



The **Fix-it** Brigade

What young climate activists are teaching Apple, Caterpillar and other Fortune 500 companies

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Imperiled

Nature speaks to the child in each of us. But the world we love is imperiled by climate change.

In 2014, we have the tools we need to begin stabilizing the planet, including proposed rules to control greenhouse gas emissions from power plants.

What we don't have is time to waste.



We have the tools. Now, let's use them.



PEOPLE OFTEN ASK ME HOW I REMAIN hopeful in the face of growing environmental threats and political stalemate at the national and international levels.

It's a reasonable question. Climate change is already at our doorstep, with ocean temperatures and sea levels rising faster than scientists expected. We're seeing the effects not just in headline-making extreme weather and tragic

loss of life, but in barely noticeable changes that could signal the unraveling of the web of life (*see story, p. 16*).

And yet at EDF, we remain optimistic that we can still prevent the worst effects of climate change. We're hopeful because, with our partners, we've developed a set of policies and incentives that have delivered promising results. If we bring them to scale in time, they will do the job. I'm hopeful, too, since more people are joining with us to build these solutions.

Last summer, EDF members sent 115,000 messages in support of President Obama's new Climate Action Plan—including EPA's proposed national limits on climate pollution from new power plants, standards that we have long been fighting for.

In California, a mandatory, declining cap on carbon that EDF helped design took effect in January 2013. A year later, the state's carbon market is off to a great start, creating incentives for businesses to reduce emissions and convert to clean energy.

In Colorado, Governor John Hickenlooper recently proposed new regulations that, if adopted, will make Colorado the first state in the nation to tackle the problem of methane emissions from shale gas. And in China, the government launched the first three of seven pilot carbon-trading programs—Shenzhen, Shanghai and Beijing—and announced that a national carbon-trading program will be part of its next five-year plan.

This is real progress—and I'm proud to say EDF played a pivotal role in each case, bringing together multiple stakeholders to negotiate solutions that work for the environment and the economy.

I'm also optimistic because of the incredible young men and women I meet every day. As our cover story illustrates, there's an amazingly motivated, smart group of young professionals, called EDF Climate Corps, that finds energy waste at businesses and public institutions across the country (*see story, p. 8*). Climate Corps alumni are rapidly becoming the next generation of green leaders.

Looking forward to 2014, we're pushing for federal regulations on methane leakage from natural gas as well as strong carbon standards for new and existing power plants. These are the nation's two largest sources of greenhouse gas pollution. Power plants still have no limits on carbon. This year, with help from our members and supporters, we'll ensure that EPA moves quickly to adopt strong carbon standards for power plants and proposes rules to cut methane pollution from oil and gas operations.

With great need comes great opportunity. Thank you for your steadfast support. It makes our work possible.

Fred Krugg
EDF President



Finding the ways that work

Environmental Defense Fund's mission is to preserve the natural systems on which all life depends. Guided by science and economics, we find practical and lasting solutions to the most serious environmental problems.

Our work is made possible by the support of our members.



On the cover:

Adults have despaired of young people since the time of Socrates, but today's millennial generation is proving their elders wrong once again. Since 2008, 400 graduate

students have enlisted in EDF Climate Corps to fight global warming. Embedded at companies around the country, EDF Climate Corps fellows devise strategies to curb climate change.

Solutions writer Charlie Miller reports on the innovative EDF program that is reshaping the world of energy efficiency and launching the careers of a new generation of green leaders. See p. 8.

Cover photo-illustration: Arthur Hochstein

Solutions

Editor Peter Klebnikov

Environmental Defense Fund
257 Park Ave. South
New York, NY 10010

Main number 212-505-2100

Membership questions 800-684-3322
or members@edf.org


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FIELD NOTES



SHUTTERSTOCK

From 2006 to 2011, the number of producing natural gas wells in Colorado rose nearly 50%, to more than 30,000.

Mile-high milestone: Colorado proposes strong air rules

Locals call it the “brown cloud,” a veil of smog that often plagues the Front Range of the Rockies, where most Coloradans live. Today, smog-forming emissions increasingly come from the booming oil and gas industry. Leaks of methane, a potent greenhouse gas, are also a problem.

In November, Gov. John Hickenlooper proposed strong air regulations for oil and gas operations that explicitly address these emissions, including methane—making his state the first in the nation to do so.

EDF and three leading en-

ergy companies helped develop the proposed rules. The outcome shows that the gas industry, state officials and an environmental group can work together, even in these partisan times, to deliver cleaner, safer air. In a press conference, the governor credited EDF president Fred Krupp with persuading him to go “farther faster.”

Colorado is just one state where EDF is fighting to get the rules right on energy development. Now we need to ensure the rules are adopted. “These can be a model for the nation,” says Krupp.

DID YOU KNOW?

Pollution can make your computer sick

In China and India, sulfur dioxide pollution is corroding the copper circuitry in PCs and servers, making computer failure much more likely. The problem was discovered by Intel.



Golden State climate warriors put a price on carbon

A year ago, California kicked off America’s most ambitious climate solution—a cap-and-trade program covering 350 of the state’s largest greenhouse gas polluters.

After four auctions, all signs point to a robust carbon reduction market. The auctions have raised almost \$400 million to invest in projects that stimulate the clean energy economy.

It all started with the state’s landmark 2006 climate bill, AB 32, which EDF cosponsored and helped defend in court. The law requires the state to reduce climate pollution to 1990 levels by 2020. Already, California has cut carbon emissions by nearly 20% in just five years.

California has set rigor-



GETTY IMAGES

ous standards for cleaner cars, renewable energy and low-carbon fuels, sparking innovations in the way utilities generate electricity and automakers design cars.

“As the world’s eighth largest economy, California is a model for national—and global—action on climate change,” says Derek Walker, EDF’s associate VP for U.S. climate and energy.

FACTOID IN VINO VERITAS

Climate change is expected to cause an **85% decrease** in production of Rhone, Bordeaux and Tuscany wines by 2050.



DUELING DATA

\$34 BILLION: Projected cost of sea-level rise protection for NYC and New Orleans

\$8 BILLION: Annual budget of the Environmental Protection Agency

Can a great American river once again reach its delta?

The Colorado River is a lifeline for 33 million people in the arid West, but not since the 1950s has freshwater flowed regularly into its delta, where desert wetlands once covered two million acres.

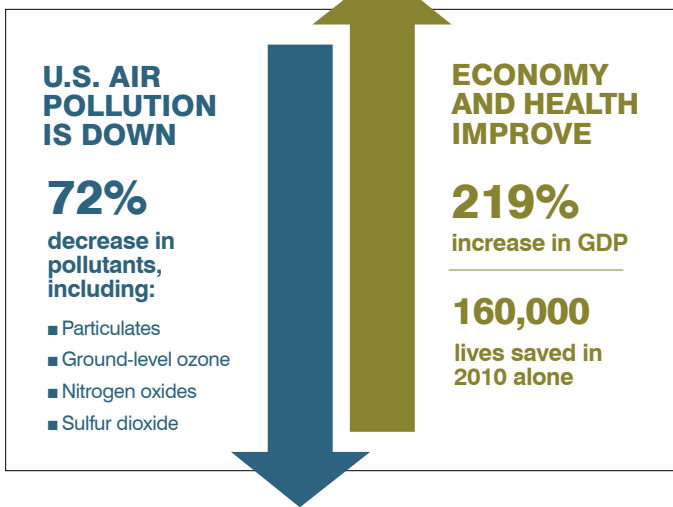
Thanks to a pact EDF helped broker between the United States and Mexico, part of the original delta may thrive again, benefiting farmers and wildlife, including 380 bird species. The pact pro-

vides a framework for water conservation and sharing.

This marks the first time Mexico and the United States have agreed to release water to restore the delta’s ecological health. This “is the most important agreement that has ever been put together between the United States and Mexico on water in the Colorado River,” says Ken Salazar, who served as Secretary of the Interior from 2009 to 2013.

The Clean Air Act

A resounding success since 1970



Lifting the curtain of smog in China



GETTY IMAGES

It takes five days for China's pollution to reach the western U.S.


It's smog season in northern China, largely due to the burning of coal and agricultural refuse. In the city of Harbin, visibility this fall was less than ten yards, all but closing down a metropolis of 11 million and causing a 30% increase in hospital admissions of patients with respiratory problems. In collaboration with leading Chinese universities, EDF has been training environmental enforcement officials to improve air pollution control. So far, we've helped train

some 15,000 officials from every province of China.

In Heilongjiang province, whose capital is Harbin, massive burning of straw has traditionally been a major source of smog.

This year, however, an enforcement officer who was trained in an EDF program at Peking University, used his new communications skills to reach out to large farmers. They responded by cutting incidents of straw burning throughout the province thereby reducing pollution.

IN THE COURTS

 In October, the **Supreme Court** denied a flurry of legal petitions challenging EPA's finding that greenhouse gas emissions endanger public health. The Endangerment Finding, which EDF helped defend, is the cornerstone for controlling climate pollution under the Clean Air Act. The decision upholds forthcoming carbon regulations for new and existing power plants. Although the high court did grant review on a narrow procedural issue, we're confident we'll prevail there, too.



“For a long time, I despised environmentalists. But since I got to know EDF, I realized we want the same thing, lots of fish out there and healthy fisheries.”

—Rob Seitz
California commercial fisherman

BY THE NUMBERS DEFENDING EPA'S MERCURY AND AIR TOXICS STANDARDS

35 tons of mercury are emitted by U.S. coal plants annually

40% of U.S. lakes and rivers have mercury advisories

400,000 infants are born with high levels of mercury in their blood annually

\$293 million spent in 2009 and 2010 by opponents of EPA's rules

5 major cases where EDF defended the mercury rule from the coal lobby in 2013

11,000 premature deaths will be prevented annually

90% decrease in emissions from power plants by 2016

By the year **2050**
two out of three
polar bears
could be **lost**.

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To learn more, call 800-684-3322 or visit edf.org/monthlygiving.

From chief diplomat to climate statesman

AT 92, GEORGE SHULTZ CAN LOOK back on a distinguished career in public service, having served two presidents in four cabinet-level positions—only the second man in American history to have done so.

And after all that, he's still ready to fight for what he believes in—particularly when it comes to the environment.

Shultz has been defending the natural world for decades. In 1987, as Secretary of State in the Reagan administration, he helped negotiate the Montreal Protocol, the historic treaty that phased out the use of ozone-depleting chlorofluorocarbons.

Today, the GOP wise man is deeply engaged in the struggle to stem climate change. “The climate is changing—all the science is pointing in just one direction,” he says. “You’ve got to be living in another world if you don’t realize it.”

In 2010, Shultz helped lead the fight to defeat a ballot initiative to dismantle California’s landmark global warming law.

“Secretary Shultz co-chaired the campaign to protect the law,” says Derek Walker, EDF associate VP for U.S. climate and energy. “When oil companies put millions of dollars behind the ballot initiative, Shultz worked closely with EDF and other organizations to maintain a steady drumbeat of support for the law.”

In Shultz’s view, the United States is key to any effort to stop climate change. “The U.S. needs to lead on climate change by getting the science right, and then



“I have great-grandchildren,” says George Shultz. “What kind of a world will they inherit?”

finding practical solutions,” he says. “The world responds when the U.S. leads.”

In particular, Shultz urges the United States to engage China. “As the world’s largest emitter of carbon, China is the principal country we need to work with,” he says. “China is acutely aware of climate change. They’re ready to do something. We ought to reach out to them.”

Shultz advises EDF on a range of issues, including global warming and natural gas, where his decades of experience have proved invaluable in bringing diverse groups together. “EDF takes an

informed, careful approach to environmental issues and understands the real world,” he says. “They call attention to environmental issues and devise practical solutions. That gains respect. In the end, that’s all that matters: did you achieve something?”

Today, Shultz remains a man in step with the times: he drives an electric car and charges it with solar panels on his roof. And he’s still looking to the future.

“I have great-grandchildren,” he says. “I often think, ‘What kind of a world will they inherit?’”

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of life is to plant trees,
under whose shade
you do not expect to sit.**

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The Gulf Coast's culture, economy and environment depend on oysters.

Consider the oyster—and save the coast

LAST AUGUST, IN SOUTHERN LOUISIANA, there was no escaping the sun. Temperatures were in the high 90s as men worked in the shallow, muddy waters at the edge of Marsh Island. A parade of tugs and barges arrived to scatter ton after ton of recycled oyster shells collected from local processing plants.

Their goal: To build an artificial oyster reef where floating oyster larvae can settle and grow.

Big changes are under way in the Mississippi River Delta. Large-scale restoration work will soon begin to revive the vanishing coastline, reconnecting the river to its wetlands by breaching the levee in targeted places. We're helping guide the work, in which enormous quantities of sediments carried by the river will create landmass to bring the coast back to life. This project is vital to the survival of New Orleans and the area's shipping, fishing and petrochemical industries.

Oystermen worry that increasing the flow of freshwater will upset the delicate balance their oyster beds need to thrive. The state of Louisiana and the oyster industry are using cutting-edge science to develop new ways to grow oysters.

"Oysters are a critical part of the ecosystem," says EDF scientist Dr. Angelina Freeman, who designed the artificial reef and habitat mapping project. "They create a living coastline."

When Canadian Catholics who became known as Cajuns arrived in the delta in the 1700s, vast oyster reefs stretched for miles in the shallow waters, growing

to ten feet tall. The oysters grew one on top of another and laid down a three-dimensional ecosystem that protected the shoreline from storm surges, provided nooks and crannies for fish and filtered impurities from the water. The abundance of oysters created a booming industry and jobs.

Now most of those reefs are gone, victims of overfishing, dredging for building materials, pollution and the ecological tragedy caused by engineering the Mississippi River Delta for flood control and navigation projects.

"The oyster population is the lowest I've seen in 42 years," said Steve Voisin of Motivati Seafoods, whose ancestors began harvesting oysters when the area still belonged to King Charles IV of Spain.

Louisiana remains the world's top oyster producer, boosting the economy by \$317 million yearly. But the industry and the thousands of jobs that depend on it are in trouble after being hit by multiple storms and the BP oil disaster. South of Houma, 90% of manmade beds have vanished since Hurricane Katrina.

Now, coastal rebuilding efforts pose an additional challenge. "Some oysters will have to be moved," says Steve Cochran, who heads EDF's Gulf restoration work.

Oystermen have been moving beds for over a century. But never this extensively. "This is a transition period—and it won't be easy for some oystermen," says Cochran. "But by working with them, we can help the industry survive."

That's why we launched the artificial

reef project. With the Louisiana Department of Wildlife and Fisheries and academic partners, we mapped unknown oyster habitats using side-scan sonar, echo sounders and other geo-imaging tools to collect data about the sediment and seafloor. And then, an old-fashioned long pole to test the findings.

Identifying the best places to relocate oyster beds is critical to restoring both the industry and the Gulf Coast to health. "We have no choice," says Cochran. "If we don't fix the coast, we'll lose everything."

Can oysters protect the Big Apple?



Following Superstorm Sandy, historic oyster centers are re-creating once-extensive beds to protect against storm surge. In New York Harbor, four reef restoration projects are under way.



Esprit de Corps

By Charlie Miller

How a small cadre of grad students is helping the Fortune 500 save energy—and deliver huge reductions in greenhouse gas emissions. EDF Climate Corps is the planet's fix-it brigade.

IT WAS WHILE WORKING AS A TREKKING guide in Patagonia that Nick Gordon first witnessed climate change in action. “I watched glaciers retreating so fast I could see the changes on a weekly basis,” says the Santiago, Chile, native. “Being in such a remote place you realize—this really is a global issue.”

So after spending time as a professional triathlete, Gordon enrolled as a graduate student at Columbia University and took up the challenge of fighting climate change as an EDF Climate Corps fellow. EDF Climate Corps pairs

graduate students with companies and institutions around the country looking to use energy more efficiently. Embedded at their assigned companies for the summer, the fellows recommend ways to cut greenhouse gas emissions while lowering utility bills.

Gordon worked at the reinsurance firm AIG in New York City, where he recommended numerous actions, including adding solar window film to reduce the air-conditioning load. The changes Gordon suggested could prevent 1,700 tons of carbon dioxide from entering the



ENSE DESTOUT

EDF's network of new green leaders has been embedded in Fortune 500 companies.

atmosphere. That's equal to the carbon emissions of burning almost 4,000 barrels of oil. Gordon is now eyeing a career in the sustainability field.

"For me," he says, "sustainability is more than a field—it's how you approach everything."

Since its launch in 2008, EDF Climate Corps has trained 400 fellows, who together have identified nearly \$1.3 billion in energy savings, enough to power 180,000 homes annually over the lives of the projects. EDF Climate Corps fellows are the next generation of green business leaders.

EDF Climate Corps: Counting the Results



Nearly **1.3 billion** reduction in energy costs

More than **3.6 million** metric tons of emissions avoided



Note: Amounts calculated over projects' lifetimes, once projects are implemented.

Many of them have been hired by their host firms and some 70% are working in sustainability at leading companies, startups, private equity firms and other organizations.

Energy savings are typically found in lighting, heating and cooling, but waste comes in many forms. At one company, the sleep timers on conveyer belts at a distribution center hadn't been set properly, so the belts, powered by more than 1,000 motors, were running for hours when no one was using them. Ani Krishnan, a 2012 fellow working with the City of Dallas, ferreted out thousands of computers operating without power management. He found free software that puts the computers to sleep at night when they are not needed.

Last May, as tourists strolled along San Francisco's Embarcadero, in a nearby hotel 116 brand new Climate Corps fellows were receiving a week of intensive training. They learned from outside experts and EDF staff how to locate energy waste and calculate potential savings. Then they fanned out across the country to companies like AT&T and Verizon, JPMorgan Chase and Bank of America, Facebook and Apple.

Getting smart about energy

The need for energy efficiency is urgent. According to experts at Lawrence Livermore National Laboratory, almost 60% of the energy produced in the United States is wasted, from waste heat at power plants to inefficient lightbulbs and appliances. No expert who has studied global climate change believes we can solve the problem without dedicating ourselves wholesale to energy efficiency. The global consulting firm

McKinsey & Co. has estimated that 40% of the emissions reductions we need to stabilize the climate can be found in energy efficiency alone.

Saving energy means saving money, but many companies still don't get it. That's changing as companies realize that they can't afford to leave money on the table if they hope to compete globally.

Focused elsewhere, busy managers overlook efficiency

But why do powerful multinationals need the advice of a graduate student? Often, managers are focused on a company's core business, so opportunities to make profits in other ways go unnoticed.

Other reasons lie mostly in behavioral economics: the tendency of busy managers to procrastinate, and the so-called endowment effect, an apparently deep-seated human need to stick with the status quo. EDF Climate Corps brings into the corporate environment a trained expert whose only job is to find and eliminate energy waste.

EDF Climate Corps fellows come from many backgrounds and nationalities, but all have sustainability in their blood. As millennials, they were schooled from an early age in threats to the environment. They nagged their parents about recycling and prepared ecology science fair projects.

Now they're in a hurry to fix things. Research has shown that they're much more concerned about global warming than boomers. An overwhelming 87% consider a company's commitment to social and environmental causes when deciding where to work.

EDF Climate Corps reflects this generational commitment. Jason Klein

developed a highly rated iPhone app that helps drivers stay within speed limits. That entrepreneurial background made him a perfect fit for EDF's Climate Corps program. Today he's working for a firm in Sacramento that advises companies on energy use in their data centers.

"I came to business school wanting to get involved in clean energy," Klein says. "Climate Corps was exactly what I was looking for."

Michelle de Arruda spent the summer of 2012 as a fellow at UNICEF in New York. Her interest in the environment was triggered by something she saw in a grocery store in Ukraine. Hanging from the wall was a Geiger counter, used to measure radiation on the store's produce from the Chernobyl nuclear accident—a vivid reminder of what happens when humans are careless with the environment. Today, she is working in Mozambique for a development program called MBAs Without Borders.

Repeat customers

Many organizations participate in EDF Climate Corps for multiple years, having seen the many economic and environmental benefits the programs offers.

AT&T has been hosting fellows since 2010, when a business school student trained by EDF found ways to reduce lighting energy use in AT&T's call centers by 80%. "I'm sure we are going to be doing this for many years to come," says John Schinter, AT&T's executive director of energy.

And it isn't just private industry taking advantage of the program. Many fellows have worked for major cities such as Atlanta, Cleveland and Los Angeles and for public institutions such as the New York City Housing Authority. Since 2009, we have also brought fellows to many historically black colleges and universities, from Howard University to Florida A&M.

Derek Oliver, a Naval Academy grad-

“If you are unsure how to jump-start your company's energy efficiency journey, EDF Climate Corps provides the best path forward that I have found.”

—Scott Tew, Director, Center for Energy Efficiency & Sustainability, **Ingersoll Rand**

uate and former Marine Corps fighter pilot once deployed to Iraq, worked last summer as an EDF Climate Corps fellow at the Massachusetts Port Authority. There he helped tenants of Boston Logan International Airport, such as restaurants and airlines, take on energy efficiency. Oliver's recommendations could eliminate more than 5,000 tons of carbon every year, equal to the emis-

Spotlight on Climate Corps fellows

Saving energy at data centers



A former asthma sufferer, Varma (center) is now an avid bicyclist.

Dhruv Varma's interest in environment issues dates to a childhood in heavily polluted Mumbai, India, where he grew up suffering from asthma. Today, his asthma is under control, but his commitment to sustainability remains.

A business student at Babson College, Varma spent the summer of 2013 as an EDF Climate Corps fellow at Yahoo! in Sunnyvale, CA. Yahoo! data centers require substantial cooling—a big energy drain. But while the rest of the data center world was focused on cooling them efficiently, Varma decided to see if Yahoo! servers were actually being used to capacity, or if some could be safely shut down. His findings could result in major savings for Yahoo!

New light in the nation's capital



Changing a lightbulb at the Smithsonian can take two hours, says Downs, so it made sense to switch to longer-lasting bulbs.

As a Peace Corps volunteer in Gambia, Annie Downs oversaw a reforestation project that planted hardwood seedlings along the Gambia River. As an EDF Climate Corps fellow more recently, she planted ideas for saving energy at the Smithsonian Institution.

Downs' ideas took root immediately. Working at the National Portrait Gallery, the National Air & Space Museum and other museums, Downs found multiple examples of inefficient lighting that, once upgraded, could save the Smithsonian \$175,000 a year and cut as much pollution as burning 80,000 gallons of gasoline. Today, Downs continues sleuthing for ways to cut climate pollution as a research analyst at the American Council for an Energy Efficient Economy.

sions of more than 1,000 cars.

"I have consumed more than my fair share of energy as a pilot and am eager to compensate," says Oliver.

Climate Corps 2.0

As corporate America's commitment to sustainability grows, EDF Climate Corps is moving beyond the low-hanging fruit of energy efficiency—lighting, heating and air-conditioning—to promote systemic change in organizations.

Elizabeth Turnbull Henry, an EDF Climate Corps alumna, is now adidas Group's senior manager for environmental affairs. She has created an investment fund for the company called the Green Energy Venture Capital Fund. The fund makes strategic investments in energy efficiency across the company's real estate portfolio and has delivered an impressive 37% return on investment to date.

Almost 60% of the energy produced in the U.S. is wasted.

EDF Climate Corps is also breaking new ground in Chicago. We recently launched the Building Energy Initiative, designed to help the city's Retrofit Chicago program reduce energy use in commercial buildings by 20% within five years. More than 30 buildings are now participating in Retrofit Chicago, including landmarks like the Merchandise Mart and the Wrigley Building.

We're recruiting more building to join the program, and have two experts on the ground providing year-round technical support. Six fellows descended on the city in 2013, embedded at AT&T, the Chicago Public Schools and the John D. and Catherine T. MacArthur Foundation, among others. Next summer, that number will jump to 25 fellows.

"Retrofit Chicago is making Chicago a more livable, competitive and sustainable city," says Karen Weigert, chief sustainability officer for the City of Chicago. "EDF Climate Corps is providing the boots on the ground to help reach that goal."

What's next?

By now, the idea behind EDF Climate Corps—that a smart young leader armed with specialized training can find huge opportunities to cut emissions and

costs—has been validated repeatedly in hundreds of organizations.

So what's next? "Our vision of EDF Climate Corps is a network—not just a fellowship program," says Victoria Mills, managing director of corporate partnerships. "That way we'll be able to drive change farther and faster than we ever could on our own."

That's what happened last summer at Texas Southern University (TSU) in Houston, when fellow Jenise Young helped develop a climate education consortium for historically black colleges and universities across the Southeast. In addition to identifying energy efficiency upgrades on TSU's campus, Young helped dozens of universities in the region understand that they too must invest in energy efficiency.

She helped build a compelling case by pointing out that climate change is already hurting minority communities, like those surrounding TSU. One clear vulnerability is hurricanes, which scientists predict will become more intense and more destructive in a warmer world. The six states with the highest African American populations are all within Atlantic hurricane zones. "Despite the challenges ahead, I'm hopeful my generation will continue to change the way we use energy," says Young.



COURTESY OF NICK GORDON

After two years watching the glaciers recede in Patagonia, Nick Gordon felt compelled to enroll in EDF Climate Corps.

EDF Climate Corps is already bringing together a broad network of people and organizations with the power to transform the way the country uses energy: large energy consumers, young professionals, policy makers, utilities, and our colleagues in the environmental community. Through this network, we can create change on a scale commensurate with the challenge at hand: reining in global climate change.

It's a tall order. But once you've found \$1.3 billion in energy savings in just six years with only a small team of graduate students, nothing seems impossible.

EDF Climate Corps: It's Showtime!

EDF Climate Corps is featured in executive producer James Cameron's Showtime TV series on global warming, *Years of Living Dangerously*. In the series, actress Jessica Alba follows three EDF Climate Corps fellows as they attempt to change the culture at organizations across the United States.



The Showtime series, six one-hour episodes, premieres in April.

»»»» WATCH THE TRAILER »»»»
yearsoflivingdangerously.com



A male lesser prairie chicken struts his stuff.

JACOB S. SPENGLER/ISTOCK.COM

Saving the lesser prairie chicken



David Wolfe, based in Austin, TX, is EDF's director of conservation strategy and habitat markets.

An estimated one million Attwater prairie chickens roamed Texas and Louisiana in 1900, before habitat loss drove them to the brink of extinction. The few left on the Attwater prairie chicken refuge, in southeast Texas, were raised in zoos.

What have we learned from this experience? Prairie chickens need millions of acres of habitat to survive—far more than can be preserved through purchase and the establishment of federal or state refuges and preserves.

Today, the lesser prairie chicken, which lives in the southern Great Plains, is following the same path as the Attwater. Just 17,000 remain in the wild.

What to do? EDF is developing a strategy to recover the lesser prairie chicken, while enabling the responsible continuation of farming, ranching and energy development. We call this strategy the Lesser Prairie Chicken Habitat Exchange.

Farmers and ranchers earn money by taking conservation actions that benefit the species, such as planting native grasses, removing fences and cutting down invasive trees. First they receive "chicken credits" for these actions, then they sell them through the Habitat Exchange to energy companies that need to offset the impacts of development.

The goal? Putting the lesser prairie chicken on a path to long-term sustainability. More broadly, Habitat Exchanges could create habitat for other at-risk species, like Sandhill cranes and San Joaquin kit foxes, which also range predominantly over working lands.

>>> READ THE WHOLE STORY >>> edf.org/prairiechicken

The link between air pollution and cancer



Keith Gaby, based in Washington, DC, is EDF's climate communications director.

There is no argument about bladder cancer. There are no strident cable TV debates, warring websites or ideological struggles about whether lung cancer is real. The same can't be said about climate change.

But strangely, those two issues are closely linked. A new study shows that air pollution causes hundreds of thousands of cancer deaths every year. Particulate matter produced by factories, cars and other sources is one culprit. Scientists now classify polluted air as a "Group 1" cancer source, along with plutonium, silica dust, ultraviolet radiation and tobacco smoke. And the result is more than 220,000 human lives cut short.

The results are sobering, but not surprising. Common sense suggests that putting chemicals in the air is bad for those who breathe it. Similarly, dumping billions of tons of pollution into the air is bad for the planet. And the connection doesn't stop there, because the solution is the same in both cases. Shifting rapidly toward clean energy will mean less particulate matter and carbon pollution, leading to fewer cases of cancer and other diseases and lessening the impacts of climate change.

>>> READ THE WHOLE STORY >>>
edf.org/cancer&pollution

Five ways climate change is affecting our oceans



The world's oceans are changing rapidly in response to climate change. Find out what's happening: edf.org/5ways

Restoring precious marine resources in Cuba

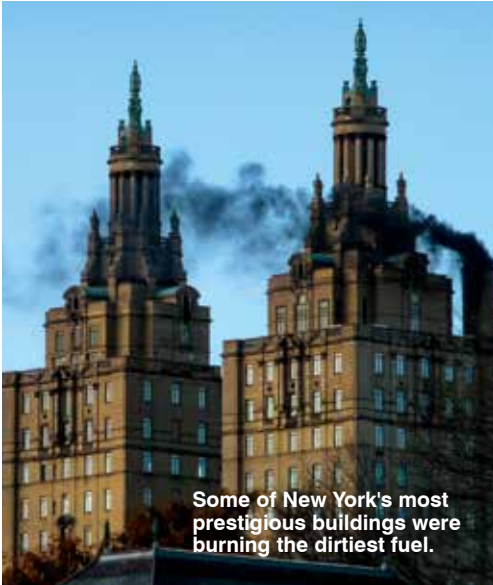


Cuban fishermen are working to integrate sustainable fishing into their traditional way of life. edf.org/cubafishing

EDF Voices blog

Find out what other topics our experts are talking about. Visit EDF Voices at edf.org/blog.

A big win for healthy air in New York City



New York City's air is the cleanest it's been in 50 years, thanks to EDF's partnership with the city to phase out dirty heating oil.

We launched the partnership in 2008 after our groundbreaking report, *The Bottom of the Barrel*, revealed that 1% of New York City's buildings were producing as much soot as all the city's cars and trucks combined. Those 9,000 buildings, some of them in the city's most exclusive neighborhoods, burned the dirtiest kinds of heating oil, essentially sludge.

Our campaign gained additional momentum when EDF attorney Isabelle Silverman handed then-Mayor Michael Bloomberg a vial filled with the dirtiest heating oil. The mayor asked, "If I drink this, will I die?" Silverman replied, "Yes."

That got the mayor's attention. Five years on, air quality in New York has improved dramatically.

BY THE NUMBERS NYC AIR SINCE 2008

2,700

Buildings converted to cleaner heating fuels

69%

Reduction in toxic sulfur dioxide pollution*

35%

Reduction in toxic nickel pollution*

23%

Reduction in fine particulate matter (soot)*

800

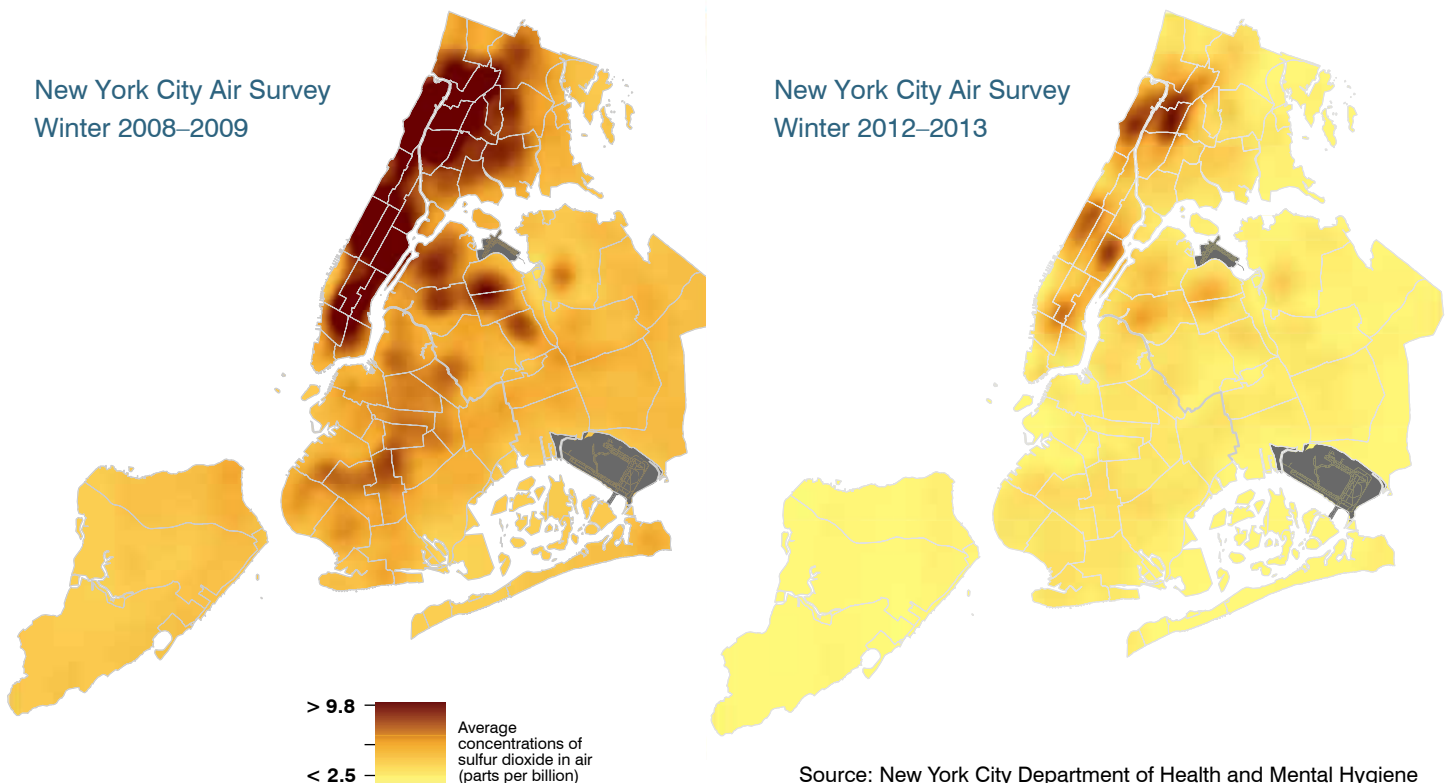
Lives saved each year

*Average concentration in air

“The Environmental Defense Fund has played a big part in the success of our initiative.”

—Michael Bloomberg, New York City Mayor, 2002–2013

Cleaning up soot, street by street



Source: New York City Department of Health and Mental Hygiene



JOHN PAE

Most people think products on retail shelves are safe—but that's not necessarily the case.

Can we get toxic chemicals out of our cupboards?

Ever worry about what's in that cleaner you just sprayed all over the kitchen? What about your baby's shampoo? Thanks to a new chemicals policy announced by Walmart, with help from EDF, consumers are a step closer to having safer products in their homes.

FOR 127 MILLION AMERICANS, a trip to Walmart is a weekly household ritual. In September, the retailer unveiled a new policy to phase out some potentially harmful ingredients found in everyday products like shampoo, baby lotion, cosmetics and air fresheners, and replace them with safer ingredients. It was the first major retailer to do so.

"Consumers are demanding safer products," says Dr. Sarah Vogel, EDF's Health program director. "Scientific research points to serious risks of chemical exposures to our health, including cancer, diabetes and infertility."

In 2007, EDF opened an office in Bentonville, AR, near Walmart's corporate headquarters, to help the retailer lessen its environmental footprint. "The very first conversation we had was about chemicals," says Michelle Harvey, our project manager.

Two years later, Walmart began using a software screening tool, developed with help from EDF to assess the chemical ingredients of household cleaners, personal care products and other chemical-based items on its shelves. The software, called GreenWERCS, eventually revealed disturbing news: Almost 40% of formulated products on Walmart shelves contain chemicals that may pose health risks.

Faced with these findings, Walmart took action. "EDF was instrumental in assisting us with a rigorous yet achievable policy to further our goal and help ensure the products on our shelves are affordable and sustainable," says Andrea Thomas, Walmart's senior VP for sustainability.

Disclosure is key

Walmart's new policy targets about ten chemicals commonly found in consumer products for replacement with safer ingredients. By 2015, for more than 3,000

product categories, it will require suppliers to disclose all product ingredients online. The company also plans to take its private label products through a more stringent screening process.

“We’ve learned through experience that you really can create environmental progress by leveraging corporate purchasing power,” says Elizabeth Sturcken, managing director for EDF’s corporate partnerships. “And who has more purchasing power than Walmart? Walmart’s action is sure to have a ripple effect across the entire supply chain.”

“When companies like this make a shift, it’s huge,” says Judi Shils, executive director of Teens Turning Green, a nonprofit that promotes environmentally conscious choices for young adults. “You’re influencing Middle America.”

“The changes won’t happen overnight, but they represent a major step forward,” says Sturcken. EDF will closely monitor and verify the reduction of haz-

ardous chemicals until the promise for healthier products becomes a reality. “Ultimately,” Sturcken adds, “Walmart’s policy will be evaluated on results.”

Some suppliers are already taking action. For example, Procter & Gamble, the world’s largest manufacturer of consumer products, including Cover Girl, Crest and Ivory, recently announced plans to phase out two ingredients—phthalates and triclosan—from beauty and personal care products by 2014. Meanwhile, Johnson & Johnson has begun removing some potentially cancer-causing chemicals from baby products.

Voluntary efforts to rein in chemicals of concern are important, but they cannot take the place of strong regulatory standards. We’re urging Congress to strengthen and pass the Chemical Safety Improvement Act, which represents the first real chance in nearly 40 years to replace the current, woefully inadequate chemical safety law.

What kinds of products does Walmart’s safer chemicals policy cover?

			
		10,000+ products	
3,000+ product categories			
		Products in these categories must have ingredients disclosed online by 2015	

Simulated products are solely to illustrate product categories. Some products may already disclose their ingredients.

One mom who got involved

EDF helped found Moms Clean Air Force, a band of mothers—now more than 150,000 strong—that is committed to taking direct action to protect the health and well-being of their families.



A key member of our team is Molly Rauch, a mom blogger who lives and works in Washington, DC. She joined our effort because of an array of health risks her children face. Among other things, tests showed that the couch her kids played on contained a toxic flame retardant linked to cancer.

Rauch’s writing on environmental health has appeared in The Huffington Post and elsewhere. After joining MCAF, she has galvanized other parents to take action. “We need a committed army of moms determined to make our children’s health a national priority,” says Rauch. “Are we mom enough to do that?”

>>>> ONLINE

Join the growing ranks of parents and grandparents fighting for clean air. momscleanairforce.org

Can wildlife survive a warmer world?

CLIMATE CHANGE IS DISRUPTING THE BIOLOGICAL world, pushing many species to the brink of extinction and turning others into runaway pests.

In a recent study of 1,700 species, more than 50% show signs of having been affected by climate change. For example, habitats have shrunk, shifted north or moved to higher elevations; animal species are breeding earlier in the year; and many varieties of plants are blooming sooner than ever before.

For migratory birds, this can mean a mismatch between their food source and breeding schedule. Where will shorebirds that nest in the Arctic go when their habitat is compromised?

What troubles scientists most is that if we are only in the early stages of warming, the imperiled animals might be just the first of many to be harmed. “We need policies that help species survive and make ecosystems resilient—in part by capping pollution but also by removing other stressors,” says EDF scientist Dr. Rebecca Shaw.

To help wildlife, EDF is developing programs that pay landowners to maintain habitat vital to many threatened animals. We’re also creating incentives to end overfishing, protect wetlands and encourage water conservation. Since humans are largely responsible for climate change, we owe it to our wild brethren to help them adapt.

Climate invaders!

Not all species are suffering under climate change. Some are thriving, unfortunately.

■ Ticks

Warmer temperatures are expanding the range of deer ticks that spread Lyme disease.

■ Jellyfish

Jellyfish thrive in warmer waters and need less oxygen than other sea life. Some species eat large quantities of plankton, a key food source for many fish and whales.

■ Bark beetles

Without severe winter cold that kills beetle larvae, pine bark beetles have exploded across the West, laying waste to forests.

■ Salt cedar

Drought-resistant salt cedar is lowering water tables and crowding out cottonwoods and other plants important to wildlife.



GETTY IMAGES

CANADA LYNX Declining snowpack has meant the Canada lynx can't effectively hunt snowshoe hares, its principal prey. Deep snow typically excludes the lynx's main competitors—coyotes and bobcats—and its predator, the mountain lion, from its winter habitat. It is believed fewer than 1,000 survive in the lower 48 states.

>>>> ONLINE >>>>

See more wildlife that is imperiled by climate change and learn how you can help at edf.org/wildlifeatrisk.



ANIMALS ANIMALS

EDITH'S CHECKERSPOT BUTTERFLY This non-migrant species inhabits patches no larger than several acres, but plants on which checkerspot caterpillars live are withering, starving the insects before they can become butterflies. As a result, the butterfly's range has shifted north by 63 miles, perhaps dooming the southern subspecies, the endangered Quino.



ANIMALS ANIMALS

MOOSE Moose populations in Montana, New Hampshire and Minnesota are in steep decline. The die-off has been linked to shorter winters. Warm autumns and wet springs benefit ticks, which can cluster on moose, causing anemia and loss of appetite. This weakens the animals at the onset of winter when they need their strength most.



WIKIPEDIA

PURPLE FINCH Roughly 60% of 305 species of North American birds including the purple finch already are wintering farther north, some hundreds of miles from their former range. Shifting habitat can produce new threats.



ANIMALS ANIMALS

ELKHORN CORAL Once the most abundant reef-building coral in Florida and the Caribbean, elkhorn have declined by 90% in many areas, mainly as a result of coral bleaching caused by rising sea temperatures and ocean acidification.



ISTOCKPHOTO

AMERICAN PIKA Well-known to hikers in the Rockies, pikas are sensitive to heat—even brief exposures to temperatures above 78 degrees can be fatal. Some populations already occupy the highest altitudes, with no place to move upward.

Six kinds of fish you can order safely

NEARLY TWO-THIRDS OF THE world's fisheries are overfished. At the same time, EDF and our partners are making real progress working with fishing communities throughout the world. In the United States, for instance, more than 100 species are on the path to recovery. In the Gulf of Mexico, the red snapper fishery, once on the brink of collapse, is rebounding.

That's great, you may be thinking—but what can you do personally? You can make the best choices as a consumer. Buying sustainably caught fish supports sensible, scientifically sound practices that contribute to a healthy ocean.

In the meantime, you can also improve your own health. Fish are good for you, just like your mother said. They are a high-protein, low-fat food, and oily fish are high in heart-healthy omega-3 fatty acids. Since we can't make enough of these essential nutrients on our own, fish are an important part of our diet.

On the other hand, fish can accumulate high levels of environmental contaminants like mercury and PCBs. Excess mercury can severely affect a child's development, so young children and women of childbearing age should limit their intake of some fish. But for adults who eat an average amount of seafood, the cardiovascular benefit usually outweighs the risk from PCBs and mercury.

Making sense of the complex information available is not easy. To help consumers make informed choices, EDF, in collaboration with the Monterey Bay



Healthy for you—and the environment.

Aquarium, created the Seafood Selector, a simple guide that assesses fish and shellfish you're likely to find in your local supermarket or restaurant. Our guide, for instance, details provides ratings for levels of contaminants for each fish.

Here are six eco-friendly kinds of fish that are also healthy to eat.

■ Albacore tuna (U.S., Canada)

Albacore are resilient to fishing pressure because they grow quickly and reproduce often. Their Eco-Rating is: Best; Omega-3s: High; Mercury Level: Moderate. *Note:* Mercury Level Ratings for canned white and imported albacore are Elevated.

■ Atlantic mackerel (Canada)

Mackerel mature quickly. The type of gear typically used to catch mackerel—purse seines and gillnets—results in low to mod-

erate bycatch. Their Eco-Rating is: Best; Omega-3s: High; Mercury Level: Low.

■ Pacific sardines (U.S., Canada)

Sardines reach sexual maturity quickly and spawn several times a year. This makes them very resilient to fishing pressure. Their Eco-Rating is: Best; Omega-3s: High; Mercury Level: Low.

■ Sablefish (Alaska, Canada)

Sablefish (black cod) populations are healthy, and the method of fishing them (bottom longlines) produces little bycatch or harm to bottom habitat. Their Eco-Rating is: Best; Omega-3s: High; Mercury Level: Moderate.

■ Salmon (canned)

The majority of fresh and frozen salmon sold in the U.S. is farmed Atlantic salmon. However most canned salmon sold in U.S. supermarkets is wild caught pink or sockeye salmon from Alaska, which we strongly recommend. Their Eco-Rating is: Best; Omega-3s: High; Mercury Level: Low.

■ Wild salmon (Alaska)

Wild salmon from Alaska come from a well-managed fishery and are low in contaminants. There are five species of wild salmon from Alaska: chinook, chum, coho, pink and sockeye. Their Eco-Rating is: Best; Omega-3s: High; Mercury Level: Low.



EDF's Seafood Selector

To create our guide, EDF scientists and colleagues from the Monterey Bay Aquarium analyzed more than 200 types of fish and shellfish sold in the U.S. We encourage you to buy fish caught or raised in an environmentally responsible way. The Selector also provides the health recommendations for which fish to eat, including the latest information on omega-3s and mercury in seafood.

»»»» **ONLINE** seafood.edf.org

Letters

Can wind power be made safe for birds?

My enthusiasm for wind turbines has been tempered by the fact that they kill birds. I was encouraged to read in Fall *Solutions* that wind farm developers are working with local wildlife groups to minimize harm to birds and bats. What, exactly, is being done? I applaud all of your hard work on behalf of the environment.
—Sharon Marquis

Eric Holst, head of EDF's Working Lands program, responds:

You're right, wind power can harm birds, as do many other forms of energy development. With U.S. wind energy capacity nearly doubling from 2010 to 2012, one study estimates 234,000 birds are killed each year from collisions with turbines. But we don't know the true number because companies are not required to make wildlife fatality studies public.

Even so, that's a painful statistic. Protected species like golden eagles and certain bats can be disproportionately affected by wind turbines. We recognize the need for urgent action to lower the threat to birds and bats. That's why EDF is a founding member of the American Wind and Wildlife Institute (AWWI), a collaboration between environmental groups



Collaboration between environmentalists and the wind industry can help save birds.

and the wind industry. The partnership is building data-driven tools to help wind companies avoid and offset harm to wildlife. For example, a landscape mapping tool for wildlife and wind resources helps developers make safer siting decisions. AWWI is developing a database of confidential industry records of bird fatalities and exploring mitigation options to compensate for wildlife losses. Learn more at awwi.org.

How clean are EVs?

Certainly battery-powered cars are much cleaner than conventional gas guzzlers. But how much coal, gas or hydro does it take to provide the electricity needed for recharging? Is it an equal tradeoff—spew carbon on the road, or spew it at the power plant?
—Shirley Wall, Suttons Bay, MI

Mary Barber, EDF energy expert, responds:

Though we do need to be mindful of where the electricity for electric vehicles comes from, EVs already have significant environmental advantages over gasoline-powered vehicles. They eliminate the vehicles' combustion process, which is a huge contributor to unhealthy air and climate pollution. The benefit to climate is clear when renewable sources like solar and wind are used to charge EV batteries.

Many promising vehicle-to-grid technologies are being developed, including solar-charging batteries that store energy for later use or sell it to the power grid—and EDF's Smart Power team is analyzing their environmental benefits. As these technologies improve and are widely used, the environmental advantages will accrue.

Letters may be edited for length and clarity.

READERS RECOMMEND

Documentary

As the glaciers melt

Chasing Ice

On assignment in Iceland, photographer James Balog was shocked by how fast climate change was melting glaciers and decided to record their rapid disappearance worldwide. The results will astound you. You'll see the largest glacial calving event in history in which a piece of ice the size of lower Manhattan crashes into the ocean. Kelly Lyon of Boulder, CO, told us: "My husband was finally convinced about climate change by watching this movie."

>>>> HOST A SCREENING
bit.ly/1bxzG5G



Online videos

Time to confront our addiction to material things

The Story of Stuff



We have a problem with Stuff. These online videos were created to help build a society based on *better*, not more. The Story of Stuff Project's journey began with a 20-minute movie about all the Stuff in our lives. Forty million views later, it's a global community of 500,000 people working for a healthier planet. Says one EDF member, "It's very entertaining, funny—and informative!"

>>>> WATCH ONLINE bit.ly/IPCL6M

Children's book

From cocoa beans to candy bars

No monkeys, No chocolate

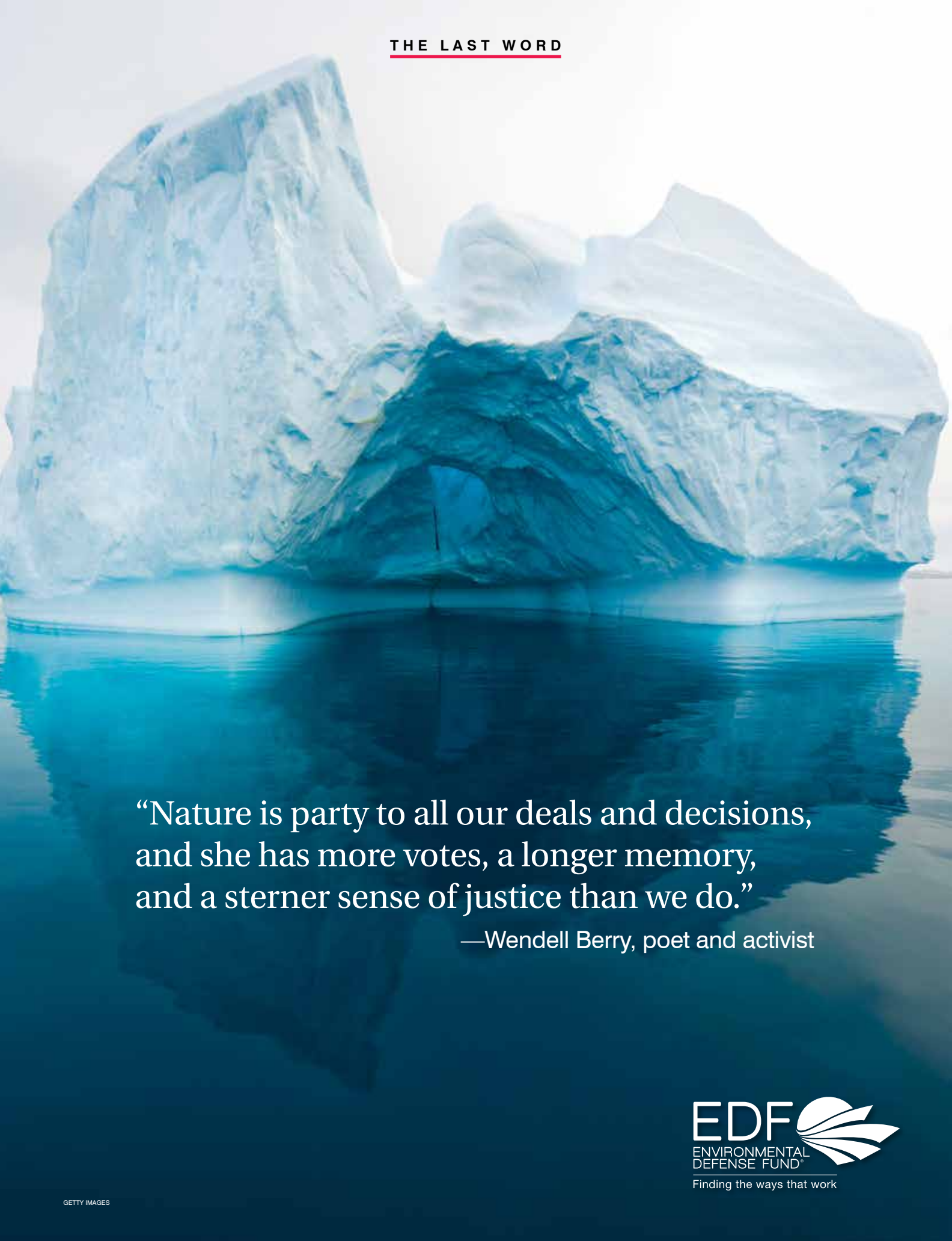


This luscious book explores the ecology of a cocoa tree in the Costa Rican rain forest where a lizard, a midge, maggots—and capuchin monkeys!—enable the tree to produce pods and flourish. The story "clearly demonstrates the interdependence of everything" and is "not just for children," says our reader.

>>> TELL US >>>

What do you recommend?

Share what inspires you as an environmentalist at editor.edf.org.



“Nature is party to all our deals and decisions,
and she has more votes, a longer memory,
and a sterner sense of justice than we do.”

—Wendell Berry, poet and activist