Special Report

THE COLLECTED SENATE SPEECHES ON CLIMATE CHANGE SCIENCE

BY
SENATOR JAMES INHOFE OF OKLAHOMA

July 28, 2003 – May 24, 2005

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1976

1983

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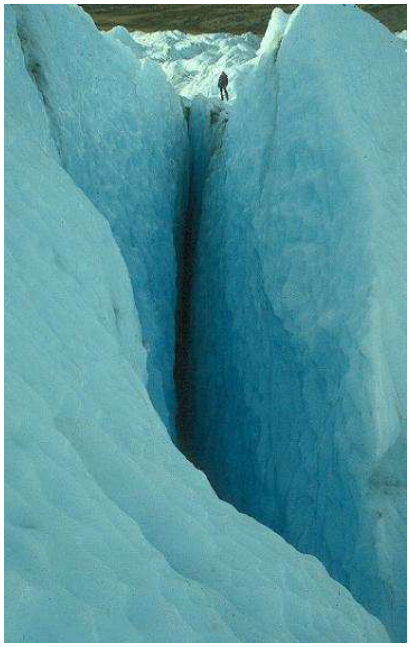


Ice Crevasse

Senator James M. Inhofe
Chairman
Senate Committee on Environment and Public Works
"The Science of Climate Change Senate Floor Statement"
July 28, 2003

As chairman of the Committee on Environment and Public Works, I have a profound responsibility, because the decisions of the committee have wide-reaching impacts, influencing the health and security of every American.

That's why I established three guiding principles for all committee work: it should rely on the most objective science; it should consider costs on businesses and consumers; and the bureaucracy should serve, not rule, the people.

Without these principles, we cannot make effective public policy decisions. They are necessary to both improve the environment and encourage economic growth and prosperity.

One very critical element to our success as policymakers is how we use science. That is especially true for environmental policy, which relies very heavily on science. I have insisted that federal agencies use the best, non-political science to drive decision-making. Strangely, I have been harshly criticized for taking this stance. To the environmental extremists, my insistence on sound science is outrageous.

For them, a "pro-environment" philosophy can only mean top-down, command-and-control rules dictated by bureaucrats. Science is irrelevant-instead, for extremists, politics and power are the motivating forces for making public policy.

But if the relationship between public policy and science is distorted for political ends, the result is flawed policy that hurts the environment, the economy, and the people we serve.

Sadly that's true of the current debate over many environmental issues. Too often emotion, stoked by irresponsible rhetoric, rather than facts based on objective science, shapes the contours of environmental policy.

A rather telling example of this arose during President Bush's first days in office, when emotionalism overwhelmed science in the debate over arsenic standards in drinking water. Environmental groups, including the Sierra Club and the Natural Resources Defense Council, vilified President Bush for "poisoning" children because he questioned the scientific basis of a regulation implemented in the final days of the Clinton Administration

The debate featured television ads, financed by environmental groups, of children asking for another glass of arsenic-laden water. The science underlying the standard, which was flimsy at best, was hardly mentioned or held up to any scrutiny.

The Senate went through a similar scare back in 1992. That year some members seized on data from NASA suggesting that an ozone hole was developing in the Northern Hemisphere. The Senate then rushed into panic, ramming through, by a 96 to 0 vote, an accelerated ban on certain chlorofluorocarbon refrigerants. Only two weeks later NASA produced new data showing that their initial finding was a gross exaggeration, and the ozone hole never appeared.

The issue of catastrophic global warming, which I would like to speak about today, fits perfectly into this mold. Much of the debate over global warming is predicated on fear, rather than science. Global warming alarmists see a future plagued by catastrophic flooding, war, terrorism, economic dislocations, droughts, crop failures, mosquito-borne diseases, and harsh weather-all caused by man-made greenhouse gas emissions.

Hans Blix, chief U.N. weapons inspector, sounded both ridiculous and alarmist when he said in March, "I'm more worried about global warming than I am of any major military conflict."

Science writer David Appell, who has written for such publications as the New Scientist and Scientific American, parroted Blix when he said global warming would "threaten fundamental food and water sources. It would lead to displacement of billions of people and huge waves of refugees, spawn terrorism and topple governments, spread disease across the globe."

Appell's next point deserves special emphasis, because it demonstrates the sheer lunacy of environmental extremists: "[Global warming] would be chaos by any measure, far greater even than the sum total of chaos of the global wars of the 20th century, and so in this sense Blix is right to be concerned. Sounds like a weapon of mass destruction to me."

No wonder the late political scientist Aaron Wildavsky called global warming alarmism the "mother of all environmental scares."

Appell and Blix sound very much like those who warned us in the 1970s that the planet was headed for a catastrophic global cooling. On April 28, 1975, Newsweek printed an article titled, "The Cooling World," in which the magazine warned: "There are ominous signs that the earth's weather patterns have begun to change dramatically and that these changes may

portend a drastic decline in food production-with serious political implications for just about every nation on earth."

In a similar refrain, Time magazine for June 24, 1974 declared: "However widely the weather varies from place to place and time to time, when meteorologists take an average of temperatures around the globe they find that the atmosphere has been growing gradually cooler for the past three decades."

In 1974 the National Science Board, the governing body of the National Science Foundation, stated: "During the last 20 to 30 years, world temperature has fallen, irregularly at first but more sharply over the last decade." Two years earlier, the board had observed: "Judging from the record of the past interglacial ages, the present time of high temperatures should be drawing to an end...leading into the next glacial age."

How quickly things change. Fear of the coming ice age is old hat, but fear that man-made greenhouse gases are causing temperatures to rise to harmful levels is in vogue. Alarmists brazenly assert that this phenomenon is fact, and that the science of climate change is "settled."

To cite just one example, Ian Bowles, former senior science director on environmental issues for the Clinton National Security Council, said in the April 22, 2001 edition of the Boston Globe: "the basic link between carbon emissions, accumulation of greenhouse gases in the atmosphere, and the phenomenon of climate change is not seriously disputed in the scientific community."

But in fact the issue is far from settled, and indeed is seriously disputed. I would like to submit at the end of my remarks a July 8 editorial by former Carter Administration Energy Secretary James Schlesinger on the science of climate change. In that editorial, Dr. Schlesinger takes issue with alarmists who assert there is a scientific consensus supporting their views.

[Refer to Chart 5] "There is an idea among the public that the science is settled," Dr. Schlesinger wrote. "...[T]hat remains far from the truth."

Today, even saying there is scientific disagreement over global warming is itself controversial. But anyone who pays even cursory attention to the issue understands that scientists vigorously disagree over whether human activities are responsible for global warming, or whether those activities will precipitate natural disasters.

I would submit, furthermore, that not only is there a debate, but the debate is shifting away from those who subscribe to global warming alarmism. After studying the issue over the last several years, I believe that the balance of the evidence offers strong proof that natural variability is the overwhelming factor influencing climate.

It's also important to question whether global warming is even a problem for human existence. Thus far no one has seriously demonstrated any scientific proof that increased global temperatures would lead to the catastrophes predicted by alarmists. In fact, it appears that just the opposite is true: that increases in global temperatures may have a beneficial effect on how we live our lives.

For these reasons I would like to discuss an important body of scientific research that refutes the anthropogenic theory of catastrophic global warming. I believe this research offers compelling proof that human activities have little impact on climate.

This research, well documented in the scientific literature, directly challenges the environmental worldview of the media, so they typically don't receive proper attention and discussion. Certain members of the media would rather level personal attacks on scientists who question "accepted" global warming theories than engage on the science.

This is an unfortunate artifact of the debate-the relentless increase in personal attacks on certain members of the scientific community who question so-called conventional wisdom.

I believe it is extremely important for the future of this country that the facts and the science get a fair hearing. Without proper knowledge and understanding, alarmists will scare the country into enacting its ultimate goal: making energy suppression, in the form of harmful mandatory restrictions on carbon dioxide and other greenhouse emissions, the official policy of the United States.

Such a policy would induce serious economic harm, especially for low-income and minority populations. Energy suppression, as official government and non-partisan private analyses have amply confirmed, means higher prices for food, medical care, and electricity, as well as massive job losses and drastic reductions in gross domestic product, all the while providing virtually no environmental benefit. In other words: a raw deal for the American people and a crisis for the poor.

THE KYOTO TREATY

The issue of global warming has garnered significant international attention through the Kyoto Treaty, which requires signatories to reduce their greenhouse gas emissions by considerable amounts below 1990 levels.

The Clinton Administration, led by former Vice President Al Gore, signed Kyoto on November 12, 1998, but never submitted it to the Senate for ratification.

The treaty explicitly acknowledges as true that man-made emissions, principally from the use of fossil fuels, are causing global temperatures to rise, eventually to catastrophic levels. Kyoto enthusiasts believe that if we dramatically cut back, or even eliminate, fossil fuels, the climate system will respond by sending global temperatures back to "normal" levels.

In 1997, the Senate sent a powerful signal that Kyoto was unacceptable. By a vote of 95 to 0, the Senate passed the Byrd-Hagel resolution, which stated that the Senate would not ratify Kyoto if it caused substantial economic harm and if developing countries were not required to participate on the same timetable.

The treaty would have required the U.S. to reduce its emissions 31% below the level otherwise predicted for 2010. Put another way, the U.S. would have had to cut 552 million metric tons of CO2 per year by 2008-2012. As the Business Roundtable pointed out, that target is "the equivalent of having to eliminate all current emissions from either the U.S. transportation sector, or the utilities sector (residential and commercial sources), or industry."

The most widely cited and most definitive economic analysis of Kyoto came from Wharton Econometric Forecasting Associates, or WEFA. According to WEFA economists, Kyoto would cost 2.4 million US jobs and reduce GDP by 3.2%, or about $300 billion annually, an amount greater than the total expenditure on primary and secondary education.

Because of Kyoto, American consumers would face higher food, medical, and housing costs-for food, an increase of 11%, medicine, an increase of 14%, and housing, an increase of 7%.

At the same time an average household of four would see its real income drop by $2,700 in 2010, and each year thereafter.

Under Kyoto, energy and electricity prices would nearly double, and gasoline prices would go up an additional 65 cents per gallon.

Some in the environmental community have dismissed the WEFA report as a tainted product of "industry." I would point them to the 1998 analysis by the Clinton Energy Information Administration, the statistical arm of the Department of Energy, which largely confirmed WEFA's analysis.

Keep in mind, all of these disastrous results of Kyoto are predicted by Wharton Econometric Forecasting Associates, a private consulting company founded by professors from the University of Pennsylvania's Wharton Business School.

In July, the Congressional Budget Office provided further proof that Kyoto-like carbon regulatory schemes are regressive and harmful to economic growth and prosperity.

As the CBO found, "The price increases resulting from a carbon cap would be regressive--that is, they would place a relatively greater burden on lower-income households than on higher-income ones."

As to the broader, macroeconomic effects of carbon cap and trade schemes, CBO said, "A cap-and-trade program for carbon emissions could impose significant costs on the economy in the form of welfare losses. Welfare losses are real costs to the economy in that they would not be recovered elsewhere in the form of higher income. Those losses would be borne by people in their roles as shareholders, consumers, and workers."

Now some might respond that government can simply redistribute income in the form of welfare programs to mitigate the impacts on the poor. But the CBO found otherwise: "The government could use the allowance value to partly redistribute the costs of a carbon cap-and-trade program, but it could not cover those costs entirely." And further: "Available research indicates that providing compensation could actually raise the cost to the economy of a carbon cap."

Despite these facts, groups such as Greenpeace blindly assert that Kyoto "will not impose significant costs" and "will not be an economic burden."

Among the many questions this provokes, one might ask: Won't be a burden on whom, exactly? Greenpeace doesn't elaborate, but according to a recent study by the Center for Energy and Economic Development, sponsored by the National Black Chamber of Commerce and the United States Hispanic Chamber of Commerce, if the U.S. ratifies Kyoto, or passes domestic climate policies effectively implementing the treaty, the result would "disproportionately harm America's minority communities, and place the economic advancement of millions of U.S. Blacks and Hispanics at risk."

Among the study's key findings: Kyoto will cost 511,000 jobs held by Hispanic workers and 864,000 jobs held by Black workers; poverty rates for minority families will increase dramatically; and, because Kyoto will bring about higher energy prices, many minority businesses will be lost.

It is interesting to note that the environmental left purports to advocate policies based on their alleged good for humanity, especially for the most vulnerable. Kyoto is no exception. Yet

Kyoto, and Kyoto-like policies developed here in this body, would cause the greatest harm to the poorest among us.

Environmental alarmists, as an article of faith, peddle the notion that climate change is, as Greenpeace put it, "the biggest environmental threat facing...developing countries." For one, such thinking runs contrary to the public declaration of the 2002 World Summit on Sustainable Development-a program sponsored by the United Nations-which found that poverty is the number one threat facing developing countries.

Dr. John Christy, director of the Earth System Science Center at the University of Alabama, Huntsville, passionately reiterated that point in a May 22 letter to House Resources Committee Chairman Richard Pombo (R-Calif.). As an addendum to his testimony during the committee's hearing on the Kyoto Protocol, Christy, an Alabama State climatologist, wrote eloquently about his service as a missionary in Africa.

For Christy, "poverty is the worst polluter," and as he noted, bringing modern, inexpensive electricity to developing countries would raise living standards and lead to a cleaner environment. Kyoto, he said, would be counterproductive, and as I interpret him, immoral, for Kyoto would divert precious resources away from helping those truly in need to a problem that doesn't exist, and a solution that would have no environmental benefit. The following is an excerpt from the letter, and worth quoting at length:

"The typical home was a mud-walled, thatched-roof structure. Smoke from the cooking fire fueled by undried wood was especially irritating to breathe as one entered the home. The fine particles and toxic emissions from these in-house, open fires assured serious lung and eye diseases for a lifetime. And, keeping such fires fueled and burning required a major amount of time, preventing the people from engaging in other less environmentally damaging pursuits.

"I've always believed that establishing a series of coal-fired power plants in countries such as Kenya (with simple electrification to the villages) would be the best advancement for the African people and the African environment. An electric light bulb, a microwave oven and a small heater in each home would make a dramatic difference in the overall standard of living. No longer would a major portion of time be spent on gathering inefficient and toxic fuel. The serious health problems of hauling heavy loads and lung poisoning would be much reduced. Women would be freed to engage in activities of greater productivity and advancement. Light on demand would allow for more learning to take place and other activities to be completed. Electricity would also foster a more efficient transfer of important information from radio or television. And finally, the preservation of some of the most beautiful and diverse habitats on the planet would be possible if wood were eliminated as a source of energy.

"Providing energy from sources other than biomass (wood and dung), such as coal-produced electricity, would bring longer and better lives to the people of the developing world and greater opportunity for the preservation of their natural ecosystems. Let me assure you, notwithstanding the views of extreme environmentalists, that Africans do indeed want a higher standard of living. They want to live longer and healthier with less burden bearing and with more opportunities to advance. New sources of affordable, accessible energy would set them down the road of achieving such aspirations.

"These experiences made it clear to me that affordable, accessible energy was desperately needed in African countries.

"As in Africa, ideas for limiting energy use, as embodied in the Kyoto protocol, create the greatest hardships for the poorest among us. As I mentioned in the Hearing, enacting any of

these noble-sounding initiatives to deal with climate change through increased energy costs, might make a wealthy urbanite or politician feel good about themselves, but they would not improve the environment and would most certainly degrade the lives of those who need help now."

Some in this body have introduced Kyoto-like legislation that would hurt low-income and minority populations. Last year, Tom Mullen, president of Cleveland Catholic Charities, testified against S. 556, the Clean Power Act, which would impose onerous, unrealistic restrictions, including a Kyoto-like cap on carbon dioxide emissions, on electric utilities. He noted that this regime would mean higher electricity prices for the poorest citizens of Cleveland.

For those on fixed incomes, as Mr. Mullen pointed out, higher electricity prices present a choice between eating and staying warm in winter or cool in summer. As Mr. Mullen said, "The overall impact on the economy in Northeast Ohio would be overwhelming, and the needs that we address at Catholic Charities in Ohio with the elderly and poor would be well beyond our capacity and that of our current partners in government and the private sector."

In addition to its negative economic impacts, Kyoto still does not satisfy Byrd-Hagel's concerns about developing countries. Though such countries as China, India, Brazil, South Korea, and Mexico are signatories to Kyoto, they are not required to reduce their emissions, even though they emit nearly 30 percent of the world's greenhouse gases. And within a generation they will be the world's largest emitters of carbon, methane and other such greenhouse gases.

Despite the fact that neither of Byrd-Hagel's conditions has been met, environmentalists have bitterly criticized President Bush for abandoning Kyoto. But one wonders: why don't they assail the 95 senators, both Democrats and Republicans, who, according to Byrd-Hagel, oppose Kyoto as it stands today, and who would, presumably, oppose ratification if the treaty came up on the Senate floor?

And why don't they assail former President Clinton, or former Vice President Gore, who signed the treaty but never submitted it to the Senate for ratification?

To repeat, it was the unanimous vote of this body that Kyoto was and still is unacceptable. Several of my colleagues who believe that humans are responsible for global warming, including Sen. Jeffords, Sen. Kennedy, Sen. Boxer, Sen. Moseley-Braun, Sen. Lieberman, and Sen. Kerry, all voted for Byrd-Hagel.

Again, all of these senators, the most outspoken proponents of Kyoto, voted in favor of Byrd-Hagel.

Remember, Byrd-Hagel said the Senate would not ratify Kyoto if it caused substantial economic harm and if developing countries were not required to participate on the same timetable. So, if the Byrd-Hagel conditions are ever satisfied, should the United States ratify Kyoto?

Answering that question depends on several factors, including whether Kyoto would provide significant, needed environmental benefits.

First, we should ask what Kyoto is designed to accomplish. According to the U.N.'s Intergovernmental Panel on Climate Change, Kyoto will achieve "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system."

What does this statement mean? The IPCC offers no elaboration and doesn't provide any scientific explanation about what that level would be. Why? The answer is simple: thus far no one has found a definitive scientific answer.

Dr. S. Fred Singer, an atmospheric scientist at the University of Virginia, who served as the first Director of the US Weather Satellite Service (which is now in the Department of Commerce) and more recently as a member and vice chairman of the National Advisory Committee on Oceans and Atmosphere (NACOA), said that "No one knows what constitutes a 'dangerous' concentration. There exists, as yet, no scientific basis for defining such a concentration, or even of knowing whether it is more or less than current levels of carbon dioxide."

One might pose the question: if we had the ability to set the global thermostat, what temperature would we pick? Would we set it colder or warmer than it is today? What would the optimal temperature be? The actual dawn of civilization occurred in a period climatologists call the "climatic optimum" when the mean surface temperature was 1-2º Celsius warmer than today. Why not go 1 to 2 degrees Celsius higher? Or 1 to 2 degrees lower for that matter?

The Kyoto emissions reduction targets are arbitrary, lacking in any real scientific basis. Kyoto therefore will have virtually no impact on global temperatures. This is not just my opinion, but the conclusion reached by the country's top climate scientists.

Dr. Tom Wigley, a senior scientist at the National Center for Atmospheric Research, found that if the Kyoto Protocol were fully implemented by all signatories-now I will note here that this next point assumes that the alarmists' science is correct, which of course it is not-if Kyoto were fully implemented it would reduce temperatures by a mere 0.07 degrees Celsius by 2050, and 0.13 degrees Celsius by 2100. What does this mean? Such an amount is so small that ground-based thermometers cannot reliably measure it.

Dr. Richard Lindzen, an MIT scientist and member of the National Academy of Sciences, who has specialized in climate issues for over 30 years, told the Committee on Environment and Public Works on May 2, 2001 that there is a "definitive disconnect between Kyoto and science. Should a catastrophic scenario prove correct, Kyoto would not prevent it."

Similarly, Dr. James Hansen of NASA, considered the father of global warming theory, said that Kyoto Protocol "will have little effect" on global temperature in the 21st century. In a rather stunning follow-up, Hansen said it would take 30 Kyotos-let me repeat that-30 Kyotos to reduce warming to an acceptable level. If one Kyoto devastates the American economy, what would 30 do?

So this leads to another question: if the provisions in the Protocol do little or nothing measurable to influence global temperatures, what does this tell us about the scientific basis of Kyoto?

Answering that question requires a thorough examination of the scientific work conducted by the U.N.'s Intergovernmental Panel on Climate Change, which provides the scientific basis for Kyoto, international climate negotiations, and the substance of claims made by alarmists.

IPCC Assessment Reports

In 1992, several nations from around the globe gathered in Rio de Janiero for the United Nations Framework Convention on Climate Change. The meeting was premised on the concern that global warming was becoming a problem. The U.S., along with many others,

signed the Framework Convention, committing them to making voluntary reductions in greenhouse gases.

Over time, it became clear that signatories were not achieving their reduction targets as stipulated under Rio. This realization led to the Kyoto Protocol in 1997, which was an amendment to the Framework Convention, and which prescribed mandatory reductions only for developed nations. [By the way, leaving out developing nations was an explicit violation of Byrd-Hagel.]

The science of Kyoto is based on the "Assessment Reports" conducted by the Intergovernmental Panel on Climate Change, or IPCC. Over the last 13 years, the IPCC has published 3 assessments, with each one over time growing more and more alarmist.

The first IPCC Assessment Report in 1990 found that the climate record of the past century was "broadly consistent" with the changes in Earth's surface temperature, as calculated by climate models that incorporated the observed increase in greenhouse gases.

This conclusion, however, appears suspect considering the climate cooled between 1940 and 1975, just as industrial activity grew rapidly after World War II. It has been difficult to reconcile this cooling with the observed increase in greenhouse gases.

After its initial publication, the IPCC's Second Assessment report in 1995 attracted widespread international attention, particularly among scientists who believed that human activities were causing global warming. In their view, the report provided the proverbial smoking gun.

The most widely cited phrase from the report-actually, it came from the report summary, as few in the media actually read the entire report-was that "the balance of the evidence suggests a discernible human influence on global climate." This of course is so vague that it's essentially meaningless.

What do they mean by "suggests?" And, for that matter, what, in this particular context, does "discernible" mean? How much human influence is discernible? Is it a positive or negative influence? Where is the precise scientific quantification?

Unfortunately the media created the impression that man-induced global warming was fact. On August 10, 1995, the New York Times published an article titled "Experts Confirm Human Role in Global Warming." According to the Times account, the IPCC showed that global warming "is unlikely to be entirely due to natural causes."

Of course, when parsed, this account means fairly little. Not entirely due to natural causes? Well, how much, then? 1 percent? 20 percent? 85 percent?

The IPCC report was replete with caveats and qualifications, providing little evidence to support anthropogenic theories of global warming. The preceding paragraph in which the "balance of evidence" quote appears makes exactly that point.

It reads: "Our ability to quantify the human influence on global climate is currently limited because the expected signal is still emerging from the noise of natural variability, and because there are uncertainties in key factors. These include the magnitude and patterns of long-term variability and the time evolving pattern of forcing by, and response to, changes in concentrations of greenhouse gases and aerosols, and land surface changes."

Moreover, the IPCC report was quite explicit about the uncertainties surrounding a link between human actions and global warming. "Although these global mean results suggest that there is some anthropogenic component in the observed temperature record, they cannot be considered compelling evidence of a clear cause-and-effect link between anthropogenic forcing and changes in the Earth's surface temperature."

Remember, the IPCC provides the scientific basis for the alarmists' conclusions about global warming. But even the IPCC is saying that their own science cannot be considered compelling evidence.

Dr. John Christy, professor of Atmospheric Science and Director of the Earth System Science Center at the University of Alabama in Huntsville, and a key contributor to the 1995 IPCC report, participated with the lead authors in the drafting sessions, and in the detailed review of the scientific text. He wrote in the Montgomery Advertiser on February 22, 1998 that much of what passes for common knowledge in the press regarding climate change is "inaccurate, incomplete or viewed out of context."

Many of the misconceptions about climate change, Christy contends, originated from the IPCC's six-page executive summary. It was the most widely read and quoted of the three documents published by the IPCC's Working Group, but, Christy said-and this point is crucial-it had the "least input from scientists and the greatest input from non-scientists."

IPCC Releases Third Assessment on Climate Change

Five years later, the IPCC was back again, this time with the Third Assessment Report on Climate Change. In October of 2000, the IPCC "Summary for Policymakers" was leaked to the media, which once again accepted the IPCC's conclusions as fact.

Based on the summary, the Washington Post wrote on October 30, "The consensus on global warming keeps strengthening." In a similar vein, the New York Times confidently declared on October 28, "The international panel of climate scientists considered the most authoritative voice on global warming has now concluded that mankind's contribution to the problem is greater than originally believed."

Note again, look at how these accounts are couched: they are worded to maximize the fear factor. But upon closer inspection, it's clear that such statements have no compelling intellectual content. "Greater than originally believed"? What is the baseline from which the Times makes such a judgment? Is it .01 percent, or 25 percent? And how much is greater? Double? Triple? An order of magnitude greater?

Such reporting prompted testimony by Dr. Richard Lindzen before the Committee on Environment and Public Works, the committee I now chair, in May of 2001. Lindzen said, "Nearly all reading and coverage of the IPCC is restricted to the highly publicized Summaries for Policymakers, which are written by representatives from governments, NGO's and business; the full reports, written by participating scientists, are largely ignored."

As it turned out, the Policymaker's Summary was politicized and radically differed from an earlier draft. For example the draft concluded the following concerning the driving causes of climate change:

"From the body of evidence since IPCC (1996), we conclude that there has been a discernible human influence on global climate. Studies are beginning to separate the contributions to observed climate change attributable to individual external influences, both anthropogenic and natural. This work suggests that anthropogenic greenhouse gases are a substantial

contributor to the observed warming, especially over the past 30 years. However, the accuracy of these estimates continues to be limited by uncertainties in estimates of internal variability, natural and anthropogenic forcing, and the climate response to external forcing."

The final version looks quite different, and concluded instead: "In the light of new evidence and taking into account the remaining uncertainties, most of the observed warming over the last 50 years is likely to have been due to the increase in greenhouse gas concentrations."

This kind of distortion was not unintentional, as Dr. Lindzen explained before the EPW Committee. He said, "I personally witnessed coauthors forced to assert their 'green' credentials in defense of their statements."

In short, some parts of the IPCC process resembled a Soviet-style trial, in which the facts are predetermined, and ideological purity trumps technical and scientific rigor.

The predictions in the summary went far beyond those in the IPCC's 1995 report. In the Second Assessment, the IPCC predicted that the earth could warm by 1 to 3.5 degrees Celsius by the year 2100. The "best estimate" was a 2-degree-Celsius warming by 2100. Both are highly questionable at best.

In the Third Assessment, the IPCC dramatically increased that estimate to a range of 1.4 to 5.8 degrees Celsius, even though no new evidence had come to light to justify such a dramatic change.

In fact, the IPCC's median projected warming actually declined from 1990 to 1995. The IPCC 1990 initial estimate was 3.2°C, then the IPCC revised 1992 estimate was 2.6°C, followed by the IPCC revised 1995 estimate of 2.0°C.

What changed? As it turned out, the new prediction was based on faulty, politically charged assumptions about trends in population growth, economic growth, and fossil fuel use.

The extreme-case scenario of a 5.8-degree warming, for instance, rests on an assumption that the whole world will raise its level of economic activity and per capita energy use to that of the United States, and that energy use will be carbon intensive. This scenario is simply ludicrous. This essentially contradicts the experience of the industrialized world over the last 30 years. Yet the 5.8 degree figure featured prominently in news stories because it produced the biggest fear effect.

Moreover, when regional climate models, of the kind relied upon by the IPCC, attempt to incorporate such factors as population growth "the details of future climate recede toward unintelligibility," according to Jerry Mahlman, Director of NOAA's Geophysical Fluid Dynamics Laboratory.

Even Dr. Stephen Schneider, an outspoken believer in catastrophic global warming, criticized the IPCC's assumptions in the journal Nature on May 3, 2001. In his article, Schneider asks, "How likely is it that the world will get 6 degrees C hotter by 2100?" That, he said, "depends on the likelihood of the assumptions underlying the projections."

The assumptions, he wrote, are "'storylines' about future worlds from which population, affluence and technology drivers could be inferred." These storylines, he wrote, "gave rise to radically different families of emission profiles up to 2100 - from below current CO2 emissions to five times current emissions."

Schneider says that he "strongly argued at the time that policy analysts needed probability estimates to assess the seriousness of the implied impacts." In other words, how likely is it that temperatures would go up by 5.8 degrees Celsius, or 1.4 degrees Celsius, which represent the IPCC's respective upper and lower bounds?

But as Schneider wrote, the group drafting the IPCC report decided to express "no preference" for each temperature scenario.

In effect, this created the assumption that the higher bound of 5.8 degrees Celsius appeared to be just as likely as the lower of 1.4 degrees Celsius. "But this inference would be incorrect," said Schneider, "because uncertainties compound through a series of modeling steps."

Keep in mind here that Schneider is on the side of the alarmists.

Schneider's own calculations, which cast serious doubt on the IPCC's extreme prediction, broadly agree with an MIT study published in April of 2001. It found that there is a "far less" than one percent chance that temperatures would rise to 5.8 degrees C or higher, while there is a 17 percent chance the temperature rise would be lower than 1.4 degrees.

That point bears repeating: even true believers think the lower number is 17 times more likely to be right than the higher number. Moreover, even if the earth's temperature increases by 1.4 degrees Celsius, does it really matter? The IPCC doesn't offer any credible science to explain what would happen.

Gerald North of Texas A&M University in College Station, agrees that the IPCC's predictions are baseless, in part because climate models are highly imperfect instruments. As he said after the IPCC report came out: "It's extremely hard to tell whether the models have improved" since the last IPCC report. "The uncertainties are large." Similarly, Peter Stone, an MIT climate modeler, said in reference to the IPCC, "The major [climate prediction] uncertainties have not been reduced at all."

Dr. David Wojick, an expert in climate science, recently wrote in Canada's National Post, "The computer models cannot...decide among the variable drivers, like solar versus lunar change, or chaos versus ocean circulation versus greenhouse gas increases. Unless and until they can explain these things, the models cannot be taken seriously as a basis for public policy."

In short, these general circulation models, or GCMs as they're known, create simulations that must track over 5 million parameters. These simulations require accurate information on two natural greenhouse gas factors-water vapor and clouds-whose effects scientists still do not understand.

Even the IPCC conceded as much: "The single largest uncertainty in determining the climate sensitivity to either natural or anthropogenic changes are clouds and their effects on radiation and their role in the hydrological cycle ... at the present time, weaknesses in the parameterization of cloud formation and dissipation are probably the main impediment to improvements in the simulation of cloud effects on climate."

Because of these and other uncertainties, climate modelers from four separate climate modeling centers wrote in the October 2000 edition of Nature that, "Forecasts of climate change are inevitably uncertain." They go on to explain that, "A basic problem with all such predictions to date has been the difficulty of providing any systematic estimate of uncertainty," a problem that stems from the fact that "these [climate] models do not necessarily span the full range of known climate system behavior."

Again, to reiterate in plain English, this means the models do not account for key variables that influence the climate system.

Despite this, the alarmists continue to use these models and all the other flimsy evidence I've cited to support their theories of man-made global warming.

The 20th Century: Satellite data, Weather balloons, CO2, and Glaciers

Now I want to turn to temperature trends in the 20th Century. GCMs predict that rising atmospheric CO2 concentrations will cause temperatures in the troposphere, the layer from 5,000 to 30,000 feet, to rise faster than surface temperatures-a critical fact supporting the alarmist hypothesis.

But in fact, there is no meaningful warming trend in the troposphere, and weather satellites, widely considered the most accurate measure of global temperatures, have confirmed this.

To illustrate this point, just think about a greenhouse. The glass panes let sunlight in but prevent it from escaping. The greenhouse then warms from the top down. As is clear from the science, this simply is not happening in the atmosphere.

Satellite measurements are validated independently by measurements from NOAA balloon radiosonde instruments, whose records extend back over 40 years.

If you look at this chart of balloon data extremists will tell you that warming is occurring, but if you look more closely you see that temperature in 1955 was higher than temperature in 2000.

A recent detailed comparison of atmospheric temperature data gathered by satellites with widely-used data gathered by weather balloons corroborates both the accuracy of the satellite data and the rate of global warming seen in that data.

Using NOAA satellite readings of temperatures in the lower atmosphere, scientists at The University of Alabama in Huntsville (UAH) produced a dataset that shows global atmospheric warming at the rate of about 0.07 degrees C (about 0.13 degrees Fahrenheit) per decade since November 1978.

"That works out to a global warming trend of about one and a quarter degrees Fahrenheit over 100 years," said Dr. John Christy, who compiled the comparison data. Christy concedes that such a trend "is probably due in part to human influences," but adds that "it's substantially less than the warming forecast by most climate models, and"-here is the key point-"it isn't entirely out of the range of climate change we might expect from natural causes."

To reiterate: the best data collected from satellites validated by balloons to test the hypothesis of a human-induced global warming from the release of C02 into the atmosphere shows no meaningful trend of increasing temperatures, even as the climate models exaggerated the warmth that ought to have occurred from a build-up in C02.

Some critics of satellite measurements contend that they don't square with the ground-based temperature record. But some of this difference is due to the so-called "urban heat island effect." This occurs when concrete and asphalt in cities absorb-rather than reflect-the sun's heat, causing surface temperatures and overall ambient temperatures to rise. Scientists have shown that this strongly influences the surface-based temperature record.

In a paper published in the Bulletin of the American Meteorological Society in 1989, Dr. Thomas R. Karl, senior scientist at the National Climate Data Center, corrected the U.S. surface temperatures for the urban heat-island effect and found that there has been a downward temperature trend since 1940. This suggests a strong warming bias in the surface-based temperature record.

Even the IPCC finds that the urban heat island effect is significant. According to the IPCC's calculations, the effect could account for up to 0.12 degrees Celsius of the 20th century temperature rise, one-fifth of the total observed.

When we look at the 20th century as a whole, we see some distinct phases that question anthropogenic theories of global warming. First, a strong warming trend of about 0.5 C began in the late 19th century and peaked around 1940. Next, the temperature decreased from 1940 until the late 1970s.

Why is that decrease significant? Because about 80% of the carbon dioxide from human activities was added to the air after 1940, meaning the early 20th Century warming trend had to be largely natural.

Scientists from the Scripps Institution for Oceanography confirmed this phenomenon in the March 12, 1999 issue of the journal Science. They addressed the proverbial "chicken-and-egg" question of climate science, namely: when the Earth shifts from glacial to warm periods, which comes first: an increase in atmospheric carbon dioxide levels, or an increase in global temperature?

The team concluded that the temperature rise comes first, followed by a carbon dioxide boost 400 to 1,000 years later. This contradicts everything alarmists have been saying about man-made global warming in the 20th century.

Now we can even go back 400,000 years and see this phenomenon occurring, as this chart clearly shows.

Yet the doomsayers, undeterred by these facts, just won't quit. In February and March of 2002, the New York Times and the Washington Post, among others, reported on the collapse of the Larsen B ice shelf in the Antarctic Peninsula, causing quite a stir in the media, and providing alarmists with more propaganda to scare the public.

Although there was no link to global warming, the Times couldn't help but make that suggestion in its March 20 edition. "While it is too soon to say whether the changes there are related to a buildup of the 'greenhouse' gas emissions that scientists believe are warming the planet, many experts said it was getting harder to find any other explanation."

The Times, however, simply ignored a recent study in the journal Nature, which found the Antarctic has been cooling since 1966. And another study in Science recently found the West Antarctic Ice Sheet has been thickening rather than thinning.

University of Illinois researchers also reported "a net cooling on the Antarctic continent between 1966 and 2000." In some regions, like the McMurdo Dry Valleys, temperatures cooled between 1986 and 1999 by as much as two degrees centigrade per decade.

In perhaps the most devastating critique of glacier alarmism, the American Geophysical Union found that the Arctic was warmer in 1935 than it is now. "Two distinct warming periods from 1920 to 1945, and from 1975 to the present, are clearly evident ...compared with the

global and hemispheric temperature rise, the high-latitude temperature increase was stronger in the late 1930s to early 1940's than in recent decades."

Again, that bears repeating: 80% of the carbon dioxide from human activities was added to the air after 1940-yet the Arctic was warmer in 1935 than it is today.

So, not only is glacier alarmism flawed, but there is no evidence, as shown by measurements from satellites and weather balloons, of any meaningful warming trends in the 20th Century.

Now Global Warming Health Risks/Benefits

Even as we discuss whether temperatures will go up or down, we should ask whether global warming would actually produce the catastrophic effects its adherents so confidently predict.

What gets obscured in the global warming debate is the fact that carbon dioxide is not a pollutant. It is necessary for life. Numerous studies have shown that global warming can actually be beneficial to mankind.

Most plants, especially wheat and rice, grow considerably better when there is more CO2 in the atmosphere. CO2 works like a fertilizer and higher temperatures usually further enhance the CO2 fertilizer effect.

In fact the average crop, according to Dr. John Reilly, of the MIT Joint Program on the Science and Policy of Global Change, is 30 percent higher in a CO2 enhanced world. I want to repeat that: PRODUCTIVITY IS 30 PERCENT HIGHER IN A CO2-ENHANCED WORLD. This is not just a matter of opinion, but a well-established phenomenon.

With regard to the impact of global warming on human health, it is assumed that higher temperatures will induce more deaths and massive outbreaks of deadly diseases. In particular, a frequent scare tactic by alarmists is that warmer temperatures will spark malaria outbreaks. Dr. Paul Reiter convincingly debunks this claim in a 2000 study for the Center for Disease Control. As Reiter found, "Until the second half of the 20th century, malaria was endemic and widespread in many temperate regions,"-this next point is critical- with major epidemics as far north as the Arctic Circle."

Reiter also published a second study in the March 2001 issue of Environmental Health Perspectives showing that "despite spectacular cooling [of the Little Ice Age], malaria persisted throughout Europe."

Another myth is that warming increases morbidity rates. This isn't the case, according to Dr. Robert Mendelsohn, an environmental economist from Yale University. Mendelsohn argues that heat-stress deaths are caused by temperature variability and not warming. Those deaths grow in number not as climates warm but as the variability in climate increases.

The IPCC Plays Hockey

I would now like to go back to the IPCC's Third Assessment. In addition to trying to predict the future, the Third Assessment report looked back into the past. The IPCC released a graph depicting global temperatures trending slightly downward over the last ten centuries, and then rather dramatically increasing beginning around 1900. The cause for such a shift, of course, is attributed to industrialization and man-made greenhouse gas emissions.

The now-infamous "hockey stick" graph was enthusiastically embraced by the IPCC, which used it as a basis of the Third Assessment. Dr. Michael Mann of the University of Virginia was

its principal author. The study, which Mann and others conducted, examines climate trends over the past 1,000 years. As many scientists have pointed out since its publication, it contains many flaws.

First, Mann's study focuses on temperature trends only in the Northern Hemisphere. Mann extrapolated that data to reach the conclusion that global temperatures remained relatively stable and then dramatically increased at the beginning of the 20th century. That leads to Mann's conclusion that the 20th century has been the warmest in the last 1000 years. As is obvious, however, such an extrapolation cannot provide a reliable global perspective of long-term climate trends.

Moreover, Mann's conclusions were drawn mainly from 12 sets of climate proxy data, of which nine were tree rings, while the remaining three came from ice cores. Notably, some of the ice core data was drawn from the Southern Hemisphere-one from Greenland and two from Peru. What's left is a picture of the Northern Hemisphere based on 8 sets of tree ring data-again, hardly a convincing global picture of the last 1,000 years.

Mann's hockey stick dismisses both the Medieval Warm Period (800 to 1300) and the Little Ice Age (1300 to 1900), two climate events that are fairly widely recognized in the scientific literature. Mann believes that "the 20th Century is "nominally the warmest" of the past millennium and that the decade of the 1990s was the warmest decade on record.

The Medieval Warm Period and Little Ice Age are replaced by a largely benign and slightly cooling linear trend in climate until 1900. But as is clear from a close analysis of Mann's methods, the hockey stick is formed by crudely grafting the surface temperature record of the 20th century onto a pre-1900 tree ring record.

This is a highly controversial and scientifically flawed approach. As is widely recognized in the scientific community, two data series representing radically different variables (temperature and tree rings) cannot be grafted together credibly to create a single series. In simple terms, as Dr. Patrick Michaels of the University of Virginia explained, this is like comparing apples to oranges.

Even Mann and his coauthors admit that if the tree ring data set were removed from their climate reconstruction, the calibration and verification procedures they used would undermine their conclusions.

A new study from the Harvard-Smithsonian Center for Astrophysics, which I will comment on shortly, strongly disputes Mann's methods and hypotheses. As coauthor Dr. David Legates wrote, "Although [Mann's work] is now widely used as proof of anthropogenic global warming, we've become concerned that such an analysis is in direct contradiction to most of the research and written histories available," Legates said. "Our paper shows this contradiction and argues that the results of Mann...are out of step with the preponderance of the evidence."

That's worth repeating: Mann's theory of global warming is out of step with most scientific thinking on the subject.

More Scientists Reject Kyoto

Based in part on the data supporting the IPCC's key reports, thousands of scientists have rejected the scientific basis of Kyoto. Recently, 46 leading climate experts wrote an open letter to Canada's National Post on June 3 claiming that the Kyoto Protocol "lacks credible

science." I would ask that the entire text of the letter be reprinted in the record at the end of my remarks.

The scientists wrote that the Canadian Prime Minister essentially ignored an earlier letter they drafted in 2001. In it, they wrote: "Many climate science experts from Canada and around the world, while still strongly supporting environmental protection, equally strongly disagree with the scientific rationale for the Kyoto Accord."

In their June 3 letter, the group wrote to Paul Martin, a Canadian Member of Parliament, urging him to consider the consequences of Kyoto ratification:

"Although ratification has already taken place, we believe that the government of Canada needs a far more comprehensive understanding of what climate science really says if environmental policy is to be developed that will truly benefit the environment while maintaining the economic prosperity so essential to social progress."

Many other scientists share the same view. I mentioned several of the country's leading climate scientists earlier in this speech. In addition, over 4,000 scientists, 70 of whom are Nobel Prize winners, signed the so-called Heidelberg Appeal, which says that no compelling evidence exists to justify controls of anthropogenic greenhouse gas emissions.

I want to repeat that: over 4,000 scientists, 70 of whom are Nobel Prize winners, signed the so-called Heidelberg Appeal, which says that no compelling evidence exists to justify controls of anthropogenic greenhouse gas emissions.

I also point to a 1998 recent survey of state climatologists, which reveals that a majority of respondents have serious doubts about whether anthropogenic emissions of greenhouse gases present a serious threat to climate stability.

Then there is Dr. Frederick Seitz, a past president of the National Academy of Sciences, and a professor emeritus at Rockefeller University, who compiled the Oregon Petition, which reads as follows:

"We urge the United States government to reject the global warming agreement that was written in Kyoto, Japan in December, 1997, and any other similar proposals. The proposed limits on greenhouse gases would harm the environment, hinder the advance of science and technology, and damage the health and welfare of mankind.

"There is no convincing scientific evidence that human release of carbon dioxide, methane, or other greenhouse gasses is causing or will, in the foreseeable future, cause catastrophic heating of the Earth's atmosphere and disruption of the Earth's climate. Moreover, there is substantial scientific evidence that increases in atmospheric carbon dioxide produce many beneficial effects upon the natural plant and animal environments of the Earth."

Again, that was Dr. Frederick Seitz, a former past president of the National Academy of Sciences.

The petition has 17,800 independently verified signatures, and, for those signers holding the degree of PhD, 95% have now been independently verified. Environmental groups have attacked the credibility of this petition based on one false name sent in by green pranksters. Several names are still on the list even though biased press reports have ridiculed their identity with the names of famous personalities. They are actual signers. Perry Mason, for example, is a PhD Chemist.

Harvard-Smithsonian 1,000-Year Climate Study

The IPCC's hockey stick represents a radical departure from the well-established scientific literature. I urge this body to reject the IPCC and instead rationally examine the best available science on climate change before pursuing drastic measures that address climate change.

Let me turn to an important new study by researchers from the Harvard-Smithsonian Center for Astrophysics.

The study, titled "Proxy Climatic and Environmental Changes of the Past 1,000 Years," offers a devastating critique of Mann's hypothesis, calling into question the IPCC's Third Assessment, and indeed the entire intellectual foundation of the alarmists' views. It draws on extensive evidence showing that major changes in global temperatures largely result not from man-made emissions but from natural causes.

Smithsonian scientists Willie Soon and Sallie Baliunas, with co-authors Craig Idso, Sherwood Idso and David Legates, compiled and examined results from more than 240 peer-reviewed papers published by thousands of researchers over the past four decades. In contrast to Mann's flawed, limited research, the Harvard-Smithsonian study covers a multitude of geophysical and biological climate indicators.

While Mann's analysis relied mostly on tree-ring data from the Northern Hemisphere, the researchers offer a detailed look at climate changes that occurred in different regions around the world over the last 1000 years.

The range of climate proxies is impressive and worth recounting here. The authors examined borehole data; cultural data; glacier advances or retreats; geomorphology; isotopic analysis from lake sediments or ice cores, tree or peat celluloses (carbohydrates), corals, stalagmite or biological fossils; net ice accumulation rate, including dust or chemical counts; lake fossils and sediments; river sediments; melt layers in ice cores; phenological (recurring natural phenomena in relation to climate) and paleontological fossils; pollen; seafloor sediments; luminescent analysis; tree ring growth, including either ring width or maximum late-wood density; and shifting tree line positions plus tree stumps in lakes, marshes and streams.

Based on this proxy data drawn from 240 peer-reviewed studies, the authors offer highly convincing evidence to support the Little Ice Age and the Medieval Warm Period. As co-author Dr. Sallie Baliunas explained, "For a long time, researchers have possessed anecdotal evidence supporting the existence of these climate extremes."

Baliunas notes that, during the Medieval Warm Period, "the Vikings established colonies in Greenland at the beginning of the second millennium that died out several hundred years later when the climate turned colder." And in England, she found that, "vineyards had flourished during the medieval warmth." In their study, the authors accumulated reams of objective data to back up these cultural indicators.

The Medieval Warm Period, or Medieval Optimum, occurred between 800 to 1300. Among the studies surveyed by the authors, 112 contain information about the warm period. Of these 103 showed evidence for the MWP, 2 did not, and 7 had equivocal answers. Looking just at the Southern Hemisphere, the authors found 22 studies, 21 of which confirmed the warm period and only one that did not.

The authors also looked at the 20th century, and examined 102 studies to determine whether it was the warmest on record. Three studies answered yes, 16 had equivocal answers, and of

the remaining 83, 79 show periods of at least 50 years that were warmer than any 50-year period in the 20th century.

I must say, to any reasonable person, these ratios appear very convincing, and undoubtedly rest on a solid scientific foundation. Again, remember, the conclusions of this study are based on 240 peer-reviewed studies, and this chart here shows what the Harvard-Smithsonian researchers concluded.

Peer review means they were rigorously reviewed and critiqued by other scientists before they were published. This climate study, published in March of 2003, is the most comprehensive of its kind in history.

According to the authors, some of the warming during the 20th century is attributable to the climate system recovering from the Little Ice Age. Global warming alarmists, however, vehemently disagree, and pull a scientific sleight-of-hand by pointing to the 140-year direct temperature record as evidence of warming caused by humans. But as the authors note, "The direct temperature measurement record is too short...to provide good measures of natural variability in its full dynamic range."

This research begs an obvious question: if the earth was warmer during the Middle Ages than the age of coal-fired power plants and SUVs, what role do man-made emissions play in influencing climate? I think any person with a modicum of common sense would say, "Not much."

How did the media report on the Harvard-Smithsonian study? The big dailies, such as the New York Times and the Washington Post, basically ignored it. I was impressed by a fair and balanced piece in the Boston Globe. Unfortunately, some in the media couldn't resist playing the politics of personal destruction.

I would refer my colleagues to a May 29 story by Jeff Nesmith of Cox News Service, which was marred by errors and an alarmist bias. Rather than focusing on the scientific merits of the study, Nesmith reported that petroleum companies were behind it, thereby corrupting its conclusions.

Nesmith writes that the "research was underwritten by the American Petroleum Institute, the trade association of the world's largest oil companies." This is simply false. API funded less than 10 percent of the research. Had Nesmith read the Harvard-Smithsonian press release announcing the study, he would have learned that most of the funding came from federal grants through NASA, the Air Force Office of Scientific Research, and the National Oceanic and Atmospheric Administration.

Even so, what if API funded the whole study? If that automatically means, as it apparently does to Nesmith, that the science lacks credibility, then at least he could offer some proof to those who think differently-that is, no matter who funds such studies, their merits hinge on the quality of the science. Nesmith instead offers no proof and dismisses the science.

Moreover, is he suggesting that Harvard and the Smithsonian can be unduly influenced by oil companies, or by any organization for that matter?

Nesmith also attacks Dr. Sallie Baliunas and Dr. Willie Soon, two of the report's authors, because of their ties to the George C. Marshall Institute. Nesmith noted that institute gets some of its funding from Exxon Mobil. Again, for Nesmith, this is proof positive that the Marshall Institute is inherently suspect, though he offers no evidence to support that case.

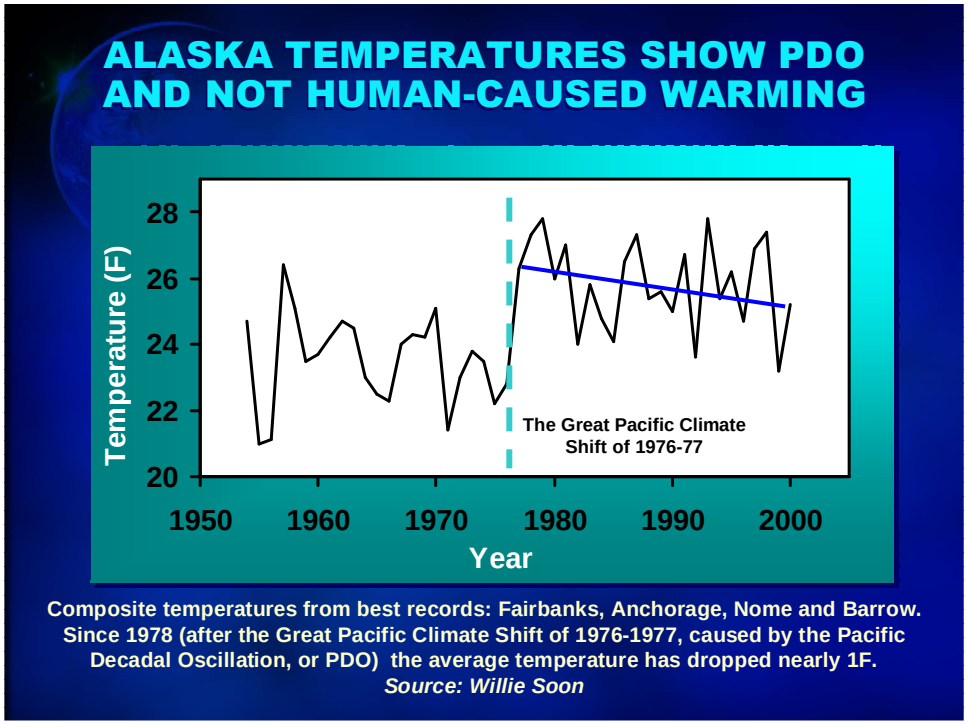
In another stunning sentence, Nesmith writes, "most climate scientists think the rise [of global temperatures] results from the atmospheric buildup of heat-trapping 'greenhouse gases,' especially released by the combustion of fossil fuels such as coal and petroleum." Most climate scientists? I think that based on the extensive record of climate skeptics I've outlined today, that statement is outlandish.

The Ice Ages

Before I move on, I would like to add another point about climate history. For the last several minutes I have been talking about natural climate variability over the past 1,000 years. But we can go back even further in history to see dramatic changes in climate that had nothing to do with SUVs or power plants.

During the last few hundred thousand years, the earth has seen multiple and repeated periods of glaciation. Each of these "Ice Ages" has ended because of dramatic increases in global temperatures, which had nothing to do with fossil fuel emissions.

Indeed the last major glacial retreat, marking the end of the Wurm Glaciation, was only 12,000 years ago. At its end, the temperature was 14 degrees Celsius lower.



Senator James M. Inhofe
Chairman
Senate Committee on Environment and Public Works

The Science of Climate Change
2004

As chairman of the Committee on Environment and Public Works, I have previously addressed the Senate to discuss the issue of so-called global warming. I have taken a special interest in this issue because the gravity of what is at stake demands it. I have taken a simple, yet profound approach to dealing with environmental issues, working to ensure that the laws we pass represent sound public policy. Of my three guiding principles for all committee work, the first principle is that government should rely on the most objective science.

Unfortunately, a commitment to drawing conclusions based on science is not a popular approach. What has most galled my critics is that I do not "spin the science" to make it something it is not. Good science is and should remain the product of well designed and reproducible studies and research.

All too often, however, the studies that are touted by my critics are tainted by political and ideological agendas and cannot be reproduced because the authors will not release the data that supposedly supports their conclusions – all of which raises the eyebrows of credible scientists. Such science has no place in our system of government and should not be used to

drive major U.S. policy.

When I led the congressional delegation to Milan last December, I was greeted by posters that quoted me as saying global warming is "the greatest hoax ever perpetrated on the American people." I thanked the green activists for uncharacteristically quoting me correctly. Global warming is the greatest hoax ever perpetrated on the American people. It was true when I said it before, and it remains true today.

Perhaps what has made this hoax so effective is that we hear over and over that the science is settled and that there is consensus that, unless we fundamentally change our way of life by limiting greenhouse gas emissions, we will cause catastrophic global warming. This is simply a false statement.

4,000 scientists, 70 of whom are Nobel Prize winners, signed the Heidelberg Appeal, which says that no compelling evidence exists to justify controls of anthropogenic greenhouse gas emissions. Over 17,000 scientists signed another document that directly contradicts the false claims of consensus. [chart 1] The Oregon Petition, compiled by Dr. Frederick Seitz, a past president of the National Academy of Sciences and a professor emeritus at Rockefeller University, reads as follows:

> "There is no convincing scientific evidence that human release of carbon dioxide, methane, or other greenhouse gasses is causing or will, in the foreseeable future, cause catastrophic heating of the Earth's atmosphere and disruption of the Earth's climate."

What a powerful, unequivocal statement that is. So powerful, in fact, that ideologues fraudulently sent in made-up names and belittled legitimate scientists on the Petition such as Dr. Perry Mason simply because he and a few others shared their names with famous fictional characters. Such immature acts belong on a grade school playground, but are simply shameful in a serious policy debate. Yet we have heard these baseless charges repeatedly. But these distortions only serve to underscore the fragileness of the myth that there is consensus. If there truly is consensus, why would so many renowned scientists sign such statements? If there truly is consensus, why would these environmental activists be so threatened by these documents that they would make fraudulent submissions? In short, if there is such controversy over whether there is consensus, how can there possibly be consensus? The controversy over its existence is itself proof that no consensus exists.

This point was made succinctly by former Carter Administration Energy Secretary James Schlesinger, who wrote in the *Washington Post*: "there is an idea among the public that the science is settled. That remains far from the truth." He also wrote that the global warming theory has hardened into "orthodoxy that searches out heretics and seeks to punish them."[chart 2]

And that was James Schlesinger, Energy Secretary in a Democrat Administration.

Thankfully, despite the efforts to "punish them", credible scientists continue to conduct well designed, reproducible studies, and I will list some of them here today. Last year, I spoke at length to describe the great number of uncertainties surrounding claims of global warming. I described real science that contradicts the alarmists, who, wracked by fear, see a future plagued by catastrophic flooding, war, terrorism, economic dislocations, droughts, crop failures, mosquito-borne diseases, and harsh weather – all caused by man-made greenhouse gas emissions.

We cannot afford to forget that climate change alarmists' visions have been with us for decades. In 1972, the National Science Board, the governing body of the National Science Foundation, observed: "Judging from the record of the past inter-glacial ages, the present time of high temperatures should be drawing to an end...leading into the next glacial age."

In 1974, TIME magazine in an article entitled "Another Ice Age?" warned: [chart 3A & 3B] "However widely the weather varies from place to place and time to time, when meteorologists take an average of temperatures around the globe they find that the atmosphere has been growing gradually cooler for the past three decades. The trend shows no indication of reversing. Climatological Cassandras are becoming increasingly apprehensive, for the weather aberrations they are studying may be the harbinger of another ice age."

These fears became the motivation of a drumbeat from environmentalists that we must fundamentally alter our way of living to avoid a cataclysmic ice age. Of course, these fears proved baseless.

And when this 30 year cooling cycle ceased, these same alarmists again proclaimed we must fundamentally alter our way of living to avoid cataclysmic global warming. From the scientific literature, I believe these fears are equally baseless.

I believe it would be unconscionable to heed the alarmists' cries for economic disarmament without subjecting these claims of doom to the scrutiny they deserve. Predictably, those who peddle fear do not want discussions of science. Hiding behind claims of "the science is settled," they conjure ever more creative ways to market the myth.

The most recent example is the movie, "The Day After Tomorrow," in which the laws of physics are repeatedly violated to create fear of an ice age caused by global warming. First it was an ice age! Then it was global warming! Now it is an ice age caused within days because of global warming! Seems they can't make up their minds what they are afraid of – but their solution is always the same, restrict the economy and outsource American jobs overseas.

Of course, the movie was widely panned, not simply as a "bad" movie, but a "stupid" movie. Even some environmentalists had to admit there was no science to support the movie. For instance, Dan Schrag, a paleoclimatologist, said, "My first reaction was, "Oh my God, this is a disaster because it is such a distortion of science." [chart 4]

What disturbed me was not the movie, which after all is simply the vision of a German film producer with a dislike for Americans who says "My secret dream is that this film moves politicians to act."

No, what disturbed me was he may get his wish. Former Vice President Gore teamed up with the activist group, MoveOn.org, to use the movie as an opportunity to market their alarmist views and economy-capping solutions. This is exactly what is wrong with how alarmists discuss this issue. Rather than joining me and those like me in a commitment to using the best, non-politicized science – whatever it finds – politically motivated groups such MoveOn.org pander to our worst fears to drive their political agenda.

I would rather discuss what real science is showing. I said last July that "After studying the issue over the last several years, I believe that the balance of the evidence offers strong proof that natural variability is the overwhelming factor influencing

climate."

After continuing to study the science over the last year, that belief has been strengthened. I would submit, furthermore, that the scientific debate is shifting away from those who subscribe to global warming alarmism.

IPPC Incorrectly Attributes Ground Station Temperature Rise to Climate Change Instead of Local Activity

One of the areas that has caused global warming advocates the most heartburn has been the inconvenient, yet inescapable, fact that records from satellites using highly reliable Microwave Sounding Units show little warming, on a globally averaged basis, in comparison to ground station records. This important discrepancy on its face would suggest the ground-based data is contaminated. It is now widely recognized that ground-based measurements are affected by such things as the "heat island" effect, large-scale land-use changes and problems with maintaining ground-stations.

The Intergovernmental Panel on Climate Change, or IPCC, report published in 2001 is claimed to be the most authoritative source for claims that temperatures are rising due to climate change. The IPCC has become increasingly alarmist in its three successive reports. In its summary referring to globally averaged temperature data, it says only that "These numbers take into account various adjustments, including heat island effects." The discussion within the body of the report to this important issue, which must be thoroughly explained if ground-based data is to be considered of more importance than highly reliable satellite data, is disappointingly brief and uninformative as well. Moreover, it leaves the impression that everything except for temperature changes due to climate has been factored out.

Thus, the entire validity of the conclusions from ground-station temperature data rests on the claim that these temperature bias effects in the data from such things as growing cities, construction, agricultural practices and other economic activities which potentially could impact temperature measurements have been completely subtracted out from the conclusions. But this may not be true.

A new study by Drs. Ross McKitrick and Patrick Michaels that was presented in an article published in May 25th issue of Climate Research, throws these assurances of the IPCC into serious doubt.

The study examined temperature records for 218 individual stations located in 93 countries since 1979, when satellite data first began being collected. The study then compared these to the IPCC grid cells containing these 218 stations.

The study concluded that the differences between the satellite data and the ground station data were almost completely explained by local economic and social factors, and data quality control. Moreover, it found that,
"outside the dry/cold regions the measured temperature change is primarily explained by economic and social variables."

In short, the IPCC's claims of increasing temperatures based on ground-based data appear to be greatly overstated. As the article puts it, non-climate related variables "add up to a significant net warming bias at the global level."

This finding is of tremendous importance, seriously eroding the foundation for the house of

cards upon which the global warming hysteria is built. Moreover, the study is well-designed and reproducible.

Mann's Hockey Stick is Flawed and Irreproducible

That study's design and reproducibility stands in stark contrast to another study heavily relied upon by global warming advocates – the famous, or perhaps I should say, infamous, hockey stick chart published by Dr. Michael Mann. The conclusions of this study have become a rallying cry for alarmists who would have us believe this is final proof that 20th century temperatures have spiked up dramatically. These results are routinely used in presentations to corporate officers to demonstrate that they had better restructure their companies' operations and annual reports.

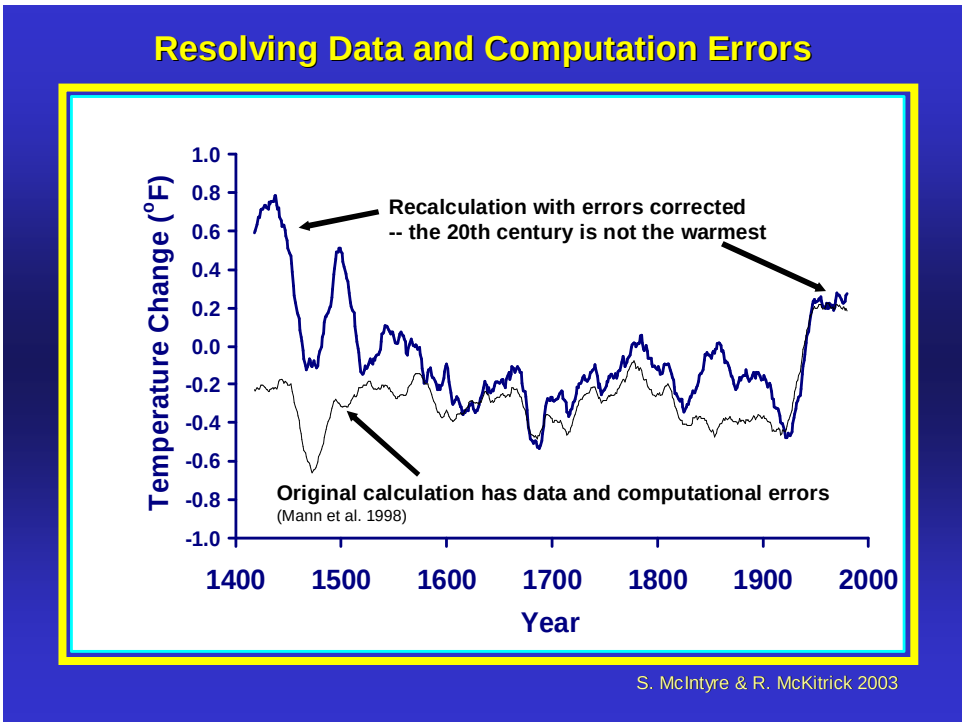
But Mann's conclusions have come under intense criticism recently, as other researchers have challenged both the methodology he used and the reliability of the results.

A team of scientists led by Dr. Willie Soon and Dr. Sally Baliunas, who are astrophysicists from the Harvard-Smithsonian Center, surveyed 240 articles concerning local and regional-scale climate reconstructions over the last 1,000 years. The proxy record they examined was far more extensive than that used by Mann. While Mann's analysis relied mostly on tree-ring data from the Northern Hemisphere, the researchers offer a detailed look at climate changes that occurred in different regions around the world over the last 1000 years using over 20 different proxies.

As a result of this extensive survey, Drs. Soon and Baliunas concluded that: [chart5] "the 20th century does not contain the warmest anomaly of the past millennium in most proxy records, which have been sampled world-wide. Past researchers implied that unusual 20th century warming means a global human impact. However, the proxies show that the 20th century is not unusually warm or extreme."

Other studies that are devastating to Mann's conclusion focus not on its inconsistency with the results of work of a multitude of other researchers, but on his extremely questionable and improper methods. In an attempt last year to perform an audit of Mann's unique conclusions, Drs. McIntyre and McKitrick found that Mann's work was irreproducible without resorting to the use of flawed data sets, inappropriate data manipulation, or ill-advised statistical procedures. To quote the researchers, "the dataset used to make [the Mann reconstruction] contained collation errors, unjustified truncation or extrapolation of source data, obsolete data, incorrect [methodological] calculations, geographical mislocations and other serious defects."

When the researchers corrected for these data and methodological flaws, they conclude that temperatures in the early 1400s rivaled those of today, indicating that human influences have not taken the climate to unprecedented territory.



Dr. Esper, a paleoclimate researcher, and his colleagues published a paper that suggests that the tree-ring histories heavily relied upon by Mann in his temperature reconstructions were manipulated in such a way as to have most of the long term variability removed, making the 20th century temperatures appear much more unusual than they in fact were. Esper and his colleagues produced temperature reconstructions for the past 1,000 years using a more scientifically defensible approach to handling tree-ring records that preserves long-term variability.

The study concludes that the past 1,000 years have been characterized by periods of warm and cold, and that as far back as about 1,000 years ago, temperatures were as warm or warmer than in the late 20th century.

Of course, these studies show that the "shaft" of the hockey stick created by Mann is wrong. And it is intuitively true that the shaft is wrong. We have known for years about the Medieval Warm Period from 800 to 1400 A.D. We have known for years about what has been called the Little Ice Age from 1600 to 1850 A.D. And the new studies I've just described confirm these well-established naturally occurring climatic events.

In other words, in creating his so-called hockey stick, Mann deliberately eliminated the first blade of the hockey stick. By eliminating the blade he left the false conclusion that the 20th century temperatures are unprecedented. They are not. The fact is that the real temperatures spike far higher during the period he portrays as a straight shaft than current temperatures – despite that his extraordinarily flawed results indicate we are living in the hottest period in the last 1,000 years.

Ironically, the often-criticized IPCC report itself contradicts Mann's findings. As I described earlier, a new reproducible study indicates the IPCC's estimates of temperature rise themselves appear to mistakenly attribute socioeconomic and data quality factors that affect

temperature readings to climate change. Yet even so, the IPCC shows a far smaller temperature increase than Mann. The IPCC shows an increase of 0.6 degrees Celsius over the last 100 years, but the "blade" of the Mann hockey stick shows an increase of 0.95 Celsius – more than a 50 percent larger increase.

Moreover, the so-called hockey stick 'blade' does not appear to be explained by the statistical techniques Mann claims he used. In a recent letter published in *Geophysical Research Letters*, Drs. Soon, Baliunas, and Legates closely examined the 'blade' and found that it could not be reproduced using either the technique Mann says he used, or other common statistical techniques. Once again, this key requirement of reproducibility seems missing from the flagship study of those crying that the sky is falling.

Most recently, Dr. Chapman and his colleagues commented on a comparison of borehole temperature measurements with Dr. Mann's proxy records and questioned Dr. Mann's analysis techniques, concluding they are "just bad science" and that Dr. Mann had undertaken a "selective and inappropriate presentation" of results.

Thus, as Dr. Legates concluded in testimony before the Environment and Public Works Committee, this so-called flagship study: [chart 6] "certainly does not conform to the requirements of open access and reproducibility, required by the Data Quality Act, nor does it meet even minimal quality standards."

Dr. Legates went on to say in respect to the many problems inherent in Mann's study: "This leads me to reject Dr. Mann's .. conclusions.. that anthropogenic factors provide the overwhelming influence on global and hemispheric temperatures in the last 1800 years and that the 1990s are the warmest decade, and 1998 the warmest year, of the last 1800 years."

Some may try to defend the Mann conclusions, and believe his work is unimpeachable. But a recent article published in the July 1st, 2004 issue of *Nature* magazine repudiates that belief. In a brief "corrigendum," Mann makes a clear admission that the disclosure of data and other methods supporting the hockey stick was materially inaccurate. This corrigendum was ordered by the Editorial Board after two other scientists, Dr. McIntyre and Dr. McKitrick filed a "Materials Complaint." According to these scientists, the on-line supplemental information accompanying Mann's correction notice essentially concedes for the first time that key steps in the computations behind his conclusions were left out of and conflict with the description of methods in the original paper.

Despite this, Mann continues to assert that these errors do not affect his results, saying, and I quote: "None of these errors affect our previously published results."

But as McIntyre and McKitrick point out: [chart 7] "if this were true, then a simple constructive proof could have been provided, showing before and after calculations. This is conspicuously missing... We have done the calculations and can assert categorically that the claim is false. We have made a journal submission to this effect and will explain the matter fully when that paper is published."

While this sad spectacle clearly is not yet over, three things are clear. Mann's hockey stick has never been reproduced, efforts to do so showed that the study was replete with errors and miscalculations, and despite his continuing faith in his hockey stick conclusions, Mann has yet to offer any proof whatsoever that they are correct. And yet the alarmists continue to claim we should unilaterally disarm America's economy based on Mann's unbelievable – literally unbelievable – results.

Sea Level Rise

Another controversial claim is that sea level is rising, and that this is due to climate change. It has been claimed for years that sea level was rising rapidly, yet again fueling the call for action. Based on modeling, the IPCC estimates that sea level will rise 1.8 millimeters annually, or about one-fourteenth of an inch.

In a study published this year in *Global and Planetary Change*, Dr. Nils-Axel Morner of Sweden found that sea level rise hysteria was overblown. In his study, which relied not only on old observational records, but satellite altimetry as well, he concluded that: [chart 8] "there is a total absence of any recent 'acceleration in sea level rise' as often claimed by IPCC and related groups."

Morner's findings go to the heart of the debate – the reliance by global warming advocates on faulty models that conflict with observational records instead of observational records themselves. According to Morner, the: "IPCC made an estimate of all variables and their possible contribution to sea level rise. They arrived at a mean value of 0.9 millimeters per year. This value is in harmony with the records of the present and near-past... Still – and this is remarkable, [says Morner,] – IPCC compared their own value with a model value of 1.8 millimeters per year and discarded their own estimate as unrealistic."

Morner has blunt words for the IPCC approach, saying that he – and I quote – "discard[s] the model output of IPCC as untenable, not to say impossible."

Using satellite altimetry and other observational data, Morner finds that the late 20th century lacks any sign of acceleration of sea rise, including the last decade. He concludes that, based on long-term observational data as well as the newest technology, sea level in a century can be expected to be within the range of a 10 centimeter sea level decline to a 20 centimeter sea level rise, which translates to about a four inch sea level decline to an eight inch sea level increase.

Yet, remarkably, we still hear fears that the world will become flooded due to global warming. Such claims are, to be blunt, completely out of touch with most comprehensive science. As Sweden's Morner puts it, "there is no fear of massive future flooding as claimed in most global warming scenarios."

Are Severe Weather Events Increasing? Western Droughts and Hurricanes

Something else I am told is that there has been an increase in the number and intensity of severe weather events. Typically these doomsayers point to the droughts in the Southwest or point to more violent hurricanes to prove that global warming is occurring.

In response to the current 5 year drought in the southwest, the *New York Times* proclaimed on May 10th that "Drought may be normal, but there may be nothing normal about this drought." Of course the paper inserted a weasel word to avoid actually describing how it was abnormal.

This is one of those claims that makes me want to utter the old insult, "you are so wrong, I don't know where to begin." If an increased number of severe droughts is to prove global warming, it would have to be true that the number and severity of these droughts are, in fact, increasing. But nothing could be farther from the truth.

Drought is a serious and damaging climate-related hazard. But this fact should not obscure the fact that carbon dioxide is not the cause of this recurring disaster that plagued even the Ancient Egyptians. The two worst droughts to hit this country in the last century occurred in the 1930s – known as the Great Dustbowl – and the 1950s. But they were neither the longest droughts to afflict this country, nor the most severe.

According to an article published in the December 1998 Bulletin of the American Meteorological Society, Dr. Connie Woodhouse and Dr. Jonathan Overpeck conducted tree-ring reconstructions in the Southwest that suggest the lengths and severity of droughts of the 1930s and 50s have been equaled or, in some regions, surpassed by droughts in the past several centuries.

They further concluded that it is clear that major multi-year Great Plains droughts have occurred naturally once or twice a century over the last 400 years. And there is evidence that during the 13th and 16th centuries, there were two megadroughts that exceeded the severity, length and spatial extent of 20th century droughts.

Of course, this study was published before the onset of the most recent 5 year drought in the southwest. More recent studies published just last year, however, confirm its findings. In a 2003 article in Geophysical Research Letters, Dr. Stephen Gray and his colleagues stated that: "like the 1950s drought, the late 16th century megadrought was followed by a wet period, and both events were associated with intense La Nina episodes typical of southwestern U.S. and Great Plains droughts."

In an article in the July 2003 issue of the American Meteorological Society, Dr. Falko Fye and his colleagues found that: [chart 9] "there appear to have been at least 12 droughts since 1500AD that were analogous to the 1950s drought in terms of location, intensity, and duration.... [and] the 16th century megadrought lasted some 18 years and the tree-ring data indicate it was the most severe sustained drought to impact North America in the past 500 to perhaps 1000 years."

What is also worth noting is that the global temperature record doesn't provide any useful information concerning drought conditions.

In the wake of this year's successive hurricanes hitting Southeast and Gulf States, some have even had the gall to claim it is due to global warming. Credible meteorologists have been quick dismissing such claims. As Hugh Willoughby, senior scientist at the International Hurricane Research Center of Florida International University stated in the plain language we non-scientists can understand: "This isn't a global-warming sort of thing.... It's a natural cycle."

Benjamin Preston, senior research fellow at the Pew Center on Global Climate Change – an green activist organization that promotes the global warming theory – echoed his sentiments, saying about the link between hurricanes and global warming: The general consensus is that it's unlikely.... We can actually explain an active hurricane season using natural variability."

Now, if even the Pew Center has said that, it seems pretty obvious that the activists and writers who have been quick to implicate global warming should be dismissed as the opportunists they are. Weather simply changes. In the words of Professor Perry Samson, associate chair of the Department of the Atmospheric, Oceanic, and Space Sciences at the University of Michigan: "Abnormal weather is normal."

When it comes to the argument that hurricanes are getting worse, it is typical to hear statistics about increasing costs due to hurricane damage. Of course, we can expect monetary damage from hurricanes to increase in the future, "not as a result of anthropogenic climate change, but from natural climate cycles, and ... increasingly expensive properties along the coast."

These are not my words, but of a top U.S. government scientist named Dr. Christopher Landsea.

Science simply doesn't support the claims that there is a link between hurricanes and global warming. A team led by the National Oceanic and Atmospheric Administration's Dr. Landsea concluded that the relationship of global temperatures to the number of intense landfalling hurricanes is either not present, or is very weak. In fact, if we examine hurricane records for which we have good data going back to the 1800s, there is much evidence supporting the conclusion that we have had more hurricane activity historically than in the last few decades, so an increase the last several years should perhaps be expected as part of natural variability. In this chart [chart 10], you can see that the overall number of hurricanes and the number of the strongest hurricanes fluctuated greatly during the last century, with a great number in the 1940s. In fact, through the last decade, the intensity of these storms has declined somewhat.

Hopefully, we can finally put to rest the unsubstantiated claim that global warming is leading to more severe and unpredictable weather. What is certain is that the drought record in the Southwest over the last 1,000 years and the hurricane record flatly refutes that claim.

Glaciers and Kilamanjaro

Global warming advocates will often recite statistics that glaciers are in retreat. For instance, it is said that the number of glaciers in Glacier National Park has dwindled from 150 more than a century ago to about 35 today and that the part of the Arctic Ocean that remains frozen year-round has been shrinking.

But what do these examples really say about global warming? Scientists know very little about glacial activity, but what they do know suggests there are as many expanding glaciers as there are shrinking ones (this even happens with two glaciers within a few miles of each other) and that there is no universal trend either way. There are more than 160,000 glaciers on the planet. Scientists have good, long-term mass balance measurements on a comparative handful of them. So how can someone assert that glaciers are shrinking?

Dr. Roger Braithwaite last year looked at mass balance trends in 246 glaciers worldwide from 1946 to 1995. He found that "there are several regions with highly negative mass balances in agreement with a public perception of 'the glaciers are melting,' but there are also regions with positive balances." This holds true even within continents. In Europe, "Alpine glaciers are generally shrinking, Scandinavian glaciers are growing, and glaciers in the Caucasus are close to equilibrium for 1980-95." Globally, adding all the results together, "there is no obvious common or global trend of increasing glacier melt in recent years."

Indeed, the observed variability of Arctic sea ice thickness, which shows that the sea ice mass can change by up to 16 percent within one year, contrasts with the concept of a slowly dwindling ice pack, produced by global warming.

But if global warming is not the cause, what is? In 2002, work done by Dr. Greg Holloway and Dr. Tessa Sou, showed that the decadal-scale wind pattern changes were responsible for rearranging the ice, giving some regions thinner and others thicker amount of ice. Research by Dr. Ignatius Rigor in 2002 confirmed this, finding much of the so-called Arctic ice thinning is caused by decadal variations in wind patterns over the Arctic.

Alarmists also speak eloquently about Kilimanjaro, and like to show two pictures – one from the early 1990s with a modest snow cap on it, and another from 2000 showing the snow caps had shrunk.

Of course, those are just two pictures. Let me show you three. [chart 11] Yes, Kilimanjaro's snows were smaller in the late 90s than the 80s, but they were bigger in the 80s than in the 70s. In fact, the snows of Kilimanjaro in 1997 appear to resemble the snows of Kilimanjaro in 1976.

I show you these photos to make a simple point. If you are given only partial facts, you can easily be misled into thinking you see something when in fact you are seeing a very different thing indeed. The pictures you have been shown are simply transient snows and are meaningless. To quote an April white paper from the Center for Science and Public Policy entitled *The Consensus on Kilimanjaro is Wrong*, "though a photograph may be worth a thousand sound bytes, those words and photos do ***not*** go together."

Of course, the real question is what does the issue of melting glaciers on Kilimanjaro have to do with man-induced global warming? Not much. On November 26, the New York *Times* had some interesting insights into Kilimanjaro and global warming. Here's what the Times had to say: "The glaciers on Kilimanjaro have been in retreat for at least a century, shrinking by 80 percent between 1912 and 2000. ***Although it is tempting to blame global warming, the most likely culprit is deforestation*.**"

As explained in Nature's Science update, with forest present, the natural updraft from the slopes carried moist air to the summit and helped reinforce and sustain the ice cap. Without those forests, the updrafts are dry and fail to replenish the ravages of the sun on the summit ice cap. And since the equatorial sun is extremely hot, deforestation also means the updrafts are warmer than they were when Kilamanjaro's forests were abundant.

Conjuring up fears of global warming because of Kilimanjaro's glaciers – to my mind – represents exactly the kind of misuse of science that leads to increased misunderstanding instead of understanding. If the problem is deforestation and there is public will to fix the problem, fix it. Don't try to mislead people into thinking the problem is something else simply because that fits your agenda.
This is a point I have made repeatedly. I believe it is extremely important for the future of this country that the facts and the science get a fair hearing. Without proper knowledge and understanding, alarmists will scare the country into enacting its ultimate goal: making energy suppression, in the form of harmful mandatory restrictions on carbon dioxide and other greenhouse emissions, the official policy of the United States.

ECONOMICS

While the science underlying hysterical claims of catastrophic global warming is thin, the analyses showing the costs of capping our economy are not. Perhaps the most well known study examining the Kyoto Protocol came from Wharton Econometric Forecasting Associates,

or WEFA. According to WEFA economists, Kyoto would cost 2.4 million American jobs and reduce GDP by 3.2%, or about $300 billion annually, an amount greater than the total annual expenditure on primary and secondary education.

It's hard to imagine such huge amounts, so I will put the findings in context. Because of Kyoto, American consumers would pay 11% more for food, 14% more for medicine, and 7% more for housing. Electricity prices would nearly double and gasoline prices would go up an additional 65 cents per gallon.

New studies that have come out since my last speech on global warming examining the consequences of unilaterally putting a cap on the economy through carbon restrictions are also revealing. Using perhaps the most sophisticated model to assess the issue – what is known as a dynamic model that incorporates future changes in behavior – the renowned economic forecasting firm of Charles River Associates has concluded that under the McCain-Lieberman bill, S.139, economic growth would slow. [chart 12]

The nation would lose up a quarter million jobs by 2010, increasing to up to 610,000 jobs by 2020. Energy-intensive industries would be the hardest sector hit. Natural gas prices would increase by up to 82 percent, driving thousands of companies overseas, as we have already seen happen to fertilizer manufacturers, who cannot afford to make their product at even today's natural gas prices. Production from these energy-intensive industries alone would decline annually by up to $160 billion.

The bill would hit specific state economies harder. For instance, Ohio and West Virginia, both with economies that rely on coal production, would see their industries decimated, with production decreasing by as much as 73 percent.

Average households in the United States would incur a financial cost up to $1,300 in the year 2010, with the annual cost rising up to $2,300 by 2020. Families' direct costs in the form of higher electricity and gasoline prices would increase dramatically. Within 6 years, residential electricity prices would rise by up to 30 percent, dramatically increasing families' monthly electricity bills. By 2020, those prices would rise by up to 43 percent due to carbon restrictions.

Regardless of which study one looks at, gasoline price increases will be substantial [chart 13]. According to the Energy Information Administration, gas prices will increase by 27 percent, or 40 cents. The more sophisticated Charles River Associates assessment puts the cost even higher, with gasoline prices increasing by up to 50 cents.

Of course, for many wealthier people, these may seem like trivial costs. Rich people don't think about their electric bills or the cost of gasoline at the pump. But average Americans do. And the elderly living on fixed income and the poor pay attention to these costs even more. What is worse, these costs are regressive, which means that poor people will bear a bigger burden because they spend a larger share of their income on energy, such as gasoline and electricity. When the costs go up, they must give up something else important to them.

And what do we buy for costs?

As even James Hansen, the NASA scientist who popularized the global warming theory, admits, it would take massive reductions in carbon emissions to have any appreciable impact on climate change. And, of course, his views are based on the assumption it even exists. [chart 14] Calculating what affect implementing the Kyoto Protocol would have, Martin Parry

and other researchers concluded in *Nature* that Kyoto would only reduce global surface temperatures by 0.06 Celsius by 2050. Coming to a nearly identical conclusion, U.S. Global Change Research Program researcher Tom Wigley estimated in *Geophysical Research Letters* that implementing the Kyoto Protocol would reduce global surface temperatures by 0.07 Celsius by 2050. The temperature differences within this room exceed such a minuscule amount.

WEALTH IS HEALTH

Despite these studies which increasingly suggest that precipitous action to combat global warming is unjustified, alarmists often trot out a concept known as the precautionary principle – which is that it is better to be safe than sorry. But they misunderstand or at least, misapply this concept. From all I have learned about the subject of global warming, I believe that the safest course is to reject the hypothetical claims of those who fear planetary doom is around the corner and are willing to doom the economy to avert it. The science of global warming is uncertain, the costs of capping our economy with carbon restriction are high, and even if the doomsayers were correct, it would do little to nothing to reduce the temperature increases.

But there's more to the story. Taking precipitous action will actually do more harm than good.

A 2003 study by Indur Goklany of the Department of Interior examined this question in some depth. In the study, which did not challenge the validity of global warming's existence and its consequences in its assumptions, Goklany examined the benefits and opportunity costs of taking action to mitigate global warming. In essence, the study examined whether humanity would be better off if we tried to avert or otherwise mitigate global warming or whether humanity would better off adapting to it.

What the study concluded was remarkable. Even if global warming were real, money spent to combat global warming would do comparatively little – as a percentage of the problem to reduce the afflictions of hunger, malaria, and water shortages versus if no action were taken at all. Yet it went farther – it then examined the benefits of diverting the money spent on global warming and using the monies to directly fight these afflictions through such activities as agricultural research and development and investments in treatment and prevention in combating malaria. The final results? Fewer people would go hungry, fewer would suffer from malaria, and fewer would lack access to adequate supplies of water if we simply adapted rather than attempted to combat global warming. And at far less cost, meaning those resources can be invested productively.

So, rationing our energy supply would make the world not safe, but sorry. And that's assuming global warming is happening. How much sorrier will we be if it isn't?

British Prime Minister Tony Blair's goal of serious investment in public health and infrastructure for energy and water, and delivering real progress on African development is in conflict with his aims on global warming. His Science Advisor, Sir David King, has stated that choices won't have to be made as to how to spend resources. But that flies in the face of basic economics. If resources are spent in one way, they are not available to be spent another. In short, even a wealthy future world will have constraints on the resources it can devote to disease and other problems. How much more will those constraints be in a poorer world.

The point is clear. Look at this next chart [chart 15]. Back in the earlier part of the last

century, when Asia was far poorer than it is today, deaths from climate events were far higher than now, when the region is wealthier. And let's look at the hurricanes from this hurricane season. Unfortunately, 100 Americans died during four naturally occurring hurricanes to hit land. But compare the fate of this wealthy country to that of Haiti, where in that small, terribly poor country 2,000 people died and 300,000 become homeless from a single hurricane – Hurricane Jeanne.

It's not simply common sense, its backed up by data. Capping carbon will cap the economy. As this chart shows, [chart 16] there is an incredibly strong relationship between a country's GDP growth rate and its carbon dioxide growth rate. Because carbon is synonymous with economic activity. While we can and should increase our energy efficiency because its good business, we must realize that we are tied to carbon.

As this next chart shows [chart 17], fossil fuel is the energy base of this country. And while some may claim we can simply and easily move to a non-carbon based society, they are not being honest. We have an enormous infrastructure reliant on fossil energy that will be with us for many, many decades to come. And for those few alternatives that could replace older units such as building wind-farms off Nantucket or building new dams or new nuclear plants, green activists bring efforts to a grinding halt. As the chart shows, technology will not quickly restructure our energy infrastructure.

SCIENCE BASED ON IDEOLOGY

Unfortunately, despite the many studies, facts and figures I have shared with you today demonstrating that the science does not support catastrophic global warming claims, well-designed, reproducible studies are not the driving force behind today's climate science debate. Rather, ideology is.

This point was made by Dr. Richard Lindzen in regards to his contributions to the preparation of the United Nations IPCC report. [chart 18] Lindzen stated:
" I personally witnessed coauthors forced to assert their 'green' credentials in defense of their statements."

But Lindzen's words are tame compared to those spoken earlier this year in Russia. At a press conference on global warming and the Kyoto Protocol, Russian Presidential Economic Advisor Andrei Illarionov made some comments about ideology that are nothing short of remarkable. Let me share with you what he says is driving the global warming debate. Illarionov stated: [chart 19]

> "There have been examples in our fairly recent history of how a considerable portion of Europe was flooded with the brown Nazi ideology, the red Commie ideology that caused severe casualties and consequences for Europe and the entire world. Now there is a big likelihood that a considerable part of Europe has been flooded with another type, another color of ideology – [and he is speaking of global warming here –– again, another type, another color of ideology] – but with very similar implications for European societies and human societies the world over."

He also said that imposition of the Kyoto Protocol: "would deal a powerful blow on the whole humanity similar to the one humanity experienced when Nazism and communism flourished."

And that was the chief economic advisor to Russian President Putin. The world has certainly

turned on its head that we Americans must look to Russians for speaking out strongly against irrational authoritarian ideologies. Putin's economic advisor's words are underscored by the conclusion of the Russian Academy of Science which this last May concluded that there is a high degree of uncertainty that global warming is caused by anthropogenic factors, that the Kyoto Protocol does not have a scientific basis and it would not be effective in achieving the IPCC's aims.

And while the Russia legislature may well indeed ratify the Kyoto Protocol, Illarionov has stated that it would occur for political considerations, not scientific or economic. Last May, it was reported that the European Union had promised to help Russia enter the World Trade Organization and would smooth over WTO requirements in exchange for signing the Kyoto Protocol. Additionally, there is speculation within Russia that the Kyoto Protocol will fail of its own weight since only two European countries will meet their carbon emission targets. So, clearly, Russia is playing politics with the issue for its purposes just as others have for their own.

That much of this debate is about world governance and instead of science is not news. [chart 20] At the Hague in November 2002, French President Jacques Chirac stated that Kyoto represents: "the first component of an authentic global governance."

Those are his words, not my characterization of his words.

CONCLUSION [21]

To summarize my remarks today, it makes no sense to take action on climate change when the costs are so profound and the benefits are non-existent.

Last year I spent two hours addressing the Senate about the state of science regarding the global warming debate. And today, I have spent another two hours providing the latest, most up-to-date information on the science about global warming – or more to the point – the lack of credible science supporting it.

I have been told many times that the science is irrelevant – that we have moved beyond the science, and that we must now concentrate on what to do to stop global warming from happening. I, for one, would hope that we never abandon the science. Those who are afraid of the newest and best science are usually the same people who are afraid that the more the public actually knows, the more it will interfere with their grand geopolitical plans to ration America's energy.

I believe we should be held accountable for the actions we take, and not bet the American economy on something unless it is firmly rooted in science, and our actions can have some beneficial effect. Global warming ideology has no place in policy debates regarding scientific issues. Credible, reproducible studies should be our gold standard – our minimum standard. By that standard, carbon restrictions fail the test.

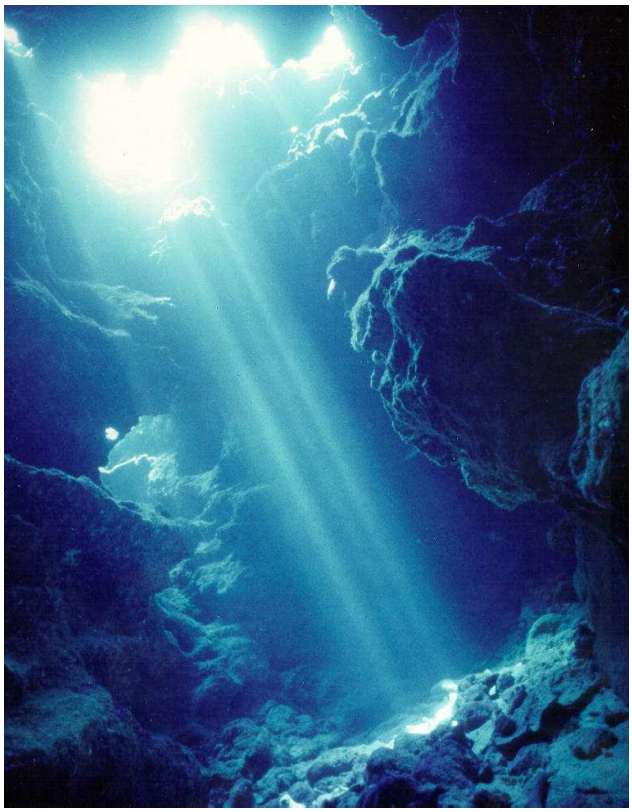
Unfortunately, we are in a political season and some legislators believe that they can score political points with this issue. Last year, when Democratic nominee for President was focusing on the liberal base in his primary, he criticized President George Bush on his campaign website for rejecting the global warming treaty, stating this:
"Dropping out of international implementation of the Kyoto Protocol was foolhardy then, and it is even more obviously foolhardy today."

But now that Democratic nominee is trying to be more main stream he has removed that statement from his website and replaced it with the statement that he and his running mate: "believe that the Kyoto Protocol is not the answer. The near-term emission reductions it would require of the United States are infeasible, while the long-term obligations imposed on all nations are too little to solve the problem."

Yet in the September 30th presidential debate he criticized President Bush when he said: "You don't help yourself with other nations when you turn away from the global warming treaty, for instance, or when you refuse to deal at length with the United Nations."

Now, I'm trying to figure out what he means by those these statements. And unless he's simply doing another of his all-too-familiar flip-flops, I can only conclude that while he does not believe the Kyoto Protocol is the answer, he would support it anyway. If I lived in the Midwest, I would find his shifting stances worrisome.

I have laid out my case today for why capping our economy with carbon restrictions is wrong-headed and rash. And I believe that the future health of our great nation and the world is too important to have an issue as vital as this one relegated to the status of a political football. My hope is that the legislators who have *moved beyond the science* will, once again, develop a healthy respect for what it has to say in guiding our actions.



The reef off Grand Cayman Island

Senator James M. Inhofe
Chairman
Senate Committee on Environment and Public Works
"An Update on the Science of Climate Change"
January 4, 2005

As I said on the Senate floor on July 28, 2003, "much of the debate over global warming is predicated on fear, rather than science." I called the threat of catastrophic global warming the "greatest hoax ever perpetrated on the American people," a statement that, to put it mildly, was not viewed kindly by environmental extremists and their elitist organizations. I also pointed out, in a lengthy committee report, that those same environmental extremists exploit the issue for fundraising purposes, raking in millions of dollars, even using federal taxpayer dollars to finance their campaigns.

For these groups, the issue of catastrophic global warming is not just a favored fundraising tool. In truth, it's more fundamental than that. Put simply, man-induced global warming is an article of religious faith. Therefore contending that its central tenets are flawed is, to them, heresy of the most despicable kind. Furthermore, scientists who challenge its tenets

are attacked, sometimes personally, for blindly ignoring the so-called "scientific consensus." But that's not all: because of their skeptical views, they are contemptuously dismissed for being "out of the mainstream." This is, it seems to me, highly ironic: aren't scientists supposed to be non-conforming and question consensus? Nevertheless, it's not hard to read between the lines: "skeptic" and "out of the mainstream" are thinly veiled code phrases, meaning anyone who doubts alarmist orthodoxy is, in short, a quack.

I have insisted all along that the climate change debate should be based on fundamental principles of science, not religion. Ultimately, I hope, it will be decided by hard facts and data—and by serious scientists committed to the principles of sound science. Instead of censoring skeptical viewpoints, as my alarmist friends favor, these scientists must be heard, and I will do my part to make sure that they are heard.

Since my detailed climate change speech in 2003, the so-called "skeptics" continue to speak out. What they are saying, and what they are showing, is devastating to the alarmists. They have amassed additional scientific evidence convincingly refuting the alarmists' most cherished assumptions and beliefs. New evidence has emerged that further undermines their conclusions, most notably those of the UN's Intergovernmental Panel on Climate Change—one of the major pillars of authority cited by extremists and climate alarmists.

This evidence has come to light in very interesting times. Just last month, the 10th Conference of the Parties (COP-10) to the Framework Convention on Climate Change convened in Buenos Aires to discuss Kyoto's implementation and measures to pursue beyond Kyoto. As some of my colleagues know, Kyoto goes into effect on February 16th. I think, with the exception of Russia, an exception that I will explain later, the nations that ratified Kyoto and agreed to submit to its mandates are making a very serious mistake.

In addition, last month, popular author Dr. Michael Crichton, who has questioned the wisdom of those who trumpet a "scientific consensus," released a new book called "State of Fear," which is premised on the global warming debate. I'm happy to report that Dr. Crichton's new book reached #3 on the New York *Times* bestseller list.

I highly recommend the book to all of my colleagues. Dr. Crichton, a medical doctor and scientist, very cleverly weaves a compelling presentation of the scientific facts of climate change—with ample footnotes and documentation throughout—into a gripping plot. From what I can gather, Dr. Crichton's book is designed to bring some sanity to the global warming debate. In the "Author's Message" at the end of the book, he refreshingly states what scientists have suspected for years: "We are also in the midst of a natural warming trend that began about 1850, as we emerged from a 400 year cold spell known as the Little Ice Age." Dr. Crichton states that, "Nobody knows how much of the present warming trend might be a natural phenomenon," and, "Nobody knows how much of the present trend might be man-made." And for those who see impending disaster in the coming century, Dr. Crichton urges calm: "I suspect that people of 2100 will be much richer than we are, consume more energy, have a smaller global population, and enjoy more wilderness than we have today. I don't think we have to worry about them."

For those who do worry, or induce such worry in others, "State of Fear" has a very simple message: stop worrying and stop spreading fear. Throughout the book, "fictional" environmental organizations are more focused on raising money, principally by scaring potential contributors with bogus scientific claims and predictions of a global apocalypse, than with "saving the environment." Here we have, as the saying goes, art imitating life.

As my colleagues will remember from a floor speech I gave last year, this is part and parcel of what these organizations peddle to the general public. Their fear mongering knows no bounds. Just consider the debate over mercury emissions. President Bush proposed the first-ever cap to reduce mercury emissions from power plants by 70 percent. True to form, these groups said he was allowing more mercury into the air. Go figure.

BUENOS AIRES

As I mentioned earlier, several nations, including the United States, met in Buenos Aires in December for the 10th round of international climate change negotiations. I'm happy to report that the U.S. delegation held firm both in its categorical rejection of Kyoto and the questionable science behind it. Paula Dobriansky, under secretary of state for global affairs, and the leader of the U.S. delegation, put it well when she told the conference, ''Science tells us that we cannot say with any certainty what constitutes a dangerous level of warming, and therefore what level must be avoided."

Ms. Dobriansky and her team also rebuffed attempts by the European Union to drag the U.S. into discussions concerning post-Kyoto climate change commitments. With the ink barely dry on Kyoto ratification, not to mention what the science of climate change is telling us, Ms. Dobriansky was right in dubbing post-2012 talks "premature."

It was clear from discussions in Buenos Aires that Kyoto supporters desperately want the U.S. to impose on itself mandatory greenhouse emission controls. Moreover, there was considerable discussion, but no apparent resolution, over how to address emissions from developing countries, such as India and especially China, which over the coming decades will be the world's leading emitter of greenhouse gases. But developing nations, most notably China, remained adamant in Buenos Aires in opposing *any* mandatory greenhouse gas reductions, now or in the future. Securing this commitment, remember, was a necessary component for U.S. ratification of Kyoto, as reflected in the Byrd-Hagel resolution, which the Senate passed 95 to 0. Without that commitment, Kyoto, at least in the U.S., is dead.

Kyoto goes into force on February 16th. According to the EU Environment Ministry, most EU member states won't meet their Kyoto targets. They may do so only on paper due to Russia's ratification of the treaty. Russia, of course, ratified Kyoto not because its government believes in catastrophic global warming—it doesn't—but because ratification was Russia's key to joining the World Trade Organization. Also, under Kyoto, Russia can profit from selling emissions credits to the EU and continue business as usual, without undertaking economically harmful emissions reductions.

As talks in Buenos Aires revealed, if alarmists can't get what they want at the negotiating table, they will try other means. I was told by reliable sources that some delegation members of the European Union subtly hinted that America's rejection of Kyoto could be grounds for a challenge under the WTO. I surely hope this was just a hypothetical suggestion and not something our European friends are actively and seriously considering. Such a move, I predict, would be devastating to US-EU relations, not to mention the WTO itself.

But I suspect it's not just hypothetical. The lawsuit is the stock in trade of environmental activists, and we are witnessing a new crop of global warming lawsuits now being leveled at individual U.S. companies and the U.S. itself.

In Buenos Aires, Earth Justice, a San Francisco-based environmental group, and the Center for International Law, announced plans to seek a ruling from the Inter-American Commission

on Human Rights that the U.S., because of its supposed contribution to global warming, is causing environmental degradation in the Arctic, and therefore violating the human rights of Alaska's Inuits, or Eskimos. As the New York *Times* wrote, "The commission, an investigative arm of the Organization of American States, has no enforcement powers. But a declaration that the United States has violated the Inuits' rights could create the foundation for an eventual lawsuit**,** either against the United States in an international court or against American companies in a U.S. court, said a number of legal experts, including some aligned with industry."

The *Times* didn't mention that such lawsuits already have been filed in the U.S. Eliot Spitzer, New York's state attorney general, along with 8 other state attorneys general, mainly from the Northeast, last year sued 5 coal-burning electric utilities in the Midwest. The reason? "Given that these are among the largest carbon dioxide polluters in the world," Mr. Spitzer wrote, "it is essential that the court direct them to reduce their emissions."

To me, this is a clear-cut sign of desperation by the alarmists, but I'm not surprised. President Bush has rejected Kyoto, the United States Senate rejected Kyoto 95 to 0, the United States Senate rejected the McCain-Lieberman bill 55 to 43, and there is little hope that Congress will pass mandatory greenhouse gas reductions, at least not in the near future. So resorting to the courts is their last, best hope.

I hope the courts have enough sense and moderation to reject these lawsuits out of hand. I am interested, for one, to see how Mr. Spitzer quantifies with scientific precision just how these particular companies have contributed to climate change. How is it, one might ask, that emissions, specifically from American Electric Power, are causing rising sea levels, droughts, and hurricanes?

NEW SCIENCE

Such efforts fly in the face of compelling new scientific evidence that makes a mockery of these lawsuits. By now, most everyone familiar with the climate change debate knows about the hockey stick graph, constructed by Dr. Michael Mann and colleagues, which shows that temperature in the Northern Hemisphere remained relatively stable over 900 years, then spiked upward in the 20th Century. The hockey-stick graph was featured prominently in the IPCC's *Third Assessment Report,* published in 2001. The conclusion inferred from the hockey stick is that industrialization, which spawned widespread use of fossil fuels, is causing the planet to warm. I spent considerable time examining this work in my 2003 speech. Because Mann effectively erased the well-known phenomena of the Medieval Warming Period—when, by the way, it was warmer than it is today—and the Little Ice Age, I didn't find it very credible. I find it even less credible now.

But don't take my word for it. Just ask Dr. Hans von Storch, a noted German climate researcher, who, along with colleagues, published a devastating finding in the Sept. 30, 2004 issue of the journal *Science*. As the authors wrote: *"We were able to show in a publication in Science that this [hockey stick] graph contains assumptions that are not permissible.* ***Methodologically it is wrong: Rubbish****."*

Dr. von Storch and colleagues discovered that the Mann hockey stick had severely underestimated past climate variability. In a commentary on Dr. von Storch's paper, T. J. Osborn and K. R. Briffa, prominent paleo-climatologists from the University of East Anglia, stressed the importance of the findings. As they wrote, "*The message of the study by von Storch et al. is that existing reconstructions of the NH [northern hemisphere] temperature of*

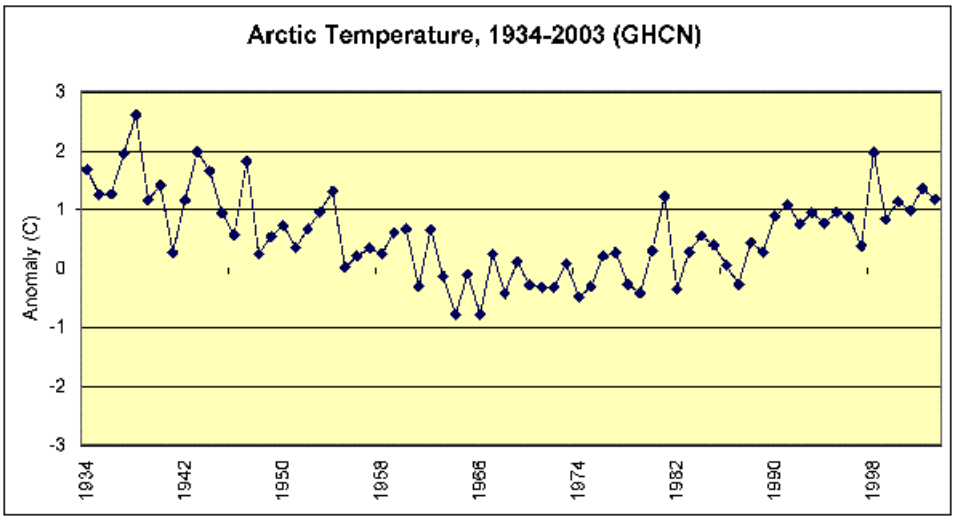
recent centuries may systematically underestimate the true centennial variability of climate" and, "If the true natural variability of NH [northern hemisphere] temperature is indeed greater than is currently accepted, the extent to which recent warming can be viewed as 'unusual' would need to be reassessed." In other words, in obliterating the Medieval Warming Period and the Little Ice Age, Mann's hockey stick just doesn't pass muster.

Dr. von Storch is one of many critics of Michael Mann's hockey stick. To recount just one example, three geophysicists from the University of Utah, in the April 7, 2004 edition of *Geophysical Research Letters*, concluded that Mann's methods used to create his temperature reconstruction were deeply flawed. In fact, their judgment is harsher than that. As they wrote, Mann's results are "based on using end points in computing changes in an oscillating series" and are **" *just bad science*."** I repeat: "***just bad science***."

ARCTIC CLIMATE ASSESSMENT

These findings come alongside a spate of new reports that, at least in the eyes of the media, supposedly confirm the "consensus" on global warming. "The Arctic Climate Impact Assessment," released last fall, perfectly fits that mold. "Arctic Perils Seen in Warming," blared a headline in the New York *Times*. As the *Times* wrote, "The findings support the broad but politically controversial scientific consensus that global warming is caused mainly by rising atmospheric concentrations of heat-trapping greenhouse gases, and that the Arctic is the first region to feel its effects."

What do we really know about temperatures in the Arctic? Let's take a closer look. As Oregon State University climatologist George Taylor has shown, ***Arctic temperatures are actually slightly cooler today than they were in the 1930s.*** **[**Chart #1]



As Dr. Taylor has explained, it's all relative—in other words, it depends on the specific time period chosen in making temperature comparisons. "The [Arctic Climate Impact Assessment]," Dr. Taylor wrote, "appears to be guilty of selective use of data. Many of the trends described in the document begin in the 1960s or 1970s—cool decades in much of the world—and end in the warmer 1990s or early 2000s. So, for example, temperatures have warmed in the last 40 years, and the implication, 'if present trends continue,' is that massive warming will occur in the next century."

Dr. Taylor concluded: "Yet data are readily available for the 1930s and early 1940s, when temperatures were comparable to (and probably higher than) those observed today. Why not start the trend there? Because there is no net warming over the last 65 years?"

This is pretty convincing stuff. But, one might say, this is only one scientist, while nearly 300 scientists from several countries, including the United States, signed onto the Arctic report. Mr. President, I want to submit for the record a list of scientists, compiled by the Center for Science and Public Policy, from several countries, including the United States, whose published work shows current Arctic temperature is no higher than temperatures in the 1930s and 1940s. For example, according to a group of 7 scientists in a 2003 issue of the *Journal of Climate*: "***In contrast to the global and hemispheric temperature, the maritime Arctic temperature was higher in the late 1930s through the early 1940s than in the 1990s***." Or how about this excerpt from the 2000 *International Journal of Climatology*, by Dr. Rajmund Przybylak, of Nicholas Copernicus University, in Torun, Poland: "***The highest temperatures since the beginning of instrumental observation occurred clearly in the 1930s and can be attributed to changes in atmospheric circulation***."

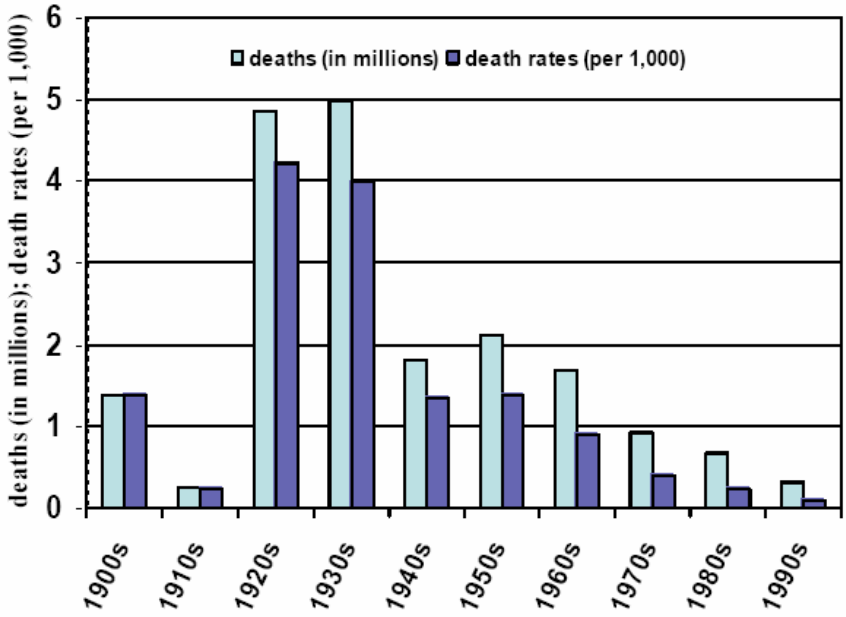
THE TSUNAMI AND GLOBAL WARMING

Despite this evidence, alarmism is alive and well. [Chart #2] As you can see behind me, the Washington *Post* today ran an editorial cartoon that actually blames the Sumatra tsunami on global warming.

Are we to believe now that global warming is causing earthquakes? The tsunami, of course, was caused by an earthquake off Sumatra's coast, deep beneath the sea floor, completely disconnected from whatever the climate was doing at the surface. Regrettably, the tsunami-

warming connection is yet another facet of the "State of Fear" alarmists have concocted. As Terence Corcoran of Canada's *Financial Post* wrote, "The urge to capitalize on the horror in Asia is just too great for some to resist if it might help their cause…Green Web sites are already filling up with references to tsunami risks associated with global warming."

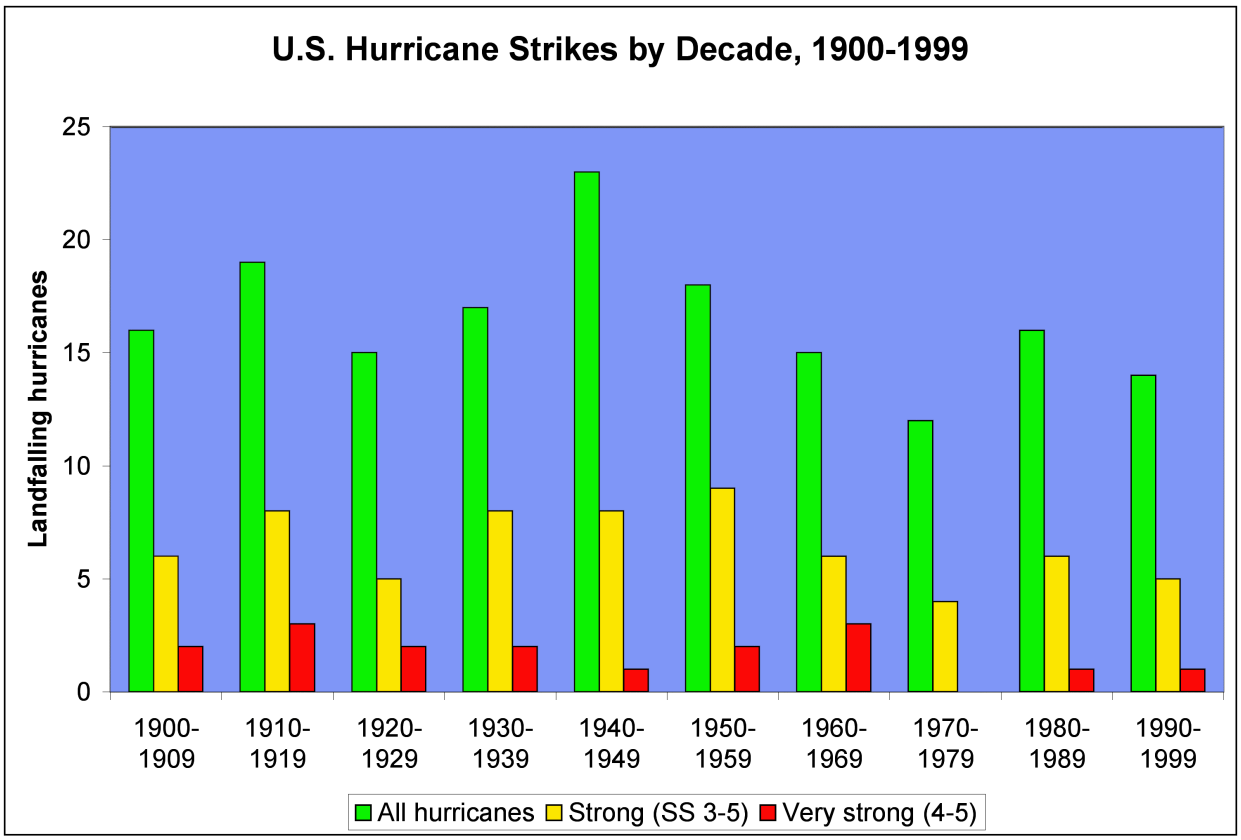
To address this, let's ask some simple questions: Is global warming causing more extreme weather events of greater intensity, and is it causing sea levels to rise? The answer to both is an emphatic 'no'.
[Chart #3] Just look at this chart behind me. It's titled "Climate Related Disasters in Asia: 1900 to 1990s."



Source: Asian Disaster Reduction Center (2000); McEvedy & Jones (1978); FAOSTAT (2002)

What does it show? It shows the number of such disasters in Asia, and the deaths attributed to them, declining fairly sharply over the last 30 years.

Or let's take hurricanes. Alarmists linked last year's hurricanes that devastated parts of Florida to global warming. Nonsense. Credible meteorologists quickly dismissed such claims. Hugh Willoughby, senior scientist at the International Hurricane Research Center of Florida International University stated plainly: "This isn't a global-warming sort of thing.... It's a natural cycle." A team led by the National Oceanic and Atmospheric Administration's (NOAA) Dr. Christopher Landsea concluded that the relationship of global temperatures to the number of intense land-falling hurricanes is either non-existent or very weak. In this chart [chart #4], you can see that the overall number of hurricanes and the number of the strongest hurricanes fluctuated greatly during the last century, with a great number in the 1940s.



In fact, through the last decade, the intensity of these storms has declined somewhat.

What about sea level rise? Alarmists have claimed for years that sea level, because of anthropogenic warming, is rising, with ominous consequences. Based on modeling, the IPCC estimates that sea level will rise 1.8 millimeters annually, or about one-fourteenth of an inch.

[Chart #5]

> **"There is a total absence of any recent 'acceleration in sea level rise' as often claimed by IPCC and related groups."**
>
> **-2004 Global and Planetary Change,**
> **Dr. Nils-Axel Morner of Sweden**

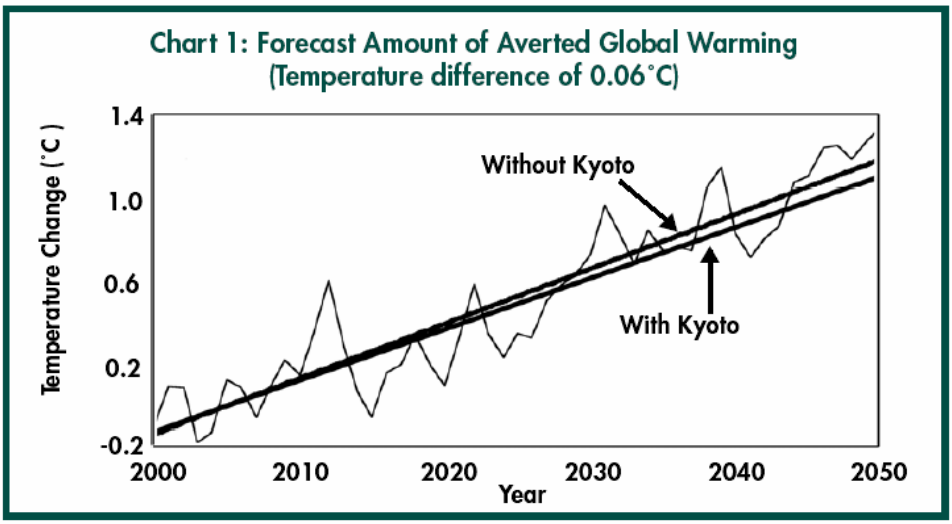
But in a study published this year in *Global and Planetary Change*, Dr. Nils-Axel Morner of Sweden found that sea level rise hysteria is overblown.

In his study, which relied not only on observational records, but also on satellites, he concluded: "There is a total absence of any recent 'acceleration in sea level rise' as often claimed by IPCC and related groups." Yet we still hear of a future world overwhelmed by floods due to global warming. Such claims are completely out of touch with science. As Sweden's Morner puts it, "there is no fear of massive future flooding as claimed in most

global warming scenarios."

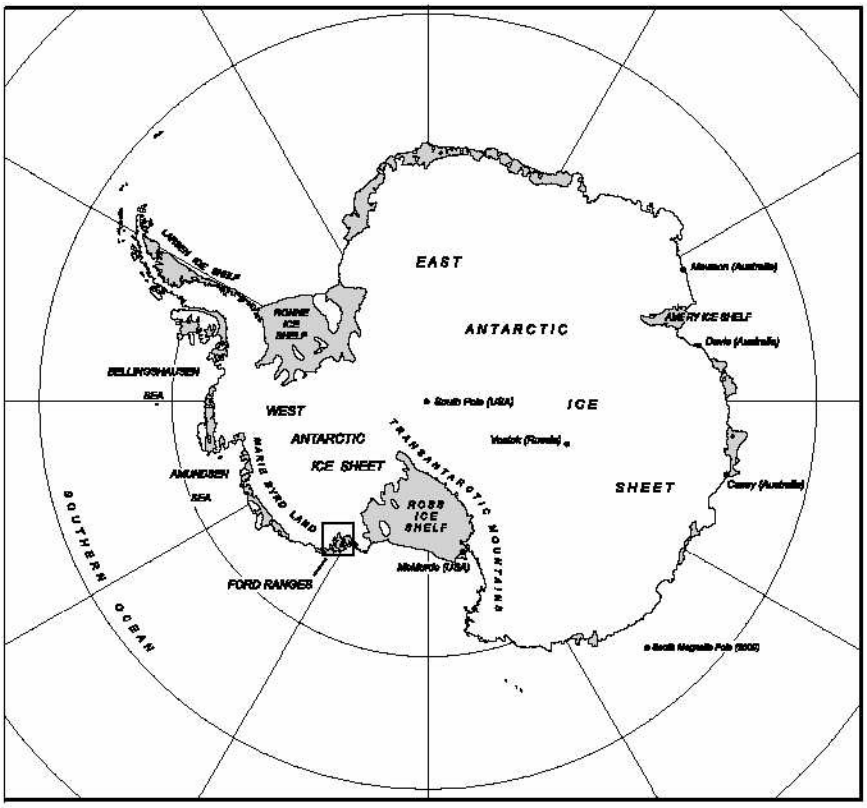
CONCLUSION

What I have outlined today won't appear in the New York *Times*. Instead you'll read much about "consensus" and Kyoto and hand wringing by its editorial writers that unrestricted carbon dioxide emissions from the United States are harming the planet. You'll read nothing, of course, about how Kyoto-like policies harm Americans, especially the poor and minorities, causing higher energy prices, reduced economic growth, and fewer jobs. After all, that is the real purpose behind Kyoto, as Margot Wallstrom, the EU's environment minister, said in a revealing moment of candor. To her, Kyoto is about "leveling the playing field" for businesses worldwide—in other words, we can't compete, so let's use a feel-good treaty, based on shoddy science, fear, and alarmism, and which will have no perceptible impact on the environment (Chart #6), to restrict America's economic growth and prosperity.



Unfortunately for Ms. Wallstrom and Kyoto's staunchest advocates, America was wise to the scheme, and it has rejected Kyoto and similar policies convincingly. Whatever Kyoto is about—to some, such as French President Jacques Chirac, it's about forming "an authentic global governance"—it's the wrong policy and it won't work, as many participants in Buenos Aires grudgingly conceded.

Despite the bias, omissions, and distortions by the media and extremist groups, the real story about global warming *is* being told, and, judging by the welcome success of Michael Crichton's "State of Fear," it's now being told to the American public.



The Antarctic

Senator James M. Inhofe
Chairman
Senate Committee on Environment and Public Works

First "Four Pillars" on Global Warming Speech

April 7, 2005

As I noted in my last speech, there is a perception, especially among media and environmental elites, that the scientific community has reached a "consensus" on global warming. As Sir David King, the chief science adviser to the British government, recently said, "There is a very clear consensus from the scientific community on the problems of global warming and our use of fossil fuels."

Those "problems" amount to rising sea levels, floods, tsunamis, droughts, hurricanes, disease, and mass extinction of species, all caused by ever-increasing greenhouse gas emissions. The alarmists confidently assert that "most scientists" agree with this. And they vehemently dispute claims of uncertainty about whether these catastrophes will occur.

Therefore questioning the science of catastrophic global warming is considered illegitimate. Consider Dr. Naomi Oreskes, who wrote in the Washington Post last December: "We need to

stop repeating nonsense about the uncertainty of global warming and start talking seriously about the right approach to address it." Global warming, then, is no longer an issue for scientific debate. It appears to have soared into the realm of metaphysics, reaching the status of revealed truth.

Although more than 17,000 scientists have signed the Oregon Petition, stating that fears of catastrophic global warming are groundless, these and other scientists who do not subscribe to the so-called consensus are condemned as "skeptics" and tools of industry. In order to avoid professional excommunication, one must subscribe to the four principal beliefs underlying the alarmist consensus. These are the Four Pillars of Climate Alarmism, all of which, it is said, provide unequivocal support for the consensus view.

The Four Pillars are as follows: 1) the 2001 National Academy of Sciences NAS report summarizing the latest science of climate change, requested by the Bush Administration; 2) the scientific work of the United Nations Intergovernmental Panel on Climate Change, most especially its Third Assessment Report, released in 2001; 3) the recent report of the international Arctic Climate Impact Assessment; and 4) the data produced by climate models.

I will show over the next several weeks that none of these pillars support the consensus view. Today I will begin my Four Pillars series with the NAS.

KYOTO

Before I delve into the NAS report, some historical context is in order. Back in early 2001, the Kyoto treaty was on the verge of collapse. President Bush announced his rejection of Kyoto, calling it "fatally flawed in fundamental ways." Our friends in Europe expressed outrage, even shock, though it was never in doubt where the U.S. stood.

In 1997, the U.S. Senate voted 95 to 0 in favor of the Byrd-Hagel resolution, which required that any international climate change treaty that excluded developing countries such as China, India, and Mexico from mandatory greenhouse gas commitments or that caused significant harm to the American economy was unacceptable. Kyoto easily failed on both counts. It still does today. On June 11, 2001, President Bush delivered a speech detailing Kyoto's flaws. He also provided an overview of the current state of climate science, as described in a report, which he requested, by the National Academy of Sciences. Though the report offered very modest conclusions about the state of climate science, alarmists repeatedly invoke it as ironclad proof of their consensus. So let's take a closer look at what the NAS had to say. THE 2001 NAS REPORT The NAS report was wide-ranging and generally informative about the state of climate science. It stated that, "Because there is considerable uncertainty in current understanding of how the climate system varies naturally and reacts to emissions of greenhouse gases and aerosols, current estimates of the magnitude of future warming should be regarded as tentative and subject to future adjustments (either upward or downward)." Let me repeat that: "Considerable uncertainty in current understanding." "Estimates should be regarded as tentative and subject to future adjustments." Does this sound like solid support for the consensus view? Surely there must be more. Well, in fact there is. Under the headline "The Effect of Human Activities," the NAS addressed the potential impact of anthropogenic emissions on the climate system. Here's what it said: "Because of the large and still uncertain level of natural variability inherent in the climate record and the uncertainties in the time histories of various forcing agents (and particularly aerosols), a causal linkage between the buildup of greenhouse gases in the atmosphere and the observed climate changes in the 20th century cannot be unequivocally established."

Again, that's worth repeating: "Because of the large and still uncertain level of natural variability." "Uncertainties in the time histories of various forcing agents." "Cannot be unequivocally established." I read numerous press accounts of the NAS report, yet I failed to come across reporting of this quote. Is this what the consensus peddlers have in mind when they assert that everything is "settled"?

The NAS also addressed the relationship between climate change and aerosols, which are particles from processes such as dust storms, forest fires, the use of fossil fuels, and volcanic eruptions. To be sure, there is limited knowledge of how aerosols influence the climate system. This, said the NAS, represents "a large source of uncertainty about future climate change." By any conceivable standard, this and other statements made by NAS cannot possibly be considered unequivocal affirmations that man-made global warming is a threat, or that man-made emissions are the sole or most important factor driving climate change. It certainly cannot provide the basis for the United States Congress to adopt economically harmful reductions of greenhouse gas emissions. CLIMATE MODELS It would be a grand folly to do that, especially considering what the NAS had to say about global climate models. The NAS believes much of the uncertainty about climate change stems from those models, which researchers rely on to make projections about future climate changes. These models, as the NAS wrote, contain serious technological limitations that cast doubt on their ability to simulate the climate system: "[the models] simulation skill is limited by uncertainties in their formulation, the limited size of their calculations, and the difficulty of interpreting their answers that exhibit as much complexity as in nature." Model projections, as the NAS pointed out, rest on a raft of uncertain assumptions. "Projecting future climate change first requires projecting the fossil-fuel and land-use sources of CO2 and other gases and aerosols," the NAS found. "However, there are large uncertainties"—please note the phrasing again, "large uncertainties"—"in underlying assumption about population growth, economic development, life style choices, technological change and energy alternatives, so that it is useful to examine scenarios developed from multiple perspectives in considering strategies for dealing with climate change." For this reason, simulations produced by climate models provide insufficient proof of an absolute link between anthropogenic emissions and global warming. "The fact that the magnitude of the observed warming is large in comparison to natural variability as simulated in climate models is suggestive of such a linkage," according to NAS, "but it does not constitute proof of one because the model simulations could be deficient in natural variability on the decadal to century time scale."

That last point demands further elaboration and emphasis. The NAS thinks climate models could be off by as much as a decade, or perhaps 100 years. Why is this important? Global climate models constitute one of the Four Pillars. Alarmists frequently point to computer-generated simulations showing dramatic, even scary, pictures of what might happen decades from now: more floods, more hurricanes, more droughts, the Gulf Stream shutting down. In many cases, the media eagerly report what these models produce as pure fact, with little or no explanation of their considerable limitations. THE IPCC THIRD ASSESSMENT The NAS also addressed the work of the UN's Intergovernmental Panel on Climate Change, another of the Four Pillars. The IPCC's 2001 Third Assessment Report, particularly its Summary for Policymakers, is frequently cited as proof of the consensus view. But the NAS disagrees. "The IPCC Summary for Policymakers," the NAS wrote, "could give an impression that the science of global warming is settled, even though many uncertainties still remain." Here again, the NAS is saying the science is not settled. The NAS also addressed the IPCC's future climate scenarios. These scenarios are the basis for the IPCC's projection that temperatures could increase to between 2.7 to 10.4 degrees Fahrenheit by 2100. The NAS said: "The IPCC scenarios cover a broad range of assumptions about future economic and technological development, including some that allow greenhouse gas emission reductions. However, there are large uncertainties in underlying assumptions about population growth, life style choices,

technological change, and energy alternatives." Once again, the NAS says "there are large uncertainties in underlying assumptions." The same is true, the NAS said, about future projections of CO2 emissions. As the NAS stated, "Scenarios for future greenhouse gas amounts, especially for CO2 and CH4, are a major source of uncertainty for projections of future climate." To bolster the point, the NAS found that actual CO2 emissions contradicted the IPCC, stating that, "the increase of global fossil fuel CO2 emissions in the past decade, averaging 0.6% per year, has fallen below the IPCC scenarios." There are those troublesome words again: "Large uncertainties in underlying assumptions." "Major source of uncertainty." The NAS also expressed clear reservations about the relationship between carbon dioxide emissions and how they interact with land and the atmosphere. "How much of the carbon from future use of fossil fuels will be seen as increases in carbon dioxide in the atmosphere will depend on what fractions are taken up by land and by the oceans," NAS wrote. "The exchanges with land occur on various time scales, out to centuries for soil decomposition in high latitudes, and they are sensitive to climate change. Their projection into the future is highly problematic." Let me offer one final quote from the study before I turn to the media. Taking stock of the many scientific uncertainties highlighted in the report, the NAS issued explicit advice to guide climate research—advice, by the way, that alarmists reject: "The most valuable contribution U.S. scientists can make is to continually question basic assumptions and conclusions, promote clear and careful appraisal and presentation of the uncertainties about climate change as well as those areas in which science is leading to robust conclusions, and work toward a significant improvement in the ability to project the future." THE MEDIA AND THE NAS REPORT It's not surprising that the media distorted and exaggerated the NAS report. The public was told that the NAS categorically accepted that carbon dioxide emissions were the overwhelming factor causing global warming, and that urgent action was needed. One factually challenged CNN reporter said the NAS study represented "a unanimous decision that global warming is real, is getting worse, and is due to man. There is no wiggle room." The New York Times opined that the report reaffirmed "the threat of global warming, declaring fearlessly that human activity is largely responsible for it." Of course, as the preceding quotes from the report show, this is not true. Unfortunately, the media wasn't burdened with any actual knowledge of the report. Rather, it seized on a sentence fragment from the report's summary, and then jumped to conclusions that, to be charitable, cannot be squared with the full report. That fragment from the summary reads as follows: "Temperatures are, in fact, rising. The changes observed over the last several decades are likely mostly due to human activities…" There's the smoking gun, we were told then and even now, proving a global warming consensus.

However, the second part of the sentence, along with much else in the report, was simply ignored: "we cannot rule out that some significant part of these changes is also a reflection of natural variability."

And as we have seen, it is amazing how one could conclude that the NAS "left no wiggle room" that "global warming is due to man." Dr. Richard Lindzen, a professor of meteorology at MIT, and a member of the NAS panel that produced the report, expressed his astonishment in an editorial in the Wall Street Journal on June 11, 2001. Dr. Lindzen wrote that the NAS report showed "there is no consensus, unanimous or otherwise, about long-term climate trends and what causes them." Yet to this day, the media continues to report exactly the opposite.

It is not surprising that alarmists want to fabricate the perception that there is consensus about climate change. We know the costs of this would be enormous. Wharton Econometrics Forecasting Associates estimates that the costs of implementing Kyoto would cost an American family of four $2,700 annually. Acknowledging a full-fledged debate over global warming would undermine their agenda. And what is that agenda. Two international leaders

have said it best. Margot Wallstrom, the EU's Environment Commisioner states that Kyoto is "about leveling the playing field for big businesses worldwide." French President Jacques Chirac said during a speech at the Hague in November 2000 that represents "the first component of authentic global governance."

CONCLUSION

As I noted earlier, raising uncertainties or questioning basic assertions about global warming is considered "nonsense." I wonder if the same applies to the NAS. For on just about every page of the 2001 report, the NAS did exactly that.

But for the alarmists, global warming has nothing to do with science or scientific inquiry. Science is not about the inquiry to discover truth, but a mask to achieve an ideological agenda. For some, this issue has become a secular religion, pure and simple.

Dr. Richard Lindzen has written eloquently and powerfully on this point, so I will end with his words: "Science, in the public arena, is commonly used as a source of authority with which to bludgeon political opponents and propagandize uninformed citizens. This is what has been done with both the reports of the IPCC and the NAS. It is a reprehensible practice that corrodes our ability to make rational decisions. A fairer view of the science will show that there is still a vast amount of uncertainty—far more than advocates of Kyoto would like to acknowledge—and that the NAS report has hardly ended the debate. Nor was it meant to."

Kanaga Volcano in Alaska

Senator James M. Inhofe
Chairman
Senate Committee on Environment and Public Works

Second "Four Pillars" on Global Warming Speech

April 13, 2005

Today I would like to continue my series of speeches examining the Four Pillars of Climate Alarmism. Last week, I showed that the first pillar, the 2001 climate change report by the National Academy of Sciences, is nothing but hot air. The same is true of the 2001 report by the Intergovernmental Panel on Climate Change. It supposedly provides irrefutable evidence of the global warming "consensus." Put simply, it does not, as my speech today will demonstrate.

The media greeted the release of the IPCC's Third Assessment Report with predictable hysteria. "In a report published today by the United Nations Intergovernmental Panel on Climate Change (IPCC)," blared the Independent newspaper of London, "hundreds of the

world's leading scientists give their unqualified support to the view that global warming is real and that the release of man-made greenhouse gases is largely responsible." Moreover, the Independent reported, "The latest three-volume report, amounting to 2,600 pages of detailed analysis, leaves the reader in little doubt that the scientific uncertainties of the previous decade are being resolved in favor of an emerging, and increasingly pessimistic consensus."

The preceding quotes, and many that followed in the Independent's report, came from the Third Assessment's "Summary for Policymakers." In fact, the media based much, if not all, of its reporting on the summary itself. It did this even though, in some respects, the Summary distorted the actual contents of the full report. The National Academy of Sciences, in its 2001 report, criticized both how the Summary was written and how the media portrayed it."The IPCC Summary for Policymakers," the NAS wrote, "could give an impression that the science of global warming is settled, even though many uncertainties still remain." This clearly contradicts the claim that, in the Independent's words, there is "little doubt that the scientific uncertainties of the previous decade" are settled.

Another claim the media featured prominently was that temperature increases over the last century are unprecedented, at least when considered on a time-scale of the last 1,000 years. According to the IPCC, the 1990s were the warmest decade on record, and 1998 was the warmest year since temperature records began in 1861. The basis for this claim is the so-called hockey stick graph, which has become the iconic symbol of global warming alarmism.

The graph was constructed by Dr. Michael Mann of the University of Virginia and his colleagues using a combination of proxy data and modern temperature records. The hockey stick curve showed a gradual cooling beginning around 1400 AD (which is the hockey stick handle) then a sharp warming starting about 1900 (the hockey stick blade). Its release was revolutionary, overturning widespread evidence adduced over many years confirming significant natural variability long before the advent of SUVs. The IPCC was so impressed that the hockey stick was featured prominently in its Third Assessment Report in 2001.

As Dr. Roy Spencer, the principal research scientist at the University of Alabama, noted, "This was taken as proof that the major climatic event of the last 1,000 years was the influence of humans in the 20th century." One of its authors, Dr. Michael Mann, confidently declared in 2003 that the hockey stick "is the indisputable consensus of the community of scientists actively involved in the research of climate variability and its causes."

The hockey stick caused quite a stir, not just in the scientific community, but also in the world of politics. It galvanized alarmists in their push for Kyoto. It is supposedly ironclad proof that man-made greenhouse gas emissions are warming the planet to an unsustainable degree.

But here again, one of the essential pillars of alarmism appears to be crumbling. Two Canadian researchers have produced the most devastating evidence to date that the hockey stick is bad science. Before I describe their work, I want to make a prediction: the alarmists will cry foul, saying this critique is part of an industry-funded conspiracy. And true to form, they will avoid discussion of substance and engage in personal attacks. That's because one of the researchers, Stephen McIntyre, is a mineral exploration consultant. Dr. Mann already has accused them of having a conflict of interest. This is nonsense. First, Stephen McIntyre and his colleague Ross McKitrick, an economist with Canada's University of Guelph, received no outside funding for their work. Second, they published their peer-reviewed critique in Geophysical Research Letters. This is no organ of Big Oil, but an eminent scientific journal, the same journal, in fact, which published the version of Dr. Mann's hockey stick that appeared in the IPCC's Third Assessment Report. Apparently the journal's editors didn't see

much evidence of bias. The remarks of one editor are worth quoting in full: "S. McIntyre and R. McKitrick have written a remarkable paper on a subject of great importance. What makes the paper significant is that they show that one of the most widely known results of climate analysis, the 'hockey stick' diagram of Mann. et. al., was based on a mistake in the application of a mathematical technique known as principal component analysis." Further, he said, "I have looked carefully at the McIntyre and McKitrick analysis, and I am convinced that their work is correct."

What did McKitrick and McIntyre find? In essence, they discovered that Dr. Mann misused an established statistical method called principal components analysis (PCA). As they explained, Mann created a program that "effectively mines a data set for hockey stick patterns." In other words, no matter what kind of data one uses, even if it is random and totally meaningless, the Mann method always produces a hockey stick. After conducting some 10,000 data simulations, the result was nearly always the same. "In over 99 percent of cases," McIntyre and McKitrick wrote, "it produced a hockey stick shaped PCI series." Statistician Francis Zwiers of Environment Canada, a government agency, says he agrees that Dr. Mann's statistical method "preferentially produces hockey sticks when there are none in the data." Even to a non-statistician, this looks extremely troubling. But that statistical error is just the beginning. On a public web site where Dr. Mann filed data, McIntyre and McKitrick discovered an intriguing folder titled "BACKTO_1400-CENSORED." What McIntyre and McKitrick found in the folder was disturbing: Mann's hockey stick blade was based on a certain type of tree—a bristlecone pine—that, in effect, helped to manufacture the hockey stick.

Remember, the hockey stick shows a relatively stable climate over 900 years, and then a dramatic spike in temperature about 1900, the inference being that man-made emissions are the cause of rising temperatures. So why is the bristlecone pine important? That bristlecone experienced a growth pulse in the Western United States in the late 19th and early 20th centuries. However, this growth pulse, as the specialist literature has confirmed, was not attributed to temperature. So using those pines, and only those pines, as a proxy for temperature during this period is questionable at best. Even Mann's co-author has stated that the bristlecone growth pulse is a "mystery." Because of these obvious problems, McIntyre and McKitrick appropriately excluded the bristlecone data from their calculations. What did they find? Not the Mann hockey stick, to be sure, but a confirmation of the Medieval Warm Period, which Mann's work had erased. As the CENSORED folder revealed, Mann and his colleagues never reported results obtained from calculations that excluded the bristlecone data. This appears to be a case of selectively using data—that is, if you don't like the result, remove the offending data until you get the answer you want. As McIntyre and McKitrick explained, "Imagine the irony of this discovery…Mann accused us of selectively deleting North American proxy series. Now it appeared that he had results that were exactly the same as ours, stuffed away in a folder labeled CENSORED."

McIntyre and McKitrick believe there are additional errors in the Mann hockey stick. To confirm their suspicion, they need additional data from Dr. Mann, including the computer code he used to generate the graph. But Dr. Mann refuses to supply it. As he told the Wall Street Journal, "Giving them the algorithm would be giving in to the intimidation tactics that these people are engaged in."

Just a second: Who are "these people"? And what "intimidation tactics"? Mr. McIntyre and Mr. McKitrick are trying to find the truth. What is Dr. Mann trying to hide? For many scientists, McIntyre and McKitrick's work is earth-shattering. For example, Professor Richard Muller of the University of California at Berkeley recently wrote in the MIT Technology Review that McIntyre and McKitrick's findings "hit me like a bombshell, and I suspect it is having the same effect on many others. Suddenly the hockey stick, the poster-child of the global

warming community, turns out to be an artifact of poor mathematics." Dr. Rob van Dorland, of the Royal Netherlands Meteorological Institute, and an IPCC lead author, said, "The IPCC made a mistake by only including Mann's reconstruction and not those of other researchers." He concluded that unless the error is corrected, it will "seriously damage the work of the IPCC."

Or consider Dr. Hans von Storch, an IPCC contributing author and internationally renowned expert in climate statistics at Germany's Center for Coastal Research, who said McIntyre and McKitrick's work is "entirely valid." In an interview last October with the German Newspaper Der Spiegel, Dr. von Storch said the Mann hockey stick "contains assumptions that are not permissible. Methodologically it is wrong: rubbish." He stressed that, "it remains important for science to point out the erroneous nature of the Mann curve. In recent years it has been elevated to the status truth by the UN appointed science body, the Intergovernmental Panel on Climate Change (IPCC). This handicapped all that research which strives to make a realistic distinction between human influences and climate and natural variability."

If McIntyre and McKitrick's work isn't convincing enough, consider the recent paper published in the Feb. 10 issue of Nature. The paper, authored by a group of Swedish climate researchers, once again undercuts the scientific credibility of the Mann hockey stick. The press release for the study by the Swedish Research Council says, "A new study of climate in the Northern Hemisphere for the past 2000 years shows that natural climate change may be larger than generally thought."

According to the paper's authors, the Mann hockey stick does not provide an accurate picture of the last 1,000 years. "The new results," they wrote, "show an appreciable temperature swing between the 12th and 20th centuries, with a notable cold period around AD 1600. A large part of the 20th century had approximately the same temperature as the 11th and 12th centuries."

In other words, here's evidence of the Medieval Warm Period and the Little Ice Age, demonstrating that climate, long before the burning of fossil fuels, varied considerably over the last 2,000 years. The researchers note that changes in the sun's output and volcanic eruptions appear to have caused considerable natural variations in the climate system. "The fact that these two climate evolutions," they contend, "which have been obtained completely independently of each other, are very similar supports the case that climate shows an appreciable natural variability—and that changes in the sun's output and volcanic eruptions on the earth may be the cause."

ECONOMICS AND THE IPCC

Another important development chipping away at the so-called scientific consensus has to do with economics and statistics, and how both are used by the IPCC.

To determine how man-made greenhouse gases might affect the climate over the next century, the IPCC had to predict 100 years' worth of greenhouse gas emissions. Predicting emissions rates depends on several factors, including population growth, technological advances, and future economic growth rates in developed and developing countries. Based on these and other factors, the IPCC's Third Assessment Report projected an average global temperature increase by 2100 ranging between 1.4 to 5.8 degrees Celsius (that's about 2.7 to 10.4 degrees Fahrenheit).

This temperature range was determined from several different emissions scenarios. In each of those scenarios, the IPCC arbitrarily assumed that incomes in poor countries and rich countries would converge by 2100. According to Warren McKibbin of Australia National

University's Center for Applied Macroeconomics and the Brookings Institution, this assumption is unwarranted. Even if it were to happen, McKibbin and his colleagues write, "the empirical literature suggests that the rate of convergence in income per capita would be very slow." Even the IPCC agrees: "It may well take a century (given all other factors set favorably) for a poor country to catch up to [income] levels that prevail in the industrial countries today, never mind the levels that might prevail in affluent countries 100 years in the future."

Nevertheless, the IPCC assumed poor and rich countries would achieve parity by the end of the century. To measure that growth over time, the IPCC had to compare what income levels look like today. It did that by using market exchange rates. But this raises a major problem: Relying on exchange rates fails to account for price differences between countries. This has the effect of vastly overstating differences in wealth. "This comparison is invalid," said Ian Castles, formerly head of Australia's National Office of Statistics, now with the National Center for Development Studies at Australian National University.

Castles, along with his colleague David Henderson, former chief economist with the Organisation for Economic Co-operation and Development, now of the Westminster Business School, discovered the IPCC's error last year, and have published their findings in the distinguished scientific journal Energy and Environment. Castles and Henderson note that using exchange rates is invalid because it is based on the assumption that "[a] poor Bangladeshi family has converted the whole of its income into foreign currency, and spent it on goods and services at average world prices rather than [at much lower] Bangladeshi prices."

Through the use of exchange rates, the IPCC concluded that average income of rich countries right now is 40 times higher than the average income in developing countries in Asia, and 12 times higher than the average income in other non-Asian developing countries.

As you can see, there's a huge gap here, which raises a significant point: if the initial income gap is large, then poor countries will have to grow incredibly fast to catch up. And according to the IPCC, the greater the economic growth, the greater the emissions released into the atmosphere, and hence higher temperatures. But the IPCC, as the Economist magazine wrote, is simply wrong. "The developing-country growth rates yielded by this method [market exchange rates] are historically implausible, to put it mildly. The emissions forecasts based on those implausibly high growth rates are accordingly unsound."

Castles and Henderson have shown convincingly that the IPCC's temperature range rests on a major economic error, and therefore is wildly off the mark. Because of this error, even the IPCC's low-end emissions scenario is implausible. As the Economist wrote, "But, as we pointed out before, even the scenarios that give the lowest cumulative emissions assume that incomes in the developing countries will increase at a much faster rate over the course of the century than they have ever done before."

"Disaggregated projections," the Economist continued, "published by the IPCC say that—even in the lowest-emission scenarios—growth in poor countries will be so fast that by the end of the century Americans will be poorer on average than South Africans, Algerians, Argentines, Libyans, Turks and North Koreans. Mr Castles and Mr Henderson can hardly be alone in finding that odd."

Let's get a better sense of why that's odd. Under the IPCC's low-end scenario, the amount of goods and services produced per person in developing countries in Asia would increase 70-fold by 2100, and increase nearly 30-fold for other developing countries. To put that in

perspective, the United States only achieved a five-fold increase in per-capita economic growth in the 19th century and Japan achieved a nearly 20-fold increase in the 20th century.

The IPCC's mistakes are fatal. Jacob Ryten, a leading figure in the development, evaluation, and implementation of the U.N.'s International Comparisons Programme, said the IPCC suffers from "manifest ignorance of the conceptual and practical issues involved in developing and using intercountry measures of economic product." The Economist said the IPCC's methods proved it was guilty of "dangerous economic incompetence."

THE IPCC AND POLITICS

Castles and Henderson, along with the Economist and other scientists, have pressed the IPCC to abandon its use of market exchange rates in its upcoming Fourth Assessment Report. This is essential, they say, to provide a more accurate projection of future emissions. Thus far, the IPCC has ignored their request. But this is no surprise. The IPCC has become politicized and appears more intent on pursuing propaganda over science.

Consider the case of Dr. Christopher Landsea, the world's foremost expert on hurricanes. Dr. Landsea accepted an invitation to provide input on Atlantic hurricanes for the IPCC's Fourth Assessment Report, due out in 2007. But over time, Dr. Landsea realized that certain key members of the IPCC were bent on advancing a political agenda rather than providing an objective, fact-based understanding of climate change. As a result, he resigned from the IPCC process.

Dr. Landsea was outraged that Dr. Kevin Trenberth, the lead author on Observations for the upcoming Fourth Assessment, and other scientists participated in a politically-charged press conference at Harvard University on the supposed causal link between global warming and extreme weather events. The press conference was promoted this way: "Experts to warn global warming likely to continue spurring more outbreaks of intense hurricane activity."

As Dr. Landsea explained, the topic was bogus. It has no scientific basis and none of the scientists who participated had any expertise on the matter. In his resignation letter, Dr. Landsea wrote: "To my knowledge, none of the participants in that press conference had performed any research on hurricane variability, nor were they reporting on any new work in the field…It is beyond me why my colleagues would utilize the media to push an unsupported agenda that recent hurricane activity has been due to global warming."

What is the real state of the science on this topic? "All previous and current research in the area of hurricane variability has shown no reliable, long-term trend in the frequency or intensity of tropical cyclones, either in the Atlantic or any other basin," Dr. Landsea wrote. "Moreover, the evidence is quite strong and supported by the most recent credible studies that any impact in the future from global warming upon hurricanes will likely be quite small." Dr. Landsea noted that the most recent science shows that "by around 2080, hurricanes may have winds and rainfall about 5% more intense than today. It has been proposed that even this tiny change may be an exaggeration as to what may happen by the end of the 21st century."

Dr. Landsea concluded that because the IPCC process has been compromised, resigning was the only option. "I personally cannot in good faith continue to contribute to a process that I view as both being motivated by pre-conceived agendas and being scientifically unsound."

As with Castles and Henderson, the IPCC leadership has brushed off Dr. Landsea's concerns. This is outrageous. In doing so, the IPCC is seriously undermining its credibility. One can only

hope that the IPCC will change its ways. Otherwise, we can expect yet another Assessment Report that is unsupported by facts and science.

CONCLUSION

It is not surprising that alarmists want to fabricate the perception that there is consensus about climate change. We know the costs of this would be enormous. Wharton Econometrics Forecasting Associates estimates that implementing Kyoto would cost an American family of four $2,700 annually. Acknowledging a full-fledged debate over global warming would undermine their agenda. And what is that agenda? Two international leaders have said it best. [chart 10] Margot Wallstrom, the EU's Environment Commissioner, states that Kyoto is "about leveling the playing field for big businesses worldwide." [chart 11] French President Jacques Chirac said during a speech at the Hague in November 2000 that Kyoto represents "the first component of an authentic global governance."

Facts and science are showing that the catastrophic global warming consensus doesn't exist. The IPCC has been exposed as a political arm of UN's Kyoto Protocol, with a mission to prop up its flawed scientific conclusions.

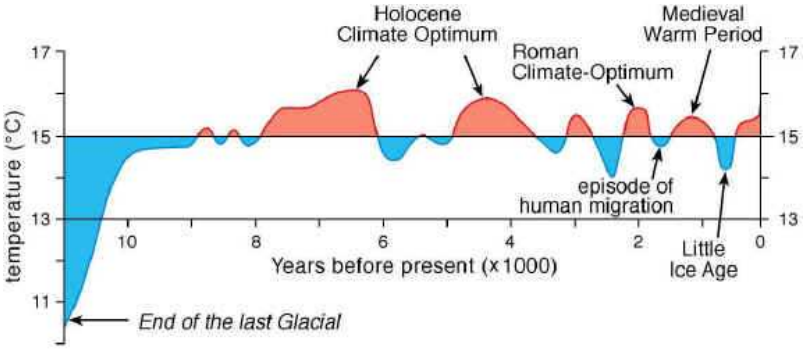
The Mann hockey stick, the flagship of the IPCC's claims that global warming is real, has now been thoroughly discredited in scientific circles. Projections of future carbon emissions – which drive temperature model conclusions – have been proven to be based on political decisions that, by the end of the century, countries like Bangladesh will be as wealthy, or wealthier, than the United States.

A world renowned scientist has just resigned from the IPCC because it is too politicized, saying that the IPCC plans to make claims that contradict scientific understanding. Increasingly, it appears that the scientific case for catastrophic global warming is a house of cards that will soon come tumbling down.

Despite this, there are still some who choose to ignore science. In a speech last week, Duke Energy CEO Paul Anderson advocated a tax on carbon dioxide and other greenhouse gases. In doing so, the company has seemingly bought into the spurious notion that the science is settled. But perhaps not. Unfortunately, to some global warming advocates, the science is irrelevant.

As Myron Ebell of the Competitive Enterprise Institute says "Duke Energy has now admitted that the costs will be significant. But the fact is it will only be expensive for their competitors. Nuclear plants don't emit carbon dioxide and Duke is already one-third nuclear generation. Moreover, the company has announced plans to build even more nuclear plants, giving it an even bigger competitive edge."

Late 20th Century Surface Temperatures are neither "extreme nor unusual."



Average near-surface temperatures of the northern hemispere during the past 11.000 years (after Dansgaard et al., 1969, and Schönwiese, 1995)

Senator James M. Inhofe
Chairman
Senate Committee on Environment and Public Works

Third "Four Pillars" on Global Warming Speech

April 24, 2005

Today I would like to continue my series on the Four Pillars of Climate Alarmism. In my first speech, I outlined how the media and environmental extremists distorted, exaggerated, and mischaracterized a major climate change report from the National Academy of Sciences. I showed how the Left and the media exaggerated a document that contained numerous caveats about the uncertainties of current knowledge and the caution that its conclusions were tentative, proclaiming the report showed conclusively that global warming due to man is occurring.

In my second speech, I described some of the more serious, and indeed fatal, flaws in the 2001 Third Assessment Report from the UN's Intergovernmental Panel on Climate Change, also known as the IPCC. In that speech, I exposed how Michael Mann's now infamous "hockey stick," the flagship of the IPCC's claims that global warming is real, has been thoroughly discredited in scientific circles. And that the IPCC's projections of future carbon emissions - which drive temperature model conclusions - have been proven to be based on political decisions that, by the end of the century, countries like Libya will be as wealthy or wealthier than the United States.

Now I would like to examine the Arctic Climate Impact Assessment report, which received considerable attention upon its release late last year. Last November, the Arctic Council, described as a "high-level international forum" that includes the United States, Canada, Denmark, Finland, Iceland, Norway, the Russian Federation, and Sweden, released a 140-page Arctic synthesis report, titled "Impacts of a Warming Arctic." It details the major findings from the Arctic Council's 1200-page Scientific Report, which will be released in the coming weeks.

The essence of the synthesis report is this: The Arctic is experiencing unprecedented climate change, caused in large part, if not entirely, by man-made greenhouse gas emissions, while projections show dramatic Arctic warming accompanied by even more pronounced changes that will have serious repercussions for the entire planet.

At first blush, the report appears to be quite impressive: It contains glossy photos, charts, and graphs, and was produced by some 300 scientists from several nations. But it lacks virtually any scientific documentation, which casts doubt on the report's page after page of unqualified, matter-of-fact claims about Arctic warming. That documentation, we are told, is forthcoming in the more lengthy 'Scientific Report'. So it's unclear if the 140-page document accurately reflects the contents of the Scientific Report.

If it does, then the Scientific Report simply ignores or dismisses reams of peer-reviewed scientific work contradicting the Arctic Council's conclusions. If it does not, then the synthesis report would appear to be an exercise in global warming propaganda.

THE MEDIA

The release of the report created a media sensation, with nearly every major news outlet declaring, once again, that the scientific "consensus" on global warming had been reaffirmed. Here was the Chicago Tribune's report from November 24, 2004: "The council's 140-page report, four years in the making, warns of immense ice melts, a dramatic rise in ocean levels, the depletion of the Gulf Stream and other sea currents, wild fluctuations in weather patterns, increased ultraviolet radiation and wrenching dislocations in the food chain and habitat."

In equally dramatic fashion, the Associated Press described the report this way: "This most comprehensive study of Arctic warming to date adds yet more impetus to the projections by many of the world's climate scientists that there will be a steady rise in global temperature as the result of greenhouse gases released into the atmosphere from the burning of fossil fuels and other sources."

Such descriptions of the report are not far off the mark, and for good reason. In this case, the media and extremist groups got exactly what they wished for - 140 pages detailing a daunting list of projected environmental catastrophes: permafrost melting; infrastructure collapsing; glaciers vanishing; sea levels rising; coastal communities flooding; polar bears facing extinction.

Worse, the report's authors left the impression that these scenarios were all but assured, despite the fact that the assumptions on which they are based are highly uncertain, a point I will examine later in this speech. Thus, no spin, distortion, or exaggeration on the media's part was necessary.

ARCTIC TEMPERATURE

The synthesis report constructs a deceptive picture of climate changes that have occurred in the Arctic over the last 30 years, particularly with respect to temperature change. A major piece of evidence supporting the Arctic Council's alarmist conclusions is the Arctic's "unprecedented" temperature increase over the last several decades. The report's authors make the following statement on page 23: "Examining the record of past climatic conditions indicates that the amount, speed, and pattern of warming experienced in recent decades are indeed unusual and are characteristic of the human-caused increase in greenhouse gases."

Specifically, according to the Council, annual average temperature in the Arctic has increased at almost twice the rate of the rest of the world, while winter temperatures in Alaska and western Canada have increased about 3-4 degrees Celsius over the past half-century, with larger increases projected in the next 100 years.

Surely this is proof of unprecedented, human-induced warming, and of worrisome warming trends for the future? Not quite. Let's take a closer look at the peer-reviewed literature on the temperature history of the Arctic, which the Arctic Council's synthesis report ignored.

First, in the November 2002 issue of the journal Holocene, researchers examined proxy temperature data in Northern Russia spanning over 2,000 years. They found that "the warmest periods over the last two millennia in this region were clearly in the third, tenth to twelfth, and during the twentieth centuries." The earlier periods, they claim, were warmer than those of the 20th century, while 20th century temperatures appeared to peak around 1940.

For a much broader perspective on Arctic temperatures, one can read the 2003 paper by researcher Igor Polyakov in the journal EOS, a publication of the American Geophysical Union. In the paper, titled "Trends and Variations in Arctic Climate Systems," Polyakov studied land and ocean data from northward of latitude 62.5* N, dating back to 1870. As is obvious from this chart, one can see that current temperature over the entire region is similar to that measured seventy years ago. According to Polyakov, "Two distinct warming periods from 1920 to 1945, and from 1975 to the present, are clearly evident." He goes on to note that "compared with the global and hemispheric temperature rise, the high-latitude temperature increase was stronger in the late 1930s to the early 1940s than in recent decades."

Strangely, there's no mention of this in the Arctic report. But alarmists don't seem to care. They would probably respond that "300 scientists from all over the world believe such warming is occurring. You, sir, have merely identified two whose research presents a contrary view." To answer that charge, I will submit for the record an impressive list of scientists from several countries, including the United States, whose peer-reviewed work shows current Arctic temperatures are no higher than temperatures recorded in the 1930s and 1940s.

Let me quote from a few salient examples. In a 2003 issue of the Journal of Climate, 7 researchers concluded the following: "In contrast to the global and hemispheric temperature, the maritime Arctic temperature was higher in the late 1930s through the early 1940s than in the 1990s." Here's another excerpt from the 2000 International Journal of Climatology, by Dr. Rajmund Przybylak, of Nicholas Copernicus University, in Torun, Poland. It reads: "The highest temperatures since the beginning of instrumental observation occurred clearly in the 1930s and can be attributed to changes in atmospheric circulation." Finally, in 2001,

researchers examined a 10,000-year span of sea core sediment in the Chukchi Sea, and concluded that "in the recent past, the western Arctic Ocean was much warmer than it is today." They also found that "during the middle Holocene [approximately 6,000 years ago] the August sea surface temperature fluctuated by 5 degrees Celsius and was 3-7 degrees Celsius warmer than it is today." Obviously, the middle Holocene period was not known for SUVs and coal-fired power plants.

To get a fuller sense of the report's bias, consider the Arctic Council's geographical definition of "the Arctic." This is important because the temperature record differs depending on one's definition. The Arctic report's temperature record includes data from northward of latitude 60°N. Why the Arctic Council chose this point is not explained. In fact, the report's authors responsible for defining the Arctic admitted last November that their choice was arbitrary.

The Arctic Council's starting point is problematic for two reasons. First, Dr. George Taylor, Oregon's state climatologist and a past president of the American Association of State Climatologists recently examined Arctic temperature trends using different starting points. As Dr. Taylor found, "[u]sing 60ºN introduced a lot of...questionable Siberian stations." In other words, measurements at that point are based in part on bad data.

Second, other researchers see the Arctic differently, and probably more accurately when describing long-term temperature trends. Polyakov, for example, defined Arctic as northward of 62.5*N. This 2.5-degree difference is not trivial. Temperatures can change significantly between 62.5* and 60*N. In fact, pushing the geographical boundaries southward, as the Arctic Council did, contributes to a substantial upward bias in temperature measurements.

Not only was the Arctic region arbitrarily defined, it appears that marine and coastal-based data were arbitrarily excluded from the report's temperature record. This is strange, considering two-thirds of the Arctic is covered by the Arctic Ocean. So it seems unreasonable to use only land-based stations, as the Arctic Council did, and not to include coastal stations, Russian drifting stations in the Arctic Ocean, and drifting buoys from the International Buoy Programme, as Polyakov and his colleagues did.

Using such data reveals a less dramatic temperature picture than the Arctic Council's. In 1993, University of Wisconsin climatologist Jonathan Kahl examined declassified data collected over the Artic Ocean during the Cold War. In a paper in the journal Nature, Kahl found an "absence of evidence for greenhouse warming over the Arctic Ocean in the past 40 years" and a net decline in Arctic temperature. Admittedly, Kahl's temperature history stretches only from 1958 to 1986. But more importantly, it relies on marine and coastal-based data.

Dr. Taylor was among many mystified by these omissions. For him, there is only one possible explanation: "The [Arctic Climate Impact Assessment] appears to be guilty of selective use of data." He further explained, "Many of the trends described in the document begin in the 1960s or 1970s - cool decades in much of the world - and end in the warmer 1990s or early 2000s. So, for example, temperatures have warmed in the last 40 years, and the implication, 'if present trends continue,' is that massive warming will occur in the next century. Yet data are readily available for the 1930s and early 1940s, when temperatures were comparable to (and probably higher than) those observed today. Why not start the trend there? Because there is no net warming over the last 65 years?"

ARCTIC GLACIERS/SEA ICE

In the pop culture version of global warming, there is no greater attraction than melting glaciers and sea ice. Press accounts appear daily of new studies purporting to show widespread glacial retreat stemming from man-made greenhouse gas emissions. Warnings abound that this melting will cause a calamitous rise in sea levels.

True to form, the Arctic Council follows the same story line, asserting that, "glaciers throughout the Arctic are melting." "This process is already under way," the report states, "with the widespread retreat of glaciers, snow cover, and sea ice. This is one reason why climate change is more rapid in the Arctic than elsewhere." But is this really the case?

Interestingly, the IPCC Third Assessment Report references peer-reviewed studies that contradict the Arctic Council's assessments. The IPCC, an organization convinced of the validity of the global warming consensus, noted that, "Glaciers and ice caps in the Arctic also have shown retreat in low-lying areas since about 1920," but also stated, "However, no increasing melting trend has been observed during the past 40 years."

Sonar data on sea ice collected in the 1990s also tell a different story. As the BBC wrote in 2001: "The latest and most comprehensive analysis yet of the sonar data collected in the 1990s shows little if any thinning - at least towards the end of that decade. Indeed, at the North Pole, there are indications in the data that the ice even got a little thicker."

Among other omissions, the Arctic Council gave little weight to the observed variability of Arctic sea ice thickness. The term "observed variability" of sea ice thickness has specific meaning in the Arctic: Scientists estimate that sea ice mass there can vary by as much as 16 percent in a single year. As Dr. Seymour Laxon, a lecturer in the Department of Space and Climate Physics at the University College London, explained, "The observed variability of Arctic sea ice thickness contrasts with the concept of a slowly dwindling ice pack, produced by global warming."

So what causes these variations in sea ice mass? In 2002, Dr. Greg Holloway, of the Institute for Ocean Sciences in Sidney, Canada, and his colleague Dr. Tessa Sou, showed that decadal wind pattern changes caused a shifting of Artic sea ice, creating thinner ice in some regions and thicker ice in others. As Dr. Holloway explained, "It's a circumstance where the ice tends to leave the central Arctic and then mostly pile up against the Canadian side, before moving back into the central Arctic again." Based on this research, Dr. Holloway believes that "we have been a little bit overly stampeded into the idea that there is a terribly alarming melting taking place."

Holloway is not alone in his assessment. In 2003, German researchers Cornelia Koeberle and Ruediger Gerdes found evidence of natural "wind stress" strongly affecting variability in Arctic sea ice. "The results make connecting 'global warming' to Arctic ice thinning very difficult for two reasons," the researchers wrote. "First, the large decadal and longer-term variability masks any trend...Second, the wind stress strongly affects the long-term development of ice volume. A long-term change in wind stress over the Arctic, possibly by an increase in the number of atmospheric circulation states that favor ice export, would affect the ice volume in a similar manner as a temperature increase."

GREENLAND ICE SHEET

In addition to questionable claims about Arctic sea ice, the Arctic report includes dubious projections about the Greenland Ice Sheet. Climate models, the Arctic Council reports, "project that local warming in Greenland will exceed 3 degrees Celsius during this century." The result? "Ice sheet models project that a warming of that magnitude would initiate the long-term melting of the Greenland Ice Sheet." And furthermore, "Even if climatic conditions then stabilized, an increase of this magnitude is projected to lead eventually (over centuries) to a virtually complete melting of the Greenland Ice Sheet, resulting in a global sea level rise of about seven meters."

This sounds ominous, but again, peer-reviewed literature on the subject, excluded from the Arctic report, tells a countervailing story. For example, a team of experts at Los Alamos National Laboratory recently examined Greenland's instrumental surface temperatures. Here's what they found: "Since 1940, however, the Greenland coastal stations data have undergone predominantly a cooling trend. At the summit of the Greenland ice sheet, the summer average temperature has decreased at the rate of 2.2 [degrees Celsius] per decade since the beginning of the measurements in 1987."

Finally, the report's projections for the Greenland ice sheet, glaciers, and sea ice were based on data obtained from global climate models. Those projections assume anthropogenic warming, and proceed to show a gradual but persistent melting of glaciers and ice, leading to a dangerous rise in sea levels. However, as climate scientists have repeatedly pointed out, climate models are highly imperfect. In fact, they are notoriously inaccurate in how they simulate the complexities of the climate system.

This is especially true of Arctic climate. According to a letter signed by 11 climate scientists, sent to the Senate Commerce Committee last fall, "Arctic climate varies dramatically from one region to another, and over time in ways that cannot be accurately reproduced by climate models. The quantitative impacts of natural and anthropogenic factors remain highly uncertain, especially for a region as complex as the Arctic."

Researchers associated with the University of Alaska-Fairbanks wholeheartedly endorsed this view. They recently wrote, "Unfortunately, most global climate models are not capable of sufficiently reproducing the climatological state of the Arctic Ocean, sea ice and atmosphere...as [an] example, the simulated sea ice thickness is overestimated, and its overall pattern is in error, with the thickest ice located in the Siberian instead of the Canadian sector of the Arctic Ocean."

Based on these well-documented technological constraints, how can one take seriously the Artic Council's claim that "While the models differ in their projections of some of the features of climate change, they are all in agreement that the world will warm significantly as a result of human activities and that the Arctic is likely to experience noticeable warming particularly early and intensely"?

CONCLUSION

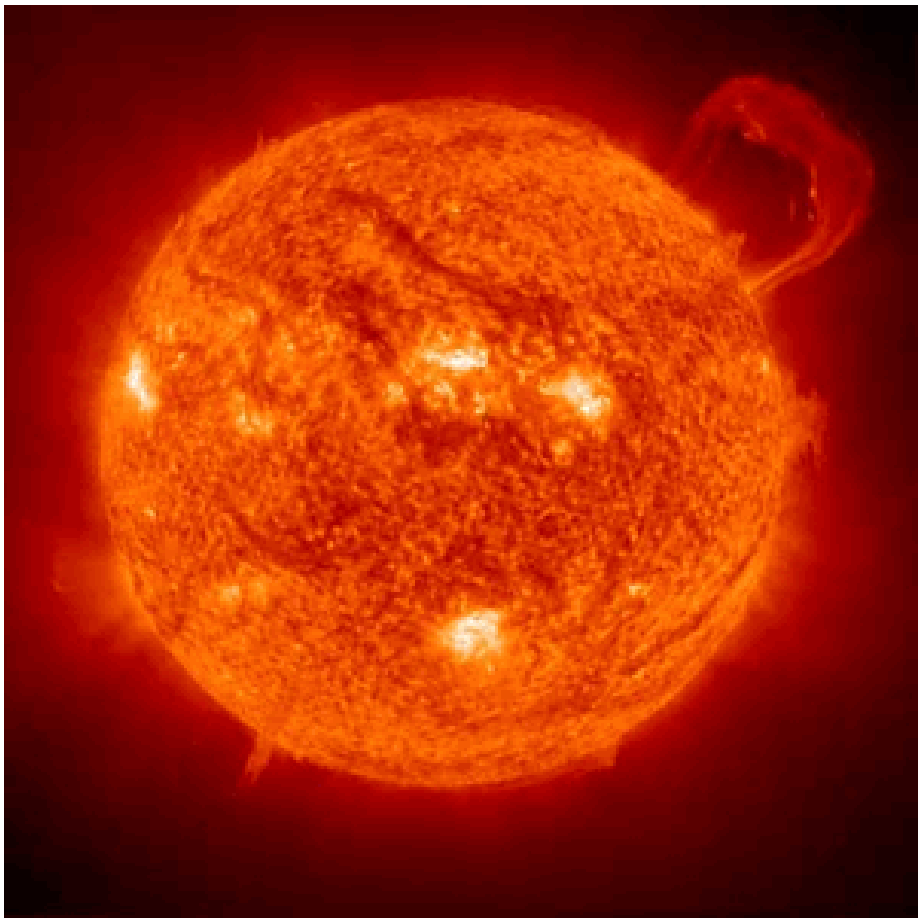
The alarmist nature of the Arctic report is to be expected. How else can they justify its enormous costs of regulating carbon dioxide? And we know the costs of this would be enormous. Wharton Econometrics Forecasting Associates estimates that implementing Kyoto would cost an American family of four $2,700 annually. Acknowledging the holes in the

science underlying claims of catastrophic global warming would undermine their agenda. And what is that agenda? Two international leaders have said it best. Margot Wallstrom, the EU's Environment Commissioner, states that Kyoto is "about leveling the playing field for big businesses worldwide." French President Jacques Chirac said during a speech at the Hague in November 2000 that Kyoto represents "the first component of an authentic global governance."

Based on these and other major deficiencies, the Arctic Climate Impact Assessment hardly serves as compelling proof that greenhouse gas emissions are causing unprecedented changes in Arctic climate, or that trends point to a future marred by widespread damage to Arctic ecosystems. And to be sure, the report fails to provide a thorough, balanced, comprehensive overview of the most compelling research on Arctic climate.

Instead, the so-called "synthesis report" is a biased, selective examination of climate trends in the Arctic. It completely ignores well-known, established facts. For instance, it is firmly established that Arctic temperatures in the late 1930s and early '40s were higher than in the '90s and that Greenland's temperatures in recent decades have undergone a cooling trend. It is also well known that sea ice mass can vary by as much as 16 percent in a single year. Moreover, this report fails the test of transparency and openness and lacks virtually any documentation. It reads more like an ideological tome. Extremist groups are even using it as a legal brief to sue energy producers on behalf of Arctic peoples. Hardly surprising.

Dr. George Taylor, Oregon's state climatologist, succinctly described the report when he said: "Nice graphics but bad science."



Solar flare
(http://store.spaceimages.com/sun.html)

Senator James M. Inhofe
Chairman
Senate Committee on Environment and Public Works

Fourth "Four Pillars" on Global Warming Speech

May 24 ,2005

Over the last few weeks, I have debunked the notion of a scientific "consensus" about global warming. The claim there is consensus rests on four fundamental pillars. My previous speeches made clear that the first three pillars are made of sand. It's not true, for example, that the National Academy of Sciences believes the science of climate change is settled. In fact, the report is replete with caveats warning the reader of the many uncertainties associated with claims of global warming. Yet advocates continue to recite small excerpts while ignoring the caution about uncertainties contained within the same paragraph or even

the same sentence. It is also not true that the second pillar – the UN science report known as the IPCC report – proves a consensus. The flagship study on which the IPCC report relies, known as the hockey stick and which shows an unprecedented rise in 20th century temperatures, has been thoroughly discredited by scientists on both sides of the debate. Moreover, the UN report relies on explosive increases in greenhouse emissions by poor countries over the next century based on the political decision by the report's authors that countries such as Algeria will be as wealthy, or wealthier, than the United States. The third pillar supposedly proving that the science is settled – that the Arctic is melting – is not so much based on hard science as on political science. Arctic temperatures are no warmer than they were in the 1930s. Similarly, the thickness of Arctic glaciers and sea ice appears to vary naturally by as much as 16 percent annually. These and other facts which alarmists find inconvenient would seem to indicate that projections of an Arctic climate catastrophe are speculative at best. Today I would like to conclude my series on the Four Pillars of Climate Alarmism by discussing the problems associated with global climate models. Let me begin by briefly explaining what climate models are and how they function. Climate models help scientists describe changes in the climate system. They are not models in the conventional sense; that is, they are not physical replicas. Rather, they are mathematical representations of the physical laws and processes that govern earth's climate. According to Dr. David Legates of the University of Delaware, climate models "are designed to be descriptions of the full three-dimensional structure of the earth's climate." Dr. Legates explained that models are used "in a variety of applications, including the investigation of the possible role of various climate forcing mechanisms and the simulation of past and future climates." Thousands of climate change studies rely on computer models. The Arctic Council, whose work I addressed last week, stated that Arctic warming and the impacts stemming from that warming are firmly established by computer models. "While the models differ in their projections of some of the features of climate change," the Arctic Council wrote, "they are all in agreement that the world will warm significantly as a result of human activities and that the Arctic is likely to experience noticeable warming particularly early and intensely." Similarly, the IPCC, which I also discussed in an earlier speech, relied on such models to project a long-term temperature increase ranging from 2.5 to 10.4 degrees Celsius and assorted and potentially dangerous climate changes over the next century. According to Dr. Kenneth Green, Dr. Tim Ball and Dr. Steven Schroeder, "politicians clearly do not realize that the major conclusions of the IPCC's reports are not based on hard evidence and observation but rather largely upon the output of assumption-driven climate models." PUTTING MODELS IN CONTEXT Alarmists cite the results of climate models as proof of the catastrophic warming hypothesis. Consider one alarmist scribe, who wrote recently, "Drawing on highly sophisticated computer models, climate scientists can project – not predict – how much temperatures may rise by, say, 2100 if we carry on with business as usual." He continued: "Although scenarios vary, some get pretty severe. So do the projected impacts of climate change: rising sea levels, species extinctions, glacial melting, and so forth." Sounds pretty scary, but the statement is completely vacuous: It sheds no light on the likelihood or reliability of such projections. If, for example, a model shows a significant temperature increase over the next 50 years, how much confidence do we have in that projection?

Attaching probabilities to model results is extremely difficult and rife with uncertainties. In the 2000 edition of Nature, four climate modelers noted that, "A basic problem with all such predictions to date has been the difficulty of providing any systematic estimate of uncertainty." This problem stems from the fact that "these [climate] models do not necessarily span the full range of known climate system behavior." According to the National Academy of Sciences, "…without an understanding of the sources and degree of uncertainty, decision-makers could fail to define the best ways to deal with the serious issue of global warming." This fact should temper the enthusiasm of those who support Kyoto-style

regulations that will harm the American economy.

Note too the distinction between "project" and "predict." The alarmist writer noted earlier creates the misimpression that a projection is more solid than a prediction. But a projection is the output of a model calculation. Put another way, it's only as good as the model's equations and inputs. As we will see later in this speech, such inputs, or assumptions about the future, can be extremely flawed, if not totally divorced from reality. And this, to be sure, is only one of the many technical shortcomings that limit the scientific validity of climate modeling.

CLIMATE MODELING 'IN ITS INFANCY'

Unfortunately, rarely does any scrutiny accompany model simulations. But based on what we know about the physics of climate models, as well as the questionable assumptions built into the models themselves, we should be very skeptical of their results. This is exactly the view of the National Academy of Sciences. According to NAS, "Climate models are imperfect. Their simulation skill is limited by uncertainties in their formulation, the limited size of their calculations, and the difficulty of interpreting their answers that exhibit as much complexity as in nature." At this point, climate modeling is still a very rudimentary science. As Richard Kerr wrote in Science magazine, "Climate forecasting, after all, is still in its infancy." Models, while helpful for scientists in understanding the climate system, are far from perfect. According to climatologist Gerald North of Texas A&M University, "It's extremely hard to tell whether the models have improved; the uncertainties are large." Or as climate modeler Peter Stone of the Massachusetts Institute of Technology put it, "The major [climate prediction] uncertainties have not been reduced at all." Based on these uncertainties, cloud physicist Robert Charlson, professor emeritus at the University of Washington, Seattle, has concluded: "To make it sound like we understand climate is not right." This is not to deny that climate modeling has improved over the last three decades. Indeed, scientists have constructed models that more accurately reflect the real world. In the 1970s, models were capable only of describing the atmosphere, while over the last few years, models can describe – albeit inadequately – the atmosphere, land surface, oceans, sea ice, and other variables. But greater complexity does not mean more accurate results. In fact, the more variables scientists incorporate, the more uncertainties arise. Dr. Syukuro Manabe, who helped create the first climate model that coupled the atmosphere and oceans, has observed, "Models that incorporate everything from dust to vegetation may look like the real world, but the error range associated with the addition of each new variable could result in near total uncertainty. This would represent a paradox: The more complex the models, the less we know." We are often reminded that the IPCC used sophisticated modeling techniques in projecting temperature increases for the coming century. But as William O'Keefe and Jeff Kueter of the George C. Marshall Institute pointed out in a recent paper, "The complex models envisioned by the IPCC have many more than twenty inputs, and many of those inputs will be known with much less than 90 percent confidence."

Also, tinkering with climate variables is a delicate business – getting one variable wrong can greatly skew model results. Dr. David Legates has noted that "anything you do wrong in a climate model will adversely affect the simulation of every other variable." Take precipitation, for example. As Dr. Legates noted, "Precipitation requires moisture in the atmosphere and a mechanism to cause it to condense (causing the air to rise over mountains, by surface heating, as a result of weather fronts, or by cyclonic rotation). Any errors in representing the atmospheric moisture content or precipitation-causing mechanisms will result in errors in the simulation of precipitation." "Clearly," Dr. Legates concluded, "the interrelationships among the various components that comprise the climate system make climate modeling difficult." The IPCC, in its Third Assessment Report, noted this problem, and many others, with climate

modeling, including:

• "Discrepancies between the vertical profile of temperature change in the troposphere seen in observations and models."

• "Large uncertainties in estimates of internal climate variability (also referred to as natural climate variability) from models and observations."

• "Considerable uncertainty in the reconstructions of solar and volcanic forcing which are based on limited observational data for all but the last two decades."

• "Large uncertainties in anthropogenic forcings associated with the effects of aerosols."

• "Large differences in the response of different models to the same forcing." THE SURFACE AND THE TROPOSPHERE I want to delve a little deeper into the first point concerning discrepancies between temperature observations in the troposphere and the surface. This discrepancy is very important, because it tends to undermine a key assumption supporting the warming hypothesis – that more rapid warming should occur in the troposphere than at the surface, creating the so-called greenhouse "fingerprint." But the National Research Council (NRC) believes real-world temperature observations tell a different story. In January 2000, an NRC panel examined the output from several climate models to assess how well they mimicked the observed surface and lower atmospheric temperature trends. They found that, "Although climate models indicate that changes in greenhouse gases and aerosols play a significant role in defining the vertical structure of the observed atmosphere, model–observation discrepancies indicate that the definitive model experiments have not been done." John Wallace, the panel chairman and Professor of Atmospheric Sciences at the University of Washington, put it more bluntly: "There really is a difference between temperatures at the two levels that we don't fully understand." More recently, researchers at the University of Colorado, Colorado State University, and the University of Arizona examined the differences between real-world temperature observations with the results of four widely used climate models. They probed the following question: Do the differences stem from uncertainties in how greenhouse gases and other variables affect the climate system, or by chance model fluctuations – that is, the variability caused by the model's flawed representation of the climate system?

As it turned out, neither of these factors was to blame. According to the researchers, "Significant errors in the simulation of globally averaged tropospheric temperature structure indicate likely errors in tropospheric water-vapor content and therefore total greenhouse-gas forcing, precipitable water, and convectively forced large-scale circulation." Moreover, based on the "significant errors of simulation," the researchers called for "extreme caution in applying simulation results to future climate-change assessment activities and to attributions studies." They also questioned "the predictive ability of recent generation model simulations, the most rigorous test of any hypothesis." There doesn't seem to be much wiggle room here: Climate models are useful tools, but unable in important respects to simulate the climate system, undermining their "predictive ability." Based on this hard fact, let me bring you back to the alarmist writer I referenced earlier. As he wrote recently, "Drawing on highly sophisticated computer models, climate scientists can project – not predict – how much temperatures may rise by, say, 2100 if we carry on with business as usual." Again, based on what I've just recounted, this is disingenuous at best. I think a fair-minded person would find it horribly misleading and inaccurate. CLOUDS AND WATER VAPOR Another serious model limitation concerns the interaction of clouds and water vapor with the climate system. Dr. Richard S. Lindzen, professor of meteorology at MIT, reports of "terrible errors about clouds

in all the models." He noted that these errors "make it impossible to predict the climate sensitivity because the sensitivity of the models depends primarily on water vapor and clouds. Moreover, if clouds are wrong," Dr. Lindzen said, "there's no way you can get water vapor right. They're both intimately tied to each other." In fact, water vapor and clouds are the main absorbers of infrared radiation in the atmosphere. Even if all other greenhouse gases, including carbon dioxide, were to disappear, we would still be left with over 98 percent of the current greenhouse effect. But according to Dr. Lindzen, "the way current models handle factors such as clouds and water vapor is disturbingly arbitrary. In many instances the underlying physics is simply not known." Dr. Lindzen notes that this is a significant flaw, because "a small change in cloud cover can strongly affect the response to carbon dioxide." He further notes, "Current models all predict that warmer climates will be accompanied by increasing humidity at all levels." Such behavior "is an artifact of the models since they have neither the physics nor the numerical accuracy to deal with water vapor." AEROSOLS Along with water vapor and clouds, aerosols, or particles from processes such as dust storms, forest fires, the use of fossil fuels, and volcanic eruptions, represent another major uncertainty in climate modeling. To be sure, there is limited knowledge of how aerosols influence the climate system. This, said the National Academy of Sciences, represents "a large source of uncertainty about future climate change."

Further, the Strategic Plan of the U.S. Climate Change Science Program (CCSP), which was reviewed and endorsed by the National Research Council, concluded that the "poorly understood impact of aerosols on the formation of both water droplets and ice crystals in clouds also results in large uncertainties in the ability to project climate changes."

Climate researcher and IPCC reviewer Dr. Vincent Gray reached an even stronger conclusion, stating that "the effects of aerosols, and their uncertainties, are such as to nullify completely the reliability of any climate models."

DATA GAPS

Another issue affecting model reliability is the relative lack of available climate data, something the National Research Council addressed in 2001. According to the NRC, "[a] major limitation of these model forecasts for use around the world is the paucity of data available to evaluate the ability of coupled models to simulate important aspects of past climate."

There is plenty of evidence to support this conclusion. Consider, for example, that most of the surface temperature record covers less than 50 years and only a few stations are as much as 100 years old. The only reliable data come from earth-orbiting satellites that survey the entire atmosphere. Notably, while these temperature measurements agree with those taken by weather balloons, they disagree considerably with the surface record. There is also concern of an upward bias in the surface temperature record, caused by the "urban heat island effect." Most meteorological stations in Western Europe and eastern North America are located at airports on the edge of cities, which have been enveloped by urban expansion. In the May 30, 2003 issue of Remote Sensing of Environment, David Streutker, a Rice University researcher, found an increase in the Houston urban heat island effect of nearly a full degree Celsius between 1987 and 1999. This study confirmed research published in the March 2001 issue of Australian Meteorological Magazine, which documented a significant heat island effect even in small towns. Although climate modelers have made adjustments to compensate for the urban heat island effect, other researchers have shown such adjustments are inadequate. University of Maryland researchers Eugenia Kalnay and Ming Cai, in Nature magazine, concluded that the effect of urbanization and land-use changes on U.S. average

temperatures is at least twice as large as previously estimated. MODEL SCENARIOS Finally, to expand on a point I raised earlier, climate models are helpful in creating so-called "climate scenarios." These scenarios help scientists describe how the climate system might evolve. To arrive at a particular scenario, scientists rely on model-driven assumptions about future levels of economic growth, population growth, greenhouse gas emissions, and other factors. However, as with the IPCC, these assumptions can create wildly exaggerated scenarios that, to put it mildly, have little scientific merit. In 2003, scientists with the federal Climate Change Science Program agreed that potential environmental, economic, and technological developments "are unpredictable over the long time-scales relevant for climate research." William O'Keefe and Jeff Keuter of the George C. Marshall Institute reiterated this point recently. As they wrote, "The inputs needed to project climate for the next 100 years, as is typically attempted, are unknowable. Human emissions of greenhouse gases and aerosols will be determined by the rates of population and economic growth and technological change. Neither of these is predictable for more than a short period into the future." Put simply, computer model simulations cannot prove that greenhouse gas emissions will cause catastrophic global warming. Again, here's the National Academy of Sciences: "The fact that the magnitude of the observed warming is large in comparison to natural variability as simulated in climate models is suggestive of such a linkage, but it does not constitute proof of one because – [and this is a point I want to emphasize] – the model simulations could be deficient in natural variability on the decadal to century time scale." CONCLUSION It's clear that climate models, even with increasing levels of sophistication, still contain a number of critical shortcomings. With that in mind, policymakers should reject ridiculous statements that essentially equate climate model runs with scientific truth.

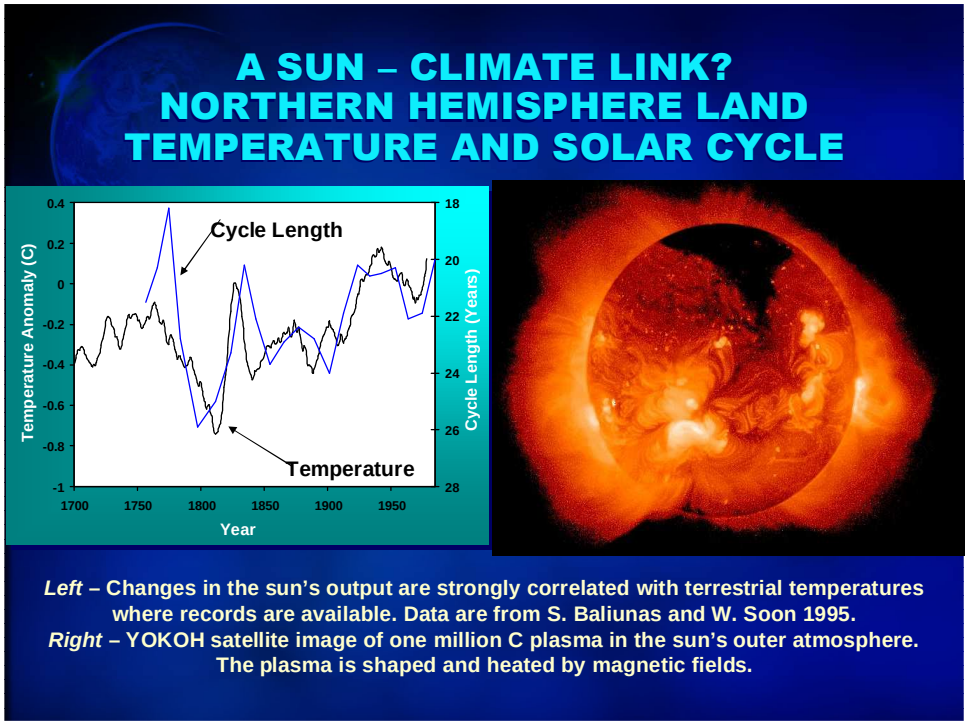
As I discussed today, climate modeling is in its infancy. It cannot predict future temperatures with reasonable certainty that these predictions are accurate. The physical world is exceedingly complex, and the more complex the models, the more potential errors are introduced into the models. We understand little about how to accurately model the troposphere and about the role of aerosols, clouds and water vapor. Moreover, there are enormous data gaps in the very short temperature records that we have. And surface data often conflict with more accurate balloon and satellite data.

Models can enhance scientists' understanding of the climate system, but, at least at this point, cannot possibly serve as a rational basis for policymaking. It seems foolish in the extreme to undermine America's economic competitiveness with policies based on computer projections about what the world will look like in 100 years. In short, we have no idea what the world will look like in 20 years, or even 10 years.
This concludes my series on the Four Pillars of Climate Alarmism. I hope these speeches will prod my colleagues to examine the science of climate change. In my view, if they examine the facts and evidence closely and dispassionately, they will find no "consensus" that catastrophic global warming is occurring or will occur – and further, they will recognize that Kyoto-style polices are scientifically unjustified, environmentally useless, and economically harmful.

It is clear that the cost of ignoring the science is enormous. Wharton Econometrics Forecasting Associates estimates that implementing Kyoto would cost an American family of four $2,700 annually. Inducing the United States to adopt policies that erode its economic power in world markets appears to be the goal of some economic rivals, as evidenced by the words of two international leaders who said it best. [chart] Margot Wallstrom, the EU's Environment Commissioner, states that Kyoto is "about leveling the playing field for big businesses worldwide." [chart] French President Jacques Chirac said during a speech at the Hague in November 2000 that Kyoto represents "the first component of an authentic global

governance."

Let us hope that America's leadership has the wisdom not to fall prey to their openly admitted agenda.



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