



“Censorship” and the Uncertain Science of Climate Change

By Samuel Thernstrom

The Bush administration omitted any discussion of global climate change from the EPA's draft report on the state of the environment, initiating a political debate that obscured the real scientific facts. While average global temperatures rose slightly during the twentieth century, we do not have sufficient evidence to know definitively whether that rise was man-made or natural. A realistic, unbiased assessment of the state of climate change science is essential to formulating sound policy on this important issue.

“What the White House doesn’t want you to know about global warming” was the plug CNBC used to introduce its story about the news that the *New York Times* had broken that day: The White House had heavily edited the global climate change section of the Environmental Protection Agency’s draft report on the state of the environment. Notably absent after the editing was any reference to the National Research Council (NRC) report that was conducted at the president’s request in 2001. EPA staff—joined by outgoing Administrator Christine Todd Whitman—balked at the White House’s work. Whitman eliminated that section of the report altogether rather than publish the “pabulum” that her staff and the White House had been able to agree upon, she told the *Los Angeles Times*.¹

So the federal government’s assessment of the state of our environment contains no information

about an issue on which it spends \$4.5 billion annually—and which we have, for more than a decade, considered a “common concern of humankind,” as the 1992 United Nations Framework Convention on Climate Change put it.²

This, surely, was the low point in the Bush administration’s handling of this subject. While rejecting the Kyoto Protocol and refusing to impose mandatory limits on greenhouse gas emissions from power plants were more controversial, even critics would admit that those actions were consistent expressions of administration policy—understandable, if debatable. With this latest turn of events, however, the president’s goal of crafting a new approach to climate change seems to have succumbed to internal divisions so deep that the administration became literally unable to say anything about an issue that all parties—regardless of where they stand in the debate—recognize as one of the leading global environmental issues. Even the president’s most ardent supporters must wonder why the administration cannot even discuss this topic in its report on the state of the environment.

And for those who were puzzled, the administration offered various explanations. In contrast to Whitman’s “pabulum” charge, White House Council on Environmental Quality chairman James L. Connaughton had a different interpretation: “Ultimately, E.P.A. made the decision not to include the section on climate change because we had these ample discussions of the subject already,” he told the *New York Times*.³ In other words, there was just

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nothing left to say. The administration, it seems, had simply talked itself into a state of climate exhaustion.

Silence Begets Suspicion

Whatever the reasons, one fact is indisputable: the Bush administration *did* silence itself by publishing its report on the state of the environment without including any discussion of global climate change data, trends, science, technology, policies, or goals. (Instead, the report covered just one global environmental issue, stratospheric ozone depletion.) Largely unnoticed by critics, however, is the fact that the censorship cut two ways. While the White House stopped EPA from publishing references to studies such as the 2001 NRC report, EPA also prevented the White House from discussing work such as a recent report by Sally Baliunas and Willie Soon that provides credible evidence that recent warming is not as unusual as environmental activists claim.

Whether this was truly “censorship” is certainly questionable, but the end result was the same—silence, rather than information, and greater public suspicion rather than understanding. But it is certainly wrong to assume, as activists and the media did, that the White House’s involvement in the report was necessarily inappropriate. In fact, a stronger case can be made for the opposite view: the White House’s error was its failure to assert its right to articulate its position on climate change. A report of this sort, covering an issue that involves multiple agency jurisdictions, is typically treated as a forum in which to state administration policy—a consensus approach that integrates the perspective of the involved agencies. Naturally, the White House usually crafts these statements of policy—such as, for example, the annual *Economic Report of the President*. In fact, for many years just such a report was issued annually by the White House’s Council on Environmental Quality. So it is hardly inappropriate for the White House to be involved; the only unusual aspect of this case was that the White House allowed Administrator Whitman to silence the entire administration on such a significant issue.

On the other hand, fault can certainly be found in the manner of editing that the White House reportedly engaged in. While it had a responsibility to use this report to articulate administration policy, there was certainly no need to suppress discussion of credible scientific reports—particularly a report that had been conducted by a blue-ribbon panel at the president’s request—in order to do so. Regardless of what agency published the report,

one thing is clear: it was a lost opportunity to examine the state of the science, economics, and public policy questions related to global climate change. And a look at what *was not* discussed reveals how constructive a review of the data could have been.

Instead, we were treated to a classic Washington media circus, which shed plenty of heat but little light. When the inevitable EPA staff leak reached the *New York Times*, national news anchors, reporters, columnists, and environmental advocates bemoaned the White House’s censorship. CNN compared the beleaguered EPA scientists to Galileo’s persecution at the hands of flat-earthers (forgetting that Galileo’s sin was discovering that Earth orbits the Sun, not that it is round), and warned ominously that “so far nobody’s gone to jail for saying that” industry is “at least in part to blame” for global warming.⁴ The implication was clear: “So far” nobody’s been jailed for speaking truth to power, but that’s coming soon. Editorial writers lambasted the administration’s “censorship” and “revisionist history” conducted by “know-nothing underlings” that covered up “inconvenient truths.”⁵ Cartoonists, of course, had a field day: The *Palm Beach Post* showed readers the EPA report before (“As for global warming, the news isn’t good when it comes to the future for you and your family”) and “after it was edited by the Bushies” (“Global warming . . . is good . . . for you and your family”).

Global warming activists, while mustering genuine outrage for media interviews, must have been delighted. If they had written the EPA report themselves, they could hardly have done a better job of convincing the public that the scientific consensus on global warming is overwhelming. Scientists, we were to believe, had proved that man-made climate change is destroying the earth—only to be silenced by the Galileo-persecuting Bush administration.

And that, by and large, is where the media left the matter. Left largely unexamined was the information that had been covered up. What *was* it that the White House did not want us to know? And what was the pointless “pablum” that Christie Whitman refused to dignify with publication? Driven by the immediacy of the daily news cycle, TV and newspaper reporters asked the question, but did not answer it, falling back instead on the easy assertions of advocates: If the report was so damning that it had to be suppressed, it must have shown that human-induced global warming is certainly happening.

Fundamental Uncertainties

Here is the dangerous truth that had to be silenced: The suppressed reports show clearly that the science of predicting global climate change is a fiendishly complex matter, plagued by tremendous uncertainties in data, models, assumptions, and understanding. Although the 2001 NRC report concluded (in a widely quoted passage) that the recent, slight rise in global average temperatures is “likely mostly” caused by humans, it also acknowledged (in rarely quoted passages) significant reasons to doubt those findings. Indeed, some recent studies have strongly reinforced those doubts. Distinguished scientists and economists continue to debate many fundamental facets of this complex issue.

And that, it appears, is the simple truth of the matter. Both sides marshal strong arguments, but none are decisive. All we can be truly certain of, given the limits of data and models, is that it is impossible to draw definitive conclusions about what drives long-term global climate change, and what influence humans have on that process. Global warming skeptics have strong evidence to support their arguments; global warming advocates claim that the majority of scientists support their position—although scientific truths can hardly be determined by merely counting heads on either side of an argument. In any case, it seems there is more than enough evidence to support various theories—sometimes convincingly—but not nearly enough to prove much of anything. Given the high political and economic stakes in this debate, advocates tend to slant the picture they paint strongly to one extreme or the other, leaving the public with little sense of the enormous middle ground: the possibility of man-made climate change is a genuine concern, but far from a proven reality. Billions of dollars are spent annually researching these questions (\$1.7 billion each year in federal funds alone) but so far only producing tentative conclusions, limited by large uncertainties.

Is that conflicted picture “pabulum”? Whatever value judgment one puts on it, it is the reality of climate change science today. And given the persistence of these vast uncertainties in the science, the most counterproductive approach to the problem we could take is to ignore or even disguise those uncertainties. The challenge, in fact, is to embrace that uncertainty—to accept it, and find ways to craft policy despite it—not to deny it. Yet the one thing that advocates, politicians, and the media abhor is uncertainty and complexity. Until all sides in the climate change debate can agree on

some basic facts—what is known, what is not known, and what needs to be known to draw meaningful conclusions—we can have little hope of reaching greater consensus on the thorny policy issues.

And in fact, a plain reading of two of the key studies that the White House and EPA deadlocked on is quite revealing. Far from being a settled matter, as environmental activists claim, both reports—even the one that the White House did not favor—are quite clear about the extent of the remaining uncertainty, and the importance of focusing on that uncertainty rather than disguising it.

Take the 2001 NRC report, for instance. Although media reports described it as supporting the theories of environmental advocates, its findings are actually quite delicately balanced: The NRC concluded that the slightly warmer temperatures of the last several decades “are *likely mostly* due to human activities,” but science “cannot rule out that some significant part of these changes is also a reflection of natural variability” (emphasis added). In fact, it is difficult to determine just how much warming is normal (or not) because “the range of natural climate variability is known to be quite large.”⁶

And the NRC reminds us that there are other fundamental uncertainties as well. There is a “wide range of uncertainty inherent in current model predictions of global climate change” that can only be reduced by “major advances in understanding and modeling” of greenhouse gas emissions, the role of aerosols in the global climate system, and the incredibly complex “feedback” mechanisms in the Earth’s climate.⁷

In fact, it seems the only constant in climate history is change—continuous change, in varying ways at various times, collectively spanning a very broad range of temperatures. What causes these changes is unclear. Temperatures have been warmer than now, and greenhouse gas concentrations higher—but which caused which remains uncertain. As the NRC wrote, “climate is continually varying [naturally] on time scales ranging from seasons to the lifetime of Earth.”⁸

The range of natural climate variability is known to be quite large (in excess of several degrees Celsius) on local and regional spatial scales over periods as short as a decade. Precipitation also can vary widely. For example, there is evidence to suggest that droughts as severe as the “dust bowl” of the 1930s were much more common in the central United States during the 10th to 14th centuries

than they have been in the more recent record. . . . It is more difficult to estimate the natural variability of global mean temperature because of the sparse spatial coverage of existing data and difficulties in inferring temperatures from various proxy data.⁹

In fact, we cannot determine whether the warming we have seen is natural or man-made; whether the evidence stacks up on one side or another depends on what set of assumptions one makes about different aspects of the climate system. When asked the bottom-line question—*are greenhouse gases causing climate change?*—the NRC admitted that no one could say for sure:

Whether [the warming of the last twenty years] is consistent with the change that would be expected in response to human activities is dependent upon what assumptions one makes about the time history of atmospheric concentrations of the various forcing agents, particularly aerosols.¹⁰

There is no question that average surface temperatures have risen somewhat in recent years; the question is whether they have risen more than might be expected naturally. As climatologists have noted, we may still be emerging from the tail end of the Little Ice Age, so warming that is occurring now may simply be natural recovery from that period of cooling. It is hard to know, though, because we do not have reliable, precise temperature data that is more than a few hundred years old—and we know that natural temperature variations extend across thousands of years or more. We know the general range of natural climate variability is enormous, but it is hard to accurately assess changes over relatively short time periods. The most reliable data—actual, direct temperature measurements—go back only to 1861. To study earlier climate history, scientists use elaborate (and inherently uncertain) methods to try to reconstruct the temperature record. Even that only offers limited results. As the NRC report explains:

The [temperature] data become relatively sparse prior to 1600, and are subject to uncertainties related to spatial completeness and interpretation making the results somewhat equivocal, e.g., less than 90% confidence. Achieving greater certainty as to the magnitude of climate variations before

that time will require more extensive data and analysis.¹¹

Despite its oft-quoted “likely mostly” conclusion mentioned earlier, the NRC was also quite clear in expressing the extent of the uncertainty remaining in the science when it comes to assessing the influence of humans on the climate.

Because of the large and still uncertain level of natural variability inherent in the climate record and the uncertainties in the time histories of the various forcing agents (and particularly aerosols), *a causal linkage between the buildup of greenhouse gases in the atmosphere and the observed climate changes during the 20th century cannot be unequivocally established.* 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 the model simulations could be deficient in natural variability on the decadal to century time scale.*¹² (emphasis added)

In fact, in recent years, important work has been done comparing the predictions that models have made about warming that should have already occurred with actual observations. The NRC report looked at the evidence that was available in 2001 and concluded that, in fact, the models had overestimated warming.

The warming that has been estimated to have occurred in response to the buildup of greenhouse gases in the atmosphere is somewhat greater than the observed warming.¹³

That is one critical question—how much warming can we expect from a given level of emissions? Equally critical, and perhaps equally difficult, is predicting what global emissions will be over the course of the next century or more, given the vast range of dubious assumptions that have to be made about levels of economic growth, technological development, and so forth, in every country of the world, over very long time periods. Again, however, we can test the accuracy of predictions by comparing them to actual emissions today. When the NRC examined the track record of the International Panel on Climate Change in this regard, it found little reason to trust the panel’s accuracy:

There are large uncertainties in [the IPCC's] underlying assumptions about population growth, economic development, life style choices, technological change, and energy alternatives. . . . Scenarios for future greenhouse gas amounts, especially for CO₂ and CH₄, are a major source of uncertainty for projections of future climate. . . . The period of record is now long enough to make it useful to compare recent trends with the scenarios. . . . *The increase of global fossil fuel CO₂ emissions in the past decade, averaging 0.6% per year, has fallen below the IPCC scenarios. The growth of atmospheric CH₄ has fallen well below the IPCC scenarios.*¹⁴ (emphasis added)

Indeed, more recent studies confirm that the IPCC overestimated the level of greenhouse gas emissions humans are likely to create in the rest of this century, and may also overestimate overall population growth, economic growth, technological progress, and other factors that drive aggregate greenhouse gas emissions.

Ian Castles, the former head of Australia's national office of statistics, and David Henderson, a former chief economist of the Organization for Economic Cooperation and Development, have developed a powerful critique of the IPCC's methodology for projecting future greenhouse gas emissions. Their conclusion: the economic assumptions the IPCC used (basing its future GDP calculations on currency exchange rates, rather than purchasing power parity) grossly overestimated future emissions. Like the NRC, they also compared the IPCC's track record at projecting global emissions with the actual emissions of the last decade. The results are quite damning: The IPCC expected global carbon dioxide emissions to rise by about 15 percent in the 1990s—which turns out to be more than twice the level (roughly 6 percent) that emissions actually grew during that period. The IPCC's estimates of methane emissions in the developing world appear similarly off-base.¹⁵

Although critics may well dispute Castles and Henderson's work (the IPCC itself is reviewing it now), at the very least it vividly demonstrates the difficulty of making reliable, long-term projections about such complex matters, and the degree to which outcomes are driven by the assumptions that are used to construct complex forecasting models.

While the White House is at fault for refusing to allow the EPA to discuss the 2001 NRC report, EPA scientists similarly have a lot of explaining to do over their

reported refusal to allow the White House to include references to the recent work by Willie Soon and Sally Baliunas of the Harvard-Smithsonian Center for Astrophysics. Their study takes up a central claim of environmental advocates, that the warming observed in the twentieth century was historically unprecedented, and therefore must have been man-made (or at least human-influenced). In fact, studies that Soon and Baliunas reviewed found "strong evidence that the climate of the 20th century was not unusual, but fell within the range experienced during the past 1,000 years" during, for instance, a period known as the "Medieval Warm Period."¹⁶

While time and space constraints here do not permit a thorough review of the evidence Soon and Baliunas present for their findings, or the possible natural explanations for these temperature variations, a few salient points about their study—and criticisms of it—are worth making.

Not surprisingly, this study immediately came under attack from environmental advocates, who reportedly proposed a boycott of the scientific journals that published it. The Cox News Service breathlessly reported that the "foes of global warming theory have energy ties"—although it would have been equally accurate to headline its article, "Foes of global warming theory have prestigious academic and governmental ties." The authors' crime was being affiliated with a nonprofit organization that accepts some funding from the petroleum industry—illustrating what the news service called "a three-way intersection of money, science and policy." Readers are left to themselves to judge the nature of that "intersection," but to Cox the inference is clear: the money must be guiding the science, not vice versa. For anyone who did not get the message, however, the news service found someone to spell it out: Ross Gelbspan, a former reporter for the *Boston Globe* and author of a book criticizing climate skeptics, told the news service that Soon and Baliunas's work offered only "contradictory statements of a tiny handful of discredited scientists, funded by big coal and big oil, [which] represent a deliberate—and extremely reckless—campaign of deception and disinformation."¹⁷

Strong charges to make—but do they bear up? The real question, of course, is not what organizations Soon and Baliunas are affiliated with—since their academic credentials are unimpeachable—but rather whether their work is scientifically rigorous and objective. When critics attack the funding behind a work rather than its findings,

it suggests that perhaps there is no discernable flaw in the study itself. Such seems to be the case here. For one thing, as the authors would presumably admit, the Soon and Baliunas study is not truly a work of original scientific research, in the sense of conducting experiments and so forth, which presumably might offer opportunities for mischief in the recording or interpretation of data. Their study, in fact, does not represent the “contradictory statements of a tiny handful of discredited scientists”—it is a review of more than 200 other top-notch scientific studies of the climate record; rather than drawing their own conclusions about their own data, Soon and Baliunas report on what the preponderance of other scientists have discovered. (The original research conducted by those scientists was presumably unaffected by the nefarious “intersection” of money, science, and politics.)

And here is what Soon and Baliunas found when they reviewed the literature:

- Of the 124 studies that examined the issue of whether or not there was a “Little Ice Age” between 1300 and 1900 A.D. (which Soon and Baliunas believe we are still emerging from, providing a natural explanation for recent warming), 122 found evidence “confirming the existence of the Little Ice Age.”
- Of the 112 studies that examine the Medieval Warm Period (between 800 and 1300 A.D.), 103 showed evidence of such a period, while only 2 did not and 7 were equivocal.
- Of the 102 studies that looked at the twentieth century temperature record to determine whether it showed unusually extreme warming, only 3 concluded that it did. Sixteen produced equivocal results, and 79 identified fifty-year-long periods of time that were warmer than any equivalent period in the century, suggesting that recent warming is not particularly unusual.¹⁸

In the month after the EPA environmental quality report was issued, controversy about the Soon-Baliunas study grew, with climate change activists mounting an extraordinary campaign to discredit their work and pressure the journal that published it to rescind its endorsement of the work. The newly appointed editor in chief of the journal resigned, although his decision seems to have been driven more by internal management issues than

over principled or practical objections to the Soon-Baliunas study. But activists seized upon this as evidence that the intersection of science and politics had driven him from his post. Lost in the furor was any serious examination of the merits or flaws of the study itself. Once again, controversy succeeded in overshadowing science.

The federal government is redoubling its efforts to reduce the uncertainties in our understanding of the global climate and develop a science-based policy, but with each new chapter in this debate it becomes increasingly clear that politics—from all sides—will continue to obscure the facts that should be driving the debate. (That, of course, is the lesson of the administration’s handling of the EPA report: At the end of the day, although the report presented compelling evidence that environmental quality is improving in America, media accounts focused almost exclusively on the controversy over the climate change section, largely ignoring the substantive findings of the report.)

Facing Up to Limited Knowledge

When all is said and done, the climate change debate boils down to a few simple facts: We know that average global temperatures rose somewhat during the twentieth century. We know that atmospheric greenhouse gas concentrations also rose, and will continue to rise in the years ahead. There may well be a relationship between those two facts—but there may not be, or the relationship may be slight. We know that the Earth’s climate varies considerably without any human influence—and so do greenhouse gas concentrations in the atmosphere. Which one causes the other—or how much—remains somewhat unclear. Although many scientists believe that recent warming is the result of—or at least influenced by—human actions, there is also evidence that recent warming could be no more than a century-long emergence from a 600-year-long ice age. Given the range of natural climate variability in the temperature record, and the limitations of the precise data in that record, it is hard to make more certain conclusions.

The one thing all parties should be able to agree upon, however, is the importance of understanding what we know for certain and what remains to be proven. Without an honest and accurate assessment of the state of our knowledge, there can be no real hope of making sound climate change policy; we are not likely to answer questions that are left unasked. Ironically, the politically

unpalatable National Research Council understood this clearly:

[A] thorough understanding of the uncertainties is essential to the development of good policy decisions. . . . Climate projections will always be far from perfect. Confidence limits and probabilistic information, with their basis, should always be considered as an integral part of the information that climate scientists provide to policy and decision makers. Without them, the IPCC [Summary for Policymakers] could give an impression that the science of global warming is “settled,” even though many uncertainties still remain. . . . 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.¹⁹

Environmental activists believe efforts to address the remaining uncertainties in climate change science are nothing more than a way to delay mandatory greenhouse gas emission limits by revisiting questions that have already been long ago “asked and answered,” as the Natural Resources Defense Council’s climate change science director recently told the *Washington Post*.²⁰ They could hardly be more wrong. As the NRC’s 2001 report said:

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. In the process, we will better define the nature of the problems and ensure that the best possible information is available for policy makers.²¹

The irony of this episode is that it was not the scandalous cover-up the media portrayed it as; it was a tragedy of lost opportunity. Faced with a rich occasion to develop an honest dialogue about the complexities of the science and challenging economics of climate change, the White House chose silence. This administration, already subject to frequent partisan (and even some bipartisan) criticism on every aspect of its climate change policies, needs to

articulate as clearly and as frequently as possible its understanding of this issue—what we know, what we do not know, where the latest research is taking us, and how the president sees the issue.

Several weeks after the news of the EPA report hit the press, the administration convened an Earth Observation System summit in Washington. More than thirty nations agreed to undertake a cooperative effort to collect better environmental monitoring data, including precise global weather data that may help refine climate change projections. The data they will gather may be extraordinarily useful—but their value is limited if neither the public nor the policymakers involved understand why we actually need this information.

As the president of one major environmental organization recently told me, there will always be uncertainty in the science, so he sees little point in policymakers paying much attention to that uncertainty; as with all activists, he simply wants action now. He, like most environmental advocates, dismisses efforts to discuss the uncertainty of the science as transparent excuses for inaction. In some cases, that charge may be true, but it certainly need not be. We need not wait until all uncertainty is eliminated before we act, but in choosing our course of action, we ought to remain mindful of the distinctions between knowledge and guesswork. As President Bush himself said in his first speech on this subject, “The policy challenge is to act in a serious and sensible way, given the limits of our knowledge.” He directed his staff to develop a science-based policy that is “measured” and “flexible” so it adjusts “as we learn more from science.”²² That is a sensible approach—but it requires a dedication and vision to implement that the administration now seems to lack. President Bush has a good story to tell here, albeit a complicated one—but nothing will guarantee failure quite as absolutely as silence.

Notes

1. Elizabeth Shogren, “Editing Flap over EPA’s Report on Environment,” *Los Angeles Times*, June 20, 2003.

2. First sentence of the United Nations Framework Convention on Climate Change, 1992.

3. Andrew C. Revkin with Katharine Q. Seelye, “Report by the E.P.A. Leaves Out Data on Climate Change,” *New York Times*, June 19, 2003.

4. CNN “NewsNight with Aaron Brown,” June 19, 2003.

5. See, for instance: Editorial, "Censorship on Global Warming," *New York Times*, June 20, 2003; Editorial, "An Environmental Report Card," *New York Times*, June 26, 2003; Editorial, "EPA Muzzle Tightens," *Los Angeles Times*, June 25, 2003; Editorial, "Inconvenient Truths," *St. Louis Post-Dispatch*, June 20, 2003; Editorial, "More Revisionist History," *Baltimore Sun*, June 20, 2003; Editorial, "Spinning the Environment: White House Tinkers with EPA Report," *Miami Herald*, June 23, 2003.

6. Committee on the Science of Climate Change, National Research Council, "Climate Change Science: An Analysis of Some Key Questions" (National Academy Press: Washington, D.C., 2001), 1.

7. *Ibid.*

8. *Ibid.*, 8.

9. *Ibid.*, 1–2.

10. *Ibid.*, 3.

11. *Ibid.*, 17.

12. *Ibid.*

13. *Ibid.*

14. *Ibid.*, 18–19.

15. See www.lavoisier.com.au for Castles and Henderson's latest work. Steve Hayward discussed their work in greater detail in April's Environmental Policy Outlook, "New Doubts about the Dominant Climate Change Models."

16. Willie Soon and Sallie Baliunas, *Lessons & Limits of Climate History: Was the 20th Century Unusual?* (The Marshall Institute, Washington, D.C: 2003), 1. The authors also published their findings in peer-reviewed scientific journals, but readers may find the Marshall Institute paper more approachable. For more information, see Soon and Baliunas, "Proxy Climate and Environmental Changes of the Past 1,000 Years," *Climate Research*, 23: 89–110; Soon, Baliunas, et al., "Reconstructing Climatic and Environmental Changes of the Past 1,000 Years: A Reappraisal," *Energy & Environment* 14, n. 2.

17. Jeff Nesmith, "Foes of Global Warming Theory Have Energy Ties," *Seattle Post-Intelligencer*, June 2, 2003.

18. Soon and Baliunas, "Lessons & Limits of Climate History," 11–13.

19. National Research Council, "Climate Change Science," 22–23.

20. Guy Gugliotta, "Taking On Global Climate Change: Planned Study Is Decried as Stalling," *Washington Post*, July 24, 2003, p. A6, quoting Daniel A. Lashof, Natural Resources Defense Council.

21. National Research Council, "Climate Change Science," 23.

22. President George W. Bush, remarks on climate change, June 11, 2001, available at: www.whitehouse.gov/news/releases/2001/06/20010611-2.html.