PERC REPORTS

VOLUME 22 NUMBER 1 MARCH 2004

COVER STORY

When facing the unknown, care is in order. But the elusive "precautionary principle" goes beyond reasonable precaution. On page 3, the administrator of the federal Office of Information and Regulatory Affairs explains how damaging it can be.

FROM THE EDITOR

A Philosophical Bent

In each issue of *PERC Reports*, we explore a few aspects of free market environmentalism. We might offer examples of how inspired individuals achieve environmental goals, how incentives can spur better outcomes, and how regulations retard voluntary efforts. Sometimes we even get philosophical.

This issue has a philosophical leaning, starting with a discussion of the precautionary principle. Activist groups and, increasingly, governments are trying to hold back innovations on the grounds that they should not be allowed until they are known to be safe. John D. Graham, former director of the Harvard Center for Risk Analysis and now administrator of the federal Office of Information and Regulatory Affairs, reveals this "principle" as the shadowy thing it is. We are pleased to reprint his lecture, "Perils of the Precautionary Principle," given in October before the Heritage Foundation in Washington, D.C.

Continuing in a philosophical vein, J. Bishop Grewell addresses ethical questions about recreation fees. Do higher entrance and user fees at our parks keep out low-income visitors? If so, what should be done about it? Grewell, a PERC research associate and law student at Northwestern University, discusses this question, one of four that he has addressed in a longer essay, forthcoming from PERC.

David Roodman, a research fellow with the Center for Global Development and formerly a WorldWatch Institute staff member, offers some thoughts about free market environmentalism. He sympathizes with some of PERC's views, but not all. His comments are also excerpted from a longer paper (available on our Web site). Responses are welcome.

Moving from philosophy to frightening reality, we publish a passage from Linda Platts' new book *Forest Fires*. This is one of two new books in the Greenhaven Press series on "Critical Thinking about Environmental Issues." (The other is *Energy*, by Manuel Nikel-Zueger and me.) In the selection we include here, Platts reports on the unintended impact that environmental laws have had on our forests. The series, which I edited, is aimed at middle-school and high-school students, but anyone can learn from them. These and other books in the series (*Endangered Species*, by Randy T. Simmons, *Pesticides*, by Samantha Beres, and *Global Warming*, by me), can be ordered for $18 each from PERC.

As usual, we also have Daniel Benjamin's "Tangents" column—which this time reminds us that regulation can provide benefits—as well as Linda Platts' "Greener Pastures," and letters from our readers. I hope you'll take the time to think deeply.

Jane S. Shaw

From left: Graham, Grewell, Roodman, and Platts.




PERC
Property and Environment Research Center

2048 Analysis Drive, Suite A
Bozeman Montana 59718-6829
Ph: (406) 587-9591 Fax: (406) 586-7555
perc@perc.org www.perc.org

PERC Reports
Volume 22 No. 1 March 2004

ISSN 1095-3779

Cover: Mandy-Scott Bachelier

Perils of the "Precautionary Principle"

By John D. Graham

The concept of a universal precautionary principle apparently has its origins in early German and Swedish thinking about environmental policy. The idea was to encourage policymakers to practice foresight in order to prevent long-range environmental problems. The concept was included in the Amsterdam Treaty of 1997, a step toward establishment of the European Union, but the concept was left undefined and was applied only to environmental policy. In the past twenty years, there have been numerous references to precaution in various international treaties, statements of advocacy groups, and academic writings, but the significance of the principle in international law remains uncertain.

The United States government believes it is important to understand that, notwithstanding the rhetoric of our European colleagues, there is no such thing as the precautionary principle.

There has been growing international interest in precaution. Reacting to criticism that the principle was too ambiguous, the European Commission in 2000 issued a formal "Communication" that extended the applicability of the precautionary principle to public health and consumer protection as well as environmental policy. The German Marshall Fund has been working with Duke University to sponsor several informal dialogue sessions involving governmental officials and academics from Europe and the United States. Several months ago, the Canadian government released a "framework" document for the application of precaution in science-based decisions about risk.

The United States government believes it is important to understand that, notwithstanding the rhetoric of our European colleagues, there is no such thing as the precautionary principle. Indeed, the Swedish philosopher Per Sandin recently documented 19 versions of the precautionary principle in various treaties, laws, and academic writings. Although these versions are similar in some respects, they have major differences in terms of how uncertain science is evaluated, how the severity of consequences is considered, and how the costs and risks of precautionary measures are considered. The United States government believes that precaution is a sensible idea, but there are multiple approaches to implementing precaution in risk management. A single "precautionary principle" is not one of them.

Defining Precaution

Webster's 2nd edition of the *New World Dictionary* defines precaution as "care taken beforehand" or "a measure taken beforehand against possible danger." Understood in this way, precaution is a well-respected notion that is practiced daily in the stock market, in medicine, on the highway, and in the workplace. In both business and politics, decision

www.photostogo.com

The number of alleged hazards far exceeds the number that are ever proven based on sound science. Consider electric power lines and childhood leukemia, silicone breast implants and autoimmune disorders, cell phones and brain cancer, and disruption of the body's endocrine system from multiple low-dose exposures to industrial chemicals.

makers seek the right balance between taking risks and behaving in a precautionary manner.

Before joining the Office of Management and Budget, I served for 17 years on the faculty of the Harvard School of Public Health. I learned that public health historians have documented the preventable pain and suffering that can occur from insufficient consideration of the need for precaution. We in the United States felt that pain as a result of how we handled emerging science about tobacco, lead, and asbestos. The major health problems from these substances could have been reduced or prevented altogether if decision makers had reacted to early scientific indications of harm in a precautionary manner.

We should not belittle the scientific complexities in each of these examples, however. Take the link between smoking and lung cancer. Although this link now seems obvious, in the middle of the previous century it was not obvious to many competent and thoughtful physicians. They knew that many lifetime smokers never developed lung cancer and that some lung cancer patients had never been smokers. Compounding the problem was the inability of laboratory scientists to produce lung tumors in laboratory animals exposed by inhalation. It took large-scale statistical studies of smokers to resolve the issue, including a large-scale study of the health of British physicians.

In each of these examples (tobacco, lead, and asbestos), epidemiology, not the experimental sciences, played the pivotal role in identifying health risks. Ironically, epidemiology is now one of the more controversial contributors to public health science.

Exaggerated Claims of Hazard

There is no question that postulated hazards sometimes prove more serious and/or widespread than originally anticipated. Ralph Nader has argued that this is the norm in regulatory science, and the European Commission recently issued a report of case studies where hazards appear to have been underestimated. However, the dynamics of science are not so easily predicted. Sometimes claims of hazard prove to be exaggerated, and some predictions of doom have simply not materialized.

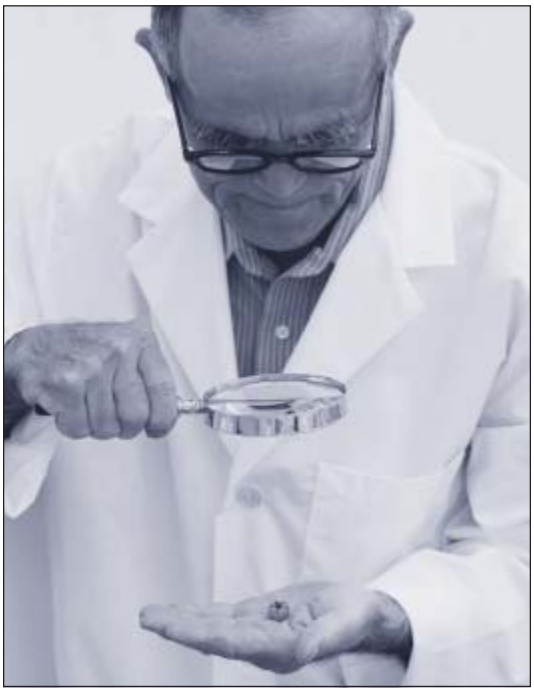
One is the "dismal theorem" of the Reverend Thomas Malthus, who hypothesized in 1798 that population would grow exponentially while sources of sustenance would only grow arithmetically. Thus, living standards would fail to rise beyond subsistence levels. Malthus did not foresee the technological advances that have allowed both population and standard of living to rise steadily and substantially.

A more recent example concerns the artificial sweetener saccharine. The Food and Drug Administration attempted to ban saccharine based on experimental laboratory test results showing that huge doses of saccharine cause bladder cancer in rodents. (Congress overturned the FDA's action.) With the benefit of hindsight, it now appears that the FDA's attempted ban may have been poorly grounded in science. The federal government recently removed saccharine from the official list of carcinogens.

Students of risk science are aware that the number of alleged hazards far exceeds the number that are ever proven based on sound science. Consider the following scares: electric power lines and childhood leukemia, silicone breast implants and autoimmune disorders, cell phones and brain cancer, and disruption of the body's endocrine system from multiple, low-dose exposures to industrial chemicals. In each of these cases, early studies that suggested danger were not replicated in subsequent studies by qualified scientists. On the other hand, when early studies are replicated by independent work, as occurred with the acute mortality events following exposure to fine particles in the air, public health regulators should take this information seriously in their deliberations.

Imagine that it is 1850 and no innovation shall be approved for use until it is proven safe. What would happen to electricity, the internal combustion engine, plastics, pharmaceuticals, the Internet, and the cell phone?

Given that the dynamics of science are not predictable, it is important to consider the dangers of excessive precaution. One is the threat to technological innovation. Imagine that it is 1850 and the following version of the precautionary principle is adopted: No innovation shall be approved for use until it is proven safe, with the burden of proving safety placed on the technologist. Under this system, what would have happened to electricity, the internal combustion engine, plastics, pharmaceuticals, the Internet, and the cell phone? Technological innovation occurs through a process of trial-and-error and refinement, and this process could be disrupted by an inflexible version of the precautionary principle.



www.photostogo.com

Many risk specialists in the United States regret some policy steps we have taken on the basis of precaution. The Three Mile Island incident, for example, had a large policy impact—a de facto moratorium on the construction of new nuclear power plants in the United States—although even today there is no evidence that the accident caused significant public health harm. We have become more deeply dependent on fossil fuels for energy, and now precaution is being invoked as a reason to enact stricter rules on use of fossil fuels. Part of the answer may rest with clean coal technologies and renewable energy, but we should not

foreclose the advanced nuclear option.

Some argue that the United States is more tolerant than Europe of the possible risks of bioengineered foods, global climate change, and industrial chemical exposures. However, a fair analysis would also show that Europe has been less precautionary than the United States on diesel engine exhaust, environmental tobacco smoke, and lead in gasoline.

A subjective concept such as "the precautionary principle" is dangerous because it permits what conservative scholars have called "precaution without principle." In particular, the principle may be easily manipulated by commercial interests for rent-seeking purposes. According to Henry I. Miller and Gregory Conko (*Washington Times*, Sept. 10, 2003), the European Union policy on genetically modified organisms creates a "bizarre bureaucratic distinction that favors certain classes of products widely made in Europe." That is precisely what the World Trade Organization found in its earlier decision against the European Union ban on hormone-treated beef, a ban that had no grounding in public health science.

Recent Progress in Europe

There are recent signs of progress from Europe. Take the response of Brussels to "mad cow disease." Once the British government and industry had taken all reasonable steps to address this problem, Brussels instructed member states of the European Union to lift their bans on beef imports from the United Kingdom. All member states complied except France, which invoked the precautionary principle. Brussels took France to the European Court of Justice, which ruled against France, indicating that speculative appeals to the precautionary principle must have some grounding in science.

While it is fashionable to criticize Europe on the subject of precaution, and much of that criticism is deserved, it should be noted that the European Commission's official views on precaution are becoming more nuanced. In the February 2000 Communication, for example, we found the following views that are similar to the perspective of the U.S. government:

1. Precaution is a necessary and useful concept but it is subjective and susceptible to abuse by policymakers for trade purposes.
2. Scientific and procedural safeguards need to be applied to risk management decisions based on precaution.
3. Adoption of precautionary measures should be preceded by objective scientific evaluations, including risk assessment and benefit-cost analysis of alternative measures.
4. There are a broad range of precautionary measures, including bans, product restrictions, education, warning labels, and market-based approaches. Even targeted research programs to better understand a hazard are a precautionary measure.
5. Opportunities for public participation—to discuss efficiency, fairness, and other public values—are critical to sound risk management.

In summary, two major perils are associated with an extreme approach to precaution. One is that technological innovation will be stifled. A second peril, more subtle, is that public health and the environment will be harmed as the energies of regulators and the regulated community are diverted from known or plausible hazards to speculative and ill-founded ones. For these reasons, please do not be surprised if the U.S. government continues to take a precautionary approach to calls for adoption of a universal precautionary principle in regulatory policy.

John D. Graham is administrator of the Office of Information and Regulatory Affairs at the Office of Management and Budget. He gave this lecture before the Heritage Foundation on October 20, 2003. It is reprinted with permission.

Slamming the Door on Low-Income People?

By J. Bishop Grewell

A federal program that began in 1996 has raised fees at national parks, forests, and other public lands. This policy, which may become permanent, raises a question: Is it unfair to low-income people to charge substantial entrance fees?

The quandary really has two parts: Do recreational fees in fact price lower-income users out of public lands? If so, what can be done about it?

www.photostogo.com

Research on the first question shows that low-income families spend less time in outdoor recreation, including visits to national parks, than higher-income families. But fees are probably not the reason.

Some surveys do suggest that introducing fees would lead low-income users to visit less. Researchers surveyed visitors to day-use sites operated by the Army Corps of Engineers (Reiling et al. 1996) and Maine state park campgrounds (Reiling, Cheng, and Trott 1992). They concluded that fees would lower visitation by low-income people. In both cases, however, people were interviewed about hypothetical situations.

New Hampshire and Vermont residents were asked if a $5 increase in access fees would affect their visitation. Forty-nine percent of low-income respondents said it would. But when told that access fees had already increased over the previous five years, 60 percent of the low-income respondents said it had not affected them or they had "just paid" the increases (More and Stevens 2000, 347–49). This suggests that intentions voiced in surveys and actual actions may differ.

Costs do apparently affect many low-income families' decisions not to spend time at national parks and forests—but the costs are travel and the purchase of goods, not fees. This conclusion has been reported since the 1960s.

In fact, income is the biggest determinant of whether a family chooses to travel in the first place. A study of 3,000 Texas residents found that those with incomes of more than $20,000 per year were 60 percent more likely than lower-income residents to participate in outdoor recreation away from home and 30 percent more likely to participate in outdoor recreation close to home (Lee, Scott, and Floyd 2001, 439).

Costs do apparently affect many low-income families' decisions not to spend time at national parks and forests—but the costs are travel and the purchase of goods, not fees. This conclusion has been reported since the 1960s.

The costs of visiting Yellowstone National Park illustrate the importance of travel expenses. If a family of four traveled from Washington, D.C., my calculations show that it would spend between $770 and $1,360 on food, lodging, and transportation. Once the family got to Yellowstone, it would pay $20 to drive into the park for a two-day visit. If Yellowstone were completely funded by fees, I estimate that a $20-per-person fee, or $80 for a family of four, would cover operating costs. This $80 charge would be a small part of total expenses—less than half the price of a single day's visit to Disneyland (currently $47 for adults, $37 for kids).

Other factors, too, may affect low-income travel. A study of public parks in the Cleveland area found that low income reduced the use of city parks (Scott and Munson 1994). Since travel costs are a small factor and fees virtually nonexistent, other forces may inhibit outdoor recreation among the poor.

When people live near public lands, and travel costs are low, recreation fees could affect low income people's decisions to visit public lands. This brings us to the second question. What can be done if recreation fees *are* keeping poor people from public lands? Here are a few policy options:

- Recreation vouchers, coupons, or rebates could be distributed to the poor through charitable groups or land agencies. These vouchers or passes might be linked to time donated as volunteers.

- Occasional free days could improve access for the poor. Or a limited number of free admission tickets could be set aside each day, available on a first come-first served basis.

- Some areas could be free of fees, with operating expenses covered from fees at other sites. While this is technically illegal under some fee statutes, it is probably occurring in practice on many state and federal public lands today.

We should recognize, however, that recreation policy may not be the best avenue for addressing welfare concerns. Because poor people use the parks less, they might like to see the tax dollars spent elsewhere than on public lands.

And using tax dollars for public lands is a regressive policy. Because affluent people engage in recreation more than poor people do, it benefits middle-class and wealthy citizens more than it does the poor. That may be why the poor generally support recreation fees. For example, low-income respondents in Oregon and Washington approved of the Northwest Forest Pass, which provides access to Forest Service lands for a fee (USDI and USDA 2003, 54).

In sum, fairness is an important concern—but recreational fees may improve equity rather than make it worse. They shift the burden to those who spend more time in recreation—the middle-class and wealthy—and away from those who use the parks less.

REFERENCES

Lee, Jin-Hyung, David Scott, and Myron F. Floyd. 2001. Structural Inequalities in Outdoor Recreation Participation: A Multiple Hierarchy Stratification Perspective. *Journal of Leisure Research* 33(4): 427–49.

More, Thomas, and Thomas Stevens. 2000. Do User Fees Exclude Low-income People from Resource-based Recreation? *Journal of Leisure Research* 32(3): 341–57.

Reiling, Stephen D., Hsiang-Tai Cheng, and Cheryl Trott. 1992. Measuring the Discriminatory Impact Associated with Higher Recreational Fees. *Leisure Sciences* 14: 121–37.

Reiling, Stephen D., et al. 1996. Potential Equity Effects of a New Day-use Fee. In *Proceedings of the 1995 Northeastern Recreation Research Symposium.* General Technical Report NE-218. Radnor, PA: USDA, Forest Service, Northeastern Forest Experiment Station, 27–31.

Scott, David and Wayne Munson. 1994. Perceived Constraints to Park Usage among Individuals with Low Incomes. *Journal of Park and Recreation Administration* 12(4): 79–96.

USDI and USDA. 2003. *Recreational Fee Demonstration Program Progress Report to Congress Fiscal Year 2002.* Washington, DC: National Park Service, U.S. Fish and Wildlife Service, Bureau of Land Management, and Forest Service, March.

J. Bishop Grewell, a PERC research associate, is author of the Policy Series *paper, "Recreation Fees: Four Hard Questions," forthcoming from PERC.*

ANOTHER TAKE ON FREE MARKET ENVIRONMENTALISM

A Friendly Critique

By David Roodman

It is not easy to determine whose rights to productive enjoyment of property should take precedence. The line between your property rights and mine is quite fuzzy and a legitimate subject for a debate—one that often boils down to irreconcilable differences in values and vision.

As I understand free market environmentalism, the prescription works like this: Accept and strengthen private property rights; then allow private parties to work together to find reasonable solutions. Although there is much to be said for this two-part recipe, there are some problems.

www.photostogo.com

To begin with, although property rights can take a dizzying variety of forms, the image we all have of property is of property in land. This implicit analogy can be misleading. The picture is that you can draw thin lines across the landscape and slice it up with a super-sharp knife. That's yours on that side of this Euclidean line. This is mine. You do what you want on your land. I do what I want on mine. We are next to each other, yet severed from one another.

The problem is that we are not severable from each other. We are parts of communities. If you build a giant hotel on your lot, you block my view. If you start your car, you'll damage my lungs. If you graze cattle on your land and I grow corn on mine, then your cattle will inevitably wander onto my lot, damaging my crops.

The corn-and-cattle example I take from a classic paper by Ronald Coase (1960). Coase's genius was to point out that in conflicts over exactly where your property rights start and mine end, the conflict is *jointly* generated by the parties involved. If I cease to breathe, there is no problem with your car. If you cease to drive, there is no problem with my lungs.

When we are jointly responsible for a conflict, it is not easy to determine whose rights to productive enjoyment of property should take precedence. A community norm might give precedence to scenic views over big buildings—on Nantucket Island, for example—but do the opposite in New York City. The line between your property rights and mine is quite

fuzzy and a legitimate subject for a debate—one that often boils down to irreconcilable differences in values and vision.

Now, as an economist, Coase pointed out that as long as the norms about *which* rights take precedence are clearly defined, economic welfare can be maximized (assuming markets work perfectly). To paraphrase his example, suppose your cattle are straying onto my cornfield and doing $200 worth of harm to me, while earning you an extra $100 from the additional forage. From the collective point of view, this activity is economically destructive, doing more harm than good, and it should stop. But how will that happen?

www.photostogo.com

If the community norm is that cattle can wander freely, it makes sense for me to pay you $150 to reduce your herd. I'd pay $150 but avoid $200 in crop damage. You would lose $100 in cattle earnings but get $150 from me. Good deal for both of us.

If the community norm is that you have no right to interfere with my cultivation of corn, then my wishes take precedence. Because your herd is causing $200 in damage to me, I'd insist that you pay me at least $200 for the permission. If the extra grazing would only raise your income $100, you would not do it. You would reduce your herd so that it does not encroach on my land. In either version, thanks to clear property rights, your cows would stop grazing on my land, which would be the "optimal" solution.

If you're like me, something feels funny about this argument. Indeed, Coase acknowledged that it is not the whole picture. The initial allocation of property rights—the community norm—*does* matter in that it affects the distribution of wealth. From my point of view, the $150 I had to pay in the first version of the story was simply unjust; but maybe from your point of view, my power to restrain your herding seems equally unjust.

A lot of environmental problems can be seen as conflicts over which rights should take precedence. Do water polluters get precedence over those who would fish in clean water bodies, or vice versa?

Since people's values and the realities of a society change over time, how the boundaries are drawn between property rights must be allowed to evolve over time. Existing norms protect established interests. Special interests had a big hand in the current property rights regime—they were the people who abetted the holocaust of the first Americans, exploited railroad monopolies, and so on. So, to oppose modifying the property rules on the grounds that it opens the door to special interests is only half the story. The doors were opened long ago and a lot of horses are already out of the barn.

I see two main mechanisms by which a modern community can revise the legal norms that govern conflicts between property rights. One is through the courts. As community norms evolve and circumstances change, courts take this into account as they apply the common law to specific disputes. In one generation, a court might give the scenic view precedence over the tall building. A generation later, bowing to unstoppable urban growth, the same court might favor the tall building.

This mechanism is adaptable, not too rule-bound, and local. But it has an inherently conservative bias. Judges tend to come from the elite and tend to pro-

tect established interests more than undermine them. Judges did not free the slaves; in fact, they tightened the bondage. The Supreme Court justices who made that shameful Dred Scott ruling in 1854 had much stronger ties to the enslaving class than to the enslaved class. Chief Justice Roger B. Taney came from a wealthy, slave-owning family.

Nor did courts strengthen the property rights we all have to our own bodies by cleaning the air and water in this country over the last thirty years. Legislatures did that—and that is the other major mechanism I see for revising the boundaries between competing property rights.

www.photostogo.com

As Winston Churchill said, democracy is the worst form of government except for all the others that have been tried. Democratic mechanisms are important because people will always disagree about whose rights dominate; the best one can hope for is a *process* for making the calls that are widely seen as legitimate. We've had major environmental successes in this country, and those have come about through the legislature, often the federal legislature.

Last year in Washington, D.C., we had many "code red days," which were caused by the combination of heat and air pollution. I take the problem personally since I live in the middle of Washington, D.C., along a popular morning rush-hour route, and I have two little boys, one of whom has asthma. My best hope for solving this problem lies in pressing local and federal government to act. I do not see how free market environmentalism can solve my problem. In sum, there is a place for legislation.

Now to the second step in the recipe: allowing free actors, once property rights are allocated, to strike mutually amenable deals. My concern here: it is often impractical.

For problems such as acid rain, smog, global warming, it is inconceivable that all parties concerned could gather together to strike a bargain about automotive technology, land use planning, payments of compensation, etc. The only practical way they could do that would be to send representatives empowered to make binding decisions. And those decisions might need to involve shortcuts like regulating tailpipe emissions. This sounds a lot like active government—and it is.

In sum, while free-market environmentalism has much to offer, it also has serious limitations. Questions of how to assign property rights are morally complex and politically charged; the courts alone cannot be relied upon to revise property rights appropriately as society and values evolve; and even when rights are clearly defined, environmental problems often involve so many parties—sometimes millions of people—that FME-style bargaining among them is simply impractical.

REFERENCE

Coase, Ronald H. The Problem of Social Cost. *Journal of Law and Economics* 3(1): 1–44.

David Roodman is a research fellow with the Center for Global Development and author of The Natural Wealth of Nations: Harnessing the Market for the Environment *(W. W. Norton). This is an excerpt from a longer talk he gave at PERC's 2003 conference for journalists. It is available at www.perc.org.*

The new laws and regulations were intended to provide greater protection for the forests. Instead, they often contributed to worsening forest health. The national forests in the Blue Mountains (illustrated here) are an example of what went wrong.

Unintended Consequences of Protection

By Linda E. Platts

During the 1960s, a profound shift in public attitudes took place in the United States. Reverence for progress was replaced by reverence for nature.

Boise Cascade Corporation

Congress passed a tidal wave of new legislation addressing environmental concerns and establishing new policies for the Forest Service and other public land management agencies. As this legislation changed how land, air, and water would be managed, a growing environmental movement determined to save nature from humans was making its presence felt.

New legislation required the Forest Service to consult with the public about management plans. Organized environmental groups showed up in force at public meetings to air their views and seek changes in Forest Service plans that they believed favored timber production over concerns for forest health and biodiversity.

A New Environmental Era

By the mid-1980s, the public input process was having a huge impact on forest management. Environmental organizations, timber firms, and the Forest Service engaged in long-running battles over timber sales, logging roads, stream protection, wildlife habitat, water quality, and recreational use. Kate Klein, a district ranger in the Apache-Sitgreaves National Forest in eastern Arizona, has seen her share of court cases: "Every time we lose a battle, we have to go back and do some more analysis, computer models and evaluations. It's a downward spiral. We're forced to do so much writing that we spend less time in the woods knowing what we're making decisions about" (quoted in Trachtman 2003, 44). Time and money were spent in court rooms and on legal fees rather than on the land.

The new laws and regulations were intended to provide greater protection for the forests. Instead, they often contributed to worsening forest

health. The Blue Mountains are an example of what went wrong. Holly Fretwell, a policy analyst who has provided congressional testimony on public land issues, writes, "Early travelers named the Blue Mountains for the constant haze of wildfire smoke that surrounded them. Frequent, small fires cleared the understory [of the forest], allowing the stately fire-resistant ponderosa pines to flourish. Wagon trains traveling west along the Oregon Trail rolled easily between the widely spaced trees of the forest landscape" (Fretwell 1999, 10). In a landscape that had once been defined by the constancy of fire, the Forest Service worked to eliminate fires.

Without fire, shade-tolerant firs grew up in dense thickets under the big pines. During the 1940s, timber companies harvested the mature pines, which generate the most revenue, and left behind the crowded and weakened firs. This created the ideal habitat for the western spruce budworm, and the infestation spread rapidly. Immediate harvest and treatment could have saved valuable timber and might have prevented an epidemic. Instead, Fretwell explains that it took years for the Forest Service to respond. A maze of federal regulations and a lengthy public comment process slowed active management to a standstill.

Today, the Wallowa-Whitman and Umatilla national forests in the Blue Mountains are covered with "gray ghosts," six million acres of dead and dying trees. The lovely big pines are mostly gone, replaced with sickly firs unsuited to the dry climate and vulnerable to insects. In her book *Forest Dreams, Forest Nightmares*, Nancy Langston, an ecologist at the University of Wisconsin, explains how the dream of improving the forests with scientific management has led to the nightmare that exists today in the Blue Mountains. She writes: "In trying to make the land green and productive, they ended up making it sterile. . . . It was a tragedy in which decent people with the best intentions destroyed what they cared for most" (quoted in Nelson 1997, 32).

The Endangered Species Act was supposed to protect the northern spotted owl in the Shasta-Trinity National Forest of northern California. To save the old growth habitat preferred by the owl, the usual harvesting and thinning were halted. Mortality from root disease and bark beetles increased. As trees weakened and fell, fewer standing trees were left for nesting, and the dense, closed forest canopy was opened. Furthermore, the forest became more vulnerable to catastrophic fire that had the potential to wipe out the entire old-growth habitat in the area. In testimony before Congress on forest ecosystem health, Thomas M. Bonnicksen, a professor of forest restoration and resource policy at Texas A&M University, stated:

> By simply drawing a line around those forests and assuming that they're going to stay that way, we're setting up a catastrophe for the long-term viability of the owl, because inevitably those forests are going to burn. . . . When we lose these forests or when they deteriorate, we also lose the habitat we need for many of the wildlife we value and we also further endanger species. (Bonnicksen 1997,49)

Rather than protect the species, the act appears to have hastened the decline of critical habitat.

The Clean Air Act also has had an impact on forest management. Any fire that is deliberately set by a federal land management agency—a prescribed burn—must meet air quality standards just as a factory or power plant must. Ironically the prescribed burns are intended to reduce the risk of much worse air pollution that would result from a huge and uncontrollable wildfire. It goes without saying that wildfires meet no clean air standards. Despite good intentions on the part of land managers, citizens still register complaints about smoke from prescribed burns. When that happens, prescribed fires are quickly extinguished.

Private Forests

As we look closely at how the Forest Service, under the Department of Agriculture, manages the national forests, it is useful to draw a comparison with private forests.

Private industrial forests suffer few of the problems seen in the national forests. Boise Cascade owns a forest in the Blue Mountains that is managed for its timber values. It is free from dense undergrowth, sickly trees, and bug infestations, and it looks remarkably similar to the open forests of more than one hundred years ago. Private forests adjacent to California's Shasta-Trinity National Forest are free from beetles and root rot and even provide habitat for northern spotted owls. In the South, the International Paper Company welcomes the public onto its timberlands. The fees that it collects from hunters, hikers, anglers, and campers have added significantly to the company's profits. With these incentives, the company is actively managing its forests for valuable timber as well as wildlife habitat and scenic landscapes.

Can these private forests provide valuable lessons for public forests? Should all public forests be managed for the same goals? Or should each be managed for its highest-valued use, such as timber, wildlife, or recreation, but not all of these values? Fires, too, have a role to play in each forest, but it is different for each one. Managing forests spread over such a vast and varied landscape with the same objectives and goals may not be good forest management.

REFERENCES

Bonnicksen, Thomas M. 1997. Forest Ecosystem Health in the United States. Testimony before House Committee on Agriculture and Committee on Resources. House of Representatives, Washington, DC, April 9.

Fretwell, Holly. 1999. Forests: Do We Get What We Pay For?" *Public Lands Report II*. Bozeman, MT: PERC, July.

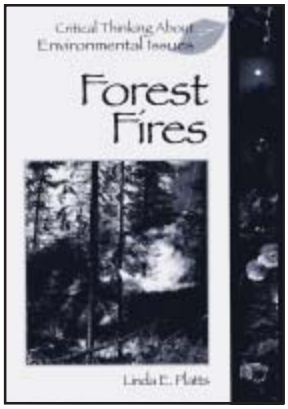
Nelson, Robert H. 2000. *A Burning Issue*. Lanham, MD: Rowman & Littlefield Publishers Inc.

Trachtman, Paul. 2003. Fire Fight. *Smithsonian*, August, 44.

This article is excerpted from Forest Fires*, by Linda E. Platts, part of the "Critical Thinking about Environmental Issues" series developed by PERC and published by Greenhaven Press, an imprint of Thomson Learning.*

CRITICAL THINKING ABOUT ENVIRONMENTAL ISSUES

A New Series from Greenhaven Press



The "Critical Thinking about Environmental Issues" series of books for young adults has added two new volumes, *Forest Fires* and *Energy*. The series, edited by Jane S. Shaw, offers an objective look at environmental issues—unlike many environmental books found in school libraries that stress catastrophe. A 2002 *Booklist* review of two books in the series called them "balanced, nonalarmist introductions to major global issues."

The series was initiated in 2002 by PERC and the Competitive Enterprise Institute. The publisher is Greenhaven Press, widely known among library circles for its library books on topical issues for students from grades three to twelve. The books are illustrated hardbacks, about 100 pages long.

Forest Fires, by Linda E. Platts, explores why forest fires have been raging throughout large stretches of the western United States during the past few years. *Energy,* by Jane S. Shaw and Manuel Nikel-Zueger, tackles the environmental issues surrounding energy.

For more information or to order books at $18 each, contact PERC's web site at www.perc.org or write to Jane S. Shaw at perc@perc.org.

GREENER PASTURES

By Linda E. Platts

Revolutionizing Pulp

The rising global demand for paper is forcing producers to look beyond trees to crops such as flax and hemp. The increase in forests set aside for wildlife preserves and recreation is also reducing the availability of wood pulp typically used in paper-making.

Experiments conducted by Alberta-Pacific Forests Industries Inc. (Al-Pac) of Canada indicate that nonwood fibers from linen flax, hemp, and cereal straws are capable of producing high quality papers that are sought after in both India and China. Full production would require the company to build a specialized pulping mill with costs ranging from $40 million to as much as $100 million. The apparent size and strength of the export market makes such an investment potentially worthwhile, according to company executives. At the moment, technical problems managing the effluent are still being resolved.

The next step for Al-Pac will be encouraging Alberta farmers to switch from agricultural crops to fiber crops. With 50 million acres of farmland, Alberta has enough space to grow the fiber crops, but the question is whether it would be profitable for farmers to switch from livestock and crops to fiber production. One advantage for farmers is that crops such as linen flax require less care and attention than cereal grains. Furthermore, weather extremes that can ruin traditional food crops are beneficial to fiber crops.

In any case, before proceeding with the project, Al-Pac will need guaranteed contracts with farmers to supply the 1,000 tons of raw material needed daily for a single mill. But time is on their side. As one executive pointed out, it takes 25 years to replace a crop of poplar trees, but only one year to grow untold acres of flax.

—Calgary Herald

Incentives at Work

In Anchorage, Alaska, companies are giving their employees incentives to reduce winter air pollution. They come in the form of cold hard cash, and they work. But the companies too have an incentive to reduce air pollution. Green Star, a local nonprofit,

Linda E. Platts is PERC's editorial associate and Web site manager (www.perc.org). "Greener Pastures" showcases market approaches to environmental protection and natural resource use that benefit private entities as well as the public.

hands out well publicized Air Quality Awards to the companies that make an effort to improve air quality.

The problem in Anchorage is that people driving to and from work twice a day push the city's carbon monoxide levels above federal standards. ABR Inc. pays its employees $3 a day if they don't use a car. If two employees carpool, they each get $1.50 a day. Another firm, Ecology and Environment Inc., offers $1 a day for those using alternative transportation such as the bus or a dogsled. Three employees forming a carpool is worth $1.50 to each.

To further boost participation, E&E started a raffle. For each day without driving, an employee was entitled to one entry in the monthly drawing for $500 and a yearly drawing of $1,000. The program has been in effect at E&E since 1973, and the benefits to the community as well as the individual employees have mounted up over that time. The company estimates that its employees have avoided 31 million miles of driving, saved 1.7 million gallons of gasoline and prevented the release of 1.5 million pounds of carbon monoxide.

ABR has taken a different tack in extending its efforts to reduce air pollution. The company taxes itself for the amount of carbon it puts in the air, and then uses that money in the community. It buys engine heaters and hybrid cars for its employees, and even helped a junior high school install solar panels.

While the incentives may seem trivial, they build over time, just as the reductions in air pollutants do. It's a fact. Incentives work, even at work.

—Anchorage Daily News

Unsalted Water

In Wyoming's Powder River Basin, efforts to access a major new source of natural gas stalled when drilling for coalbed methane also produced millions of gallons of tainted groundwater. In order to release the methane gas, water trapped in the underground coal seams must be pumped to the surface. The water is so laden with sodium that it cannot be used for irrigation or released into nearby streams.

Typically, the water would be stored in huge pits, reinjected into the ground, or treated chemically. None of these solutions was satisfactory to the owner of the land's surface rights where Western Gas Resources was planning to drill. David Barone, a senior foreman with the gas company, sought a solution that would satisfy the landowner by making the groundwater usable. He contracted with a small company in Sheridan, Wyoming, Emit Water Discharge Technology, to treat the water. In collaboration with a Pennsylvania company that deals in filtration products, Emit designed a treatment method. It relies on something called the Higgins loop, named after a scientist who worked on the Manhattan Project during World War II.

The discharge water is squeezed through a vertical loop packed with tiny resin beads. A process called ion exchange uses the beads to pull the sodium compounds from the water. The resulting salty waste stream represents less than 1 percent of the total water volume. The rest of the water is suitable for irrigation or discharge into rivers and streams. The salty residue is trucked off the site for disposal or recycling.

The machinery that cleans the water is portable and can be set up on a foundation of crushed gravel and wood, so site reclamation is minimal. It is an economically feasible solution to the basin's problem of excessive discharge water, which could run as high as 1.6 million barrels a day. Emit is currently treating the water from 80 wells in Arvada, Wyoming, producing 750 gallons a minute to irrigate hundreds of acres of alfalfa and forage.

This pilot project, paid for by Western Gas, has attracted the attention of other industry representatives, landowners, and government officials. The possibility of increasing the nation's energy resources while providing clean water to an arid region is moving closer to reality.

—Billings Gazette

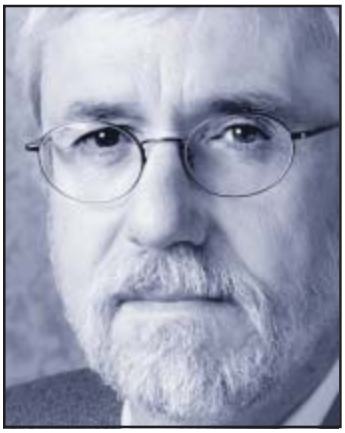
The Benefits of Clean Air

By Daniel K. Benjamin

economist, *n. a scoundrel whose faulty vision sees things as they really are, not as they ought to be.*

—after Ambrose Bierce

Daniel K. Benjamin is a PERC senior associate and professor of economics at Clemson University. This regular column, "Tangents—Where Research and Policy Meet," investigates policy implications of recent academic research. He can be reached at: wahoo@clemson.edu.



For more than thirty years, the Environmental Protection Agency has been regulating air pollution in the United States. As I reported in my March 2003 column, the costs of this regulation have been well in excess of $30 billion per year. But until now it has proven difficult to systematically pin down the resulting benefits. Recent research by Kenneth Chay and Michael Greenstone (2003) has begun the process of accurately quantifying these benefits. In an extraordinarily careful and comprehensive study of total suspended particulates (TSPs), the tiny particles emitted by internal combustion engines, for example, they have found evidence that reductions in air pollution are associated with important reductions in infant mortality rates. Indeed, their estimates imply that a ten percent reduction in TSPs from observed levels would lead to roughly 100 fewer infant deaths per year in the United States.

It is well established that very high elevations of TSPs have adverse human health effects. Finding such a link at the lower concentrations regulated by the EPA has proven elusive, however. To date, there has been no consensus on whether (1) there *are* no adverse effects of TSPs at low concentrations, or whether (2) the evidence of adverse effects has been masked by some of the confounding factors that go into determining health outcomes (such as income, age, and lifestyle).

The great advance made by the Chay and Greenstone study is that it focuses on the dramatic and very uneven declines in TSPs that occurred in 1980–82. The economic recession of those years caused reductions in manufacturing and transportation activities. This induced changes in TSP concentrations independent of most other potentially relevant factors. Moreover, because the recession was felt very unevenly across the nation, TSP concentrations changed unevenly across the nation as well.

On both counts, the 1980–82 period provides Chay and Greenstone with something very much like a controlled experiment; hence their ability to isolate the health effects of TSPs. This precision is reinforced by their focus on the impact of TSPs on infant mortality: Because people tend not to move to other parts of the country immediately before and after the birth of a child, the exposures occurring around the time of birth are likely to be representative of the total exposures relevant for a given infant.

With these data, the authors find that, even after controlling for other factors likely to affect infant mortality—such as prenatal care, age, marital status and education of mother, and race and gender of the infant—changes

A 10 percent reduction in total suspended particulates could be expected to yield about a 3.5 percent reduction in the infant mortality rate. At current infant mortality rates (about 7 per thousand) this translates into roughly 100 fewer infant deaths per year in the United States.

in TSP concentrations have effects on infant mortality rates that are both statistically and medically important. Thus, the authors estimate that a 10 percent reduction in TSPs could be expected to yield about a 3.5 percent reduction in the infant mortality rate. At current infant mortality rates (about 7 per thousand) and birth rates (about 4 million per year), this translates into roughly 100 fewer infant deaths per year in the United States.

Quite apart from the human tragedies that would be avoided, there would be clearly quantifiable economic benefits from such a change. The most conservative estimates of the value of a human life put the number at $1.6 million, while most studies estimate it to be $5–8 million or so. Hence, this hypothetical 10 percent reduction in TSP concentrations could be expected to yield annual benefits of at least $160 million, and perhaps as much as $500–800 million per year. While these figures are small compared to the *total* costs of air pollution control, they may also be only a small part of the potential benefits of reducing pollution: Other age groups may benefit from cuts in TSPs, and air pollution regulations target a variety of other pollutants.

As the authors themselves admit, a significant limitation of their study is the inability to pinpoint a specific mechanism by which reductions in TSPs lead to lower infant mortality rates. One potential linkage is through birth weights, because low birth weights are known to be associated with higher infant mortality rates. The authors do find that cutting exposures to TSPs helps reduce the incidence of low birth weights. Even in the present study, however, this effect cannot account for the observed fall in infant mortality. Another mechanism, touched on only tangentially by the authors, but one that is a current subject of medical research, is that exposure to TSPs may cause inflammation in the pregnant mother, and the resulting stress may adversely affect the fetus and its viability.[1]

Limitations notwithstanding, the present study is important on two grounds. First, it demonstrates clear evidence of some important benefits of reduced air pollution. Second, and perhaps more importantly, it establishes a methodology that can be used in future studies to broaden our understanding of the value of environmental quality. After all, if we don't know what we are getting for our money, how will we know what to buy?

NOTE

1. Personal correspondence with Daniel K. Benjamin, Jr., M.D., M.P.H., Ph.D., Assistant Professor of Pediatrics, Duke University.

REFERENCE

Chay, Kenneth Y., and Michael Greenstone. 2003. The Impact of Air Pollution on Infant Mortality: Evidence from the Geographic Variation in Pollution Shocks Induced by a Recession. *Quarterly Journal of Economics* 118(3): 1121–67.

LETTERS TO THE EDITOR

Abuses and Horror Stories

Lynn Scarlett did a fair job in defending the current Bush administration and the Department of the Interior (December 2003). I am pleased to see some changes in policy, especially the dramatic drop in purchasing private lands. Still, most of the Interior's spending is not authorized by the Constitution.

One thing I would like to see is an out-of-control federal bureaucrat held accountable for an abuse of property rights. Abuses and horror stories are all too frequent and include Wally Klump in jail for grazing cattle; Alaska miners still waiting for compensation 18 years after their property was taken; myself cited by the feds for accessing private property using a motorcycle when I broke no laws or regulations; and in Alaska, denial by the Park Service of reasonable access to a family's own inholding. For every injustice, there is a government attorney defending the out-of-control bureaucrats.

Government employees have destroyed a lot of peoples' lives yet their jobs are secure and they go on to collect wages and retirement benefits far in excess of those of most working people. It takes a rare person to speak up about an injustice for fear of jeopardizing his job. Maybe Scarlett can be one of these rare individuals.

Steve Hicks
White Sulphur Springs, MT

The More We Use the More There Is?

Daniel K. Benjamin says (September 2003) that "we are not running out of natural resources." For example, he says, "as we continue to use more oil, the standard measures of proven oil reserves get larger, not smaller."

Carried to its logical extreme, this would mean—wouldn't it?—that the more oil we use the more there is. Therefore, if we use enough oil eventually the planet will turn into a gigantic oil field. Or if we use enough bauxite eventually the planet will turn into a gigantic bauxite deposit.

Is there an explanation for this? We do live on a finite planet, and eventually we will run out of natural resources.

Steven Dapra
Albuquerque, NM

Editor's note: "Proven reserves" are the amount of a raw material that is commercially recoverable at any one time. Even though we continue to use oil, the recoverable amount has been increasing. The physical amount of oil in the crust of the earth hasn't increased, but we have access to more and more.

Jane S. Shaw, a senior associate of PERC, is editor of *PERC Reports*. She believes that vigorous debate about controversial environmental topics furthers understanding and lays the foundation for better policies. Send your letters to her at: *PERC Reports*, 2048 Analysis Drive, Suite A, Bozeman, MT 59718 or shaw@perc.org.

PERC REPORTS

PERC Reports *comes to you from Montana, home of Glacier National Park (illustrated below). Cold weather lingers here. "Springtime in the Rockies" is a great time to ski, but also to stay inside, relax, and read. We hope you'll join us by perusing this quarterly.*

www.photostogo.com

PERC, the Property and Environment Research Center, in Bozeman, Montana, is a nonprofit institute dedicated to improving environmental quality through property rights and markets. PERC Reports *endeavors to bring the ideas that underlie PERC into the light of careful scrutiny, by advocates and critics alike.*

Non-Profit Organization
U.S. POSTAGE
PAID
Permit No. 433
Bozeman MT
59718

ADDRESS SERVICE REQUESTED

PERC
Property and Environment Research Center
2048 Analysis Drive, Suite A
Bozeman Montana 59718-6829