

[Union of  
Concerned Scientists



# Catalyst

Volume 23, Spring 2023

## Fossil-Fueled Forest Fires

*How new science can  
pinpoint Big Oil's role*

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## Transforming the New Food and Farm Bill


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## The Cumulative Impacts of Chemical Exposures



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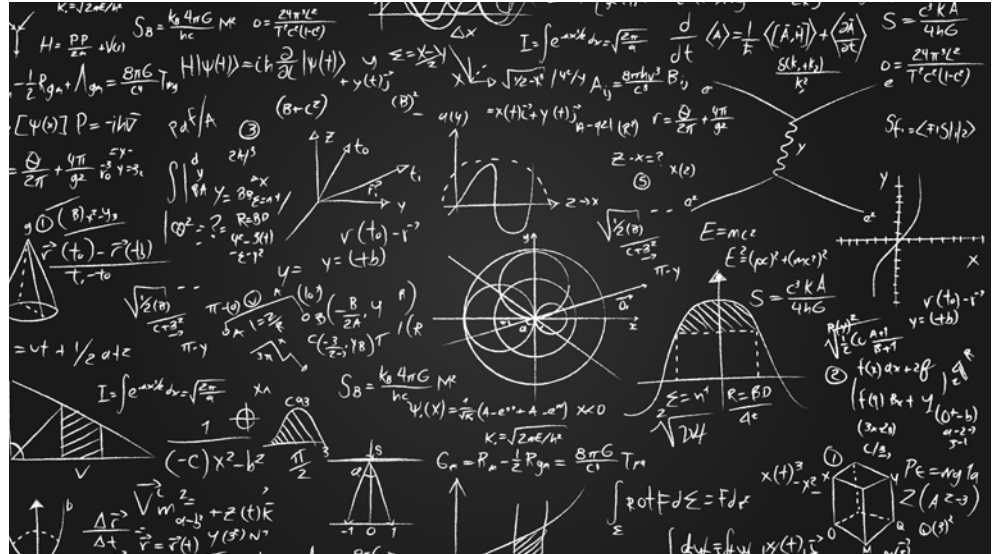
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# Solving for Multiple Challenges



One of my climate scientist colleagues likes to say that while there's no silver bullet to address the climate crisis, we need silver buckshot: a lot of useful solutions all at once, to tackle a multifaceted threat.

This “multi-solving” approach—whereby we acknowledge that the problems we face are interconnected, so their solutions must be as well—is part of our mission at the Union of Concerned Scientists. We aim to apply our prodigious problem-solving abilities across the multiple issue areas we work in, from food and nuclear disarmament to transportation and climate, accounting for multiple variables at once while centering science and equity.

I think you'll see this theme emerge as you take in the topics covered in this issue: how we can now attribute increases in wildfires in western states to fossil fuel companies, and how these fires are both exacerbated by climate change and contribute to it (p. 8); how policies intended to protect communities overburdened and sickened by chronic exposure to pollution must also factor in structural racism (p. 22); and how sustainable agricultural practices can lead not only to healthier farms and soils, but also to cleaner water, safer conditions for workers, and lower carbon emissions (p. 16).

It's not easy work envisioning all these dimensions at the same time—or reckoning with the scale of the various crises we're confronting. Reading the latest United Nations report released earlier this spring (p. 7), which informs us that the world is not on track to stay below the critical target of 1.5°C of warming, made me feel a profound and unsettling sense of loss. But I'm learning that discomfort is a necessary catalyst for growth. To achieve the changes we need in our world, we must acknowledge that we're uncomfortable with the status quo—that it's time to do things differently. If our work is to be transformative, it's also, by definition, going to make us uncomfortable.

I thank you as always for supporting our efforts—for joining us in navigating this productive discomfort with stubborn optimism as, together, we develop and advocate for solutions to the complex and interconnected challenges we face. It takes courage and resilience to face these truths. And I'm so grateful for your strength, resolve, and commitment. (C)

**Johanna Chao Kreilick** is president of UCS.



## UCS ON THE RECORD ... AND HAVING AN IMPACT

“These regulations are long overdue, by almost a decade. I’m relieved and pleased that the EPA has finally issued proposed standards that are based on their own scientists’ recommendations on an updated, higher cancer risk value.”

**DARYA MINOVI**, senior research analyst with the Center for Science and Democracy at UCS, commenting on proposed new standards for emissions of cancer-causing ethylene oxide, in an Associated Press story published by roughly 390 news outlets

“We can’t meet our climate goals without continuing to cut vehicle pollution, including by ensuring that 100 percent of new vehicle sales are electric by 2035.”

**DAVE COOKE**, senior vehicles analyst with the UCS Clean Transportation Program, responding to new standards for passenger vehicles and medium- and heavy-duty trucks that the EPA proposed this April

“The Union of Concerned Scientists is playing an enormously critical role as trusted experts for the very sensitive and compassionate outreach necessary to our congregational networks across the country and the globe. Your ability to deliver scientifically proven information in a way that communities can become educated, inspired, and mobilized is impeccable.”

**SUSANNAH TUTTLE**, director of North Carolina Interfaith Power & Light, after a UCS training on creating scientist-community partnerships

“It’s great news that the abnormally wet winter has improved drought conditions, but the risks for flooding in the Missouri [River basin] and Sierra Nevada and especially the upper Mississippi River basin are particularly concerning. With climate change, we are seeing wetter wet conditions and drier dry conditions. We can’t escape the fact that we simply aren’t prepared. Federal leadership is needed to both slash emissions more deeply and protect people from flooding and other weather extremes.”

**SHANA UDVARDY**, senior climate resilience policy analyst with the UCS Climate and Energy Program, on ABC News, talking about flooding risks in the United States this spring

“It’s been almost 33 years since the first IPCC report was issued. Instead of triggering a global wakeup call to policymakers around the world, global emissions have only increased since then—by a whopping 54 percent. That’s in no small part due to the fossil fuel industry’s deep-pocketed opposition to climate action at any level and its unfettered access to elected officials. . . . But now is not the time—nor will it ever be the time—to throw in the towel. There is simply too much at stake.”

**KRISTINA DAHL**, principal climate scientist in the UCS Climate and Energy Program, commenting on the release of the latest United Nations Intergovernmental Panel on Climate Change (IPCC) report this spring (see p. 7)



### [ IN THIS ISSUE ]

#### 8 Measuring Fossil-Fueled Forest Fires

*Science shows how much Big Oil is contributing to wildfires in the West*

#### 16 A Food Fight with High Stakes

*How a new food and farm bill can make the US food system better for all of us*

#### 2 First Principles Solving for Multiple Challenges

#### 3 Field Notes

#### 4 Advances

#### 14 Inquiry Interview with Steven Higashide

#### 20 By the Numbers Climate Disasters Mount while Big Oil Profits Soar

#### 21 Donor Profile Retired, but Still Wanting to Save Lives

#### 22 Final Analysis A Real-World Approach to Improving Chemical Protections

# Minnesota Joins the 100 Percent Carbon-Free Energy Club



THE STATE'S 100 PERCENT STANDARD WILL **REDUCE RESIDENTIAL ENERGY BILLS** AND SIGNIFICANTLY **IMPROVE AIR QUALITY.**

*In early February, Minnesota Governor Tim Walz signed a bill requiring the state's utilities to get 100 percent of their electricity from carbon-free sources by 2040. UCS and our partners worked for several years to help secure this victory.*

This past February, following approval by the state legislature, Minnesota Governor Tim Walz signed into law a standard that will make the North Star State's electricity 100 percent carbon-free by 2040. The Union of Concerned Scientists had worked with partners in the state for the past several years to make this happen, by demonstrating how 100 percent standards are not only achievable but also produce tremendous health and economic benefits for states.

Last year, we and our partners published a report and a state-specific fact sheet that outlined how Minnesota could meet its electricity

needs entirely with renewable resources while dramatically reducing its use of fossil fuels. In testimony to the state legislature, we highlighted this report and other studies showing how clean energy can produce electricity reliably (even during heat waves and drought), create new jobs, drive economic growth, reduce residential electricity bills, and significantly improve air quality. UCS supporters also sent hundreds of messages to lawmakers advocating for the bill.

Notably, the new standard includes critical provisions that pursue environmental justice and ensure that Minnesota's transition to

carbon-free electricity will be carried out in an equitable manner. It directs the state's public utilities commission, which has authority over how electricity targets are met, to ensure the standard reduces air pollution in all communities, delivers affordable service to all households, provides workers with tools and economic assistance to navigate the transition, protects the rights of workers to unionize, builds clean energy facilities in communities where fossil fuel plants have closed, and creates jobs that pay a living wage. The law also requires utilities to report every two years on the impact the new standard is

having on their workforce and Minnesota's communities.

Minnesota now joins 21 other states, Puerto Rico, and the District of Columbia that have 100 percent standards in place. Its two largest electric utilities, Xcel Energy and Minnesota Power, already have state-approved plans to significantly increase their use of wind and solar power while phasing out coal-fired power plants, and the new standard also sends a strong signal to the regional grid operator, the Midcontinent Independent System Operator (MISO), to continue working on much-needed transmission upgrades that will support the region's transition to renewables.

# Farmers, Rock Stars, and Advocates Unite for a Farm Bill that Helps Farms and Climate

Hundreds of farmers and their allies from across the country gathered in Washington, DC, this spring at a Rally for Resilience to advocate for a food and farm bill that confronts the climate crisis head-on and includes protections for the environment and workers. They were joined by longtime farm advocates John Mellencamp and Willie Nelson, who performed at the rally, as well as UCS and 20-plus partner organizations.

UCS President Johanna Chao Kreilick addressed the Rally for Resilience at a press conference with Representative Ro Khanna from California, pointing out that harmful agricultural policies and practices exacerbate climate change, hurt workers, and price smaller farmers out of business in favor of massive corporations. Because farmers and farmworkers live and work on the front lines of the climate crisis, Kreilick said, their voices need to be heard. She added that the best chance for us to protect the environment, farms, food, and workers—and take back control of our food system—is a transformative food and farm bill (see p. 16).



UCS President Johanna Chao Kreilick (far left) looks on as Yadi Wang, a farmer from Arizona, speaks during a Rally for Resilience press conference addressing the intersection of science, social justice, and agriculture.

## National Electric Vehicle Charging Standards Reflect UCS Feedback

More widespread electric vehicle (EV) charging may be on its way in your state. Back in November 2021, the Infrastructure Investment and Jobs Act established the National Electric Vehicle Infrastructure (NEVI) Formula Program that allocates funding to states for EV charging infrastructure. UCS experts got to work on the implementation of this key program, which involves setting standards for charging stations to create a consistent, accessible, and reliable driver experience.

During the comment period, after the proposed rule on the standards was released, UCS advocated for several improvements, including lower power requirements for

chargers at community hubs so communities have more choices to suit their needs affordably, and provisions to ensure that each charging port at a station functions reliably to give EV drivers (and potential EV drivers) confidence in

the network. The final rule incorporates many of UCS's recommendations and provides much of the information states need so they can secure funding for projects that will expand their EV charging infrastructure.





# Introducing Our New Podcast: *This Is Science with Jess Phoenix*



UCS is excited to announce our new podcast host and science ambassador, Jess Phoenix, as well as our newly launched podcast, *This Is Science with Jess Phoenix*, which you can listen to at [www.sciencewithjess.org](http://www.sciencewithjess.org). Our new podcast follows in the successful footsteps of the *Got Science?* podcast. If you were a fan of *Got Science?* (which retired along with host Colleen MacDonald),

we know you are going to love our new incarnation.

Phoenix, a geologist, author, podcaster, and science TV host, has years of experience as a science communicator with frequent appearances on CNN, the Discovery Channel, and the Science Channel. She holds a master's degree in geology and has conducted research around the world, including working on projects funded

by National Geographic, the National Science Foundation, the US Geological Survey, and Woods Hole Oceanographic Institution. Before joining UCS, Phoenix created and hosted the *Catastrophe!* podcast; wrote a memoir, *Ms. Adventure: My Wild Explorations in Science, Lava, and Life*, that was nominated as a finalist for a 2022 American Association for the Advancement of Science prize; and launched and ran an environmental science research and education nonprofit.

An advocate for “boots on the ground” science, Phoenix has ventured to the mountains and jungles of South America, rural Mexico, the Hawaiian islands, the Australian Outback, the expanses of the North American West, and remote parts of Africa. She brings her scien-

tific training, spirit of adventure, and endless curiosity to her conversations with *This Is Science with Jess Phoenix* guests—scientists and others with varied research interests and experiences.

Her first episodes feature interviews with author and *Ologies* podcast host Alie Ward, the cofounders of a group called Minorities in Shark Science, as well as UCS scientists discussing their groundbreaking wildfire attribution research (see p. 8). As UCS science ambassador, Phoenix also serves as the face of the organization's YouTube channel, which you can find at [www.youtube.com/@unionconcernedsScientists](http://www.youtube.com/@unionconcernedsScientists). You can follow her and the podcast on social media to see bonus content and get information about potential in-person UCS events.

**Check out the latest podcast at [www.sciencewithjess.org](http://www.sciencewithjess.org). You can also find Jess on social media:**

**f** [www.facebook.com/ScienceWithJess](https://www.facebook.com/ScienceWithJess)

**@ScienceWithJess**

**@ScienceWithJess**

# UCS Scientists React to United Nations Report: “Giving Up Is Not an Option”

The United Nations’ Intergovernmental Panel on Climate Change (IPCC) earlier this spring released a major new climate report, synthesizing the findings from thousands of pages of IPCC reports released over the past five years. According to UCS Lead Economist and Policy Director Rachel Cleetus, policymakers’ inaction and fossil fuel companies’ deception have left the world at grave risk of surpassing a 1.5°C global temperature increase. Beyond that threshold, she says,

“science shows untenable and irreversible climate impacts will mount.” Cleetus and other UCS experts were widely quoted in the media discussing the report. Their key message: While the IPCC findings are grim, there’s so much at stake for people and the planet that we must keep fighting for a transition to clean energy, sharply phasing down all fossil fuels, and funding climate resilience measures. You can find the posts about the report at <https://blog.ucsusa.org/tag/2023ipccreport>.

# How Do You Choose the Right Electric Vehicle? Check Out Our Buyer’s Guide

The cars and trucks many of us depend on to get us to work, home, and everywhere in between play a big role in climate change. In the United States, transportation is the largest source of the emissions that contribute to global warming. In addition to heat-trapping pollution, tailpipe emissions from gasoline-powered cars and trucks also carry significant health risks for humans; studies have linked pollutants created by vehicle exhaust to adverse impacts on nearly every organ system in the body.

There are many good environmental and economic reasons for us to switch from fossil fuel-powered cars and trucks, yet many consumers

have lots of questions about making the transition to electric. That’s why UCS wrote a guide on how to choose the right electric vehicle—or to decide if you need a vehicle at all. The best choice for the climate (and your bottom line)

is to consider whether you can meet your transportation needs by walking, biking, or riding public transportation. But our current system means those aren’t options for everyone, and we know EVs are better for the envi-

ronment than comparable gasoline models.

For helpful tips on whether transitioning to an electric vehicle is right for you, check out our latest guide at [www.ucsusa.org/resources/ev-buying-guide](http://www.ucsusa.org/resources/ev-buying-guide).



## Calling Out the Fossil Fuel Industry’s Windfall Profits

On February 1, Delta Merner (center), lead scientist for the UCS Science Hub for Climate Litigation, joined members of Congress and other advocates at a press conference on the US Capitol grounds to call for a windfall profits tax on the oil and gas industry (for more, see p. 20).

Merner spoke about UCS’s work promoting attribution science, which has linked climate impacts to specific companies. A growing number of lawsuits (many of which cite UCS research) are using attribution science to hold fossil fuel producers accountable for their role in accelerating climate change.



**HYUNDAI IONIQ 5**  
220 TO 303 MI



**FORD MUSTANG MACH-E**  
224 TO 312 MI



**KIA EV6**  
206 TO 310 MI

*Certain models of electric vehicles, including the ones shown here, have ranges of more than 300 miles per charge.*





# MEASURING FOSSIL-FUELED FOREST FIRES

*A new technique helps scientists trace substantial responsibility for the increase in wildfires to oil, gas, and cement companies.*

BY MICHELLE RAMA-POCCIA

The moment we saw the red glow on the mountain, my cousin and I sped over to see if help was needed putting out the fire before it spread. It looked so small we thought for sure it would be easily extinguished. But it was a windy summer night in coastal Galicia, Spain, and even though we arrived just five minutes later, the flames were already whipping across a large, dry swath of pine forest near the road, keeping us from driving any farther. It was the first of many forest fires we'd witness in the area, each of which would be worse than the last.

Anyone who has watched a wildfire sweep down a mountain knows how quickly it can devour a countryside before firefighters even have a chance to mobilize. People

living nearby track the approach of the leaping flames with dread and worry whether their homes will be safe. Will they be evacuated? Will they lose everything?

This scenario is playing out more and more often in western North America because, while forest fires are a natural occurrence, climate change is increasing their size and severity while lengthening the duration of fire season—a devastating new reality whose toll can be measured in human and animal deaths, homes and towns practically vaporized, and forests turned charcoal black and smoldering, not to mention the financial cost of preparing for fires, putting them out, and rebuilding in their wake.





Now, for the first time, researchers at the Union of Concerned Scientists are linking these increases directly to emissions traced to major fossil fuel producers including Chevron and ExxonMobil.

New research led by Kristina Dahl, principal climate scientist at UCS and lead author of the organization's new report, *The Fossil Fuels behind Forest Fires*, shows that nearly 20 million acres of the total amount of land burned by forest fires across the western United States and Canada since 1986—an area roughly equal in size to the state of Maine—can be attributed to the carbon emissions from the products of 88 companies.

Climate change is causing hotter, drier conditions that are fueling increasingly large and severe wildfires. In particular, Dahl and the UCS team focused on a growing vapor pressure deficit, or VPD (see sidebar), a measure of atmospheric “thirst,” which is drying out vegetation and making it more flammable. Peer-reviewed scientific studies have shown that increases in VPD have nearly doubled the area burned by forest fires in western North America. Now, UCS scientists have linked the increases in VPD—and the resulting increases in burned forest area—to the rising levels of carbon dioxide in the atmosphere resulting from fossil fuel production.

“What I take from the results of our analysis is that the actions of the large fossil fuel companies have put us in a dangerous position in the western United States,” says Dahl. “For decades they have deceived the public about climate change while not changing their business models. To date, it’s the general public and communities affected by wildfires who have been forced to pay the price for this inaction and deception. It’s time these companies be held accountable for their contribution to increases in wildfire activity.”

The UCS analysis offers a new way to measure fossil fuel companies’ responsibility for the impacts and costs of climate change—data that are critical as communities in the United States and around the world increasingly turn to the courts to hold these companies accountable for the preventable harms they foresaw. Our research finds that 88 companies are responsible for 37 percent of the total area burned by forest fires in the western United States and southwestern Canada since the mid-1980s. This includes forest land in California, Colorado, Idaho, New Mexico, Oregon, Washington, and Wyoming.

### CLIMATE ATTRIBUTION SCIENCE

The new UCS research combines and adds to the two types of analysis that make up the emerging field of climate attribution science.

The first type, known as *climate event attribution*, determines how climate change has influenced the likelihood or intensity of extreme weather events such as heat waves,

droughts, floods, and storms. “As extreme weather events have become more frequent and severe, climate event attribution science underscores the need to dramatically reduce carbon emissions and help communities adapt to the impacts,” explains Delta Merner, lead scientist at the UCS Science Hub for Climate Litigation.

The second type, known as *climate source attribution*, identifies where the pollutants that cause climate change originate. Source attribution science determines the relative contributions of different emissions sources—including the oil and gas, agricultural, industrial, and transportation sectors—to the overall increase in heat-trapping gas concentrations in the atmosphere.

“Climate source attribution science involves a range of techniques, including measuring atmospheric concentrations of heat-trapping gases and their isotopic signatures, analyzing emissions data from different sectors and regions, and modeling studies that simulate the sources and transport of global

## VAPOR PRESSURE WHAT?

Vapor pressure deficit (VPD) refers to the “thirstiness” of the air. It’s the difference between the actual amount of moisture in the air and the amount of moisture the air *could* hold if it were saturated. When the difference is large, the air pulls more water out of plants and soils.

Climate change increases VPD because warmer air can hold more moisture. It’s not just the hotter conditions that are fueling increasingly large and severe wildfires but high VPD as well, which means the atmosphere’s increased evaporative power will dry out vegetation, allowing it to ignite more easily. As VPD rises, plants literally lose water more quickly each time they open their pores to perform photosynthesis.

For agricultural areas in California, VPD is especially important because the higher it is, the more water is needed for crops in a region already affected by water overuse, according to Pablo Ortiz, senior bilingual water and climate scientist at UCS.

Evaporation caused by high atmospheric “thirst” over multiple seasons or years can lead to drought conditions as vegetation dries out and water flow in streams and rivers decreases, he says—exactly the conditions that led to the 23-year-long megadrought western North America has been experiencing. While a wet winter and spring have helped California’s water deficit, the precipitation is not enough to address groundwater depletion and likely future drought conditions.



***Fossil fuel companies' actions have put us in a dangerous position in the western United States. It's time they be held accountable for their contribution to increased wildfires.***

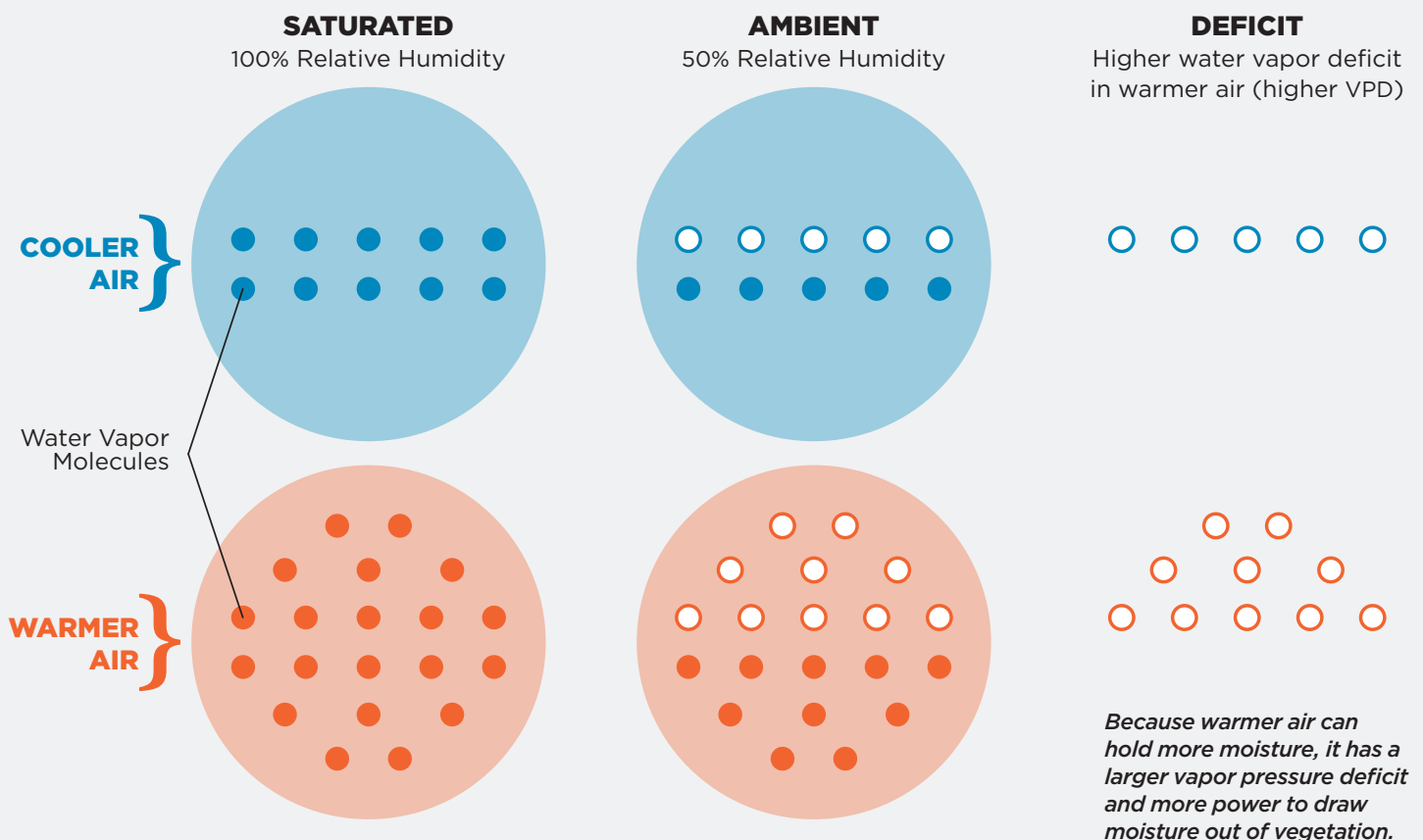
warming gases in the atmosphere,” Merner says. This research can help decisionmakers develop targeted policies that address climate change at its source.

#### SO MUCH SMOKE

For Dahl, VPD and its effect on forest fires isn't just a subject of scientific study. It's something she experiences every year at her home in San Francisco. While there aren't forest fires in the city itself, the smoke from fires even hundreds of miles away often

darkens the sky and makes the air in her neighborhood hard to breathe. “You get up in the morning and the light outside looks metallic and yellowed, almost like you're in an old movie,” says Dahl. “Once, we left a skylight open overnight and found ash on our dining room table in the morning.”

The number of days when wildfire smoke affects Northern California is increasing, bringing significant disruptions to daily life. In 2020, smoke kept Dahl's kids from going outdoors for a week, canceling sports and other activities.



The smoke became a regular problem about six years ago, Dahl recalls. “That’s when I became aware of how dangerous the air was, especially for kids. Children were getting out of their parents’ cars at school drop-off and pulling their shirts over their noses to block the smoke. A shirt won’t provide any protection from particulate matter, which is more harmful to kids because they breathe at a faster pace, so their lungs are taking in more of the toxic air.” Breathing wildfire smoke can exacerbate asthma and allergies and is shown to increase the severity of COVID-19. It can also lead to increased risk of premature birth and death.

Dahl and her family have tried to adjust to the new normal—for example, by buying four air purifiers for their home—but the conditions have caused her family to question whether it’s worth staying.

### UNEQUAL IMPACT

Some communities have it much worse than Dahl’s: people of color face greater vulnerability to wildfires compared with primarily White communities in the United States, according to the University of Washington and The Nature Conservancy. In particular, Native Americans are six times more likely than other groups to live in areas prone to wildfires. The same study found that communities that are mostly Black, Hispanic, or Native American are 50 percent more vulnerable to wildfires than other communities.

Lower-income neighborhoods are at a disproportionate risk from wildfire smoke because their jobs often require in-person and/or outdoor work. In addition, they often have fewer resources to adapt, such as by purchasing air purifiers, or relocating, according to a Stanford University study. And for

## THE SCIENTIST BEHIND UCS’S FIRE RESEARCH

In *The Fossil Fuels behind Forest Fires*, UCS research quantifies fossil fuel companies’ responsibility for more frequent and increasingly devastating forest fires. The driving force behind the analysis is UCS Principal Climate Scientist Kristina Dahl.

The idea came from Dahl’s personal and professional experience, as well as her deep love for the California wilderness. As a mother in Northern California who has seen wildfire seasons progressively worsen, Dahl began building her expertise about the recurring disasters and their connection with climate change.

“I started reading scientific studies on wildfire trends mostly so I could answer reporters’ questions,” Dahl says. “That led me to realize we could probably attribute a portion of those trends to fossil fuel producers, which hadn’t been done before.”

The study is the first to examine a regional trend using source attribution methodologies—tying events or trends to their root causes—an advancement Dahl hopes will inform future climate litigation.

“I have two kids and I’m thinking about their future,” she says. “We love California’s landscapes and I want to preserve them.”

Dahl’s career began at MIT-Woods Hole Oceanographic Institution, where she studied paleoclimatology, or the

history of Earth’s climate. After working as a consultant to UCS for about eight years, Dahl joined the staff full-time five years ago so she could use her skills to push for climate action in a more deliberate way. She credits UCS’s work environment for enabling her to



*Kristina Dahl (left) examines burn scars on a tree in California’s El Dorado National Forest, where the Mosquito Fire burned last fall. Her colleague Bill Cotter recorded the visit for a video that accompanies the analysis.*

develop expertise in different issue areas and empowering her to lead this new analysis.

Dahl’s work builds on pioneering research by Brenda Ekwurzel, UCS director of climate science, Peter Frumhoff, former director of science and policy and chief climate scientist at UCS, and Rachel Licker, UCS principal climate scientist—all of which quantitatively linked fossil fuel companies’ contributions to the carbon emissions driving increases in global temperatures, sea level rise, and ocean acidification. The findings have been instrumental in shaping scientific and legal cases seeking to hold fossil fuel companies accountable.

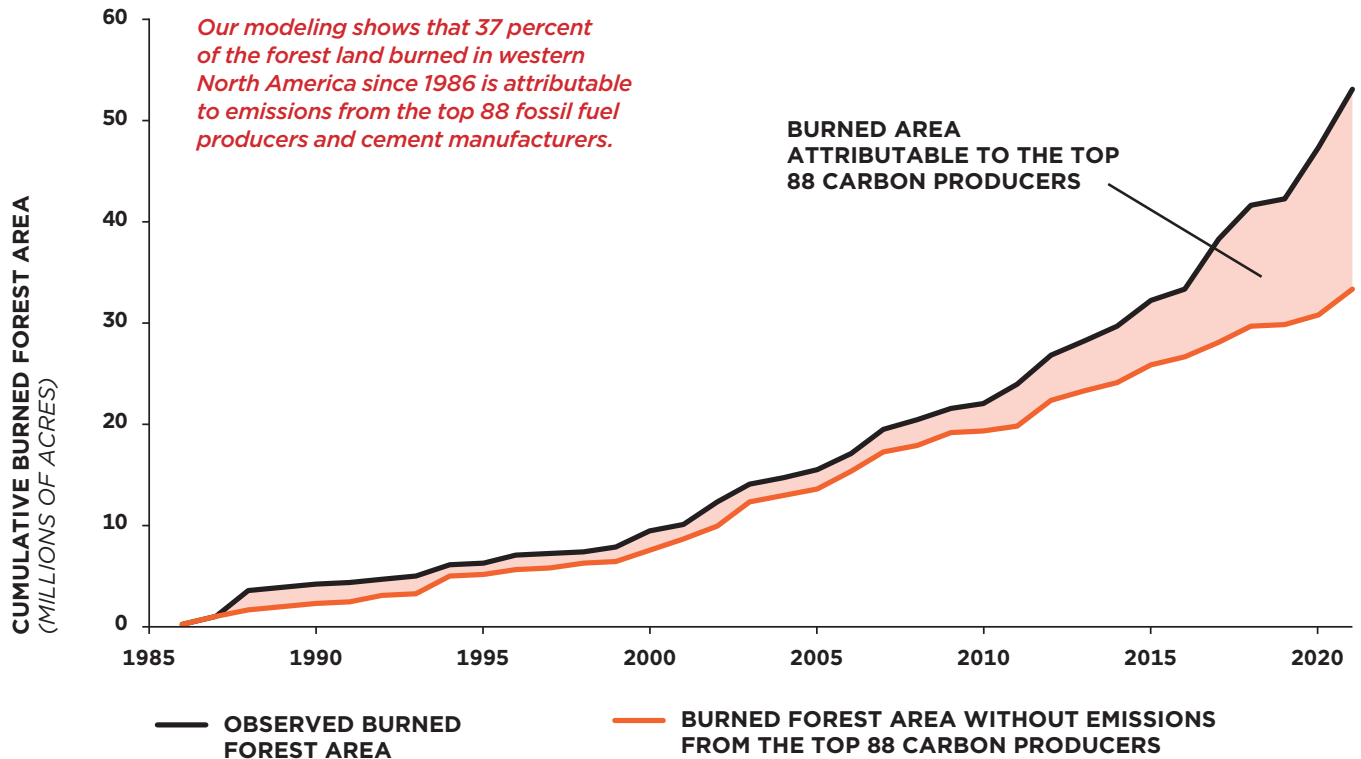
And now, with this latest research, Dahl adds wildfires to the list.

“Putting out fires, rebuilding after them, and building climate resilience is hugely expensive. Right now, ordinary people are having to pay those bills—whether through taxes or updating their homes to be safer,” Dahl says.

“Yet there’s a whole industry that has brought us to this point where the western United States is more flammable. While we’re dealing with this increased risk and expense, they’re raking in record profits. It’s time for them to pay their fair share.”



## CUMULATIVE BURNED FOREST AREA SINCE 1986



people in rural, underserved communities, including communities where farmworkers work outside for long stretches every day, wildfire smoke elevates the risks associated with breathing already polluted air.

### HOLDING COMPANIES TO ACCOUNT

There is no bringing back forests that have been destroyed by fire anytime soon. Some with the most extensive damage may never recover at all. Still, it's not too late to stop fossil fuel companies from doing more harm, to start making drastic cuts in global emissions, and to implement clean energy alternatives.

Alongside efforts to minimize wildfire risk and build resilience to wildfires, it's time for governments and public officials to hold the fossil fuel industry accountable for its fair share of the costs associated with wildfire prevention, suppression, and recovery, as well as other climate loss and damage.

Visit [www.ucsusa.org/resources/fossil-fuels-behind-forest-fires](http://www.ucsusa.org/resources/fossil-fuels-behind-forest-fires) for the report (in both English and Spanish), related blogs, and an informational video. {C}

*Michelle Rama-Poccia is the bilingual writer and Spanish-language podcast host at UCS.*

# Clean Transportation Is More Than Electric Vehicles

INTERVIEW WITH STEVEN HIGASHIDE

*How did you get started working in clean transportation?*

**STEVEN HIGASHIDE:** It was accidental. I majored in metropolitan studies at NYU and knew I was interested in cities. My first internship was with an environmental group working on a campaign to make the New York metro area a safer place to walk, ride your bike, and take public transportation. That first summer I researched, met with elected officials, blogged, and helped decisionmakers



**STEVEN HIGASHIDE** joined the Union of Concerned Scientists this February as director of our Clean Transportation Program. Previously, he served as director of research for TransitCenter, a New York-based foundation that supports innovations in urban transportation across the country. He is the author of the 2019 book *Better Buses, Better Cities*, and holds a BA from New York University in metropolitan studies and a master's in urban planning from New York University's Wagner Graduate School of Public Service.

understand how they could grow the transportation system instead of building sprawl. It was a huge education for me in lobbying and advocacy because prior to that I had no sense of how change happens.

About nine years ago I joined a foundation focused on improving public transit. We provided grants to advocacy groups fighting in their own communities and did research into transit choices and improvements. That was the place where I really started to see and think about how we can create good public transit and why it is such an important environmental issue to work on. For example, we studied the role of public transit in the Green New Deal, and during the pandemic we researched how to keep transit running. It was a rewarding place to work because we were able to make an impact on how transit was understood by decisionmakers, and I had the opportunity to create and nurture a network of advocates, people locally pushing for better transportation around the country.

*You wrote a book about improving urban bus service. What is it about bus riding that appeals to you?*

**STEVEN HIGASHIDE:** The bus is an incredible way to see new cities. You get to be at the street level. You get to be with other people. I've had great experiences riding the bus in places you wouldn't expect, places like Houston. If you can arrange your life in a way where you don't need a car, your life is so much better.

But I find something to love in every form of transportation. I recently moved about an hour outside of New York City and have been using long-distance commuter trains more. My son is now old enough to look out the train window

and it's so satisfying to watch him be enthralled by what he's seeing.

*Transportation is a web of overlapping problems. With so many challenges before us, what keeps you motivated to keep working on solutions?*

**STEVEN HIGASHIDE:** Transportation is an intersection of so many of the societal challenges we must solve, and at the same time, it's also so practical. Everyday people understand transportation's importance and its complexity. It's the biggest contributor to global warming emissions, and a source of deep inequity. The status quo is one where highways were built right through communities of color, and where—by design—we've made it so much harder for people to get where they need to go. Whether it's creating charging infrastructure to address people's anxiety about switching to an electric vehicle or talking to folks about the broken sidewalks in their neighborhood, what keeps me in the fight is an understanding that transportation is a critical part of solving many of the challenges facing our country.

*In the next five years, what are the biggest challenges and opportunities in this sector, and how can UCS make an impact?*

**STEVEN HIGASHIDE:** Between the bipartisan infrastructure law and the Inflation Reduction Act [passed in 2021 and 2022, respectively], we are seeing the largest federal investments ever for climate action in the transportation sector. This means that the key arenas where we can make an impact going forward are with regulators.



*There are a lot of organizations that work on electrifying vehicles, or on transit, or on biking and walking issues. But UCS works on all of those, and can help decisionmakers connect the big dots between these issues.*

For example, the Clean Transportation team at UCS is continually weighing in on [Environmental Protection Agency] emissions standards for cars and trucks. And our team solicits testimony from supporters and pours it toward state legislatures that oversee regulatory bodies, and utility commissions. As clean transportation advocates, we're in the middle of a huge pivot from seeking legislative victories to making sure the new rules are implemented well.

Furthermore, as good and transformational as those two legislative victories were, they left a lot of unfinished business on the table that needs to be addressed. For example, there is plenty of funding for electrifying buses, but right now transit agencies are headed over a fiscal cliff because the funding can pay for capital projects but not for running service. Meanwhile, transit agencies struggle with hiring and retaining workers, and bus riders routinely experience ghost buses: the schedule says

the bus is coming but it never shows up because of labor issues.

There is so much to do to make sure our transportation system is clean, affordable, convenient, and accessible for everyone. I think there's a critical role for UCS to play in that space. There are a lot of organizations that work on electrifying vehicles, or on transit, or on biking and walking issues. But we are an organization that works on all of those and can help decisionmakers connect the big dots between these issues. UCS used to call this program Clean Vehicles; now it's Clean Transportation, in recognition of the whole picture.

***What else can UCS supporters do to support clean transportation besides making sure their next car is electric?***

**STEVEN HIGASHIDE:** First, advocate for more pedestrian options. While electrifying cars and trucks is essential, it goes hand in hand with building more places where

people don't need cars at all. Giving people the freedom to live car-free is the most climate-effective transportation solution.

Second, consider how many vehicles you do have. Maybe your family can get by with one car, not two? Maybe that second car could be an e-bike instead?

Third, because implementing a clean transportation system is moving more and more into the realm of state regulators and local government, almost everyone everywhere can be part of relevant conversations in their communities. Maybe that means getting involved in a public hearing on charging infrastructure, or on a local commission tasked with creating more walkable neighborhoods. It's important to get involved, to diversify who speaks in these public spaces, to ensure that organized opposition groups don't dominate, and that paid interests who have a reason to slow things down, don't.

The most important thing you can personally do is get involved in collective action. {C}

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*Big corporations have hijacked the US food system, but a new food and farm bill could make the system work for all of us. UCS is pushing to make it a reality.*

BY BRYAN WADSWORTH

In my usual rush through the grocery store, I rarely pause to consider how or why particular foods end up in the store, or how the people who raised or harvested the foods might struggle to make a profit or simply put food on their own tables. I'm fairly sure few of my fellow shoppers think about these things either. Yet much of the answer to these questions, at least indirectly, stems from government policy—specifically, a single, massive piece of legislation historically referred to as “the farm bill.”

The current farm bill is set to expire at the end of September. Eighteen previous ones have been passed to date, roughly every five years beginning in 1933. The first sought to help desperate farmers during the Great Depression and the Dust Bowl by paying them subsidies to reduce their production of certain crops, which in turn would raise crop prices overall. As time passed, the scope of these bills expanded to include soil conservation, farm insurance, wetland and forest protections, nutrition assistance—and starting in 1990, the first steps toward addressing climate change.

Today, calling this sprawling set of laws merely a *farm* bill obscures its impact on the food we eat. More than two-thirds of the \$867.2 billion—yes, billion—authorized by the 2018 legislation goes to nutrition programs. Its funding of the Federal Crop Insurance Program decides which crops are insured against losses and encourages industrial-scale production of commodity crops, while its relatively meager investments in the Farmers Market Promotion Program help consumers buy fruits and vegetables from local farmers. So it would be more appropriate if we thought of this legislation as “the *food* and farm bill.”

Sadly, the shape these bills have taken over the years has been a disaster for both our food and our farms. The subsidies and insurance that were originally intended to aid the average US farmer have instead allowed a few large corporations to hijack US agriculture and put in place a system that prioritizes profits over people and the environment, which ultimately puts agriculture and our food supply at risk. With a new food and farm bill, Congress and the Biden administration have an opportunity to begin changing this dangerous status quo.

#### PUTTING PEOPLE FIRST

To build the kind of food system we all deserve—one that is healthy, sustainable, and fair—the Union of Concerned Scientists is calling on Congress to pass, and President Biden to sign, a bill that does the following:

**Prioritizes nutritious fruits and vegetables, not commodity crops that don't actually feed people.** Our current agricultural system relies on industrial-scale monocultures: a single commodity crop (primarily corn or soybeans that are turned into animal feed) cultivated on immense swaths of land. This system pollutes our water, degrades the soil, incentivizes the production of unhealthy processed foods (think high-fructose corn syrup), and concentrates power in a way that eliminates competition and allows workers to be mistreated.



*Millions of people work under difficult and dangerous conditions to get our food from farm to table. Many do not currently earn a living wage or have access to health care. The new food and farm bill should protect these workers.*

## CAN A FOOD AND FARM BILL ALSO BE A CLIMATE BILL?

As the energy sector adds more renewable resources to the electricity grid, global warming emissions from industrialized agriculture play a growing role in the climate crisis, making up 11 percent of total US emissions today and rising steadily since 1990. Farmers and farming communities are feeling the impact in the form of extreme weather that destroys crops and livelihoods: government data show that insurance payouts related to drought increased fourfold from 1995 to 2020, and payouts related to heavy rain and flooding increased threefold. California's recent drought—which is not nearly over despite the torrential rains and huge increase in snowpack this past winter—caused \$1.7 billion in damage to agriculture last year alone. Without action, the costs will continue to rise.

How can the new food and farm bill be part of the solution? It could shift funding from counterproductive crop subsidies to programs that help farmers adopt practices that build healthy, sponge-like soils—soils that resist erosion, soak up more water, and keep carbon in the ground (where it can't heat the atmosphere). UCS analysis has demonstrated that healthier soils could reduce runoff in flood years by one-fifth, reduce flood frequency by the same amount, and make as much as 16 percent more water available for crops during dry seasons. Farmers could achieve improved yields

with less fertilizer and pesticide, thereby reducing contamination of both local drinking water supplies and bodies of water hundreds of miles downstream.

The food and farm bill could also redirect money to research that treats agriculture, climate, and the environment as the interconnected pieces of a whole that they are—a field known as sustainable nutrition science. Over the past two decades, federal funding for agricultural research has fallen by a third, and the portion devoted to sustainable nutrition science currently amounts to a paltry 25 cents out of every \$1,000 of federal research. The Agricultural Resilience Act, which UCS helped to draft and which we are now seeking to incorporate into this year's food and farm bill, would exponentially increase research funding while dramatically expanding the adoption of science-based practices that can keep farmland productive in the face of extreme weather.

A number of Republicans in Congress who once questioned the reality of climate change now acknowledge the harm it is doing to farmers in their districts, but disagree with Democrats on how to bring relief. UCS is working to find common ground where possible, while standing firm for the science-based policies that will protect our food supply and our environment for future generations.





treated as expendable, as they were during the early days of the pandemic when corporate indifference allowed thousands to become sick and hundreds to die.

**Helps combat climate change and makes farms more resilient** (see the sidebar).

#### THE POLITICAL LANDSCAPE

Given that many politically conservative states are also farm states, there is potential for bipartisan agreement on a food and farm bill in an otherwise highly polarized Congress. For example, senators and representatives on both sides of the aisle have already cosponsored the Strengthening Local Processing Act, which would increase competition in the meat and poultry processing industry by supporting small businesses.

On the other hand, tempers could flare when it comes to the Supplemental Nutrition Assistance Program (SNAP), which more than 40 million people rely on to help pay their grocery bills. Even though SNAP participants have already lost up to \$95 in monthly benefits with the expiration of a pandemic-related expansion of benefits, Republicans who want sharp cuts in government spending are looking to slash SNAP benefits further. Some on the far right have even linked SNAP to the US debt ceiling—implying that they might let the government default on its financial obligations unless more people go hungry.

UCS is working with our supporters around the country to ensure this doesn't happen, and to secure a food and farm bill that reins in corporate agriculture, safeguards farms and our food supply from the effects of climate change, produces more nutritious food, and protects workers, soils, and water. With these changes in place, even if I still rush to get through my grocery shopping, I'll feel better knowing more people are eating healthier, more farmers have a chance to pursue what they love, and our food system is more resilient and sustainable. (C)

**Promotes fair competition, particularly for Black farmers who have been locked out of opportunities given to White farmers.** In 1920, Black farmers accounted for 14 percent of all US farmers, but that number had dropped to 1.6 percent by 2017 because of institutional racism at the USDA, which has denied Black farmers loans and other assistance at disproportionate rates, and antiquated property laws that have cost many Black farmers their land. Two bills that could make their way into a new food and farm bill—the Justice for Black Farmers Act and the Heirs' Property Bill—would attempt to redress these injustices, while a third, the Food and Agribusiness Merger Moratorium and Antitrust Review Act, would make agriculture fairer for all farmers by curbing corporate excesses and increasing competition.

**Protects the 20 million food and farm workers who feed our nation.** The people who plant, harvest, process, transport, sell, and serve our food should be able to earn a living wage; organize and join a union; be safe on the job from pesticides, extreme heat, and abusive labor practices; and have access to health care, housing, and citizenship. The Protect America's Children from Toxic Pesticides Act would also protect farmworkers by cracking down on dangerous chemicals being used on farms, and the Protecting America's Meatpacking Workers Act would ensure that this group of workers—who have the highest injury rates of any US industry—are never again

# Climate Disasters Mount while Big Oil Profits Soar

According to the National Centers for Environmental Information, the United States experienced 18 climate-related disasters in 2022 with losses exceeding \$1 billion each.

These climate-driven weather disasters, categorized at right by type, resulted in 474 deaths and a cumulative cost of almost \$170 billion—costs borne by individuals, insurance companies, and federal and state governments.

Meanwhile, as the Russian invasion of Ukraine and other factors constrained supplies of oil and gas, major fossil fuel companies saw record-breaking profits in 2022 that were eerily commensurate with the damages they helped cause.

ExxonMobil led the pack with reported profits of \$55.7 billion; the cumulative total among some of the biggest publicly held oil and gas companies exceeded \$177 billion.

None of the companies were held accountable for their substantial and ongoing contributions to these climate-driven disasters. What's more, the fossil fuel industry and its powerful trade associations continued to lobby the US government to block climate action. According to OpenSecrets.org, oil and gas industry lobbying totaled \$124.4 million in 2022. {C}

## DAMAGES FROM CLIMATE DISASTERS IN 2022: \$169.8 BILLION

HURRICANES  
\$116.4 BILLION

DROUGHTS  
\$22.2 BILLION

TORNADOES & OTHER SEVERE STORMS  
\$21.8 BILLION

WINTER STORMS  
\$4.8 BILLION

WILDFIRES  
\$3.1 BILLION

FLOODS  
\$1.5 BILLION

## BIG OIL & GAS PROFITS IN 2022: \$177.5 BILLION

ExxonMobil  
\$55.7 BILLION

  
\$39.9 BILLION

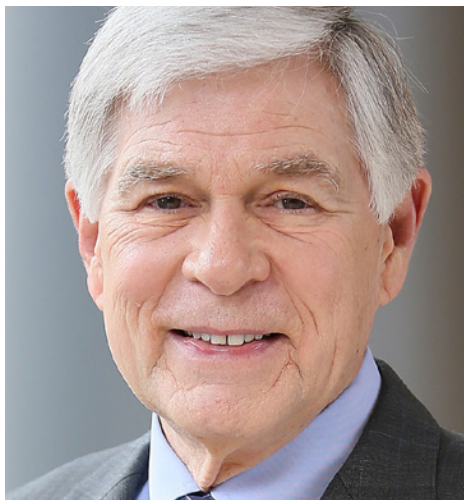
  
\$35.5 BILLION

  
\$27.7 BILLION

  
ConocoPhillips  
\$18.7 BILLION



# Retired, but Still Wanting to Save Lives



Dr. William McCauley is a retired pulmonologist and former president of the Susquehanna [Pennsylvania] Health Medical Group. While he was still practicing medicine, he began supporting the Union of Concerned Scientists because of the breadth of issues UCS works on, each of which he believes is critically important to our quality of life, if not our very survival. “It’s remarkable to me that one organization covers such a broad range of

interests,” he says, “including responding to climate change; protecting our land, air, and water; supporting agriculture free of the grip of monopolies; overturning governmental policy inequities; and strengthening democracy.”

When he retired, Bill began giving to UCS from his individual retirement account (IRA). He sees these contributions working toward a common good, collectively with other UCS donors. As he puts it, “Although I can do what I can in terms of reducing my own carbon footprint, the most effective impact can be achieved by working together and pooling our resources so that an organization like UCS can spearhead initiatives and focus the support where it can do the most good.”

Bill is also concerned about the unequal burdens of climate change, and how its worst effects tend to hit people with the fewest resources. He sees clearly how efforts to weaken our democracy are connected to climate change—in trying to diminish the political power of those who are most vocal about the issue. “Attacks on

our democratic process contribute to inequality,” he says. “We need to try to maintain shared consequences, instead of having the burden fall on the poorest people in our country and on the planet.”

Ultimately, Bill says, “I perceive UCS as an organization with integrity that stands for many of my values: the fight to sustain democracy, science in the public interest, evidence-based decisionmaking, and research that is not influenced or fettered by political considerations.”

Pragmatically, Bill has considered how he could continue supporting UCS well into the future—even when he is no longer around. “I realized when I’m gone, I can’t continue to contribute on an annual basis,” he says. “But I would like my resources to help UCS going forward. I thought that could best be done through a legacy gift.” To that end, Bill has designated UCS as a beneficiary of his retirement account. “I’m mostly concerned about how humans can continue to live on this planet. And therefore, I support anything we can do to protect our environment. {C}

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# A Real-World Approach to Improving Chemical Protections

By Kristie Ellickson



In February, a train carrying hazardous chemicals derailed in East Palestine, Ohio, and the resulting chemical spill and burn-off polluted the air, soil, and water,

and sickened many residents. While this disaster was a one-time event, all of us in the United States regularly encounter pollution and hazardous chemicals.

My research at the Union of Concerned Scientists focuses on the harms from exposure to multiple pollutants from multiple sources that accumulate over time—also known as cumulative impacts—and how agencies such as the Environmental Protection Agency (EPA) can implement environmental protections that reflect people's lived experiences with chemical exposure. I use the scientific approach known as Mixed Methods, in which scientists consider both quantitative data and input from communities.

## WE'RE EXPOSED TO MULTIPLE CHEMICALS

There are detectable levels of many different chemicals in most of our bodies resulting from environmental exposures, through skin contact, ingestion, breathing, or a combination of these. Many of these exposures will have no impact, though scientists have found that doses of multiple chemicals can have different and sometimes greater adverse impacts than doses of individual chemicals alone.

Today in the United States, chemicals are regulated by comparing an individual chemical exposure to a level that has been found to have little to no impact on our bodies, within a margin of safety. But a growing body of scientific evidence supports regulating chemicals with similar structures, functions, and impacts

as a class rather than as individual pollutants. For example, many per- and polyfluoroalkyl substances (PFAS, often referred to as “forever chemicals”) could be regulated under this framework.

## UNEQUAL RISKS AND OUTCOMES

Scientific studies have shown repeatedly that BIPOC (Black, Indigenous, and other people of color) and low-income communities bear heavier burdens of pollution exposure, a result of industry placing toxic factories and power plants in these communities for decades.

Now, scientists are working to determine if chemical exposures together with psychosocial and socioeconomic stress, racism, and other factors often observed in these communities worsen health outcomes. There is some evidence to support this. For example, a study showed that people exposed to air pollution and who also experienced higher levels of material hardship had higher rates of ADHD (attention-deficit/hyperactivity disorder).

To decrease these disproportionate impacts and protect health, chemical regulation should reflect multiple chemical exposures from multiple sources, non-chemical stressors such as measures of social adversity, and people's past exposures. Some states are beginning to move in this direction. And the EPA has published a legal document outlining its authority to address cumulative impacts, and is working on a cumulative impacts framework to guide its regulatory process and structure as well as its research agenda.

It's time to update protections to reflect the cumulative exposures we all experience. (C)

***Kristie Ellickson** is a Kendall Fellow with the Center for Science and Democracy at UCS. Her research focuses on the integration of cumulative risk and impacts into regulatory analyses and decisionmaking. Read more from Kristie at our blog, The Equation, at <https://blog.ucsusa.org>.*



*Toxic chemicals were burned off after a train derailment in Ohio, bringing a massive plume of pollution to nearby communities. Communities of color and low-income communities are often exposed to higher levels of pollution, a result of industry placing power plants, factories, and railroads in their backyards for decades.*



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