



## GOINGS ON

## Are we getting warm yet?

Since designing climate policy requires an understanding of the underlying science, RFF recently convened three eminent climate scientists—and two science journalists—for a debriefing on the latest known information.

The scientists who sat on the **RFF Climate Science Forum** panel in June described the uncertainties that hamper climate forecasting and noted the progress made to overcome them. With varying degrees of optimism, they estimated when we can expect computer models to predict climate change with any real accuracy.

**Tom M. L. Wigley** of the National Center for Atmospheric Research observed how far we have come in enhancing the precision of models to reflect the past climate record, which bodes well for their power to predict the future. Meanwhile,

the evidence is growing, he said, that human beings have had a hand in causing a global temperature rise in the past century. Even some leading skeptics, he claimed, now say the evidence is enough to discern our influence.

While also citing modeling advances, **Ronald Prinn** of the Massachusetts Institute of Technology noted the need to better understand the phenomena—the oceans, clouds, glaciers, and aerosols in the atmosphere—whose mysterious workings cast doubt on climate models and forecasts, however much improved.

Despite progress, **Michael Schlesinger** of the University of Illinois at Urbana-Champaign said he thought climate change forecasts would not be “unequivocal” until the latter half of the 21st century. But imperfect models are not to be dismissed, he strongly implied, considering the latency of climate effects. Carbon emissions dwell in the atmosphere



SYLVIA JOHNSON

*Richard Kerr of Science magazine and Curt Suplee of the Washington Post put questions to the panel scientists at RFF's Climate Science Forum.*

long after they're emitted, Schlesinger explained. Thus, if we waited until we could actually see their effect on temperature, we would have little time to respond. It's not a good idea, he added, to require the “equivalent of the ozone hole” before we take action.

Like many a policy analyst, Schlesinger the scientist argued for an adaptive approach: take some mitigative action now and

then modify it up or down as the scientific indicators become more precise.

RFF convened the forum to air the latest scientific findings since the United Nations Intergovernmental Panel on Climate Change issued its 1995 report.

 For more information, visit <http://www.weathervane.rff.org>, RFF's digital forum on global climate policy.

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*Panel moderator J.W. Anderson and climate scientist Michael Schlesinger field questions from the forum audience.*



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*Climate scientists Tom M. L. Wigley and Ronald Prinn share their thoughts.*



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## Expanded trading

Incentive-based approaches to controlling air pollution sound great on paper: Give the nation's coal-fired electric power plants permits to emit a certain amount of acid-rain-producing sulfur dioxide annually. Let each plant use the permits itself, save them for later, or—if clean enough to afford to—sell some to another utility, hungry for extra allowances. That's the gist of the program that EPA developed under Title IV of the 1990 amendments to the Clean Air Act.

Considering how much sense it makes compared with “command and control” regulations, why hasn't such an approach caught fire and spread outside the SO<sub>2</sub> program?

RFF Senior Fellow **Dallas**

**Burtraw**, who has analyzed emissions trading since its inception, hears that question a lot. The main reason, he answers, is that efficiency, equity, and administrative issues make the permit process more complex than imagined and often not well understood.

Still, tradable pollution permits are hardly languishing in some dark corner of the ivory tower. Far from it, says Burtraw, who hosted RFF's small conference on the subject in April, which brought together U.S. and European representatives of regulatory agencies, electric utilities, environmental advocacy groups, academics, and policy analysts.

As the meeting made clear, interest is growing in how to use emissions permit trading in a variety of regulatory settings.

What's more, interest is growing in new ways to allocate permits.

For now, the method most commonly used is that created under EPA's acid rain program in which allowances are allotted to existing emitters based on their historic electricity generation.

Though not controversial when the innovative program started in 1990, this allocation scheme is now recognized as having effected large transfers of wealth. After all, these emissions allowances are worth money. When allocated for free to existing emitters, they constitute a marketable asset that can be sold or—if an emitter needs to use them—recouped by charging electricity customers their value.

The facilities that benefit may consider such transfers appropriate compensation for their investments in pollution reduction. Economists, meanwhile, have focused on the efficiency implications of this approach, compared with other allocation schemes such as government-sponsored auctions of allowances that raise revenue. These economists include Burtraw, RFF Fellow **Ian Parry**, and **Lawrence Goulder**, who is an RFF university fellow and professor at Stanford University.

At the RFF conference, the focus fell on allocating permits based on future projections of energy production rather than past performance. **Thomas Sterner**, an RFF Gilbert F. White fellow and professor at

Sweden's Goteborg University, described how this forward-looking method is used to regulate nitrogen-oxide emissions in that country. Conference participants also heard from RFF Fellow **Carolyn Fischer**, who has laid the theoretical groundwork for understanding the merits of such an approach.

“Rarely does the timing of new thinking in economic theory coincide so closely with current public policy as it does in this case,” Burtraw noted.

Burtraw was referring to EPA's proposed new trading program for nitrogen-oxide emissions in the eastern United States and the possibility that EPA may decide to opt for a future-production-oriented allocation scheme along the lines discussed at the conference. Burtraw and RFF Senior Fellow **Karen Palmer** presented results from a simulation model that addressed just how such an approach would affect investment and operation of existing plants in the electricity industry. A final decision about the new program is pending.

In the long run, Burtraw thinks, EPA's consideration of such a scheme may signal an important transition. Eventually, permit trading systems may combine the “compensation benefits” of allocating permits at zero cost with the “efficiency benefits” of charging emitters for permits, perhaps through a revenue-raising auction. ☺

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## Seeking a vision for the trees

The U.S. Forest Service needs vision. On that point everyone gathered at the RFF conference to honor the late **Marion Clawson** agreed. The lack of a clear mission stood in stark contrast to the sweep and clarity of the man they came to remember. Clawson, who literally wrote the book on assessing the value of outdoor recreation had an eagle eye that gazed out over the land for more than seventy years, those present recalled.

When he died in April 1998 at the age of ninety-two, the senior fellow emeritus had set a standard for the study of agriculture, park and forest use, outdoor recreation, and land development. His influence on policy analysis in these areas is likely to continue through the forty books he authored, such as the widely read *Economics of Outdoor Recreation* and *Forests for Whom and for What?*

Yet as Clawson himself noted near the end of his long life, huge shifts have taken place in American attitudes toward public forests, heightening tensions among the competing ways in which they can be treated and used. He noted the surge in the number of people concerned about environmental problems associated with forest harvesting. He noted, too, a rise in widespread technical knowledge and with it a new aggressiveness in advocacy.

As former U.S. Forest Service Chiefs **Max Peterson**

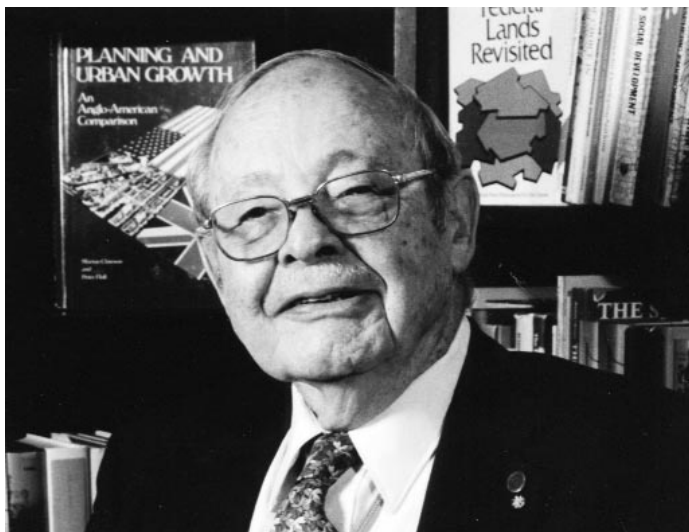
and **Jack Ward Thomas** remarked at the conference, preferences for biodiversity and recreation now overshadow the more traditional role of U.S. forests as a source of timber. The upshot is that the agency that manages American federal forest lands is in a state of transition as it enters the next millennium.

Thus the forestry experts in government, industry, and academia, who came to RFF this past spring to pay their respects to Clawson also came to consider how the Forest Service can regain its vision and what its focus should be. What public forests will look like and what types of benefits they will offer future generations will depend a great deal on how the service shapes its management strategy over the next decade, speakers at the conference maintained.

The conference opened with remarks from **Robert Lewis**, deputy chief of research for the U.S. Forest Service, and Senior Fellow **Roger A. Sedjo's** tribute to Clawson.

Over the course of the next two days, **Chris Wood**, who is special assistant to the chief of the Forest Service, provided an insider's overview of current activities. **Robert Nelson** of the University of Maryland addressed the role of science in public land management, and **Sally Fairfax** of the University of California-Berkeley described what might be applicable lessons from efforts to manage state and trust lands.

**Clark Binkley**, of the



PATRICK DEASON PHOTOGRAPHY

Marion Clawson, senior fellow emeritus


Hancock Timber Resources Group and a former dean of the faculty of forestry at the University of British Columbia, offered perspectives on forest management on public lands in Canada.

Sedjo returned to the podium to examine the various political constituencies to which the Forest Service must answer and to share his own vision of what its management objectives should be. Likewise, former chief Thomas presented his thoughts on how the service might function better in an increasingly complex operating environment.

President of Pinchot Institute **Al Sample** closed the meeting by urging the eighty participants to look forward to the next decade as a period of innovation. If there was a parting consensus, it was that the U.S. Forest Service will operate in the years to come under a very different mandate and

management strategy than it has over the past century.

Some of the scholarly papers presented at the conference are now available as part of RFF's Discussion Paper series. The full collection will be published as a book in memory of Marion Clawson later this year.

 View and download selected conference papers at [www.rff.org](http://www.rff.org). or order individual hard copies through RFF (see page 18).

## The unkindest cuts

When it comes to making an environmental difference in forestry, "to log or not to log" is not the real question, Senior Fellow **Roger A. Sedjo** told the International Trade Commission in May. In an industry gone global, the apter question is "where to log?"

Reducing the timber harvest in the Pacific Northwest, for



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example, has not meant that fewer trees are cut down but only that logging has shifted elsewhere, Sedjo said in his testimony before the ITC hearing on “Conditions of Competition in U.S. Forest Products Trade.” Similarly, he argued, if U.S. producers are impeded from selling to Japan, that country will simply go elsewhere to fill its huge appetite for wood products.

The Japanese, who currently import about 80 percent of their timber, would have to draw more on the forests of Malaysia, Indonesia, and Southeast Asia, among others. The environmental damage, Sedjo contended, would be substantially greater than if the wood were harvested in the United States.

Not only are U.S. logging and reforestation practices among the best in the world, he maintained, but old growth here is now protected—something that is not the case in many logging locations. U.S. wood products are also originating

more and more from second-growth and plantation forests, he said, where the damage to biodiversity is minimal.

Most significantly, Sedjo told the commission, the U.S. forestry industry is poised to shift most of its harvesting activity into plantation forests. These high-yielding, biotechnologically sophisticated stands hold out the environmentally friendly promise of requiring far less land to produce.

Sedjo and his colleague **Dan Botkin** estimate that an area equal to 5–10 percent of the world’s current forest land could easily produce all of the world’s industrial wood needs, if properly managed. If so, the remaining 90–95 percent could be converted to other purposes, including conservation and recreation.

But restrictions on industry trade might well wreck the chances of such plantations succeeding, Sedjo warned. Regions that specialized in this form of wood production would need to be able to export

freely to the rest of the world.

In offering his testimony Sedjo, who directs RFF’s Forest Economics and Policy Program, emphasized that his remarks reflected his personal views and not RFF’s. ☰

### A lesson before drowning

One of the largest natural teak forests in Thailand may soon be inundated as a result of dam construction. Meanwhile, researchers from RFF and Thai universities are attempting to identify and quantify some of the forest’s most elusive economic values.

In a special seminar at RFF in June, **Suthawan Sathirathai** of Bangkok’s Chulalongkorn University joined **R. David Simpson** and **Roger A. Sedjo** to present an overview of the collaborative research that they have been engaged in since spring 1997 with support from the government of Thailand and the Ford Foundation.

The aim of the project, the three explained, is to quantify ecological impacts of the proposed Kaeng Sua Ten dam in economic terms, something that was not done in earlier studies of the project. The dam, which would supply water primarily for irrigation, would flood some 65 square kilometers of the Mae Yom National Park where the forest is situated.

In developing a common measure for both ecological losses and material benefits, the researchers hope to eventually

arrive at a methodology that might be applied elsewhere in Southeast Asia, where a number of similar projects are under consideration.

At the seminar, the researchers described their assessments of three sources of value not investigated until now. They include the genetic diversity in teak genes, which might contribute to the health and variety of future trees in commercial plantations; nontimber forest products, such as mushrooms and bamboo shoots, collected by local people; and the forest’s capacity to sequester carbon, which is thought to contribute to global warming.

Other members of the research team in Thailand are considering the value of the forest as a recreation spot and ecotourist attraction, and its cultural value to Thai citizens.

Among their preliminary findings the researchers cited the role of nontimber forest product collection—the gathering of mushrooms, bamboo shoots, and the like—in providing a form of “insurance” to local people. These products provide alternatives to wage labor and agricultural earnings, which are vulnerable both to natural disruptions and the types of economic disturbances that Thailand has experienced recently.

Overall, the study documents that important values have been ignored in previous work, and should be considered before a final decision is made on the dam project. ☰

## Cheap gas in cars may mean more gas in air

Over the past three decades the United States has involuntarily become a huge economic laboratory, demonstrating the tight relationship between energy prices and consumption. When prices go up consumption falls, and vice versa.

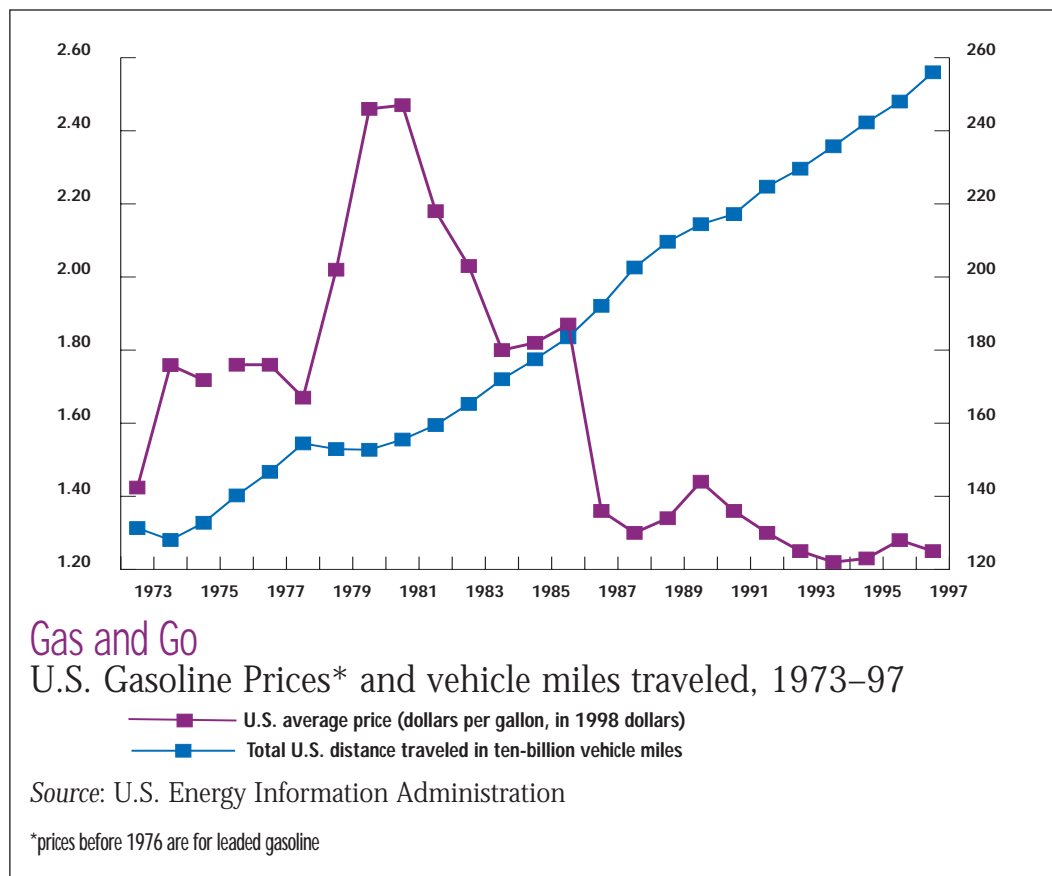
Gasoline prices in the United States fell this past winter to their lowest level ever, adjusted for inflation. For consumers, of course, it's welcome news. But the resulting increase in driving will make it more difficult than ever for the United States to reduce its emissions of the greenhouse gases that contribute to cause global warming.

At the beginning of March, the average price of a gallon of regular grade gasoline, taxes included, was 91.3 cents, according to the government's Energy Information Administration. That was 12 cents less than a year earlier.

At the trough of the Depression in 1933, the average cost of a gallon of regular gasoline in this country was 18 cents, the American Petroleum Institute's historical data show. Adjusted for inflation, that's the equivalent of \$2.29 a gallon in today's dollars. In 1948, during the first postwar recession, the average price was 26 cents, or \$1.77 in today's dollars. Although prices have risen since last winter, there appears to be no point in the past when the real price of gasoline was nearly as low as at present.

## Facts for Thought


*An occasional presentation of data about energy, natural resources, the economy, and the environment.*



The combination of falling prices, strong economic growth, and rising incomes has had a powerful effect on gasoline sales. In January, the API estimated that gasoline consumption in this country has been increasing recently at a rate of about 3 percent a year—twice the trend in the 1990s until now. That is a conservative estimate, since the EIA's figures show that in mid-February the industry was supplying 4.3 percent more gasoline to the market than a year earlier.

Energy efficiency, meanwhile, has been a casualty of cheap gas. The fuel efficiency of the average automobile on the road rose steadily from 13.4 miles to the gallon in 1973 to 21.5 in 1997, according to the EIA. But even though the cars got better gas mileage, people drove each car slightly fewer miles per year when gas prices were rising. With prices falling, though, each car traveled nearly one-fourth farther in 1997 than it did in 1986. More important, there are now a great many more cars.

Since the census year 1970, the American population has increased by one-third. But the number of motor vehicles on the road—cars, trucks, buses, motorcycles, and all—has nearly doubled.

 This synopsis is adopted from J.W. Anderson's "Do Cheap Gas Prices Undermine U.S. Climate Policy?" at <http://www.weather-vane.rff.org>.