

## Environment Wins at the State Level

**E**DF's successes in California, Colorado, North Carolina, and Texas show the importance of environmental coalitions acting at the state level. With the trend to move power from Washington to individual states, targeted state action can sometimes yield dramatic benefits for the environment.

### NORTH CAROLINA

North Carolina's General Assembly has approved landmark legislation that begins to reshape environmental policy in the state, including appropriating as much as \$60 million a year for a Clean Water Management Trust Fund—the largest appropriation for environmental protection in North Carolina history. The legislators acted in response to public outrage on pollution that is fouling rivers and killing fish. EDF helped lead a coalition of environmental groups in crafting the legislation and fighting many efforts to weaken the bills.

One of the bills orders tougher regulation of the state's rapidly growing hog industry, a major source of water pollution,



*Ecologists Dr. Douglas Rader and Dr. Joseph Rudek and North Carolina EDF director Melinda Taylor helped persuade the state legislature to pass landmark environmental legislation.*

especially along the coastal plain where it is concentrated. The new law requires permits for hog farms, better training of operators, and annual inspection of the facilities. The package of bills includes funds for hiring

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## Director's Message EDF Turns to Every Member To Help Meet Deadline for All-Or-Nothing Challenge

**T**his is a crucial time for EDF's *21st Century Campaign*, the fundraising effort to strengthen EDF's capability to take on some of the most critical environmental challenges of the next century. We must raise \$500,000 from our members to qualify for the Kresge Foundation's \$1 million all-or-nothing challenge grant.

If we are successful, Kresge's grant will provide the advanced computer equipment essential to the success of our efforts to protect global oceans, engage businesses in reducing waste and pollution, create environmental regulations that work, protect wildlife and habitats, and help China meet its energy needs without massive environmental damage. We've come a



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## Alliance Projects Aim to Make Businesses Greener

**T**he Alliance for Environmental Innovation has enlisted two major American corporations, S.C. Johnson Wax and Starbucks Coffee—each a leader in its field—to participate in joint projects that will build environmental improvements into the design and development of their products and packaging. EDF and The Pew Charitable Trusts created the Alliance to engage businesses in reducing waste and pollution. EDF's work in the landmark McDonald's and Paper Task Force efforts showed that environmental-business partnerships can lead to innovative solutions.



*Studying possible alternative coffee cups at Starbucks headquarters in Seattle are Starbucks environmental affairs specialist Karen Humphrey, EDF scientist Kevin Bryan, Starbucks director of environmental affairs Susan Mecklenburg, and EDF economic analyst John Ruston.*

S.C. Johnson, based in Racine, WI, is a leading maker of household and consumer products, including cleaners, insecticides and repellents, and personal care items. The company's major brands include Raid, OFF!, Drano, Glade, Edge, Future, Pledge, and Windex.

The Alliance-S.C. Johnson task force will focus on how to integrate environmental objectives into Johnson's product design and development process. The aim is to make environmental considerations an integral part of all of the company's products—from the initial prod-

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**7 Population and Climate**  
An EDF study suggests that world population may be a key variable for stabilizing atmospheric carbon dioxide.

## South Texans Strongly Prefer Clean Electric Energy Future

Texas electricity customers prefer solar and wind energy and energy efficiency above all other options, according to recent polls conducted by three Texas utility companies. The polls asked consumers how the companies, West Texas Utilities, Southwestern Electric Power Company, and Central Power and Light, should meet new demand for electric power over the next several years.



Lower Colorado River Authority

EDF's energy program is working to give consumers practical options for clean energy, such as this West Texas wind farm.

Scientifically selected customers were polled both before and after they had an opportunity to deliberate among themselves and ask questions of experts. EDF energy program manager Karl R. Rábago served as an expert on renewable energy and environmental concerns.

When asked which options the utilities should pursue first and second, over half the customers chose efficiency and renewables—far more support than for fossil fuel and imported power options. Customers were also willing to pay more for clean energy and expressed strong concerns about global warming and air pollution problems.

"These poll results send a strong message to utilities about what it takes to satisfy customers," said Rábago. "Everyone says customers will rule in the competitive future. These companies and the Public Utility Commission now have an opportunity to make that slogan into reality."

## New Approach to Restoring the San Francisco Bay and Delta

A technical report prepared by EDF and The Bay Institute of San Francisco outlines a new scientific framework for measuring the health of the entire San Francisco Bay-Delta-River system. The proposed set of ecological indicators represents a major departure from the old approach of measuring the success of individual small projects piecemeal.



Jay Thomas/International Stock

A new approach, which EDF helped develop, considers the San Francisco Bay-Delta ecosystem as a whole rather than piecemeal.

The report, *Restoration of the San Francisco Bay-Delta-River System: Choosing Indicators of Ecological Integrity*, is being used by the Federal/State consortium responsible for designing an ecosystem restoration plan under the 1995 Bay-Delta Accord. EDF attorney John Krautkraemer negotiated the accord shortly before his death.

## Get EDF Letter Online

The full text and graphics of *EDF Letter*, as well as other EDF publications, are available on the World Wide Web at [www.edf.org](http://www.edf.org). Members who read the newsletter online can opt not to receive it by mail, simply by sending an e-mail request to [members@edf.org](mailto:members@edf.org).

"One day, all non-profit organizations will have well-designed and useful sites on the Web," said the online magazine *Better World* recently. "Let's hope that they look at EDF's example."

## Tripp Named to Task Force on Closing Fresh Kills Landfill

EDF General Counsel James T.B. Tripp is serving on a task force to find alternative ways of managing the 13,000 tons per day of New York City solid waste that are now being dumped at the notorious Fresh Kills Landfill, the largest in the city. The state and city have agreed to close Fresh Kills by the end of 2001. The issue is how much of this waste will be exported and how much recycled.

Tripp and Barbara Warren of Staten Island, the other environmentalist named to the Task Force, are urging a major reorientation of the city's solid waste strategy, away from disposal and toward intensive recycling and waste reduction strategies, including composting of food and yard waste and use of economic incentives to increase recycling. (See related article on page 4.)

## BECAUSE OUR FUTURE DEPENDS ON IT....



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For more information or a personal proposal, please contact:

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### EDF Letter

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# Coalitions of National and State Groups Win Important Victories Together

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more hog farm inspectors as well as for cleaning up the Neuse River and other polluted waters, restoring and protecting wetlands, and protecting still-pristine waters.

NCEDF director Melinda Taylor praised the General Assembly action. "The bills passed this session are a critical step toward long-term management that will protect and restore the state's drinking water, fishing, and recreational resources," Taylor said.

## CALIFORNIA

EDF helped lead a wide coalition of California environmental, farm, and business interests in negotiating a \$995-million environmental restoration bond issue. Labeled the Safe, Clean, Reliable Water Supply Act, it won overwhelming statewide bipartisan support from legislators and from Gov. Pete Wilson. It goes before voters as Proposition 204, in November.

Prop. 204, the state's biggest water bond in

a generation, would earmark more than \$600 million for direct environmental restoration efforts throughout the San Francisco Bay-Sacramento/San Joaquin Delta watershed. It also includes funds for erosion control above Lake Tahoe and for wastewater reclamation and water conservation projects.

"Voter approval of Prop. 204 would be an especially big boost to the environment of the most important estuarine watershed on the Pacific Coast," said Thomas J. Graff, an EDF attorney and early leader in the coalition.

EDF analyst David Yargas sees similarities in how EDF and other environmental and taxpayer groups thwarted Congressional efforts to authorize the massive Auburn Dam on California's American River and to turn back the clock on the 1992 Central Valley Project Improvement Act. "This sends a clear signal that there's a way to get things done—by rolling up our sleeves and working together—as an alternative to continued conflict and gridlock," he said.

## COLORADO

EDF and Colorado's other conservation organizations teamed up to defeat several extreme bills before the Colorado General Assembly in 1996 and forged a bipartisan consensus to support a strong new clean air plan.

The legislature considered nine "takings" bills that would have limited local governments' authority to adopt land use plans and zoning ordinances, even though Colorado is one of the nation's fastest growing states and its citizens are insisting that local governments help plan for sensible growth. EDF attorney Jim Martin played a

key role in a wide coalition that defeated all but one of the bills and convinced Gov. Roy Romer to veto the bill that passed both houses. The coalition also helped defeat legislation that would have made it more difficult to clean up Colorado's air.

In a major legislative success, EDF led a bipartisan effort to establish a state-based program for protecting air quality within pristine areas. Although the Federal Clean Air Act provides a means to protect visibility in "class 1" pristine areas such as national parks and wilderness, there is no comparable program to protect these areas from such pollution as acid rain. Under the new program, if Colorado gets Federal notice that air pollution is damaging a class 1 area, the state must promptly confirm the pollution, identify its sources, and develop a plan to reduce it. "This isn't a perfect bill," Martin said, "but it is a major step forward and demonstrates that we can build bipartisan coalitions to protect the West's natural resources."

## TEXAS

Over the opposition of private utilities in Texas, EDF helped pass a utility reform law to provide significant environmental and consumer benefits. This law—EDF's top priority in the 1995 Texas legislative session—requires utilities to compare up front the costs, including the environmental costs, of all reasonable alternatives (such as renewable energy and energy efficiency) to meet energy needs. It also requires, for the first time, real and timely public participation in the process.

As an outcome of this law, the Texas Public Utility Commission can reward util-

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Rick Gerhart/Impact Visuals

California state capitol at Sacramento

# Making Environmental Considerations an Integral Part of Businesses

*Continued from page 1.*

uct concept through development, production, packaging, and marketing.

"Ultimately, we want to show how building environmental factors into product development from the outset can meet consumers' needs with less harm to the environment," said Jackie Prince Roberts, the Alliance's associate director.

## The Double-Cup Problem

Starbucks is the leading national retailer of gourmet coffee with more than 900 stores that sell hot coffee, coffee-based cold drinks, pastries, sandwiches, coffee beans, coffee makers, and accessories. It aims to have 2,000 stores by the year 2000.

The Alliance-Starbucks joint task force will try to solve the company's "double-cup" problem: having to deliver one serving of take-out hot coffee in two disposable cups to insure customers' comfort. The project's first priority will be to maximize the use of reusable cups in the Starbucks system, for in-store customers as well as commuters and people working near Starbucks stores. The Alliance-Starbucks team will also recommend different single-use cup materials to reduce the environmental impacts of the virgin, bleached paperboard now being used.

The Alliance hopes that solving Starbucks's double-cup problem will lead to a range of other initiatives, potentially cover-

ing additional types of packaging, store construction, and coffee growing and processing, for example.

"We believe Starbucks can enhance its customers' experience by further integrating the environment throughout its operations," said Alliance director Ralph Earle, a member of the EDF-Starbucks team. "This project has the potential to set a new standard for environmental leadership in the retail and service sectors."

The Alliance intends all of its projects to produce measurable environmental and business benefits. Its aim is to create models and methods that other businesses will adopt to the benefit of both the environment and the economy.

# Community Composting Starts from the Ground Up

By EDF General Counsel James T. B. Tripp and EDF Founding Trustee Arthur P. Cooley.

Most municipalities in the U.S. now have programs for recycling various kinds of paper, cardboard, and plastic, metal, and glass containers. These materials are centrally collected and processed for efficient transport to mills and factories that use them to make new products.

Another major component of municipal solid waste is organic waste: food, grass clippings, leaves, and woody debris. Food waste typically constitutes 10% to 15% of municipal solid waste by weight; yard waste from 4% in New York City to well over 20% in suburban areas. Together, food and yard wastes make up over 20% of municipal solid waste. Thus there is good reason for municipalities to look closely at efficient management of organic wastes. Although many municipalities have yard waste composting programs, only a few cities, such as Seattle and Los Angeles, have initiated municipally supported food waste composting programs.

Landfilling or incinerating food and yard wastes is expensive and creates environmental problems. Organic wastes can be centrally collected and composted, but—unlike recyclables—there are powerful reasons for managing them decentrally, ideally at the individual sites where they are generated. Composted organic matter can be used on-site, in home and community gardens, parks, or around trees. Composting on site also avoids municipal collection—often the most expensive step in managing solid waste—and disposal and other costs.

EDF is testing on-site composting in two settings: one in the small suburban community of Bellport in the Town of Brookhaven on Long Island, where EDF was founded in 1967; the other in urban New York City.

The Village of Bellport has embarked on a home composting program that will create tons of organic matter for local gardens while diverting a significant amount of waste from an incinerator. The program began two years ago, with creation of a Compost Committee, chaired by Tripp, with Cooley and two EDF members, Dava Stravinsky and Anthony Graves—both composting experts—as members. Working with Bellport Mayor Frank Trotta, we set up a pilot home food waste composting project involving 16 families who received a free

composter in return for agreeing to weigh and compost their kitchen wastes, weigh their non-recyclable curbside mixed waste, attend a training session, and prepare monthly reports.

This eight-month pilot project found that about 30% of the mixed waste otherwise destined for the incinerator went into the composter. Many participants found that, after composting in combination with Bellport's existing recycling program, they had little garbage remaining. Just as important, they reported few problems. Encouraged by these results, the village agreed to expand the program. Working with its Compost Committee, it offered a composter for \$10 (far below cost) to any household that agreed to use it for food waste and attend a training session. More than 150 families signed up.

Last summer Mayor Trotta hired four students to visit residents and better explain the recycling and home composting efforts and the costs of different waste disposal techniques. More families have since expressed interest in participating in the program. Our goal is 25% of households participating this year and 50% by 1998.

## Village Will Reap Savings

Bellport has endorsed the program both because of the breadth of resident support and potential cost savings. Each ton of food and yard waste handled on site means one less ton sent to an incinerator or landfill. Since Bellport households generate about 300 tons of food waste per year, the potential savings in disposal fees (currently \$65 a ton) and collection costs should allow Bellport to recover its one-time investment in composters within a year. Future savings could also come from reducing the current two weekly mixed-garbage pick-ups to one. Combined, these savings could reduce Bellport's annual budget by more than 3%.

We believe that this is the first time a municipality in New York State has embraced home-based food composting with enthusiasm and support, and the State Department of Environmental Conservation has honored Bellport's innovative approach with a special award. The program's environmental benefits and cost savings have caught the interest of other Long Island communities, and we hope the program will serve as a

model for others. The key to its success has been a municipality that is willing to offer financial incentives out of potential waste disposal savings, a small citizens committee



Working with a backyard composter are Bellport Compost Committee members Jim Tripp, Dava Stravinsky, and Art Cooley.

including some composting experts, and an informed citizenry.

## Composting In An Urban Setting

In New York City, Tripp chairs the Compost Committee of the Citywide Recycling Advisory Board set up under the City's recycling law. We have focused initially on urban institutions with space to conduct pilot on-site composting of food as well as yard waste. We are working closely with a number of grassroots and educational organizations, including City Green, Open Road of New York, the New York Botanical Garden's composting program, the Gaia Institute, and the Frederick Douglass Academy, a school in Harlem. These organizations are testing a variety of on-site composting demonstration methods and technologies, and we have advocated for strong budgetary support for the projects before the City Department of Sanitation and the New York City Council.

Decentralized and on-site food and yard waste composting programs have tended to take a back seat to recycling programs. The real energy behind composting programs comes from small firms, grassroots organizations, and citizen enthusiasm. In both Bellport Village and New York City, we have found that cooperation between a national environmental organization, municipal officials, and grassroots groups is not only possible but productive in solving environmental problems.

# Director's Message: 21st Century Campaign Needs Every Member's Help

Continued from page 1.

long way. *The 21st Century Campaign* has already received \$11 million in gifts from foundations and individuals, and with additional projected major gifts we think we can come within \$500,000 of the \$15 million goal. But unless we reach the full goal, we will not receive any part of the Kresge grant.



Fred Krupp  
Executive Director

That's why I'm turning to each and every member to help close the gap. I hope you will help us reach our membership goal of \$500,000 *by December 31* to let us take advantage of this all-important opportunity.

Every gift, large or small—from \$10 to \$10,000—is critical at this stage of the campaign. Any gift you make now to the Kres-

ge challenge campaign will help us qualify for Kresge's \$1 million grant.\*

## Tools for the New Century

If we succeed in meeting the Kresge challenge, EDF's scientists and economists will have the hardware and software they need to perform technical and economic analyses that are essential to solving environmental problems. Using advanced computer networks, we will be able to work with others—including traditional adversaries—to find "win-



T. Charles Erickson

win" solutions that benefit both the environment and the economy.

## Your Gift Is Important

Your special gift *before December 31* will help ensure EDF's effectiveness into the next century. Whether \$25 or \$2500, yours could be the gift that takes us over the top and unlocks the \$1 million Kresge grant!

I ask for the help of every member. Please join EDF in building an environmentally secure future, for the well-being of our world and future generations.

*Fred Krupp*

\*Since we are only permitted to count new and additional contributions that our members *designate* for the Kresge challenge, please use the specially marked reply envelope facing this page to make your gift.

# Variable Tolls Can Cut Traffic Congestion and Smog

As a direct result of EDF efforts, variable tolls—higher at rush hours and lower at off-peak times or for car pools, vans, and buses—are being considered for use on highly congested bridges in both New York and California. Demand-based tolls offer drivers incentives to avoid rush hour travel and to use car pools and mass transit, thus reducing congestion and delays, saving motor fuel, and cutting air pollution.

The New York State Thruway Authority has agreed to study variable tolls and transit improvements on the Tappan Zee Bridge, a major Hudson River crossing north of New York City. EDF first urged peak-hour tolls on Hudson River bridges in 1977, with the support of Dr. William Vickrey, professor of economics at Columbia University and world-renowned authority on utility and transportation pricing.

The Tappan Zee toll for the general public is now \$2.50, but a discount allows most daily commuters who travel at times of peak traffic congestion to pay only \$1. Studies of Tappan Zee traffic problems have concluded that the commuter discount worsens congestion and have recommended its elimination.

For more than two years, a coalition of environmental groups that includes EDF, Federated Conservationists of Westchester County, and the Regional Plan Association, joined with business groups and public officials to urge toll reforms and expanded cross-Hudson travel alternatives.

Variable pricing, familiar in off-peak rates for telephones and electricity and low-season travel, helps equalize demand and reduce the need for costly new equipment. "Demand-based pricing gives us better phone service and cuts travel and electric utility costs," said James T.B. Tripp, EDF general counsel who also serves as chair of the Tri-State Transportation Campaign coalition. "It can also help reduce traffic congestion and air pollution."

"The key to success," added EDF transportation specialist Michael Replogle, "will be to deliver better value for Thruway users—more travel options and chances to save money and time and reduce pollution." The Thruway Authority will talk to bridge users, regional officials, and the public to determine the best, most equitable strategies for dealing with the increasingly severe traffic problems before making any changes in bridge tolls.

## California Misses Opportunity

California lawmakers, faced with the need for money to reinforce state-owned bridges against earthquakes, nearly passed legislation that would have doubled fares on all five bridges crossing San Francisco Bay, from \$1 to \$2. EDF urged them instead to consider charging variable tolls to improve traffic flow while raising funds—at least on the San Francisco-Oakland Bay Bridge, where nearly 30,000 vehicles cross daily during peak commuting hours.



Scenic Hudson

*Congestion pricing and alternative mass transit could reduce traffic tie-ups on the Tappan Zee Bridge north of New York City.*

"A \$3 peak-hour toll, with off-hour discounts and no toll for car pools, would reduce traffic delays by 40% in morning rush hours," said EDF economist Michael Cameron. "An across-the-board \$1 toll hike does almost nothing to reduce congestion."

Although the Governor, many legislators, and a key business group endorsed variable tolls, they were removed from consideration by a key conference committee of the legislature. The *San Francisco Chronicle* said, "State lawmakers passed up a rare opportunity to...help pay for strengthening seven earthquake-prone bridges and reduce nightmarish congestion on the Bay Bridge and improve air quality."

EDF attorney Thomas J. Graff said, "The legislature's failure to pass a variable toll option dooms Bay Area commuters to suffer through ever more horrible traffic jams. We intend to change that."

## Ecologist David Wilcove's Life is for the Birds

The bird photos adorning Dr. David S. Wilcove's tidy office compete for attention, like snapshots of favorite friends and family. The exotic Sulawesi crested myna from last summer's trip to Indonesia. The pensive-looking spotted owl Wilcove championed while at the Wilderness Society. The mighty harpy eagle, a memory from his 1994 trip to Venezuela. Wilcove hesitates to pick a favorite—after all, he estimates he has seen between a quarter and a third of the world's 9,600 or so bird species over the years. That's a lot of birds, and a lot of memories.

Wilcove is not paid to globetrot and spot birds. He does that on vacations. The rest of the year, this energetic, bespectacled scientist, an ecologist in EDF's ecosystem restoration program, fights for the cause of endangered species in the United States. His passion for protecting biodiversity stems from a deep love of wildlife, a love that began with birds.

An unusually clear Washington D.C. skyline glistens through the window behind Wilcove as he explains that he was fascinated with birds even as a toddler growing up in Buffalo. As a sixth-grader, at the height of the environmental movement of the early 1970's, he developed a broader concern for environmental issues and how they affect wildlife. This concern never wavered. Wilcove majored in biology at Yale, then went on to Princeton to pursue a doctorate in ecology and evolutionary biology. His

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*"I think all environmentalists are optimists at heart."*

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thesis explored the disappearance of songbirds from Eastern U.S. forests as these habitats became fragmented. "It was a sobering project," reflects Wilcove, "because it was in a sense a metaphor for what is happening to wildlife habitat around the world."

Initially, Wilcove expected to join the academic world after earning his doctorate, but the "Sagebrush Rebellion" of the early 1980's changed his plans. He entered graduate school when James Watt held the reins at the Department of the Interior and Ann Gorsuch Burford headed the Environmental Protection Agency. Laws protecting wildlife, clean air and water, and parks were under fire, and environmentalists fought an uphill



Charles Erickson

*As a committed ecologist and birdwatcher, protecting birds and other wildlife is exactly what David Wilcove wants to do with his life.*

battle to keep them strong. "At about the beginning of my second year in graduate school, I made the decision that when I got out, I wanted to work full time for the environment."

After Princeton, Wilcove moved to Washington and worked for a year at The Nature Conservancy, studying the rare species of Virginia. Then he spent five years at the Wilderness Society, working with economists and attorneys to protect ancient forests and the species living in them.

Since joining EDF's staff in the summer of 1991, he has taken on three projects of which he is especially proud. First, in 1993, he published a study of how rare a species must become before the Federal government will put it on the endangered species list. "We were able to show that by the time most species are listed, their populations are so small that there is a strong possibility of extinction and a very difficult uphill battle to recover them."

Second, he is working on the Safe Harbor program with attorney Michael J. Bean, chair of EDF's wildlife program, and EDF economist Robert Bonnie. The program develops economic incentives to encourage private landowners to protect and restore habitat for endangered species, such as EDF's work in the Southeast to assist the endangered red-cockaded woodpecker.

Talk of a third project sends Wilcove racing to a gray file cabinet. A few seconds

later, he is rifling through a file of colored maps of the United States. Wilcove is working with Princeton scientists on a "hot spots" project that will pinpoint areas with the greatest concentration of all types of endangered species, from insects to mammals. "Our findings lead me to believe that we can target critical areas for protection and incentives, and protect a great many endangered species on a relatively small amount of land."

Despite many dire predictions of looming extinctions, Wilcove remains upbeat about the future of biodiversity, and thinks he has plenty of company. "I think all environmentalists are optimists at heart," he says. "I wouldn't be doing this work if I didn't think we were making progress."

Wilcove's hard work and optimism rub off on colleagues. "I often use David as an example to my students of what very productive and important career paths ecologists can take," says Oregon State University professor Dr. Jane Lubchenco, president of the American Association for the Advancement of Science and a member of EDF's Board of Trustees.

Adds Michael Bean, "David is an exceptionally talented writer, an exceptionally committed ecologist, and a remarkably humorous and fun person to work with."

So what does Wilcove do when he's not working to save species or chasing birds in distant lands? "I am an avid but uninspiring swimmer and runner," he says with a chuck-

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*"We can protect a great many endangered species on a relatively small amount of land."*

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le, "and I like writing." He has written natural history articles for *Wilderness*, *Wildlife Conservation*, *Audubon*, and other magazines, and coauthored a book on Southwestern ecosystems, *Defending the Desert*. Currently he is writing a book on the wildlife of the United States.

And what would he like to do in the future? "More of the same. I get paid to go out and protect endangered species—you can't beat that," Wilcove says, with a growing smile. "Though I hope I can spend more time birdwatching."

By Howard Youth

# Population Growth Could Affect Global Warming

By Drs. Stuart R. Gaffin and Brian C. O'Neill, climatologists in EDF's New York office, and Dr. John Bongaarts, Vice President, Research Division, The Population Council, New York.

Of the many changes forecast for the 21st century—new technology, resource depletion, loss of biodiversity, global warming—projections of world population growth probably conjure up the most vivid images in the public's mind. It is hard not to form strong mental pictures when we think of today's crowded cities and then learn that world population is currently expanding at the rate of nearly one billion per decade.

Although world population a century from now is anyone's guess, projections of population in the next several decades are arguably among the more accurate estimates we have about the future. The so-called "population momentum," associated with the many young people now alive who will eventually have children of their own, makes a planet of around 8 billion people in 2025 very likely.

Vivid images notwithstanding, do we really know what a world of 8 or more billion people will look like, compared to the 5.8 billion today? This is tantamount to asking, do we understand the linkages between population growth and environmental change? The answer to these questions has to be "No," considering the separation of these issues at two recent global conferences. The 1992 Earth Summit Conference in Rio de Janeiro focused on many environmental issues but largely overlooked population. The 1994 Conference on Population and Development in Cairo led to a comprehensive Program of Action but largely overlooked the environment.

Study of the linkages between population and the environment might have prevented

the gap evident between Rio and Cairo. Until such linkages are clarified, the "population-consumption debate" will rage on. Developing countries, with the highest population growth rates, are understandably sensitive to the widespread tendency to blame all environmental problems on population without considering the relative contribution of other factors such as consumption.

## A Mathematical Model

With these issues in mind, EDF has begun a new joint effort with The Population Council, focusing on one specific environmental issue: global climate change. In this effort, the authors are working to quantify the relationship between population and emissions of greenhouse gases (principally carbon dioxide, CO<sub>2</sub>) that lead to global warming. Such work will be important to upcoming negotiations on ways to limit emissions in the future.

The new study borrows a method first developed by scientists Paul Ehrlich and John Holdren to examine the environmental impacts of population in general. Their equation is sometimes called the "IPAT" model:

$$I \text{ (environmental impact)} = P \text{ (population)} \times A \text{ (affluence per person)} \times T \text{ (technology)}$$

When applied to global warming, *I* represents total CO<sub>2</sub> emissions and *T* stands for the amount of CO<sub>2</sub> emitted per dollar unit of income.

Several analysts have already used this method to explore the relationship between population and greenhouse gas emissions. However, they have often failed to take a few necessary precautions such as dividing the world population into many regions and, to the extent known, allowing for interactions between the *P*, *A*, and *T* factors. Our work is new in that we are the first to apply the model (with precautions) to study the role of population growth in stabilizing atmospheric CO<sub>2</sub> at target levels ranging from 450 to 750 parts per million (ppm), the targets considered by the Intergovernmental Panel on Climate Change.

Our modeling indicates that population may be a key variable for stabilizing atmospheric CO<sub>2</sub> in the long term and that the CO<sub>2</sub> target chosen will affect the extent to which population policies help meet the goal. In general, we find that stabilizing climate is much easier with lower population growth. To quote a result from the model, if population follows the UN high path (see

graph), *T* (CO<sub>2</sub> emitted per dollar unit of income) has to be reduced 80% below its projected "business-as-usual" value in the year 2100 to stabilize CO<sub>2</sub> concentrations at 650 ppm. If instead the world were to follow the UN low projection, then achieving stabilization at 650 ppm would require only a 10% reduction in *T* below its projected business-as-usual value.

For 450 ppm (the level EDF advocates), the corresponding reductions required are 90% and 75% respectively. In this case more of the reductions would have to come from other strategies, such as reduced consumption, improved energy technology and efficiency, or switching to lower carbon intensity fuels.

## What Population Policies Are Available ?

Population policies aim to bring down fertility rates, the average number of children born to a woman during her reproductive years. The desirable means to reduce fertility rates are all non-coercive and focus on

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*These options constitute one excellent "no-regrets" climate change policy.*

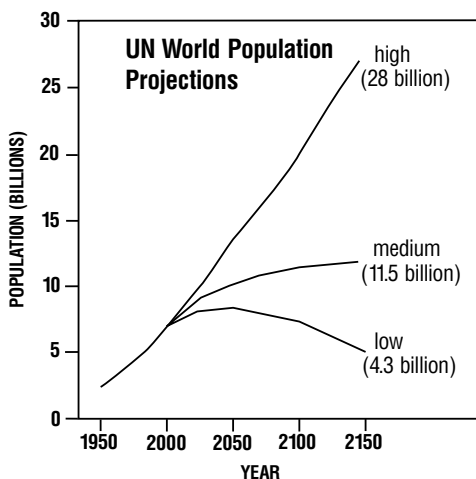
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improving the well-being of women.

The most obvious first step is to help women avoid unwanted pregnancies. More than 100 million women in developing countries do not want to get pregnant but are not practicing contraception. Voluntary family planning programs of high quality can provide needed information and access to contraception.

Fertility declines can be accelerated by improvements in girls' education, greater gender equality, and reductions in child mortality. Even today's population momentum can be partially offset by raising the average age of onset of childbearing through increasing secondary school education for girls and by efforts to reduce premature adolescent pregnancy.

All of these population policy options are desirable in their own right because they improve individual welfare directly. Our work shows that they may also be important for stabilizing global climate. Thus they constitute an excellent "no-regrets" climate change policy. By looking at the whole picture, we will realize a unique opportunity to achieve simultaneous environmental and socioeconomic benefits.



United Nations, N.Y., 1992

# Uncertain Future for South America's Pantanal Wetlands

The Pantanal—along the border of southwestern Brazil, Paraguay, and Bolivia—is the world's largest remaining wetland, more than ten times the size of the Florida Everglades. Rich in biodiversity, it is estimated to contain more than 150,000 species of birds, plants, and animals, many unique to the region, including the giant river otter, caiman, puma, and hyacinth macaw.



This jabiru stork, typical of the Pantanal's abundant bird life, could be harmed by the Hidrovia project.

This critical ecosystem of global importance is threatened by a planned massive navigation project, known as the Hidrovia Paraguay-Paraná. The five countries that share the Paraguay and Paraná Rivers—Argentina, Bolivia, Brazil, Paraguay, and Uruguay—want to create a navigation system similar to that of the Mississippi River. An \$11 million feasibility study and environmental assessment, funded primarily by the Inter-American Development Bank and the UN Development Program, is underway to design a waterway to bring convoys of 16 to 20 barges from the Atlantic Ocean to South

America's interior, a distance of more than 2,000 miles. Intended to expand the import of agricultural chemicals, fuels, and other products and the export of soybeans, timber, gold and iron, the waterway could cost more than \$1 billion.

## Working for Better Alternatives

Since 1994, EDF has worked with the Rios Vivos Coalition (Rivers Alive), a network of more than 300 non-governmental organizations from South and North America and Europe, to reform the Hidrovia project. The indigenous peoples of the Paraguay Basin are united against the project. Hydrologist Victor Ponce of San Diego State University, who published his own analysis of the possible impacts, found that the engineering works could forever change the area's wetlands, vegetation, wildlife, and even its climate.

Deborah Moore, a scientist who is leading EDF's efforts to protect the Pantanal, said "This region is of global environmental

importance and should not be ruined by poor planning, short term profits, and marginalization of local communities." The first phase of the Hidrovia project was intended to focus on minor improvements for safety and navigation and maintenance dredging in the lower river; the second phase would include heavy engineering works, such as dredging, channelization, and rock blasting through the Pantanal. However, the first phase—extending as far as Corumbá, Brazil—is now set to create a major shipping channel, which would require significant dredging at 93 sites, including in the Pantanal. EDF and Rios Vivos are working to ensure that construction on the first phase is not started until a comprehensive environmental assessment is complete.

Brazilian officials have publicly stated that Brazil will exclude damaging engineering works from the Pantanal. Yet feasibility studies continue to focus on designing the project through the Pantanal, and plans for a new port at Descalvados—in the Pantanal—are under discussion.

"In the Mississippi Basin and in the Everglades, millions of dollars are now being spent to undo the engineering works of the last 100 years," noted Moore. "We now know the serious environmental, social, and economic costs of large-scale river modifications. We should avoid repeating the same mistakes and instead work hard to find better alternatives, including different barge design, improved stream-flow information to barge operators, and sustainable agriculture."



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## Environment Wins at the State Level

Continued from page 3.

ities for investing in energy efficiency and renewables. Ironically, the existing Texas rate structure lets utilities profit most by building the dirtiest power plants. Texas also leads the nation in greenhouse gas emissions; if Texas were an independent country, it would rank seventh among nations in carbon dioxide emissions. About a third of these emissions come from electric power plants in the state.

Besides providing new incentives for clean power, the law opens the electric grid to wholesale competition. Independent power producers with cleaner gas turbine and wind power technologies can now compete for a share of the growing Texas market.

"If the U.S. is to come closer to meeting its commitments under the Rio treaty to reduce greenhouse gas emissions, there is no better nor more cost-effective opportunity than reforming the way electric utilities operate in Texas," said Jim Marston, director of EDF's Texas office. "This law, if well implemented, can be a significant step in reducing emissions that are contributing to global climate change."

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