieve, Science vol 315, Jan 5, 2007, page 36

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Since the human life span is finite, the focus of scientist became limited. Some scientists realize that their specialty overlaps other scientific fields but few realize that non-scientific fields are important as well. One of those fields is economics. In economics, a pyramid exists much like the pyramid of life in biology. On the bottom of the pyramid lies the environment, which $\pm 12,000$ years ago was exploited by humans to provide an abundant food supply by limiting biodiversity. The abundance of food produces leisure time, which can be exploited to develop crafts, art and science. The result of that investment in leisure time produced industry. Industry produced products that other people could sell which developed trade and merchandizing. The result of this merchandizing was wealth. On top of the pyramid is discretionary wealth or charity, which is used to fund humanitarian work.



The Economic Pyramid

The underlying concept to this pyramid is that **wealth is a result and a concentration of the environment**. Environmentalists are quick to grasp that industry is destroying large amounts of our environment. However, they totally miss the fact that wealth destroys even more. To waste money is to waste the environment. Economics must be a part of all environmental solutions or the solution will destroy more environment than it saves. For example, to spend 40 million dollars on the clean up of the New Carissa wreck on the Oregon coast to save eight marbled murrelets is a waste of tens of thousands of acres of trees or thousands of tons of salmon used to make those dollars. The idea that the environment is more important than money is fostered by economic ignorance. A large amount of the environment must be destroyed before money can be made to repair the environment. The economic pyramid like all pyramids is terribly inefficient. Increasing the cost of food production by unnecessary environmental spending increases the cost of food and the poor of the world suffer first.

Globe Temperature

Global temperature is easy to conceptualize but extremely difficult to measure. Thus, the temperatures that the global warming conclusions are drawn on, or inferred from, are based on other measurements. This allows considerable latitude to generate almost any temperature you like. The same is true of the human body. However, humans have standardized the measuring of body temperature by designating where and how it is to be taken. Unlike the human body, the earth has no orifice in which a thermometer can be inserted. Nor is there any standard means of measurement. Where, when and how is left up to the researcher to decide daily or hourly, maximum, minimum or average temperatures, and how many and which places should be used to calculate global temperature. Temperature records from, mostly large cities have been recorded over the last 75 years. Unfortunately, there is not a standard format for when, how and

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specifications on accuracy and the calibration of instruments sufficient to measure temperature to 0.1° C. Early temperature measurements before 150 years ago are almost non-existent terribly inconsistent and inaccurate. Even until the last quarter of the 20th century, they were used as point sources to indicate local conditions. As such, their accuracy and consistency invalidate them for uses to determine global temperature with any accuracy less than 3 or 4 degrees.

Measuring the temperature in one place say Portland is not global temperature, any more than measuring the temperature in a single room in your home reflects the temperature of the house. Choosing different cities around the world and averaging there data introduces error and bias. It is not a trivial thing to change these readings into an annual global reading. For example, how many cities do you choose, 100, 1000, 10,000 and which 10,000 do you choose. By judiciously choosing the cities, you can get almost any result you wish. Another major problem with thermometer data is that rural areas make up most of the globe and rural temperatures are ignored. More importantly, cities are often warmer than rural areas. This bias tends to give global temperatures several degrees higher, than a true global temperature.

MEASURING THE TEMPERATURE OF THE GLOBE

Measuring a true global temperature is not a trivial exercise. Presently there is no consistent or approved standard method of measuring global temperature. To get a true global temperature you must average the temperature at every spot on the earth. Since temperature varies greatly with space a contour map of temperature could be produce that may more accurately represent surface temperatures. Further, global temperature is not just surface temperature, it is composed of atmosphere temperature as well.

In order to get a truly global temperature, we need a method that senses the temperature for the entire globe at the same time at multiple elevations to reduce the affected of local conditions. It has only been in the last few years that we have had the capability to get instantaneous hemispherical readings from satellite imagery. One possible way to measure global temperature accurately would be measure both hemispherical temperatures simultaneously, and at multiple elevations to account for temperature variation with elevation. These instantaneous readings then must be process to get hourly daily and finally annual readings. By now, it should be fairly easy to see that any reference to historic global temperature is pure fiction, and lives in the twisted minds of climatologist. Thirty years ago during a distinct cooling period, climatologist were predicting the come of a new ice age.

Historic Temperature

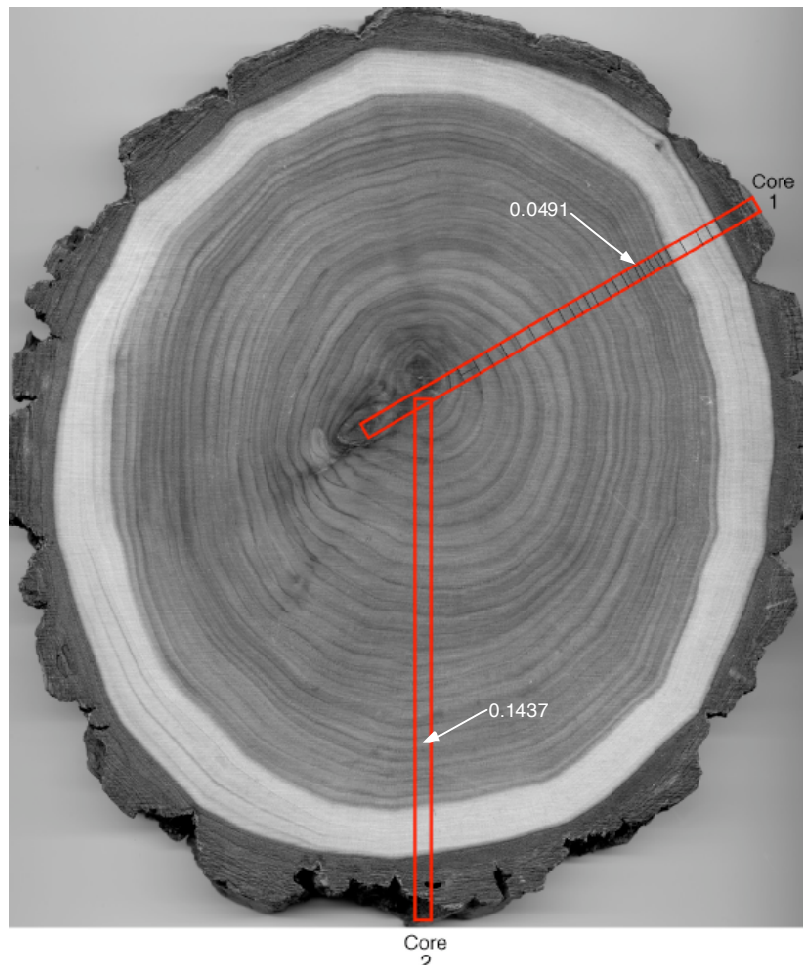
The temperature 4.5 billion years ago was several hundred degrees hot than it is today. It has changed radically since then. Temperature is one of the variables that drive evolution. Changing temperature will therefore change the course of evolution. To correctly change the temperature, it is necessary to know the course of evolution. This means that it is necessary to understand both global temperature and evolution. Presently human knowledge is lacking in both areas. For example, not only do humans not fully understand the evolution process, they certainly are completely unaware of its direction and ultimate target. Obviously to safely fly a plane it is necessary to know how to control the plane and where its going.

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In order to get a meaningful temperature gradient to determine whether the globe is warming or cooling requires a means of measuring global historic temperatures. This introduces new complications and accompanying errors. To understand global temperature it is necessary to study the trends over 100,000 years and longer. Much of the historic data is gathered from unpopulated areas and is estimated use either the width of growth rings in trees or oxygen isotopes found in glacial cores. Tree ring data can be obtain over the last 1000 years. Glacial records can indicate temperature over a million years scale. Each of these methods has limitations for example trees are only in forests and glaciers are only in the Polar Regions.

TREE RING DATA

Almost all basic tree ring data is gathered with an instrument, called an incremental borer. The research assistant picks out a tree assembles the borer and $\frac{1}{4}$ inch core sample from the tree. This core is taken essentially at random with no guarantee that it will represent average tree ring width. The figure below is a photograph of a typical tree cross section.



Looking at this photo, several data extraction problems are apparent. First, the lines between the rings are indistinct. The blurring of the lines between the growth rings makes the determination of the absolute thickness of the rings difficult. This blurring is

caused by the tree growth starting and stopping near the beginning and ending of the growing season. There are in generally several starts and stops at both ends of the growing seasons. This makes measuring the width of the ring subjective.

The rings are also not symmetrical and the center of the tree is not in the center of the section. This lack of symmetry is caused by environmental changes during the growth of the tree. For example, more sunlight on one side of the tree will produce irregular rings width. That makes the tree ring width dependent more on the placement of the incremental borer than it does on the growing season. For example, the position of the borer at core location one shows the 6th ring into have a width of 0.0491, compared to the 0.1437 width measured of the same ring in core position 2; that amounts to a 300 % error depending simply on the random placement of the borer.

In addition, inspection shows a general trend of rings with narrower width, as the tree gets older. It is known that young trees increase their height much faster than older trees. Climatologist interpreted that as the tree's growth slowing with age. This bias is traditionally offset by applying a factor to the tree ring width, which favors a longer (warmer) growing season with age. The truth is that as the tree gets older, it simply adjusts its priorities and more energy is put into girth rather than height. A better way for gauging the growing period would be to compare the area or circumference of the ring. Both of these two approaches eliminates the error due to asymmetrical rings, and since growth is a volume function both would better related to growing season. This approach is not used because of labor and environmental problems. However, not using it also significantly reduces the validity of the findings obtain from this data.

Tree Ring Data transformation

Once the tree ring data is gathered, it is necessary to transform the basic data from ring width into average annual global temperature. This requires at least 4 steps and each step introduces error into the conclusions.

1. Transforming tree ring width to length of growing season.
2. Growing season length to average annual temperature
3. Individual tree to average area temperature
4. Average annual area temperature to average global temperature

All of these processes require multiple simplifications and assumptions; the more assumptions, the greater the opportunity to fudge the data and the possibility that the true temperature value is close to the calculated value diminishes. It seems astonishing that a process so complex would produce a final set of values that is accurate to less than 1° C. There is a saying that goes "Figures don't lie", but on the other hand, it is also well known that "Liars can figure." The popular press plays a large role in this process.

Width to Length of the Growing Season

The length of the growing season is assumed to be proportional to the width of the ring. This is not true. Tree ring growth is proportional to the optimum temperature for growth not average temperature. Temperatures both hotter and colder, than the optimum temperature can cause the lack of growth. Thus, the assumption that all narrow growth rings only indicate cold weather is false. This assumption also ignores other factors that can affect tree growth such as rainfall, shade, nutrients and disease. A cold wet growing season can produce as much as a hot dry growing season.

Growing Season Length to Average Annual Temperature

Then it is assumed to be proportional to the average temperature, experience by the tree during a particular year. Then that temperature is assumed to be proportional to the air temperature in the local area of the tree.

Individual Tree to Average Area Temperature

The assumption that a single tree or even several trees in an area of hundreds of miles represents the temperature of that area is false. Likewise the temperature data taken from several spots in the northern hemisphere does not accurately reproduce the global temperature to the nearest 0.1°C . The inaccuracy of this data is easily seen on any plot where data scatter is shown. The scatter renders the data useless, however the data can be subjected to various models so smooth the data and make it more useful.

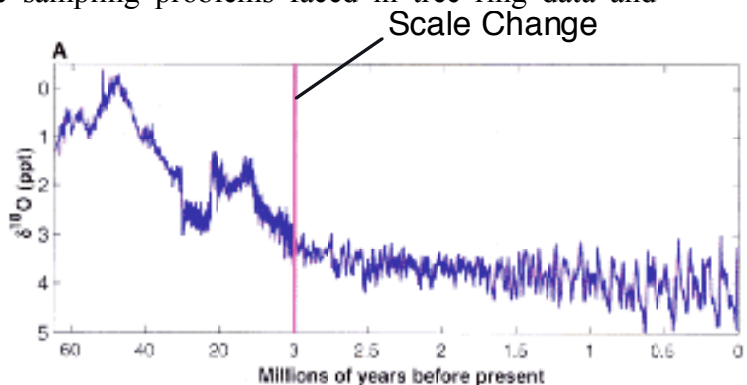
Then the local temperature is assumed to represent the temperature of the providence in which the tree grows.

Average Annual Area Temperature to Average Global Temperature

Finally, this data is processed into global temperature. The accurate of the conclusion is related to the number of assumptions made to arrive at the conclusions. However, the smoothing method can be used to manipulate the data as well. Models are not necessarily accurate and are extremely easy to manipulate. Any model used to predict anything must be verified and validated. None of the models currently being used to predict long-term temperature has been subjected to rigorous forms of either.

GLACIAL TEMPERATURE DATA.

Recent research has data gathered from glaciers on the isotope of oxygen called ^{18}O which has two more neutrons than the more common ^{16}O . See figure. Glacial temperature data is not subjected the sampling problems faced in tree ring data and therefore is more likely to indicate true temperature trends. This data has an apparent relationship with global temperature; higher values indicate colder temperatures. A problem with this data is that the relationship with ^{18}O and ^{16}O is also dependent on the overall oxygen content of the air. The general assumption is that the oxygen content of the air is constant at 20%. This is not true. Research has shown that the oxygen content of the air over the last 60 thousand years has been as low as 16% and as high as 26%¹⁰. The effects of that variance have not been factored into this curve.



Notice 4 things about this curve, first the scale changes at three million years, second the general trend is downward, (warming), and third the last 600,000 years the ^{18}O isotope variation is much more erratic. The last cycle (100,000 years) shows a major drop in ^{18}O (warming) and then 10 thousand years ago a major increase in ^{18}O (cooling).

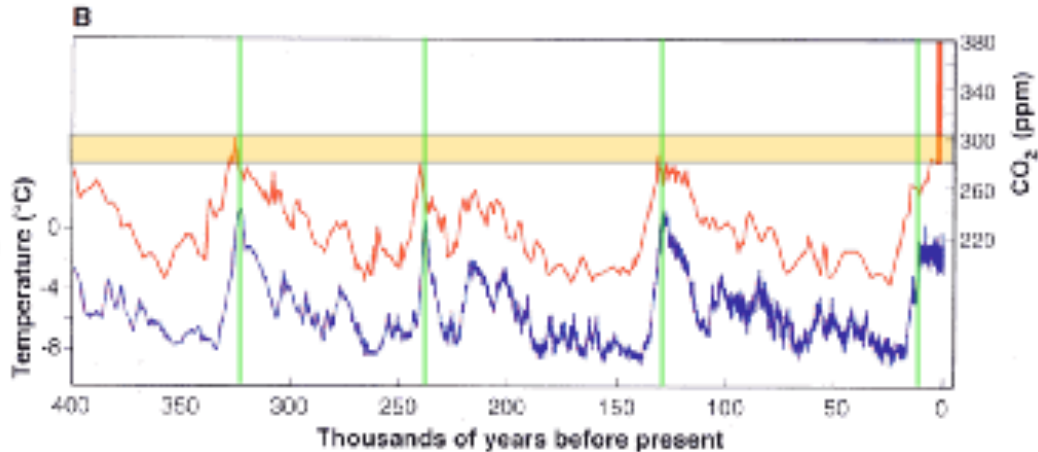
¹⁰ Berner, Robert A., VandenBrooks, John M., and Ward, Peter D., Oxygen and Evolution, Science, April 27, 2007, page 557

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According to this data, one would expect a major warming cycle to occur, even without the industrial revolution. The question is will the current warming trend will end soon due to other unidentified factors, and because we have take steps to alter the course of nature, plunge the earth into another ice age? Or will the rise in temperature cause serious global warming or just prevent an ice age? Recent history is filled with scientists with a little knowledge, altering the course of nature and making things worse.

A Closer Look at the Last 400,000 Years

Another plot contained in this paper, which shows global temperature, (what ever that is) and atmospheric CO₂ plotted over the last 400,000 years is shown below.



Here we see that in the last 200 years the CO₂ content has certainly risen considerably. Just what the author wants us to see. This graph is subject to the same criticism as the global temperature graph earlier. That is, the dark red line is based on actual CO₂ measurements and the remaining curve is based on a model of oxygen isotope data. Again connecting two separate data sources on a single curve is not good scientific practice. The earlier CO₂ data is calculated not measured and connecting the two curves is arbitrary and could easily be off a few hundreds of parts per million, which would significantly reduce the impact of the graph.

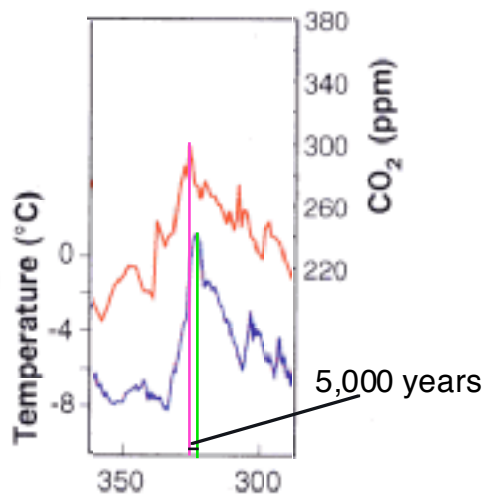
However, there is a lot of other information contained on this curve that needs to be recognized. First, notice that over the last 400 thousand years the global temperature has varied as much as 10° C at least four times and the CO₂ content has varied as much as 80 ppm. Notice also that the warming is almost always faster than the cooling.

This data is a strong indication that global temperature change is normal and a conclusion that might be made is to expect or force constant temperature is unnatural. More importantly, the curve also shows that the common result of increased CO₂ is not global warming but global cooling.

Further, there seems to be a critical level between 280 and 300 ppm CO₂ that triggers the cooling event and the cooling trend lags the peak in CO₂ by 1 to 3 thousand years. That level has been reached and surpassed 4 thousand years ago. Therefore, any catastrophic climate event is 1000 years over due. This should raise the question, “Why has the earth not plunged into another ice age?”

Time Lag

By enlarging the cycle that occurred about 325,000 YA we can see that there is a lag between the peak of the CO₂ level and the onset of global cooling. This pattern



repeats itself every time the CO₂ level reaches around 300 ppm and the temperature drop routinely occurs about 5000 years after the peak CO₂ level. This indicates that past temperature changes were not sudden.

Now, notice that every time **but the most recent cycle** the temperature has topped out about + 1 Degree and plunged rapidly downward except for the last cycle. The most recent cycle is atypical, in that the temperature is about 2 degrees below the tipping point and has flattened out over the last 10 to 15 thousand years even though the CO₂ levels are supposedly 80 ppm above any critical historic level, again a non-typical event. Why has the temperature not plunged? This is a unique event over at least the last 400,000 years. What caused that occurrence?

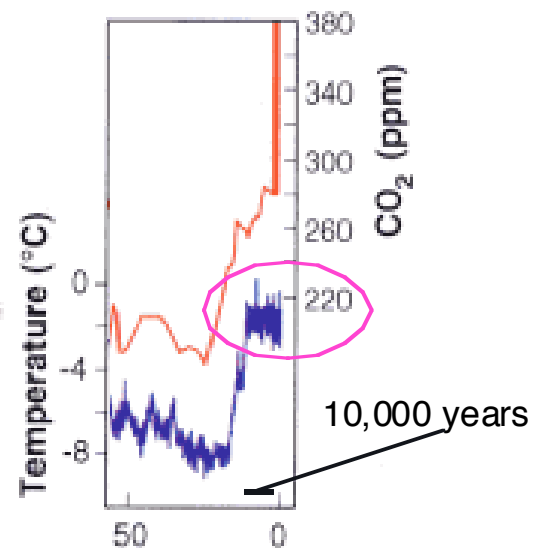
Was it human meddling? Could it be due to the increase CO₂ level during the industrial revolution? Probably not, the industrial revolution is not 12,000 years old, what is 12,000 years old is the agricultural revolution. Could the static temperature over the last 12,000 years be an abnormality caused by that human intervention? Agriculture severely reduces biodiversity and increases density of plant cover. It apparently didn't effect the CO₂ production but definitely altered the global temperature. According to this data, without this intervention, the temperature on earth could be 8 ° C degrees higher than it is today rather than the 1 ° C predicted by the hockey stick fabrication. This of course is against the precepts of the environmental religion; humans other than biologist, actually helping the environment? **In dealing with such a critical issue as global climate, we need to understand these questions before mucking about in mother natures workshop.**

Global Cooling

What do we know about global cooling? Data extracted from glacial records indicate that about 12,700 years ago, average temperatures in the North Atlantic region abruptly plummeted nearly 5°C and remained that way for 1,300 years before rapidly warming again. A similar abrupt cooling occurred 8,200 years ago. This cooling period was not so severe and lasted only about a century.

Then an abrupt warming took place about 1,000 years ago. This rapidly melted the glaciers in Greenland and precipitated the settlement of that island by the Norwegians. This event was not nearly so dramatic as earlier events, but the warming allowed the Norse to establish settlements in Greenland. The Norse abandoned their Greenland settlements when the climate turned abruptly colder 700 years ago.

Between 1300 and 1850, severe winters produced profound agricultural, economic, and political impacts in Europe. This period has been referred to as the little



ice age. Part of the current temperature rise is because of that cooling event. Similar cooling events could occur in the future, and may produce catastrophic results similar to events caused by global warming. The idea that temperature is, or should, remain constant on this planet makes sense only to those who are unfamiliar with history.

Where Have All the Glaciers Gone.

The hydrological cycle is familiar to most people with even a modest amount of education. The Sun, shines on the ocean, changing the water into water vapor, the vapor rises into the air which cools the moist air forming clouds and eventually rain, the rain falls back to the ocean and the cycle is complete. If we look at the energy balance of this system, we find that the heat from the solar energy increases the temperature of the water until it evaporates. If we start with water at 12 ° C, and a kilogram of water it takes 82,000 calories to boil the water at the ocean surface, another 539,000 calories to evaporate it. The warm moist air rises and displaces colder air above it. The water rises into the atmosphere, as the vapor rises, the potential energy contained in the water vapor increases. If the water vapor is raised to an elevation of 5500 meters, then 13,000 calories of potential energy is added to the kilogram of water. If the temperature of the air is colder, than the boiling point of water at that elevation then the water condenses into a cloud, and falls as rain back into the sea, then a neglecting entropy a total of 644,000 (82,000+539,000) calories are lost back into the atmosphere. All is right with the world neglecting entropy.

However, if a platform is constructed at 3000 meters and the rain falls into a container on that platform about 7000 calories are held in that water as potential energy. If that energy is extracted from the water and stored before the water is returned to the ocean, 7000 per kilogram of heat is removed from the atmosphere. When the energy is used the heat is returned to the atmosphere and once again all is right with the world. The key here is how the energy is used.

The average discharge of the Columbia River is 7,500 cubic meters/sec. Since there is 31.557 million seconds per year, the volume of flow from the Columbia system is 27 million cubic meters per hour. The weight of that amount of water is 27 billion kilograms. If the average elevation of the Columbia River basin is 1500 meters then 112 gigawatt-hours are of energy is contained in the Columbia River water system. The hydropower currently developed on the Columbia is 36 gigawatt-hours. This means that 76 gigawatts of energy is wasted as heat every hour. That amounts to 570 billion gigacalories, per year that is waste heat dumped into the atmosphere by the free flowing water in the river. That is sufficient to melt 7 billion metric tons of glacier ice.

The boiling point at 5500 meters drops to about 82 ° C due to the reduction of pressure and 18,000 calories are lost into the atmosphere. Basic physic tells us that evaporation of the water from the ocean cools the ocean, while raising tons of water into the lower 5500 meters of the troposphere. The necessary energy is extracted from the sun. If the rain falls on the ocean almost all of the heat energy required to evaporate and transport the water is returned by the condensation and fall of the rain except for a small amount, which lost to the atmosphere as heat. The process over the ocean has little effect on global temperature.

However, if the water is transferred over land by the wind, and deposited on the earth areas above sea level, the energy is not returned to the ocean until the water reaches the ocean again. In this case, the energy is lost in a different manner. Free flowing rivers

and streams have considerable rapids and waterfalls, which extract energy from the water in the form of heat and transfer much of that heat to the atmosphere. The amount of heat is dependant on the amount of energy stored in the water.

Since dams extract energy from the water, they materially reduce the energy that is wasted as heat. The amount of energy extracted by the Columbia River System is over 36,000 megawatts. That is equivalent to 300 Mega calories per hour, which is not being released into atmosphere. All free Running streams produce heat that escapes into the atmosphere. The more potential energy the stream contains the more heat that is released into the atmosphere. Considering the number of drainage systems on the planet this factor is significant contributor to global warming.

HOW ACCURATE IS THE DATA?

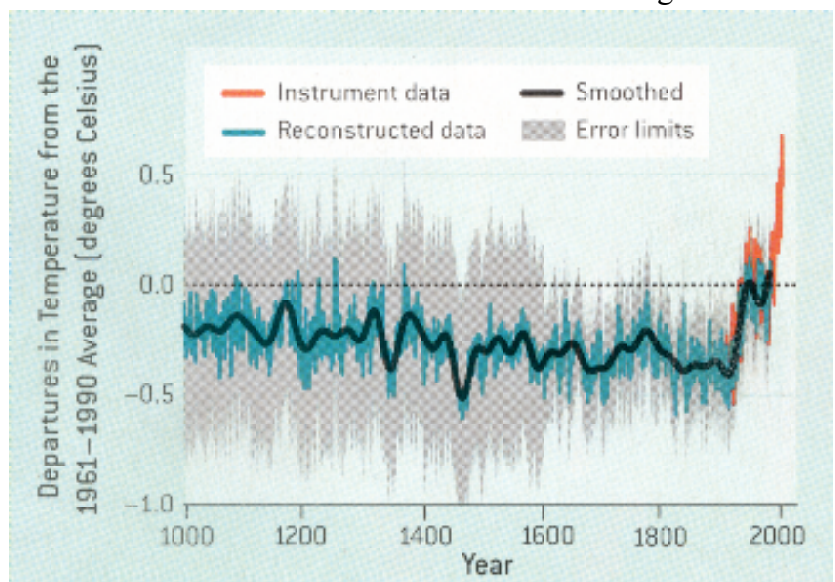
There is a basic law of science that says the accuracy of your calculations cannot exceed the accuracy of your basic data. The accuracy of a single thermometer is on the order of 1 or 2 degrees, tree ring data ± 5 degrees and glacial data ± 3 degrees. The data supplied by climatologists generally shows curves plotted to the nearest 0.1 degree C. Where this nuance slips by the average human, most qualified research specialist should be well aware of these limitations. Defending a temperature variation to the nearest 0.1 degree over the next 100 years, seems like over kill for a science that cannot predict the temperature the day after tomorrow within 2 degrees.

Accurate temperature records exist only in a few populated areas for more than 100 years. Almost no accurate temperature measurements exist for rural and sparsely populated areas even today. Satellite data has only been around for 25 years.¹¹ This data gives us the best chance of actual measuring global temperature, and shows a 0.15°C , $\pm 0.05^{\circ}\text{C}$ rise per decade or about 0.01°C . No data was presented. This would indicate that the accuracy of the data is less than 30%. This would indicate if you measured the width of a room as 20 feet the actual width could be from 26 to 14 feet wide. Basing far reaching decisions on that level of precision is not prudent.

The Famous Hockey Stick Plot.

Much of the fervor over global warming has been produced by a paper published in 2004 showing the curve to the right.

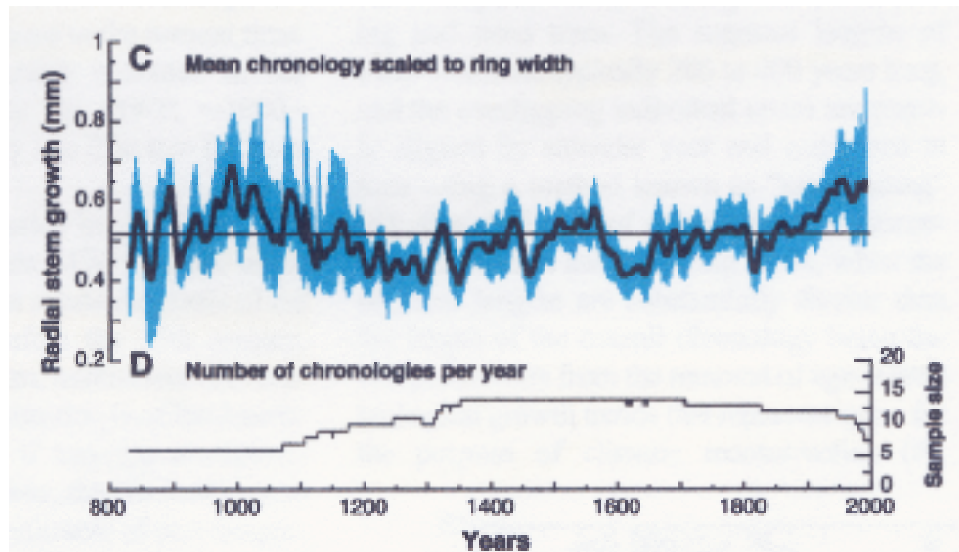
This paper has been criticized by many scientists as sensationalism, rightly so. The procedures used by these authors are questionable in many areas. The research industry has been plagued with many scandals in resent years, where data and conclusions have been falsified for various



¹¹ Kerr, Richard, No doubt about it, the world is warming, Science vol 312 May 12, 2006, page 825

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reasons. Much of the procedure used by this group crosses over the line from science to propaganda. For example, the handle of the curve was based on tree data published 2 years earlier.¹² The figure below shows the curve generated in that paper. Note that the tree temperature shows that 1000 years ago the temperature was warmer than it is today. The original curve shows more variation than the hockey stick curve, shows the up trend beginning in 1800. The hockey stick curve has a strange y-axis rather than showing just temperature as most researchers do it shows something called departure in temperature from the 1961 – 1990 average. Is this mathematical trick is used to accentuate the shape of the curve?



History however doesn't agree with either curve. The first curve shows a constant temperature between 1000 and 1250, which history reports a wide spread warming of Northern Europe, which allowed the Vikings expansions into Greenland and Iceland. The second curve actually shows a cooling trend during that period.

Throughout most of what is commonly called the Little Ice Age (1500–1850), the mean solar activity was quite low. The main westerly storm belts shifted about 500 kilometers to the south, and for much of the time the northern latitudes came under cool continental conditions. Observed temperature series in Europe from Paris to Leningrad show large fluctuations until 1850. These fluctuations are not shown on either curve.

There are some distinct differences in these curves. First, the hockey stick curve ignores the previous warming period between 800 and 1000. This warming trend is larger than the current warming trend and steeper. The Hockey stick author's choice of where to begin the curve favors his conclusions. Second, the current warming trend or the hockey blade begins in 1900 not 1800 as it does in the lower curve once again accenting the sharpness of the hockey stick curve. Third, and most importantly, the hockey stick plot is constructed using two entirely distinct sets of data (Tree ring and Thermometer) arbitrarily jointed together at 1900. The joining of these two different data

¹² Espar J., et. al. Low Frequency Signals in Long Tree Ring Chronologies for Reconstructing Past Temperature Variability, Science, Vol 295, 3/22/2002, page 2251

sets gives the plot its distinct shape, if the connection point is off even one degree the hockey stick disappears. Since the data for the blade is taken from urban thermometer measurements, while the data for the handle is derived by tree ring data from wooded areas. It is a fact that temperature in wooded areas are often as much as 5 degrees cooler than temperatures taken in a nearby urban area. The validity of this connection without a mathematical adjustment of the data is questionable.

Cities have concrete and asphalt that stores heat and air conditioners belching hot air. In the woods, the trees expel moisture, which cools the atmosphere. This connection cannot be made unless there is a factor included that would adjust the forest temperature upward or the urban temperature downward. This adjustment could completely reverse the conclusion of this pivotal research. For example, if this connection point were off even by one degree, the hockey stick would predict global cooling.

What Causes global warming?

ROUND UP THE USUAL SUSPECTS.

The most common reasons given for global warming are the industrial revolution and the burning of fossil fuels, which produces Carbon dioxide. The second most quoted suspect is the use of aerosols, which twenty years ago resulted in banning human use of Aerosols. There is no evidence that banning those aerosols had any effect on global aerosol production. The third is methane, which until recently was not thought to be a problem.

FOCUS ON INDUSTRIAL ACTIVITY

The increase in CO₂ and global temperature has been linked charted many times. The simple minds of some politicians and the media have centered on a single cause of this rise in CO₂, i.e. "the industrialization of the planet." This idea seems to be based on the environmental belief that humans are the caused of all evil in the world. This belief seems to be religious in nature, that is requires no proof, and cannot be questioned. This impression is loosely based on the industrial revolution that supposedly began in the early 1800. However, the actual extent of industrial pollution in the 19th and the beginning of the 20th century is supposition. No actual data exists to verify this assumption. We do know that much of the early industrialization was water or wind powered, and that diesel power did appear until the middle of the 19th century. The U.S. measurements of power consumption began in 1949. How the power consumption grew before that time is conjecture. Actual measurements of pollutants began in the 1970s. There is little basis for extrapolating this data backwards. The idea that industry and automobiles **alone** are the cause of global warming is convenient for the environmentalist but has little basis in fact.

Surprising as this may seem other events also occurred around the turn of the 19th century. For example, the world population reached 1 billion in 1804. In 1798, Thomas Malthus recognized that human population was increasing exponentially and that humans were facing overpopulation. Nobody cared. In the mid 1900's again there was a brief discussion of the problem of overpopulation. Paul Ehrlich's The Population Bomb (1968), Donella H. Meadows' The Limits to Growth (1972), and Edward Goldsmith's Blueprint for Survival (1972). This and other books resulted in much of the basis for the environmental movement. Julian Simon and Herman Kahn's, The Resourceful Earth

(1984), emphasized humanity's ability to find or to invent substitutes for resources that were scarce and in danger of being exhausted. For the last thirty years, we have been blindly following those concepts. Unfortunately, many of the problems on this planet today can be traced to those shortsighted human decisions in the past. This planet does not have an infinite source of energy, and will not support an infinite amount of life human or otherwise.

Population and Energy

There is a strong connection between population and energy use. For the first 5 million years of man's existence small populations of hunter gatherers survived and saturated every habitable area of the planet by about 15 million years ago. The population at that time was between four and five million people. Life was not good. Around 12 million years ago, agriculture was born and produced an abundance of food, by reducing biodiversity, thus concentrate the solar energy into edible plants only. Life became good again. The next increase in energy use came by harnessing animal power and then simple water wheels were invented around 2000 years ago. By this time, the population had grown by a factor of 60 to about 300 million. Wind power became viable around 800 years ago. Wind and water powered the population into its first billion people. Both wind and waterpower do not pollute the atmosphere. Steam took over in the middle of the 1800's pollution began to increase very slowly. According to the climate research data the global carbon dioxide and temperature increases, began in the early 1800's. Industrialization does not fit that data. However population does.

The second billion people arrive in 1928. Global industrialization was minimum. The Second World War destroyed most of the industry in Europe, and Asia. It wasn't until the early fifties that industry began to flourish and produce large amounts of Carbon Dioxide. In the 1950's, there was concern about the population and that concern centered on food supply. That hungry problem was solved by technology and the third billion arrived in 1960. The fourth billion arrive in 1976, and thirty years later, we have 7 billion and at least a billion of them are hungry.

While most people are aware that photosynthesis removes carbon dioxide from the atmosphere, few are aware that a natural process called metabolism produces carbon dioxide as a waste product. Metabolism is the method by which all animal life on the planet depends for survival. Humans are just one of the animals that exhale carbon dioxide. Consider the following:

7. The average human breathes about 30 times per minute.
8. The human lung exchanges about 4.5 liters of air with each breath.
9. The carbon dioxide content of the average exhaled breath is about 5.5%¹³.
10. Carbon dioxide weighs 1.8 grams per liter

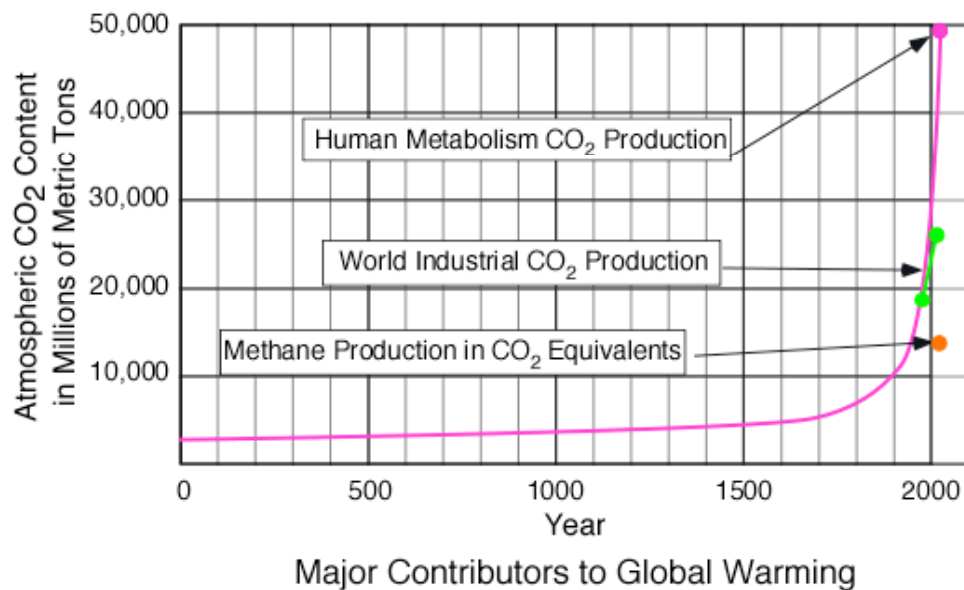
A few simple calculations based on these facts shows that the average human exhales 7 metric tons of CO₂ each year. Combining this fact with human population data, in table 1 results in a startling conclusion shown in the figure just below the table.

¹³ Fuks, Leonardo; Prediction and Measurements of Exhaled Air effects in the pitch of wind instruments, Proceedings of the Institute of Acoustics Vol. 19 part 5, book 2, page 373 to 378

Table 1. World Population and CO₂ Emissions

Year	World Population	CO ₂ Contribution In Millions of Metric Tons
0	300,000,000	2,100
1500	550,000,000	3,850
1804	1,000,000,000	7,000
1928	2,000,000,000	14,000
1960	3,000,000,000	21,000
1976	4,000,000,000	28,000
1988	5,000,000,000	35,000
1999	6,000,000,000	42,000
2007	7,000,000,000	49,000

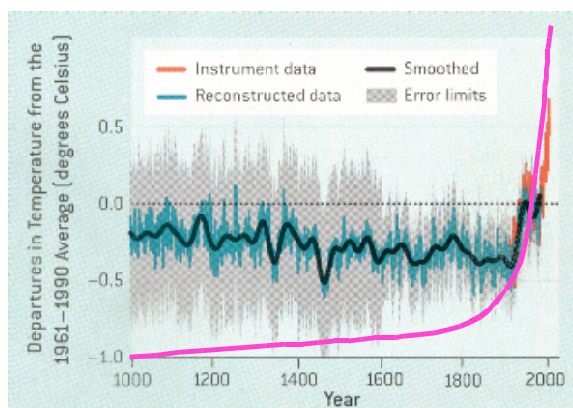
Plotting this CO₂ production along with the 2007 world almanac's data on industrial carbon dioxide emissions the two curves in the figure below are generated. Notice that the industrial emissions are about half of the CO₂ produced by the metabolism of the population, and that the industry produced waste tracks the population curve very well. That is reasonable because the population uses what industry makes. Population uses the energy, and drives the cars, takes the planes, requires the goods made by industry and shipped around the world, etc. This leads to the obvious fact that by reducing the population by 50 %, the CO₂ production would be reduced by $(49,000+27,000)/2$ or 38,000 MMT, which is more than was produced by industry in 2004.



The fact that humans themselves produce 2 times more CO₂ than industry cannot be ignored if carbon dioxide is contributing to global warming. Unfortunately, humans are not the only animals on the planet. North Pacific Research has not calculated the contribution to CO₂ that the world population of animals other than humans produce, but it is at least as large as the human contribution. This throws a new light on the protection of species.

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It is extremely interesting to overlay the human metabolism CO₂ production curve on the infamous hockey stick curve discussed earlier. In the figure to the right, the black line is the temperature data extracted from tree ring width. The orange line is actual temperature measurements in cities around the world. Note, that human population growth alone supports the rapid temperature increase due to CO₂ beginning in 1800 and accelerating dramatically in 1900.



The population data is supported as far back as 1650 by census. On the other hand, the actual extent of industrial pollution in the 19th and the beginning of the 20th century is supposition. No actual data exists to verify the assumption that burning of fossil fuels and industrial pollution produced large CO₂ emissions. The U.S. measurements of power consumption began in 1949. Actual measurements of pollutants began in the 1970s.

In summary, focusing the solution to a global problem on a single cause that produces less than 30 percent of the problem will not solve the problem. The idea that industry and automobiles alone are the cause of global warming has little basis in fact. If the problem exists and needs to be solved, no potential large contributors should be removed from the solution. This analysis shows that the solution must include the methane contribution by wetlands and forests, the CO₂ contributions of humans, and all other animals. If the problem is as bad as it has been portray to the public, all pollution producers should be regulated.

Unfortunately, this produces many complex issues, including population control. Population control was first discussed by Thomas Malthus in 1798 in an “*Essay on the Principle of Population*.” Over the last two hundred years, this problem has been discussed many times, but its consequences ignored or dismissed by assuming that technology would solve the problem. Technology has not solved it, and cannot solve it with out massive amounts of energy. This means that we need to be thinking in terms of population as a major part of the carbon footprint. Presently the only country that has taken the necessary steps to control population is China. It may be time for the rest of the world to follow its lead. The top 20 offending countries producing 75 % of the population increase are listed in table 2.

Table 2. Top 20 Population Contributors by Country

Country	Growth Rate	Population Increase
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India	1.64%	23.49%
China	0.62%	10.49%
Pakistan	2.15%	4.59%
Indonesia	1.38%	4.12%
Bangladesh	2.15%	4.08%
Nigeria	2.35%	3.99%
Brazil	1.04%	2.52%
Congo	3.04%	2.45%
Philippines	1.95%	2.25%
Ethiopia	2.31%	2.23%
Mexico	1.60%	2.21%
Egypt	1.77%	1.80%
Sudan	2.55%	1.35%
Uganda	3.51%	1.32%
Kenya	2.83%	1.31%
United States	0.31%	1.19%
Vietnam	1.07%	1.16%
Afghanistan	2.63%	1.05%
Tanzania	2.13%	1.03%
Turkey	1.06%	0.96%

Those in Red have greater than 2 % annual increase. Forty-Five other countries of the 192 countries in the world have greater than a 2% annual growth rate. Only 24 have a negative growth rate. If humans are to survive, population growth must be stopped. If humans are to thrive, population must be reduced to between two and three billion. The truth is that without population control the fate of the human species and much of the other life on the planet is not just inconvenient, it is extremely grim.

There is a direct connection between population and energy/industry. Cleaning up industrial pollution without solving the population problem will not reduce global warming. As the population grows, so will the need for energy, cars and industry. Solving the population problem will however, also solve the energy/industry problem by reducing the need for both as well as reducing world hungry. We must somehow change the thinking to terms of a population footprint rather than just a carbon footprint. There are economic and military values in increasing population, but maybe it is time to think of the quality of life not just the quantity of life.

THE ROLE OF METHANE

It is indeed ironic that the highly valuable Amazon Forest turned out to be a major contributor to global warming. This of course is a conclusion that is counter to what many environmental scientists have preached for 30 years but was exactly that reached by a recent article on methane's contribution to global warming, which was prefaced with the following statement, "*What do you do as a scientist when you discover something that clearly contradicts the textbooks?*"¹⁴

That a scientist should ask this question is in itself and expression of the sad state that science finds itself today. The results obtained by the research team that produced this paper obviously caused considerable dread to the authors. Why? Science is

¹⁴ Keppler and Rockmann, Methane, Plants, and Climate Change, Scientific American, February 2002, page 53.

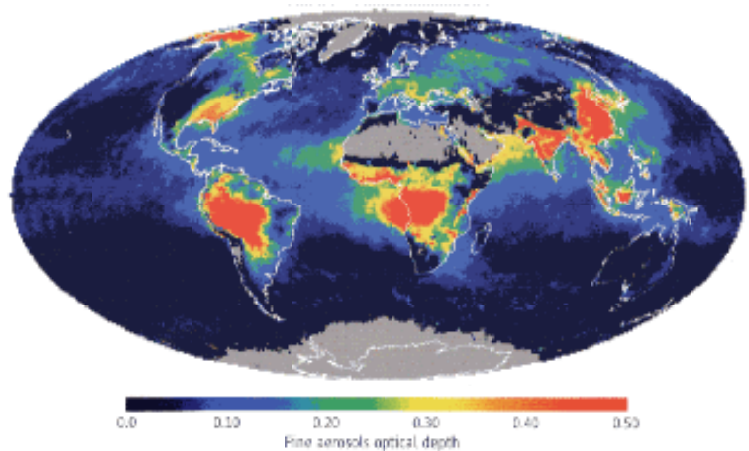
supposed to be a search for truth. The paper is a good paper but throws considerable doubt on the mainstream environmental religions sect ideals that controls much of the research in the world. Their soul searching was real and expressed in the text of the document, and maybe rightly so, because their work showed that green plants not only make methane but do so in major quantities.

According to their article, 600 million metric tons (MMT) are produce by the worlds forest and rise into the atmosphere each year. Now this is about 1/10 of the CO₂ produced by industry each year. That is the good news; the bad news is that methane warms the atmosphere 23 times greater than CO₂. That means that the methane produce by forests in carbon equivalents is equal to 13,800 MMT of CO₂. Compare that with the 6,000 MMT of carbon produced by world wide industry indicates that forest methane produce over twice the pollution effects of industry.

Other articles show the same conclusions. A recent article in Science Magazine June 2, 2006 states, that the chemical composition of aerosol (methane and aerosol particles behave similarly) particles is much less important than their size in determining their ability to nucleate clouds.¹⁵ Included in this article was the following figure showing data gathered by satellite imagery during the summer months in the northern hemisphere.

The aerosol thickness varies from 0 to 5, with the red color indicating 5. Notice that in the eastern US there is a small patch of light red and a larger patch of yellow. The author attributed the red over the eastern US as due to industrial waste and the red over the major tropical forest areas as caused by burning forests. Does that make sense to you? First, how can a few natives using slash and burn techniques cause more pollution than the industrial US? A closer look at the light read area in the US indicates that the red is located over the southeastern states, which are on the average less industrial than the northeastern states. One would expect the red to be further north. Is it possible that some other reason is the cause of the pollution? There are 20,000 square kilometers of swampland in the southeastern part of the United States. Could the deep red areas over the tropical forest be due to some other factor, say methane.

The dark red areas also include the African and Asian tropical forests as well as the tropical forests in Indonesia. What causes the red area in Alaska? None of these large concentrations of greenhouse gas are located over industrial nations. Europe is green. Further study of the figure shows that China and India are two major red areas. The forest in both countries, are not extensive especially China. However, these two countries are the most densely populated countries in the world and contribute 1/3 of the entire worlds population growth. The living standards of the average citizen in these



¹⁵ Rosenfeld Daniel, Aerosols, Clouds and Climate, Science Vol 312, 2 Jun 2006, page 1323

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countries are very low. Two billion people all cooking and heating use combustion, a rather inefficient and aerosol producing process. If these two countries had cheaper and efficient electrical power, the high concentrations of aerosol may disappear. Is it possible that industrialization is not all bad?

This figure clearly indicate that population forests and swamplands are the major contributors to global warming. It is an inconvenient truth that these are **the same forests and wetlands that have been greatly expanded by environmental groups in the last 40 years.**

Another article on methane production also indicated wetlands as a serious contributor to methane. This article was centered on a controversy surrounding the Balbina dam in Brazil.¹⁶ The author, not a scientist, reports that a 2,500 Km² reservoir emits between 23 and 122 million metric tons of methane per year. That is quite a spread in estimates. The cause of the methane generation was attributed to the vegetation left in the reservoir after the dam was closed. A possible reason for this spread in data is that the methane production is dependant on the amount of vegetation left behind the dam. Since in the case of the dam the source is limited the release of methane from this source is time dependent and decreases with time. Thus the maximum release of methane would occur shortly after the reservoir is flooded (122 MMT). As the vegetation is consumed by the methane-producing bacteria, the methane released into the atmosphere is reduced (23 MMT). A question not answered in the article was, why the trees were left in the reservoir. Dam reservoirs are normally cleared of debris and trees.

The article is accompanied by a picture showing trees partially submerged in water. The interesting thing is that the picture is not of the 2,500 Square kilometers reservoir, but of the Pantanal a 100,000 Square Kilometer flood plain, which is in effect a natural recurring reservoir on one of tributaries of the Amazon. This wetland, like most natural wetlands renews the biological debris every year. What seemed to slip the mind of the author is that this natural reservoir produces is 40 times larger than the human made reservoir and therefore produces 40 times more methane than the Balbina dam. Unlike the dam the supply of methane producing debris is renew each year and the production of methane does not decreases with time.

The Solution

The environmental movement has for years, tried to place the blame for all ills on this planet at the feet of human induced industrialization. If global warming is such a critical problem, is it wise to exclude the major producer? If we are going to solve this problem things are going to get ugly. Even such small things that we have decided to do in the last 40 years have affected the temperature of the globe. For example, has the dramatic increase in the world population of wild animals in the last 40 years partially to blame for the increase in CO₂? Now consider that, in the last 40 years there has been a campaign and a definite movement to increase the amount of vegetables in the human diet and reduce the amount of animal protein. This seems like a noble cause. However, as a result, of this movement millions of people to stopped eating organisms that exhaled CO₂ and instead ate organism that consumed CO₂ - a double edge sword. The physical fitness exercise encouraged by fitness programs over the last 40 years, quadruples human

¹⁶ Giles, Jim; Methand Quashes Green Credentials of Hydropower, Nature, Nov 30, 2006, pg 524

the expulsion of CO₂. These issues of course do not make a difference if a few people do them, but if billions of people do them major changes occur. Presently the focus of the much of the world is on human caused climate change. But, the solution is focused on Industry. Concentrating on 5 % of the problem will not produce a solution.

As a result, the world is throwing large sums of money at correcting industrial pollution while neglecting the more important causes. This planet does not have an infinite source of energy, and will not support an infinite amount of life human or otherwise. Reducing energy sources and using less efficient energy sources will only make problems worse. We need more and cheaper sources of food and less people. Above all else less people, if we had less than 2 billion people on the planet the problem would go away. Unfortunately, before the world human population can act in concert against this problem another billion people will be on the planet. In the year 2000, we had six billion people on the planet. At that time, the humans were consuming 20% of the total world biomass. That would indicate by the time human population reached 30 billion humans will consume 100% of the biomass. That should happen if population is unchecked before 2050.

The idea that the earth has an infinite food supply is dead wrong. So it will be bye, bye spotted owl, bald eagle and polar bear, and all other forms of life except humans and their food sources. Even nuclear war will not stop this problem. A recent article in Science Magazine looked at the consequences of limited nuclear war and concluded that if all the hot spots erupted simultaneously the earth would only loose about 85 million people.¹⁷ That is about 0.18% of what would be needed to return the population to a sustainable figure. We have traditionally looked to technology to save humans from disaster. It is not clear that technology can solve this problem with out major population control. The problem is not global climate change. **That has been going on constantly for 4.5 billion years.** The key is not to stop change because that is impossible we simple do not have that power, but we can understand the change and position ourselves like the early humans to survive the change.

PAYING BOTH PETER AND PAUL OUT OF THE SAME POCKET

The earth does not have an infinite source of energy. It has an energy budget comprised of solar energy, chemical energy, nuclear, and geothermal energy. Drawing on any of these sources depletes that source. Solar energy is often touted as a non-polluting, environmental friendly source of energy. Pollution is in the eye of the beholder. Solar energy used to produce power for human consumption, competes directly with the weather, photosynthesis and metabolism. The world energy production 1999 for human use was 235×10^{15} BTU or 56,000,000,000,000,00 calories. Redirecting that amount of energy away form weather, and photosynthesis will produce a major impact to our planet.

The amount of solar energy striking our atmosphere is about 1.4 kW/m². About one third of that is reflected, The remaining 1kW/m² only strikes half of the earths surface at any one time, and if it strikes obliquely the energy available varies from zero to a maximum depending on the direction the angle the ray strikes the surface. Thus at the

¹⁷ Toon, Owen B. et al. Consequences of Regional-scale Nuclear Conflicts, Science, vol 315, Mar 2, 2007, page 1225

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earth's surface that number is reduced by 700 % to about 0.2 kW/m². In order to produce the world human consumption of energy a band of 100% efficient solar panels, surrounding the earth that covers 345,000,000,000,000 square meters is needed. That is 133 million square miles of the earth surface remove from production of life, and 56,000,000,000,000,000 calories removed from the weather system. The entire land surface of the earth is only 57 million square miles that would mean the other 76 million miles would have to come from covering the ocean.

Does anyone believe that will not significantly affect the biosphere or the global climate? It is not so much what we use to generate the power as the amount of power required. It is true that each source of power impacts the planet in different ways. For example, extracting large amounts of energy from wind will affect the weather far greater than global warming. Wind is what mixes, cleans the atmosphere and operates the weather system. In truth, wind and solar power because of their high cost and the economic pyramid are wasting far more environment than they will ever save. The problem isn't what is used to supply the power, tidal power, wind power, geothermal power, flower power all affect the environment, but the amount of power that is supplied that is causing the impact to the environment. It is not a case of no impact, but the least impact. The only two sources of power that are viable to supply the human need for power are nuclear and hydro. A far more effective way of reducing pollution is to reduce the population. Based on the conditions in the 1940's, a world population of humans, ±2.5 billion, and an animal population similar to that time would solve the global warming problem.

There is a direct relationship between the amount of energy available and the number of people and quality of their life. If we cut back on human consumption of power, we must either reduce the number of people or the quality of their life. If we do not do that voluntarily, father nature will do it for us.

The Grim Face of Reality

There are many people in third world countries that are starving. They need more and cheaper sources of food. The human environmental movement has taken cropland out of production in the first world countries and thus increasing the cost of producing food and now are using that precious resource to produce biofuels instead of feeding starving populations. The impact of those actions are least notice by the relatively well off, well fed environmentalist elite, living comfortable in the midst of abundant food and energy. Those that are taking the brunt of the pain are the third world countries that rely on the excess food produced by first world countries.

Now the human environmentalists are trying to reduce the amount of power and increase its cost. Again, who will take the brunt of this short-sided decision; the same unfortunate people who are trying to exit a culture based on 10th century technology. Neither of these solutions will

The problem isn't food, pollution or drowning polar bears, it is population. If we take seven years to decide what to do, we will have eight billion. There are two ways to control population decrease birth rate or increase death rate. The later method is unacceptable for obvious reasons. Medical science is striving to extend life expectance, which places extreme expectations on decreasing the birth rate. The question is do the governments and the religious leaders of the world have the courage to follow China's

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Lead and restrict birth rates to one family one child, or better yet each person can participate in only one birth. This is a severe restriction of personal freedom.

The world is gaining a billion people every 8 years. Humans have to change their attitude toward life or die like the dinosaurs. Unrestricted birth and protection of all life on the planet doesn't work. Unfortunately, the roots of these problems lie in religious beliefs. The sacred cows of India are part of the Hindu religion. Other religions, stubbornly believe that birth control in any form is immoral. Environmental religion believes in Earth First. Ignoring the fact, that the environment has been around for 4.5 billion years without any protection and will be here long after the last environmentalist dies off.

The list of mistakes that are supported by religious beliefs is long. Many of these religions were conceived in a world with less than 100 million people. The problems of those people thousands of years ago are considerably different than the problems of today. Correcting these problems will conflict with somebody's religion on every front. The sacrificing the sacred cows of all religions, from the polytheism of the environmental religion to the monotheism of Islam will cause anguish. China's experiment with birth control must succeed. But, that is only the painful beginning. Every human on the planet must face personal and unpleasant reality. Religion by its nature deals with feelings not rational thought. The future lies in the hands of rational thought. Don't shoot the messenger, the world is not of human making, but humans like dinosaurs can affect its path. God save us from stupidity.

The Environmental Movement as a Factor

The sad truth is that many of the problems on this planet today unfortunately can be traced to shortsighted human decisions in the past. The common notion that the earth has an infinite food and energy supply is false. One hundred years ago, Saint Audubon and Muir saw nature being decimated. To correct the problem they started a movement to protect animals and birds; a noble but shortsighted concept. On a planet that contains only 2 billion people that concept may be acceptable, but on a planet that contains 7 billion people and a finite food supply it is a mistake. For example, protected species consume millions of salmon each year; salmon that could be used to feed the hungry of the world. See "Saving Salmon" in the north pacific archives. Where are our values when we feed seals instead of people?

Until we get the human population back to a sustainable level, the unpleasant truth is there is no room on this planet for polar bears, seals, terns and spotted owls. If we reduce the number of humans to a couple of billion, then and only then, we may have extra food and energy to diversify the ecosystems. China's experiment with birth control must succeed. Less people need less everything; the industrial nations need to follow China's lead. But, that is only the painful beginning. Every human on the planet must face personal and unpleasant reality. Religion by its nature deals with feelings not rational thought. The future lies in the hands of rational thought. The world is not of human making, but humans like dinosaurs can affect its path. Solving the population problem will not only solve global warming, but the real major problems of the world like hungry, starvation, poverty and suffering, and world terrorism.

The causes of hungry and starvation is quite simply the lack of cheap and abundant food. Poverty and suffering can be reduced by cheap and abundant energy. Without these sources of discontent to fuel the flame, Terrorism would die out. Promises

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of a happy life in the hereafter will not tempt happy people to strap bombs to their backs. Humans that are well fed, and contented with their lives will not strap a bomb on their bodies and blow up anything. God save us from stupidity.