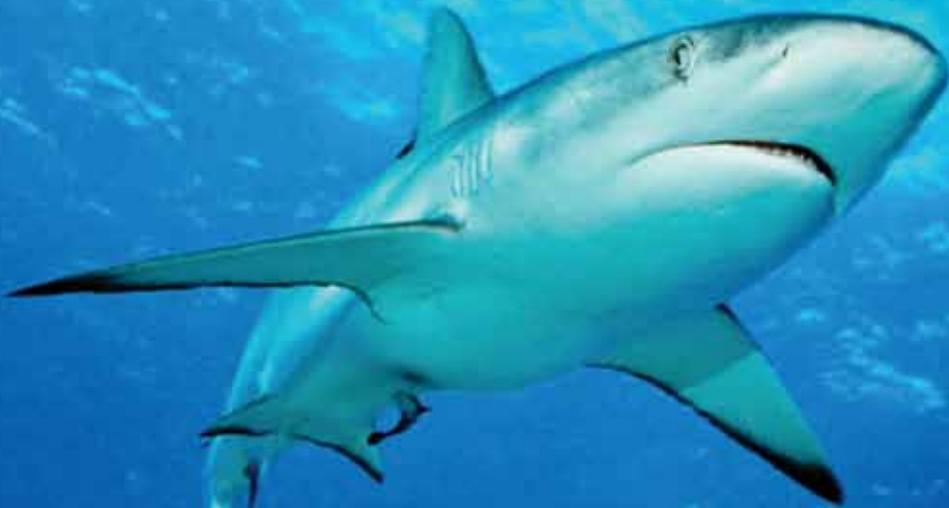


SOLUTIONS

Vol. 43, No. 3 / Summer 2012



> **PROTECTING THE
GREAT PREDATORS**

Sharks are among the oldest surviving animals on Earth. Can we save them?

PAGE 6

WHERE WE STAND

By EDF President Fred Krupp



Facing up to the growing challenge of natural gas

Many people wish that hydraulic fracturing, or fracking, would just go away. I understand why, having met people whose lives have been turned upside-down by irresponsible shale gas development which threatens air, water and public health.

Let's be clear: We can't ask people to trade away their health and quality of life in exchange for cheap energy. And there are some places, where shale formations are too close to aquifers that supply water for drinking and farming, where drilling should be banned.

But the truth is, hydraulic fracturing and natural gas are not going away. The genie is out of the bottle and the abundant new supply of energy that hydraulic fracturing has made available can benefit the nation.

Natural gas is helping revive American manufacturing and create jobs. And it's rapidly supplanting dirty coal as the nation's primary source of electric power. Paired with new rules from public utility commissions that improve energy efficiency and make electric grids more responsive to shifts in demand, natural gas can help us avoid substantial long-term investments in coal and oil, paving the way to a renewable energy future.

So the real question isn't, "to frack or not to frack," but rather, how do we develop this resource responsibly? EDF is working hard to make sure that shale gas is developed as safely and responsibly as possible. In state after state, we're helping enact:

- Rules that require disclosure of what is going into wells, and what is coming out of them.
- Rules about water use, about waste disposal, about air emissions, including methane. Methane leaks can erase the climate benefits of natural gas because it accelerates global warming, particularly in the short term. (See story, page 4.)
- Rules that empower communities to minimize impacts of gas development, such as the fragmentation of landscapes, congestion and noise.

With these controls and with tough enforcement, natural gas could be developed in a way that's good for the economy and the environment. But this simply will not happen unless we move beyond the current impasse in which many in industry deny the existence of serious problems, while others dream of turning back the clock on shale gas.

At EDF, we don't believe either 'Just Say Yes' or 'Just Say No' is the answer. We need tough regulation, rigorously enforced, to avoid problems and to give communities confidence. These are achievable goals, but only if industry, citizens and regulators pursue them together.

A handwritten signature in black ink that reads "Fred Krupp".



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:

Like many of the world's shark species, the Caribbean reef shark has been little

studied and may be threatened by overfishing. *Solutions* writer Leslie Valentine met with the tri-national team of scientists from Cuba, Mexico and the United States who are working toward an international solution in the Gulf of Mexico, since sharks do not observe national boundaries.

(See page 6.)

Cover photo: David Nardini/Getty Images

SOLUTIONS

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Online edf.org

©2012 Environmental Defense Fund.
Published quarterly in New York, NY.
ASSN 0163-2566

New York / Austin / Bentonville, AR / Boston / Boulder / Raleigh / Sacramento / San Francisco / Washington / Beijing, China / La Paz, Mexico

EDF MEMBERS AND THE BATTLE FOR CLEANER AIR

In Congress our opponents, backed by fossil-fuel lobbyists, continue their relentless assault on clean air rules. Their latest target: EPA's new rule to limit pollution from America's power plants.

Corporate giants and ideologues have funded groups like the Heartland Institute to wage war on climate science.

With your help, EDF is working to expose this disinformation industry and fight for clean air. Here are a few of the ways EDF supporters are making their voices heard.

BUILDING COMMUNITY POWER



Josh Lopez

When we appealed for support of EPA's landmark rule limiting carbon pollution from coal-fired power plants, you responded. Here, EDF staff and our coalition partners proudly deliver nearly a million comments to EPA from citizen activists. U.S. power plants emit about 40% of U.S. carbon pollution.

➤ See how you can help at edf.org/tohelp

Firing up citizen activism

"I'm an EDF Superhero," says Tami Calliope. "I take action for the environment, and I try to fire up other people to do the same." EDF's "Superheroes" are our most active Facebook supporters—people like Calliope who drive environmental progress by signing petitions, writing letters and, when they can, giving money. "C'mon, c'mon," she says, urging on her fellow online activists. "We're the superheroes here. If we're not taking action, who will?"

Calliope is a lifelong environmentalist. At 20 she lived in Florida, caring for manatees wounded by speedboats and brown pelicans threatened by DDT.

Now living in Vermont, Calliope is battling personal health issues but she remains undaunted, lending her impassioned online presence to the causes she believes

in. "I work with many organizations," she says, "but EDF has my heart."



Tami Calliope says, "I take action for the environment."

 Join 74,000 EDF supporters on Facebook at [facebook.com/EnvDefenseFund](https://www.facebook.com/EnvDefenseFund)

Speaking truth to climate change deniers

After the Heartland Institute ran a billboard ad in Chicago comparing supporters of climate action to Ted Kaczynski, the so-called Unabomber, EDF supporters protested with thousands of emails calling for an end to the group's extremism. Hundreds more spoke out on Facebook (see excerpts below), contributing to the public outcry. As a result, Heartland pulled the ad within 24 hours.

"When you're losing an argument, this [billboard] is the kind of tactic you resort to. Let's keep putting out the truth."

—Kent M., CA

"I don't get why people who are looking to conserve our planet are seen as radical extremists. It doesn't take a scientist to see all the extreme weather around the world and know that something bad is happening."

—Cynthia N. (via Facebook)

"Why do we use 'believe in' when we mean 'it's scientifically proven'? We make it seem like global climate change can be disbelieved like the tooth faerie."

—Emma C. (via Facebook)

"To quote Scarecrow from *The Wizard of Oz*, 'Some people without brains do an awful lot of talking, don't they?'"

—Ruth F. (via Facebook)

Quietly spreading the word

"I enjoy the way *Solutions* was mailed (without my name ID). It makes it convenient for me to 'plant' copies in places like my gym and doctor's office."

—Michael V., Appleton, WI

EDF wants to hear from you. Email us at editor@edf.org or visit solutions.edf.org. All printed letters are edited for clarity and length.



THE CONFLAGRATION OVER NATURAL GAS

As the energy boom continues, EDF is working to make sure that it doesn't harm people or the environment.

It was a heart-wrenching encounter. Last summer, EDF President Fred Krupp and other members of the U.S. Secretary of Energy's Advisory Board on Natural Gas visited rural Pennsylvania to learn firsthand about the local impacts of natural gas development. While there, they met a young mother who told them how she had been forced to leave her family farm because of severe air pollution from shale gas wells.

The problem had grown so bad, she said, that her young son had become ill and she was living out of her car.

Krupp came away convinced that no matter how much economic promise the natural gas boom holds—it is helping to revive American manufacturing and steelmaking—no community should be forced to trade a safe environment for cheap energy.

That's why EDF has made a major commitment to working on natural gas issues.

We're fighting for tough regulations so the rush to develop gas reserves doesn't trample on the environment or the health of communities. And our scientists have answered some fundamental questions about how natural gas can become a net

plus for the environment—minimizing local impacts and maximizing potential benefits on global climate change.

The big questions

On billboards, radio and television, natural gas is sold as a clean and safe fuel that reduces global warming pollution. But is it?

EDF scientists Dr. Ramon Alvarez and Dr. Steven Hamburg have come up with some basic answers to that question. They are among the authors of a paper, published this spring in the prestigious Proceedings of the National Academy of Sciences (PNAS), which found that the potential climate benefits of natural gas could be lost entirely

because too much gas may be leaking.

Natural gas emits less carbon dioxide than coal when burned (and none of coal's mercury and far less of other poisons). But it consists mostly of methane, a greenhouse gas many times more potent than carbon dioxide.

The problem is that there are innumerable places, from well site to burner tip, where small leaks of natural gas can add up to large amounts of methane pollution. So the fundamental questions are:

- How much methane leaks across the whole natural gas system?
- Is natural gas really better than other fossil fuels for slowing climate change?

The PNAS paper, *Greater Focus Needed on Methane Leakage from Natural Gas* (edf.org/methaneleakage) compared natural gas to coal (in power plants), gasoline (in cars) and diesel fuel (in trucks) to see how changes in the leakage rate can make natural gas better or worse for the climate.

The results showed that natural gas has a climate advantage over coal for power plants as long as



A shift to natural gas-powered buses and trucks may speed up global warming unless we control gas leaks into the atmosphere.

the leakage rate stays below 3.2%. But, to maintain that advantage, the rate would have to fall to 1.6% for cars, and even lower for trucks.

Overall, says Hamburg, the opportunities for leaks in natural gas-powered vehicles are so numerous that “we’ve got to ensure methane leakage is 1% or below, or else there’s no advantage to natural gas.”

The paper’s findings triggered a heated response from the natural gas industry and proponents of natural gas vehicles. “It would be premature to draw any policy conclusions about natural gas vehicles based solely on this report,” a spokesman for the American Gas Association said.

We agree—the paper was intended to start a conversation about leakage, not be the final word. We hope industry will engage in the discussion, not try to block it.

Bringing science to the table

The Environmental Protection Agency (EPA) estimates the current leakage rate at 2.4%. Industry claims it is much lower, while some studies say it’s much higher. But no one knows for sure.

That’s why EDF, working with industry and academic partners, is developing a complete picture of methane leakage across the nation. No analysis on this scale has ever been attempted with modern instruments.

We need to ensure natural gas leakage is 1% or lower across the whole system.

We and our partners are designing five studies to quantify the methane leakage rate in production, processing, pipeline transportation and distribution of natural gas, and in natural gas vehicles.

The University of Texas, with EDF’s help, is leading a production study that will work with nine major natural gas companies to determine the leak rates from their wells.

For the local pipeline transportation and distribution study, we are working

There are problems with hydraulic fracturing. The energy industry needs to admit that.

with Duke University, Harvard University and Boston University.

The goal is to complete these studies by late next year.

But methane isn’t the only dangerous pollutant from natural gas operations. It’s one among a class of chemicals called volatile organic compounds (VOCs), many of which are a harmful to people and the environment. VOCs are a prime cause of smog, which kills or sickens tens of thousands of Americans every year.

An investigation of gas wells in Denton County, TX, led by Southern Methodist University and coordinated by EDF, found emissions of air pollutants including benzene, a carcinogen. In fact, the amount of VOCs and nitrogen oxides from the region’s oil and gas wells roughly equalled the amount emitted by the four million cars and trucks in the nearby Dallas–Fort Worth area. The study led Texas to monitor the wells more closely.

The drilling boom has only made emissions and other environmental and health problems more urgent. It’s clear that we must dramatically improve natural gas operations to safeguard not only our air, but our water and communities.

Transparency is key to this effort. The Energy Secretary’s Advisory Board on Natural Gas, following suggestions made by EDF’s Krupp, called for stronger oversight and enforcement, better regulation of water and air pollution, and disclosure of the many chemicals used in hydraulic fracturing—the high-pressure process through which natural gas is released from shale.

In addition, several responsible drilling companies, including Southwestern Energy, are working with EDF and state governments to develop rigorous safety criteria for well construction and design.

EDF has also helped secure adoption of new rules in Arkansas, Colorado, Montana, Ohio, Pennsylvania, Texas and Wyoming, requiring drillers to disclose the chemicals they use in hydraulic fracturing. We also supported EPA’s tough, new oil and natural gas air pollution standards,

which were finalized in April. These standards are an important step toward significantly reducing methane and other emissions from oil and gas wells.

The fight to clean up natural gas operations won’t be won overnight. But we’re committed to winning it. There’s no environmental battle more important right now.

METHANE LEAKAGE FROM NATURAL GAS OPERATIONS

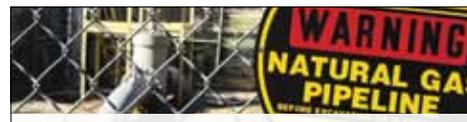
Natural gas, which is mostly methane, finds many ways to escape into the atmosphere, as these estimates show.



59% Natural gas production



20% Transmission and storage



13% Local distribution



8% Processing



SAVING THE GREAT PREDATORS

By Leslie Valentine

Sharks have ruled the oceans for millions of years. Now they face threats from the ultimate predator: humans. In an unusual bid to save sharks in the Gulf of Mexico, EDF has convened scientists from nations that don't always talk to each other.

Every year in late spring, giant whale sharks begin to appear off the tip of Mexico's Yucatan Peninsula, where the Caribbean joins the Gulf of Mexico. By midsummer, up to 800 of these majestic animals have gathered to feed off a rich diet of plankton and fish eggs. Above, sea birds wheel and dive for fish.

This spectacular gathering of whale sharks—which scientists learned of less than a decade ago—may be the largest in the world. Fishermen from the nearby village of Holbox had long known of it but had no reason to share the information.

It was Dr. Bob Hueter, director of the Center for Shark Research at Mote Marine Laboratory in Sarasota, FL, who in 2006 confirmed the existence of the annual congregation. Today, boatloads of tourists venture out to watch these graceful creatures “graze.”

“This is one of the few great animals on Earth you can get so close to without being in real danger,” says Hueter, who has been studying sharks for 38 years.

Little is known about these gentle creatures, which can reach 65 feet in

length. No one knows where they breed, or how many still roam the oceans.

In fact, little is known about most of the world's sharks. But one thing is clear: many species are in trouble.

An uncertain future

Sharks have survived 400 million years, since before dinosaurs. But their future hangs in the balance. Every year tens of millions are killed, for food and for their fins. Fins, for shark fin soup, can fetch hundreds of dollars a pound in Asian markets.

“In U.S. Atlantic and Gulf of Mexico waters, populations of large sharks, including tigers and hammerheads, have been severely depleted,” says Dr. Douglas Rader, EDF's chief oceans scientist. Nearly 100 different shark species, one fifth of the world's shark species, live in the Gulf.

EDF, working with the Mote Laboratory and other partners, is leading an ambitious effort to save sharks in the Gulf—uniting the United States, Mexico and Cuba in an unprecedented conservation partnership.

“EDF is a true pioneer,” says Hueter,

Sharks migrate long distances. That's why EDF united Cuba, Mexico and the U.S. in the first-of-its-kind initiative to save sharks.

who joined forces with us three years ago. “They don't practice science in a vacuum but connect science with people and come up with workable solutions to environmental problems.”

Saving sharks is a challenge because, as Hueter says, “these highly migratory animals don't just sit still on a reef.” EDF's initiative combines scientific research with cooperative management that fosters conservation in all three countries. Each has its own economic and conservation priorities. For example, in Mexico sharks are an important source of food.

Working with Cuba presents a special challenge because of the 50-year-old U.S. embargo. But EDF has worked for a decade to build trusted relationships with scientists and local organizations there.

In 2010, EDF and Mote convened the first-ever tri-national meeting of scientists and officials to chart a course of action.

Mysterious creatures of the sea

In folklore and literature, sharks have traditionally been depicted as evil and demonic. Santiago, the fisherman in Ernest Hemingway's *The Old Man and the Sea*, speaks of “hateful sharks, bad smelling, scavengers as well as killers.”

In fact, their fearsome reputation is

undeserved. You're more likely to die from a dog bite than a shark attack.

Yet it's hard to generate sympathy for sharks even though they're victims of overfishing. Most sharks grow slowly, take years to mature and produce few pups. The great white, for instance, starts breeding only around age 20. So today, many shark species are being caught faster than they can reproduce.

The extinction of sharks would have cascading effects on marine ecosystems. Sharks, at the apex of the food chain, cull populations of animals they prey on and engender a richer, more diverse ecosystem.

Off the U.S. Atlantic coast, hammerheads and other big sharks that feed on stingrays have been heavily fished for the past 30 years.

“Rays snuffle around the bottom eating scallops, clams and oysters,” says Rader. “With the removal of so many sharks, populations of cownose rays exploded and decimated seagrass beds, key habitat for bay scallops.”

The result: the collapse of the century-old scallop fishery off North Carolina.

Sharks are also important to biological research and human health. The Mote Laboratory is studying sharks' resistance to cancer and their ability to heal their wounds



John Rhee

Marine biologist **PAM BAKER** is a fierce advocate for the Gulf of Mexico's threatened sea life. Her work has helped protect endangered Kemp's ridley turtles and revive red snapper. Baker's next challenge: saving imperiled sharks.

quickly. Understanding these biological processes could advance human medicine.

Cutting-edge research

Basic research on shark populations is a critical first step. EDF and our partners are conducting comprehensive surveys of sharks caught by fishermen—species, numbers, age and sex—along Cuba's northwest coast and Mexico's Gulf coast. Dr. Juan Carlos Perez Jimenez, of El Colegio de la Frontera Sur, heads the research team in Campeche state, far from the tourist hubbub of Cancun to the east.

“This area is perfect habitat for sharks,” says Dr. Perez. The Campeche bank—a shallow coastal shelf that extends 100 miles into the Gulf—is scalloped by lagoons and mangrove forests. The biggest lagoon, Laguna de Terminos, is a nursery for bull sharks and bonnetheads.

Laguna de Terminos is a protected area, but illegal fishing still takes place because there's little enforcement. Dr. Perez has built relationships with fishermen along the Campeche and Yucatan coast, allowing him to inspect their catches. “This will help us develop management plans for species with high biological productivity that can be fished sustainably, if done right,” he says.

Research is also moving forward in Cuba, where University of Havana scientists are taking a detailed shark fishery survey. “We believe the team has discovered nursery and pupping grounds for oceanic whitetips off Cuba,” says Rader.

These surveys will become part of a database on Gulf species. “Until now, >



Brian J. Sherry/Getty Images

Hidden lagoons and undisturbed mangroves are shark nurseries that deserve protection.

the scattered research has never been pulled together to build the big picture of Gulf sharks,” says EDF’s Pam Baker, who heads up the tri-national effort.

This collaboration will yield the data necessary to permit limited fishing of robust populations while ensuring protection for imperiled ones—both key steps to a healthy future for sharks. “Whale sharks and 18 other species are already off-limits in U.S. waters, but the reality is many people depend on sharks for food and income in parts of the Gulf,” says Baker, “and many sharks die accidentally in other fisheries. To reverse the decline before it is too late, we need better management of shark populations and fisheries.”

The research will also reveal the special places that warrant protection, such as the plankton-rich waters off the Yucatan. “The Holy Grail of conserving sea life is good fisheries management coupled with marine reserves,” says Rader.

Will fishermen help?

Fishermen’s help is essential to restore healthy shark populations. Some sharks are caught in inadequately managed fisheries.

“Just about anyone in Mexico can go out and fish,” notes Dr. Perez. “We need to rethink management.”

Working with fishermen, EDF is promoting sustainable fishing through incentive-based management, or catch shares. Catch share programs in many U.S. fisheries are helping rebuild fish populations of the most at-risk species.

“These programs bring real benefits to fishermen and fish,” says Angie Boehm, who operates a family seafood business in Florida.

The United States is now moving toward instituting a catch share program for shark species to help recover depleted populations. This is likely to result in more sharks swimming in Gulf waters.

“Our hope is that our tri-national program for sharks will be a model for management of other highly migratory species like tuna,” says Hueter. “We’re not doing it for ourselves but to leave our children and grandchildren a better world.”

IN THE GULF, THE ENDURING MYSTERY OF SHARKS

From dwarf lanternfish that you can grasp in your hand to the harmless whale shark that grows as big as a school bus, shark species display a breathtaking diversity. An abundance of sharks is a sign of an ecosystem in balance. Yet little is known about these mysterious creatures.

In the Gulf of Mexico, a key breeding ground, only a handful of species have

been studied. The five species depicted here represent the array of sharks found in the 600,000 square mile Gulf.

To save these ancient animals, EDF and our partners are filling the research gaps and improving fishing practices.

Oceanic whitetips often swim with pilot fish, which scavenge for their leftover food. They’re infamous for attacks on survivors of shipwrecks. One study found that Gulf populations have been depleted by 99%. Until the 1960s, when industrial fishing took off, ocean whitetips could elude fishermen in remote, deep waters.

THREATS

- Sought for their large fins on the Asian market.
- Caught in large numbers as incidental catch in swordfish and tuna fisheries.

SOLUTIONS EDF and Cuban partners discovered what may be a nursery off northern Cuba. We’re working to recover these highly endangered sharks by protecting special places in the Gulf.

ATLANTIC SHARPNOSE

(Rhizoprionodon terraenovae)

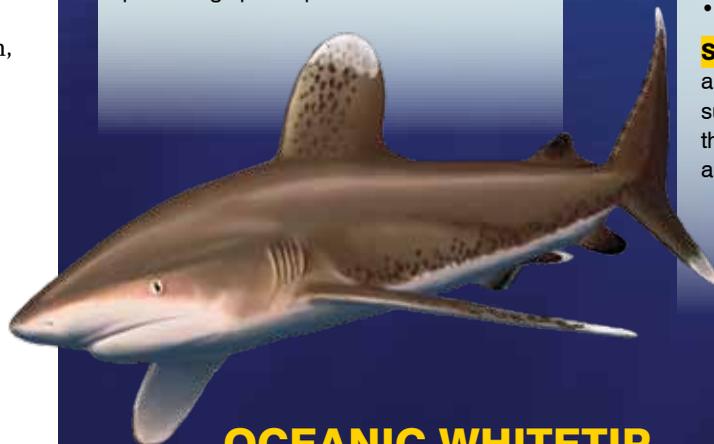


The Atlantic sharpnose, often seen in surf zones, is the most commonly caught coastal shark in the U.S. and an important source of food and income in Mexico.

THREATS

- Nursery and pupping grounds are close to shore.
- Caught incidentally in shrimp trawls.

SOLUTIONS Sharpnoses grow fast and reach maturity early, so they can be sustainably fished if well managed. But they are heavily fished. EDF and partners are seeking to improve management.



OCEANIC WHITETIP

(Carcharhinus longimanus)



WHALE SHARK

(*Rhincodon typus*)

The world's largest fish (they grow to 65 feet), whale sharks are known to migrate 8,000 miles or more. They gather in summer off northern Yucatan, attracting eco-tourists.

THREATS

- Very vulnerable to overfishing; harvested for meat and fins in Asia.
- Harmed by contact with large fishing nets, ships and divers.
- As surface filter-feeders, they may have been harmed by BP oil spill.

SOLUTIONS We are tracing migration patterns and exploring ways to safeguard the animals and their habitat.

Caribbean reef sharks are plentiful in Cuba's Gardens of the Queen, a coral reef ecosystem nearly untouched by humans since Columbus first set eyes on it 500 years ago. Little is known about their migration patterns.

THREATS

- As a slow-growing species, vulnerable to overfishing. Populations believed to be declining in Gulf.
- Taken accidentally by fishermen throughout its range.
- Reef habitat is vulnerable to global warming and ocean acidification.

SOLUTIONS Both the U.S. and Cuba have special protections for the species. EDF and partners are working to enhance local benefits from tourism and find alternatives to fishing.

CARIBBEAN REEF SHARK

(*Carcharhinus perezii*)



BLACKTIP SHARK

(*Carcharhinus limbatus*)

Prized for their meat and fins, blacktips are among the most important shark fisheries in the U.S. and Mexico. They leap from the water and spin like a top when attacking schooling fish.

THREATS

- Easily caught by fishermen as they stay close to shore.
- Inshore habitat and pupping grounds at risk from pollution and development.
- Heavily fished.

SOLUTIONS EDF is urging federal regulators to develop a U.S. catch share. EDF and partners are surveying shark species in Mexican and Cuban waters with the goal of protecting critical habitat.



COAL'S DAY OF RECKONING

Pushed by EDF action, EPA clamps down on global warming pollution

In March, the Environmental Protection Agency proposed the first nationwide limits on global warming pollution from power plants that burn coal, oil or natural gas. EDF was one of the parties that brought the suit prompting this advance.

The so-called New Source Performance Standards (NSPS) apply only to new power plants. U.S. power plants emit about 40% of the nation's carbon pollution and are one of the largest sources of greenhouse gas emissions in the world.

"EPA's historic action will bring multiple benefits—cleaner air, a stronger economy

and a lower risk of global warming," says Fred Krupp, EDF's president. "For the American people, it's a home run."

Already the coal industry, some backward-looking power companies and their allies in Congress are mobilizing to block the proposed limits. The U.S. Chamber of Commerce, in a statement, has promised to "evaluat[e] all of its options to overturn this rule."

EDF is fighting back. We and our allies have already generated 1,000,000 comments to EPA in support of the rule. "The stakes are high," says Krupp.

"Climate change is already affecting American communities. This is a reasonable first step toward getting power plant emissions under control."

EPA began developing the regulations after a 2007 Supreme Court case that EDF was instrumental in winning. The court ruled that under the Clean Air Act, the agency had a duty to

determine whether carbon pollution posed a threat to human health and was therefore subject to the Clean Air Act. In 2009, EPA found that it did and began to work on standards to control carbon pollution.

Contrary to what opponents in Congress claim, some businesses welcome the new EPA rules. Many of the power plants built in the last decade already meet the new standards. But that hasn't stopped entrenched climate change deniers such as Sen. James Inhofe (R-OK) from vowing to kill them.

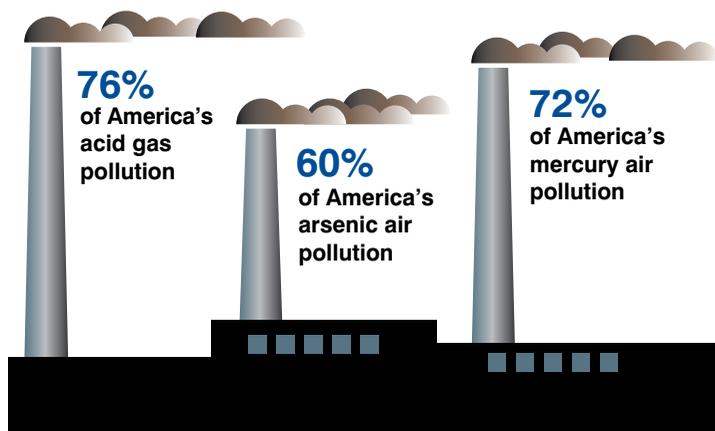
The naysayers should listen to the growing chorus of voices, many from unexpected places, calling for a cleanup of dirty coal.

"EPA's action establishes a logical and modest standard for new electric power plants and provides the industry with much-needed regulatory certainty," says Ralph Izzo, CEO of PSEG, a New Jersey utility. "It provides a framework for the industry to confront this problem in a cost-effective manner."

If we win, the new rules will cut the carbon pollution from a new coal plant in half.

➤ **Take action! Add your voice to the hundreds of thousands fighting for this new rule against those who are trying to kill it. Go to edf.org/endedirtyenergy**

TIME TO CLEAN UP



Coal-fired power plants emit more hazardous air pollution than any other source in the United States. Those emissions include 386,000 tons of 84 different hazardous air pollutants.

WHY I FIGHT FOR CLEAN AIR

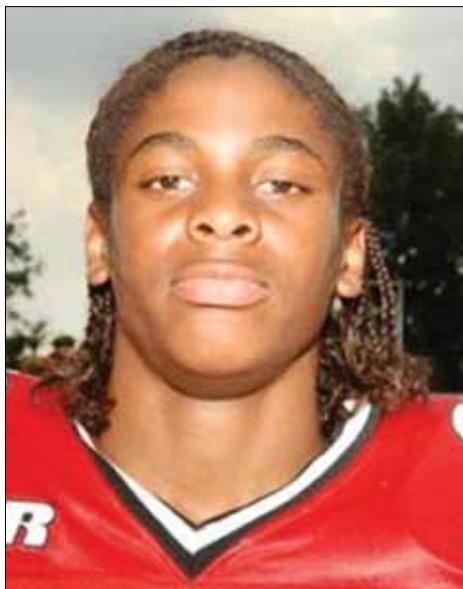
A mother's story



Robert Warren/Getty Images

Some political leaders choose to address pollution in cool, abstract terms. On March 27, 2012, EDF ally Chandra Baldwin-Woods of Cincinnati posted this account of the real costs of air pollution. This article first appeared on the Moms Clean Air Force site and is abridged for publication.

An asthma attack turned my world upside just two years ago, and it has never been the same since. After returning home from football practice on a typical muggy August day, my 16-year-old son Jovante suffered an asthma attack that



Woods family photo

Sixteen-year-old Jovante Woods suffered a fatal asthma attack in 2010. Asthma claims more than 3,000 American lives every year.

rendered him unconscious from anoxic brain injury. Jovante's father and I spent the next four days by his side in the hospital praying for his recovery, which was not to be.

I do not have adequate words to describe the pain of losing a child. It's something no parent should ever have to experience. Knowing that we will never watch Jovante graduate high school, attend college, or experience the joy of starting a family is a pain we live with every day.

Jovante idolized Jerome "The Bus" Bettis for his courage to never let asthma stand in his way on or off the field. Jovante's doctor was confident that he could continue to pursue his passion for athletics, which runs deep in our family. I play women's full contact football and Jovante's father, Ickey, was a fullback for the Cincinnati Bengals. Both Ickey and I had asthma growing up and fully expected Jovante would someday grow out of it just as we had.

When I hear those who undoubtedly know better—corporate polluters and even politicians in Congress—minimizing

the serious health consequences caused by air pollution, my heart breaks all over again. How these people have the audacity to callously deny what is common information in the medical community—air pollution causes asthma attacks and cuts short the lives of those we love most—is beyond me.

By fighting alongside the American Lung Association and Moms Clean Air Force, we are passionate about building a future where every child has healthy air to breathe. Cleaning up power plant pollution and other air pollution will prevent thousands of asthma attacks every year while giving other children the chance to fulfill their dreams. It is through this work that the best memories of our wonderful, loving child live on.

We are also proud of the foundation and scholarship program we started in our son's name. To learn more, please visit: www.jovantewoodsfoundation.org.

A poem by Jovante

I am truly glad to call you my mom
I really appreciate in hard times the way
you make ends meet
I love you with all my heart and you're the
bomb
You taught me to work hard and never cheat

In past times, we've had our share of fights
Sometimes I may say your name
followed by a swear
But still you've always encouraged me to
reach new heights
I'm so sorry my asthma attacks gave
you a scare

Without you, I would not be here
When I'm upset, you've always kept calm
With a house filled with six kids you found
time to care
This is why I'm glad you are my mom

—Jovante Woods 1994–2010

WHAT YOU CAN DO

Chandra Baldwin-Woods and EDF are part of a powerful new movement, Moms Clean Air Force, which is standing up to those who would sacrifice public health for profit. The group includes influential bloggers who inspire mothers and mothers-to-be to protect the Clean Air Act and put an end to further health tragedies. Get the facts and join us at momscleanairforce.org





istockphoto.com

HELP KEEP THE HIVE ALIVE

How bees can flourish in your own backyard

Is your lawn punctuated with white dots of blooming clover? If so, instead of breaking out the weedkiller, why not give your local bees a break? Bees—along with birds, bats and butterflies—transfer pollen from flower to flower as they forage, which pollinates clover and other plants. Many people aren't aware of how big a deal this is. In fact, bees pollinate an astonishing 30% of the fruits, nuts and vegetables grown on the planet. There are nearly 5,000 species of bees in the United States.

Why do the bees suddenly need your help? They're under assault as never before. Global warming is changing when flowers bloom; herbicides and pesticides are taking a toll (two recent studies suggest that common pesticides known as neonicotinoids harm colonies); and parasites such as mites are attacking hives.

As a result, a phenomenon called honey bee Colony Collapse Disorder has become a worldwide problem. In the United States since 1990, for instance, more than 25% of the managed honey bee population has disappeared.

Here are a few things you can do to ensure a healthy bee population survives:

BE BEE FRIENDLY According to Patty Pulliam, a mainstay of the Backyard

Beekeepers Association, "Avoid pesticides or herbicides—bees are very sensitive to them—and don't mow every square inch of your lawn—leave a little as pasture or meadow."

MAKE A BEE HEAVEN Grow the plants bees love. These include bee balm, sunflowers, every kind of herb (including thyme and oregano) and any kind of mint. Other planting choices that bees adore include: goldenrod, wild lupine, coneflowers, butterfly weed, milkweed and hyssop. Last year's garden crops can also be allowed to flower (Bumblebees love



bolted kale, for instance). Color also seems to matter. Bees find blue, purple and yellow flowers most appealing.

MAKE A POLLINATOR HAVEN Your native plants will send out a signal that attracts all pollinators, including hummingbirds, butterflies, wasps and beetles. You'll be amazed at how lively your backyard will become when you go natural!

ADOPT YOUR OWN HIVE You can pay to support a hive at a local honey producer. In return you get to visit your bees, and enjoy bee goodies such as honey and lip balm. Or, if you're more ambitious, local enthusiast groups will play matchmaker and hook you up with a beekeeper, who will set up and care for a hive on your own land.



BUILD A BEE BUNGALOW You can help solitary bees by making a simple house from pieces of scrap lumber. Just drill three- to five-inch-deep holes of various widths (1/8th to 5/16th of an inch) into the wood, but don't drill all the way through. In the early spring attach these in building eaves. A birdbath or plastic water bowl also helps.

—By Jim Motavalli

MORE BUZZ ON BEES

- Attracting bees to your garden: enature.com/articles/detail.asp?storyID=641
- Adopt a hive: marinbeecompany.com/Adopt_A_Hive.html
- UC Berkeley guide to bee-friendly urban gardening: nature.berkeley.edu/urbanbeegardens
- Build a bee house in your backyard: goo.gl/1HbhM
- For an East Coast guide to bees: winfreelab.rutgers.edu/outreach
- Why we should care about vanishing bees: *The Forgotten Pollinators* by Stephen L. Buchmann and Gary Paul Nabhan, Island Press, 1997
- Host a hive: backyardbeekeepers.com

Jim Motavalli writes regularly about green products for The New York Times, National Public Radio and thedailygreen.com. Opinions are the author's and not those of Environmental Defense Fund.

THE ENERGY PIONEERS

In Austin, EDF's smart grid project takes shape



Pecan Street Inc.

“We plug it in when we get home and unplug it before we leave,” says Regina Emmitt. “It’s become as routine as opening and closing the garage door.”

Emmitt, a resident of the Mueller neighborhood in Austin, TX, is talking about her new electric car, a Chevy Volt. By summer’s end there will be roughly 100 Volts tooling around her neighborhood, which is home to Pecan Street, one of the world’s most ambitious smart grid experiments. This may be the highest concentration of electric cars in a single square mile anywhere, and it will provide critical data on how these machines should be incorporated into the electric grid.

Electric vehicle deployment is just one sign that the new energy future is finally coming of age. In 2009 EDF joined a small group of visionaries in Austin to create Pecan Street, a nonprofit collaboration among the city, the local electric utility, researchers at the University of Texas and corporate partners like Sony, Intel, Oracle and Whirlpool—all dedicated to reinventing the electric grid.

The idea, called “pioneering” by *Time* magazine, is to turn America’s century-old grid into an interactive system, a smart grid, to make electricity more efficient, responsive, reliable, resilient and green. “In this vision, all the

devices in your house or business will work as a whole to find the most efficient and inexpensive ways to use energy,” says Miriam Horn, director of EDF’s smart grid initiative.

A homeowner on the smart grid might generate solar power on her roof, then sell it back to the grid, or store it in the battery of her electric car. Every appliance in her home will talk to one another and to the grid, turning on when there’s cheap, clean wind power, or off when there isn’t.

Today, that vision has become a \$30 million project whose nexus is the Mueller neighborhood, where some 400 households (a number that will rise to 1,000) have volunteered to let Pecan Street researchers track their home energy use and to test new products, like the Volt.

Researchers at the Advanced Computing Center at the University of Texas are analyzing trillions of bytes of household data. This growing database has already created the most detailed picture of home energy use ever compiled—anywhere. And later this year, several of Pecan Street’s corporate partners will begin testing interactive consumer appliances and energy management software in Mueller homes.

“When we started Pecan Street, we all agreed to dream big, but the project is actually outpacing our imaginings,” Horn says. “Already, the Pecan Street vision has expanded to utilities throughout Texas and around the country—all of them working with us on a vision of a smarter, cleaner grid.”

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Tomorrow's generation of green leaders fans out to companies, cities and colleges

It's summertime, which means that the EDF Climate Corps program is again in full swing. Climate Corps, now in its fifth year, embeds specially trained MBA and MPA students with corporations, city agencies and universities around the country. Once in place, our Climate Corps Fellows use their skills to ferret out energy waste and develop programs

to help their hosts save money and cut carbon emissions.

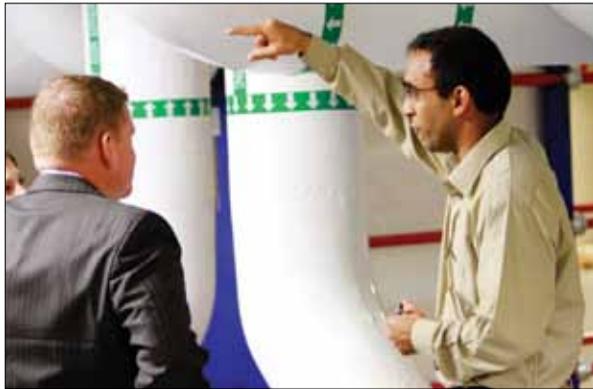
This summer, the Climate Corps, which began with just seven fellows at seven companies, will send 98 fellows to 88 host organizations. Among the many first-time participants are Google and the cities of Atlanta and Los Angeles.

As the program has grown, so have the potential savings found by our fellows. So far, they stand at:

- 1.6 billion kilowatt hours of electricity use and 27 million therms of natural gas annually, equivalent to the annual energy use of 88,000 homes.
- over 1 million metric tons of CO₂ emissions avoided annually, equivalent to the annual emissions of 200,000 passenger vehicles.

- \$1 billion in net operational costs over the project lifetimes.

These aren't just theoretical figures. Participating companies say they have begun projects accounting for over 80% of the energy savings identified by the fellows.



Not just changing lightbulbs. EDF Climate Corps students are transforming corporate culture.

Beyond the headlines: the lesser known climate impacts

In a warming world, floods, droughts and wildfires may get headlines, but most climate impacts get no attention. EDF is working to educate policy makers about these unnoticed changes.

Over the past decade, for example, mountain pine beetles have laid waste to 65,000 square miles of Rocky Mountain forest, from New Mexico to the Yukon. Beetle populations are thriving, in part,

because winters are too warm to control their numbers. In some areas, longer warm weather periods allow the beetles to produce an extra generation in the summer, according to a recent study, making a bad situation worse.

Warmer temperatures also means, increasingly, that bird migrations no longer match the availability of food supplies. For example, Europe's pied flycatcher winters

in Africa and migrates to the Netherlands for spring breeding. But the caterpillars it eats are hatching earlier in the year, so when the birds arrive at their nesting grounds, the caterpillar supply has already peaked.

The resulting food shortage has led to a population drop of 90% in some areas.



See how climate change is altering our world in ways you might not know about, at edf.org/newnormal.



Big park, little view

Two victories for clean air

In the 1930s, visitors to Shenandoah National Park could see the Washington Monument, some 70 miles away. That's rare today; the park's mountains are often shrouded in haze from coal-burning power plants in the Ohio River Valley and West Virginia. Air pollution is now an acute problem at many national parks. But thanks to an April court settlement involving EDF, its partners and EPA, the agency will now move ahead to clean up air pollution affecting parks and wilderness areas.

"People should be able to visit national parks without finding the same air pollution they left behind in the city," says EDF attorney Pam Campos. "This settlement moves us closer to that goal."

EDF and its allies scored another win in March when the Senate rejected a move to delay the cleanup of industrial boilers, the nation's No. 2 source of toxic mercury pollution. EDF fought the amendment, which would have delayed cleanup for over three years, causing more than 28,000 premature deaths and 17,000 heart attacks. "Mercury is a lethal toxin," says Campos. "There's no excuse for further delay."

Prescription for a healthy rainforest: Help the ranchers

From howler monkeys to jaguars, the Maya forest of southern Mexico is rich with wildlife. Unfortunately, large areas are being cleared for agriculture. But keeping forests alive is increasingly important for the prevention of climate change.

“To save the forests, the local people must be involved,” says EDF’s Danae Azuara. Working with AMBIO, a local group, Azuara helps coordinate a program that pairs agronomy and forestry students from Chapingo University with rural

communities in Chiapas. The students help farmers devise ways to increase production, so they don’t need to clear additional forest.

This year, we’ve placed six students. Several advised farmers on how to improve nutrition for cattle so they produce more meat and milk on the same acreage. One helped farmers deal with a fly pest that damages corn crops.

“This project can be a model for other tropical forest communities,” says Azuara. “The passion and energy of the students to improve the livelihoods of local people and protect the environment gives me hope.”

EDF has worked with the Mexican government since 2010 to contribute our technical expertise toward Mexico’s goal of reducing carbon emissions from deforestation. This year, Mexico’s legislature passed a comprehensive climate bill. It awaits President Felipe Calderón’s signature.



EDF’s pilot project explores how jaguars and ranchers can coexist.

Harlem, long a dirty air hot spot, launches a clean air renaissance

Just three years ago, EDF began a campaign to rid New York City of dirty No. 6 and No. 4 heating oil. Only 1% of the city’s buildings burn these fuels, but they spew more particulate matter, or soot, into the air than all the city’s cars and trucks combined.

That toxic cloud results in 259 preventable deaths every year, not to mention \$733 million in additional health care costs.

Last year, our campaign, which included an interactive online map showing 9,500 city buildings that burn No. 4 or No. 6 oil, helped convince Mayor Michael Bloomberg to create a Clean Heat partnership between his administration and EDF.

The partnership is dedicated to converting buildings from the dirty oil. The administration also announced rules that will phase out No. 6 oil by 2015 and No. 4 oil by 2030.

Thanks to Clean Heat, 543 buildings

have committed to converting from dirty oil and the numbers are growing rapidly.

In Harlem, meanwhile, where the asthma rate among children is far above the national average, we are developing innovative financing solutions to make

it possible for landlords to convert their buildings from oil to cleaner and cheaper natural gas.

“The clean air renaissance in Harlem is underway,” says EDF attorney Isabelle Silverman.



Children are especially vulnerable to respiratory illnesses, including asthma.

ONE RIVER, 35 MILLION LIVES

Born in the snows of the Rocky Mountains, the Colorado River flows southward through the tablelands of the Colorado Plateau and into the great deserts of the American Southwest. The only significant source of precious water in a vast and arid region, the river is a lifeline for 35 million people.

But today, there are more claims to the river than there is water available. Tapped by thirsty

cities, farms and industries, the Colorado literally dries up before it reaches the sea. Anticipating a future of more demands and drought made worse by climate change, EDF is working to bring users together to solve the imbalance between supply and demand.

Ultimately, the fate of the Colorado is in the hands of the people who use its myriad bounty.



CITIES

The Colorado system sends about 20% of its water to the West's largest cities. Without urban conservation and opportunities to buy water from farmers, cities will run out of water. But there's opportunity in this crisis. EDF is promoting water trading that lets farmers increase profits while sharing water. We're also pushing to bring diverse populations to the table.



RECREATION

Every year, millions of people enjoy fishing, boating, hiking and bird-watching along the Colorado. The river supports five national parks. The recreation industry is a vocal ally of EDF's in ensuring the river will remain healthy for years to come.



AGRICULTURE

About 80% of the Colorado's water is dedicated to agriculture, which is nowhere near as efficient as it could be. The West's water crisis cannot be solved without giving farmers and ranchers incentives to improve irrigation. At the same time, we need to create flexible markets to let them profit by saving water.



WILDLIFE

Seven national wildlife refuges sustain big horn sheep, river otters and endangered fish. The river is also a lifeline for over 350 bird species traveling along the Pacific flyway, including the yellow warbler.



EDF is working to give the environment a seat at the table and ensure that there will always be enough water to sustain the Colorado's wildlife.

