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Watch for our NEW LOOK



Soon you'll begin to see this bold new design for Environmental Defense Fund. Between now and the end of the year, the new design will replace our 'e' symbol as new materials are printed.

The House makes history!



Doug Kapustin

EDF president Fred Krupp greets Representative Henry Waxman (D-CA), the main architect of the House climate bill, at an EDF reception in Washington, DC.

On June 24, the House of Representatives passed historic legislation to dramatically lower U.S. greenhouse gas emissions, a bill that President Obama said “will open the door to a better future.” The final tally on the American Clean Energy and Security Act of 2009 was 219–212, with eight House Republicans crossing party lines to support the bill.

“Watching the vote, I realized I was an eyewitness to history,” says EDF’s legislative director Elizabeth Thompson. “Everybody—business, labor, environmentalists, centrists from both parties—came together to support this bill.”

EDF was instrumental to the victory, having contributed five years of scientific and economic research, expert testimony to Congressional committees and nonstop efforts to persuade House members to vote yes. We also organized support for the bill in target districts around the country and helped found the U.S. Climate Action Partnership, which

brought critical business support.

Our climate team, over 50 strong, had for weeks been guardedly optimistic, and in the end, we got what we needed. So we’re finally celebrating—sort of. In fact, the action now shifts to the Senate, where a filibuster is expected and the final margin is also expected to be razor thin.

We need your help. First, if your Congressman voted for the bill, call or write to say thank you; if he or she voted no, express your disappointment. Second, urge your Senators to support climate legislation. Also, the oil and coal lobbies are spending millions to defeat the bill, so we are asking for emergency contributions to the Environmental Defense Action Fund to counter their overwhelming financial advantage.

“This was a terrific moment,” says EDF’s Mark MacLeod, who focuses on the Senate. “But for me, the House vote was just the warm-up act. The big show is coming later this year.”

WHERE WE STAND

Global warming legislation: On to the Senate



T. Charles Erickson

Passage of the American Clean Energy and Security Act in the House is truly a momentous event. And it wouldn't have happened without the tireless work of EDF staff, the backing of the U.S. Climate Action Partnership and other allies, and the unwavering support of our members.

Still, we have a rough road ahead. We'll need 60 votes in the Senate to overcome a likely filibuster and get a strong bill to the President's desk. Interests vested in the status quo, like oil and coal, are spending millions to derail action.

But I am confident we will prevail in the Senate because America is ready to act: a recent Washington Post/ABC News poll shows 75% want global warming pollution regulated.

In this issue, we interview John Fetterman, the blue-collar mayor of Braddock, PA, home to many unemployed steelworkers. He gets it: a carbon cap, he says, "will create good jobs and help revitalize American towns."

Colorado farmer Edward Koester gets it too. He and his wife have been able to keep their 320-acre wheat farm in part because they earn royalties from an energy company that built wind turbines on their land.

The American Clean Energy and Security Act will spur similar investments across the economy. By putting a price on carbon, the bill will harness

the power of private markets to develop and deploy clean energy technologies at the lowest cost. This will begin to break our addiction to oil and reduce the threat to our national security that addiction supports.

This legislation is carefully designed to protect households and small businesses during the transition to a clean-energy economy. The non-partisan Congressional Budget Office puts those costs at \$175 per household per year. EPA estimates are from \$90 to \$120 per household (about the cost of a postage stamp per family per day, or about a dime a day per person). Just as important, it protects American

Time to get involved. Enlist your neighbors. Yell from the rooftops.

competitiveness by providing assistance to industries that could face competition from countries that have not yet capped their own emissions.

By capping carbon, the American Clean Energy and Security Act will help create a clean-energy economy for the 21st century—one that will help pull the country out of recession, strengthen our energy security, and heal a warming world.

This legislation, coupled with the Obama administration's new fuel economy rules, sends a powerful message to China and the rest of the world that the United States is serious about climate change.

To allow this opportunity to slip away would be a tragedy for the nation and for the planet. If ever there were a time to get involved—to call your Senator, to enlist your neighbors, to yell from the rooftops—this is it.

NEW AT EDF ONLINE

Between issues of *Solutions*, you can find the latest news online at edf.org. Check out these special features—and leave your email address for automatic updates!

Will the Canada lynx be a casualty of a warming planet?



Norbert Rosling/NIGS

This woolly cat needs deep snow to hunt snowshoe hares, its main prey. As climate change reduces

snow cover, the lynx faces tougher hunting and more predators. See the story of the lynx and six more species in peril at edf.org/warmingwildlife.

Why does the boss of a giant utility back a carbon cap?



Duke Energy CEO Jim Rogers is a maverick in a slow-changing industry. He explains: "A well-designed cap will smooth the transition to clean energy and keep electricity affordable." Watch a video at asmartcap.com.



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Talk back

Jobs for the coal industry

In the Spring 2009 *Solutions* I read that employees in wind energy outnumber those in coal in the U.S. Great! But what new work will come along for the coal dealers, the truckers and corner stores in the many towns of Northeastern Pennsylvania (where I grew up), built upon production of the hardest (anthracite: read “hottest”) coal in the world?

Dale M. Heckman, Davis, CA

Our director of sustainable technologies Jackie Roberts responds:

Coal-fired power plants supply nearly 50% of electricity in the U.S. Coal is not going away anytime soon. But if the U.S. is to meet its goals of cutting greenhouse gas emissions, we will have to get serious about controlling pollution from coal-fired plants. Carbon dioxide capture and storage



Tim Connor

is a promising area for job growth, including manufacturing, construction, transportation, and maintenance and monitoring jobs.

But other industries will grow as well because a shift to clean energy will create a market for hundreds of low-carbon solutions. For example, at LessCarbonMoreJobs.org, we profile companies in coal country poised to benefit from a cap on carbon—like Royal Mouldings in Marion, VA, a manufacturer of energy-efficient building materials, or Cardinal Glass Industries in Vinton, VA (glass is a key material for green buildings and high efficiency windows).

Livestock and pollution

I am very impressed with the work of EDF and always read *Solutions*. The pollution from factory farming is causing significantly more greenhouse gas pollution than cars, buses, trains and planes combined, yet this receives little attention from leading environmental groups like EDF. Why the silence on the subject?

Jean Cobb, St. Agatha, ME

Senior scientist Joe Rudek of our Land, Water & Wildlife program responds:

The UN estimates that the production of livestock, including feed production, accounts for nearly one-fifth of all greenhouse gas emissions. Fortunately, there are steps producers can take to reduce pollution.

In a number of places around the country, EDF works with producers to develop solutions to minimize the



Grant Heitman

environmental and health impacts from livestock production. Methane, the by-product of waste and a potent greenhouse gas, can be captured to run generators, producing renewable electricity and destroying the methane before it pollutes the atmosphere.

Operations that offset methane emissions may be eligible for carbon offset credits. EDF is working to pass federal climate legislation that would create an offset market enabling farmers, ranchers and forest landowners to participate.

Blog roundup

blogs.edf.org/greenroom

An outpouring of thanks for a historic climate vote

Our National Climate Campaign sent a personal video (edf.org/HouseVoteVideo) to thank the many EDF members who supported the landmark American Clean Energy and Climate Act. Here are some of their responses:

Thank you for acknowledging all of us who have provided a helping hand whether with signing petitions, contacting our elected officials to make a change or providing donations to the cause of protecting our planet. But it is you who deserve our thanks, by creating an organization which voices our concerns and desires when it affects our world.—**Naomi**

It's great to see the people behind the EDF organization. The environmental movement is a fellowship, and it's wonderful to actually see you all—I consider you dear friends. Thanks for your great work, and for the talking points we can use as we canvass the nation in preparation for the upcoming Senate vote. I can't wait to start phone calling!—**Mark Kraemer**

You have all articulated how important this is to my family and myself. As a Montessori teacher I teach my students that we are stewards of the earth. This makes me feel like I am setting a good example and have confidence in the work you do!—**Sophi Zimmerman**

Climate crusader

The fight for a law to curb global warming is the biggest, most important challenge EDF has ever faced. Steve Cochran has spent his whole life preparing for it.

Steve Cochran, a slight, bearded 56-year old with a Southern drawl, leads EDF's push for a climate bill. He directs 50 or so full- and part-time staffers, along with political and advertising consultants, and maps out EDF's strategies on Capitol Hill and in key districts nationwide. Through it all, he somehow maintains his characteristic good humor.

Cochran learned his craft in Louisiana, where he was raised and where politics is, to say the least, colorful. As one former governor put it, he wanted to be buried there "so I can stay active in politics." After graduating from Louisiana State University, he and a partner started an oil consulting business in Shreveport, LA, which must make him unique among environmentalists.

He left the business just before the oil bust of the 1980s, but after a brief spell studying anthropology at Harvard, he headed back home, where he worked on political campaigns and as a political consultant before becoming chief of staff to Gov. Buddy Roemer in 1988. After a stint at EPA, Cochran joined EDF in 1997.

Since the climate fight began five years ago, Cochran says, he's stopped coaching his son's sports teams (he still helps out as an assistant

coach), puts in 12-hour days and works weekends. "This is what I signed up for," he laughs. "I made a conscious choice to ask for this role, knowing it would consume my life for several years."

Lobbying is a very human business. Last year, for example, Cochran met with Sen. James Webb (D-VA), who has a reputation for bluntness. He arrived at Webb's office in the ornate Senate Russell Building primed for any contingency, but the Senator asked first about his background. The Cochrans, it turned out, hailed from Ashland, KY – coal mining country and a place Webb knew well.

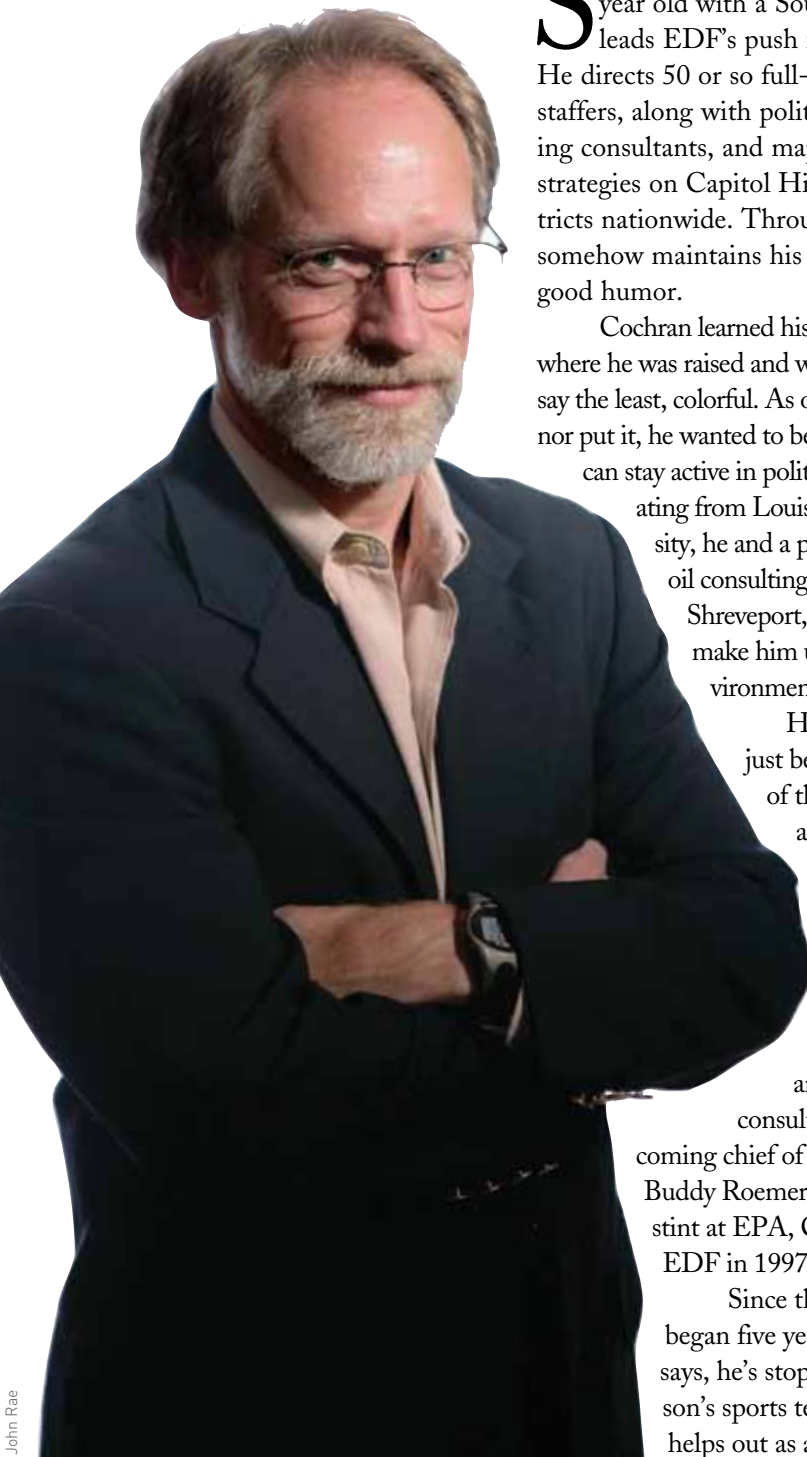
"What's your last name, again?" the senator asked. On hearing the answer, he exclaimed, "I think we're cousins!" The rest

"We have a historic opportunity today to get the legislation right, for our climate, our economy and our children."

of the meeting turned into what Cochran calls "an Appalachian love fest." Nonetheless, he adds, "The Senator still hasn't told me how he'll vote on a climate bill."

The biggest obstacle to getting climate legislation through Congress? "It's the hyper-partisanship of Washington today," Cochran says. "Back in the 1980s, my boss played poker every Wednesday night with Bob Woodward, Tip O'Neill, Antonin Scalia, and others across the political spectrum. That sort of thing doesn't happen anymore."

Cochran won't predict the outcome of the climate battle, but he's an optimist by nature. "We have a historic opportunity today to get the legislation right, for our climate, our economy and our children," he says from his desk piled high with Congressional testimony. Who knows, one day he might get back to coaching his son's baseball team.



John Rae

The challenge of India

CREATING A SUSTAINABLE FUTURE IN THE WORLD'S BIGGEST DEMOCRACY



Peter Adams/Corbis

Can India's booming economy be put on a clean path to enduring prosperity?

How do you raise awareness of the threat of global warming in a country of 1.2 billion people, one-third of whom lack access to electricity, where governing authority is dispersed among 600,000 rural villages?

That's the big challenge in India, a country that stands at a crossroads. India can continue powering its rapid development with polluting coal and oil; or it can choose a sustainable, clean energy future and cut its rapidly rising greenhouse gas emissions.

This looming choice makes India a pivotal actor at the global climate change summit in Copenhagen this December. As the world's largest democracy, India wields a huge amount of influence in the developing world. "India's going to be a central climate player, so we've begun to build relationships here in which EDF is an honest broker for change," says Richie Ahuja, the Delhi-based director of our India program.

A critical question for many Indians is how climate change relates to the country's No. 1 priority, which is addressing its extensive rural poverty. EDF and its Indian partner, The Hunger Project, have found a way to connect the two.

In India's decentralized political system, panchayats, or village councils, gov-

ern in the rural areas where 70% of Indians live. To reach this population, EDF and The Hunger Project, which has trained thousands of women to serve on panchayats, have produced a Bollywood-style film called *A New Beginning* about the connection between global warming and rural poverty in India. The film portrays a depressed, drought-stricken village that restores itself to agricultural and social health, led by a handsome male agronomist and a beautiful female council member (this is Bollywood, after all). The film will be used in the training sessions for women elected to panchayats to help spark local debate on sustainable solutions to India's development needs.

INDIAN YOUTH HELP LEAD THE WAY

EDF is also tapping into the energy of India's 700 million people under the age of 35. We helped launch the Indian Youth Climate Net-

work (IYCN), which has grown to more than 300,000 members since its founding in March of last year. EDF's Ahuja worked with Kartikeya Singh, a charismatic 24-year-old who is an IYCN founder and co-executive director.

The group's maiden voyage was The Climate Solutions Road Tour, which set out in January on a 2,100-mile trip to educate Indians about climate change and to study indigenous sustainable energy practices. The young people on the tour traveled in cars and trucks that ran on solar power and vegetable oils, accompanied by a solar-powered electric band called Solar Punch. The tour also launched the India Climate Solutions Project, a kind of environmental youth corps in colleges and universities.

More recently, IYCN and its partners sponsored the introduction of a solar lantern, called the Sunflower, to families in an industrial town in southern India. This is a pilot for a program that could soon be expanded to several thousand villages.

"Young people here have to dream about building a country that is not aping the U.S. in terms of development—a path which the recent ecological and economic signals have shown is not sustainable," Singh says. "It's up to us to define how India should develop."



Dinesh Khanna

The Climate Solutions Road Tour, supported by EDF, took its environmental message to India's rural villages.



Dave Lewinski

Mayor of steel

The man who runs a declining Pennsylvania town says the new clean energy economy is the key to revitalization of rust belt towns like his.

◀ Mayor John Fetterman believes a carbon cap will revive America's industrial heartland.

EDF has teamed up with John Fetterman, the young mayor of Braddock, PA, to create a series of powerful print, television and online advertisements in support of climate legislation before Congress.

Braddock has seen better days. Andrew Carnegie's first steel mill was built there, and for generations the town prospered along with the steel industry. At its height, 20,000 people lived in Braddock, but with the long decline of American steel, the town's population has dwindled to just 2,800.

Fetterman says he's participating in this campaign, along with the United Steelworkers union, because he believes the cap-and-trade bill is "a powerful solution" to his town's environmental and economic problems."

Solutions sat down with Fetterman recently to talk about climate change and economic policy.

How did you get interested in revitalizing your community with new energy manufacturing?

I grew up in York, PA, and I came to Braddock after getting out of graduate school. The community had suffered greatly from the deindustrialization of the 1970s and 1980s. I was attracted by the idea that you could use green manufacturing to turn things around, and after becoming mayor I had the opportunity to try that. Cap-and-trade will be the driver for these new industries—you don't have to go to Harvard to understand that.

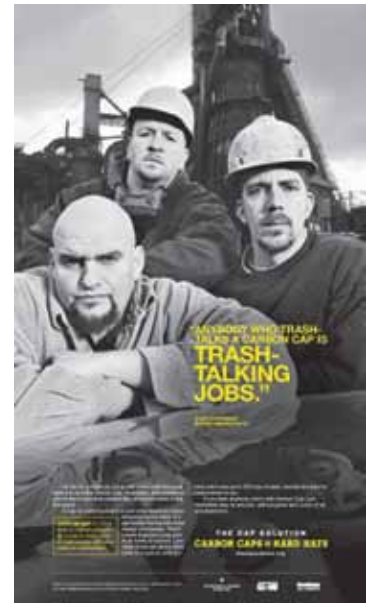
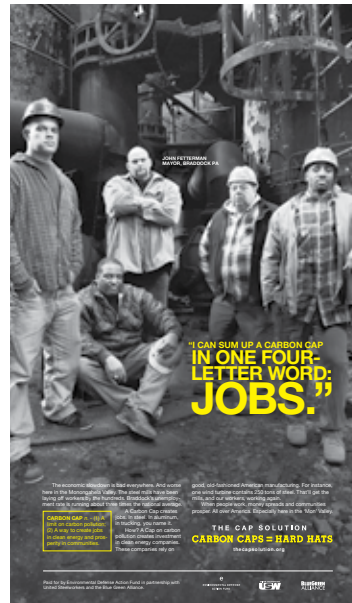
How are things working out so far?

I don't want anyone to think of this as a panacea, but I think this is a great way to revive our industry and become an exporter to countries like China, not the other way around. Since Braddock became involved in this effort, about half a dozen companies have expressed interest in working with us.

Cap-and-trade legislation is an outstanding economic opportunity for us. A single wind turbine tower contains 250 tons of steel—making steel is something we know how to do in Braddock. To fight climate change, we'll need steel, energy-efficient windows, low-energy lighting, and thousands of others products. We can make those products.

What are your thoughts about climate change?

If you're not aware and worried about climate change, you're not paying attention. A couple of years ago, we had buds coming out on trees in January. But in Braddock, we see this as an opportunity to create jobs. Most of the people I talk to don't wear Patagonia, and they're not traditional environmentalists. They just want to provide for their families. Every person in the advertisements I made with EDF is a laid-off steelworker. I want to give them a future here.



SPREADING THE WORD
EDF's hard-hitting ads featured some unusual partners in the campaign for climate action.

Way beyond business as usual

EDF's annual Innovations Review, and its Innovation Exchange website, are helping entrepreneurs and corporate visionaries turn green ideas into products and profits.

Chris Spain, the founder and chairman of the board of Hydropoint, a fast growing precision irrigation company, never expected to be in the water business. A few years ago, however, he and some business partners were looking for a new opportunity. "We looked at social networks and energy," he says. "And water just jumped out at us."

It's easy to see why. Landscape irrigation accounts for more than half of all urban water use. And at a time when water shortages threaten more than two-thirds of the nation, most landscapes, Spain says, are soaked by 30% to 300% more water than they need.

In response, he founded Hydropoint in 2002. The Petaluma, CA company specializes in making sure flowers, shrubs and lawns are watered when they should be. This is, potentially, a very big deal. There are about 60 million automatic irrigation systems in the United States, and most operate on timers, turning on and off at set intervals, whatever the weather. The result: Wasted water and dollars.

"This current technology makes about as much sense as having a timer instead of a thermostat in your house," Spain says.



Reuben Schuitz/istock photo

Sixty million automatic irrigation systems waste water daily across the United States—a golden opportunity for business innovation.

Hydropoint's answer is to make irrigation systems radically smarter. The company receives data streams from about 40,000 weather stations across the country, matches them against details of its customers' soil, plantings, sun and shade conditions, and transmits instructions to controllers on their irrigation systems.

The company's 16,500 subscribers, which include major corporations and more than 50 cities and towns, saved 11.3 billion gallons of water and \$75 million in 2008.

THE POWER OF INNOVATION

Hydropoint shows how innovation can turn an environmental problem into an opportunity—a phenomenon that will become almost commonplace as governments begin imposing limits on carbon pollution. "Enacting a cap on carbon will fire the starting gun in a new gold rush," EDF president Fred Krupp recently told the World Innovation Forum.

In that spirit, we held our second annual Innovations Review at the Fortune magazine Brainstorm Green Conference, in Laguna Niguel, CA, this spring. There we highlighted 15 business

innovations, chosen from more than 200 prospects, all of them good for the environment, good for business and ready to be implemented today.

The advances on display ran from Coca-Cola's launch of a new recycling company as part of its effort to recover

100% of its plastic bottles, to the "On-Farm Network," created by the Iowa Soybean Association, which uses crop yield and nitrate level data gathered by farmers to reduce the need for fertilizer, to the "solar mortgages" offered by a Denver condominium,

which save money for buyers who use solar modules to contribute electricity.

These innovators are part of a broad shift toward environmentally sound, economically savvy business practices. To help foster this trend, EDF has created the Innovation Exchange, an online community that provides advice, insight and practical tools to help users improve both their companies and the planet.



Igor Dutina/istock photos

With high-tech farming, soybeans need less fertilizer.

ON THE WEB: To learn more about the Innovation Exchange and forward-thinking companies highlighted in Innovations Review, go to: innovation.edf.org

In the West, a water crisis presents an opportunity for reform



Gibson Stock

“Whisky is for drinking, water is for fighting over,” goes an old Western expression.

In California’s famed Central Valley, desperate almond growers are cutting down prize groves. Along the coast, fishing communities are in similar distress, with the salmon season closed for a record second straight year, at an estimated loss of \$279 million, due to low river levels among other factors. And across the Golden State’s cities, water is being strictly rationed.

California is not alone. Throughout the West, a severe three-year drought has revived old battles among cities, farmers and conservationists over dwindling supplies of water. In response, EDF is launching projects that will bring Western water management into the 21st century. The need for reform is urgent.

TRANSFORMING HOW THE WEST VIEWS WATER

In many parts of the West, water has long been managed by the courts, through lawsuits among users. The drought has upended this jerry-rigged system.

“We’re in a perfect storm,” says Laura Harnish, California regional director for EDF. “Drought, climate change and the collapse of entire ecosystems

are not just that supply is limited, but that it is too cheap. This, for example, has encouraged farmers to irrigate low-profit crops in desert

environments even as populations grow.” Perhaps the only good thing about the crisis is that it has forced everyone to look afresh at how they use, and misuse, water. For example, one of the country’s largest agricultural organizations, representing nearly half of the West’s farmers, recently called Harnish to ask for EDF’s help on finding a comprehensive water solution for California.

“The drought has pulled people into a conversation,” says Harnish. “We all need to stop pointing fingers and resorting to short-term fixes.”

The problem with water in the West is not just that supply is limited, but that it is too cheap. This, for example, has encouraged farmers to irrigate low-profit crops in desert

environments even as populations grow.

EDF has long argued for market-based solutions to such unsustainable practices. The critical first step is to assure that rivers and deltas and the fish that depend on them have enough water. As farmers and urban districts make the necessary adjustments, innovations in water conservation will take root. This is already beginning to happen in California, where EDF is encouraging, through legislation and policy changes, the buying and selling of water by hundreds of farmers.

SAVING SOME WATER FOR ECOSYSTEMS

In the Colorado River Delta, where jaguars once roamed, the mighty Colorado River has been reduced to a trickle, its flow siphoned off by seven western states and Mexico. State by state, EDF is working on the creation of environmental water rights to ensure that ecosystem needs are met.

Recently we helped win sweeping changes to the way water is managed in the Colorado River—the most significant change since the Colorado River Compact was signed in 1922. EDF scientist Jennifer

80% of California’s water is dedicated to agriculture

Pitt helped shape a plan that paves the way for the United States and Mexico to protect the Colorado River Delta. In recognition, Secretary of the Interior Ken Salazar presented a Partners in Conservation award to EDF as one of the diverse groups that helped craft the plan.

In Texas, EDF helped lead a first-in-the-nation effort for a law that will result in standards guaranteeing all Texas rivers and bays enough freshwater to re-

main ecologically healthy. The law will allow seasonal floods and low flows—which is what rivers need to stay healthy and sustain migratory birds and other wildlife. “Finally, we’ll have a bottom-up process that can be replicated across the nation,” says Mary Kelly, director of our Land, Water and Wildlife program.

AN ALTERNATIVE TO SELLING OUT

One of the greatest impediments to fixing the West’s water woes is Gold Rush-era

“use it or lose it” water rights that have dried up rivers and killed wildlife. This year EDF helped pass legislation in Colorado that for the first time provides an income tax credit for landowners who donate their water to protect rivers and streams. “This law gives Colorado’s farmers and ranchers an alternative to selling their rights to water developers, who export the water to suburban areas,” says EDF Rocky Mountain director Dan Grossman.

Our work is being aided by a new generation of Western water managers

who seek to supply water without killing the river. Says Kelly: “My dream is that 20 years from now, agriculture and cities will be thriving and you’ll be able to float the Colorado River all the way to the Gulf of California, enjoying a huge profusion of birds along the way.”

ON THE WEB

- Get the latest developments on EDF’s water blog: blogs.edf.org/waterfront
- Calculate your water footprint at waterfootprint.org

Wanted: A water revolution

“We are all going to learn what a gallon means.” That’s how western water expert Bradley Udall describes the creeping realization out West that the era of cheap, plentiful water is over.

In California, with its semi-arid climate, the challenge is how to provide for a rapidly expanding population while

guaranteeing enough water for ecosystems to thrive. The state will need to set limits on water use to spur innovation and build efficiency, just as it has done with carbon pollution. EDF is helping find ways for California to provide water to its cities, farms and rivers.

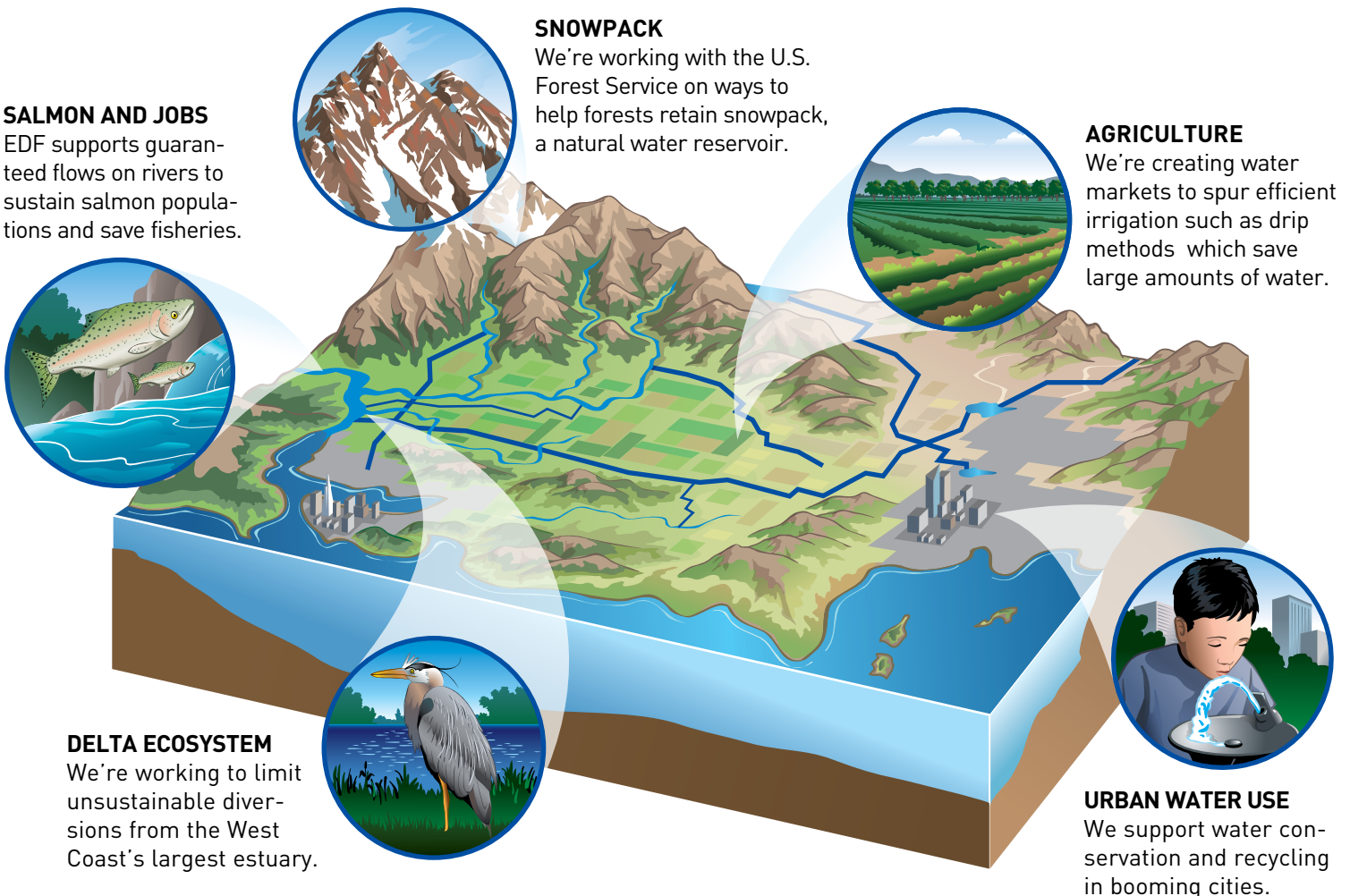


Illustration by John E. Kaufmann



Mark A. Johnson/Corbis

The next wave in energy

Ocean power is constant and close to populations that need it.

As a young surfer in Australia, George W. Taylor, now 75, reveled in the immense power of ocean waves. In 1994, those experiences helped convince Taylor to co-found Ocean Power Technologies (OPT), a pioneer in the field of generating power from waves and currents.



Ocean Power Technologies

Ocean energy systems exploit the kinetic energy of tides or currents. Some spin a turbine. Others, like the one above, use the bobbing motion of waves to move a pump that generates power.

Marine energy has many potential advantages over wind and sun. It is more consistent and predictable (tides and waves never cease); it requires a smaller footprint (water is 800 times denser than air, so wave farms and tidal turbines can produce ten times more energy per square meter than wind farms); and it exists where we need it (more than half the world's population lives within 50 miles of a coast).

Still, just 10 megawatts of wave power have been installed to date worldwide, compared to 120,000 megawatts of wind. The economic crisis hasn't helped: These are capital-intensive projects with untested technology that must be able to withstand the pounding and corrosion of hostile seas.

But Taylor is nothing if not patient. In fact, it took 13 years, until 1997, before his company had its first buoy in the water, near Atlantic City, NJ. The "PowerBuoy" bobs along like a big yellow cork, but underwater, a cylinder held sta-

tionary by a heavy plate weighting its base houses a drive shaft, hydraulics and generator. As the buoy rises and falls, a donut-shaped float encircling the cylinder moves with it. Connected to the drive shaft, the float's up-and-down motion drives the generator.

Much of the buoy's hardware is borrowed from the shipping and offshore oil industries. But its brain, made by OPT, is pure high-tech. On-board sensors gather data from each wave, measuring the time from peak to peak and the height of the wave, then transmit that data to microprocessors sealed within the cylinder, which adjust the resistance and load to keep electricity flowing smoothly.

OPT's current 40-kilowatt buoys, which Taylor calls the "little ones," weigh 40 tons each and make electricity for about 15 cents a kilowatt hour. Its bigger ones, due by 2012, will weigh 60 tons and generate 150 kilowatts for 5 cents a kilowatt hour—competitive with wind power.

WAVE POWER PLAYS CATCH-UP

In 2004, OPT became the world's first listed marine energy company, raising \$130 million in two stock offerings, and

they remain the best-financed company in the industry. The U.S. Navy is working with an OPT buoy in Hawaii, with hopes of someday using marine energy to run its far-flung bases. Lockheed is using the company's technology to power data-gathering buoys, and in Oregon, OPT has applied to the Federal Energy Regulatory Commission for permits to produce 250 megawatts in three locations. It expects to deploy its first buoy next year.

Around the world, more than 300 marine energy projects are being planned, and a new report from Pike Research forecasts that the industry will provide 2,700 megawatts of power generation capacity by 2015, up from just 264 megawatts in 2008. More than 50 companies worldwide, a third in the United States, are developing prototypes.

No one can say for sure whether marine energy will become a major energy producer, or just a niche player. But George Taylor's wave may yet come in.



Juergen Richter/Alamy

The waters around California's Golden Gate are being studied for their power-generating potential.

Wave power: EDF boosts efforts to ensure the safety of ocean energy systems

Surfers aren't the only ones who get amped by the sight of gnarly waves. Researchers at Oregon State University say that a mere 0.2% of the ocean's untapped wave energy could power the entire world.

The environmental benefits are obvious—no carbon dioxide or any other pollution associated with fossil fuels. No oil spills or nuclear waste. And for those who object to wind farms for aesthetic reasons, wave farms operate beneath the surface.

But there are also environmental concerns. For example: What impact might large numbers of electricity-generating buoys and underwater turbines have on fish and whale migrations? Will high-voltage cables stretching across the sea floor damage fragile reef systems or coastal wetlands?

**Ocean energy, though promising,
must be made safe.**

Such questions compelled EDF's chief oceans scientist, Dr. Doug Rader, to raise the issue on Capitol Hill. "The simple truth is that the current management structure for the oceans is unprepared for the complex challenges—and opportunities," Rader told Congress.

Environmental Defense Fund helped form and lead a coalition of utilities (including PG&E and Florida Power & Light), energy entrepreneurs, local governments and environmentalists to propose principles for the safe development of wave and tidal energy.

This spring, the Obama administration adopted our key



Flip Nicklin/NGS

On the West Coast our guidelines would protect sea life, including migrating grey whales.

recommendations, including one resolving how the Federal Energy Regulatory Commission and the Interior Department will cooperate to license and site ocean renewable energy, a jurisdictional dispute that had slowed development.

The new guidelines come none too soon. More than five dozen water-related energy projects have been proposed from South Florida to Washington State.

Ultimately, wave and tidal power could meet 10% of the nation's electricity demand, according to the Electric Power Research Institute, the research arm of the public utility industry.

"It's inevitable that blue energy will become an important part of America's portfolio," Rader says. "If we do it right, it could be a massive source of clean power."

Green living

Where the jobs are

PUTTING PEOPLE TO WORK IN A SUSTAINABLE AMERICA

“The process of putting people to work ... will require thousands of contracts and millions of jobs—producing billions of dollars in economic stimulus,” Van Jones, the founder of the California-based green jobs group Green For All, told EDF last February. “We should be using our Boeing-level engineering talent to manufacture wind turbines, solar panels, hybrid buses and light rail cars.”

At the time, Jones was on the outside looking in. But soon afterward he was appointed to the Obama administration as a special adviser for green jobs, enterprise and innovation. “We’ve made the single biggest investment in clean energy in the history of humanity,” he tells EDF now. “We are providing jobs, and it’s important that they be



Workers in Michigan assemble parts for wind turbines.

good jobs that provide a path from poverty to prosperity.”

The American Recovery and Reinvestment Act of 2009 instructed federal agencies to create those “good jobs,” using the \$787 billion in stimulus money recently set aside by the government, in-

cluding more than \$60 billion specifically for clean energy investments.

To see that this money helps create jobs, the Environmental Protection Agency, the Department of Energy and other federal agencies are creating programs to help pay for retrofitting homes,

Green job board

RESOURCE CENTER

The Green Collar Economy: How One Solution Can Fix Our Two Biggest Problems; Van Jones; HarperOne; \$25.99

A service bringing together qualified people with available work in green energy:
Greenjobs.com

To find work through the **American Recovery and Reinvestment Act of 2009**, better known as the stimulus bill: recovery.gov and job-search.usajobs.gov

Federal grants for job training: grants.gov

Green for All is “a national organization dedicated to improving the lives of all Americans through a clean energy economy”: greenforall.org

The **Greenbiz.com** job site: jobs.greenbiz.com

“The Clean Energy Economy: Repowering Jobs, Businesses and Investments Across America”: Pew Charitable Trusts; pewtrusts.org

Guest columnist Jim Motavalli writes for *E/The Environmental Magazine* (for subscription information: 800-967-6572 or emagazine.com). Opinions are the author’s and not those of Environmental Defense Fund staff.



Our interactive maps at LessCarbonMoreJobs.org track green job opportunities in 20 states.

businesses and government buildings to make them more energy efficient. They are underwriting the construction of renewable energy facilities that use solar, wind and geothermal power, and embarking on major infrastructure projects to ensure the safety of the nation's drinking water supply, update its electrical grid, and clean up hazardous waste sites.

Here are some tips to help job seekers:

Follow the money The broad contours of the federal stimulus funding are detailed at Recovery.gov. A clickable national map, searchable by state, agency or category, allows job seekers to see how stimulus funds have been allocated. California, for instance, has distributed more than \$24 billion to dozens of programs, aimed at everything from fixing leaking underground storage tanks to providing housing for Native Americans.



Joel Stettenheim/Corbis/Jim West

Unemployed workers in California wait for a job fair to open.

Help wanted To find the actual jobs, a link takes you to USAJobs.gov. Enter a job category, from botanist to welder, and available positions will pop up. For example, a \$22 to \$25 an hour job for a carpenter is available through the National Park Service.

Job training As of press time, the government's job training program is still under construction. But the Labor Department announced in late June that it would apply \$500 million in stimulus funding toward green-energy career building, including retraining hard-hit auto-workers and employees "affected by national energy and environmental policy." Some \$5 million is specifically set aside for entry-level or "gateway" positions.

A map of the green economy EDF's interactive website at LessCarbonMoreJobs.org tracks green companies in 20 states across the manufacturing heartland that will get new customers and create jobs when a cap on carbon becomes law. Visit the state maps and click on the pins to find companies that plan to offer jobs installing solar panels, geothermal systems and biomass furnaces. The search can be narrowed down to specific cities, legislative districts and media markets. Also on the site EDF has developed fact sheets offering overviews of the green business picture, state by state.

More opportunities Another good source of green jobs, most of them recent, is the employment board at Greenbiz.com. Want to be a "real time energy scheduler"? Southern California Edison has that job available in Rosemead, CA. You can also search for jobs internationally using a drop-down country finder.

—Jim Motavalli

Thank your parents . . .



istock photo

. . . and leave a safer planet for your children

What better way to thank your parents than with a charitable gift annuity with Environmental Defense Fund? When you give your mother, father or both parents a gift of a charitable annuity, they will receive annual income for their lifetime(s) that won't decrease, regardless of interest rate or stock market swings.

Your generous gift will provide your parents with fixed payments and ultimately support the important programs at EDF, leaving your children the legacy of a cleaner, sustainable world. You also stand to receive substantial tax benefits.

Here are sample annual payments for a \$10,000 gift:

Parent's Age	Rate	Annuity
65	5.3%	\$530
78	6.7%	\$670
82	7.5%	\$750
88	8.9%	\$890

To receive a personal proposal, please contact our Director of Planned Giving, Nick Pitaro, toll-free at 1-877-OSPREYS (1-877-677-7397), or by email at ospreys@edf.org. You can also visit us on the web at edf.org/plannedgiving

Environmental Defense Fund does not provide legal or tax advice. The figures shown are for illustration purposes only. Please consult your legal or financial adviser before making a charitable gift.



More MPGs = less GHGs. More efficient cars emit less greenhouse gas.

After a long campaign, EDF wins national fuel economy standards

It's been a long road. President Obama's decision in May to boost fuel economy standards for autos caps a multi-year campaign by EDF. Under the President's plan, a single national standard will raise fuel efficiency for cars to 35.5 miles per gallon by 2016, a 40% increase from today's level. In setting the new standard, the President granted California and 13 other states a long-sought waiver they needed under the Clean Air Act to tighten fuel-efficiency standards.

Automakers have fought tougher standards since the 1970s, but EDF has just as tenaciously battled for them. In 2002, we worked closely with the California legislature to pass the state's Clean Cars Law, the nation's first to limit global warming pollution from vehicles. The auto industry fought back

with a fury. In Vermont, the industry went to court in 2007 to block the standards, which were being adopted by other states. EDF general counsel Jim Tripp successfully argued the case for environmental groups.

Later in 2007, a California judge rejected another industry attempt to block the California law, calling the automaker's effort "the very definition of folly." EDF was a defendant-intervener in the case.

In announcing the national standard in May, President Obama effectively granted the waiver we had been seeking.

"We desperately need more fuel efficient cars," said EDF president Fred Krupp. "It's been difficult, our opponents fought us every step of the way, but we have prevailed."

Hope for America's oldest fishery

"I'm the first generation of fishermen in my family who can't take my grandson out and show him the things I've seen," says Dave Preble, whose family has fished New England waters since 1642.

Overfishing and poor management have left cod and flounder stocks at a fraction of sustainable levels. Strict limits on days at sea have led to a dangerous race for catches and tons of discarded fish.

Reform is on the way. The region's groundfish fishery is poised to move to a new type of management. Under catch shares, a group of fishermen is assigned a percentage of the total catch. As the fishery recovers, fishermen's share grows in value, giving them a stake in the health of the system.



The future is looking brighter for New England's fishermen.

"Catch shares allow fishermen to fish safely without wasting fish," says EDF expert Sally McGee, who serves on the New England council. McGee has worked closely with fishermen like Preble to demonstrate the benefits of catch shares. We even brought fishermen from British Columbia to New England fishing communities in June to show how catch shares have revived fishing communities in Canada.

At a council meeting in April, Dr. Jane Lubchenco, the NOAA administrator and former vice chair of EDF, offered an injection of hope. "Catch shares are a powerful tool to getting to sustainable fisheries and profitability," she explained. She pledged more than \$16 million to make the transition to the solution advocated by EDF.

Says Preble: "Catch shares give me hope."

Guilt-free rice

Rice feeds billions around the world. But rice cultivation also dangerously warms the planet, emitting many millions of tons of greenhouse gases annually.

EDF has created a sophisticated emissions model to determine what changes in rice growing practices can deliver the biggest climate benefits. We are field-testing several strategies in California, like turning leftover rice straw into biofuel, applying fertilizer more precisely and draining fields for a few weeks mid-season to cut methane emissions. If these strategies work, we can disseminate them in countries like China and India. Says EDF ecologist Eric Holst, "Soon, climate-friendly rice could be on the world's menu."

Greening the dining room

There are nearly a million restaurants in the nation. Each uses five times the energy per square foot of a typical office building. EDF, with Restaurant Associates (RA), a food service company, are changing that equation through a "Green Dining" menu of best practices that will save energy, water and waste, and bring healthier food to the table.

The guidelines have been tested by Random House and Hearst Corp., two RA clients whose food operations are expected to cut 275 tons of carbon pollution and 60 tons of landfill waste annually. Next, RA will roll out the program in all 110 of their facilities. "The industry is moving in this direction. If companies are slow to implement green practices, their competitors will eat their lunch," says EDF project manager Greg Andeck.

ONLINE: Watch the Green Dining video at edf.org/greendining

Smarter commuting in Shanghai

China does things on a big scale. Thus, it's no surprise that Shanghai Expo2010 promises to be the largest world's fair ever—or that it is projected to attract 70 million visitors.

Recognizing the success of our green commuting campaign during the Beijing Olympics, Shanghai invited EDF to be its sole partner in a similar program for the Expo. During the Olympics, our campaign helped more than 100 companies and 80,000 participating employees choose more environment-friendly commuting options. Subway and bus ridership jumped 75% and 48%, respectively.



Donald MacRae

All aboard for greener commuting in Shanghai.

The Expo, from May to October 2010, may be an even bigger deal. EDF will launch an online carbon calculator to track greenhouse gas reductions that result from the project. We'll then monetize the benefits, and supporting companies will reinvest proceeds into additional carbon-cutting projects.

Offering a lifeline to islands at risk



Adrew Vitchek

Rising seas threaten to submerge 52 island states.

For the people of Kiribati, global warming is not a future peril. This remote island nation in the central Pacific rises to just six feet above sea level. Higher seas are making the island's water too salty to drink, and some villages have had to move inland. Kiribati

and 51 other low-lying island states from Antigua to Vanuatu could be wiped off the map by mid-century.

Their pleas for aid have not yielded a solution—until now. EDF is spearheading a movement to band the nations together to ensure their interests are represented in international global warming negotiations.

We are also developing a way to reward vulnerable island nations for accepting a firm cap on their greenhouse gas emissions. "We want to offer a life raft to the people whose lives are at stake," says our Climate director Peter Goldmark.

In California, a big win for wildlife

Mark Twain would be overjoyed. In June 2009, the East Bay Municipal Utility District, which provides water to more than one million people in California's Bay Area, announced that it had reached an agreement, which EDF helped negotiate, to protect endangered species habitat on about 28,000 acres of land in Calaveras, Amador and San Joaquin counties.

The Valley elderberry longhorn beetle, California tiger salamander and the California red-legged frog, made famous by Mark Twain in "The Celebrated Jumping Frog of Calaveras County," will all benefit as part of the state's largest Safe Harbor agreement.

This is only the latest triumph for an idea EDF lawyer Michael Bean had some 15 years ago. Bean, who recently joined the Interior Department, proposed creating "safe harbors" on private land for threatened species.

At the time, landowners sometimes destroyed species habitats out of fear of federal regulation over their land. But EDF, working with the U.S. Fish and Wildlife Service, created Safe Harbor agreements, which allowed private landowners to voluntarily conserve endangered species, in return for legal assurances that their actions would not lead to new land restrictions.

The first agreement was signed in 1995 and today, owners of more than four million acres shelter endangered species—including the northern aplomado falcon, San Joaquin kit fox and Schaus swallowtail butterfly. Recently, the Pacific Forest Trust secured a Safe Harbor agreement for a 2,200-acre redwood stand in Humboldt, CA, which will improve habitat for the northern spotted owl.

"Farmers, ranchers and forest landowners manage roughly 70% of the land in the continental United States. They are critical to protecting wildlife," says EDF agriculture policy director Sara Hopper. "They deserve help for doing the right thing."



Peter Arnold

◀ Leggy and delicate, with huge ears, the San Joaquin kit fox has been called "the ballet dancer of the canid world."



Animals Animals

▲ The legendary California red-legged frog inspired a Mark Twain tale.



Justin Baillie/Getty Images

▲ A new Safe Harbor agreement for northern spotted owls will protect giant redwoods in Humboldt, CA.

The northern spotted owl once caused heated controversy between loggers and environmentalists.



John and Karen Hollinsworth/USFWS

▼ The Schaus swallowtail butterfly was one of the first insects protected under the Endangered Species Act.



Mitt Puttnam