

48. Global Warming and Climate Change

Congress should vote down any legislation restricting emissions of carbon dioxide, the principal human “greenhouse” emission related to global warming.

In October 2003, the Senate voted down a bill (S. 139), sponsored by John McCain (R-AZ) and Joseph Lieberman (D-CT), whose purpose was to limit emissions of carbon dioxide, because of its role in alteration of the earth’s surface temperature. Scholars accurately labeled this legislation “Kyoto Lite,” because of its strong resemblance to the Kyoto Protocol to the United Nations Framework Convention on Climate Change.

The Kyoto Protocol would have required the United States to reduce its emissions of carbon dioxide to 7 percent below 1990 levels for the period 2008–2012. Because of increases in emissions since 1990, this works out to roughly a 30 percent cut, a dramatic lowering that cannot be accomplished without major infrastructural changes. S. 139 delays the implementation time eight years, to 2016.

The Kyoto Protocol has never been ratified by the required two-thirds majority in the Senate. But S. 139, requiring only a simple majority, was defeated by a relatively narrow margin, 55–43. Sen. McCain has vowed to reintroduce this legislation at regular intervals, citing his perseverance with the McCain-Feingold campaign finance bill as the model for his activity.

The 109th Congress is likely to be confronted by increasing pressure to pass such legislation. It should be resisted.

Background

Global warming—meaning an alteration of the planetary temperature by human activity—was largely brought to public attention in the hot,

dry summer of 1988. National Aeronautics and Space Administration research scientist James Hansen testified in a joint House-Senate hearing that there was a “cause and effect relationship” between “the current climate and human alteration of the atmosphere.”

Since that landmark testimony, there have been remarkable developments in climate science, many of which have yet to exert their proper influence on climate policy. Many of those changes have taken place since the publication of the widely cited Third Assessment Report of the United Nations’ Intergovernmental Panel on Climate Change (IPCC) in 2001.

This chapter first provides an overview of the state of climate science. It will become clear that much more is known about global warming than is generally perceived, and that the most consistent interpretation of that knowledge is that expensive regulation of carbon dioxide is simply not warranted by science. The remainder of the chapter is concerned with aspects of global warming that engage political discussion. Those include whether or not humans are warming the surface temperature, what the related changes in weather are, what the amount of future warming is likely to be, and whether it is of sufficient magnitude to justify the enormous expenses required to prevent it.

The strongest evidence for human “greenhouse” warming is based on recent observations of a disproportionate increase in temperature in cold, dry air, especially in the winter. For over a century, climate theory has predicted that a change in the greenhouse effect—caused by the addition of atmospheric carbon dioxide—would be expressed in this fashion. As shown in Figure 48.1, warming in the last quarter of the 20th century indeed tended to be amplified in the winter, and in dry regions, such as interior Asia and North America.

Warming May Be Overestimated by Surface Thermometers

While the overall pattern of recent warming indeed resembles what one would expect from an increase in atmospheric carbon dioxide, the magnitude of that warming may be overestimated. The temperature trends shown in Figure 48.1 are from the United Nations Intergovernmental Panel on Climate Change (2001 and updates). They have been the subject of much debate concerning the amount of “artificial” warming that they might contain. Cities, for example, tend to grow around the location of their weather stations, which initially tended to be at centers of commerce. Warming because of urban sprawl has little to do with global warming caused by industrial emissions of greenhouse gases.

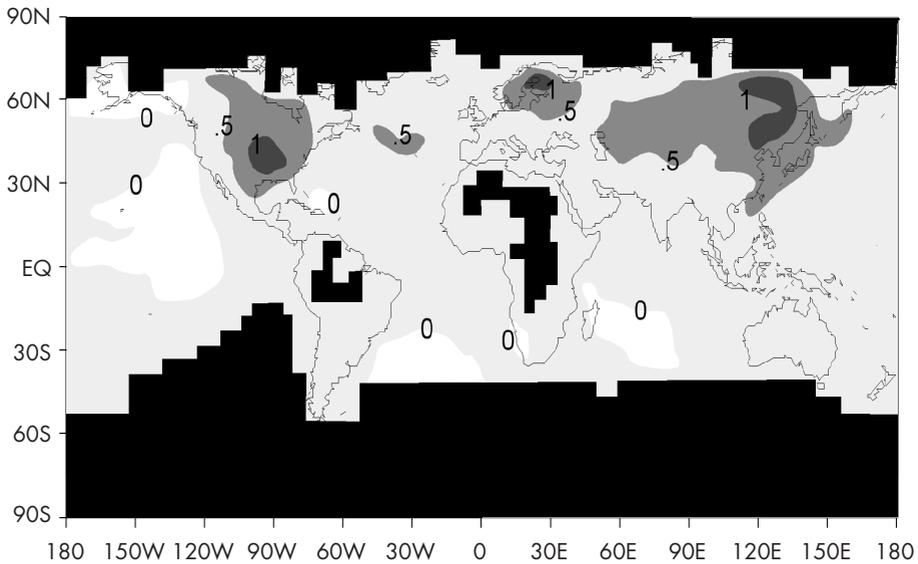


Figure 48.1

Cold season temperature trends ($^{\circ}\text{C}/\text{decade}$) from 1977 to 2000 in the surface temperature record (black regions indicate a lack of available data).

Kalnay and Cai (2003) compared temperatures calculated from weather-balloon measurements of the atmosphere to a ground-based thermometer record that is quite similar to the IPCC's and found a pervasive warm bias in U.S. temperatures. Figure 48.2 applies that bias to the 100-year-long U.S. history. The bias is so large that it removes any statistically significant warming from the record. Kalnay and Cai attributed the effect to large-scale changes in land use, including urbanization and land-cover alterations, such as changing from forests to farms.

Michaels et al. (2004) and McKittrick and Michaels (2004) examined the geographic distribution of the IPCC's temperature trends and found that these more local "economic" effects were more related to warming than were changes in the greenhouse effect, with the exception of the aforementioned dry regions in the cold season, where the human "signal" still remains.

There are other records of temperature—one from satellites, another from weather balloons—that tell a different story than the IPCC surface record. Neither annual satellite nor balloon temperature trends differ significantly from zero since the satellite record started in 1979. These records reflect temperatures in what is called the lower atmosphere, or roughly between 5,000 and 30,000 feet.

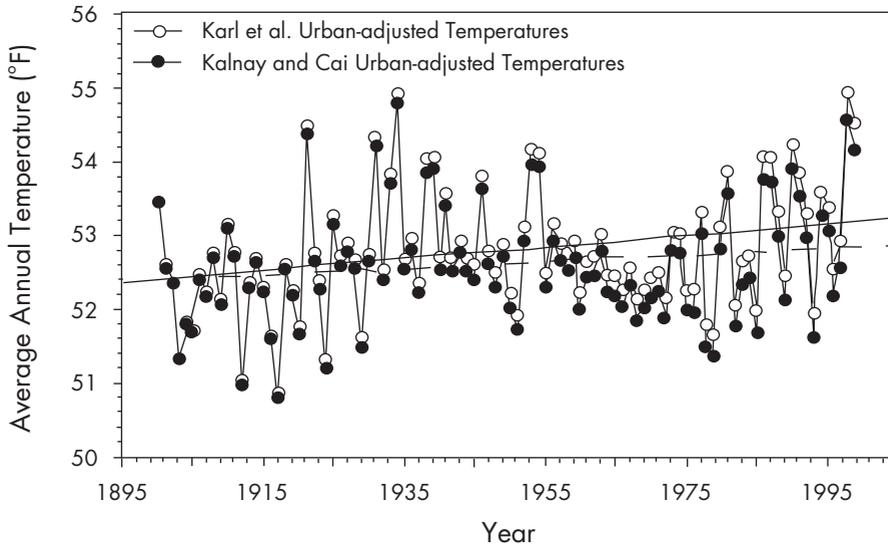


Figure 48.2

The U.S. annual temperature history (open circles) with warm urban bias removed (filled circles).

Four years ago, a distinguished panel of the National Academy of Sciences (NAS, 2000) concluded there is a real disparity between the reported surface warming and the temperature trends measured in the atmosphere above. Since then, many investigators have tried to explain the cause of the disparity while others have denied its existence. Recently, Douglass and others (2004) examined a third record, from seven feet above the ground, derived from balloon data released by the National Oceanic and Atmospheric Administration.

When all of those records—the weather balloon data from the lower atmosphere, from seven feet, from the satellites, and surface thermometers from the IPCC—are compared, the one that differs most from all of the others is the IPCC record. While this is not dispositive proof, it lends credence to the hypothesis that the IPCC record is contaminated with a significant amount of “artificial” warming, even as the pronounced warming of the Northern Hemisphere land areas in the winter is a “greenhouse” signal of human-induced change.

Related Climate Changes and Their Effects

As noted above, with an enhanced greenhouse effect, *warming is much greater in the winter than in the summer*. Since World War II, observed

warming is twice as great in winter as it is in summer. In the winter, three-quarters of the total warming is in the frigid air masses of Siberia and North America. Figure 48.3, from the National Oceanic and Atmospheric Administration (Tinker, 1999), shows how dramatic this effect is in the lower 48 states. The largest warming in the last three decades occurs in winter (January through March), when severity and presence of the cold high-pressure systems that form in northwestern North America largely determine the winter departure from normal. Late summer and early fall determine the winter departure from normal. Late summer and early fall temperatures actually show a slight decline.

Temperature Variability Is Decreasing, Not Increasing

Logically, a world in which the winters warm much more than the summers is one in which temperature variability declines. That’s because day-to-day temperature changes are greatest in the winter, so making the atmosphere less “winter-like” (which is the main “greenhouse” signal) implies less variability.

No Increase in Overall U.S. Floods or Droughts

Despite popular perception, there is no statistically significant increase in flooding rains or drought on a nationwide basis (Figure 48.4).

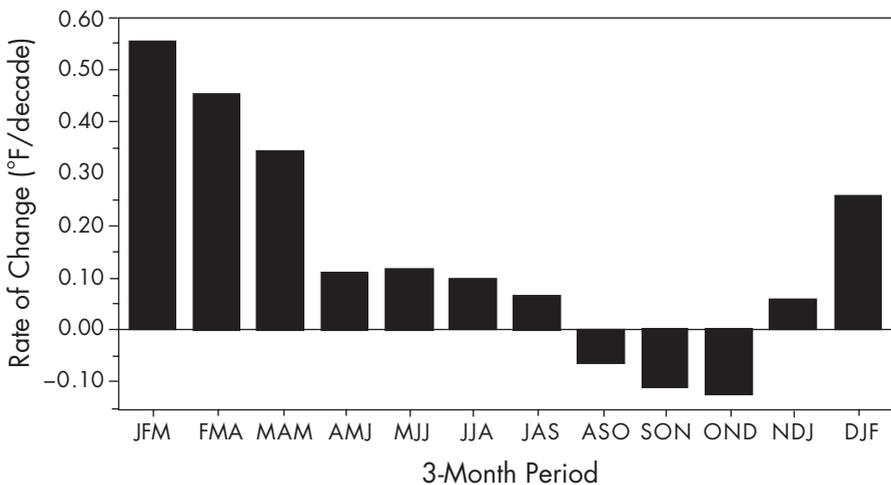
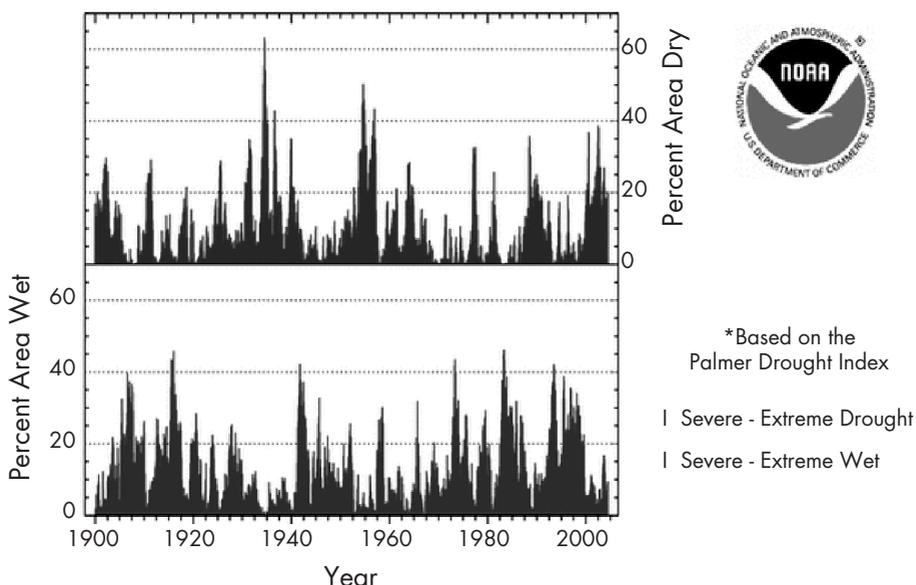


Figure 48.3
Seasonal changes since 1966 in the U.S. record, according to the U.S. National Oceanic and Atmospheric Administration.



National Climatic data Center / NESDIS / NOAA

Figure 48.4

Historical record of the percentage of the United States that is experiencing either extreme dry conditions (top) or extreme wet conditions (bottom), January 1900–July 2004.

Hurricane Frequency and Severity

Hurricanes, known generically as tropical cyclones, are the most destructive storms on earth. Figure 48.5 shows that there is no overall trend in their frequency in the Atlantic and Caribbean basin, the source for U.S. storms. While recent years have seen quite a lot of storms, they are no different than the regime that was dominant in the 1940s, 1950s, and 1960s. Similar results obtain on a worldwide basis. Perhaps more interesting, as shown by Landsea et al. (1996), is that maximum winds in these storms, as measured by hurricane-hunter aircraft, have declined significantly in the last 50 years.

Heat-Related Mortality Is in Decline in American Cities

In its Second Assessment Report on climate change, the IPCC made a statement that is often repeated in discussions of global warming and heat-related mortality.

[Based upon data from several North American cities], the annual number of heat-related deaths would approximately double by 2020 and would increase several fold by 2050.

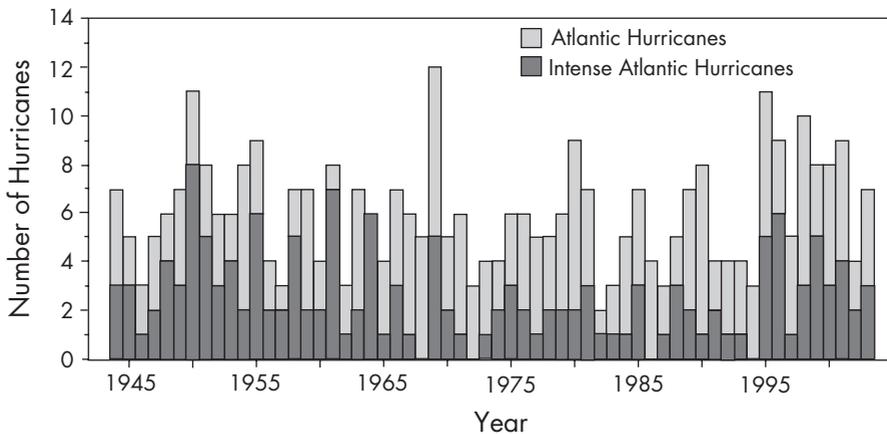


Figure 48.5

Number of hurricanes (and intense hurricanes) in the Atlantic Ocean basin, 1944–2003.

In other words, the IPCC assumed that, as cities warm, people would slowly accept increasing mortality and die in higher numbers as a proportion of the population. In fact, cities have, in general, been slowly warming, without the influence of “global” warming, as their infrastructure, especially masonry and pavement, serves to retain heat more than the vegetated countryside.

So, in reality, we have been conducting a long test of the hypothesis that people do not adapt to changing conditions. I tested this with my colleague Robert Davis and others (2002, 2003). We found that, in almost all North American cities, population-adjusted heat-related mortality is declining significantly because the “threshold” temperature at which people begin to die is rising. In other words, people are adapting and increasingly prospering in slowly warming cities, contrary to the way the United Nations believes they would behave.

Together, the behavior of climate and its impact in these important areas—means, seasonality, droughts, floods, hurricanes, and mortality—indicate that the warming that has occurred cannot glibly be claimed to be harmful; in fact, the evidence indicates the opposite.

Future Warming

One of the most overlooked facts in the vociferous discussions of global warming is that we know, to a very small range of error, how much the planet will warm in the foreseeable future, and that number is reassuringly

small. It also provides yet another example of the inaccuracy of IPCC climate science.

Over the next 50 years, the IPCC gives a probable range of warming of 0.9 to 4.5°F; the observed warming of the last 100 years has been 1.4°F. Unless around \$10 billion in climate science research has been virtually wasted, this range is a gross overestimate.

The response of temperature to a change in carbon dioxide begins to drop off with time. So, in order to simply maintain a constant rate of temperature rise, computer simulations of climate must add carbon dioxide to the atmosphere at an ever-increasing rate. This combination results in a constant temperature rise, rather than the feared “runaway greenhouse effect.”

Figure 48.6 shows projected warming from a large family of different climate models called the CMIP-1 study (Meehl et al., 2000). Note that

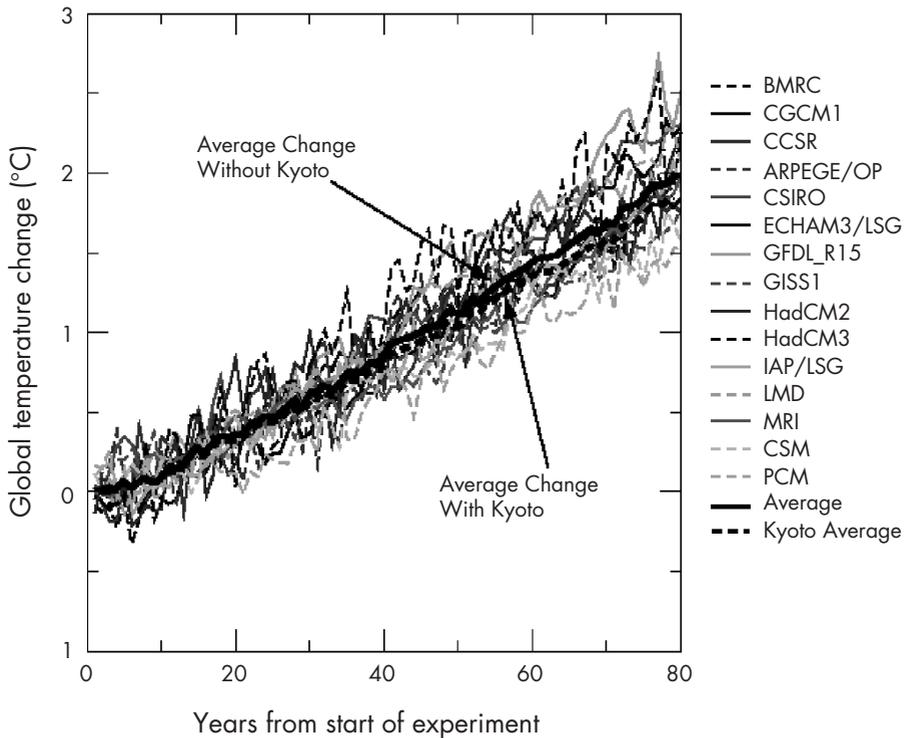


Figure 48.6

Output from several representative climate models. Once warming starts, it takes place at a constant rate. The model average is highlighted, as is the effect of full compliance with the Kyoto Protocol.

the central tendency indeed is to produce a constant rate of warming once human-induced warming begins.

Which of these models is likely to be correct? Global surface temperature has risen as a straight line, too, in the last three decades. Figure 48.7 shows the observed trend superimposed on the model projections of Figure 48.6.

How Much Warming Would Kyoto Prevent?

Soon after negotiating the Kyoto Protocol in December 1997, the Clinton administration asked federal scientists how much warming would be prevented. The answer, which was ultimately published in the journal *Geophysical Research Letters* (Wigley, 1998), is $0.07^{\circ}\text{C}/50$ years, which is far beneath the natural level of interannual global temperature variability. In other words, it will be impossible to find the effects of the protocol on global temperature. Nonetheless, because of restrictions on emissions trading that were imposed by several European nations in November 2000,

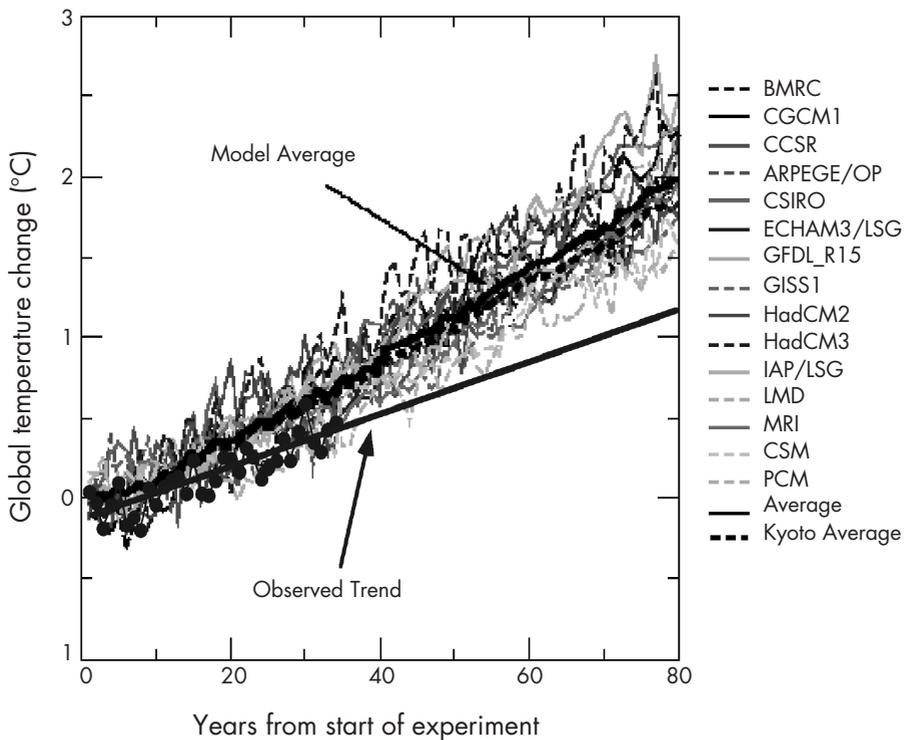


Figure 48.7

The linear temperature trend extrapolated from observed temperatures during the past three decades is lower than the projections of most climate models.

the cost to the United States of the protocol would be approximately 2 percent of GDP per year. As shown by Nordhaus (2001), this forces the economic burden of Kyoto to fall almost exclusively on the United States.

In short, Kyoto would do nothing about global warming but would cost America dearly.

Conclusion

In conclusion, several lines of evidence all point to the likelihood that warming in the next century is likely to be modest, and all evidence demonstrates that Kyoto will have no measurable effect on that warming. But the Kyoto Protocol is enormously expensive, reducing the amount of capital that can be invested in evolving and increasingly efficient technologies.

It is an inescapable conclusion that the Kyoto Protocol, or other similar instruments (such as S. 139), is precisely the wrong thing to do about global climate change.

Suggested Readings

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