Tenth Edition

Index of Leading Environmental Indicators 2005

By Steven F. Hayward

With contributions from Michael De Alessi and Joel Schwartz

April 2005

Pacific Research Institute for Public Policy
San Francisco, California

and

American Enterprise Institute for Public Policy Research
Washington, D.C.

Tenth Edition

Index of Leading Environmental Indicators 2005

By Steven F. Hayward

With contributions from Michael De Alessi and Joel Schwartz

ISBN 0-936488-94-8
April 2005 | $16.95

Pacific Research Institute
755 Sansome Street, Suite 450
San Francisco, CA 94111
Tel: 415.989.0833 | 800.276.7600
Fax: 415.989.2411
Email: info@pacificresearch.org

American Enterprise Institute
1150 Seventeenth Street, N.W.
Washington, DC 20036
Tel: 202.862.5800
Fax: 202.862.7177
Email: info@aei.org

Additional print copies of this study may be purchased by contacting PRI or AEI at the addresses above, or download the pdf version at www.pacificresearch.org or www.aei.org.

Table of Contents

Acknowledgements

Several individuals deserve special recognition for their help behind the scenes to make this report possible. At PRI, Lloyd Billingsley, Lisa Mac Lellan, and Rowena Itchon made sure all the words were in the right order, and Mary Anne Hanis supervised the arduous production process. As always, Sally Pipes was a stalwart in committing resources for the project. At AEI, Ben Schwab provided crucial research assistance, and Karlyn Bowman provided her acute insights into public opinion.

Ultimately, this annual report is made possible by the commitment and generosity of PRI's contributors, to whom we are deeply grateful. On this tenth anniversary, we would like to extend very special thanks to those supporters who have taken a particular interest in the *Index* since its inception.

We also thank those who have asked critical questions or made suggestions over the years, which have helped us strengthen both the product and its dissemination. And last but not least, we thank the many scholars and organizations that have helped to inject balance, science, and free-market solutions into the environmental debate.

Preface to the Tenth Edition

This tenth edition of the *Index of Leading Environmental Indicators* is a good time to take stock of progress over the last decade. When the *Index* was launched, there were few efforts to develop environmental indicators or report trends in a useful way for the media or the public. Now there are dozens of worthy efforts in the public and private sector, many of them highly detailed and most available on the Internet. (An inventory of 86 Internet-accessible indicator sets is included in this edition.) As often as not, these efforts reveal how much we *don't* know about environmental conditions and trends, and point to the need to fill in the large gaps in our understanding.

The *Index* is intended to be expository rather than compendious, so that it can stay within a readable length. It remains at heart a yearbook, featuring a combination of core indicators along with wide-ranging and often provocative analysis of current issues by the principal author, Steven Hayward, and other contributing writers.

There are thousands of environmental indicators that might be used, from the global scale down to the local neighborhood. The *Index* limits itself to core indicators on the national level for air quality, water quality, toxic chemicals in the environment, and land use. And it distills research and data that are buried in cumbersome government databases or unwieldy reports—data often inaccurately reported, if at all, in the media.

Because of the mixed quality of media coverage, in 2002 the *Index* began including an extensive media critique. This year, PRI is taking the effort to the next level, awarding cash prizes for Excellence in Environmental Journalism for the best news feature and opinion piece.

The tenth edition also extends a feature started last year—comparisons of environmental trends in the United States and European Union. It is commonly supposed that European environmental policy is more enlightened than U.S. policy. The reality will surprise many readers. Last year's edition looked at air quality; this edition looks at forestlands. It also includes, by popular demand, an expanded review of climate change.

The *Index* always includes a special focus on new aspects or themes of environmental consciousness. In past editions, special sections have examined toxic risk assessment, sustainable development, energy, biodiversity, forestlands, and public land management. This edition turns its critical gaze on the growing enthusiasm for corporate environmental reporting, which is a derivative of "corporate social responsibility."

Finally, as this is an anniversary edition, we take a look back at a few highlights from earlier editions, noting judgments that have been borne out over time.

Sally C. Pipes
President
Pacific Research Institute
for Public Policy

Christopher DeMuth
President
American Enterprise Institute
for Public Policy Research

Introduction: Ten Years in Review

- Air pollution in the United States fell again in 2004 to its lowest level ever recorded. Bald eagles, whales, ocean fish stocks, forestlands, and wetlands all showed increases in numbers.

- While the majority of Americans still believe environmental quality overall is declining, 71 percent are "happy" with the quality of the environment where they live—an increase of 10 percent since 1997. And the issue that ranks lowest among the public is the one that ranks highest among environmental organizations—global warming.

  The post-election debate about "the death of environmentalism" suggests a turning point has been reached, in which environmental alarmism has passed the point of diminishing returns.

- Future policymaking must address the growing politicization of environmental issues, as well as the difficulty in developing meaningful indicators for measuring conditions or results. Yet despite the challenges, we have made significant progress in changing opinion.

  Economic growth is now widely, if sometimes grudgingly, seen as the cornerstone of environmental protection. And there is growing recognition of the need to decentralize environmental efforts to state and local government, and to grassroots, citizen-led programs.

I. The Ups and Downs of 2004

It is tempting to begin this tenth edition of the *Index of Leading Environmental Indicators* with the old saying, "The more things change, the more they stay the same." There have been enormous changes and improvements in the environment over the last decade, along with major frustrations and new worries coming to the forefront. Although it may seem as though popular environmental thought is stuck in a rut, we discern a number of subtle but significant shifts in public perspectives.

Since launching this annual project, we have taken a largely contrarian viewpoint, offering criticisms of orthodox environmentalism, and especially of superficial media coverage. One purpose was to correct the egregious misperception that the environment is everywhere getting worse, the default opinion of most Americans in the early 1990s.

It remains the default position but there are signs of growing awareness that real progress has been made. In some areas, such as air pollution, improvements over the last 30 years are of greater magnitude than those in reducing the crime rate and welfare dependency, both widely celebrated as immense public-policy success stories.

Above all, we set ourselves against eco-pessimism, against the unremitting Malthusian view that human beings are an inherent liability to the planet's well-being, and that human ingenuity—short of radical and, therefore, unrealistic transformations of human nature and human institutions—is unequal to the challenge of environmental protection. Aside from the balance sheet of environmental assets and liabilities that can be constructed, we discerned something much larger. As we observed in the seventh edition (2002) of this report:

> As an expression of public sentiment toward the natural world, environmentalism is turning out to be not merely a narrow transient enthusiasm, but something akin to a broad change in public philosophy comparable to the rise of liberal individualism in the 18th century. The analogy may prove to be apt on several levels.
>
> Liberal individualism is the cornerstone of modern democracy, whose full implications required decades, if not centuries, to work themselves out in practice. So too, environmentalism will be slow to work its way fully through human social thought and action. . .

Air pollution fell again in the United States to its lowest level ever recorded, but hot air over the subject continued to increase.

The analogy has other parallels. Like liberal individualism, environmentalism comes to sight first as an indignant and often bitter complaint against the existing order. Yet liberal individualism quickly transmuted into an optimistic creed, as democracy came to be seen as the cornerstone of progress and enlightenment. . .

> Most environmentalists, like many early modern liberals, are impatient and transfixed by the perceived gap between their ideals and the reality of the present moment. This is understandable; indignation is the mark of rising social movements, as well as the source of much of their energy. In the fullness of time, however, successful social movements tend to become optimistic, forward-looking, and progressive, or they become self-limiting.

Alas, as we shall see in the second section of this edition, the orthodox environmental movement may not yet be ready for this transformation. It may even prefer to marginalize itself in much the same way as the once noble civil-rights movement. Meanwhile, events grind forward at their own pace, and 2004 delivered the usual complement of mixed news on the environment.

Air pollution fell again in the United States to its lowest level ever recorded, but hot air over the subject continued to increase. Long-range world population projections fell, for about the 20th year in a row. Bald eagles, whales, some ocean fish stocks, and U.S. forestlands all showed increases in numbers. And the latest federal study found that wetlands in the United States are at last *expanding*, reversing three centuries of decline. The 2001 edition of this report predicted this would occur.

As recently as the 1950s, the United States experienced a net loss of wetlands of about 500,000 acres a year. The net gain over the last five years has been about 26,000 acres a year. As for the national bird, in 1965 there were fewer than 500 nesting pairs of bald eagles in the United States. Today there are estimated to be more than 7,500, and the bald eagle may be removed from the Endangered Species List.[1] Meanwhile, in east Africa, animal censuses report a large jump in the lion population, completing a recovery from a drought-induced 50-percent decline in lions in the early 1990s.[2]

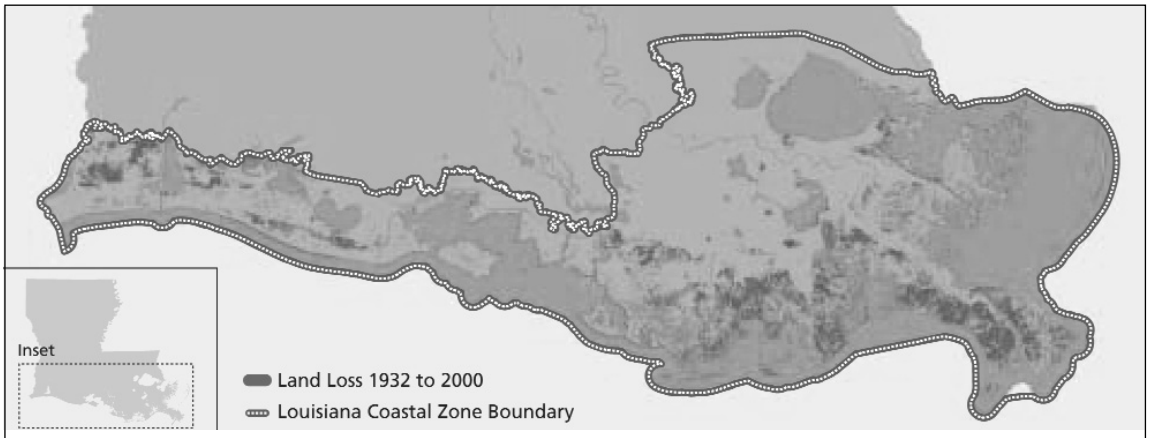
In other news, *Science* magazine reported that long-term effects of the 1989 *Exxon-Valdez* oil spill can still be detected in Prince William Sound, while *Nature* magazine reported the presence of blue whales near Prince William Sound for the first time in 30 years.[3] Overseas the picture is mixed as well.

In England, biologists involved in a detailed long-term study reported a precipitous decline in butterflies, along with losses of certain bird and plant species.[4] A field study in Venezuela finds that some species of dung beetles have declined, the result of a massive water project that disrupted their habitat, resulting in large piles of unburied monkey dung.[5]

Researchers from Oregon State University reported the reappearance of a hypoxic "dead zone" first detected in coastal waters near Newport in 2002. Hypoxia is usually attributed to human-induced pollution, but the region of Oregon's coastal hypoxia is remote from major human pollution sources, prompting speculation that it may be the result of changing ocean currents possibly related to the Pacific Decadal Oscillation (PDO).[6] Speaking of oceans, one of the more important environmental stories of 2004 was the final report of the U.S. Commission on Ocean Policy (see www.oceancommission.gov), which was created by the Oceans Act of 2000.

The report is a massive achievement but, at 676 pages, impossible to summarize or review adequately here. Much of the report concerns analysis and recommendations for the reorganization or coordination of

Figure 1:
Dramatic Coastal Land Loss in Louisiana



From 1932 to 2000, coastal Louisiana lost 1,900 square miles of land—an area roughly equivalent to the size of Delaware. An additional 700 square miles could potentially be lost over the next 50 years if no new restoration takes place, putting more than two million coastal residents at risk from floods and storms.

Source: U.S. Geological Survey, "Without Restoration, Coastal Land Loss to Continue." News release: <www.nwrc.usgs.gov/releases/pr03_004.htm> (Accessed January 2004); Map Source: U.S. Geological Survey, Lafayette, Louisiana

the myriad federal agencies and programs that have some involvement with oceans. Most of the reforms are obviously sensible, but also nearly impossible to achieve given the nature of things bureaucratic.

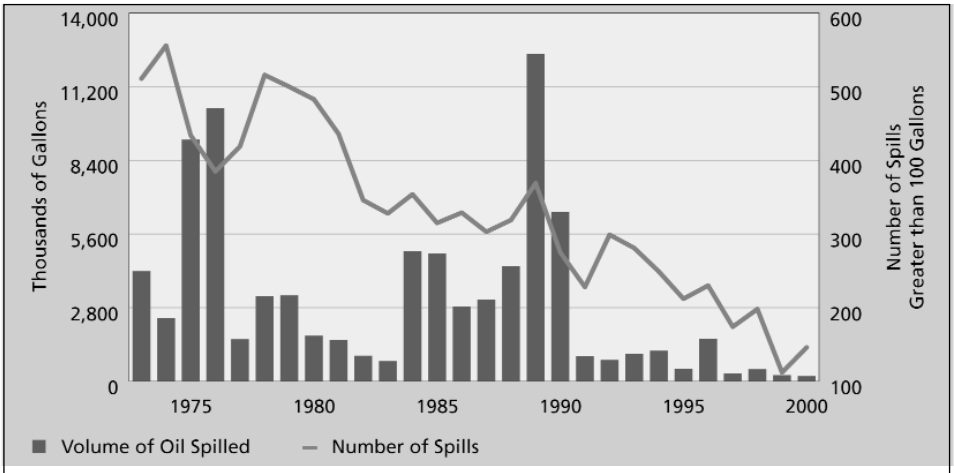
Notably missing from the recommendations, however, is any thought about how property rights and markets might be used to remediate ocean degradation. The recommendation to establish an Integrated Ocean Observing System to provide continuous monitoring and fill in gaps in our data about ocean conditions would be a worthwhile advance. Basic ocean research has dramatically lagged behind other categories of environmental monitoring.[7] Although the report concludes that "our oceans, coasts, and Great Lakes are in trouble," there are only limited data available for such a sweeping summary judgment.

The EPA's 2004 *Draft National Coastal Conditions Report*, discussed in last year's edition of this *Index*, is mentioned, but the EPA report did not develop indicator or trend data. There are some individual aspects of ocean and coastal conditions that the report usefully highlights, including the dramatic erosion of coastal Louisiana, the declining trend in oil spills (often noted in previous editions of this report), and the decline of Alaskan sea lions, the exact causes of which are still unclear.

The contrast between high-profile problems such as oil spills and the unremediated problems of coastal erosion and wildlife population declines shows that human ingenuity is better at solving pollution than complex problems of natural ecosystems. Yet where do most of our research money and regulatory effort go?

Back on dry land, a new book on New England forests, *Forests in Time: The Environmental Consequences of 1,000 Years of Change in New England*, edited by David Foster and John D. Aber (Yale University Press), adds important detail to forest trends mentioned in previous editions of this *Index*. The

Figure 2:
The Oil Pollution Act Curbs Spills in U.S. Waters



While the number of oil spills has decreased steadily since the early 1970s, the volume of oil spilled fluctuated significantly between 1973 and 1990. However, following the *EXXON Valdez* spill in 1989 and the resulting passage of the Oil Pollution Act of 1990, the amount of oil released into the environment has been significantly reduced.

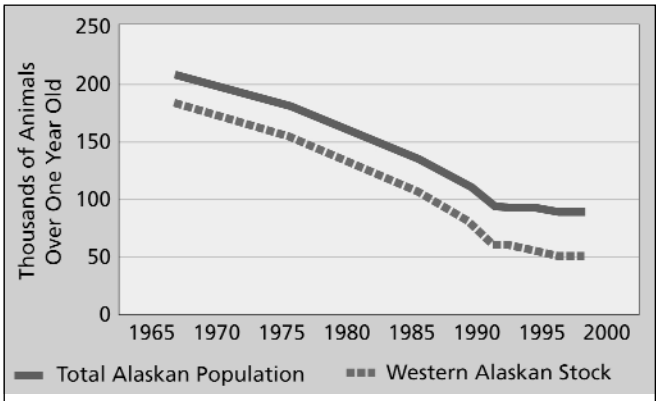
Source: Environmental Research Consulting, Cortlandt Manor, New York

book notes that forest cover in New England had declined to about 40 percent of the area's landscape by 1850, but has recovered to between 60 to 90 percent of the total land area in New England today.

For the eastern half of the United States as a whole, land cleared for farming and grazing in the 19th century has been reverting back to forestland at a net rate of one million acres a year since about 1910—in other words, since the beginning of the auto age, when cars and trucks began to replace horse-drawn transport.

Bill McKibben noted back in 1995 that this trend was "the great environmental story of the United States, and in some ways of the whole world." Most important, as one reviewer noted, the book explains that "current forests are not stable or natural but are partially, if not largely, human artifacts. . . Consequently, the concept of a pristine, pre-contact landscape frozen in time and space as a sort of base point from which to measure

Figure 3:
Sea Lion Populations in Danger



Although Steller sea lions have been protected since the early 1970s, the Alaskan populations have continued to decline, particularly those located along the Aleutian Islands. This decline cannot be traced to a single cause, underscoring the need for an ecosystem-based approach for protecting these animals.

Source: National Oceanic and Atmospheric Administration <http://stellersealions.noaa.gov/> (Accessed January 2004)

anthropogenic (usually European immigrant) change—so beloved of romantics, environmentalists, and even some anthropologists—is simply a fiction."[8]

Once again last year we were treated to numerous learned speculations on why world oil supplies are—*no kidding, for real this time*—about to peak, and why a revival of nuclear power is just around the corner.[9] A practiced gambler could make easy money wagering against either of these predictions coming to pass. The best antidote to this drearily conventional wisdom about fossil fuels and energy is Peter Huber and Mark Mills's new book, *The Bottomless Well: The Twilight of Fuel, the Virtue of Waste, and Why We Will Never Run Out of Energy* (Basic Books). Meanwhile, skepticism about the prospects for hydrogen energy seems to grow almost as fast as the hydrogen research budget.

Joseph J. Romm's book *The Hype about Hydrogen* (Island Press) offers a sobering, pessimistic counterpoint from a conventional environmentalist point of view to the cocksureness of lighter-than-air writers such as Amory Lovins and Jeremy Rifkin. Romm concludes that hydrogen fuel-cell vehicles are unlikely to achieve even a five-percent penetration of the market by 2030 and recommends: "Neither government policy nor business investment should be based on the belief that hydrogen cars will have meaningful commercial success in the near- or medium-term."

The most basic stumbling block from the beginning is how to get hydrogen, "the most abundant element in the universe," into useable form.[10] As mentioned in this report last year, most of the present means of producing hydrogen would increase air pollution and greenhouse gas

Flashback

How Economic Growth and Fossil Fuels Saved America's Forests

An equally vivid example of the long-term role of economic growth and technological progress can be seen in the trend of wood used for heating and fuel in the United States in the 20th century. At the turn of the century, nearly one-third of America's heating was provided by burning wood. As fuel oil, natural gas, and electricity became widely adopted starting in the early decades of the century, the use of wood for fuel began declining rapidly, as seen in Figure 4, from more than five billion cubic feet in 1900 to fewer than 500 million cubic feet in 1970.

Although there was no national "spot" market for fuel wood, as for other commodities in 1900, the price for construction lumber can be taken as a reasonable proxy for fuel wood. The inflation-adjusted price of lumber in 1900 was five times the price of lumber in 1970. It is worth noting in Figure 4 when the decline in wood use halts and heads back up again—during the Great Depression years, when fewer people could afford new gas and oil furnaces, and when businesses reduced spending for capital equipment. Here is a clear example of the effect of economic growth—and the lack of it—on resource use and environmental quality.

Most of the deforestation that took place in America occurred before 1850 (and was done mostly for agricultural purposes, and not for fuel wood). By 1910 deforestation

emissions. The present alternatives are nuclear power—still politically incorrect—and windmills, after which all the Don Quixotes of alternative/renewable energy are still chasing.

Economist Andrew Oswald of the University of Warwick in the United Kingdom took the wind out of the hydrogen sails with the estimate that 100,000 windmills would be required in Britain to produce hydrogen for its transport sector, while the United States would require one million windmills. To call this "unlikely" would qualify for the *Guinness Book of World Records Understatements*. Indeed, environmentalist opposition to wind power (never mind plain old NIMBYs), discussed in the previous two editions of this report, continued to grow in 2004.

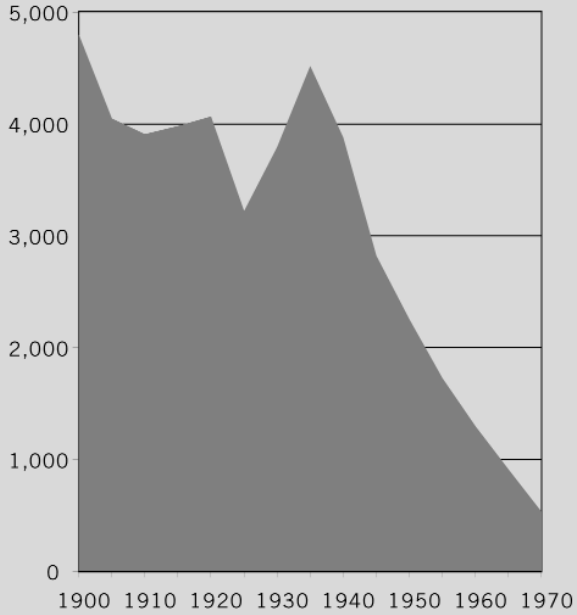
New estimates are that the annual rate of avian mortality is two birds per turbine—a rate derived mostly from studies of western wind farms. The rate would likely be higher in the eastern United States, where there are more migratory birds. In addition, it is estimated that the annual mortality rate for bats is 30 to 100 per wind turbine.[11] The United Kingdom, Germany, Holland, and Denmark began backing away from wind power in 2004.

The back-and-forth argument around perennial environmental issues is typically seen as a clash of social principles or a dispute about scientific opinion and uncertainty. Citizens and policymakers alike have grown weary of the constant scrum over "sound science," "junk science," and "reducing uncertainty." The next sentence is usually a boilerplate plea for the separation of science from politics, as though they were as easily separated as church and state.

Despite our hope that science can inform policy choices, perhaps the acrimonious state of affairs isn't going to get any better. The most notable reflection on this problem in the past year comes from Daniel Sarewitz of Arizona State University, who argued in *Environmental Science and Policy* that

stopped and has reversed in the decades since then. It is ironic, therefore, to recall that during the "energy crisis" of the 1970s one of the favored popular remedies was a return to wood stoves, which would have represented a step backward for both air quality and forest habitat.

Figure 4:
Cubic Feet of Wood Used for Fuel in the United States

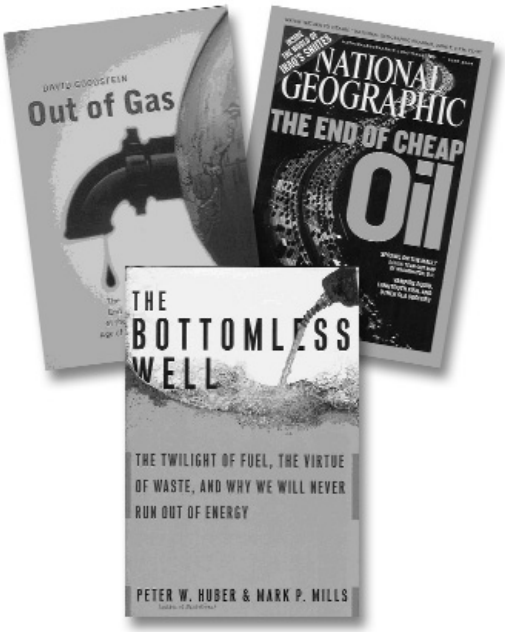


Source: *Historical Statistics of the United States, Colonial Times to 1970*, U.S. Department of Commerce, Series L-96

—from the *Index of Leading Environmental Indicators, Fourth Edition* (1999)

science makes environmental controversies worse.[12] Sarewitz believes that science today actually reinforces value disputes and competing interests:

> [N]ature itself—the reality out there—is sufficiently rich and complex to support a science enterprise of enormous methodological, disciplinary, and institutional diversity. . . Science, in doing its job well, presents this richness, through a proliferation of facts assembled via a variety of disciplinary lenses, in ways that can legitimately support, and are casually indistinguishable from, a range of competing, value-based political positions.



Environmental controversies, Sarewitz argues, are like the dispute over the 2000 presidential election in Florida. The ballot problems were theoretically susceptible to a technical resolution (an objective method of recounting all the votes), but the issue required a political solution instead because agreement on a technical approach was impossible. Uncertainty in science is more a reflection of political conflict than scientific disunity. The key point of Sarewitz's analysis is that scientific controversy on any issue is directly proportional to the stakes involved.

The Montreal Protocol that began the phase-out of chlorofluorocarbons (CFCs) to protect the ozone layer is often wistfully compared to the Kyoto Protocol to fight global warming—the Montreal Protocol being a success while the Kyoto Protocol is heading for certain failure. Through Sarewitz's framework the difference is clear: the Montreal Protocol involved a modest cost, affected only a few large industries that had substitutes available (indeed, the money-making potential of product substitution is why most of the chemical industry supported the Montreal Protocol), and it affected chiefly wealthy industrialized nations over a relatively short transition period.

Kyoto and its theoretical successors involve huge economic costs for the entire world over a

Uncertainty in science is more a reflection of political conflict than scientific disunity. The key point of Sarewitz's analysis is that scientific controversy on any issue is directly proportional to the stakes involved.

much longer time period, and substitutes for carbon-intensive energy are not readily available at a comparable cost. In other words, while both efforts involve the atmosphere, the stakes involved in the two issues are incommensurate.

The clear implication is that policy challenges such as climate change are not going to be resolved through "better science." "[P]rogress in addressing environmental controversies," Sarewitz concludes, "will need to come primarily from advances in the political process, rather than scientific research." All the political signs, unfortunately, point to even more gridlock, rather than a reconsideration of whether the environment has been over-politicized. And many scientists seem to be tilting left, if Harvard geneticist Richard Lewontin is to be believed.

"Most scientists are, at a minimum, liberals, although it is by no means obvious why this should be so," Lewontin wrote last fall in the *New York Review of Books*. "Despite the fact that all of the molecular biologists of my acquaintance are shareholders in or advisers to biotechnology firms, the chief political controversy in the scientific community seems to be whether it is wise to vote for Ralph Nader this time."[13] Several conflicts in 2004 reinforce this analysis.

Last spring the news media sensationalized a small-scale study of 1,100 species by the Center for Applied Biodiversity. When badly extrapolated, the data suggested that a third of the world's species could become extinct from global warming by 2050.[14] A group of scientists with the Biodiversity Research Group at Oxford University responded by issuing its own press release criticizing the report: "Damaging simplifications of research findings may expose conservationists to accusations of crying wolf, and play directly into the hands of anti-environmentalists."[15]

This drew a rebuttal from the Center for Applied Biodiversity, which argued that a certain amount of sensationalism—even if scientifically inaccurate—is necessary to break through a media climate preoccupied with other issues such as terrorism and war: "[W]e believe the benefits of the wide release greatly outweighed the negative effects of errors in reporting."[16]

This is all too reminiscent of Stephen Schneider's notorious and much-recalled formulation from a 1989 magazine interview:

> On the one hand, as scientists we are ethically bound to the scientific method. … On the other hand, we are not just scientists but human beings as well. . . .To avert the risk [of potentially disastrous climate change] we need to get some broad based support, to capture the public imagination. That, of course, means getting loads of media coverage. So we have to offer up some scary scenarios, make simplified dramatic statements and little mention of any doubts one might have. . . .Each of us has to decide what the right balance is between being effective, and being honest.

In fairness to Schneider, his next sentence is often omitted from most quotations of this passage: "I hope that means being both."[17]

With the bewildering crosscurrents of scientific and political conflict, it has become almost impossible to tell. The other prominent example of this problem is the ongoing controversy over the Bush administration's use or abuse of science.

In February 2004, the Union of Concerned Scientists issued *Scientific Integrity in Policymaking*,[18] a study endorsed by dozens of prominent scientists including several Nobel Prize winners. Of course, the UCS's founding preoccupation was the proliferation of nuclear weapons and the threat of nuclear annihilation, and it became a leading voice on behalf of the "nuclear freeze" and other dubious enthusiasms. It is good to know that as that threat receded with the end of the Cold War, the UCS remains fully concerned. The point is, the UCS is itself a highly politicized organization, in which case accusing someone else of politicizing science is like the waste dump calling the garbage truck smelly.

As Gregg Easterbrook observed in the *Los Angeles Times*, the UCS report consisted primarily of complaints about patronage and Bush's non-UCS approved policy agenda.[19] In other words, politics as usual. There is likely no end in sight for this problem.

Rita Colwell, the outgoing director of the National Science Foundation, was asked last winter about the Bush administration's "hostility to science." She responded by blasting the media for "tabloid journalism." She was also critical of the scientific community for not policing its own ranks better, for "allowing science to be presented in sound bites, from dangerous people."

Meanwhile, the politically-oriented environmental groups, disappointed with the results of their efforts in the last election cycle, seem determined to intensify their politicization of the environment. This is the focus of the next section.

II. The Environmental Crackup: Has Doomsaying Met Its Doom?

"All the old 'isms' are 'wasms.'"
—*Winston Churchill*

In our fifth edition (2000) we wrote,

> The pessimism that often accompanies environmentalism is ill-suited for both the naturally optimistic American character and the realities of the modern world, where economic growth and progress are the hope, and not the threat, of the future. The lesson of the past century has been that environmental progress depends on economic and technological progress, which are best produced by dynamic markets. Environmental progress in the 21st century will build upon this foundation.

Despite appearances that environmental thinking is stuck in a rut, a close look suggests that we may have reached a turning point.

For 10 years this report has followed the latest incremental changes in environmental conditions and reflected on public opinion findings about the environment. On the surface, public opinion seems generally unaware of improving environmental trends. Polls still find a majority of Americans believe that environmental quality is deteriorating.

But a closer look at the polling numbers suggests this may be more a case of fashionable attitude than considered opinion. More detailed poll questions reveal that the public seems to be absorbing the reality of environmental progress. A March 2004 Gallup Poll on the environment found that 62 percent of Americans worry "a great deal or fair amount" about the environment, but this is down from 77 percent who said this in 2001. The top response, at 80 percent, was for health care.

Moreover, Gallup found a statistically significant drop in concern for six out of 10 environmental issues that the poll rated. Another significant change in opinion was registered in the responses to the question "Which should take precedence: environmental protection or economic growth?"

In the early 1990s, "environmental protection" won out over "economic growth" by as much as a three-to-one margin. In 2004 the numbers were nearly even: 49 percent for "environmental protection" versus 44 percent for "economic growth." (See Figure 5.) This is a surprising shift in the absence of a severe recession. One reason for this may be found in the Harris Poll's "Feel Good Index," which finds that 71 percent of Americans are "happy" (versus 28 percent who report being dissatisfied) with the quality of the environment where they live—an increase of 10 percent since 1997.

It appears that public regard for environmental doomsaying is declining. This is most evident from the changing polling numbers about climate change. The Gallup Poll found that the public worries least

Flashback

The Rise of Environmental Consciousness

The environment was not seen as a mass political issue that could capture and move the sentiment of the nation [in the mid-1960s].

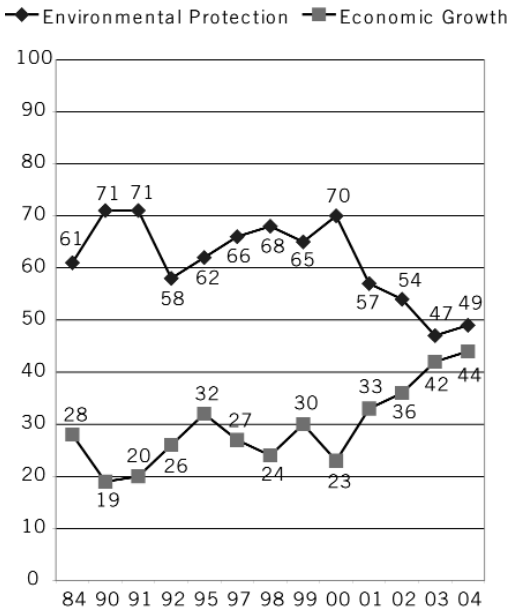
Neither Richard Nixon nor Hubert Humphrey talked about the environment in the 1968 presidential campaign, a time when "green power" still meant the Irish vote. Gallup didn't think the issue was worth polling until 1965, and the early polls generated ho-hum results. A Harris poll in the mid-1960s reported a majority against higher taxes and higher consumer prices to pay for environmental clean up. Today polls consistently find large majorities willing to pay higher prices for a cleaner environment.

Gallup's 1965 poll that asked about environmental issues found that only 28 percent considered air pollution to be a serious problem, while only 35 percent thought water pollution was a serious problem. By 1969, these numbers had risen to 69 and 74 percent. Yet there were still only two registered environmental lobbyists in Washington at the time.

—*Index of Leading Environmental Indicators, Fifth Edition* (2000)

. . . 71 percent of Americans are "happy" with the quality of the environment where they live—an increase of 10 percent since 1997.

Figure 5:
Which Should Take Precedence: Environmental Protection or Economic Growth?, 1984-2004



Source: Gallup Poll

The Gallup Poll found that the public worries least about the issue that means the most to environmental organizations: global warming.

about the issue that means the most to environmental organizations: global warming.

"Last year at this time," Gallup's Lydia Saad wrote, "Gallup reported that global warming was 'a bit of a yawn' to most Americans. Today, one might say the public is practically dozing."

Almost half of poll respondents (47 percent) say they worry "only a little" or "not at all" about global warming. Global warming ranks near the bottom of the list of environmental issues Gallup surveys. The proportion of respondents who think global warming is generally exaggerated in the news increased five percent from 2003, from 33 percent to 38 percent.

"For the first time," Gallup notes, "this skeptical group outnumbers those saying the issue's seriousness is underestimated." The Gallup results closely track a BBC poll in Britain, where respondents ranked global warming last among a list of typical issues including health care, crime, and education.

This waning public concern over the mother of all environmental catastrophes, combined with the absence of the environment as a significant, vote-moving issue in the 2004 presidential election (despite $15 million in campaign spending by environmental groups), has generated a state of panic among environmental lobbies.

Two environmental public-relations specialists, Michael Shellenberger and Ted Nordhaus, have roiled the environmental community with "The Death of Environmentalism."[20] Their report argues that environmentalism has faltered because it has become too much of a "special interest" faction—the very point we have made in previous editions of this report.[21]

Shellenberger and Nordhaus propose that environmentalism needs to recast itself within a

broader progressive movement. Reaction has been severe. Adam Werbach, a former president of the Sierra Club, embraced the thesis of Shellenberger and Nordhaus, saying in a speech to the Commonwealth Club that "Environmentalism is dead. . . I am done calling myself an environmentalist." Carl Pope, the Sierra Club's longtime executive director, emphatically rejected Shellenberger and Nordhaus, and professed to be "angered" by their analysis. Other leaders of environmental groups also expressed varying degrees of dyspepsia over the fracas.

The consensus that environmentalism has failed because it hasn't been nearly far left enough suggests that environmentalists aren't even the slightest bit open to the hypothesis that perhaps they might have been wrong about some things, or that the public at least has learned to view them with a jaundiced eye. Rather than looking to Elizabeth Kubler-Ross's *On Death and Dying* for inspiration (as Shellenberger, Nordhaus, and Werbach do), perhaps the popular title that environmentalists should consult is *He's Just Not That Into You: The No-Excuses Truth to Understanding Guys*.

Flashback

The Wealth Effect

At one level, it is perfectly understandable that as society as a whole becomes more affluent, concern for environmental quality increases. Several studies have shown a positive correlation between rising incomes and environmental concern. It is a general fact of social psychology that as people become more affluent, they lower their threshold for every kind of risk. Thus it can be reasonably expected that tolerance for environmental degradation might still decline even as actual environmental quality improves.

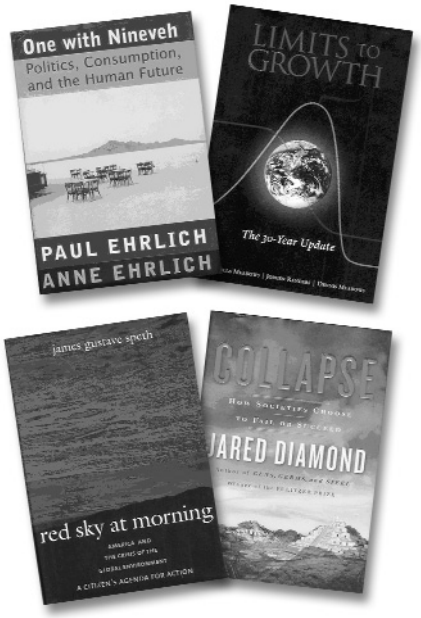
—*Index of Leading Environmental Indicators, First Edition* (1994)

In the dating world, the authors observe, there are countless excuses for not calling again: he is very busy; maybe he's afraid of getting hurt again; maybe he doesn't want to ruin the friendship. The blunt truth is: "He's just not that into you." In the case of the environmental movement, the trouble is not a failure to communicate or connect environmental issues with a larger "progressive framework."

Perhaps the public "just isn't that into" environmentalists anymore. One straw in the wind that indicates the moderation of most Americans is the election result in Oregon, where voters by a large margin approved a property-rights initiative that will require the government to compensate landowners when regulations reduce land values. Environmentalists and bureaucrats worry that Measure 37 will devastate land-use planning.

This controversy has received much more publicity than the dozens of land-conservation initiatives, which usually involve bonds to buy land from private owners, that passed in jurisdictions around the nation and suggest the obvious solution for grab-happy regulators. This seeming contradiction suggests the essential moderation of most

Perhaps the public "just isn't that into" environmentalists anymore.



Americans, who want environmental protection that is consistent with equally cherished principles of individual rights and limited government.

Another indication of public moderation is to observe the non-sensation of several leading environmental books that appeared in 2004: Paul and Anne Ehrlich's *One with Nineveh: Politics, Consumption, and the Human Future* (Island Press); James Gustave Speth's *Red Sky at Morning: America and the Crisis of the Global Environment* (Yale University Press); and Donella Meadows, Jorgen Randers, and Dennis Meadows's *Limits to Growth: The 30-Year Update* (Chelsea Green).

Once upon a time, books from these authors would cause a great splash, but today none come within drive-by shooting distance of the best seller list. Paul Ehrlich is famous for his 1968 mega-best seller, *The Population Bomb*, which sold millions of copies in the late 1960s and early 1970s, was assigned reading in many college courses, and landed Ehrlich as a frequent guest on the *Tonight Show* with Johnny Carson. Subsequently, in the 1970s, Ehrlich penned more best sellers with first-line trade publishers such as Simon & Schuster. The original *Limits to Growth* report was similarly a worldwide sensation in the early 1970s, and Gus Speth was the moving force behind the much-discussed *Global 2000* report that the Carter administration produced in 1980.

All of these books recycle the same Malthusian nightmare of an inevitable ecological collapse of the planet. They also gloss over or ignore the failure of past predictions to come true, or, more important, do not reflect on why they failed to come true. The original *Limits to Growth* study, for example, predicted that the world would run out of gold, zinc, mercury, and oil before 1992; *Global 2000* predicted that the world would face an oil shortage of 20 million barrels a day by 2000, and that oil would cost $100 a barrel; Paul Ehrlich predicted in 1970 that half the world's species would be extinct by 2000, and that all would be extinct by 2025.

It is not surprising that the newest iteration of Malthusian gloom contained in these books disdains making specific predictions for definite dates. This once-pervasive strain of environmental thought is even losing favor with its natural audience.

For example, *Nature* magazine, which is normally friendly to conventional environmentalism (Ehrlich writes frequently in *Nature*), published a harsh review of Speth's *Red Sky at Morning*. *Nature's* reviewer wrote:

> It is perhaps surprising to find a man with Speth's record resurrecting the doctrine of the doomsters of the 1970s that we will soon exhaust Earth's limited resources. Such forecasts have proven wildly inaccurate. . . Remedies prescribed by doctors who continually misdiagnose

> diseases should not be swallowed uncritically. Speth shows as little regard for contemporary evidence as he does for the reliability of previous forecasts of doom. . . Speth raises serious issues, but they deserve a more balanced treatment than the prescriptions in his book.[22]

Red Sky at Dawn was not the only eco-pessimist book to receive rough treatment at *Nature* magazine. *Nature* also panned *Global Change and the Earth System: A Planet Under Pressure*, a book with 11 authors that argues the conventional case for "sustainability." *Nature*'s reviewer, Hans von Storch, director of Germany's Institute for Coastal Research, asked: "Is this a good book? I am not entirely convinced. . . .The authors often adopt the unsatisfactory practice of relating a host of changes to ongoing anthropogenic change, without systematic attempts at formal detection and attribution."

Hans von Storch is among a small but growing number of environmental scientists who are increasingly willing to speak out against the populist abuses of environmental concern. As von Storch notes in his review, "We can already see that large parts of the public and politicians, in both Europe and the United States, no longer trust many of the knowledge claims advanced by environmental scientists." Von Storch concludes with an ironic turnabout. Ill-founded doomsaying, he says, is not *sustainable*.[23]

The exception to this trend of declining interest in doomsaying would be Jared Diamond's new offering, *Collapse: How Societies Choose to Fail or Succeed*, which as of press time remains high on the non-fiction best seller list. Diamond brings the capacious style of his previous best seller *Guns, Germs, and Steel* to bear on the environment for the first time, and offers a richer account of environmental collapse than other recent books. As such he will likely succeed the Ehrlichs, Speth, and the Meadows team as the pre-eminent voice of eco-pessimism. For all his talents, however, Diamond's perspective is likely to prove just as self-limiting, even though he ends on a note of "cautious optimism."

Gregg Easterbrook delivered a devastating critique of *Collapse* in the *New York Times Book Review*, noting the flaws in Diamond's reasoning: "*Collapse* tries to generalize from environmental failures on isolated islands to environmental threats to society as a whole. . . .He thinks backward 13,000 years, forward only a decade or two."[24]

To paraphrase Winston Churchill's epigram, perhaps orthodox environmentalism is becoming environmentalwasm.

III. Environmental Indicators as a Growth Industry

When this report began a decade ago, there were very few efforts to organize environmental trend data in a summary fashion useful for policymakers, the media, and citizens. This dearth comes despite annual federal spending of $600 million to gather environmental data. We've learned a lot since the first edition.

When we began this project in 1994, most environmental data had to be found the old-fashioned way: in paper reports in government libraries. In the intervening years almost all government data have

The first edition of this report endorsed the idea, most forcefully advocated by Paul Portney of Resources for the Future, that the federal government create a Bureau of Environmental Statistics that would be analogous to the Bureau of Labor Statistics.

gone online, and the sheer amount of information has exploded.

The first edition of this report endorsed the idea, most forcefully advocated by Paul Portney of Resources for the Future, that the federal government create a Bureau of Environmental Statistics that would be analogous to the Bureau of Labor Statistics. We have noted repeatedly in successive editions the major difficulties in developing meaningful indicators, including the lack of consistent, high-quality trend data for many environmental problems, and the problem of assigning weights among incommensurate environmental conditions.

As far back as 1972, the newly formed Council on Environmental Quality noted that "the process of developing dependable indices will be a long one." The *Index of Leading Environmental Indicators* was one of the first efforts to push this idea along. In the decade since our first edition, the development of environmental indicators has become a growth industry in both the public and private sector.

The most substantial and impressive private effort, profiled in the eighth edition of this report (2003), is the Heinz Center's *State of the Nation's Ecosystems: Measuring the Lands, Waters, and Living Resources of the United States* (available from Cambridge University Press, or online at www.heinzctr.org/ecosystems). Our evaluation of the Heinz Center report (SONE) bears repeating:

> Even though it contains plenty of troublesome information, SONE is utterly without the alarmist hype that usually accompanies reports from environmental groups. This admirable lack of hype is one reason the study failed to make the front page of newspapers or the evening network news.
>
> The Heinz Center report is as important for what it *doesn't* say as for what it does. Of the 103 indicators selected, only 33 (or one third)

STATshot: A Look at Trends That Shape Your World

How We Are Celebrating Earth Day (according to TheOnion.com):

13%	Cheering on Dale Earnhardt in the Firestone Earth Day 500
12%	Thinking locally
26%	Staying away from Dad, who goes on a huge drunk every Earth Day
9%	Swerving to avoid guy on recumbent bicycle
40%	Saying "Huh, no s---" when someone tells us it's Earth Day

Source: www.theonion.com

currently have adequate data on which to base conclusions; another 25 indicators (24 percent) have incomplete data sets. Thirty-one indicators (30 percent) have inadequate data, and another 14 indicators (14 percent) need further development to be of use.

Socratic ignorance—knowing what we don't know—is as important for environmental wisdom as it is for philosophical wisdom. Fortunately, the Heinz Center effort is ongoing, with periodic updates posted on the website as new data become available.

A helpful inventory came last year when an extensive survey by the U.S. Government Accountability Office (GAO) identified hundreds of indicator efforts at the national, state, and local level.[25] The GAO report singled out 86 individual projects for special recognition (including this report—see Table 1 for a complete listing). Despite all of this activity, the GAO report observed many of the same difficulties we have noted in nearly every edition of this report, including:

What Is an "Environmental Indicator"?

Environmental indicators track changes to the quality and condition of the air, water, land, and ecosystems on various geographic scales, and related human health and economic conditions. Whereas definitions of "environmental indicator" vary, most of them emphasize that an environmental indicator is a selected quantifiable variable that describes, analyzes, and presents scientific information and its significance . . . Federal agencies, private corporations, local communities, and others develop environmental indicator sets to condense complex topics or concepts, such as the health of ecosystems, into a manageable amount of meaningful information.

—U.S. Government Accountability Office, 2004

- "Obtaining data for use in indicator sets can be difficult largely because long-standing limitations of federal environmental monitoring and data collection activities have not been resolved. . . Past GAO work has emphasized that the federal government's current environmental information base suffers from data gaps between what is monitored and what needs to be monitored."

- "Although extensive, the environmental information base in the United States does not support comprehensive environmental and natural resource assessments."

- "Developers reported that creating an indicator set can be an intensely political process that challenges both the credibility and relevance of a set."

Translation: Never mind the huge gaps in the data—the intensely controversial nature of many environmental issues makes it difficult to come up with a set of generally accepted summary indicators.

Table 1:
Key Environmental Indicator Initiatives Identified by Experts

Indicator Set Initiative	Web Site
Agricultural Resource and Environmental Indicators	http://www.ers.usda.gov/publications/arei/
America's Children and the Environment	http://www.epa.gov/envirohealth/children/
Bay Area Alliance for Sustainable Communities	http://www.bayareaalliances.org/
Bay Area EcoAtlas and Pulse of the Bay Report	http://www.sfei.org/
Bay Institute	http://www.bay.org/main.htm
Chemical and Pesticide Results Measures	http://www.pepps.fsu.edu/CAPRM
Chesapeake Bay Program	http://www.chesapeakebay.net
Community-based Environmental Health Assessment Program	http://www.nacho.org/general955.cfm
Current Status and Historical Trends of Selected Estuarine and Coastal Habits in Corpus Christi Bay National Estuary Program Study Area	http://www.sci.tamucc.edu/css/
Ecological Indicators for the Nation	http://books.nap.edu/catalog/9720.html
Ecological Monitoring and Assessment Program	http://www.epa.gov/emap/
Environmental Indicators of Delaware Estuary	http://www.epa.gov/owow/esturaries/coastlines/jan02/envindicator.html
Environmental Public Health Indicators	http://www.cdc.gov/nceh/indicators/default.htm
EPA-Draft Report on the Environment	http://www.epa.gov/indicators/
Everglades Comprehensive Annual Report	http://www.sfwmd.gov/org/ema/everglades/
Florida Assessment of Coastal Trends	http://www.pepps.fsu/FACT/
Forest Health Monitoring Vegetation Indicator Pilot Program	http://www.fs.fed.us/na/briefs/fhm99/fhm99.htm
Illinois Department of Environmental Quality Indicators	http://www.dnr.state.il.us/orep/NRRC/balancedgrowth/indicators.htm
Index of Leading Environmental Indicators	http://www.aei.org/publications/bookID.407/book_detail.asp
Index of Silicon Valley	http://www.jointventure.org/resources/2002Index/
Index of Watershed Indicators	http://www.epa.gov/iwi/
Indicators of Livable Communities	http://www.mdf.org/megc/pubs/livable_communities.htm
Jacksonville Community Council Inc. Quality of Life Indicators	http://www.jcci.org
King County Benchmarks	http:www.metrokc.gov/budget/benchmrk/bench03/
Legacy 2002—Greater Orlando Indicators Report	http://www.hcbs.org/moreInfo.php/source/62/sby/Author/doc/251/Legacy_2002_-_Greater_Orlando_Indicator's_Report_-
Mecklenburg County State of the Environment Report	http://www.charmeck.org/Departments/LUESA/Water+and+Land+Resources/State+of+the+Environment+Report.htm
Multnomah County—Benchmarks	http://www.portlandonline.com/auditor/index.cfm?&a=39665&c=27347
National Coastal Condition Report	http://www.epa.gov/owow/oceans/nccr/
National Coastal Management Performance Measurement System	http://www.ocrm.nos.noaa.gov/
National Estuarine Reserves System Wide Monitoring Program	http://nerrs.noaa.gov/
National Park Service—Vital Signs Program	http://science.nature.nps.gov/im/monitor/index.htm
National Report on Human Exposure to Environmental Chemicals	http://www.cdc.gov/exposurereport/
New Jersey Hudson Bay Environmental Indicators Initiative	http://www.harborstuary.org/reports/harborh.htm
Oregon State of the Environment Report	http://egov.oregon.gov/DAS/OPB/soer2000index.shtml
Oregon's First Approximation Report	http://www.oregonforestry.org/sustainability/first_approximation_report.htm
Relative Sea Level Trends	http://pubs.usgs.gov/of/2002/of02-233/ppvariables.htm
Risk-Screening Environmental Indicators	http://www.epa.gov/opptintr/rsei/
Roundtable on Sustainable Forests	http://www.sustainableforests.net/info.php
Santa Monica Sustainable City Plan	http://santa-monica.org/epd/scp/
Sierra Nevada Wealth Index	http://www.sbcouncil.org/wealth.htm
State of Boston Harbor	http://www.mwra.state.ma.us/harbor/html/2002-09.htm
State of Kentucky's Environment	http://www.eqc.ky.gov/pubs/soke/
State of the Great Lakes Ecosystem Conference	http://www.epa.gov/glnpo/solec
State of the Nation's Ecosystems	http://www.heinzctr.org/ecosystems/
Sustainable Development Indicators for Pennsylvania	http://www.paconsortium.state.pa.us/pointing_pa_sustainable_future.htm
Sustainable Development in the United States	http://clinton1.nara.gov/White_House/EOP/pcsd/
Sustainable Minerals Roundtable	http://www.unr.edu/mines/smr/
Sustainable Nantucket—A Compass for the Future	http://Indicators.sustainablenantucket.org/intro.cfm
Sustainable Rangelands Roundtable	http://sustainablerangelands.cnr.colostate.edu/
Sustainable Seattle—Indicators of Sustainable Community	http://www.sustainableseattle.org/Publications/40indicators.shtml
Sustainable Water Resources Roundtable	http://water.usgs.gov/wicp/acwi/swrr/
The State of the Bay—A Characterization of the Galveston Bay Ecosystem	http://www.tnrcc.state.tx.us/admin/topdoc/pd/020/02-04/galvestonbay.html
The Status and Trends of Our Nation's Biological Resources	http://biology.usgs.gov/s+t/SNT/index.htm
The Status of Biodiversity in the United States	http://www.naturalreserve.org
U.S. Land Cover Trends	http://gam.usgs.gov/LandUseDynamics/ludatacollection.shtml
Valley Vision (California)	http://www.calregions.org/civic/partners/mid-vvr.html
Washington Department of Ecology	http://www.ecy.wa.gov/
Water Indicator System for the Environment	http://www.pepps.fsu.edu/WISE/
West Oakland—Environmental Indicators	http://www.neip.org

Source: Government Accountability Office Report

This is one reason why a Bureau of Environmental Statistics has not been created. There have been at least 15 attempts in Congress to create such a body, but all have foundered. Environmental groups are often in the forefront of opposition to the idea.

An example of the politicized and problematic nature of indicators can be seen in an indicator set that environmental reporter Seth Borenstein developed for the Knight-Ridder newspaper chain to measure environmental trends under President Bush. Borenstein set out to prove that "the steady environmental improvement [of the last 30 years] has stalled or gone into reverse in several areas since Bush took office, according to government statistics." Of 14 primary indicators Borenstein selected, nine purport to show environmental deterioration. Among the bad news findings are:

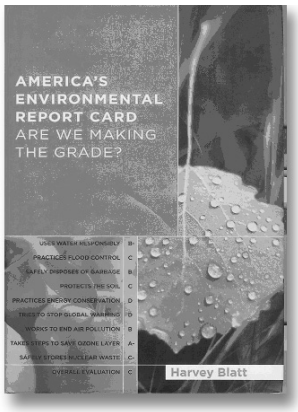
- Superfund cleanups declining 52 percent since 2001.
- Fish-consumption warnings for rivers have doubled.
- Fish consumption advisories for lakes increased 39 percent.
- Beach closings increased 26 percent.
- Civil citations issued to polluters fell 57 percent.
- Criminal pollution prosecutions dropped 17 percent.

The first thing that should be observed about these six indicators is that they are largely process-oriented, and have no direct linkage to measured environmental conditions or results. Superfund cleanups have been declining in part because the federal government is finally nearing the end of the 25-year backlog (a backlog that was originally projected to be cleaned up in less than five year). Under Borenstein's simple measure, finishing all Superfund cleanups would register as an environmental deterioration because cleanups would fall to zero.

Fish advisories in rivers and lakes, primarily the responsibility of the states, have gone up chiefly because of stepped-up monitoring efforts, though it should be pointed out that we still lack water quality monitoring capability adequate to discern trends in our rivers and lakes. So we really can't say precisely whether water quality is improving or declining. Having spent $600 billion for water pollution abatement since 1970, one would reasonable hope so.

The change in the amount of criminal prosecutions is likewise a meaningless figure. We don't measure progress in crime by the metric of criminal prosecutions, but by whether the crime rate goes down. Has EPA-regulated pollution risen or fallen over the last four years? According to two of Borenstein's other indicators, pollution has fallen.

A more balanced assessment comes from Harvey Blatt in his new book *America's Environmental Report Card: Are We Making the Grade?*[26] Blatt, a professor of geology at the Institute of Earth Sciences at Hebrew University in Jerusalem, assigns letter grades for nine categories of environmental quality, with grades running from D (for global warming and energy conservation) to A- (for protection of the ozone layer), and arriving at a summary grade of C for the United States as a whole.



Despite beginning with alarmist rhetoric—"America's environment is in danger"—in the first sentence, the book provides a sober and balanced discussion of the environment in the United States, leavened here and there with useful trivia. (American toilets were flushed an estimated 144 million times during the 2004 Super Bowl, for example.) Blatt freely notes uncertainties about the effect of climate change, and also notes the unfavorable cost-benefit ratio of many environmental regulations, as shown in Table 2.

Another approach to indicators comes from Resources for the Future and the University of Maryland Center for Environmental Science, who are trying to develop "environmental benefit indicators" (EBIs).[27] Rather than measure pollution levels or other quantitative measures of environmental liabilities, EBIs try to quantify environmental assets, such as wetlands, habitats, and other land uses.

At first sight EBIs may appear to be the next generation of the controversial method known as contingent valuation. Certainly, assigning value to ecosystem benefits in the absence of functioning markets inherently requires subjective judgments and some arbitrariness. However, the RFF/UMCES researchers believe that a consistently applied method would provide a basis for making tradeoffs among competing environmental efforts on the local level.

Table 2:
The Cost of Selected Federal Regulations

Regulation (Year issued)	Cost per life saved
Child-proof lighters (1993)	$100,000
Respiratory protection (1998)	100,000
Logging safety rules (1998)	100,000
Electrical safety rules (1990)	100,000
Steering-column standards (1967)	200,000
Hazardous waste disposal (1998)	1.1 billion
Hazardous waste disposal (1994)	2.6 billion
Drinking water quality (1992)	19 billion
Formaldehyde exposure (1987)	78 billion
Landfill restrictions (1991)	100 billion

Source: *The Economist*, January 24, 2004

IV. After 10 Years

And so we return to the core question of this report: What progress is being made? By some measures, quite a lot; by other measures, less so, because we lack data. Or, in the minds of some segments of environmental opinion, our metrics of conditions are beside the point, because nothing less than a wholesale transformation of human consciousness and social order will suffice to save the planet. While this interminable sideshow continues, over the last 10 years two general trends are unmistakable.

First, the view that economic growth is the cornerstone of environmental protection has won out over the "limits to growth" mentality that typified environmentalism in the 1960s and 1970s. Even orthodox environmentalists now concede this point, albeit grudgingly, in some instances. In 1998, for example,

the Worldwatch Institute published *The Natural Wealth of Nations: Harnessing the Market for the Environment*, by David Malin Roodman.

In language that could have come straight from Terry Anderson and Don Leal's *Free Market Environmentalism*, Roodman acknowledges that bureaucratic regulation is often ineffective "for precisely the same reason that central planning has run aground almost everywhere it has been tried." Continuing environmental improvement, Roodman suggests, will require "giving freer rein where possible to industry's own problem-solving ability."

One of two other recent milestones in this gradual change in thinking is Jack M. Hollander's important book published in 2002, *The Real Environmental Crisis: Why Poverty, Not Affluence, Is the Environment's Number One Enemy* (University of California Press). Hollander, a physicist and energy expert at UC Berkeley, wrote that "The central argument of this book is that *the essential prerequisites for a sustainable environmental future are a global transition from poverty to affluence, coupled with a transition to freedom and democracy*." (Emphasis in original.)

The other notable book from recent years is Bjørn Lomborg's 2001 *The Skeptical Environmentalist*, whose wide readership shows that the marketplace is now open to contrarian points of view. Both books were reviewed extensively in the eighth edition (2002) of this report. The coup de grace in this process came at the 2002 U.N. World Summit on Sustainable Development, where the final report emphasized the centrality of reducing poverty through economic growth.

The report also linked foreign aid to good governance and free markets. This represented a dramatic turn away from the Malthusianism and wealth-redistribution mentality that characterized the mood of previous U.N. environmental summits, and towards a new emphasis on wealth creation instead. This shift in thinking is more significant than any single indicator of pollution or ecosystem health.

The second important shift evident over the last decade is the growing recognition of the need to embrace more decentralization of environmental efforts, both to state and local government and also to grassroots citizen-led programs. This has been a long time coming, and still faces enormous resistance from the environmental establishment.

But consider the following remark from a prominent public figure made in 2000: *"We believe that people know what's best for their own communities and, given the facts, they themselves will determine what is best to protect public health and the environment."* At first blush this seems like the rhetoric of George W. Bush, who emphasized during the presidential campaign the desire to "empower people, not Washington." In fact, this remark, with emphasis added, was made by Clinton EPA administrator Carol Browner.[28]

Hollander, a physicist and energy expert at UC Berkeley, wrote that "The central argument of this book is that *the essential prerequisites for a sustainable environmental future are a global transition from poverty to affluence, coupled with a transition to freedom and democracy*."

Browner's statement reflects the growing acknowledgement that many environmental problems are best comprehended and managed locally rather than from Washington. Paul Portney of Resources for the Future comments:

> It also seems likely that the next half-century will see . . . more decentralization of environmental authority to lower levels of government . . . [T]here is no obvious reason why states in the United States and other western democracies should not have the authority to regulate the degree of stringency for solid waste landfills, for instance, or even for setting standards for drinking water contaminants. . . Given the growing budgets and sophistication of state (and in some cases even regional or local) environmental authorities, as well as the growing mistrust of the federal government, it would be most surprising if we did not see in the future a devolution of even more authority from the federal government to regional, state, or even local government.[29]

The new emphasis on state and local initiatives will make greater use of local knowledge, market incentives, flexibility, technological innovation, and cooperative dialogue among affected parties, rather than cumbersome, centralized rule-making and complicated lawsuits. Such local approaches are going to be essential to solving some kinds of environmental problems, such as non-point source water pollution. Some observers have referred to the trend of devolution as "New Environmentalism" (see www.newenvironmentalism.org).

Flashback

FME Vindicated

In 2001, Terry Anderson and Don Leal completed a new edition of *Free Market Environmentalism*, bringing their ideas up to date with more examples of FME in practice and extending FME ideas to international environmental issues. Anderson and Leal unsurprisingly find that one of the largest obstacles to sound resource stewardship in the developing world is the lack of clear and enforceable property rights. The authors cite the work of economist Seth Norton, who found that security of property rights correlates closely with whether a nation's forests are growing or shrinking. The example of forests applies broadly across other environmental categories. Norton concludes: "Environmental quality and economic growth rates are greater in regimes where property rights are well defined than in regimes where property rights are poorly defined."

—*Index of Leading Environmental Indicators, Seventh Edition* (2002)

Above all, devolution of environmental policy will provide citizens with more opportunity to affect change and improvement, rather than mentally delegating the task to an anonymous bureaucracy in distant Washington.

Others understand the trend in terms of increasing civic responsibility by citizens, with citizens taking interest in local environmental affairs in much the same way as they express their interest in their neighborhood public schools. This school of thought goes by the name "Civic Environmentalism," and it has both conservative and liberal versions (see www.civicenvironmentalism.org).

Regardless of how the trend of devolution is understood, it is apparent that the next 30 years of environmentalism will look quite differently from the last 30. Above all, devolution of environmental policy will provide citizens with more opportunity to affect change and improvement, rather than mentally delegating the task to an anonymous bureaucracy in distant Washington. As this trend deepens, public perception of environmental trends is likely to become more accurate as well.

Flashback

Practical or Romantic Environmentalism?

The kind of thinking that looks beyond real problems to the need for revolutionary, 'holistic' new social structures represents not environmentalism, but utopianism. This kind of utopianism is the greatest hindrance to serious environmentalism for the same reasons every other kind of utopianism fails—it breeds an unrealistic, if not erroneous, understanding of how the world works, and an intolerance that paves the way for political coercion. . .

Eco-utopians seem to belong more in a Monty Python skit than a serious political dialogue.

For example, in *Ecology and Socialism*, British author Martin Ryle wrote: "Most ecosocialists, myself included, doubtless *prefer* to imagine a centralized federation of autonomous communities, producers' collectives and the like, co-operating on the basis of freely entered mutual association." But the humor of this vision ends with the next sentence: "If one is honest, however, about the objectives which an ecologically enlightened society would set for itself, it is difficult to avoid concluding that the state, as the agent of the collective will, would have to take an active law-making and enforcing role in imposing a range of environmental and resource constraints."

—*Index of Leading Environmental Indicators, Fifth Edition* (2000)

Notes

1 See http://ocid.nacse.org/qml/nbii/eagles/.

2 Esa Ranta and Veijo Kaitala, "A Leap for Lion Populations," *Science*, January 21, 2005.

3 Charles H. Peterson, et al., "Long-Term Ecosystem Response to the *Exxon Valdez* Oil Spill," *Science*, December 19, 2003, pp. 2082-85; "Blue Whale Makes a Splash on Return to Alaska," *Nature*, July 29, 2004, p. 496.

4 J.A. Thomas, et al., "Comparative Losses of British Butterflies, Birds, and Plants and the Global Extinction Crisis," *Science*, March 19, 2004, pp. 1879-81.

5 "Loss of Dung Beetles Puts Ecosystems in Deep Doo-Doo," *Science*, August 27, 2004, p. 1230.

6 Robert F. Service, "New Dead Zone Off Oregon Coast Hints at Sea Change in Currents," *Science*, August 20, 2004, p. 1099.

7 The report argues: "The United States simply cannot achieve the levels of understanding and predictive capability needed, or generate the information required by a wide range of users, without the IOOS."

8 Michael Williams, "What's Been Going on in the Woods," *Science*, November 26, 2004, pp. 1479-80.

9 See David Goodstein, *Out of Gas—The End of the Age of Oil* (New York, NY: Norton, 2004); Leonardo Maugeri, "Oil: Never Cry Wolf—Why the Oil Age Is Far from Over," *Science*, May 21, 2004, pp. 1114-15; Tim Appenzeller, "The End of Cheap Oil," *National Geographic*, June 2004, pp. 80-109; Declan Butler, "Nuclear Power's New Dawn," *Nature*, May 20, 2004, pp. 238-40.

10 *Science* magazine surveyed the hydrogen controversy in a special section in the August 13, 2004 issue.

11 http://www.responsiblewind.org/reality. For a broader critique of wind power, see http://www.perc.org/publications/percreports/dec2004/wind_energy.php.

12 Daniel Sarewitz, "How Science Makes Environmental Controversies Worse," *Environmental Science and Policy* 7 (2004), pp. 385-403.

13 Richard Lewontin, "Dishonesty in Science," *New York Review of Books*, November 18, 2004, p. 39.

14 See the discussion of this study in the ninth edition (2004) of this report, p. 76.

15 Richard J. Ladle, et al., letter to *Nature*, April 22, 2004, p. 799.

16 Lee Hannah and Brad Phillips, letter to *Nature*, July 8, 2004, p. 141.

17 From Jonathan Schell, "Our Fragile Earth," *Discover*, October 1989, p. 47. Emphasis added.

18 The report can be downloaded at: http://www.ucsusa.org/global_environment/rsi/page.cfm?pageID=1642.

19 Gregg Easterbrook, "Politics and Science Do Mix: Claims that Bush Misuses Research Are Hypocritical," *Los Angeles Times*, April 6, 2004, p. B-13.

20 The report can be downloaded at: www.thebreakthrough.org/images/ Death_of_Environmentalism.pdf.

21 "It is hard to escape the impression that many environmental lobby groups (as opposed to research and conservation organizations) have become de facto adjuncts to the Democratic Party in the same fashion as the National Rifle Association is to the GOP." *Index of Leading Environmental Indicators, Eighth Edition* (2003), p. 4.

22 Dick Taverne, "When Greens See Red," *Nature*, November 25, 2004, pp. 443-44.

23 Hans von Storch, "A Global Problem," *Nature*, May 20, 2004, pp. 244-45. Storch elaborated on the problem: "The examples that are adduced in this way seem to be biased towards deleterious effects. Thus, the book is a good demonstration that the environmental sciences are driven not only by curiosity and reductionist interests for detailed processes, but by an endeavor to integrate different sorts of often uncertain and contested knowledge claims from a broad field of disciplines—in an area that has high stakes. The result is an effort with a normative agenda of improving or saving the world. I am sympathetic to the message, but as a scientist I think we must strive for objectivity (as far as possible) and avoid any overselling. Downplaying uncertainty is not useful, except perhaps for a limited time and a small audience. In the long term, this is not a sustainable approach."

24 Gregg Easterbrook, "'Collapse': How the World Ends," *New York Times Book Review*, January 30, 2005. For a general critique of all of the recent doomsaying books, see http://www.aei.org/publications/pubID.21588/pub_detail.asp.

25 *Environmental Indicators: Better Coordination Is Needed to Develop Environmental Indicator Sets that Inform Decisions*, U.S. Government Accountability Office, Report GAO-05-52 (November 2004), available at http://www.gao.gov/new.items/d0552.pdf.

26 Cambridge, MA: MIT Press, 2005.

27 See James Boyd, "What's Nature Worth? Using Indicators to Open the Black Box of Ecological Valuation," *Resources*, Summer 2004, pp. 18-22.

28 *Toxics Release Inventory 1998*, pp. 1-6.

29 Paul Portney, "Environmental Problems and Policy: 2000-2050," *Resources*, Issue 138 (Washington, DC: Resources for the Future, Winter, 2000), pp. 6-8.

Black Ink, Green News: 2004 Media Roundup

PRI Awards for Excellence in Environmental Journalism

News Feature Writing

Tina Rosenberg
"What the World Needs Now Is DDT"
New York Times, April 11, 2004

Editorials/Op-eds

Barun Mitra
"Save the Planet and the Third World Will Pay"
The Times (London), December 5, 2004

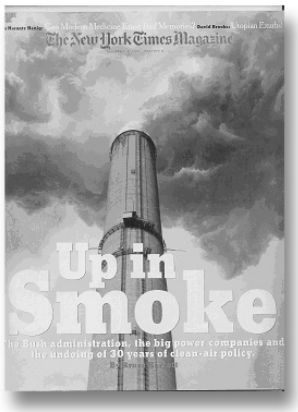
Last July the big news in pop music was the sensational story, reported prominently by international wire services, of a suitcase found at an Australian flea market that was said to contain long-lost Beatles material, including rare concert programs, photos, and unreleased tapes. Well, never mind. When examined by experts, the material turned out to consist of fakes and copies of widely available bootleg tapes. In typical fashion, while the original bogus find was front-page news in some cases, the follow-up correction was buried deep inside most newspapers and magazines.

The Washington Post's correction, for example, ran in a small box on page C-5.[1] At least this story *was* corrected. Many erroneous or misreported environmental stories, from big ones such as the "population bomb" 30 years ago to small ones such as potential health threats from local sources of pollution that don't pan out on closer inspection, never receive serious follow up.

For example, Iain Murray points to the *Tampa Tribune*, which published dozens of stories about elevated health hazards ostensibly caused by Coronet Industries, owners of a phosphate plant in Plant City, Florida. When the state conducted an independent scientific review and found no basis for the claims, the *Tribune* responded that its series on the issue was "an exercise in journalism, not science. We wanted to know what ailed people, not what caused it."[2]

The *New York Times*'s standout science writer Andrew Revkin offers useful insight into one aspect of the difficulty with environmental reporting: "Environmental issues—at least the most profound ones—are generally the antithesis of news. They are subtle, slow-moving, complicated shifts that often hide in plain sight." And subtle, complicated stories are not merely difficult to report, but unimaginative editors often bury them on the back pages—if they are printed at all. Sensationalized copy that lands on the front page and sells papers is obviously a better career move.

Sometimes even a seemingly patient and deeply reported story can go wrong, however. This is why the raspberry for the worst environmental news story of 2004 goes to Bruce Barcott's 8,000-word cover feature in the *New York Times Magazine*, "Changing All the Rules" (April 4, 2004). A more truthful title would have been "Changing All the Rules, Ignoring All the Facts."



Worst Story of the Year . . .

The trouble with the story began with the magazine's cover photo of an ominous-looking power plant smokestack that was belching forth a large column of dark steam (as in water vapor—the photo was deliberately backlit so as to make the steam appear dark). The story concerned the ongoing controversy over proposed changes to "New Source Review" (NSR), a complicated feature of the Clean Air Act that requires older power plants and industrial facilities to install state-of-the-art pollution control equipment if and when they are substantially modified. Critics charge that the utility industry has been exploiting the "routine maintenance" exception in NSR as a loophole to upgrade plants while avoiding the cost of installing new pollution-control features.

Barcott's story focuses exclusively on the complaints of critics of the Bush EPA's changes to NSR; he apparently never spoke with a single

non-industry critic of NSR. There are numerous academic and public sector critics of NSR, including the team that produced the report of the National Academy of Public Administration that detailed the dysfunctions of NSR.[3]

Instead, Barcott's article adumbrates a favorite story line of environmental activists: namely, that the Bush administration's changes to NSR amount to "gutting" the Clean Air Act, as if NSR were the sum total of the Clean Air Act. More than mere subversion, the Bush NSR changes represent a reversal of the bold action of the Clinton EPA that was just about to produce major results. Immediate across-the-board emissions reductions of 50 percent were expected by the advocates Barcott interviewed.

Barcott writes: "The problem was that [NSR] was about to work all too well—in the way, finally, that it was designed to when it was passed by Congress 25 years ago." This precious claim should be ranked as the environmental equivalent to Herbert Hoover's infamous declaration that "prosperity is just around the corner." Nor does Barcott ever provide the reader with any context about air pollution, such as sulfur dioxide (SO_2) or nitrogen oxide (NO_x) emissions trends.

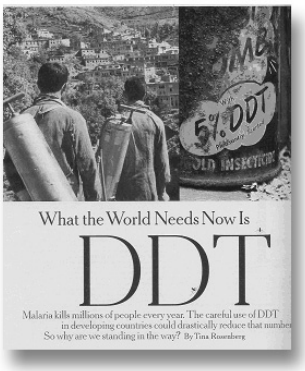
In fact, emissions from the electric utility industry and ambient levels of SO_2 and NO_x have been *falling* steadily over the last 15 years, during the same period that Barcott says electric utilities were systematically evading the law. In fact, coal-fired power plant emissions of SO_2 fell 35 percent between 1990 and 2002, while NO_x emissions fell 33 percent—impressive numbers for a bunch of scofflaws.[4]

Introducing the PRI Awards for Excellence in Environmental Journalism

Best News Feature of 2004

There is more to be learned from surveying the notable instances of superior environmental journalism than from complaining about the generally poor quality of media coverage. Much of the excellent journalism, we are happy to say, appeared in the *New York Times Magazine*, making up for the Barcott train wreck.

This year, for the first time, the Pacific Research Institute decided to formalize this review process. It is making a cash award of $1,000 each for Excellence in Environmental Journalism to the best news feature article and to the best editorial or op-ed article that appeared in print during 2004. The criteria for selection include stories that depart from the conventional wisdom or show openness to contrarian points of view, a sober, non-alarmist tone, and serious original research—in short, stories that demonstrate a reporter's originality and independence of mind. There were 19 outstanding articles nominated for recognition. A panel of judges reviewed the finalists and selected a winner for each category.



Best Story of the Year . . .

The winner of the first annual PRI Excellence in Environmental Journalism Award for News Feature Writing is **Tina Rosenberg** of the

> "DDT killed bald eagles because of its persistence in the environment. *Silent Spring* is now killing African children because of its persistence in the public mind."
> —Tina Rosenberg

New York Times, for her article "**What the World Needs Now Is DDT**," published in the *New York Times Magazine*, April 11, 2004.

After having wiped out malaria in the United States and Canada with the overuse of DDT (leading to its total ban in 1972), some environmentalists have brought pressure for a worldwide ban. However, DDT is the most effective means of preventing the spread of malaria in the developing world, where millions are still afflicted each year.

Used responsibly (chiefly through indoor use), DDT need not exact harm on the environment. Along the way to detailing the case for DDT use, Rosenberg fearlessly takes on one of the unassailable icons of environmentalism—Rachel Carson's famous book, *Silent Spring*. In rereading *Silent Spring*, Rosenberg noted that "in her 297 pages, Rachel Carson never mentioned the fact that by the time she was writing, DDT was responsible for saving tens of millions of lives, perhaps hundreds of millions."

Rosenberg goes on to deliver this devastating judgment: "DDT killed bald eagles because of its persistence in the environment. *Silent Spring* is now killing African children because of its persistence in the public mind." This is not the kind of writing that will win applause from the Society for Environmental Journalism. But it receives kudos from PRI for its refreshingly honest and scientifically sound analysis.

Several other excellent news feature stories from 2004 deserve recognition:

John Tierney, "The Autonomist Manifesto (Or, How I Learned to Stop Worrying and Love the Road), *New York Times Magazine*, September 26, 2004. Tierney, recently selected to be William Safire's replacement as a columnist on the *New York Times* op-ed page, breaks from nearly every cliché of the "smart growth" movement. (Tierney has a long record of breaking from the conventional wisdom: it was his 1991 feature in the *New York Times Magazine* that brought national attention to Julian Simon's successful bet with Paul Ehrlich about resource scarcity.) The car is politically incorrect these days—regarded as a rolling cigarette, with GM and Ford portrayed as the moral equivalent of the tobacco companies.

Tierney, who didn't own a car for a long time, admits to personally disliking cars. But he says:

> I no longer believe that my tastes should be public policy. I've been converted by a renegade school of thinkers you might call the autonomists, because they extol the autonomy made possible by automobiles. Their school includes engineers and philosophers, political scientists like James Q. Wilson and number-crunching economists like Randal O'Toole, the author of the

540-page manifesto *The Vanishing Automobile and Other Urban Myths*. These thinkers acknowledge the social and environmental problems caused by the car but argue that these would not be solved—in fact, would be mostly made worse—by the proposals coming from the car's critics. They call smart growth a dumb idea, the result not of rational planning but of class snobbery and intellectual arrogance.

> The car is politically incorrect these days—regarded as a rolling cigarette, with GM and Ford portrayed as the moral equivalent of the tobacco companies.

David Whitman, "Partly Sunny: Why Enviros Can't Admit That Bush's Clear Skies Initiative Isn't Half Bad," *Washington Monthly*, December 2004. Whitman, a long time environmental and social policy correspondent for *U.S. News and World Report* and currently a journalism fellow of the Alicia Patterson Foundation, wonders whether environmentalists haven't let political interest trump objective judgment about the Bush administration's proposal to expand tradable emissions programs to reduce air pollution. Whitman tells the story behind the development of the Bush EPA's "Clear Skies" proposal with more detail than has ever seen the light of day before, along the way debunking claims that Clear Skies represented a weakening of the Clean Air Act.

The most thought-provoking aspect of Whitman's article is his analysis of the short-sighted self-destructiveness of politicized environmental groups, which he likens to the short-sightedness that blocked a guaranteed annual income 35 years ago:

> First, a president proposes an uncharacteristically generous program. The president's foes attack the program ferociously, instead of being encouraged by the unexpected show of support from the White House. For advocates, the perceived inadequacy of the reform plan becomes so intolerable that they announce they prefer the current system to a new one. Next, some of the president's traditional allies turn on him. In the last stage, a strange-bedfellow coalition of liberals and conservatives torpedoes the legislation for opposite reasons. Afterwards, perhaps decades later, the advocates look back with a hint of wistfulness on the reform that got away.

Stephen Smith, "The Asthma Riddle: Scientists Still Struggling to Understand the Epidemic," *Boston Globe*, April 13, 2004. Asthma continues to be the mystery respiratory disease, and while medical researchers are identifying possible new causative links (see the Air Quality section of this edition for an inventory of some recent new findings), the media tend to parrot environmentalist claims that air pollution is the cause of rising asthma rates. Stephen Smith's story accurately conveys the puzzlement of medical

experts, and eschews the activists' line about air pollution: "If the first mystery of asthma is its root cause and the second is how to treat it, then the third is why it has increased so quickly and so furiously." Smith surveys the wide range of factors, some of them counterintuitive (such as better hygiene), that are associated with rising asthma rates, along with the anomalies that have researchers baffled.

Miguel Bustillo, "As Smog Thickens, So Does the Debate," *Los Angeles Times*, May 24, 2004. As we remarked upon in depth in last year's *Index*, one of the oddest and most overlooked aspects of air pollution today is the fact that in some regions (especially California), ozone levels are higher on weekends than on weekdays. This is counterintuitive given that emissions of ozone precursors are typically 40-percent lower on Saturday and Sunday.

Miguel Bustillo is the first environmental beat reporter, to our knowledge, to notice this strange trend and report accurately what many air quality scientists have been saying for several years: "Now, some scientists, armed with new research about the weekend effect, are suggesting that environmental officials may be putting too much emphasis on the wrong pollutant because they misunderstand how smog forms in the atmosphere."

Bustillo notes that regulators, stubbornly defending current policies that are counterproductive, are increasingly in the minority in explaining the weekend effect.

Climate Change and Network News

How well do the major broadcast media cover the enormous and complicated story of climate change? According to a study from Media Research Center analyst Dan Gainor, broadcast network coverage is both superficial and heavily slanted toward an alarmist point of view. It often slights many important aspects of the issue, such as the high economic cost of the Kyoto Protocol.

Gainor reviewed 165 network news stories on climate change that were aired between January 20, 2001 and September 30, 2004. Among his findings:

- Stories that emphasized the potential harms of global warming outnumbered stories that mentioned problems with the Kyoto Protocol by a three-to-one margin (46 percent to 12 percent).

- Three networks—NBC, CBS, and CNN—never mentioned any of the estimates of the potential cost of Kyoto to the American economy, not even estimates produced by the pro-Kyoto Clinton administration. Only ABC and FOX News mentioned cost estimates, and these were only brief references in larger reports. Not one network ran a story devoted solely to discussing Kyoto's economic cost.

- Of all 165 stories, only one mentioned the Byrd-Hagel resolution of 1997, in which the Senate voted 95-0 (including John Kerry) to oppose features of the Kyoto

Jim Carlton, "In the Sierras, A Raging Debate Over Clear-Cutting," *Wall Street Journal*, May 27, 2004. Carlton, noted for an outstanding feature on western ranching in the 2003 edition of this report, makes our honorable mention list again with this story on the perennial controversy over clear-cutting in western forests. The focus of the story was on the private timber landholdings of Sierra Pacific Industries (more than 1.5 million acres in California, making Sierra Pacific California's largest private landowner) and its folksy CEO, Archie "Red" Emmerson.

Carlton carefully conveys both sides of the argument over clear-cutting. "After decades in which humans have blocked the natural regenerative cycle of forest fires, they say, clear-cutting mimics the effect of natural wildfire: it opens up overgrown tree stands to sunlight and allows the trees that remain to grow more fire resistant."

On the other side of the ledger, Carlton cites environmentalists who point to increased erosion and degradation of streams near clear-cutting sites. One aspect of this story deserves special note: Sierra Pacific's landholdings became both more valuable and more intensively logged as a consequence of the federal decision to close off logging to much of the national forests in the late 1980s, on behalf of the spotted owl.

Whether the net environmental results are positive or negative is beyond the scope of Carlton's article, but this is an excellent example of the difficult tradeoffs (and implicit wealth transfer) involved in the politics of public land management.

Protocol that the Clinton administration accepted. Instead, most stories cast the blame for the U.S. rejection of Kyoto solely on the Bush administration.

- Only CNN and FOX consistently attempted to include equal input from Kyoto critics or climate science skeptics in their broadcasts.

Gainor rightly asks how the public is to understand the issue when the media does not convey important aspects of the debate, such as the potential economic cost and the adverse attitude of the U.S. Senate, which would have to ratify the Kyoto Protocol.

The Media Research Center report, rather frothily titled "Destroying America To Save the World: TV's Global Warming Coverage Hides the Cost of Kyoto," can be downloaded at: www.freemarketproject.org.

Melissa Healy, "Behind the Organic Label: As the Industry Grows, Skeptics Are Challenging the Health Claims," *Los Angeles Times*, September 6, 2004. What could be more healthy and environmentally friendly than organic food? Healy casts a jaundiced eye at the organic enthusiasm:

By one well-established measure of healthfulness—contamination with fecal matter and potentially harmful bacteria—some organic foods may pose greater risks to consumers.

> But as organic products—and their claims to superiority—have grown more common, scientists, policy analysts and some consumers have begun to ask for proof. Where's the evidence, they ask, for the widespread belief that organic foods are safer and more nutritious than those raised by conventional farming methods? The short answer, food safety and nutrition scientists say, is that such proof does not exist. Indeed, by one well-established measure of healthfulness—contamination with fecal matter and potentially harmful bacteria—some organic foods may pose greater risks to consumers.

Jane E. Brody, "A Conversation with Robert L. Brent: Calming Parents' Fears About Environmental Hazards," *New York Times*, July 13, 2004.
Dr. Robert L. Brent is a distinguished professor at Thomas Jefferson Medical College in Philadelphia and head of a birth defects research laboratory at the Alfred I. duPont Hospital for Children in Wilmington, Delaware. He has been studying environmental toxicology for nearly half a century, specializing in the effects of environmental factors like radiation, drugs, and chemicals on the developing embryo and child.

He tells *Times* reporter Jane Brody that "There's a lot of misinformation out there scaring parents. Just because you have trichloroethylene in your well doesn't tell you what your exposure is and whether there's any risk. . . .Toxicological agents all have a threshold below which they will have no effect."

Brent went on to challenge one of the totemic legends of environmentalism:

> Love Canal was an example of a terrible environmental problem that should be cleaned up, but there was no evidence of risk to the people who lived there. Many fears are irrational. Each instance has to be evaluated on its own merits. They wanted to tear down a group of houses in Philadelphia in which the level of radon was just a little above background. All that was needed was to put a fan in the basement to blow the stuff out.

Rona Kobell, "A Bull Market in Land Preservation," *Baltimore Sun*, December 12, 2004. Maryland Governor Robert Ehrlich's proposal to sell some state conservation land to private owners touched off the usual controversy, but *Sun* reporter Kobell noticed that "some experts say that private ownership of land is not necessarily incompatible with the preservation of Maryland's rural landscape. These free-market environmentalists point to tools such as conservation easements and the proliferation of land trusts as proof that a robust market exists for preservation." Kobell went on to quote a number of free-market environmentalists whom many environmental reporters often refuse to acknowledge, including Cato's Jerry Taylor, Randal O'Toole, and Robert Nelson.

Best Editorial/Op-ed of 2004

The winner of the PRI Award for Excellence in Environmental Journalism in Editorial or Op-Ed Writing is **Barun Mitra** of India's Liberty Institute, for his article "**Save the Planet and the Third World Will Pay**," published in *The Times* (London), December 5, 2004.

Mitra took aim at the enthusiasm for development assistance that promotes exotic energy technologies for the developing world as a means of combating climate change. Mitra says these proposals are "irrelevant" to the developing world: "[The] Kyoto [Protocol] does not sound convincing to the world's poor. For what this present debate over climate change has done is to divert attention from the core issue of mankind—poverty. . . .Supporters of climate change theory rightly warn that the poor are most vulnerable to natural calamities such as hurricanes, floods and droughts. Yet Kyoto protocol policies seek to retard the economic growth that would enable the poor to leave poverty behind and adapt better." Mitra rejects the kind of environmentalism that "puts the environment, rather than people, at the centre of decision-making."

Honorable mentions in the editorial/op-ed category include:

Steve Chapman, "What's All Wrong with 'Energy Independence,'" *slate.com*, February 6, 2004. Chapman, a *Chicago Tribune* columnist, chose the online venue of *slate.com* to extend beyond standard op-ed length to decry the conventional wisdom about ridding ourselves of "dependence" on foreign sources of energy. Chapman doesn't just think something is wrong with this idea: "Just about everything is wrong with it."

Why, he asks, does no one argue that the U.S. should achieve "food independence," or "clothing independence," or "steel independence"? The same economic logic that makes a hash of these ideas also applies to energy—in a globalized world, it makes economic sense to get our energy supplies from the lowest cost suppliers.

Meanwhile, the catnip of "energy independence" is a perfect cloak for new subsidy schemes that can't possibly deliver as promised: "The pretext of weaning ourselves from imported oil is more likely to divert us from that goal than to advance it, and waste a lot of money in the process. The sensible approach: billions for environmental protection, but not one cent for energy independence."

Gregg Easterbrook, "Politics and Science Do Mix: Claims that Bush Misuses Research are Hypocritical," *Los Angeles Times*, April 6, 2004. Easterbrook takes aim at the Union of Concerned Scientists' report charging the Bush administration with the abuse of science in policy making. He notes that many of the complaints are patronage-related and that many of the signatories to the report "are renowned for shouting down anyone who doesn't take a purely politically correct view on every environmental issue." Easterbrook concludes: "Bush, the Democrats and the Union of Concerned

Scientists disagree on subjects like forestry management or allowable parts-per-billion of dioxin, where science can only give guidance, not perfect answers. And such disagreements should be called what they are: legitimate policy disputes, not malfeasance."

Jonathan H. Adler, "Fact: Under Bush, Air Quality Actually Has Improved," *Philadelphia Inquirer*, October 10, 2004. No matter how often the claim that air pollution is getting worse is debunked, it always needs to be stated again. "While it is fair to say that President Bush has been less aggressive on [air pollution] than Gore might have been, charges of a massive environmental 'rollback' are simply untrue. . . .There are more air pollution regulations on the books today than when Bush took office, and air quality continues to improve."

David Brooks, "Clearing the Air," *New York Times*, April 20, 2004. Brooks seldom writes about environmental issues in his *Times* column, but he grew exasperated with the dishonest media monologue and gridlock on the issue. Reviewing several disputes, Brooks concludes: "All of these are open questions, which require a balancing of evidence and interests. These are exactly the sort of questions best hammered out through legislative wrangling. But, of course, that's not allowed to happen. This is yet another issue around which it would be easy to build a sensible majority if things were judged on their merits. Instead, we've got paralysis."

Collin Levey, "It Takes a Tree-Hugger to Raze a Forest," *Seattle Times*, July 15, 2004. Levey takes aim at environmentalist opposition not only to forest management such as tree thinning and harvesting dead trees, but also to proposals to turn over more forest management decisions to the states. Ms. Levey writes:

> So what are the Democratic governors so upset about? Richardson and Oregon's Gov. Ted Kulongoski will be empowered to keep their pristine tinderboxes under a signature of their own. But judging by their responses, it's not as appealing to support radical environmental policies when your office is on the line. . . ."The idea that governors would want to jump headfirst into the political snake pit of managing national forests is laughable," Phillip Clapp, president of the National Environmental Trust said recently. Or here's Washington's own Rep. Jay Inslee, D-Bainbridge Island. "Shifting the responsibility of federal forests to the states is a risky and absurd policy," he fumed, "that will cede the management of federal lands to the whims of individual governors."

Levey's story raises a worthy point for environmental journalists to examine more closely. The devolution of environmental regulatory authority from the federal government to the states is often

decried as setting the stage for a "race to the bottom," despite ample evidence that this is not so. The default presumption among many environmentalists is that federal regulation is superior to state and local regulation, and that states are ill-equipped to oversee environmental protection on their own.

A feature in the *New York Times* last February about an unrelated sector—financial services—should help dispel the idea that federal regulation is always superior to state regulation. In "Call In the Feds, Uh, Maybe Not," *Times* business reporter Gretchen Morgenson recounts the sad story of Metropolitan Mortgage and Securities, a financial services firm based in Washington state, that wiped out the savings of more than 35,000 local investors through mismanagement.[5]

The nub of the story was that the firm's decline into mismanagement began when the federal government took over regulatory oversight from Washington state regulators in 1996. "In the years that followed," the story reported, "state regulators, who had kept Metropolitan on a short leash, could only watch in fear as the company sold more securities—preferred stock and other debt instruments—than it could easily repay."

A 70-year old widow who had lost her life savings at Metropolitan asked, "With people's money at stake, where in the heck were the regulators at, and the people who are supposed to keep an eye on this?" They were in Washington, which supposedly knows better than the local yokels. Why is there reason to suppose that this lesson is not applicable to the environment as well?

There is a big and largely untold story waiting for an enterprising reporter about the ways and places in which states, local government, and grassroots groups, utilizing local knowledge, are outperforming the feds in environmental protection.

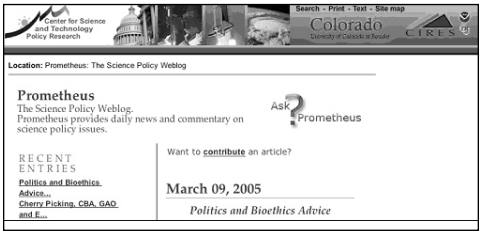
Year of the Blog

Last year has been dubbed the "Year of the Blog," when Internet weblogs took their place as de facto major forces in the news media and caused seismic shifts in the old media of newsprint and broadcast networks (all without filing an environmental impact statement!). Blogs first brought down Howell Raines at the *New York Times*, then exposed the use of forged documents by Dan Rather at CBS News, and moved on for the trifecta by publicizing the gaffes of CNN's news chief Eason Jordan. The political blogs get most of the attention, but there are several environmental websites and blogs that are worth bookmarking.

www.grist.org: The leading website and blog with an orthodox environmental point of view is *www.grist.org*. Grist was one of the sites that took after Bjørn Lomborg's *The Skeptical Environmentalist* in 2001. Grist currently offers a wide-ranging smorgasbord of commentary on the "Death of Environmentalism" debate.

www.commonsblog.com: A new blog from a free-market environmentalist point of view is now up: *www.commonsblog.com*. (Motto: "Markets Protecting the Environment.") Commonsblog features contributions from several current and past contributors to the *Index of Leading Environmental Indicators*.

http://sciencepolicy.colorado.edu/prometheus: Finally, an excellent science policy weblog written from a fiercely independent point of view is available, produced chiefly by Professor Roger Pielke of the University of Colorado. Pielke frequently dissents from environmental correctness on this site.



Notes

1 Pop Notes, August 25, 2004.

2 Iain Murray, "Green Grow the Pressies: How the Media Get the Environment Wrong," *National Review*, July 26, 2004.

3 *A Breath of Fresh Air: Reviving the New Source Review Program* (Washington, DC: National Academy of Public Administration, April 2003), available at ww.napawasg.org. NAPA concluded, among other findings, that "NSR has not been very successful in linking environmental improvement to on-going capital investments by the industrial sectors responsible for the largest amounts of air pollution."

4 For additional analysis of the NSR controversy, see Steven F. Hayward, "Making Sense of New Source Review," *Environmental Policy Outlook* (Washington, DC: American Enterprise Institute, 2003), available at http://www.aei.org/publications/pubID.18961/pub_detail.asp; Steven F. Hayward, "'Changing All the Rules,' Ignoring All the Facts on New Source Review," *Environmental Policy Outlook* (Washington, DC: American Enterprise Institute, 2004), available at http://www.aei.org/publications/pubID.20588/pub_detail.asp.

5 The story appeared February 29, 2004, section 3, p. 1.

The Year in Review: Climate Change

- Dispute continues over Michael Mann's "hockey stick" graph, which purports to prove that the last 25 years have been the warmest in the last 1,000 years. Scientists have shown that the process used to generate Mann's graph would generate the same result from any series of random numbers. One internationally renowned expert has called the graph "methodologically wrong" and "rubbish."

- July 2004 was the coolest July in the last four years. Perhaps that's partly because the annual rate of increase in the concentration of CO_2 in the atmosphere is only about half of what is expected based on man-made emissions. Scientists believe the oceans are absorbing the missing half.

- The arctic today, though warmer than it was in 1970, is colder than it was in 1930. In fact, temperatures in Greenland have fallen over the last 15 years. That is leading some scientists to believe that shifts in the wind, rather than temperature change, are responsible for any retreating of the arctic ice.

It is hard to settle on a results-oriented metric for what is happening with climate change in the United States or around the world. And it's even harder to settle on one for the ongoing dispute about policy responses.

The best metric would be temperature. Everyone agrees that global temperatures have risen about 0.6 degrees celsius over the last century.[1] But controversy remains about the accuracy of our recent measurements and the pace of warming. In 2004, there were more attempts to square one of the leading anomalies of climate measurement.

Ground-based temperature readings show a warming trend over the last 25 years. Satellite temperature measurements of the lower atmosphere (or troposphere) show only about half as much warming, even though most climate models suggest the lower atmosphere should warm even more than ground level. To understand this controversy, keep in mind that ground-level temperatures are taken the old fashioned way—with thermometers. They are then corrected for the "urban heat island effect," i.e. the fact that most temperature readings are taken near cities and other human-altered areas where temperatures are higher than the average atmospheric temperatures for the planet as a whole.

Satellite temperature readings, by contrast, come from microwave readings rather than direct measurement. They require statistical interpretation because microwave readings yield different temperatures at varying elevations from the earth's surface. Any data that can be interpreted statistically can be re-interpreted statistically to get a different result. This is exactly what a team led by Qiang Fu at the University of Washington did in a study published in *Nature* last May.[2]

By "correcting" for the cooling effect of the stratosphere (the next layer of the atmosphere above the troposphere), the satellite results can be brought into line with the surface thermometer readings. Case closed? Probably not. John Christy, director of the Earth System Science Center at the University of Alabama/Huntsville, disputes the Fu findings, and argues that the Fu team has over-corrected for stratospheric cooling and introduced new statistical errors into the analysis. Christy was one of the designers of the satellite observation system, and the first to point out, more than a decade ago, the discrepancy between satellite and surface temperature readings.

This is not the first attempt to reconcile the clashing temperature findings with statistical re-analysis, and it is unlikely to be the last. Another major statistical controversy over temperature readings erupted during the last two years.

As sports-minded readers know, the entire National Hockey League season was called off in 2004 on account of labor difficulties. While it is certainly coincidental, we can't help but notice that the famous "hockey stick" graph that was supposed to be the "smoking gun" of global warming has quit working too. The dispute about Michael Mann's "hockey stick" graph, which purports to prove that the last 25 years have been the warmest in the last 1,000 years, has intensified in recent months. Criticisms are rolling in from more scientists and statisticians.

As reported in last year's edition, the Mann "hockey stick" graph would seem to negate what has always been referred to as the "medieval warm period" that preceded the "little ice age," from roughly

1400 to 1850. New statistical critiques from Steven McIntyre and Ross McKitrick, the duo that raised the first questions about the hockey stick, have furthered doubts about the accuracy of the hockey stick. Other climate scientists, including several affiliated with the Intergovernmental Panel on Climate Change (IPCC), have reviewed the methodological dispute and come down on McIntyre and McKitrick's side.

McIntyre and McKitrick have demonstrated that the computer algorithm used to generate the hockey stick graph would generate a hockey stick-shaped graph out of any series of *random numbers*. Dr. Rob van Dorland, an IPCC lead author and climate scientist at the Dutch National Meteorological Agency, has said the controversy will "seriously damage the image of the IPCC." Van Dorland added: "It is strange that the climate reconstruction of Mann passed both peer review rounds of the IPCC without anyone ever really having checked it."

The most devastating critique comes from Hans von Storch, an IPCC contributing author and internationally-renowned expert in climate statistics at the Center for Coastal Research in Geesthacht, Germany. He has said the McIntyre-McKitrick critique is "entirely valid," and that the hockey stick graph "contains assumptions that are not permissible. Methodologically it is wrong: rubbish."

University of California physicist Richard Muller wrote in *Technology Review* that the hockey stick "turns out to be an artifact of poor mathematics." Everyone, including McIntyre and McKitrick, is quick to qualify their criticisms by saying the debunking of the hockey stick does not mean global warming is not happening today; merely that we still cannot confidently tell from the available data the exact temperature history of the last millennium.[3]

This is a vital point, because whenever anomalies call into question our mastery of climate science, the defenders of urgent action immediately repair to the "consensus." Critics of specific aspects of climate science are usually portrayed—if not demonized—as climate change "skeptics" or deniers, on par with Holocaust deniers.

Science magazine stirred a furor late in the year with "The Scientific Consensus on Climate Change,"[4] an article by Naomi Oreskes. She analyzed nearly 1,000 articles on climate science in scientific journals, and found none dissented from the "consensus" position. Oreskes concludes that "there is a scientific consensus on the reality of anthropogenic climate change. Climate scientists have repeatedly tried to make this clear. It is time for the rest of us to listen."

Roger Pielke of the University of Colorado pointed out on his website that Oreskes's argument amounts to a poorly constructed straw man.[5] Who, exactly, says the general consensus is wrong? Fred Singer, considered one of the leading "skeptics," says: "In fact, the IPCC statement is in many ways a truism. There

McIntyre and McKitrick have demonstrated that the computer algorithm used to generate the hockey stick graph would generate a hockey stick-shaped graph out of any series of *random numbers*.

> "In climate research and modeling, we should recognize that we are dealing with a coupled non-linear chaotic system, and therefore that the long-term prediction of future climate states is not possible."
> —IPCC report

certainly must be a human influence on some features of the climate, locally if not globally."

Another leading "skeptic," Pat Michaels, says: "It has been known since 1872 that water vapor and carbon dioxide are the principal 'greenhouse' gases in the atmosphere, and that increasing their concentration should elevate the temperature in the lower atmosphere. What has been a subject of contention ever since is the amount and character of the warming." And Bjørn Lomborg has said: "There is no doubt that global warming is happening or that it is important. Carbon dioxide from burning fossil fuels will increase Earth's temperature. That is likely to have an overall negative effect."

This last statement from Lomborg is especially significant because he has raised the question in acute form of what should be done now about climate change relative to other current world problems. Even Oreskes herself admits that "Many details about climate interactions are not well understood, and there are ample grounds for continued research to provide a better basis for understanding climate dynamics. *The question of what to do about climate change is also still open*." (Emphasis added.) Lomborg's "Copenhagen Consensus" exercise last year ranked global warming low on a list of world priorities, for which he was roundly abused.

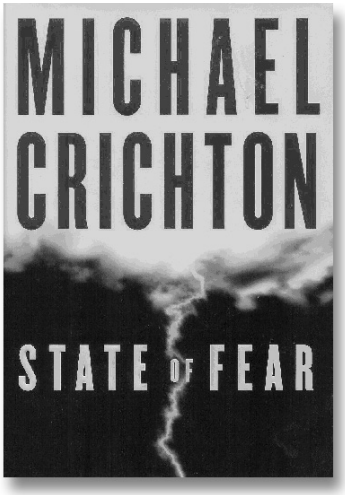
Dr. Rajendra Pachauri, the IPCC's chairman, compared Lomborg to Hitler. "What is the difference between Lomborg's view of humanity and Hitler's?" Pachauri told a Danish newspaper. "If you were to accept Lomborg's way of thinking, then maybe what Hitler did was the right thing." Lomborg's sin was merely to follow the consensus practice of economists in applying a discount to present costs for future benefits, and comparing the range of outcomes with other world problems alongside climate change.

It is hard to judge what is worse: Pachauri's appalling judgment or his abysmal ignorance of basic economics. In either case, it is hard to have much confidence in the policy advice the IPCC might give. It might be added that when Pachauri compared Lomborg to Hitler, he ran afoul of what is known in the Internet blogosphere as "Godwin's Law," which holds that resorting to *reductio ad Hitlerum* is a sure sign that someone is losing an argument.

Are the "skeptical" questions about our mastery of climate science and its relation to the timing of policy very different from some of the caveats that appear in the "consensus" reports, such as the IPCC's latest assessment? Consider, for example, this passage from the latest IPCC assessment report:

> There is an increasing realization that natural circulation patterns such as [El Nino-Southern Oscillation] and [North Atlantic Oscillation] play a fundamental role in global climate science and its interannual and longer-term variability.[6]

Or this, from a different section of the IPCC report:



> In climate research and modeling, we should recognize that we are dealing with a coupled non-linear chaotic system, and therefore that the long-term prediction of future climate states is not possible.[7]

To this can be added the judgment of the U.S. National Research Council, from whose 2001 report, "Climate Change Science: An Analysis of Some Key Questions," one sentence was widely cited by climate-action enthusiasts: "The recent [climate] changes observed over the last several decades are likely mostly due to human activities."

Less widely cited was the NRC's own policy judgment: "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."[8]

If, as keepers of the "consensus" view readily admit, "the question of what to do about climate change is still open," then why this belabored attempt to bash a straw man, if not to build political pressure for the agenda of immediate carbon suppression? As the argument over our knowledge of climate science continues to go badly for alarmists, advocates of Kyoto-style carbon suppression are becoming increasingly shrill.

Exhibit 1 is David King, Prime Minister Tony Blair's science adviser, who argued in 2004 that climate change was a more serious problem than terrorism. In this he was merely following in the footsteps of the hapless Hans Blix, who said the same thing in 2002. This should be an embarrassment to science. Meanwhile, one place where the temperature definitely continues to heat up is in popular culture.

Climate change burst upon the pop culture scene from both directions in 2004. First, there was the release of *The Day After Tomorrow*, an alarmist feature film, followed by the publication of a skeptical popular novel from Michael Crichton, *State of Fear*. Both did well with the public. *The Day After Tomorrow* racked up huge box office sales, and *State of Fear* zoomed to the top of the fiction best seller list. Now we will watch to see whether *The Day After Tomorrow* is made into a paperback book, and whether *State of Fear* is made into a feature film, as with nearly all of Crichton's novels.

The Day After Tomorrow featured the climate change scenario involving the breakdown of thermohaline circulation in the oceans, which could ironically trigger another ice age in the northern hemisphere. Whereas this scenario would take decades to play out, cinema required that it occur at warp speed. Within a week, New York City is swallowed in hundreds of feet of ice. Opinion about *The Day After Tomorrow* among orthodox environmentalists was mixed.

Nature magazine embraced the movie, editorializing that "advocates of responsible behavior must seize every opportunity to get their message across." Some environmentalists, such as Bill McKibben, worried that the film's unrealistic scenario might lead the public to shrug off the seriousness of the issue.

A team of researchers from Cambridge University surveyed moviegoers exiting the theater in Britain, and reached the mixed conclusion that the film succeeded "in raising public concern—but at the price of reducing public understanding."

The New Yorker's film reviewer, Anthony Lake, savaged the film for exactly this reason: "*The Day After Tomorrow* is so puffed up with ecological pride that it can hardly move. . . .The very silliness of *The Day After Tomorrow* means that global warming will become, in the minds of moviegoers, little more than another nonspecific fear about which they must uncomprehendingly fret. . . .[It] left me determined to double my consumption of fossil fuels."

On the other side of the scale, Crichton's *State of Fear* may be the first pulp novel accompanied by authentic scientific footnotes, data charts, and a bibliography. The book slays all the right targets—environmental activists, "concerned" but ignorant Hollywood stars, trial lawyers, politicized scientists, and wrong-headed philanthropists. His main characters are loosely based on recognizable figures, such as George Soros, and the hero of the book is modeled partly after MIT's Richard Lindzen. The novel delivers some zingers, such as when the Soros-like figure remarks, "If there's anything worse than a limousine liberal, it's a Gulfstream environmentalist."

"But George, you're a Gulfstream environmentalist."

"I know it, and I wish it bothered me more."

The book has provoked a strong reaction from climate action advocates. A new weblog, www.realclimate.org, was launched to rebut Crichton and discuss other climate-science controversies, such as the hockey stick graph. Gavin Schmidt of NASA's Goddard Institute of Space Science wrote a calm but tough critique on the site: "The issues Crichton raises are familiar to those of us in the field, and come up often in discussions. Some are real and well appreciated while some are red herrings and are used to confuse rather than enlighten." *Science* writer Chris Mooney also took up the dispute with a critique in the *Boston Globe*.[9]

While these bread-and-circus spectacles continue, a number of small advances and singular news items from the past year deserve highlighting.

- July 2004 was the coolest July in the last four years, and the coolest since 1992, when global summer temperatures were depressed slightly in the aftermath of the massive eruption of Mount Pinatubo in the Philippines earlier that year. July 2004 came in 0.21 degrees celsius below the 20-year average.

- The 2004 Democratic Party platform quietly dropped an endorsement of the Kyoto Protocol, which had appeared in the party's 2000 platform. And in an act of exquisitely bad timing, Al Gore chose New York's coldest day in 20 years to give a speech on the threat of global warming.

- William Ruddiman of the University of Virginia roiled the climate controversy with a paper arguing that human-induced climate change began not with the combustion-related greenhouse gas emissions

of the industrial revolution, but as far back as 8,000 years ago. That was when humans began clearing large areas of forests for agriculture and began flooding wide areas for rice growing, which vastly increased natural methane production.[10] Most challenging to contemporary perceptions is Ruddiman's view that "Most of Eurasia was deforested by the time of Christ." One possible implication of this analysis is that human activities may have prevented another ice age cycle from occurring over the last two millennia.

One possible implication of this analysis is that human activities may have prevented another ice age cycle from occurring over the last two millennia.

- Another area of antiquarian interest thought possibly relevant to climate science today is the dramatic warming—as much as 10 degrees celsius—that occurred very rapidly in the "Eocene" era. That was 55 million years ago. A huge and sudden increase in greenhouse gases has long been inferred as the cause, but as there were few SUVs on the roads then, the source of this increase has remained elusive. Recent research suggests methane gas hydrates on the ocean floor were released when ocean temperatures changed. The cause of the change in ocean temperatures is unknown, though volcanic activity is one prominent possibility.[11]

- A lingering anomaly of modern climate science is the fact that the annual rate of increase in the concentration of CO_2 in the atmosphere is only about half of what is expected based on total anthropogenic emissions. Where is the missing half of our CO_2 emissions going? A team of scientists from the National Oceanic and Atmospheric Administration (NOAA) has produced confirmation of the prevailing guess that the oceans are absorbing the missing half.[12] This is providing a "negative feedback mechanism," partially offsetting the warming effects of human greenhouse gas emissions. Whether the current rate of oceanic CO_2 absorption will continue at the current rate—the authors think it won't—and a number of other questions will become the focus of subsequent study.

- Closely related to the issue of oceanic absorption of CO_2 is the question of whether the oceans can be used in schemes of carbon sequestration. Recent experiments with iron fertilization in the ocean near Antarctica produced promising results. Data from an experiment conducted in 2002 indicate that each atom of iron sulfate introduced into the ocean absorbs between 10,000 and 100,000 atoms of carbon through additional plankton growth. Researchers estimated that large-scale iron seeding in the southern hemisphere oceans alone could absorb 15 percent of the predicted CO_2 buildup over the next several decades. A major concern is whether artificially induced plankton blooms or carbon-rich sediment on the ocean floor will have a harmful impact on ocean ecosystem, so much so that some environmental

Where is the missing half of our CO_2 emissions going? A team of scientists from the National Oceanic and Atmospheric Administration (NOAA) has produced confirmation of the prevailing guess that the oceans are absorbing the missing half.

groups have successfully blocked several ocean sequestration experiments.

A separate experiment off the coast of Hawaii reported encouraging results. A U.S. Department of Energy project found that marine organisms sense and avoid high concentrations of CO_2 that occur naturally from gas vents on the ocean floor, and also that fish and crustaceans recover quickly from exposure to high levels of CO_2.[13] Separately, the Pew Center for Global Climate Change published a study of forest-based sequestration strategies for the United States, concluding that CO_2 can be sequestered at a cost of $30 to $90 a ton.[14] These costs are thought to be comparable to energy-related carbon suppression strategies.

- In a separate report, the Pew Center for Global Climate Change notes that the nation with the lowest carbon-intensity (the ratio of carbon emissions to GDP) is France, "owing to its heavy reliance on nuclear power."[15] Environmental correctness still prevents a serious discussion of expanding nuclear power in the United States as a means to reducing greenhouse gas emissions.

- Research on the arctic regions generated new confusion and controversy. The Greenland ice sheet, which holds enough water to raise the oceans by seven meters if it all melted, has been retreating on the periphery, but possibly increasing in the center. *Nature* magazine summarized the current state of scientific opinion: "Scientists are less certain about what is going on in the central area of the ice sheet. Is it getting thicker or thinner?" While models predict that a three-degree celsius increase in temperature will melt the ice sheet, *Nature* notes that:

  > These models depend on assumptions about the likely rate of ice retreat that are not guaranteed to be correct, in part because the flow dynamics of glaciers are not yet fully understood.
  >
  > In Antarctica, for example, ice streams seem to come and go, and the movement of glaciers has been seen to speed up and slow down very quickly. But the cause of such shifts is not always clear.[16]

  One anomaly of the fading ice at the periphery of Greenland's ice sheet is the fact that temperatures in the region have apparently *fallen* over the last 15 years. One theory about the possible cause of retreating arctic ice is that shifts in winds rather than temperature change are responsible.[17]

- The other big story about the arctic was the Arctic Climate Impact Assessment, released last fall. The report's account of retreating ice and ecosystem disruption seemingly offered confirmation of global warming in action. Critics noted numerous flaws in the report, however, most glaringly was the choice of time scale for the study. By using 1970 as the baseline year—a known cold period—rather than, say, 1950 or 1930, the report showed a warming trend. Other temperature records suggest the arctic today, though warmer than in 1970, is *colder* than it was in 1930 and still within the range of observed natural temperature variability.

> One anomaly of the fading ice at the periphery of Greenland's ice sheet is the fact that temperatures in the region have apparently *fallen* over the last 15 years.

- Finally, the biggest climate story of 2004 was Russia's decision to reverse course and ratify the Kyoto Protocol, after having signaled its aversion to Kyoto throughout 2003. Russia's belated ratification brought Kyoto into force as of mid-February of 2005. It may turn out to be a setback for genuine greenhouse gas emission reductions if parties attempt to meet their targets by buying credits from Russia rather than reducing their own emissions. Such would be the unintended consequence of an agreement that *The Economist* magazine recently noted was "incompetently designed." Now the necessary back-to-the-drawing-board phase of global climate change strategy will be postponed for nearly a decade.

Notes

1 Causation for this increase is still in dispute. The latest edition of the U.S. Global Change Research Program's publication, *Our Changing Planet*, contains the following description of the conclusion of forthcoming research: "Comparison of index trends in observations and model simulations shows that North American temperature changes from 1950 to 1999 were unlikely to be due only to natural climate variations. Observed trends over this period are consistent with simulations that include anthropogenic forcing from increasing atmospheric greenhouse gases and sulfate aerosols. *However, most of the observed warming from 1900 to 1949 was likely due to natural climate variation*." (Emphasis added.)

2 Qiang Fu, et al., "Contribution of stratospheric cooling to satellite-inferred tropospheric temperature trends," *Nature*, May 6, 2004, pp. 55-58.

3 McIntyre and McKitrick's work can be found at: http://www.uoguelph.ca/~rmckitri/research/trc.archive.html, and on a blog, http://www.climateaudit.org. Multiple rebuttals to McIntyre and McKitrick are available on the blogsite www.realclimate.org.

4 *Science*, December 3, 2004, p. 1686.

5 http://sciencepolicy.colorado.edu/prometheus/archives/climate_change/000304shadow_boxing_on_cli.html.

6 *Climate Change 2001: The Scientific Basis*, p. 51.

7 IPCC, *Third Assessment Report*, Working Group One, 2001, p. 774.

8 Committee on the Science of Climate Change, National Research Council, "Climate Change Science: An Analysis of Some Key Questions" (Washington, DC: National Academy Press, 2001), pp. 22-23.

9 http://www.boston.com/news/globe/ideas/articles/2005/02/06/checking_crichtons_footnotes/.

10 William F. Ruddiman, "The Anthropogenic Greenhouse Era Began Thousands of Years Ago," *Climatic Change* 61 (2003), pp. 261-93; see also Betsy Mason, "The Hot Hand of History," *Nature*, February 12, 2004, pp. 582-83.

11 Gerard R. Dickens, "Hydrocarbon-Driven Warming," *Nature*, June 3, 2004, pp. 513-15. See also Helmut Weissert and Stefano M. Bernasconi, "An Earth on Fire," *Nature*, March 11, 2004, pp. 130-32.

12 Christopher L. Sabine, et al., "The Oceanic Sink for Anthropogenic CO_2," *Science*, July 16, 2004, pp. 367-71.

13 "Ocean Fix for Climate Change Finds Tentative Support," *Nature*, September 9, 2004, p. 115.

14 Robert N. Stavins and Kenneth R. Richards, *The Cost of U.S. Forest-Based Carbon Sequestration* (Arlington, VA: Pew Center for Global Climate Change, 2005), available at www.pewclimate.org.

15 Kevin Boumert and Jonathan Pershing, *Climate Data: Insights and Observations* (Arlington, VA: Pew Center, 2004), p. 7.

16 Quirin Schlermeier, "A Rising Tide," *Nature*, March 11, 2004, pp. 114-15.

17 Richard A. Kerr, "Scary Arctic Ice Loss? Blame the Wind," *Science*, January 14, 2005, p. 203.

Air Quality

With Joel Schwartz

- The entire nation has met clean air standards for four of the six pollutants regulated under the Clean Air Act, and the areas with the highest pollution levels have improved the most.

  The pollutants that continue to exceed national standards are ozone and particulates. However, in 2004, ozone pollution was recorded at the lowest level in U.S. history.

- According to the EPA's Air Quality Index (AQI), air quality in the 10 largest metropolitan areas has improved an average of more than 53 percent since 1980. Four of the five most-improved cities are in California.

- The EPA's own models project that emissions from the auto fleet will decline by more than 80 percent over the next 25 years.

New Record Low for Ozone Air Pollution in 2004

Amidst all the sound and fury surrounding national policy toward air pollution, one fact should be kept in mind: *2004 recorded the lowest levels of ozone air pollution in U.S. history*. Although complete EPA data for ambient levels for the six categories of air pollution regulated under the Clean Air Act are not yet available, we can determine that ozone levels were at a record low by examining the number of exceedences of the ozone standard recorded at the hundreds of individual monitors around the nation. This good news comes on top of a near-record-low year for ozone in 2003.

The record-low ozone level of 2004 has received scant attention in the major media. When it has been mentioned, it is usually dismissed as a product of cool weather. Weather plays an important role in ozone formation, but there have been other cool weather years over the last two decades when ozone levels remained much higher than in 2004.

Continuing emission reductions clearly played a large role in the 2004 success. And large future reductions can be expected. The EPA's own emissions models project that emissions from the auto fleet will decline by more than 80 percent over the next 25 years.

Major Findings from 10 Years of Air Quality Trend Analysis

- ***Virtually the entire nation has achieved clean air standards for four of the six "criteria" pollutants regulated under the Clean Air Act*** (carbon monoxide, sulfur dioxide, nitrogen oxides, and lead). The only pollutants where clean air standards are still widely exceeded are ozone and particulates.

- In the case of ozone and particulates, ***the areas of the nation with the highest pollution levels have shown the greatest magnitude of improvement***. The average ambient declines in pollution on a national scale that are reported here understate the magnitude of improvement in the worst areas.

- ***The long-term trend of improving air quality is certain to continue***. Government air quality models project significant decreases in emissions over the next 25 years. This is one reason why the frequently heard claim of "rolling back the Clean Air Act" should not be taken seriously.

Figure 1 shows the average number of days per year that ozone levels exceed the EPA's one-hour and stricter eight-hour standard at all monitors and at all continuously operating monitors (since some monitors are changed or taken offline for various reasons, potentially skewing the findings). Between 1975 and 2004, exceedences of the eight-hour ozone standard declined 75 percent, and exceedences of the one-hour standard declined 95 percent. (The EPA 8-hour standard

2004 recorded the lowest levels of ozone air pollution in U.S. history.

is 0.085 parts per million; the one-hour standard is 0.125 parts per million.) Another way of looking at the data can be seen in Figure 2, which shows the percentage of EPA ozone monitors that exceeded the one-hour and eight-hour standards.[1]

These average declines have translated to even larger reductions in the areas with the highest ozone smog levels, such as southern California. The Los Angeles air basin (which includes Los Angeles, Orange, Riverside, and San Bernardino Counties) exceeded the one-hour ozone standard 64 times in 2003; in 2004 the number of exceedences fell to 27. By contrast, in the 1970s the Los Angeles basin exceeded the one-hour standard nearly 200 days a year.

Figure 2 displays the trend in ozone exceedances per year in two ways. "All Sites" provides the trend from 1975-2004 for all ozone monitoring sites that happened to be operating in a given year. This could create bias because some sites are added or removed in any given year. Thus, we also show a trend from 1983-2004 for only those sites that operated continuously during that 22-year period (258 "continuous" sites). The two trends are highly correlated, showing that the "All Sites" trend provides a valid representation of the true trend in ozone exceedances.

Last year the EPA formally adopted a new, stricter ozone standard that has been nearly 10 years in the making. The new standard, 0.085 parts per million over an eight-hour period, quadrupled the number of counties out of compliance and subject to new requirements for reducing pollution. Under the old one-hour standard, 38 million Americans were deemed to live in "non-attainment" areas in 2003 (down from 68 million in 2002—a high ozone year). Under the new standard, 100 million Americans

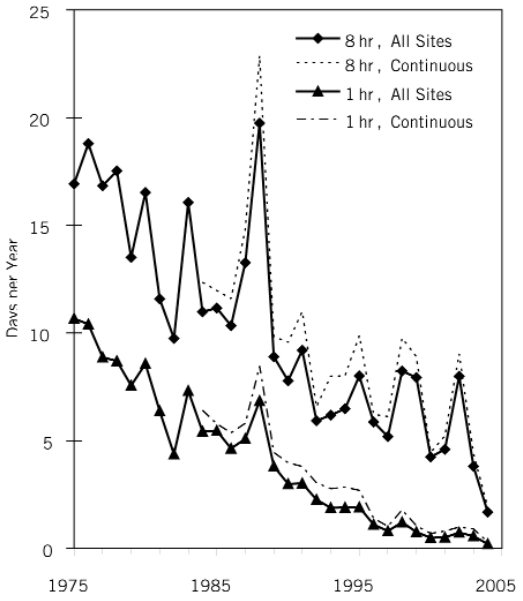
The Core Air Quality Indicators

Table 1:
National Ambient Air Pollution Levels, 1976-2003

Ozone (1-hour standard)	-31%
Sulfur Dioxides	-72%
Nitrogen Dioxide	-42%
Carbon Monoxide	-76%
Particulates (PM_{10})*	-31%
Lead	-98%

(*1988-2003)
Source: U.S. Environmental Protection Agency

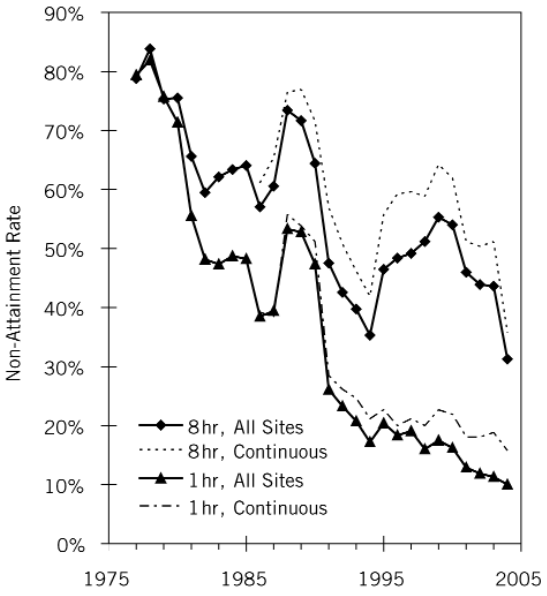
Figure 1:
Average Number of Days per Year Exceeding the Federal One-hour and Eight-hour Ozone Standards, 1975-2004



Source: Joel Schwartz, *Air Quality in America*, AEI Press, 2005

The EPA's own emissions models project that emissions from the auto fleet will decline by more than 80 percent over the next 25 years.

Figure 2:
Percent of U.S. Monitoring Locations Violating the Federal One-hour and Eight-hour Ozone Standards, 1975-2004



Source: Joel Schwartz, *Air Quality in America*, AEI Press, 2005

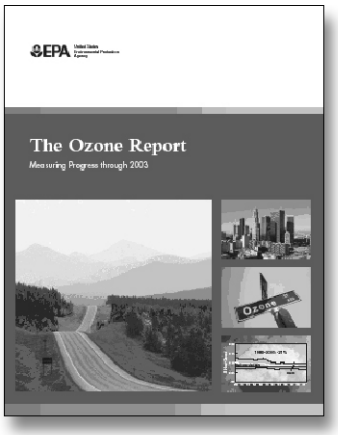
The reality is that the adoption of the new standard represents the progress being made in reducing air pollution.

were deemed to live in "non-attainment" areas (down from 138 million in 2002).

This moving of the goalposts was sometimes misreported or misunderstood as an increase in pollution, as local newspapers reported the new designation with headlines such as "City Back on Bad Air List." The *Oakland Tribune* headline, for example, read: "Region's Air Status Going Up in Smog"; the *New York Times* headline was: "Clear Skies No More for Millions as Pollution Rule Expands." This, even though actual air pollution levels in the Bay Area and New York City continued to decline.

Examples of media that did better include the *Christian Science Monitor*, whose more accurate headline read: "Smog Regulations Just Got Tougher." The reality is that the adoption of the new standard represents the progress being made in reducing air pollution.

It also must be kept in mind that the EPA jurisdictional process designates an entire county as being out of compliance even if air pollution



***The Ozone Report*, Environmental Protection Agency, 2003, www.epa.gov/airtrends/ozone.html**

is above the standard only in a part of a county. This results in artificially inflating the number of people exposed to air pollution levels that exceed the standard. In San Diego County, for example, less than two percent of the county's population lives in areas with air that exceeds the eight-hour ozone standard, yet 100 percent of the county's population is classified as breathing bad air.

The EPA expanded its ozone report last year, offering a more complete and reader-friendly explanation of the intricacies of ozone pollution as well as a good discussion of the future improvements we can expect.

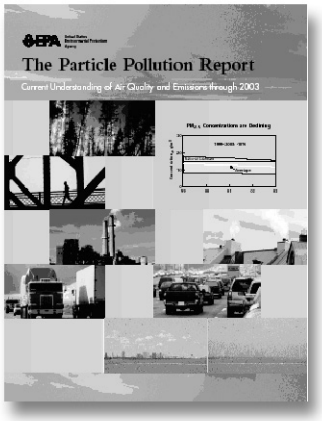
Particle Pollution on the Decline

The other principal area of concern in current air quality regulation is particle pollution (formerly called "particulates," but now simplified to the more commonsensical term "particle"). Particles can lodge deep in lung tissue and cause various respiratory diseases. Formerly EPA policy monitored and regulated for particles of 10 microns in size, or PM_{10} in the jargon (PM for "particulate matter").

As with ozone, this year a new, stricter standard was adopted, targeting particles as small as 2.5 microns in size, which are referred to as $PM_{2.5}$. As a means of reference, a typical grain of beach sand is about 90 microns wide, while an average human hair is about 70 microns. In other words, $PM_{2.5}$ is nearly invisible to the human eye.

Currently PM levels exceed the EPA standard in 97 counties with a total population of 62 million. However, the EPA is working its findings more carefully in its most recent report on particle pollution, noting with greater precision that "monitors in 97 counties (home to 62 million people) showed concentrations greater than the PM_{10} or $PM_{2.5}$ national air quality standards." This is more accurate than saying all 62 million people are exposed to air exceeding the standards.

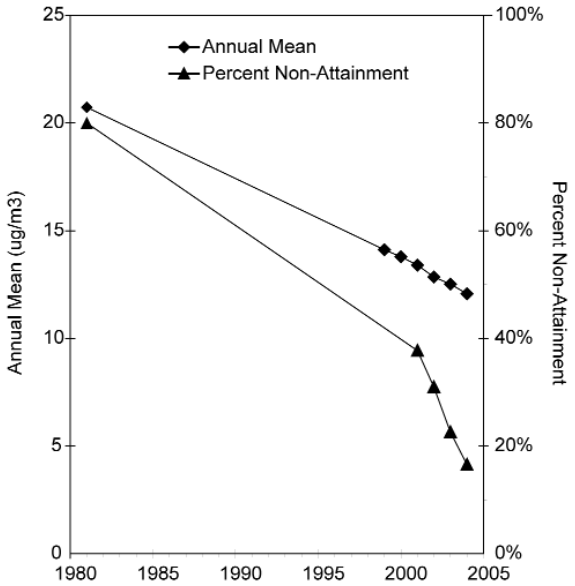
In December 2004, the EPA reported results through 2003. Monitoring of $PM_{2.5}$ began in 1999, so we only have five years' worth of data to plot a trend. The trend so far is positive: each year national ambient $PM_{2.5}$ levels have declined, by 10 percent since 1999. Some partial $PM_{2.5}$ readings taken in the early 1980s suggest that the $PM_{2.5}$ may have declined by 50 percent since then. The EPA reports that its older standard, PM_{10}, which has been monitored since 1988, recorded its second lowest level in 2003. PM_{10} levels have declined 31 percent since 1988, and seven percent since 1999. (See Figure 3.)



***The Particle Pollution Report*, Environmental Protection Agency, 2003, http://www.epa.gov/airtrends/pm.html**

The most important point to keep in mind is that large future emissions reductions are coming in the years ahead. The principal author of the *Index* has offered a standing wager of

Figure 3:
Trends in Ambient Particle Pollution, PM_{10} and $PM_{2.5}$



Source: U.S. Environmental Protection Agency

$1,000 that air quality measures in 2009 will be better than in 2001, but has found no takers among the activists and journalists who charge that the Bush administration is "rolling back the Clean Air Act." Colorado Governor Bill Owens had the same experience in 2004.

When a Colorado activist told the *Rocky Mountain News* that Denver's air quality was now the worst in 20 years, Governor Owens offered a $1,000 wager—with the winnings to go to charity—that the data would prove the air today to be much cleaner than at any point in the 1980s. The *Rocky Mountain News* dutifully passed along the proposed wager, which was, of course, declined with the weak demurral, "Do Coloradans really think it is a good idea to gamble with our air quality?"[2] A better question is whether Coloradans (or

NRC Report on Air Quality

In light of the relentless and bitter arguments over arcane aspects of air quality regulation such as New Source Review and President Bush's proposed Clear Skies plan, it is worth taking note of the National Research Council (NRC) report released in 2004, *Air Quality Management in the United States*.[3] Among the many findings of the NRC report was the recognition that current regulatory policy "focuses primarily on compliance with intermediate process steps," "probably discourages innovation and experimentation at the state and local levels," and "draws attention and resources away from the more germane issue of ensuring progress toward the goal of meeting [federal air pollution standards]."

Moreover, the NRC realizes that the Clean Air Act places meeting SIP process requirements above actual air quality improvements. While the NRC report has a number of deficiencies in its analysis,[4] it did conclude that air quality policy should "emphasize results over process, create accountability for results," "dynamically adjust and correct the system as data on progress are assessed," and "expand use of performance-oriented, market-based multi-pollutant control strategies," all of which sound roughly like what is proposed in . . . Clear Skies.

Sulfur Dioxide Trends

Sulfur dioxide (SO_2) emissions continue to be a source of controversy. Coming from coal-fired power plants in the Midwest, SO_2 is a precursor to both ozone and particle pollution, as well as a source of acid rain. Occasionally, the public is given the misimpression that SO_2 emissions have been rising, when in fact they have declined by one third since 1990. One interesting fact is that SO_2 emissions reductions have been the largest in the Midwest, where the problem is considered to be the most severe.

One interesting fact is that SO_2 emissions reductions have been the largest in the Midwest, where the problem is considered to be the most severe.

The Department of Energy has produced a state-by-state breakdown of SO_2 emissions reductions, showing that the top 10 emitting states reduced SO_2 emissions by nearly five million tons between 1990 and 2002, including the key states of Ohio, Indiana, Illinois, and West Virginia. *These 10 states accounted for 93 percent of the total reductions of SO_2 nationwide*. The results are displayed in Table 2 below.

Table 2:
Ten Largest Reductions in SO_2 Emissions from Power Plants by State, 1990-2002

	Tons of SO_2 Emissions	Percent Change 1990-2003
Ohio	-1,017,456	-46.5%
Indiana	-716,716	-47.7%
Missouri	-542,706	-68.8%
Illinois	-506,919	-55.6%
Tennessee	-445,224	-56.4%
West Virginia	-428,363	-45.0%
Kentucky	-415,192	-46.1%
Pennsylvania	-407,518	-31.4%
Georgia	-309,614	-35.4%
New York	-198,297	-46.0%
Total from Top 10	-4,988,005	-46.9%

Source: Department of Energy

Americans generally) think it is a good idea to be given relentless disinformation about real pollution trends?

Asthma Update

Many environmentalists like to attribute sharply rising asthma rates in the United States to air pollution. But as we have noted in this report previously, this is mysterious since air pollution levels have consistently declined while asthma rates have been increasing. In the United States alone more than 17 million people have asthma, and it kills 5,000 people a year. Asthma rates in children under the age of five rose more than 160 percent between 1980 and 1994—a period when air pollution rates fell from 25 to 80 percent, depending on the pollutant.

While air pollution may *trigger* asthma attacks in people with the disease, it is doubtful that air pollution can be said to be a *cause* of the disease in the first place. (Oddly, recent statistics show that hospital admissions for asthma attacks decline in the summer months, when ozone air pollution is typically highest.)

Flashback

Air Quality Trends *Before* 1970

Although the data for air pollution are not well quantified prior to 1970, studies indicate that air quality was improving rapidly *before* the passage of the 1970 Clean Air Act. For example, Paul Portney of Resources for the Future writes that it is "extremely difficult to isolate the effects of regulatory policies on air quality, as distinct from the effects of other potentially important factors," because "some measures of air quality were improving at an impressive rate before 1970."[5] Portney also points out that the historical data available show that ambient levels of particulates declined more than 20 percent during the 1960s, while ambient levels of sulfur dioxide levels fell by almost 50 percent.

—*Index of Leading Environmental Indicators, Fourth Edition* (1999)

The eighth edition (2003) of this report noted the inverse relationship that exists in international health data. The lowest asthma rates occur in nations with the worst current levels of air pollution such as China and India, while the highest rates exist in nations with low air pollution such as New Zealand and England. The ninth edition (2004) reported on the latest research findings on potential links to causes of asthma, including indoor pools and genetic markers.[6]

Now comes research suggesting a link between asthma and acetaminophen, the active ingredient in many popular over-the-counter pain relievers such as Tylenol.

Now comes research suggesting a link between asthma and acetaminophen, the active ingredient in many popular over-the-counter pain relievers such as Tylenol. Studies of children admitted to hospitals with asthma and a

An Index Top-Ten List: Air Quality Improvement by Metropolitan Area

Which metropolitan areas are doing best in reducing air pollution? Measuring air-quality improvements on a city-by-city basis is not as straightforward and simple as it might seem. There are a wide variety of air-quality conditions within many metropolitan areas.

In some cases, such as San Diego, only a handful of monitors may show an exceedence of the EPA standard, yet the entire metropolitan area will be deemed out of compliance with the Clean Air Act for regulatory purposes. A full 98 percent of San Diego County is breathing clean air, though the EPA proclaims the entire county a non-attainment area. Some cities are out of compliance only by a small margin, and have pollution levels much lower than long-time smog champions such as Los Angeles and Houston.

The EPA's Air Quality Index (AQI) is one general measure used as a threshold. The AQI rates air quality on a scale of 1 to 500, with 100 being the threshold for unhealthy air quality for sensitive individuals. The EPA and local regulatory agencies use the AQI to issue warnings for bad air. The EPA reports AQI values for the 94 metropolitan areas with populations in excess of 500,000. But there are limits and caveats to using the AQI as a trend indicator.

The methodology for calculating the AQI has been revised several times over the last two decades, such that readings for the 1980s may not exactly match up with the 1990s. And as mentioned above, not all of a given metropolitan area may have suffered bad air on every day the index exceeds 100, so the AQI has a bias towards overstating poor air quality. Nevertheless, with these important caveats and limitations in mind, the AQI can still be used as a rough indicator of progress in air quality.

Table 3 below compares the 10 cities with the largest reduction in the number of AQI readings above 100 for the 12-year period of 1980-1991 and the subsequent 12-year period of 1992-2003.

Table 3:
Top Ten Improvements in AQI over 100, 1980-1991 vs. 1992-2003

	Days above 100 on AQI 1980-1991	Days above 100 on AQI 1992-2003	Change	Percent
Los Angeles-Long Beach, CA	1,762	658	-1,104	-62.7%
San Diego, CA	1,127	345	-782	-69.4%
Riverside-San Bernardino, CA	1,991	1,265	-726	-36.5%
Orange County, CA	644	96	-548	-85.1%
Philadelphia, PA (includes NJ)	604	339	-265	-43.9%
Sacramento, CA	467	274	-193	-41.3%
Cincinnati, OH (includes KY, IN)	311	129	-182	-58.5%
Washington, DC (includes MD, VA, WV)	440	263	-177	-40.2%
Hartford, CT	331	156	-175	-52.9%
New York, NY	336	165	-171	-50.9%
Total	8,013	3,690	-4,323	-53.9%

look at the data from the large-scale Nurses Health Study found a sharply higher incidence among people who took acetaminophen frequently. Researchers speculate that acetaminophen may decrease levels of antioxidants in the lungs.[7]

Notes

1 The apparent paradox between steady progress on the one-hour standard and mixed results on the eight-hour standard is explained at least in part by the fact that one-hour and eight-hour ozone levels are somewhat different aspects of the same phenomenon. The one-hour standard is based on the highest one-hour-average ozone level on a given day, while the eight-hour standard is based on the highest eight-hour-average ozone level. In practice, reducing short-term spikes in ozone (i.e., one-hour "spikes") has proved easier than reducing day-long average ozone levels (i.e, eight-hour "hills"). For example, from 1983-2003, the June-August average of daily one-hour peak ozone levels declined 10 percent, or 6.6 ppb, while the average for daily eight-hour peak ozone levels declined six percent, or 3.5 ppb.

2 Todd Hartman, "Owens Willing to Bet on Smog Level," *Rocky Mountain News*, April 15, 2004.

3 Available at http://www.nap.edu/openbook/0309089328/html.

4 See Joel Schwartz, "Finding Better Ways to Achieve Clean Air," *Environmental Policy Outlook* (Washington, DC: AEI, Sept-Oct. 2004), available at http://www.aei.org/publications/filter.all,pubID.21225/pub_detail.asp.

5 Paul R. Portney, "Air Pollution Regulation," in Paul R. Portney, editor, *Public Policies for Environmental Protection* (Washington, DC: Resources for the Future, 1990), p. 40.

6 "Cluster of Genes Linked with Asthma," Reuters wire service story, June 16, 2003.

7 R. Barr, *American Journal of Respiratory and Critical Care Medicine*, April 2004, vol. 169, pp. 836-41.

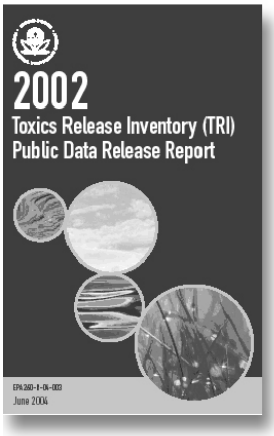
Toxic Chemicals in the Environment

- Data for recent trends in toxic emissions are confusing. Government reports range from showing a 10-percent increase for emissions in 2001-2002, to a decrease of 15 percent for the same period.

- The numbers were skewed by a dramatic increase in primary metals disposal, due to the closure of a major mining facility in Arizona, and a decrease in reporting requirements for some companies in the mining sector.

- What is clear is that the overall trend since 1988 is one of declining toxic releases, a sign of increasing efficiency and the "de-materialization" of our economy.

The Toxics Release Inventory



The Toxics Release Inventory (TRI), initiated by the EPA in 1988, is the principal source of data for analyzing the amount of toxic chemicals used in American industry. Its evolution shows the difficulty of developing consistent, objective, and useful information about environmental trends.[1]

When the TRI began it covered only about 300 chemical compounds; in subsequent years the number has grown to more than 650. The number of industries and size of enterprise required to report with the TRI have expanded, and recently included federal facilities. Approximately 24,000 individual facilities must provide information for the TRI, requiring more than 80,000 reporting forms.

The EPA emphasizes several important caveats about interpreting TRI data, including gaps in the data and the lack of straight-line applicability of human health risk. For one thing, a "release" for reporting purposes includes chemicals that are disposed properly in hazardous waste landfill, and even chemicals recycled on-site, neither of which are "releases" in the common-sense meaning of the term.

The latest TRI, for the year 2002, emphasizes that "This information does not indicate whether (or to what degree) the public has been exposed to toxic chemicals. Therefore, no conclusions on

The Dirty MRF (murf)

Recycling may be a buzz word but it is actually an age-old endeavor. For as long as humans have been discarding trash, some have sifted through it for items of value ranging from cloth rags to industrial steel. Government mandates and subsidies to increase what is recycled beyond what would be collected privately, however, are a recent phenomenon.

The state-imposed CRV (California Redemption Value), for example, sets the price for recyclable aluminum between $2,500 and $3,000 a ton, while the open market pays only $700-$1,000 a ton. Costly government-run programs that pick up recyclables at no extra charge, however, create the incentive to engage in recycling whatever the cost. Uneconomic recycling efforts also impose costs and use resources of their own.

These include increasing the number of collectors, trucks, and containers, vehicle pollution, and the environmental effects of cleaning and disinfection. For example, glass bottles must be transported to a cleaning facility, thereby burning gas or diesel and wearing down road surfaces. Bottles must be cleaned and disinfected, using heavy machinery and detergents, and so on. Cities such as Los Angeles have to make two passes at garbage collection or double the number of trucks to handle the extra curbside loads.

The merits of uneconomic recycling mandates aside, trash entrepreneurs are responding with ways for cities and municipalities to meet their targets at lower

costs, most dramatically with a new kind of recycling facility that uses a fairly low-tech system of screens, grates, magnets, and human sorters to recover materials from a mixed stream of waste.

Known as the dirty MRF (materials recovery facility), it eliminates the need for curbside sorting. Everything gets collected together, then goes through the same sorting process. This saves on pick-up, the most expensive part of trash removal, and catches recyclables that might otherwise be thrown in with the regular trash. According to Joe Sloan, a recycling facilities consultant in southern California, the dirty MRF "produces the highest recovery of recyclables at the lowest cost."

This should be great news for everyone who spends significant time separating out their trash, especially in the extreme case of Hekinan City, Japan. City officials there mandated that residents separate waste and recyclables into 22 different categories. It is also good news for everyone who has watched the trash collection on their street and suspected, rightly, that curbside sorting results in enough contamination that it all has to be sorted again at the plant anyway.

Curbside sorting remains popular, primarily due to the sense it gives people of "chipping in" to solving the problem of waste removal. But a closer look at curbside sorting shows that it has a marginal effect at best on what winds up in landfills. Curbside recycling generally reduces the volume of waste landfilled by 15 to 20 percent.

To get those fairly high recovery rates, companies are already comingling all the recyclables and sorting them together. Yet this still requires separate pick-up, and fails to address a common lack of participation, as well as difficulties in integrating commercial and industrial waste. Centralizing trash sorting in a dirty MRF, however, dramatically increases what is recovered, in some cases reaching as much as 50 percent of the waste stream.

The dirty MRF is already in use in a number of cities in California, including Pleasanton, Anaheim, and City of Industry. Most are just handling commercial waste, but City of Industry includes residential waste and no longer handles curbside separation.

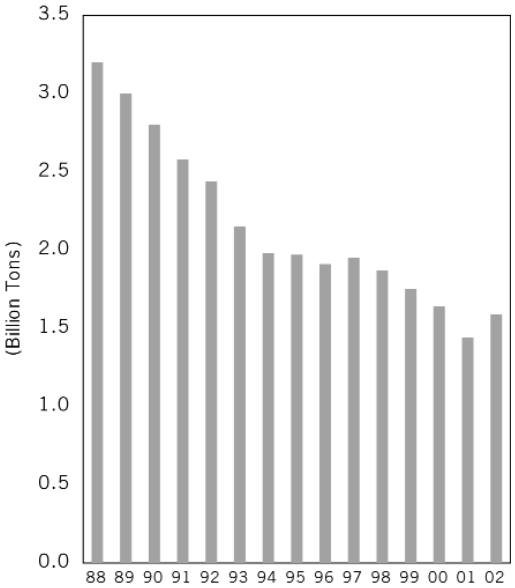
All of this begs the question—why recycle? Until now, it has been difficult to separate the two major reasons: the simple notion of thrift and to make people aware of the trash they generate.

Recycling policy should strive for effectiveness, and not be content to make people feel good about themselves. Dirty MRF may not enhance the sense that people are doing their part to clean up the planet. It does, however, ensure 100-percent user participation by having people throw all their trash in one bin. That may strike some as a step backward, but such is not the case.

With higher rates of recovery and elimination of the need for more trucks, this method is really "clean" MRF. As such, it represents the way ahead. And that's something city officials everywhere should keep in mind.

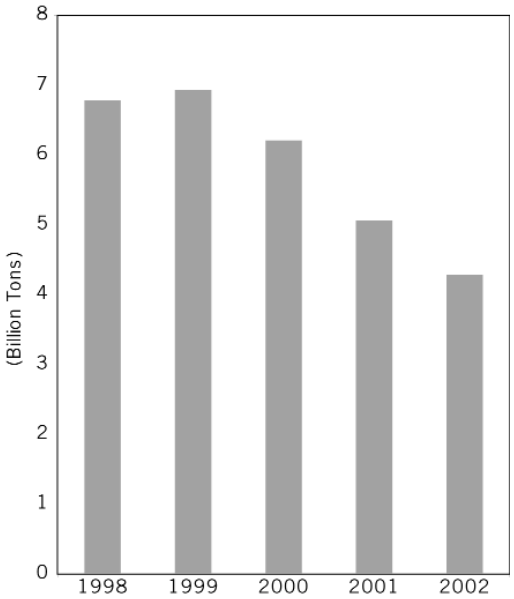
—Michael De Alessi

Figure 1:
Toxics Release Inventory, 1988 Baseline



Source: U.S. Environmental Protection Agency

Figure 2:
Toxics Release Inventory, 1998-2002



Source: U.S. Environmental Protection Agency

the potential risks can be made based solely on this information, including any ranking information."[2] This language—especially the phrase about "ranking information"—appears directed toward advocacy groups that translate TRI numbers into highly misleading and deliberately alarmist propaganda at the local level. These groups often have websites where people input their zip codes to see how many "toxic chemicals" are in their neighborhoods.

Environmental Chemicals in Humans

Ordinarily this section of the *Index* reviews the latest findings from the Centers for Disease Control's annual *National Report on Human Exposure to Environmental Chemicals*. However, the third edition of this report was not yet available as of press time.

Analyses of previous editions of this valuable report are available in the seventh (2002) and eighth (2003) editions of the *Index*, which can be found at www.pacificresearch.org <http://www.pacificresearch.org>. The previous two iterations of this study found declining concentrations of environmental chemicals and heavy metals in human tissues and urine samples.

Watch for the release of the complete third edition of this report on the CDC's website, www.cdc.gov/exposurereport/ <http://www.cdc.gov/exposurereport/>.

Revisions in the 2002 TRI, the most recent report available at this time, make trend analysis confusing. This report previously used the TRI's 1988 baseline of original reporting industries and chemicals as a proxy for overall long-term trends. Up to last year, the 1988 baseline showed a 55-percent decline.

This year's 1988 baseline shows a 10.4-percent increase from 2001 to 2002 (see Figure 1). On the other hand, the EPA's more complete TRI data for the years 1998-2002 show a *decrease* of 15 percent for 2001 to 2002 (see Figure 2), and a cumulative decline since 1998 of 37 percent.

From a quick glance at these competing trends a casual reader can easily become confused as to whether toxic chemical use is going up or down. In both cases the year-over-year changes were more determined by artificial factors that belie underlying long-term trends.

In the case of the 1988 baseline, there was an increase of 209 million pounds in the primary metals sector due to a single mining facility in Arizona that reported an increase of 248 million pounds of mine tailings classified as such this year because the mine is closing down. (The tailings will be disposed of in a landfill according to current hazardous waste regulations.) In the case of the 1998-2002 data series, the 15-percent decline in 2002 was due chiefly to a court decision that lowered the reporting requirements for some in the mining sector.

Without this change in the mining sector, the TRI would have increased by 15 percent from 2001-2002. Some environmentalists used this confusing data to charge that "There was an across the board increase in pollution."[3] This is doubtful.

With all of these caveats and limitations, what does the TRI tell us? While the TRI is limited as a tool for judging environmental or health risk, it is indicative of a deeper and more significant trend: the reductions in the use of chemicals, even as total industrial output and economic activity grow, is a sign of the increasing efficiency of our industrial plants.

It is a measure of what has been called the "de-materialization" of the economy. As such, the TRI can be viewed as a proxy for measuring "sustainable development" or industrial ecology.

Notes

1 The TRI can be downloaded from the EPA website at www.epa.gov/tri/. Individual state fact sheets are also available on this site.

2 In addition, "toxic" chemicals are not all created equal, which is why a crude measure of mere "pounds" of toxics "released" is not an especially helpful measure of health of environmental risk. As the EPA notes,

> Some high-volume releases of less toxic chemicals may appear to be a more serious problem than lower-volume releases of more toxic chemicals, when just the opposite may be true. For example, phosgene is toxic in smaller quantities than methanol. A comparison between these two chemicals for setting hazard priorities or estimating potential health concerns, solely on the basis of volumes released, may be misleading.

In an effort to make possible better judgments about the relative risks of different kinds of toxics chemicals, the EPA is developing the Integrated Risk Information System (IRIS) on its website (see www.epa.gov/ncea/iris.htm). IRIS contains the results of ongoing toxicological screens of many of the chemicals on the TRI, along with links to other studies and EPA standards for exposure to the chemical. IRIS is not easy for the non-specialist to use, but represents a major effort to adapt the massive reporting of the TRI into a useable product for local risk assessment. Another resource is EPA's chemical fact sheets, which are available at www.epa.gov/chemfact/.

3 Phil Clapp of the National Environmental Trust, in Juliet Eilperin, "Toxic Emissions Rising, EPA Says," *Washington Post*, June 23, 2004, p. A-2.

Water Quality

- Total spending on water quality since 1970 approaches the $1-trillion mark. Yet, measurements of our progress are extremely unreliable due to a lack of uniform monitoring and reporting among the 50 states.

- The increase in fish consumption advisories is more an indicator of increasingly rigorous monitoring than of declining water quality. The EPA reports that emissions of most toxic chemicals of concern for fish contamination have been declining, including mercury.

- From 1997 to 2002, wetlands on private land expanded by about 26,000 acres per year. This does not include increases on federal lands. Overall, it appears there is no longer a net loss of wetland acreage within the contiguous United States.

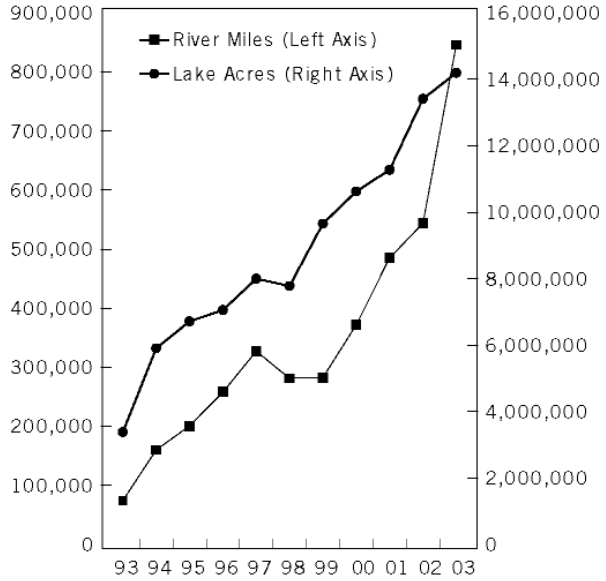
We had better hope the quality is improving: total spending on water quality since 1970 approaches the $1-trillion mark.

Of all major categories of environmental concern with ongoing efforts to develop indicators, water quality shows the least progress. This is not to say that there has not been significant progress; a number of fragmentary or local data sets suggest there have been major improvements. The Great Lakes, for example, have a number of measures showing dramatic improvements over the last 30 years. We had better hope the quality is improving: total spending on water quality since 1970 approaches the $1-trillion mark.

The first edition of this *Index* quoted two experts on water quality writing in *Environment* magazine: "Scientists still cannot reliably answer the most basic questions about national water quality," and our present data "is not capable of tracking progress toward water-quality goals."[1] A decade later this is still the case. (But *Environment* magazine, sadly, has folded.) The EPA's *Draft Report on the Environment* released in 2003 noted this problem: "At this time there is not sufficient information to provide a national answer to this question [of water quality] with confidence and scientific credibility."

Several previous editions of this *Index* have reported on the National Water Quality Inventory (NWQI), the chief measuring tool required by the Clean Water Act. The NWQI ranks lakes, rivers, streams, and estuaries according to whether they fully or partially support all uses (swimming, drinking, fishing, and so forth), or whether one or more of those uses are impaired. The problem with the NWQI from the beginning is that it is not a national monitoring program at all.

Figure 1: U.S. Fish Advisories



Source: U.S. Environmental Protection Agency

It is based on the self-reporting of each of the 50 states, among which there is wide variance in the extent of monitoring. In general, the states only assess about one third of the nation's total waterbodies. From the beginning, the EPA has stated that the NWQI cannot be used for trend analysis, though this has not stopped some environmental groups from doing so.

The EPA has sensibly decided to just about give up on the NWQI as it has been done for the last 20 years, and has stopped reporting the 50-state data in aggregated form (though individual state reports are available on the EPA's website). The EPA is remarkably frank

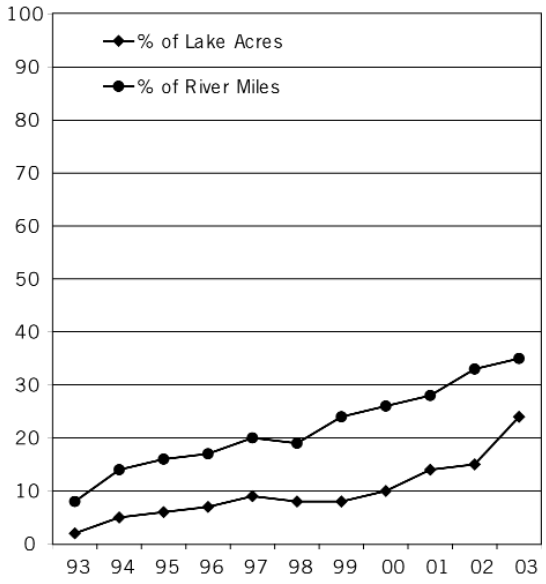
about the entire problem, stating in the FAQ section of its most recent National Water Quality Assessment Database:

> Is water quality getting worse compared to 2000?
>
> It is not appropriate to use the information in this database to make statements about national trends in water quality. The methods states use to monitor and assess their waters and report their findings vary from state to state and even over time. Many states target their limited monitoring resources to waters they suspect are impaired and, therefore, assess only a small percentage of their waters. These may not reflect conditions in state waters as a whole. States often monitor a different set of waters from cycle to cycle. Even weather conditions—such as prolonged drought—can have an impact on whether waters meet their standards from one year to the next.
>
> The science of monitoring and assessment itself changes. We know that a number of states have increased the amount of fish tissue sampling they conduct and, as a result, are issuing more protective fish consumption advisories. We don't think this means necessarily that there are new pollution problems; it's likely that states are able to identify them better as monitoring and analytical methods progress. States may also, over time, change how they issue or count fish consumption advisories.[2]

This latter caveat is important because the rising number of fish consumption advisories is being taken as an indicator of deteriorating water quality, when it is more an indicator of stepped-up monitoring. Surely no one would recommend to a state governor that he or she improve the consumption advisory record by reducing the amount of monitoring?

The number of fish consumption advisories has been rising rapidly, as shown in Figure 1. As of the end of 2003, the EPA noted 3,094 fish advisories for rivers, lakes, and seashores in 48 states (up from 1,233 advisories in 1993), comprising one quarter of the miles of the nation's rivers and streams, one third of the total

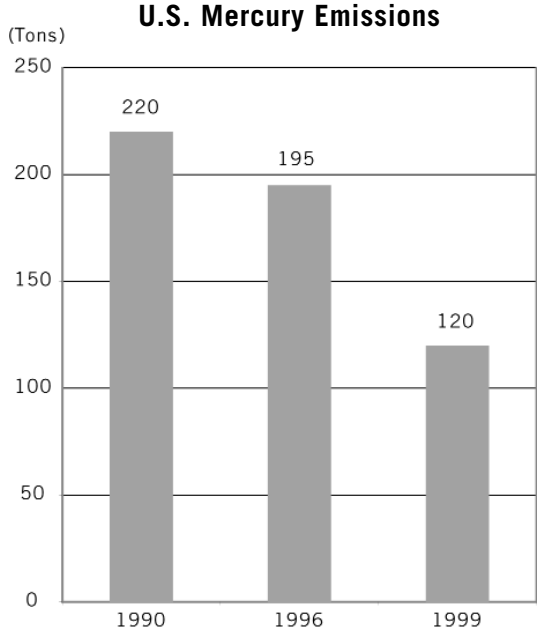
Figure 2: Percentage of River Miles and Lake Acres under Advisory



Source: U.S. Environmental Protection Agency

EPA guidance published last year emphasized that "For most people, the risk from mercury by eating fish and shellfish is not a health concern."

Figure 3:
U.S. Mercury Emissions



Source: U.S. Environmental Protection Agency

area of America's lakes, and three quarters of the nation's coastline. (See Figure 2.)

Also keep in mind that fish advisories are voluntary and do not necessarily mean that fish have unsafe levels of toxic chemicals; advisories are limited to "recreational" fishing only, and have no effect on commercial fishing. EPA guidance published last year emphasized that "For most people, the risk from mercury by eating fish and shellfish is not a health concern."

The EPA is careful to note that emissions of most toxic chemicals of concern for fish contamination have been declining, including mercury (see Figure 3).[3] Most of the 45-percent decline in mercury between 1990 and 1999 came from the phase-out of municipal and medical waste incineration. Emissions from coal-fired power plants have been flat, which is why regulatory efforts are now turning to that source.

It should be kept in mind that according to the U.N.'s 2002 Global Mercury Assessment, more than half of the mercury in the earth's atmosphere comes from sources in Asia; North America accounts for only nine percent of global mercury emissions. It is not clear how reduction of mercury emissions in the U.S. alone will affect the fish contamination problem.

Three Efforts of Note

Increasingly, water quality monitoring and indicator development efforts are being broken down into subcategories. Three to note include the Wadeable Streams Assessment, the Biological Indicators of Watershed Health, and the National Coastal Conditions Report.

The sixth edition of the *Index* noted the difficulty with national efforts on the monitoring of water quality:

> Measuring water quality is more difficult than measuring air quality because of what might be called "the Heraclitus problem." The ancient Greek philosopher Heraclitus wrote that it is

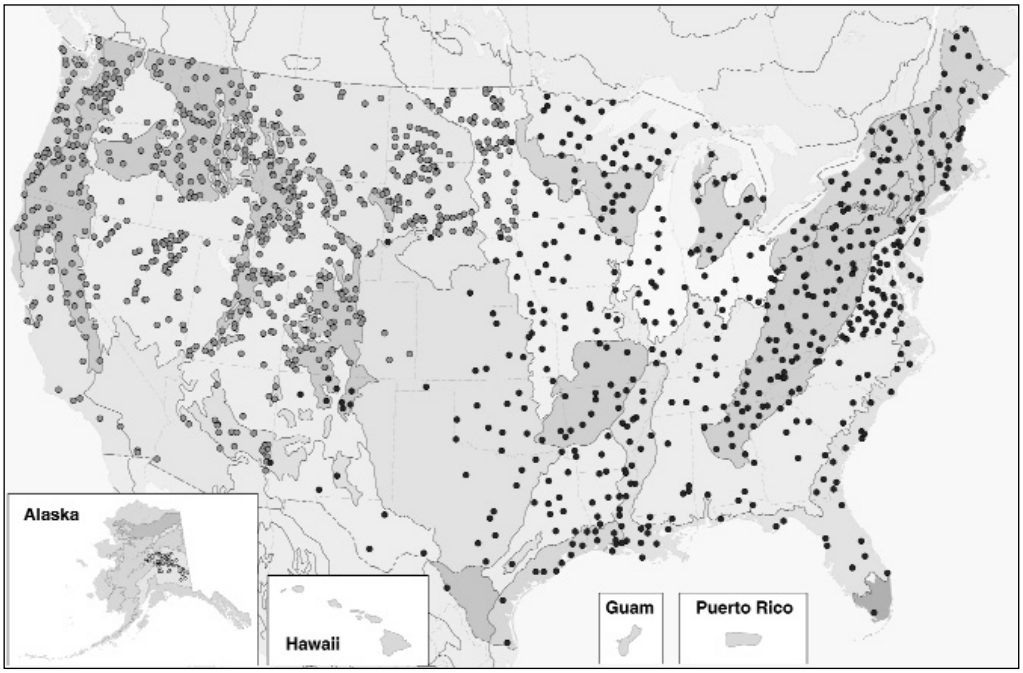
impossible to step into the same river twice; because water moves and flows, when you stick your toe back in the water, it is a different river. The wide variety of water conditions to be measured—rivers, streams, wetlands, lakes, groundwater, and so forth—along with seasonal variation in water flows makes assessment a complicated task.

Nationwide real-time monitoring in the same fashion as our air quality monitoring is probably some years away.

Nationwide real-time monitoring in the same fashion as our air quality monitoring is probably some years away.

Numerous experts and critics have long suggested that some kind of wide-scale sampling program would be a good way to start advancing our capabilities to make nationwide judgments about trends in water quality. The EPA has recently embarked on a program along these lines with the Wadeable Steams Assessment (WSA). For the first time, the EPA will study the ecological condition of small streams at 500 randomly selected locations throughout the nation. The methodology, EPA says, "is designed like an opinion poll."

Figure 4:
Wadeable Streams Assessment Sampling Locations



Source: U.S. Environmental Protection Agency

The Marine Foresters

California's coastline is one of its greatest natural assets. Below the surface, however, a number of serious environmental problems loom, principally over-fishing and the loss of productive marine habitat.

Kelp forests, for example, are havens of biodiversity. They provide habitat for fish and other aquatic life that help clean the water, and they contribute to atmospheric oxygen. But according to California's Department of Fish and Game, they've been receding in recent years, especially in Southern California. The 1997 El Nino took an especially harsh toll. Enter Rodolphe Streichenberger, a retired French aquaculture entrepreneur.

With help from the late marine biologist Wheeler North of CalTech, a noted expert on kelp beds, Streichenberger hatched a plan for seeding kelp forests and created a group called the Marine Foresters in Newport Beach. The idea was to seed shellfish, especially mussels, on suspended plastic tubes, which then creates the right ecological conditions for kelp growth. The kelp themselves attach to a series of submerged tires, the cheapest non-toxic, durable substrate they could find.

With his background in aquaculture, Streichenberger understood the fundamental importance of leased ground, not only to get permission from the local and state authorities, but to be able to ensure some control over the area where his group would work. So the Marine Foresters obtained a lease from both the city of Newport Beach and the California Department of Fish and Game. In 1993, they planted a 10-acre experimental reef, which subsequently demonstrated that they could get kelp to grow.

One more regulatory layer remained, however, and the Marine Foresters ran afoul of the state Coastal Commission, which holds jurisdiction over California's 1,150 miles of coastline.

In 1999, the Coastal Commission cited the Marine Foresters for "unpermitted development" and not only ordered them to "cease and desist" but to remove the kelp forest they had created. The Commission's problem with the Marine Foresters was all about jurisdiction and procedure; it had little to do with environmental effects. Thus began a series of lawsuits that have had repercussions in the courts and state legislature.

The Marine Foresters have achieved some success (the Coastal Commission itself was even declared unconstitutional), but they remain unpermitted, and their innovative approach to improving marine habitat remains drydocked. Meanwhile, the California legislature proposed its own regulatory solution to marine environmental decline, namely the 1999 Marine Life Protection Act, which sets out to create a system of marine reserves where fishing would be prohibited.

That effort stalled due to lack of funding, and is just now being revived by the Schwarzenegger administration. Implementing it will not be without controversy, as fishermen tend to resist closures and those proposing them. For example, when officials in California imposed a state-wide closure of the bocaccio

fishery in 2002, one central California fisherman told the *Los Angeles Times* that "There's plenty of fish out there . . . .The problem is, there's even more regulators." Fish are hard to count, but he may be on to something on the regulatory side.

Marine reserves and other closed areas do offer real promise. Numerous studies have shown that at least within the boundaries of marine reserves, marine life is more plentiful and diverse. On the other hand, reserves and closed areas are only a part of the solution. Without changes in the perverse incentives that lead to overfishing and habitat degradation, closed areas may not have much of an effect outside of their boundaries.

Faced with closure in one area, fishermen often simply relocate. Other states and countries have successfully tackled this dilemma by creating tradable fishing rights. Such rights establish who has the right to catch fish, and how much they can catch (normally a percentage of an annual, scientifically determined, total catch). In most of these cases, it is then the fishermen themselves who press for conservation measures and who often even create their own marine reserves—absent outside regulations and regulators.

Fishermen with clear harvest rights have also invested heavily in fisheries enhancement and research. The Challenger Scallop Enhancement Company in New Zealand, for example, was founded by scallop quota owners to seed scallop beds at the northern tip of the South Island.

Sorting out fishing rights in California would certainly increase the number of potential investors for the Marine Foresters to enhance California's kelp beds. At the very least, California should have the common sense to encourage, rather than discourage, innovative and entrepreneurial solutions to environmental problems.

—Michael De Alessi

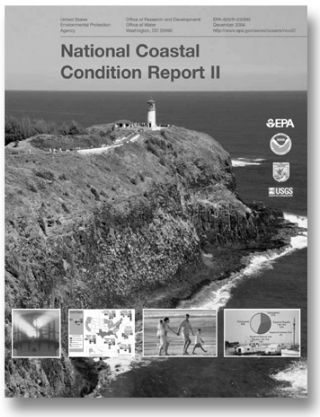
Sampling was conducted between June and October of last year; Figure 4 (page 73) displays sample locations. Results from the first round of data collection will be available some time later this year. Although information on the condition of individual sites will not be included in the national summary report, the EPA hopes the report will be able to help draw regional and national conclusions about the health of small, wadeable streams and to help water quality agencies understand stream conditions over time. The WSA can be tracked at: http://www.epa.gov/owow/monitoring/wsa/index.html.

One common-sense observation is that water quality depends ultimately on watershed conditions. So an important complementary effort is the EPA's Biological Indicators of Watershed Health project, which can be found at: http://www.epa.gov/bioindicators/. A related EPA site is the Index of Watershed Indicators (www.epa.gov.iwi/), which offers data on 18 different indicators of water quality in 2,111 watersheds throughout the U.S.

The EPA's 1996 report launching this project acknowledges the gaps and limitations of the currently available data, which provides a roadmap for improvement. This is one of the easier sites for the non-expert citizen. Other government sources of water quality information are listed in the sidebar.

The second effort to track is the National Coastal Conditions Report (NCCR), whose first report was released in 2001 (see the eighth edition of this *Index* for a review). The summary finding was that coastal conditions for most of the United States were between fair and poor. An update, NCCR II, was released in 2004, and it detailed efforts to expand monitoring and assessment capabilities around the nation.

The NCCR is developing seven core indicators of coastal water conditions: water clarity, dissolved oxygen, wetland loss, eutrophy (excess nutrients), contaminated sediments, fish contamination, and a benthic index (shellfish and mollusk health). The NCCR II update gave our coastal waters a composite rating of 2.3 (on a scale of 1 to 5, with 5 being good), down from a 2.4 rating in the 2001 report. However, the EPA cautions that the indicators and the monitoring



Additional Sources of Water Quality Information

While data for a national trend assessment are not yet available, there are several good sources of detailed local information available. The U.S. Geological Survey's National Water Quality Assessment has produced 36 detailed reports on major river basins throughout the nation. The reports are available at: http://water.usgs.gov/nawqa/nawqasum/.

The U.S.G.S. also operates the National Stream Quality Accounting Network (NASQAN), which monitors water quality in four large river basins (Colorado, Columbia, Mississippi, and Rio Grande, including the major tributaries of these rivers). This program offers some trend data for these river basins, and can be found at http://water.usgs.gov/nasqan/.

Even with this more detailed data, the Geological Survey, like the EPA, cautions that "Water quality is constantly changing, from season to season and from year to year. Long-term trends are sometimes difficult to distinguish from short-term fluctuations. For many chemicals, it is too early to tell whether conditions are getting better or worse because historical data are insufficient or too inconsistent to measure trends."[4]

The EPA has upgraded its online water quality data for watersheds, at www.epa.gov/storet/. (This site is cumbersome and requires the user to download special free software to use the data files.) The watershed data on this EPA site concentrate on effluent

effort are not yet sufficient to be used for judging trends, in part because the techniques and metrics are still being refined, and are not identical to the first NCCR.

This capability is hoped for in the next iteration of the NCCR, due to be completed in 2006.[5] The National Coastal Condition Report can be found at: www.epa.gov/owow/oceans/nccr/.

Wetlands: Turning the Corner?

The sixth edition (2001) of this report observed:

It is possible that wetlands are already expanding, but that the expansion is not yet being captured in official government data. The revised 1997 National Resources Inventory data on wetlands finds a total wetlands loss of about 160,000 acres from 1992-1997 (for an annual loss rate of 32,600 acres, down from 80,000 acres a year in the early 1990s), which is nearly within the margin of statistical error from the 1992 NRI.

The Fish and Wildlife Service, by contrast, estimates the annual wetlands loss at 58,500 acres per year.[6] . . .

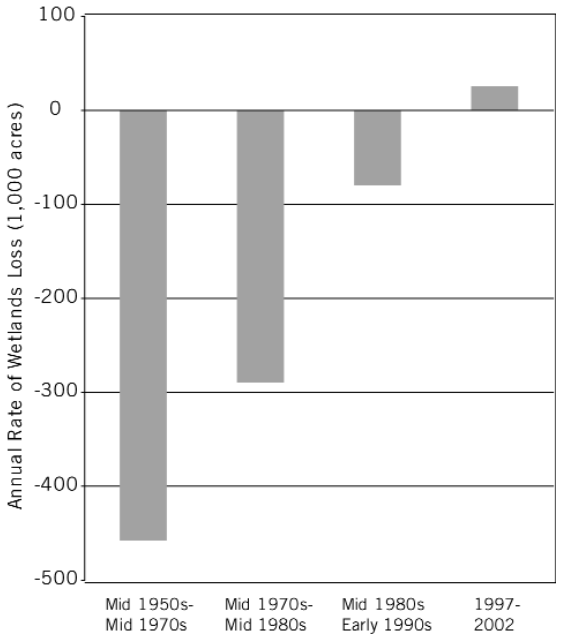
Regardless of which estimates are correct (or whether any are correct), they give cause for optimism. The current policy goal is to expand wetlands by 100,000 acres a year by 2005. This goal appears not only within reach, but is perhaps already occurring.[7]

discharge and biological conditions. Other useful websites include:

- The National Hydrology Dataset (http://nhd.usgs.gov) offers spatial images of watersheds, integrating data from the Toxics Release Inventory and tracking water bodies where Total Maximum Daily Load (TMDL) programs are being implemented.
- The Watershed Information Network (www.epa.gov/win/) also offers "geospatial" images of local watersheds, and links to dozens of state, local, and private water monitoring programs.
- The North American Lake Management Society operates a remote-sensing water quality program using satellite imagery for lakes in Michigan, Minnesota, and Wisconsin (including the Great Lakes contiguous to these states) at http://resac.gis.umn.edu/lakeweb/index.htm.

"It is likely there was no longer an overall net loss of wetland acreage occurring within the contiguous United States between 1997 and 2002."
—National Resources Inventory

Figure 5:
Trends in Wetlands, 1950-2002



Source: Fish and Wildlife Service and NRI

The most recent data from the National Resources Inventory, released in April 2004, suggest this prediction is right on target. The latest NRI finds that between 1997 and 2002, wetlands on private land expanded by a net of 131,400 acres, or about 26,000 acres a year. This contrasts with an annual loss of 32,000 acres a year in the previous NRI.

The NRI cautions that it does not include federal land in its surveys and that statistical uncertainties make it inappropriate to draw national conclusions yet. But the report does say that "It is likely there was no longer an overall net loss of wetland acreage occurring within the contiguous United States between 1997 and 2002."[8]

Figure 5 displays the likely long-term trends for wetlands if the NRI data are fully borne out by the next complete wetlands survey from the Fish and Wildlife Service.

Notes

1 Debra Knopman and Richard Smith, "20 Years of the Clean Water Act," *Environment*, January 1993, p. 17.

2 http://www.epa.gov/waters/305b/assessing_quality.html.

3 The EPA notes that 80 percent of fish advisories involve one or more of five chemicals: mercury, PCBs (production stopped in 1977), DDT (banned in 1972), dioxin (down more than 90 percent since 1987), and chlordane (banned in 1988).

4 http://water.usgs.gov/pubs/circ/circ1225/html/national.html.

5 The NCCR puts it this way: "There is insufficient information to examine the potential trends in estuarine condition that might be related to changes in environmental programs and policies."

6 *Status and Trends of Wetlands in the Coterminous United States, 1986-1997* (Washington, DC: U.S. Fish and Wildlife Service, Department of the Interior, 2001), p. 28. The FWS emphasizes that it uses a different methodology from the NRI and includes federal land in its purview, which the NRI does not.

7 See Jonathan Tolman, *Swamped: How America Achieved "No Net Loss,"* (Washington, DC: Competitive Enterprise Institute, 1997).

8 http://www.nrcs.usda.gov/technical/land/nri02/nri02wetlands.html.

Land and Wildlife

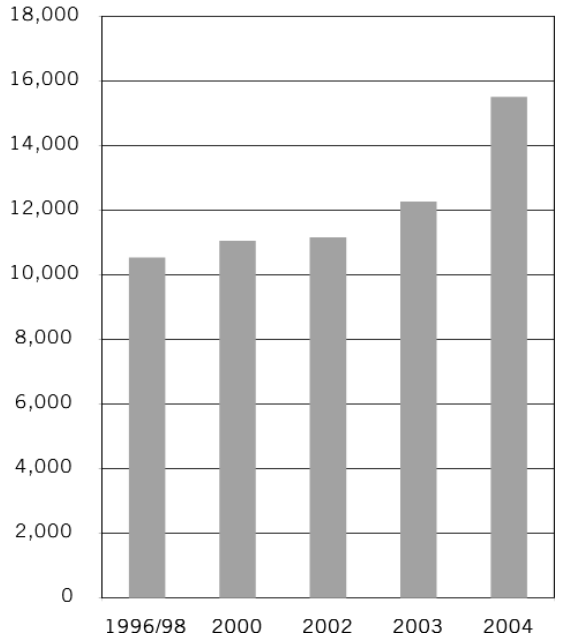
- The most widely cited source of information on endangered species, the "Red List," reports 15,503 endangered species worldwide, up from 12,259 in 2003.
- However, some experts have suggested recently that the "list" approach is too narrow. To this end, two South African researchers have developed a biodiversity index that evaluates data on land use, ecosystem extent, species richness, and population abundance.
- This more comprehensive "Biological Intactness Index" has been applied to seven countries in southern Africa. For 2000, the biota of the region is estimated to have been at 84 percent of its pre-modern level.

"Biodiversity" is one of those concepts that is generally meaningful but practically vague. The seventh edition (2002) of this *Index* considered the matter in detail, noting above all "the large uncertainties in the state of our knowledge about biodiversity." Efforts to catalogue biodiversity are proceeding, but they have a long way to go.

The Catalogue of Life Program, launched in 2001 with the purpose of identifying every living species on the planet, recently passed the 500,000 mark in its database. But as is often mentioned, estimates of the total number of species on the planet range by more than an order of magnitude, from a low of about two million to as many as 30 million or more.

The Convention on Biological Diversity, which commits 188 nations to achieving a "significant reduction" in the loss of biodiversity by 2010,

Figure 1:
IUCN "Red List" of Threatened Species



Source: IUCN

Incentives Matter, Part 7,989,214

Conservation biologists are finally recognizing what market-oriented environmentalists have been saying for nearly 30 years: that the Endangered Species Act creates perverse incentives for private landowners to degrade habitat such that their land will not be prevented from use. Private landowners facing the threat of ESA, critics note, have the incentive, to "shoot, shovel, and shut up." The Winter 2004 issue of *Conservation in Practice* noted this problem with the headline "Endangered Species Listings May Backfire."

The story reported on a study published in the scholarly journal *Conservation Biology* in late 2003 about a survey of 379 landowners in Colorado and Wyoming, in areas where the endangered Preble's Jumping Mouse is being considered for an ESA listing.[1] Amara Brook, Michaela Zint, and Raymond De Young of the University of Michigan observe that half of the landowners refused to allow a biological survey to be conducted on their land to determine whether the Preble's Jumping Mouse was present, essential to developing a conservation plan.

About a quarter of landowners worked to improve potential mouse habitat, especially if they had received information from a conservation organization, but *another quarter of landowners worked deliberately to destroy potential mouse habitat*. "Landowners were more likely to have destroyed the mouse's habitat," *Conservation in Practice* reported, "if they depended economically on agriculture." Well, Duh!

Conservation in Practice summarizes:

> This work suggests that listing the mouse may have done more harm than good. Better approaches may include letting landowners know how conserving the mouse's habitat can benefit them, reimbursing landowners for the cost of fencing to keep cows away from riparian areas, and reducing landowners' fears of regulation by including them in the conservation decision-making process.

This latter suggestion—including landowners in the decision-making process—would have to include the right to say "No" in order to be meaningful, wouldn't it?

There are two important footnotes to this story. First, the status of the Preble's Jumping Mouse has been reconsidered, and it turns out the mouse is not a separate species after all. It is an indistinct variety of a mouse species abundant on the eastern side of the Rockies and is on its way to being removed from endangered species protection.

Second, *Conservation in Practice* reported that "This [*Conservation Biology* study] is the first study to determine if this [incentive not to protect land for species] is true." This is incorrect.

Five years ago, Dean Lueck of Montana State University and Jeffrey Michael of Towson University published extensive empirical data demonstrating how private landowners preemptively destroy habitat for the endangered Red Cockaded Woodpecker in the forests of North Carolina. Rather than merely survey landowners, Lueck and Michael examined behavior at more than 1,000 individual forest plots over a six-year period to generate statistically robust results. Lueck and Michael published their results in more than one forum.[2]

lacks any benchmarks or even a framework for judging progress. Right now the most widely cited source of information on endangered species is the World Conservation Union (formerly known as the International Union for Conservation of Nature and Natural Resources), which maintains the "Red List" of endangered species around the world. (See: www.iucn.org.)

The Red List currently reports 15,503 endangered species worldwide, up from 12,259 in 2003 (out of a database of about 1.5 million "described" species).[3] See Figure 1 for trend data.

While the efforts at cataloging all species and identifying those in danger of extinction are important, the "list" approach to species is too narrow. Georgina Mace of the Zoological Society of London wrote recently in *Nature*: "Biodiversity assessments need to move away from a reliance on species lists and species extinction rates."[4]

Two South African researchers, R.J. Scholes and R. Biggs, have developed a "Biological Intactness Index" (BII) that may for the first time yield an indicator to measure biodiversity objectively. It would

Offshore Aquaculture in Hawaii

The world's capture fisheries suffer from "the tragedy of the commons." It's a phrase coined by Garrett Hardin in 1968 to describe what happens when valuable resources are free for the taking—they get depleted. When fish left in the sea are simply there for someone else, harvesters try not to leave many behind.

Apart from some notable conservation successes due to the use of exclusive fishing rights in places like New Zealand, Australia, and Iceland, along with some isolated cases in the United States and Canada, most of the world's depleted fish stocks are not recovering. According to the Food and Agriculture Organization of the United Nations, the world marine fish harvest has hovered around 90 million metric tons for the last decade. Aquaculture, on the other hand, is one of the world's fastest growing industries, with an average yearly growth rate of more than nine percent since 1970.

By "farming" the sea, aquaculturists avoid the tragedy of the commons because they know that a fish not harvested today will be there tomorrow, normal rates of mortality notwithstanding. Aquaculture offers other advantages, such as a dependable market supply. Controlling the feed also allows growers to increase fat content for sushi chefs or lower it for producers of smoked fish.

Aquaculture has its share of detractors, mainly due to the very real pollution problems that it has created in some locales around the world. Pollution is a common problem because while aquaculture facilities take care of the tragedy of the commons by providing an enclosure, another tragedy emerges—lack of access to clean water. Pollution is often exacerbated because most aquaculture (about two thirds) takes place in bays, estuaries, and other shallow, nearshore marine environments where circulation is often slow, or in coastal habitats such as mangrove forests, which are often fragile.

Intensive aquaculture in these areas may produce significant amounts of organic pollution, which can lead to reduced levels of oxygen and an increase in quick-growing algae harmful to marine life. In some cases there is also growing concern over antibiotics and the effect of escaped fish on the gene pool of wild populations.

One of the most promising solutions to these problems is to move aquaculture offshore, where ocean currents prove the mantra that "the solution to pollution is dilution." Of course, offshore aquaculture has its own set of challenges, including anchoring, feeding, and harvesting systems, monitoring and transportation to far-off sites, navigation, mammal interactions, and the legal intricacies of ocean leasing.

The only commercial offshore aquaculture facility in operation in the United States is in Hawaii, and it is proving that offshore aquaculture can be productive and clean. This approach was jump-started in Hawaii by a research project funded by a number of public agencies including the University of Hawaii Sea Grant College, the state Aquaculture Development Office, and the Oceanic

Institute. The result demonstrated that offshore aquaculture was possible in Hawaiian waters, technical difficulties were surmountable, and environmental effects negligible—by some measures even undetectable.

In fact, the project cage produced no measurable effects beyond 100 feet. Inside 100 feet, there was a barely perceptible increase in ammonium (i.e. fish urination) and an increase in the sea life underneath the cage, probably more as a result of the structure than escaping feed or fish.

According to Charles Helsley of University of Hawaii Sea Grant, the evidence was clear that "it was feasible to grow a local fish in offshore cages, that the technology was mature enough to withstand the rigors of our rough offshore waters, and that the environmental impact was virtually nil." Along with the refinement of feeding techniques that allow very little food to escape from the cage, the most important factor is Hawaii's fast currents and clean water. Hawaii's currents average .2 knots; at .1 knots, more than 217 million gallons of water will flow through the cages each day.

Cates International, the current commercial operator, was the salvage contractor for the project, and bought the cages from the researchers. Cates now has a lease from the state of Hawaii to 28 acres offshore near Honolulu. Two miles offshore, the cages lie in about 200 feet of water, hovering 40 feet under the surface and 50 feet above the ocean floor.

The cages are not visible from the surface and never raised, as fish are fed and harvested from a boat. The site is still monitored through the research project and still shows no pollution signature. In addition, Hawaii regulations mandate that only local fish varieties can be grown, and rapid currents and clean water keep the fish healthy, so disease treatments are unnecessary.

The fish grown by Cates is the Pacific threadfin (*Polydactylus sexfilis*), known in Hawaii simply as Moi. A reef fish, Moi was once the favorite of Hawaiian royalty but had since been nearly fished out. Moi is now readily available and popular in restaurants. A second offshore aquaculture operation is gearing up off of the Kona coast on the Big Island of Hawaii. Kona Blue Water Farms, Inc. obtained the last of its regulatory permits in March 2004.

If Hawaii is able to strike the right balance between ensuring environmental quality and allowing entrepreneurial activity to occur in its waters, offshore aquaculture may soon take the pressure off other wild stocks. It could also powerfully demonstrate how human ingenuity, properly channeled through a system of offshore leases, could effectively address both the overfishing in the wild and the pollution problems that have plagued nearshore aquaculture, while at the same time feeding people and maintaining a healthy environment.

—Michael De Alessi

> "Biodiversity assessments need to move away from a reliance on species lists and species extinction rates."
> —Georgina Mace

also provide policymakers with a framework for discerning meaningful conservation priorities.[5] As reported in *Nature*, Scholes and Biggs have developed a scalable model that synthesizes data on land use, ecosystem extent, species richness, and population abundance.

Applying the BII to the region of southern Africa that includes South Africa, Namibia, Lesotho, Swaziland, Botswana, Zimbabwe, and Mozambique, Scholes and Biggs give the year 2000 a score of 84 out of 100. In other words, the biota of the region is about 84 percent of its estimated pre-modern level. The BII further calculates a loss of 0.8 percent in biodiversity during the 1990s.

The BII is a complicated formula, with a number of significant methodological gaps. It cannot, for example, factor habitat fragmentation, which is an important aspect of the problem. If applied to the United States, where forestland expanded by 10 million acres during the 1990s, it might well find biodiversity to be increasing in some areas.

The Welder Wildlife Refuge

One of the more spirited debates over the use of public lands in recent years has focused on oil and gas exploration in the Arctic National Wildlife Refuge (ANWR) in Alaska. Opposing sides tend to take an absolutist view.

The pro-development side claims that exploration of ANWR is necessary for jobs and energy security, among other things. Environmentalists and other opponents believe that the Arctic environment and its wildlife are too precious and fragile to risk what will inevitably be a significant impact of any oil and gas development. Putting aside political agendas and uncertainties about just how viable or important ANWR is, anyone who thinks that oil and wildlife cannot mix has surely never visited the Rob and Bessie Welder Wildlife Refuge near Corpus Christi, Texas.

This 7,800-acre refuge was formed in 1954 by the estate of Rob Welder, a Texas rancher who earned his fortune from oil. The private, non-profit refuge was set up to demonstrate the compatibility of ranching with wildlife and habitat conservation, as well as to fund academic research projects on wildlife management. According to the Welder Foundation, "no other organization has dedicated itself solely to conducting wildlife research in the midst of a ranching operation and an active oil field."

According to Lynn Drawe, Welder's current director, "every cow and every acre is a research unit." Since the late 1950s, about 250 graduate theses and dissertations have

been supported by the foundation. Welder annually supports about 20 students to conduct research and pursue advanced degrees in wildlife conservation and management. Many of the students complete their research at Welder, and the rest are spread out across the United States and Canada. There is also an extensive outreach program that affords both younger students and their teachers the opportunity to tour the refuge.

Today the refuge remains a working cattle ranch with operating oilfields and a healthy array of wildlife, which ranges from bobcats to bobwhites to wintering populations of waterfowl and shorebirds. And the habitat it occupies is certainly an important one. It is literally a biological crossroads, where the northern limit of many tropical birds meets the southern limit for many temperate birds. The current management at Welder actively manages and enhances the ranch's wildlife habitat.

For example, they have been putting up nesting boxes for black whistling ducks for more than 25 years, during which time there has been a tenfold increase in the population of this species. Five hundred acres of wetlands have been either created or enhanced, and there has been a stable population of about 1,000 deer on the property for more than 35 years.

Lynn Drawe explains that one of the foundation's aims is to show other Texas ranchers just how strong their property rights are when it comes to negotiating oil exploration on their land. In other words, Welder leads by example and encourages other landowners to leverage their bargaining power to ensure environmentally sensitive production on their land. Welder contracts demand a deposit for clean-up and include many other environmentally motivated stipulations such as the need to transport all mud off the property and to build high levees and low ditches around drilling pads in case of spillage.

Welder has had as many as 25 producing wells on the property, but in recent years that number has dwindled significantly. This is in part due to fluctuations in the price of oil, but also to changes in technology. Advances in slant drilling, for example, allow fewer pads to access a wider area. And once a pad has been shut down and cleared out, it quickly reverts to its natural state. After one year there is a patch of wildflowers, and in another year or two it becomes impossible to tell that anything was ever there.

The Welder Wildlife Refuge is living proof that oil and wildlife can mix, especially now that scientific and technological advances have made oil exploration a more environmentally sensitive activity. Of course, that doesn't mean they should mix in ANWR.

After all, Alaska is not Texas, and ANWR is public land, not private. So many of the tradeoffs and opportunities that places like Welder face do not exist there. The Welder Foundation, for example, does not have the time nor the interest to pursue posturing in lieu of progress, the hallmark of the tedious and repetitive debate over ANWR.

—Michael De Alessi

Notes

1 A. Brook, M. Zint, and R. De Young, "Landowners' responses to an Endangered Species Act listing and implications for encouraging conservation," *Conservation Biology* 17 (6): pp. 1638-49 (2003).

2 Dean Lueck and Jeffrey Michael, "Preemptive Habitat Destruction Under the Endangered Species Act," in T. Anderson (ed.), *Political Environmentalism: Going behind the Green Curtain* (Stanford, CA: Hoover Institution Press, 2000); Dean Lueck and Jeffrey A. Michael, "Preemptive Habitat Destruction under the Endangered Species Act," *Journal of Law and Economics*, 46(1): pp. 27-60 (2003).

3 See http://www.iucnredlist.org/info/tables/table1.html.

4 Georgina M. Mace, "An Index of Intactness," *Nature*, March 3, 2005, p. 32.

5 R.J. Scholes and R. Biggs, "A Biodiversity Intactness Index" *Nature*, March 3, 2005, pp. 45-49.

The United States and Europe Compared: Forests

- Most of the deforestation in the United States took place between 1850 and 1900. America's forest area has been stable for nearly a century, rising slightly over the last decade.
- In 2002, the continental United States had 622 million acres of forestland, about 32 percent of the total land area. At that time, Europe had 401 million acres of forestland, about 34 percent of total land area.
- Forestland is expanding more rapidly in the United States than in Europe—about four times faster, relative to overall land area.

With last year's ninth edition, the *Index* began including a section comparing American and European environmental trends. European nations are generally ahead of the United States in producing short, reader-friendly environmental indicator reports similar to this *Index*. (See examples at right.) Yet there are surprisingly few comparisons between the environmental performance of the United States and European Union. In part, this is because the E.U. measures environmental factors differently than the U.S. and has a different regulatory regime.

It is sometimes presumed in press commentary and public discourse that European environmental policy is more sophisticated, enlightened, or advanced than that of the United States. Yet the comparison of air-quality trends in last year's *Index* found mixed results, offering little basis for concluding whether the U.S. or the E.U. was doing a better job in reducing air pollution. The United States, however, was far ahead of the European Union in monitoring air quality.

This year's report compares forestland trends between the U.S. and E.U. This comparison is especially useful as an indicator of the "wealth effect," that is, how affluent economies devote resources to environmental remediation. Deforestation continues to be one of the leading environmental problems in the developing world, where clearing land for low-yield agriculture and burning wood for heat are imperatives.

Samples of European Environmental Indicator Reports

Both the United States and Europe, highly industrialized and high-consuming societies, began to reverse long-term deforestation trends decades ago. And both are now gaining forestland. The experience of the United States and Europe in the second half of the 20th century should be the model for the developing world in this century.

> Forest area has been stable for nearly a century, rising slightly over the last decade.

The United States has about 622 million acres of forestland in the lower 48 states (there are another 126 million forested acres in Alaska), or about 32 percent of the total land area of the continental United States. Contrary to a frequent claim, there is not more forest area in the United

Relative to the difference in overall land area between the two continents, forestland is growing about four times faster in the United States than in Europe.

States now than at the beginning of European settlement in the 17th century.

In 1630, there were about 1.1 billion acres of forests in the United States, about 25 percent more than at present. However, forest area has been stable for nearly a century, rising slightly over the last decade.

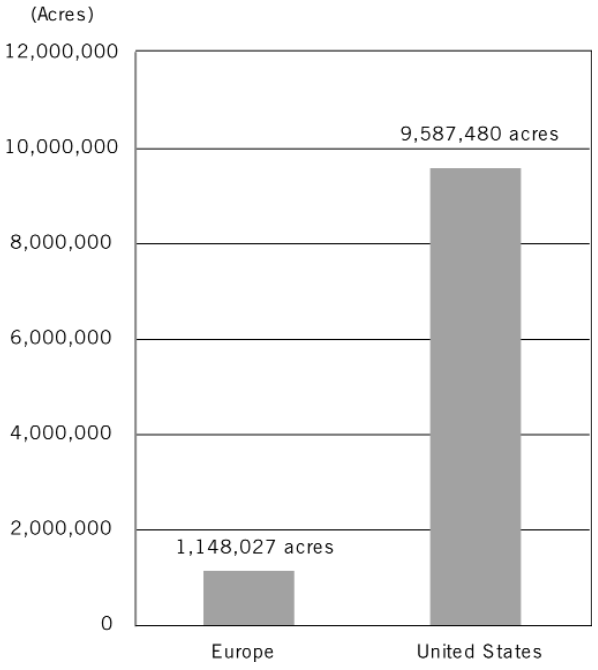
Forest area grew by eight million acres from 1987 to 1997, according to the Heinz Center; U.N. data show U.S. forestland expanding by about 9.5 million acres from 1990 to 2000. Most of the deforestation in the United States took place between 1850 and 1900, and was centered chiefly in broadleaf forests of the eastern states where trees were cleared to make way for farming.

The eighth edition of this report (2003) included a review of U.S. forest trends and a summary of the *National Report on Sustainable Forestry.*

The land area of the 15 nations of the European Union and 16 "accession countries," those eligible for entry to the E.U. at a later date, is slightly more than half that of the continental United States: 1.1 billion acres for Europe vs. 1.9 billion acres for the continental United States. This difference in overall land area must be kept in mind when comparing forest statistics.[1] While the continental United States has 622 million acres of forestland, about 32 percent of total land area, Europe in 2000 had about 401 million acres of forestland, about 34 percent of total land area.

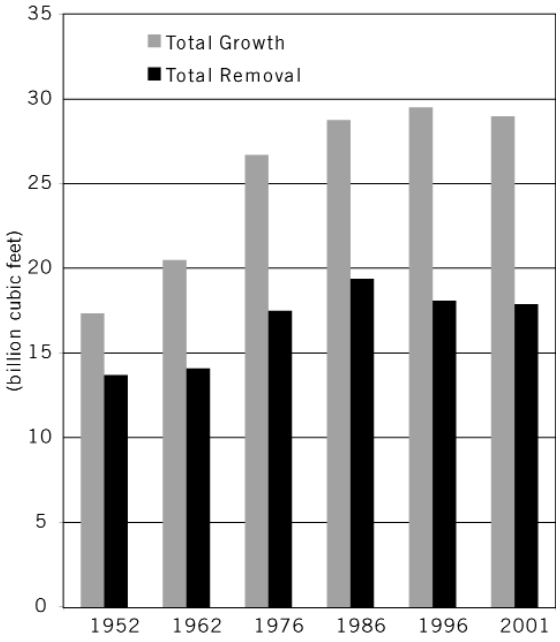
Even with the difference in overall land area, it is striking how much more rapidly forestland is expanding in the United States compared to Europe. Forestland in Europe expanded by 1.1 million acres between 1990 and 2000,

Figure 1:
Net Forest Growth in Europe and the U.S., 1990-2000



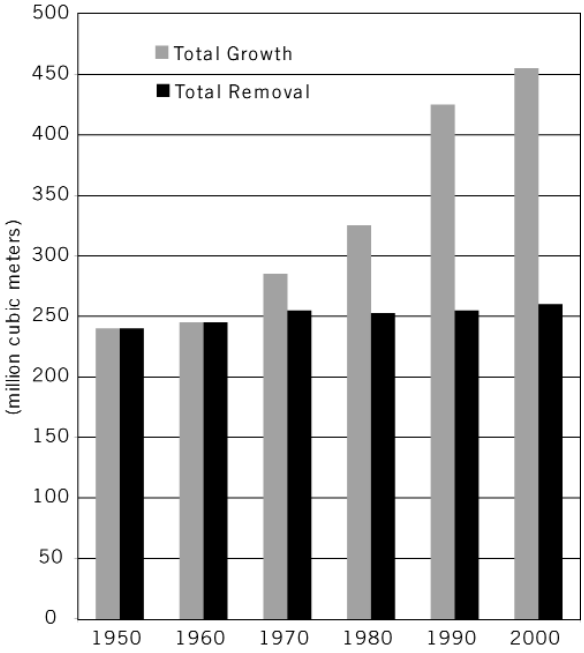
Source: U.N. FAO, *Global Forest Resource Assessment*, 2000

Figure 2:
Forest Growth and Removal in the U.S., 1952-2001



Source: U.S. Forest Service

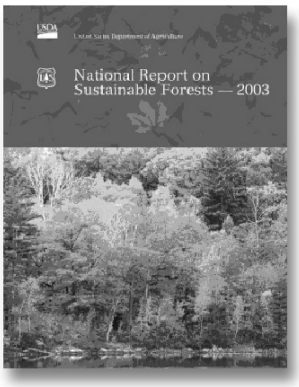
Figure 3:
Forest Growth and Removal in Europe, 1950-2000



Source: European Environment Agency

according to U.N. statistics, while forestland in the United States expanded by 9.5 million acres. (See Figure 1.) Relative to the difference in overall land area between the two continents, forestland is growing about four times faster in the United States than in Europe.

Expanding forestland in both the United States and Europe is important because the trend runs counter to popular perception. The *National Report on Sustainable Forestry* noted that "Surveys have indicated that Americans often have misperceptions about the current status and trends for forests in the U.S. For example, many think our forests are declining, while in reality the total area of forests nationally has been fairly stable since about 1920 and actually increased slightly between 1990 and 2002. Also, many think we are harvesting more trees than we are growing, while in reality net growth in U.S. forests exceeds removals by a large margin."



The *Index* has noted the data on this last point in several past editions, as seen in Figure 2. A similar trend is underway in Europe, as shown in Figure 3.

These comparisons of overall forest growth trends are only a starting point for thinking about the condition of forest ecosystems. The *National Report on Sustainable Forestry* in the United States proposed 67 indicators of forest health, many of which lack sufficient data. The European Environment

Agency, while professing overall satisfaction with the progress in forest protection in Europe, notes a number of familiar-sounding problems such as fragmentation, non-native species, air pollution, and biodiversity.

For more information, see:

- *National Report on Sustainable Forestry*: **http://www.fs.fed.us/research/sustain/**.
- *National Commission on Science for Sustainable Forestry*: **http://www.NCSEonline.org/NCSSF**/.
- European Environment Agency, *Environmental Signals 2002*, chapter 14 (forests): **http://reports.eea.eu.int/environmental_assessment_report_2002_9/en/tab_content_RLR**.
- *U.N. FAO Global Forest Resource Assessment*: **http://www.fao.org/forestry/index.jsp**.

Notes

1 Thirty-one European nations are included in the comparisons in this section: Albania, Austria, Belgium & Luxembourg, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain,Sweden, Switzerland, and the United Kingdom.

Special Feature

The New Corporate Balance Sheet: Black, Red—and Green

- The "triple bottom line," which takes into account the financial, environmental, and social aspects of a company's performance, has become part of what is more broadly known as corporate social responsibility (CSR).

- On the positive side, the triple bottom line provides a new angle on an old long-term trend of ever-increasing resource and energy efficiency. It has helped encourage more cooperation between big business and environmental groups, to the advantage of both parties.

- But CSR is also being used to advance such policies as green accounting, which tries to impose liability in areas of great scientific uncertainty. It also encourages green investing, another dubious undertaking.

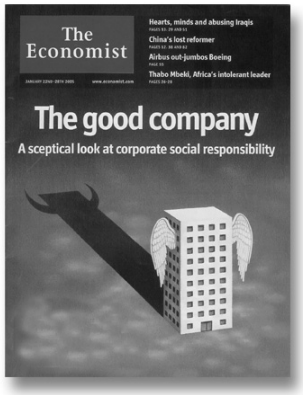
  The Economist recently cast a skeptical eye on the entire CSR idea in a special survey, arguing that "businesses should not try to do the work of governments, just as governments should not try to do the work of businesses."

For several years there has been growing interest in revising national income accounts to factor environmental costs and benefits. The environmental cost of natural resource depletion and pollution, advocates argue, should be subtracted from national income accounts in some fashion. It should also be incorporated in the balance sheets and income statements of individual firms.

The idea has not gone very far because concepts of environmental valuation are still too subjective or controversial compared to traditional economic growth and business accounting categories. These have evolved and adapted over the course of centuries and, hence, proven their value as meaningful indicators of financial wealth and health.

Even with this long tradition, financial accounting still has large ambiguities and blind spots, as the accounting frauds and failures that led to the Sarbanes-Oxley Act showed. A subset of the idea of environmental accounting can be seen at work in the current enthusiasm for corporate environmental reporting.

Sometimes called "the triple bottom line," the financial, environmental, and social aspects of a company's performance have become the leading edge of what is known as "corporate social responsibility," which is known by the shorthand "CSR." The triple bottom line has become the leading means by which business firms can aid the cause of "sustainable development." More and more multinational companies are buying into or publicly endorsing the idea.



In 1995, for example, Monsanto's CEO Robert Shapiro wrote that "We have to broaden our definition of environmental and ecological responsibility to include working toward 'sustainable development.'" This trend is apparently more popular with European firms; the NGOs (non-government organizations) that rate corporate CSR performance typically find few American companies ranking in the top 20.

Our survey of the 30 companies that make up the Dow Jones Industrial Average found that only 22 of the 30 produced a separate annual report on environment, health, and safety or included a discussion of these factors in their regular annual report. Our casual observation of the Dow 30 suggests that the extent of CSR reporting correlates closely with the extent to which firms are in more heavily regulated industries, such as energy, chemicals, and pharmaceuticals.

Our casual observation of the Dow 30 suggests that the extent of CSR reporting correlates closely with the extent to which firms are in more heavily regulated industries, such as energy, chemicals, and pharmaceuticals.

There are a number of things to be said in favor of the triple bottom line, and a number of criticisms as well. Since the triple bottom line is conceived as a balance sheet measurement, it is perhaps best to evaluate the idea in just that fashion, starting with its positive aspects.

The rise of the triple bottom line has seen cooperation replace confrontation between big business and environmental groups, often to the pleasant surprise of both parties. In one widely heralded case of business-environmental cooperation, the Natural Resources Defense Council (NRDC) teamed up with Dow Chemical in Michigan on a "source reduction initiative" that set as its goal a 35-percent reduction in the amount of pollution discharged at Dow manufacturing plants.

At the end of a three-year process Dow had not only exceeded the target, achieving a 43-percent reduction in discharges, but saved a net $5 million a year in production costs that now flow to the financial bottom line as additional profit. The production changes required to achieve this saving cost $3 million.

That a chemical company can increase its profitability through reducing pollution was an unprecedented idea for some environmentalists. Linda Greer of the Natural Resources Defense Council, who spearheaded the NRDC-Dow project, told an interviewer: "If you told me five years ago that I was going to help Dow increase its profitability by $5 million a year, I would have stood and waited for the punch line!"

The Dow example represents the harmony of the efficiency ethic with the environmental ethic, and does not represent a radical new direction for commerce. The long story of American industry is one of ever-increasing resource and energy efficiency. The resource efficiency of the American economy (the amount of raw materials and energy per dollar of GDP) has been improving at a rate of about one percent a year for more than a century. This is not to suggest that a triple bottom line emphasis is irrelevant or has no meaningful impact.

It does mean, however, that in many cases the emphasis on the triple bottom line merely speeds up efficiency gains that would likely accrue over a longer time horizon. And although the frequently short payback period of such efficiency gains may be a welcome surprise to businesses and environmentalists alike, it should be kept in mind that such investments ought to be foregone for now if they offer a lower internal rate of return on a company's working capital than alternative investments.[1]

Lately the idea of environmental accounting has sharpened a bit, and moved beyond the still gauzy triple bottom line. Now it is suggested that environmental accounting be made a mandatory part of regular financial reporting.

Robert Repetto and Duncan Austin, economists with the World Resources Institute, got the ball rolling a few years back with a paper arguing that the Securities and Exchange Commission should require disclosure of potential environmental liabilities under several existing regulatory frameworks.[2] More recently something called the Rose Foundation for Communities and the Environment formally petitioned the SEC with the same idea.[3]

The resource efficiency of the American economy (the amount of raw materials and energy per dollar of GDP) has been improving at a rate of about one percent a year for more than a century.

Senators Jim Jeffords, Jon Corzine, and Joe Lieberman requested that the Government Accountability Office get in on the action; the GAO issued a report last July that endorsed the idea of having the SEC require some kind of environmental accounting.[4] Needless to say, the U.N. Environment Program likes the idea. Since 1994, a British group named SustainAbility has surveyed the non-financial reporting practices of major multinational corporations.[5]

Increasingly, activist shareholders are floating resolutions at annual meetings to compel companies to adopt green accounting, and there are even a few shareholder lawsuits making their way through the courts. Reformers primarily have in mind two kinds of environmental liability.

The first is the "known uncertainty" of contaminated assets such as land or buildings that require costly remediation. Examples of this kind include GE's liability to clean up PCBs it dumped in the Hudson River prior to the 1970s (reported about in the seventh edition, 2002, of this *Index*). The second kind of "known uncertainty" reformers are advocating is the potential costs and liability that may come with climate change.

Here one might suspect that environmental accounting is being used to open another pressure point in the climate change debate. It is far from clear that the "known uncertainty" of *past* actions such as toxic contamination is commensurate with potential *future* harms from a global phenomenon whose exact causes will likely always remain a matter of scientific controversy. Yet the idea has received a substantial boost in legitimacy from MunichRe, the large Swiss reinsurance firm.

MunichRe has said that the prospect of large insurance losses on account of extreme weather events brought about by global warming requires that insurance premiums start to go up *now*. While MunichRe has been championed by the IPCC and the climate change action faction, Roger Pielke notes on his *Prometheus* science blog that MunichRe presents a clear case of conflict of interest.

Insurance companies make most of their money not from the spread between premiums and indemnity payments, but from investments of premium income. Increasing their premium income well ahead of potential payouts will fatten MunichRe's profits.[6]

It is far from clear that the "known uncertainty" of *past* actions such as toxic contamination is commensurate with potential *future* harms from a global phenomenon whose exact causes will likely always remain a matter of scientific controversy.

One might say this is taking the triple bottom line seriously enough to triple the bottom line. A related effort attempts to mimic portfolio analysis to keep our attention fixed on climate change. Campaign ExxonMobil, a self-appointed pressure group dedicated to making ExxonMobil annual shareholder meetings as unpleasant as possible, recently sponsored an ostensible shareholder valuation analysis of ExxonMobil by an outfit known as Claros Consulting. The report argued that ExxonMobil's market capitalization could fall by as much as 10 percent (or about $20 billion) because of its refusal to take global warming

seriously or invest in renewable energy technologies. The study claims ExxonMobil might even face "tobacco-style" liability lawsuits for the climate damage its products do if it does not reform its ways.[7]

The World Resources Institute also got into this game with a more circumspect study of "Emerging Environmental Risks and Shareholder Value in the Oil and Gas Industry." The WRI study argues more cautiously that ExxonMobil and other oil-oriented companies face an average loss in market value of about six percent because of their troglodyte ways.

There is something more than a little ironic—even comical—about environmentalists pretending to be stock market analysts after a long period in which such analysts have fallen into disrepute with the public, and when normal market volatility has greatly exceeded the possible range of valuation changes under either of these studies. Next they'll be telling us that Internet companies are a good investment.

Such solicitude for risk analysis and the integrity of capital markets is a bit precious coming from a movement that evinces unremitting hostility toward market capitalism. But this is merely a part of the unquestioned legitimization of the idea of "stakeholders," who are now regarded as *de facto* equals with shareholders.

The gradual acceptance of the semi-official role of NGOs and "stakeholders" has received surprisingly little scrutiny and criticism given how widespread a phenomenon it has become. *The Economist* recently cast a skeptical eye on the entire CSR idea in one of its special surveys, arguing that "businesses should not try to do the work of governments, just as governments should not try to do the work of businesses." CSR, it adds, "is at best a gloss on capitalism, not the deep systemic reform that its champions deem desirable."[8]

Also not to be missed is David Henderson, former chief economist with the Organization for Economic Co-Operation and Development (OECD) and professor at Westminster University in London, who argues in his recent book *The Role of Business in the Modern World* that:

> The mechanisms of "global governance" now favored by advocates of CSR, and by others too, are liable to do active harm. They assign a role which it cannot rightfully claim to what is misleadingly termed "civil society," in the form of "public interest" non-governmental organizations (NGOs); and they open the way to forms of cross-border regulation, whether by companies or by governments and international agencies, that would restrict opportunities for advancement on the part of people in poor countries.[9]

Clearly this subject needs to be thought through. Measures of environmental practice at the firm level show some promise as an indicator of market dynamism at work. But the broader idea of corporate environmental accounting for potential climate change contingencies seems more than a stretch, especially given the dubious

Such solicitude for risk analysis and the integrity of capital markets is a bit precious coming from a movement that evinces unremitting hostility toward market capitalism.

motives of its most fervent advocates. Hence, the best commentary on corporate social responsibility remains Milton Friedman's observation made 40 years ago:

> Few trends could so thoroughly undermine the very foundations of our free society as the acceptance by corporate officials of a social responsibility other than to make as much money for their shareholders as possible. This is a fundamentally subversive doctrine. If businessmen do have a social responsibility other than making maximum profits for stockholders, how are they to know what it is? Can self-selected private individuals decide what the social interest is?[10]

Notes

1 This is especially true for certain industries such as oil refining where as much as 50 percent of capital expenditures in the 1990s were spent for pollution abatement purposes, much of which was mandated by regulation.

2 Robert Repetto and Duncan Austin, *Coming Clean: Corporate Disclosure of Financially Significant Environmental Risk* (Washington, DC: World Resources Institute, 2000).

3 Sanford Lewis and Tim Little, *Fooling Investors and Fooling Themselves: How Aggressive Corporate Accounting and Asset Management Tactics Can Lead to Environmental Accounting Fraud* (Oakland, CA: Rose Foundation, 2004), available at www.rosefdn.org.

4 *Environmental Disclosure: SEC Should Explore Ways to Improve Tracking and Transparency of Information* (Washington, DC: GAO, 2004), available at www.gao.gov/cgi-bin/getrpt?GAO-04-808.

5 See www.sustainability.com.

6 http://sciencepolicy.colorado.edu/prometheus/archives/climate_change/000311climate_change_and_r.html.

7 Mark Mansley, *Risking Shareholder Value? ExxonMobil and Climate Change: An Investigation of Unnecessary Risks and Missed Opportunities*, Claros Consulting, May 2002, available at www.campaignexxonmobil.org.

8 "The Good Company: A Skeptical Look at Corporate Social Responsibility," *The Economist*, January 22, 2005, available at: http://www.economist.com/surveys/showsurvey.cfm?issue=20050122.

9 *The Role of Business in the Modern World* is available in the United States from the Competitive Enterprise Institute. See www.cei.org.

10 Milton Friedman, *Capitalism and Freedom* (Chicago: University of Chicago Press, 1962), p. 133.

About the Authors

Steven F. Hayward

Steven F. Hayward is the F. K. Weyerhaeuser fellow in law and economics at the American Enterprise Institute in Washington, D.C., and senior fellow at the Pacific Research Institute. He had been the principal author of the *Index of Leading Environmental Indicators* since its launch in 1994.

Hayward writes AEI's regular newsletter, *Environmental Policy Outlook*, and has written for a wide range of publications including *National Review*, *Weekly Standard*, *The Public Interest*, *Regulation*, and *Policy Review*. His newspaper articles have appeared in the *New York Times*, *Wall Street Journal*, *Baltimore Sun*, *San Francisco Chronicle*, *Chicago Tribune*, and dozens of other daily newspapers.

Hayward holds a Ph.D in American Studies and an M.A. in Government from Claremont Graduate University in California. He has testified about environmental issues before the U.S. Senate Environment and Public Works Committee, the House Government Reform Committee, several state legislatures, and numerous local planning bodies.

Michael De Alessi

Michael De Alessi is director of Natural Resource Policy for the Reason Public Policy Institute in Los Angeles. He is also a senior fellow at the Pacific Research Institute.

He specializes in water policy, marine conservation, and wildlife issues. He is the author of *Fishing for Solutions* (London: Institute of Economic Affairs, 1998), and his articles have appeared in such publications as *New Scientist*, *International Herald Tribune*, *Wall Street Journal Europe* and *Asian Wall Street Journal*.

Mr. De Alessi is the former director of the Center for Private Conservation at the Competitive Enterprise Institute. He received a B.A. in Economics and an M.S. in Engineering Economic Systems from Stanford University, and an M.A. in Marine Policy from the Rosenstiel School of Marine and Atmospheric Science at the University of Miami.

Joel Schwartz

Joel Schwartz is a visiting fellow at the American Enterprise Institute, where he studies air pollution, transportation, climate change, regulatory policy, and chemical risks. He is the author of the AEI study *No Way Back: Why Air Pollution Will Continue to Decline* and is currently working on the forthcoming AEI book *Air Quality in America*.

Before coming to AEI, Mr. Schwartz directed the Reason Public Policy Institute's Air Quality Project. He also served as Executive Officer of the California Inspection and Maintenance Review Committee, a government agency charged with evaluating California's vehicle emissions inspection program and making recommendations to the legislature and governor on program improvements. Mr. Schwartz has also worked at the RAND Corporation, the South Coast Air Quality Management District, and the Coalition for Clean Air.

Mr. Schwartz holds a B.S. in chemistry from Cornell University and a M.S. in planetary science from the California Institute of Technology. He was a German Marshall Fund fellow in 1993, during which he studied European approaches to transportation and air quality policy.

About the Publishers

The Pacific Research Institute

The Pacific Research Institute champions freedom, opportunity, and personal responsibility for all individuals by advancing free-market policy solutions. It demonstrates why the free market is more effective than the government at providing the important results we all seek—good schools, quality health care, a clean environment, economic growth, and technological innovation. In its 26th year, PRI puts "ideas in action" by informing the media, lawmakers, opinion leaders, and the public.

The American Enterprise Institute for Public Policy

The American Enterprise Institute for Public Policy Research is dedicated to preserving and strengthening the foundations of freedom—limited government, private enterprise, vital cultural and political institutions, and a strong foreign policy and national defense—through scholarly research, open debate, and publications. Founded in 1943 and located in Washington, D.C., AEI is one of America's largest and most respected think tanks.

"JOIN PACIFIC RESEARCH INSTITUTE IN "PUTTING IDEAS INTO ACTION."

Pacific Research Institute promotes the principles of individual freedom and personal responsibility. The Institute believes these principles are best encouraged through policies that emphasize a free economy, private initiative, and limited government. By focusing on public policy issues such as education, economics, health care, technology, and the environment, the Institute strives to foster a better understanding of the principles of a free society among leaders in government, academia, the media, and the business community.

"This Institute has done so much to further the idea of a law-governed liberty."
—FORMER BRITISH PRIME MINISTER MARGARET THATCHER

"PRI is one of the more innovative and effective think tanks in the world."
—NOBEL LAUREATE MILTON FRIEDMAN

NAME	TITLE
ORGANIZATION	PHONE
ADDRESS	FAX
CITY/STATE/ZIP	E-MAIL

All PRI Contributors receive:

- Monthly commentary by PRI policy experts (by email or fax)
- Monthly "issues alert" in core research areas—education, business and economics, health care, technology, and the environment
- Invitations to monthly breakfasts and special events with political, media, and business leaders
- Biannual newsletter

Your contribution:		You will receive:
COLLEGIATE SPONSOR	$75	• 25% discount on books and studies • Discounted admission to select PRI events
INDIVIDUAL SPONSOR	$500	All the above plus: • Complimentary copy of Steven Hayward's book, *The Age of Reagan*
POLICY LEADER	$1,500	All the above plus: • Invitations to all VIP events • Two complimentary tickets to be used for a PRI breakfast, lunch, or reception
BENEFACTOR	$5,000	All the above plus: • Four complimentary tickets to be used for PRI breakfasts, lunches, or receptions
CORPORATE SPONSOR	$10,000	All the above plus: • Direct access to PRI research scholars for timely policy analysis
CHAIRMAN'S CIRCLE	$25,000	All the above plus: • Invitation to Annual Benefactors' Summit
PRESIDENT'S CLUB	$50,000+	All the above plus: • Annual personal briefing/presentation to you and/or your company from PRI Research Directors

☐ I would like to make a donation in the amount of $_____.

☐ I would like to make a contribution of stocks/securities; please call me for details.

☐ Please send me information on PRI's current programs.

Please make check payable to:

PACIFIC RESEARCH INSTITUTE

DAY FOGARTY, DIRECTOR OF DEVELOPMENT
E-MAIL: DFOGARTY@PACIFICRESEARCH.ORG
PHONE: 415-955-6118 FAX: 415-989-2411

A 501(C)(3) ORGANIZATION