Top 10 Myths About Global Warming

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MYTH 1: *Scientists have conclusively proven that human activity is causing the earth to warm.*

FACTS: The theory of global warming rests on the idea that human emissions of carbon dioxide and other greenhouse gases have caused earth's temperature to rise unnaturally over the last century.

The largely undisputed scientific facts of climate change are these: 1) human use of fossil fuels over the last century has increased the amount of carbon dioxide and other greenhouse gases in our atmosphere; 2) greenhouse gases naturally absorb infrared radiation and retain some of that heat close to earth's surface; and 3) the 20th century was 0.5° C warmer than the previous century.[1] What is hotly disputed among scientists is how sensitive global temperature is to human greenhouse gas emissions, and how much warming—if any—is attributable these emissions.

We are just beginning to explore the function and magnitude of natural feedback systems that affect concentrations of greenhouse gases and global temperature changes. In a 2002 study attempting to compare carbon dioxide concentrations and earth's temperature over the last 500 million years, the author found that the "comparison with the geologic record of climatic variations reveals no obvious correspondence."[2]

Some scientists have argued persuasively that the earth's temperature changes are markedly more sensitive to changes in solar radiation than greenhouse gases. Solar radiation indirectly affects cloud formation that can act as a feedback mechanism to regulate earth's temperature.[3] However, the complex behavior of clouds and the primary greenhouse gas—water vapor—are poorly understood.[4] The temperature effects of clouds and aerosols are significant enough to reduce estimated warming from greenhouse gases, and in some scenarios even produce a slight global cooling.[5,6]

Many global warming proponents point to computer model simulations that show earth's temperature dramatically increasing in the 21st Century with a concurrent rise in carbon dioxide emissions. However, due to the extraordinary complexity of the natural world, computer models simplify, ignore, and/or misinterpret many important climate feedback mechanisms. Models are also prone to enormous errors from the simple fact that they often track over five million parameters. Upon testing two different computer models used in the discredited U.S. National Assessment on Climate Change, Dr. Patrick Michaels, a climatologist with the University of Virginia, found that a random number table did a better job of simulating the past century's temperatures than both models.[7] In Figure 1 below, a comparison of model temperature predictions are much higher than the observed trend.

Finally, climate models produce simulations on a global level and any attempt to predict what may happen on a smaller, regional scale flies against the consensus of international climate scientists. The United Nations' Intergovernmental Panel on Climate Change (IPCC), wrote this about computer climate models: "Despite recent improvements and developments . . . a coherent picture of regional climate change . . . cannot yet be drawn." [8] Climate models are improving all the time, but policy makers should understand they are simulations of how we believe the world works—not reality.

MYTH 2: *Earth's temperature has risen to an unnatural level over the last century.*

FACTS: NASA temperature records indicate the 20th century was slightly warmer than the previous century with surface temperatures rising about 0.5° C. Climatologist Patrick Michaels, Ph. D, identifies three different temperature trends during the last century. From 1900 to 1940 there was a period of strong warming followed by another period of cooling until about the late 1970s. Then, from the late 1970s to the present, the earth's surface has warmed again.[9]

Over 80 percent of greenhouse gas emissions occurred after 1940 so the first period of warming cannot be attributed to human activities. And the mid-20th century cooling can't be a warming response due to increased greenhouse gases. Therefore, it appears that global temperature changes for most of the last century has been natural.[10]

Reconstructions of long-term temperature records show that the 20th Century was not unusual. One analysis of 250 climate studies covering the previous millennium confirms the presence of the Medieval Warm Period from 800 to 1300 AD that was warmer than our present day temperature. Furthermore, global temperatures dipped during a period known as the Little Ice Age, which lasted approximately from 1300 to 1900 AD.[11]

Figure 1: Comparison of Model Temperature Projections

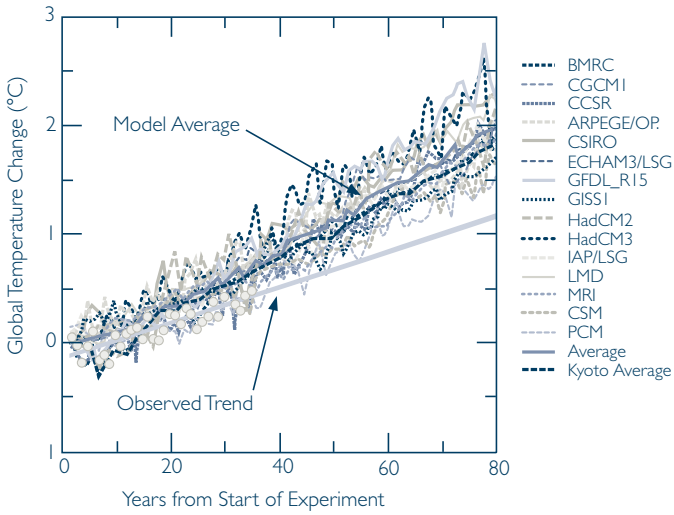
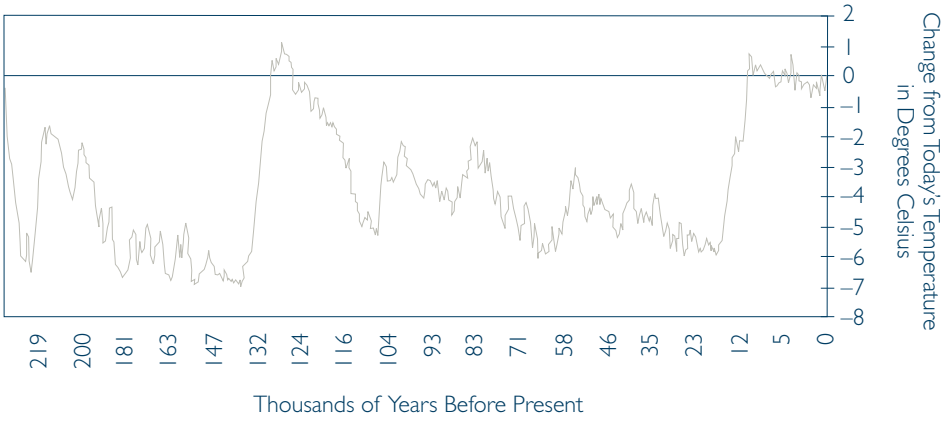


Figure 2: Vostok, Antarctica Ice Core Temperature Record



As we emerge from this cooling period, it is natural that our temperature is somewhat higher than in the immediate past.

On an even longer scale, researchers have reconstructed a temperature record covering the last 219,000 years by coring through accumulated ice in Antarctica.[12] In Figure 1, the line across the top represents deviation from today's temperature. By this measurement, you can see our current temperature is within the range of temperatures experienced over the past 9,000 years.

MYTH 3: *The ice caps are melting and sea levels are rising.*

FACTS: According to satellite data, ice coverage over the Arctic (northern hemisphere) has indeed decreased over the last 30 years.[13] However, the Arctic climate reconstructed over the last 125 years shows that ice coverage varies on multi-decade scale. The current period of warming was preceded by a prolonged period of cooling in which ice coverage was much more extensive.[14] Furthermore, the thickness of Arctic Ocean sea ice had remained constant through the 1990s.[15] On the opposite side of the globe, Antarctic (southern hemisphere) ice coverage has *increased* since 1977.[16]

As a whole, glaciers have indeed been retreating since the end of the Little Ice Age in the 1890s. However, for glaciers on which data exist, the rate of retreat has been constant or decreasing for the last 70 years—the time period during which greenhouse gases have supposedly caused unprecedented warming.[17] One comprehensive glacial study concluded that "there is no obvious common or global trend of increasing glacier melt in recent years." This same study reported that in Europe, "Alpine glaciers are generally shrinking, Scandinavian glaciers are growing, and glaciers in the Caucasus are close to equilibrium for 1980-95."[18]

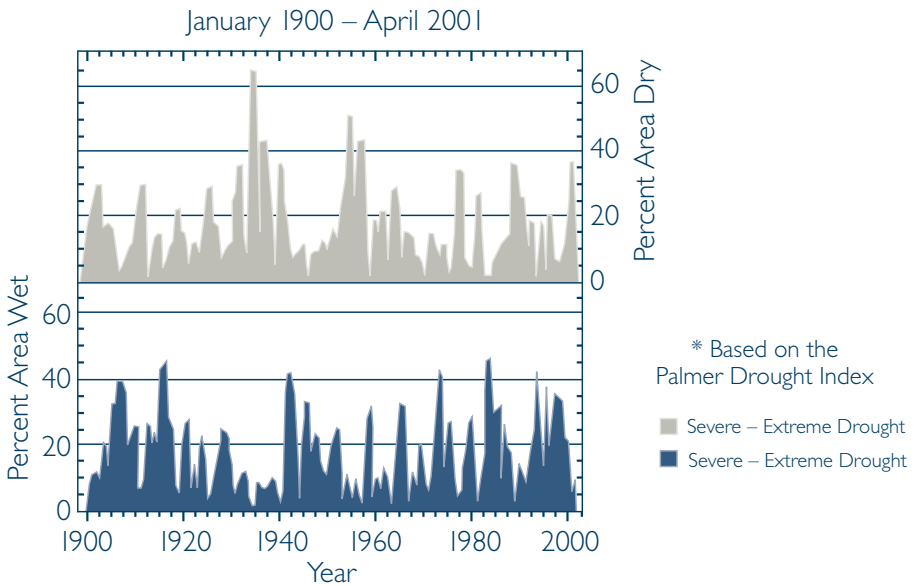
Regarding the issue of rising oceans, the science is still very unsettled. Oceans have risen and fallen extensively over the geologic past, but their current rate of change is still unknown. Australian policy analyst John Daly wrote, "an impression has been conveyed to the public, media, and policymakers that the sea level rise of 18 cm in the past century is an observed quantity and thus open to little dispute. What is not widely appreciated is that this quantity is largely the product of [computer] modeling and not a product of observation. It is therefore very much open to dispute."[19]

Global mean sea level is modeled because measurements are complicated by changes in moon and sun orbital effects, coastline and seabed topography, ocean currents, and meteorological effects of wind and pressure. Furthermore, most tide gauges are next to urban centers, which tend to subside over time due to the weight of the structures and withdrawal of water from underground aquifers. Additionally, most tidal data from the Northern Hemisphere are affected by a natural geologic phenomenon called "postglacial rebound." After the last ice age 10,500 years ago, the earth uplifted or rebounded as ice as thick as 1.3 miles melted away. Areas on the periphery of the ice sheets have in turn sunk as the crust adjusts and rebalances itself—a process that continues today.[20] In tidal gauges from the Southern Hemisphere including Australia, Uruguay, South Africa and India—regions that were not glaciated—sea levels have remained relatively stable.[21]

MYTH 4: *Extreme weather phenomena are increasing due to global warming.*

FACTS: In congressional testimony, David Legates, an expert hydrology researcher, said, "Ascertaining anthropogenic changes to these extreme weather events is nearly impossible. Climate models cannot even begin to simulate storm-scale systems, let alone model the full range of year-to-year variability . . . Clearly, claims that anthropogenic global warming will lead to more occurrences of

Figure 3: U.S. Percentage Area Wet or Dry



Source: National Climatic Data Center / NESDIS / NOAA

droughts, floods, and storms are wildly exaggerated."[22]

The American Association of State Climatologists concurs. According to the Association, "climate predictions have not demonstrated skill in projecting future variability and changes in such important climate conditions as growing season, drought, flood-producing rainfall, heat waves, tropical cyclones and winter storms."[23]

There has been no evidence for an increase in catastrophic hurricanes. Indeed, maximum wind speed in Atlantic hurricanes decreased from 1944 to 2000. After normalizing costs for inflation and population change, researchers have found that the biggest losses in the U.S. due to hurricanes occurred before 1950. "[B]y far the biggest decade during the last active era was the 1940s, where five major hurricanes made landfall in Florida. This contrasts dramatically with the very low activity of the 1970s, 1980s and 1990s."[24]

The occurrence of floods and droughts has also remained stable over the past century as can be seen by the graph to the right from the National Oceanic and Atmospheric Administration.[25] The graph shows the percentage of the U.S. that is either in severe drought or flood every year. These events are cyclical and show no increase in either severity or frequency during the latter half of the 20th century.

MYTH 5: *Global warming threatens fragile ecosystems and may cause threatened and endangered species to become extinct.*

FACTS: Since the end of the last ice age approximately 10,500 years ago, life on earth has been adapting to the warming environment. Ecosystems are necessarily flexible and shift in response to environmental stimulus including climate change.[26] The advance and retreat of various ice ages can be catalogued by the changes in the range of various plant and animal species. Scientists have documented these changes through fossil records, lakebed silt deposits, soil deposits, and other mechanisms.[27] As our climate continues to change, different ecosystems will expand and contract in response.

Plants increase their productivity in response to increased levels of atmospheric carbon dioxide.[28] Furthermore, plants growing in an atmosphere enriched with carbon dioxide show an increase of up to 5°C in their optimal growth temperature.[29] Over the past two decades, NASA satellites have found that the earth has been getting progressively greener. Their study published in *Science* "proposes climatic changes as the leading cause for the increases in plant growth over the last two decades, with lesser contribution from carbon dioxide fertilization and forest species re-growth."[30] This is important for ecosystems because richness is more positively correlated with plant productivity than any other variable.[31]

MYTH 6: *The U.S. Government believes the theory of global warming has been proven and supports capping greenhouse gas emissions.*

FACTS: The U.S. government has invested $45 billion in global warming research over the last decade.[32] Despite the enormous outlay of money, the administration concedes the science is still inconclusive. In a report to the president, the National Academy of Sciences wrote, "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 upward or downward." (pg. 1.)[33]

Due to scientific uncertainty, no U.S. president has endorsed the Kyoto Protocol on global climate change. The Senate has not ratified the Kyoto treaty, citing the economic certainty that our economy will be seriously harmed from regulating greenhouse gases. Meanwhile, the U.S. government has continued funding for climate change research and supporting programs for development and dissemination of clean energy technology.

MYTH 7: *Adhering to the Kyoto Protocol and other carbon dioxide reduction schemes will decrease earth's temperatures.*

FACTS: If global warming is indeed occurring, "According to the world's most advanced climate model, full implementation of the Kyoto Protocol [reducing CO_2 emissions an average of 5 percent below 1990 levels] would avoid only 14/100ths of a degree C of global warming by 2100—probably too small an amount for scientists to detect. Since the United States produces 25 percent of the world's greenhouse gases, U.S. compliance with Kyoto would offset global warming by a hypothetical $^{35}/_{1000ths}$ of a degree C." (pg. 2.)[34]

According to some researchers, it would take 40 Kyoto Protocols to avert any meaningful temperature rise, as projected by the models.[35] Furthermore, the major growth in greenhouse gas emissions will come from developing economies, especially China and India. These countries are exempted from international treaties requiring greenhouse gas reduction, so any action taken by the developed world will be quickly swamped by inaction in third world countries.

MYTH 8: *Adhering to the Kyoto Protocol and other carbon dioxide reduction schemes will be relatively inexpensive.*

FACTS: Carbon dioxide is the inevitable byproduct of burning fossil fuels and therefore any attempt to cap it will result in energy rationing. According to the Energy Information Administration (EIA), fossil fuels supply 70 percent of the U.S.'s electricity and 84 percent of our total energy usage.[36]

The EIA estimated the cost of reducing carbon emissions 7 percent below 1990 levels, as required by the Kyoto Protocol, would be expensive. For the average American, electricity costs would increase as high as 86 percent; gasoline prices could rise 66-cents a gallon; and fuel oil prices would rise as much as 76 percent higher while natural gas prices would rise by as much as 147 percent over baseline.[37] Because energy is such a fundamental part of our economy, the price of manufactured goods and food would also increase. This works out to a total GDP loss of anywhere from $100 billion to $400 billion per year.[38] The people hurt most by rising prices are the poor and elderly living on fixed incomes.

MYTH 9: *Multi-pollutant regulation, which includes both EPA criteria pollutants and greenhouse gases, is an inexpensive, "no-regrets" method for improving air quality.*

FACTS: "During the 30-year period from 1970 through 2000, total emissions of the six principal ("criteria") pollutants EPA regulates under the Clean Air Act decreased 29 percent, while vehicle miles traveled increased 143 percent, total energy consumption increased 45 percent, and coal consumption increased 106 percent. Automobile and equipment turnover will continue to produce substantial air quality improvement under current regulatory law in the foreseeable future."[39]

"CO_2 is neither an 'ambient' air pollutant like NO_x and SO_2, nor a 'hazardous' air pollutant like mercury. It does not foul the air, impair

visibility, contribute to respiratory disease, or bio-accumulate as a toxin in fish."[40]

The EIA estimated the cost of reducing NO_x and SO_2 emissions 75 percent below 1997 levels by 2005 would cost $6 billion. Reducing CO_2 emissions 7 percent below 1990 levels by 2005 would cost $77 billion. If all three emission requirements were coordinated, the total cost would be $77 billion—a savings of $5 billion over their aggregate costs if each requirement were imposed one at a time. However, if the goal is cleaner air, in reality you would have spent $77 billion for SO_2 and NO_x reduction that should have only cost $6 billion to begin with.[41]

MYTH 10: *Renewable energy technology can immediately replace all fossil fuels.*

FACTS: To reach the Kyoto Protocol targets of reducing CO_2 emissions 7 percent below 1990 levels, the U.S. would need to cut fossil fuel use by 15 percent and total energy use by 13 percent.[42] However, only 2 percent of our energy is currently derived from renewable sources (excluding hydropower). If fossil fuels, uranium and hydropower continue to be dismissed by alternative energy advocates, then we must rely on the remaining renewable sources.

To meet the world's energy needs in 50 years, we would need to produce three times the amount of energy currently being made by fossil fuels. One of the main proponents of global warming theory, Dr. Tom Wigley of the National Center for Atmospheric Research, wrote, "Energy sources that can produce 100 percent to 300 percent of present world power consumption without greenhouse emissions do not exist operationally or as pilot plants."[43]

Furthermore, according to Dr. Sallie Baliunas, "[T]he physical laws make the prospect for renewables on a grand scale look dismal: solar and wind energy have enormous environmental footprints. Because they are dilute and intermittent sources, they require great acreage. Their intermittency requires that stable power sources like coal or uranium provide the steady base . . . Biomass power requires frequent clear cutting of areas devoted to growing fast-rotation woody crops . . . Opportunities for power from geothermal sites and landfills are limited, and decline with use."[44]

"Hydrogen fuel cells, often touted as another futuristic renewable, merely carry energy. Fuel cells are not sources of energy. The process of energizing a fuel cell with hydrogen cracked from methane . . . or water requires more energy than returned from use of the fuel cell."[45]

Alternative energy will continue to be developed and play an important, if small role, in diversifying our energy resources. However, "[s]olar, wind and biomass energy cannot be counted on to provide the timely, reliable, inexpensive electricity resources the U.S. needs."[46]

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