

Solutions



Vol. 52, No. 3 / Summer 2021



Generation Climate

They're young, passionate and breaking new ground in the climate fight.



ALSO INSIDE: Biden's green jobs bonanza | EDF is going to space | Your garden and climate change



An icon soars

In the 1960s, in an attempt to save the nation's great birds of prey, a small group of scientists and a lawyer went to court to ban the use of the insecticide DDT, which weakened eggshells and kept chicks from hatching. Their campaign led to a nationwide ban — and to the founding of EDF. It also helped the bald eagle stage a stunning comeback. From just 417 nesting pairs in the lower 48 in 1963, the population has soared to over 300,000, according to the U.S. Fish and Wildlife Service. EDF is proud to have led the effort to save this magnificent creature.

The tipping point



A tipping point, says the writer Malcolm Gladwell, “is that magic moment when an idea, trend or social behavior crosses a threshold, tips, and spreads like wildfire.”

Today, the stage is set for just such a moment — the greatest opportunity in our lifetimes to act decisively on climate change and set the world on a path to a cleaner, healthier and more sustainable future. Now, we need action.

There are encouraging signs we will get it. A majority of American voters support the president’s transformative infrastructure plan, which promises that every dollar spent “will be used to prevent, reduce and withstand the impacts of the climate crisis.” (See p. 7). And as we’ve often seen before, U.S. action will spur other nations to greater ambition.

There is also broad business support for action. When the president committed to cutting U.S. greenhouse gas emissions 50% below 2005 levels by 2030, he had the public backing of more than 400 companies and investors, including Apple, Coca-Cola and Google. And major companies around the world are investing in a groundbreaking initiative to save rainforests — a critical element in the climate fight (see p. 13).

In the U.S. we still need stronger laws and regulations that actually require reductions in climate pollution. That’s what made the Senate’s recent vote to restore limits on methane emissions from new oil and gas wells so important. EDF helped lead this effort, and data from our MethaneSAT mission will help verify that methane leaks are being spotted and fixed both in the U.S. and around the world (see p. 14).

The window for such progress may not stay open for long. That’s why EDF’s experts are in daily contact with the White House, key agencies and Congress, pushing them to act now to speed the transition to a cleaner, more prosperous and more equitable economy.

To build the broadest possible support for this shift, EDF is listening closely to environmental justice groups, companies, unions and many others to ensure that the measures needed to help us reach our climate goals are rooted so deeply that they will resist the winds of political change.

All of us are inspired in this work by a rising generation of powerful and passionate young people, whose creativity, resilience and impatience are already making an impact on every aspect of this fight (see cover story, p. 8). As 20-year-old student leader Alexandra Grayson told us: “This is our chance to right so many injustices in our society as we work for a sustainable future. We’re on our way. There’s no looking back now.”

It’s time to make this moment the tipping point that Grayson, and the country, needs.


EDF President

In this issue

- 4 Field Notes: California’s clean cars win
- 6 Climate risk is business risk
- 7 Biden’s big green jobs plan
- 8 Cover: Meet the new climate generation
- 12 Bye-bye baby food toxics
- 13 Rainforest rescue
- 14 Tackling climate pollution from space
- 16 Harnessing tech to fight Western drought
- 17 Portraits of Change: A fisherman’s story
- 18 Green Living: Gardening for climate change
- 19 EDF Community: Your feathered friends

Managing editor
Senior writer/editor
Editor at large
Contributing writers

Tasha Kosviner
Shanti Menon
Peter Edidin
Tom Clynes
Joanna Foster
Tink Tank Studio
Paula Trotto
Kat Rossos

Design
Photo editor
Project coordinator

Talk with us

editor@edf.org

Solutions

©2021 Environmental Defense Fund. Published quarterly in New York, NY. ASSN 0163-2566

ENVIRONMENTAL DEFENSE FUND

EDF’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.

257 Park Ave. South, New York, NY 10010
212-505-2100

Support our work

Donate online at edf.org/newsletter or by mail: EDF, Member Services, 1875 Connecticut Ave. NW, Ste. 600, Washington, DC 20009. For inquiries, contact 800-684-3322 or email members@edf.org.

New York / Austin / Bentonville, AR / Boston / Boulder / Raleigh / San Francisco / St. Petersburg, FL / Washington, DC / Beijing / Jakarta / La Paz, Mexico / London



FIELD NOTES

EPA puts California back in the driver's seat

The Environmental Protection Agency has taken the first steps to restore California's long-standing authority to set its own vehicle emissions standards, which President Trump attempted to revoke. The move also sets the stage for negotiations over the ambitious new federal emissions standards the Biden administration is expected to pursue in the coming months.

Transportation is the nation's largest source of planet-warming emissions and California is the largest car market. The state's power to set its own, more stringent car pollution rules has for decades led to stricter national standards. In addition, 13 other states and the District of Columbia follow California's lead, accounting for 36% of U.S. auto sales.

"For years, states have led on protecting human health and the climate through vehicle pollution standards," says EDF senior attorney Alice Henderson. "This is a crucial step in preserving that right."

EDF and our allies took the Trump administration to court over its attempt to weaken federal clean car standards and deny California its right to set its own bar. We're now calling on the Biden administration to require that all new passenger vehicles sold in the U.S. be zero-emitting by 2035, and all medium- and heavy-duty trucks and buses by 2040.



57,000

lives will be saved cumulatively, according to an EDF report, if all new heavy-duty trucks and buses sold in the U.S. are zero-emitting by 2040.



Charging up vs. Filling up



38 tons CO₂



87 tons CO₂

A recent study found a typical gas-powered passenger vehicle would emit more than twice the CO₂ as its electric counterpart over its lifetime, with today's mix of power sources. That differential is expected to soar as manufacturing and power become more environmentally friendly.

Source: The Wall Street Journal

Dramatic vote for climate at oil giant ExxonMobil



In a watershed moment for the transition to clean energy, ExxonMobil shareholders voted to elect three new board members who have pledged to move the company away from fossil fuel production and toward a low-carbon future.



GETTY

A big break for Louisiana's battered coast

Plans for the largest ecosystem restoration effort in U.S. history have taken a major leap forward, thanks to a positive federal government review.

The \$1.8 billion project will harness the sediment-moving power of the Mississippi River to protect and restore thousands of acres of precious wetlands, creating natural defenses for the storm-battered city of New Orleans, and a much-needed

safe haven for countless wild species. It was selected as the preferred restoration approach by the U.S. Army Corps of Engineers this spring.

"This is an exciting milestone in our efforts to safeguard the future of a unique and beautiful region," says EDF's head of coastal resilience, Steve Cochran.

On average, Louisiana loses a football field-sized area of land to the sea every 100 minutes.



GETTY

Lumi Youm Community Coordinator

What do you do?

I manage the EDF Action Ambassadors online community, a group of passionate volunteers who advocate for our cause by contacting their elected officials, writing letters to the editor and raising awareness of our issues.

Who are these wonderful people?

Among them are a union attorney from Tennessee, a retired chemical engineer from Pennsylvania and a member of the Chicago Symphony Orchestra. They're from all walks of life, united by a passion for the environment.

Can anyone join?

We welcome everyone with the time and energy to get involved! Let us know you're interested at edf.org/ambassadors and I'll be in touch.

What makes your day?

Empowering people to speak up for what they believe in. Last Earth Day, we asked members to write to lawmakers about rebuilding better after COVID-19. I read letters from young people afraid for their future, grandparents worried about the effect of pollution on their families, people whose lives had been upended by climate change. Despite their fears, their hope shone through.

Who do you admire?

Everyday heroes. People who dedicate themselves to their community and creating a better world. They're not on the news and they won't be in history books. But their impact is immeasurable.



Rolling back the rollbacks

President Biden has already overturned 33 of the Trump administration's anti-environmental policies. Recent highlights include:

1 The EPA scrapped a Trump-era regulation, known as the cost-benefit rule, that distorted the agency's assessment of clean air protections. This helps EPA protect public health against dangerous air pollution.

2 At press time, a bipartisan Senate vote repudiated the Trump administration's efforts to roll back methane regulations. This helps clear the way for the EPA to reduce methane emissions from hundreds of thousands of existing oil and gas wells.



GETTY

A good year for baby whales

North Atlantic right whales are among the most endangered of large whales, but spotters counted 17 calves that were born last winter off the southeastern United States. That was more than in any year since 2015. It is estimated that just 360 of the whales remain.

High time to get the lead out

Finally, an issue almost everyone can agree on: Let's replace lead pipes.

Lead pipes connecting houses to water mains are the most significant source of lead in drinking water in as many as 10 million American homes. Even low levels of lead can permanently damage children's brains and increase risk of adult heart disease.

A recent poll by EDF and partners BlueGreen Alliance and Black Millennials for Flint found that 80% of American voters support funding lead pipe replacement nationwide. The findings strongly suggest bipartisan support for President Biden's proposal to dedicate \$45 billion

to replace the millions of lead pipes as part of his infrastructure package.

Tom Neltner, EDF's chemicals policy director, says lead pipe replacement would yield more than \$205 billion in societal benefits over 35 years by cutting adult cardiovascular disease, as well as the benefits of protecting children.



SHUTTERSTOCK



Accounting for climate

EDF is spearheading reforms that will force businesses to disclose the growing financial risks of climate change.

GETTY

PLACE A MAP OF U.S. INTERNET infrastructure over a map of sea level rise projections and you'll find alarming overlaps. Thousands of miles of fiber optic cables and more than a thousand clusters of key internet infrastructure appear destined to be underwater in the next 15 years. This could disrupt internet service for millions of Americans. Despite this, neither AT&T nor Century-Link, the companies that own most of the equipment in the flood zones, made any mention of sea level rise in recent financial filings that were supposed to flag potential risks for investors.

That's because they don't have to.

The U.S. Securities and Exchange Commission, which is charged with ensuring that investors have the information they need to make prudent investment decisions, doesn't require companies to report meaningful information about how climate change will affect their operations. So investors may have no idea that a particular corporation has hundreds of millions of dollars tied up in infrastructure at risk of chronic flooding.

That might all be about to change. This spring, after years of inaction, the

SEC created a task force to examine corporate environmental, social and governance issues. It has also appointed a climate czar and issued a call for public input on how best to design new climate risk regulation. It's high time. The U.K. and New Zealand have already committed to mandatory climate risk disclosure and the European Union is moving toward its own regulations. In May, President Biden issued an executive order on climate-related financial risk. And ExxonMobil's recent investor-forced changes to its board shows climate action is now an imperative for investors (*see story p. 4*).

EDF is increasing the momentum for action. On Capitol Hill, our environmental justice liaison Heather McTeer Toney and then-Senior VP for climate, Nat Keohane, testified in congressional committee hearings on climate-related financial risk and the importance of climate action to the stability of the U.S. economy. We also collaborated with the Institute for Policy Integrity at NYU School of Law on a recently released report that contains detailed recommendations on how the SEC should develop mandatory rules for disclosure of climate-related financial risk.

"Climate change poses systemic risks

to the financial system itself, and relying on voluntary programs for this information isn't good enough," says Michael Panfil, lead counsel at EDF and co-author of the new report. "This isn't just about protecting investors; it's about protecting society as a whole."

Climate change cost the U.S. more than \$500 billion in direct damages over the last five years, and the price is rising.

The fact is, everyone is vulnerable when there is a shock to the financial system. You didn't have to own a sub-prime mortgage to take a hit when the housing bubble burst. In the ensuing financial crisis, 8.8 million Americans lost their jobs and a quarter of U.S. households lost at least 75% of their net worth. Similarly, when tough times come, you could end up just as underwater as AT&T's fiber optic cables, even if you don't own shares in the company.

Forewarned is forearmed.

"Preparing for the impacts of climate change is about much more than clearing underbrush to reduce fire risk in the West or restoring wetlands to mitigate flooding on our coasts," says Panfil. "We have to prepare our financial systems to weather a new reality."

Joanna Foster

Biden's big boost for clean jobs

The president's historic infrastructure plan will help America realize the clean energy economy the country needs now.

KEENA MULLINS, THE DAUGHTER OF a coal miner, grew up in the heart of Appalachia. She always wanted to be a scientist, but when a series of tragic events landed her back in her hometown of Clintwood, Virginia in 2014, a single mom with two toddlers, she took the best job she could find — working at Applebee's for \$2.16 an hour, plus tips. It was the same salary her mom had made at Pizza Hut 20 years earlier.

"The whole region is struggling," says Mullins. "The decline of coal is just one in a string of downturns. I wanted something better for my kids and neighbors."

When Mullins, a member of EDF affiliate Moms Clean Air Force, heard about a program training workers to install solar panels, she knew she'd found a way to help her family and community start a



ALAMY



Keena Mullins, co-founder of Revolt Energy, at work on a large-scale solar project.

LESLIE VON PLESS / EDF

new chapter. In 2019, she became a licensed general contractor. Just one year later, she co-founded her own solar installation company, Revolt Energy, in Nitro, West Virginia.

"We're on a mission to make sure central Appalachia plays just as important a role in America's energy future as we did in our country's past," says Mullins.

Mullins is leading the way to a better future for her community. And thanks to President Biden's recently unveiled \$2 trillion American Jobs Plan, millions more Americans may soon follow in her footsteps.

"President Biden pledged to create 10 million clean energy jobs to combat climate change and reinvigorate the economy," says EDF's vice president for U.S. climate Derek Walker, whose team advocated for many of the job-creating solutions included in the plan. "This package is a road map for getting to that cleaner, safer, fairer future."

Like so much of the economy, the clean energy sector was hit hard by the pandemic, and many jobs were lost. But the industry still employs nearly three times as many workers as fossil fuel extraction and generation and is adding jobs faster than the rest of the economy.

Biden's plan, which will guide congressional action, is focused on building a national clean energy economy while

targeting investments to help regenerate communities hit hardest by job losses and the decline of coal. For example, it includes a \$27 billion green bank that would help fossil fuel communities transition to a clean energy future. The proposals would help create wind, solar and electric vehicle jobs while also employing fossil fuel workers to clean up abandoned mines and plug oil and gas wells — notorious for leaking climate, air and water pollution. Biden has suggested tying clean energy tax credits to strong labor standards so workers will be protected and have access to unions.

Perhaps most crucially, Biden's plan invests in communities hit hardest by pollution. For decades, chronic underinvestment and disenfranchisement have left many low-wealth communities and communities of color battling a disproportionate burden of pollution. Biden's plan creates a government-wide Justice40 Initiative to ensure that 40% of the benefits of climate-related investments accrue to communities who need them most.

Mullins is ready to take her place in this promising new future.

"I'm the fifth generation of my family working to power America," says Mullins. "I'm just doing it in a way that looks different for the 21st century."

Joanna Foster

The new climate generation

By Joanna Foster, Tasha Kosviner and Shanti Menon

They're in the fight of their lives and they're in it to win. Meet eight rising stars making strides toward a sustainable tomorrow.



EVERY YEAR THOUSANDS OF PEOPLE die from heat stress. As the planet warms, that number will rise and more and more people will need ways to cool down. By midcentury, the demand for air conditioners is expected to quadruple. But this comes at a cost. If left unchecked, air conditioning itself could add an additional half a degree Celsius of warming by 2100, according to the clean energy think tank Rocky Mountain Institute.

Enter Radhika Lalit. A graduate of EDF's Climate Corps fellowship program, she leads the Global Cooling Prize, a competition that challenges participants to reinvent the air conditioner so it has dramatically less climate impact. The opportunity is huge: most commonly sold

room air conditioners are highly inefficient, achieving just 6%–8% of their maximum theoretical efficiency. The \$1 million prize was recently shared by two teams that created air conditioners at least four times more efficient than the average unit currently available. Both teams expect the new technologies to be in units on the market by 2025.

Lalit, who is also a director for the Rocky Mountain Institute, knows the danger of excessive heat firsthand. Growing up in Delhi, India, she was hospitalized more than once because of heat stress.

"Everyone deserves access to cooling without warming the planet," says Lalit. "It's not a luxury. It's a necessity for millions to work, learn, sleep, and in some cases, survive."

Note: EDF does not endorse companies or products.

Corporate change-maker

Matt Panopio, 29



WHEN THE RIDE-HAILING company Lyft announced it would become carbon neutral, Matt Panopio received a message from the company's head of sustainability stating simply: "Thank you for making this possible."

Panopio laid the groundwork for Lyft's bold announcement during an EDF Climate Corps fellowship in summer 2018, when he was asked by Lyft to analyze the company's carbon footprint and map its route to a zero-carbon future.

"Matt delivered a seriously impressive Climate Corps win," says Scott Wood, who runs the Climate Corps program.

Born in the Philippines, Panopio grew up bouncing between naval bases in San

Diego and Okinawa, Japan. That means he also bounced between the terror of wildfires and the fury of typhoons.

"Climate change is simply the most pressing issue of our time," he says.

Today Panopio is a manager on Amazon's energy and sustainable operations team, charged with helping meet the company's goal of achieving net zero carbon emissions by 2040. The goal is ambitious but Panopio relishes the challenge ahead. Some milestones have already been met: In 2020, Amazon toppled Google as the world's largest corporate investor in renewable energy.

"Amazon's scale and reach means I can make an impact in every corner of the globe," he says.

ETOSHA CAVE'S COMPANY, OPUS 12, has developed a device that allows industries to recycle carbon dioxide instead of releasing the climate-warming gas into the atmosphere. It bolts onto any existing emissions source and uses electricity and a unique metal catalyst to convert CO₂ and water into chemicals that can be used to make fuel, plastics or household cleaners.

In a pilot project, Opus 12 worked with Mercedes-Benz to create the world's first car part made from CO₂. Another pilot with Procter & Gamble aims to convert CO₂ into an ingredient for Tide.

With early backing of more than \$25 million from government agencies, research institutions, corporate partners and top-tier investors, the Berkeley, California company is now looking to develop its carbon-recycling devices in a range of sizes, including a building-sized one that can handle large volumes of CO₂ from industrial facilities like power plants.

Cave grew up in a Houston neighborhood adjacent to an abandoned oil and gas waste site, which got her thinking about energy waste. She started Opus 12 in 2015 with two Stanford University classmates, eager to put her Ph.D. research on CO₂ conversion to real-world use.

"We were among a handful of people familiar with this technology," says Cave. "It seemed like if we weren't going to do it, might not ever happen."

Ultimately, Cave envisions transforming billions of tons of CO₂ into useful products every year. While technologies like these can be costly and don't address the need to pollute less, reducing emissions from industrial facilities, which account for 23% of U.S. climate pollution, is critical to solving the climate crisis.

"We need bold innovators like Etosha to tackle the toughest sources of carbon emissions," says Derek Walker, EDF's VP for U.S. Climate. "We don't have time to wait."



POWER IN NUMBERS

EDF is fostering the next generation of climate heroes.

38 countries reached by *Degrees*, EDF's podcast about careers that protect the planet

LISTEN: business.edf.org/degrees

100,000+ young activists have taken climate actions thanks to organizing by EDF-affiliate Defend Our Future

JOIN: defendourfuture.org

1,100 grad students have jump-started environmental careers with the help of EDF's Climate Corps fellowship program

APPLY: edfclimatecorps.org

800+ young fellows and interns welcomed by EDF since 2015

DISCOVER: edf.org/internfellow

The carbon recycler

Etosha Cave, 36



AS A WISCONSIN YOUNGSTER steeped in Tea Party ideology, Benji Backer used to be a climate skeptic. But as his awareness of the climate crisis grew, so did his realization that divisive politics was impeding progress. Seeking a new way forward, Backer helped found the American Conservation Coalition as a college freshman in 2017 to engage young conservatives on environmental issues. Two years later, he testified in Congress alongside Greta Thunberg about the need for climate action.

Today, the ACC has nearly 300 branches on college campuses and in communities across the country, helping young conservatives advocate for bipartisan climate policies. The group released its own climate policy platform this spring, earning praise from members of Congress, conservation groups and bipartisan think tanks, among others.

The climate conservative

Benji Backer, 23



“Many conservatives are passionate environmentalists,” says Backer. “Once you include the business owners, the farmers, the people in rural America in the solutions, they will be at the table and ready to fight.”

The ACC has worked with Defend Our Future, an EDF affiliate that supports and trains young environmental advocates, to jointly advocate solutions

such as clean energy and sustainable agriculture. “We don’t agree 100% of the time,” says Backer. “And that’s OK.”

Says Jonathan Soohoo, manager of Defend Our Future: “Our elected officials need to hear from everyone who cares about the climate crisis, not just people from one side of the aisle. Backer is an influential new voice in the fight for climate solutions.”

Grassroots and up

Alexandra Grayson, 20

WHEN ALEXANDRA GRAYSON looks at the people making decisions on environmental policy at the highest levels, she mostly notices who isn’t there.

“The field is not diverse,” says the Howard University student, who grew up in one of Baltimore’s most polluted neighborhoods. “Who represents the communities most affected, the people who really understand what’s happening?”

Grayson isn’t waiting to be invited. In high school she co-led a group which successfully lobbied Baltimore City to ban polystyrene foam food containers. As a rising college senior, she’s already held prestigious internships with the National Oceanic and Atmospheric Association, the U.S. House of Representatives Committee on Science, Space and Technology and WE ACT for Environmental Justice, whose co-founder is EDF trustee Peggy Shepard.

In 2020, Grayson founded the Howard chapter of Defend Our Future, an EDF affiliate that supports and trains young environmental advocates on college campuses across America. This spring, she led them on a virtual visit to Capitol Hill to lobby senators to support environmental justice legislation. In the future, Grayson, who’s studying environmental science and economics, plans to host such meetings from the other side of the table — as a civil servant at the Environmental Protection Agency or NOAA.

Jonathan Soohoo, manager of Defend, calls her “a future star and a force to be reckoned with.”

For Grayson, the country is at a pivotal moment for climate action and youth engagement is critical.

“This is our chance to right so many injustices in our society as we work for a sustainable future,” she says. “We’re on our way. There’s no looking back now.”

FOR DECADES, EVEN AS SCIENCE revealed the growing threat of climate change, governments were slow to act. Today, a new wave of young scientists is determined to make the science hit home.

“Climate science is not just about average global temperature any more,” says Geeta Persad, who was mentored by former EDF Chief Scientist Michael Oppenheimer and is now an assistant

professor of climate science at the University of Texas at Austin. “It’s about people and the decisions we make. It’s about how high should I build this bridge? Where should I plant my crops? How do I sustain my water supply?”

Says Oppenheimer: “Geeta is a very sharp scientist who’s not satisfied to let others make the world a better place. She’s eager to do some of that heavy lifting herself.”

As a child, Persad obsessed over colorful weather maps on the back page of the newspaper. Today, her goal is to map how climate decisions affect society. Her research has already helped California legislators plan for climate-driven changes to water supplies. Now she’s examining how fast-acting climate pollutants like soot affect regions around the world. She’s found that soot emitted in the United States, for example, can

AS AN EDF CLIMATE CORPS FELLOW at the multibillion-dollar crowdfunding platform Kickstarter, Alexandra Criscuolo launched an online resource center to help entrepreneurs build sustainability into their projects.

Using her guidance, fledgling companies have adopted strategies such as offering lifetime repairs on their products and minimizing packaging. Today, more than 14,000 Kickstarter creators have committed to reducing their environmental impacts.

A former Division 1 college swimmer and triathlete, Criscuolo is today the environmental sustainability manager for New York Road Runners, the organization best known for staging New York City's marathon, the world's largest.

Criscuolo is propelling NYRR toward carbon neutrality as part of the U.N. Sports for Climate Action initiative, a group of more than 200 sports organizations that have committed to cutting the carbon footprint of their operations and events. They also publicly advocate climate action to help inspire billions of sports fans worldwide.

Criscuolo is using her expertise to guide fellow initiative members without a full-time sustainability director on how to reach their climate goals.

"Collaboration is how we're going to solve this," she says. "I'm so thankful for EDF and the Climate Corps network. We're moving the needle together."

The kickstarter

Alexandra Criscuolo, 31



New power generation

Gene Berdichevsky, 37



GENE BERDICHEVSKY IS ON A mission to speed the transition to electric vehicles by revolutionizing battery technology, which hasn't fundamentally changed in 30 years. Vehicle electrification is critical to achieving President Biden's climate goals by reducing emissions from trans-

portation — America's largest source of climate pollution.

As co-founder and CEO of Sila Nano technologies in Alameda, California, Berdichevsky has led the development of batteries that can store up to 40% more energy and cost up to 40% less than today's standard. These advances could

end concerns about the range of electric vehicles and drive down costs, alleviating two barriers to mainstream adoption.

Sila Nano's innovation could take off fast. Because the breakthrough essentially involves an ingredient swap — silicon instead of graphite — the technology can be dropped seamlessly into existing battery manufacturing processes. To date, Sila Nano has raised \$925 million and, thanks to partnerships with Daimler and BMW, the company is on track to get the batteries into cars by 2025.

"The 20th century belonged to combustion, the 21st century will belong to electrification," says Berdichevsky, who got his start at Stanford, racing solar cars from Chicago to L.A., before joining Tesla to help bring the all-electric Roadster from drawing board to reality.

"We need entrepreneurs with the vision, passion and confidence to deliver the solutions the world needs," says Tom Murray, VP of EDF+Business. "Gene and his team are a great example and I'm rooting for their success."

suppress rainfall in Indonesia, which in turn can affect everything from crop yields to infant mortality.

These complex interactions need to be taken into account when people make decisions about how and where to cut pollution and build resilience, says Persad. "We only have one planet," she says. "Climate stability needs to be factored into all the decisions we make to move society forward."

Follow the science

Geeta Persad, 33



Parents demand action on heavy metals in baby food

EDF is working with regulators and manufacturers to get toxics out of children's food.



AFTER CONGRESS RELEASED A report in February disclosing that popular baby foods contain the toxic heavy metals arsenic, cadmium, lead and mercury, Cleveland pediatrician Aparna Bole started getting a lot of questions from worried parents.

"Food safety is always on parents' minds, and after this a lot of parents are scared," says Bole, a mother of two who chairs the American Academy of Pediatrics Council on Environmental Health and Climate Change. "We know there's no safe level of exposure to heavy metals for children, especially in the critical years of rapid brain development." Even in trace amounts, these contaminants

can alter the developing brain and diminish a child's IQ. Since heavy metals accumulate in the body, minimizing exposures is critical.

Many parents assumed the U.S. Food and Drug Administration was protecting them from these kinds of contaminants. But according to Tom Neltner, EDF's chemicals policy director, federal agencies have done little to tackle the stubborn issue over the past 20 years.

"Exposure to heavy metals remains a significant public health problem in the U.S., and families need the FDA to be held accountable for making our food supply safer — especially for the youngest among us," says Neltner.

Arsenic, cadmium, lead and mercury all occur naturally and as residue from pesticides, fuels and industrial processes that pollute the air, water and soil. Their sheer ubiquity causes them to appear throughout our food supply system, so even making baby food from scratch may not reduce exposure.

For the past four years, EDF and allies have pressed the FDA to drive down levels of heavy metals in kids' food. In April, after the outcry over the congressional findings, the agency finally announced a plan to develop guidance and actions to reduce toxic elements in foods commonly consumed by infants and children. We are now urging the FDA to move up its deadlines and account for the cumulative effect of these metals.

But EDF isn't waiting for government action. Two years ago, EDF and Cornell University brought together leading baby food makers with health and regulatory experts to form the Baby Food Council. The group is evaluating ways of growing, processing and packaging food in order to reduce contamination and developing voluntary standards for baby food.

"We're determined to reduce these contaminants," says Neltner, "and we've got a plan to make it happen — so that parents can ensure that they're giving their children safer and healthier food from the very first bite."

Tom Clynes

Visit **Healthy Babies Bright Futures** for tips on reducing toxic heavy metals in your child's diet.

hbbf.org/healthybabyfood

Will *your* story inspire the next generation of environmental progress?

EDF's founding victories against DDT helped spark the modern environmental movement and continue to strengthen our resolve today. Now your story can do the same. Will you let tomorrow's EDF members know what inspires you in our **2042 Time Capsule**?

See the enclosed reply envelope to start planning your long-term impact today, or visit us at edf.org/legacy.



BETTY

Raising billions to save the world's tropical forests

TO PREVAIL IN THE RACE AGAINST catastrophic climate change, one thing is clear: We must preserve the planet's tropical forests, home to indigenous tribes, forest-dwelling communities and more than half the world's plant and animal species. Ending loss of these forests, along with reforestation, can reduce global greenhouse gas emissions by at least one quarter.

But from the Congo to Brazil, tropical forests are threatened by logging, mining, agriculture, cattle ranching and more. From 2002 through 2019, global tropical forest loss averaged 8.3 million acres a year — an area larger than Belgium. Well designed and enforced regulation can

help stem the losses, but a fundamental problem remains: there's money to be made from cutting down trees.

That basic fact has long suggested a possible solution to economically minded environmentalists. As Stephen Schwartzman, EDF's senior director for tropical forest policy, puts it: "To save the forests, we must make them worth more alive than dead."

A significant step toward that end has now been taken. On Earth Day, April 22, at the Leaders Summit on Climate hosted by President Biden, the United States, the United Kingdom and Norway joined nine major corporations, including Amazon, GlaxoSmithKline and Unilever,

to announce the formation of LEAF — the Lowering Emissions by Accelerating

Forest finance coalition. LEAF is creating a new international market for tropical nations to sell carbon credits to private companies that commit to rapidly reducing their emissions. The credits are tied to verifiable reductions in deforestation at large scales — whole countries or states.

The coalition's goal is to play a meaningful role in halting tropical deforestation by 2030, and saving the forests that remain, which still cover some 3 million square miles. To do that, LEAF will commit an initial \$1 billion this year, with at least half from companies — by far the largest private-sector investment ever to protect these critical ecosystems.

"Finally, tropical forest countries can be assured that financial rewards are available if they can demonstrate reduced deforestation," the Norwegian Prime Minister Erna Solberg said in a statement celebrating LEAF's creation.

The work is progressing rapidly. Roughly a dozen countries and jurisdictions are already discussing deforestation reductions that could be used by LEAF, led by Costa Rica, Guyana and three Brazilian states. Additional corporate participants are expected to join LEAF soon. The aim is to finalize deals by year-end and pay for the first verifiable reductions by 2022.

The coalition is a "game changer," says Ruben Lubowski, EDF's chief natural resource economist. "LEAF could start a new market for emissions reductions, channelling tens of billions of dollars per year for indigenous peoples, local communities and sustainable agriculture, while protecting forests at the scale needed to stabilize the climate."

Two decades ago, working to preserve the Amazon rainforest, EDF, with Brazilian nonprofits and indigenous groups, pioneered the concept of compensating those who reduced emissions from deforestation. Today, we remain a leader in the field. LEAF will operate using Emergent, a nonprofit we established in 2019, which facilitates transactions between buyers and sellers of large-scale tropical forest credits. We also helped launch the advanced verification framework LEAF will use to authenticate deforestation reductions.

"Tropical forests are critical for the future of the planet," says Lubowski. "But we need the right economic incentives to save them."

Peter Edidin



THE WILSON LEGACY

This feature honors the memory of Robert W. Wilson, a long-time EDF supporter and champion of harnessing market forces to drive environmental progress. See edf.org/wilson

The climate solution that's out of this world

By Shanti Menon

EDF is going to outer space to find and fix methane leaks — the fastest way to slow down global warming.

IN 2018, EDF PRESIDENT FRED KRUPP made a dramatic announcement: EDF would launch a satellite to locate and measure methane pollution around the globe. Today, that vision is becoming a reality. MethaneSAT is under construction and will be ready to launch in late 2022.

Why on earth would an environmental group venture into space? Because cutting all methane pollution in half by 2030 could slow the rate of global warming as much as 30%. And locating the sources of that pollution is a job best done from space.

Research coordinated by EDF revealed that the oil and gas industry is a much bigger source of methane pollution than previously thought. Reducing methane pollution from wells, pipelines and other equipment can be as simple as tightening a valve, but there are millions of oil and gas sites around the world and hundreds of thousands of miles of major pipelines.

Locating and measuring global emissions from the ground would be a herculean task, but satellites make it possible.

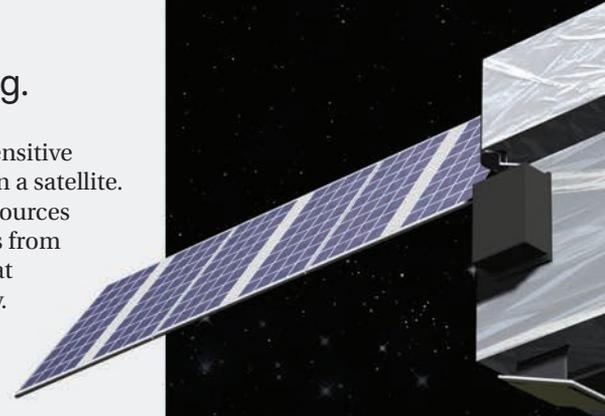
MethaneSAT, designed and operated by EDF subsidiary MethaneSAT LLC, will scan

the entire globe with the most sensitive methane detector ever carried on a satellite. It will pinpoint large emissions sources and also map regional emissions from thousands of smaller sources that are invisible to current technology. It will calculate methane emissions rates in near real time, a process that today can take months.

What's more, MethaneSAT will make emissions data public in order to hold oil and gas producers responsible for reducing their pollution.

As the climate impact of methane emissions has become more clear, companies and governments are moving to reduce methane pollution. EDF's goal is to cut methane pollution from across the oil and gas industry 45% by 2025 — the equivalent of shutting down one-third of the world's coal-fired power plants — and 75% by 2030. MethaneSAT will propel us toward that goal.

Here's a close look at this unique satellite and what it will do.



MethaneSAT data will support and drive action by:

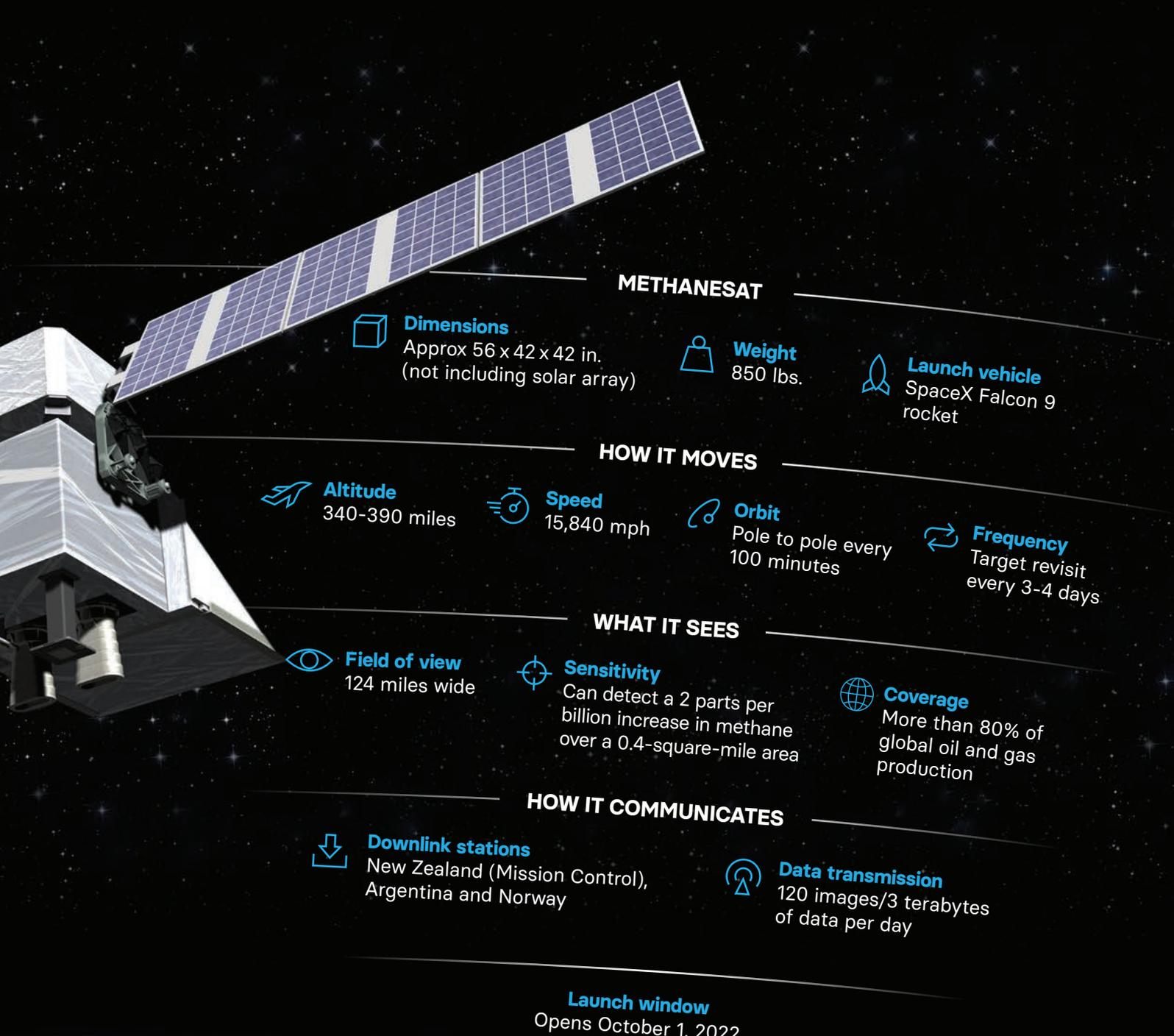
Oil and gas companies

to send ground crews to pinpoint and fix methane emissions

Communities

concerned about harmful chemicals that leak along with methane





METHANESAT

Dimensions
Approx 56 x 42 x 42 in.
(not including solar array)

Weight
850 lbs.

Launch vehicle
SpaceX Falcon 9
rocket

HOW IT MOVES

Altitude
340-390 miles

Speed
15,840 mph

Orbit
Pole to pole every
100 minutes

Frequency
Target revisit
every 3-4 days

WHAT IT SEES

Field of view
124 miles wide

Sensitivity
Can detect a 2 parts per
billion increase in methane
over a 0.4-square-mile area

Coverage
More than 80% of
global oil and gas
production

HOW IT COMMUNICATES

Downlink stations
New Zealand (Mission Control),
Argentina and Norway

Data transmission
120 images/3 terabytes
of data per day

Launch window
Opens October 1, 2022

INSIDE Solutions

LIVE WEB EVENT

Meet MethaneSAT

Join experts from the MethaneSAT team for an inside look at this game-changing satellite. Learn about the latest successes and challenges as the team races to meet the launch deadline. They'll also take time to answer your questions!

August 11, 2021 | 2-3 p.m. ET
Sign up at edf.org/InsideSolutions

Investors

who evaluate corporate responsibility and climate risk



Governments

including the EU, China and the U.S., which are considering ways to tackle methane emissions



New hope in parched West

In the next installment of our *Common Ground* series, exploring how America's farms, forests and coasts are the new frontier in the battle against climate change, meet the ranchers harnessing satellite data to tackle drought.

COLORADO RANCHER PAUL BRUCHEZ learned his first hard lesson about drought in college, when he had to convince bankers not to foreclose on his family's land. His father had been diagnosed with cancer and a bad harvest caused by a dry year had left the family short of hay to sell to pay their mortgage.

Almost two decades later, conditions are again bleak. The entire western United States is suffering the worst drought in 500 years. The Colorado River, which provides drinking water to 40 million people and irrigates 5.5 million acres of farmland, has shrunk nearly 20% compared to a century ago. Climate science predicts worse to come, even as populations continue to grow.

"Demand is rising and supply is shrinking," says Bruchez (*pictured*) whose high altitude 6,000-acre ranch is crossed by the Colorado River. "Water conservation in all sectors is going to be required."

That's why Bruchez and eight other ranchers are working with EDF, Colorado

State and Utah State universities, The Nature Conservancy and others on a four-year project to test the impact of using less water on their fields. The goal: to learn more about how much water pastures need, establish the science required to develop better conservation policy and help landowners adapt to dwindling supplies.

"If we are going to talk about water conservation, we need the most accurate data," says Bruchez.

One critical element of the effort is an online platform called OpenET — a joint project of EDF, NASA, Desert Research Institute, Google and others — which makes satellite-based water consumption data widely accessible to farmers, ranchers and water managers. This summer, OpenET will go live with data on 17 western states.

In Colorado, OpenET will estimate water use on nearly 1,500 acres of pastureland to help assess the long-term impacts of varying irrigation levels. The

study will seek to answer a number of questions. For example, how is hay production affected on fields that use less water? And do more noxious weeds grow on those fields? By analyzing how different fields respond and why — say, varying soil types or field locations — farmers will be able to figure out where they can safely use less water in the future.

Tracking water use with satellites instead of ground-based towers makes it possible to cover much larger swaths of land. This can help inform and improve water management across much of the parched West.

"OpenET will enable locally developed, sustainable water management solutions to be easily expanded to other communities," says Robyn Grimm, EDF's manager of water information systems. "This is crucial to adapt to climate change and water scarcity across the West."

For Bruchez, who faces not only drought but also wildfires fueled by climate change, such innovations can't come soon enough.

"Farmers and ranchers are on the front lines of climate change," he says. "We can help develop the right tools to succeed in growing more food with less water."

Ronna Kelly

Learn more about the **OpenET project** at openetdata.org

THE BASICS: OpenET

What is it? An online platform that makes satellite-based data on water use available to landowners, regulators and the public.

What's it for? To help us manage water use as climate change worsens.

Isn't ET an alien? Yes ... but it also stands for evapotranspiration, the process by which water evaporates from the land and transpires from, or is exhaled by, plants.

Where does the satellite come in? ET causes plants to cool. The temperature changes show up in satellite images so scientists can estimate how much water is being consumed by crops. Farmers can compare that data to irrigation rates and field productivity and adjust their water use accordingly.



Sea change ahead

Claudio Pichaud | Chiloé Island, Chile

IN COASTAL COMMUNITIES AROUND THE WORLD, THE IMPACTS of climate change threaten millions of people who make a living from the sea. Declining fish populations, degraded habitats and more frequent extreme weather events are imperiling families who depend on fishing to pay their bills and put food on their tables.

“The water temperature has changed drastically here,” says Claudio Pichaud, a father who harvests stone crabs in the cold waters off Chiloé Island, in southern Chile. “We get one good day followed by three bad, and storms like we’ve never seen before.”

Pichaud believes his community can and must anticipate the changes and respond with actions to make their fishery more sustainable. An energetic leader, he has teamed with other fishers in his region to better understand how ocean conditions and fishing practices affect the health of the stone crab stock.

On Chiloé Island and in other coastal communities around the world, EDF is supporting networks of fishers like Pichaud in their efforts to build a brighter future for themselves, their families and the marine resources they depend on.

“We have a great group of people that support us, including EDF, with workshops about climate change and fisheries management,” says Pichaud. Based on what they’ve learned, the Chiloé Island fishing community has modified catch limits and established a system to rotate zones open to fishing. They’ve also adopted new crab traps with entrances that block egg-carrying females.

“We have to protect the sea,” says Pichaud. “It’s our livelihood, both today and tomorrow.”

Tom Clynes



Hear Pichaud and other fishers talk about the impact of climate change on their livelihoods and communities at

edf.org/PortraitsOfChange



Plant like the planet depends on it

In backyards across the country, sustainable gardening is gaining ground.

IF YOURS IS AMONG THE MILLIONS OF U.S. households that garden, you already know that growing your own fresh fruits, vegetables and flowers is a fun and relaxing way to get out, get dirty and eat clean.

Gardening can also give back to the environment. According to the National Wildlife Federation, people are transforming their gardening practices to benefit wildlife and the planet in ever-increasing numbers. Join them!

■ Plan for wildlife

Increasingly, wild creatures need gardens that mimic their disappearing natural habitats. So, consider plantings that will create a diverse and inviting ecosystem. Incorporate wildlife-friendly flowers, herbs, shrubs and trees to create a garden that encourages wild mammals, birds, bees and butterflies to visit.

■ Go native

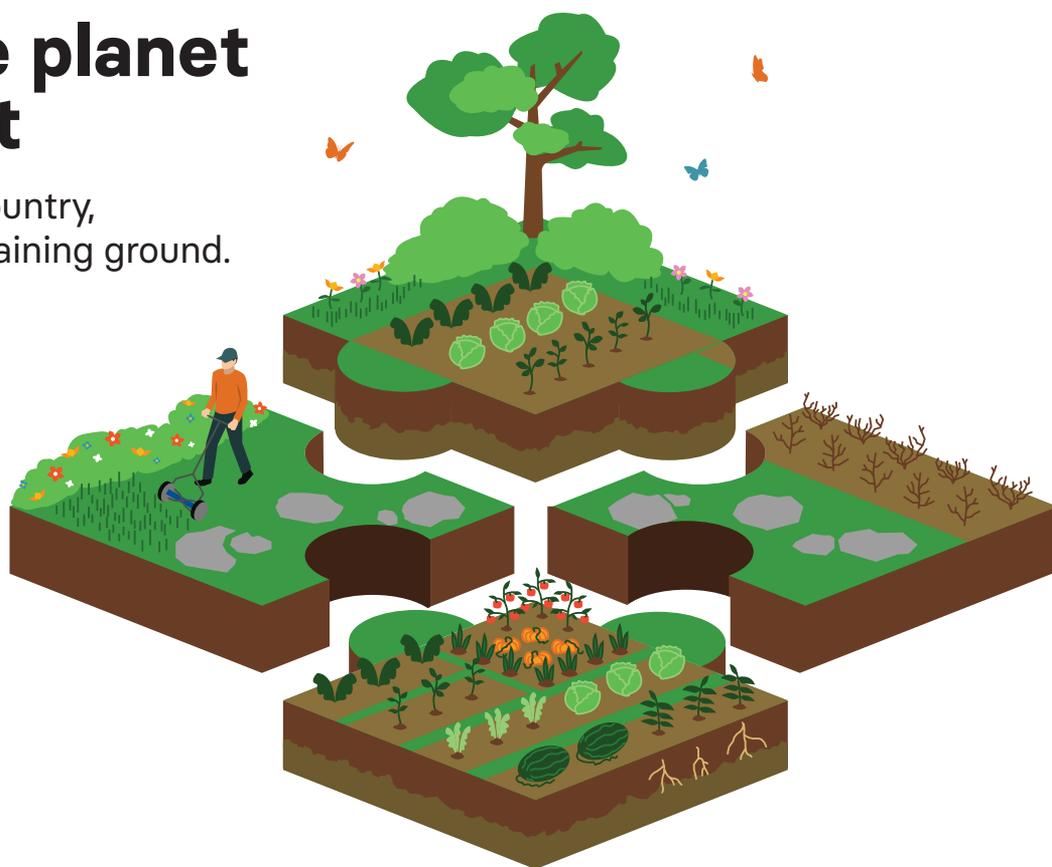
There are approximately 25,000 non-native plant species in the United States. These plants can break the food chain by destroying or replacing the native food sources of insects and other animals. When buying plants or seeds, ask for pollinator-friendly natives. A bonus: Because native plants are well adapted to their ecological niche, they are often easier to grow.

■ Not so fast

Neat freaks will bristle, but cavity-nesting bees and other pollinators will thank you for letting your garden stand over the winter, allowing them to nest in the hollow plant stems the following spring. Postpone spring cleanups until you've had a stretch of a few 50-degree days, to avoid disturbing the soon-to-be winged creatures who will pollinate your flowers and devour pests.

■ Activate your soil's superpowers

No-till or no-dig gardening is catching on among gardeners. Rather than breaking up the soil and destroying organisms and



beneficial humus, no-till proponents regularly top up the soil with compost and other mulch. Some also use cover crops to capture nutrients and add organic matter. This all encourages healthy microbial life and reduces the need to fertilize, irrigate and weed. Also: If you garden near a house or other building built before 1978, be sure to check your soil for lead before growing fruits and vegetables.

■ Ditch the pesticides and power tools

Even organic pesticides can be poisonous to creatures that are beneficial in your garden. Try companion planting, a method of growing certain plants close together to take advantage of complementary characteristics such as pest-repelling abilities, nutrient requirements or growth habits. If you're still using a gasoline mower, consider trading it for an electric or push mower. Even better: Convert part of your lawn to a natural wildflower meadow. Start with areas that are difficult to mow, such as hillsides, and choose a regional wildflower seed mix or a mix targeted to your growing conditions.

Tom Clynes



DIG DEEPER

National Gardening Association
[garden.org](https://www.garden.org)

National Wildlife Federation's Native Plant Finder
bit.ly/3vGsXz

Gardening with Charlie Nardozzi
bit.ly/3vL55Q

GrowVeg.com's "No-Till Gardening: An Easier Way to Grow"
bit.ly/3wzJnc

Farmers' Almanac "Companion Planting Guide: Sow Easy"
bit.ly/3c79D8

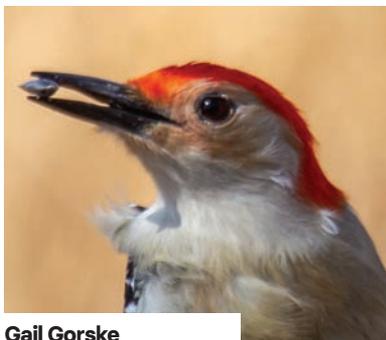
Don't have a backyard? Urban gardening is also a thing!

"10 Reasons to Give Urban Gardening a Try"
bit.ly/3pmmK7

WE ASKED, YOU ANSWERED

Close encounters

When birders spotted a black-browed babbler in Indonesia earlier this year, they were ecstatic — the little bird hadn't been seen in 170 years. But birds don't have to be so rare to surprise and delight us, as we learned from the stories and photos you sent when we asked about your favorites. Here are just a few. Feel free to share more on Instagram, Facebook or Twitter with the hashtag **#EDFLovesNature**



Gail Gorske
Waterford, MI

I love photographing wildlife, but to be honest I sometimes forget to look in my own backyard. The pandemic has forced me to revisit local areas with a renewed sight. It has been a wonderful outlet for my photography bug and an amazing self-care/meditative adventure. This red-bellied woodpecker found a nice assortment of seeds to eat. I quietly settled in to snap away.

Francis L. Reilly
Austin, TX

My partner and I have been walking in our neighborhood a lot since the pandemic started. I'm deaf, but my partner has good hearing and hears the owls in the evening. Once she hears the "who cooks for you," we try to spot them in the trees. One was easy to see: it was perched not 10 feet above us, looking at us like it wondered if we were too big to eat.

David Goldstein
Eden, UT

When I lived in San Diego, scrub jays were frequent visitors to my backyard. After talking to them for some time, I decided to try feeding them. I tossed some peanuts onto the patio and they didn't seem frightened by my standing close by. Imagine my surprise when I dropped some peanuts onto the kitchen floor and these bold birds flew in as if I wasn't there, picked up the nuts and flew back outside with their prizes.



Dennis Eamon Young
Shell Beach, CA

We have a tree next to our loft bedroom by the ocean. Unbeknownst to us a night heron nested there, about 12 feet from where we sleep, and hatched two chicks. As they grew, I was able to climb into the tree and take photos. Their conversations at 3 a.m. were not music to our ears, but eventually our nature show ended and we did get some sleep.



Ari Messenger
New York, NY

On an excursion to Central Park, I stumbled across this rather somber-looking goldfinch, who seemed, at first glance, to match the mood of the rather dreary year. However, the longer I watched I realized that despite its drab appearance, this little bird was hanging in there just as well, or better, than I was. I found myself encouraged to look for more flits of color and spots of beauty.

Cecelia Crane
South Lake Tahoe, CA

We KNOW spring is here in March when the Cheeseburger Bird starts singing "cheeseburger" very early in the morning! They are chickadees and are favorites with the locals and mystify our visitors. Kids and adults love saying "cheeseburger!" back to them.



Yellow-crowned night heron
Frank Grasso
Barnegat, NJ

TRIPLE your impact by supporting EDF's 2021 summer match campaign

Slash climate pollution and build momentum for net zero emissions to protect nature and avert climate catastrophe.

DONATE NOW at edf.org/2021Match



“ Hope is a verb with its sleeves rolled up. ”

— David Orr, Professor Emeritus of
Environmental Studies and Politics, Oberlin College

