Union of Concerned Scientists

Catalyst

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Justice at Last for Radiation Exposure Survivors

After years of struggle, a big win—and more to do

Tracking and Fighting Attacks on Science

How Much of Our Water and Energy Does AI Consume?

Union of Concerned Scientists

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ON THE COVER:
Fred Vallo, veteran and member of the Acoma Pueblo, addresses a candlelight vigil held in Washington, DC, honoring those who suffered from exposure to radiation. Read more about their fight for justice on p. 8.

Standing Strong Against Authoritarianism

Authoritarian governments often depend on propaganda and shows of force to prop up unpopular policies. Here, a banner depicting President Trump hangs from the building housing the Department of Agriculture in Washington, DC, where a parade featuring soldiers and military equipment was held in honor of the 250th anniversary of the US Army—and President Trump's birthday.

By Gretchen Goldman

In an op-ed published in *Science* magazine this summer, I made a case for scientists' role in defending our democracy as the administration attempts to dismantle it. In the piece, my co-author, Erica Chenoweth, a professor at the Harvard Kennedy School and an expert on political violence, and I felt it was important to call President Trump's second term exactly what it is: a slide into authoritarianism.

Elevating loyalists? **Check.**
Consolidating power? **Check.**
Targeting scientists, intellectuals, and truth-tellers? **Check.**
Trying to silence any voice that challenges the president? **Check.**

We need a society-wide effort to resist these efforts, and scientists have an important part to play. In our op-ed, Erica and I wrote:

> *The ability to tell the truth, especially when it does not suit any particularly partisan aims, is an essential prerequisite for a free society. Scientists can leverage their substantial social standing and trustworthiness to preserve this vital ingredient.*

And:

> *Building alternative institutions outside of government that reduce reliance on the authoritarian regime, lessen its power and relevance over day-to-day life, and preserve sites of independent thought can be vital both in preserving science and in defending democracy.*

(continued on p. 11)

Photo: Jainey Bavishi/Getty Images

UCS ON THE RECORD . . . AND HAVING AN IMPACT

"Lawmakers are taking notice of a regulatory scheme devised by . . . UCS that would allow gas stations to use a limited amount of conventional U.S. [gasoline during fuel shortages]. In exchange, suppliers who take advantage of the voluntary system would put 25 cents per gallon into a mitigation fund to help low-income drivers afford electric vehicles. That proposal is garnering kudos from other experts."

POLITICO, *in an August 13 newsletter, on ongoing UCS work in California to reduce emissions and increase EV adoption*

"Firing the top statistical official sends a clear signal to others across the government that you are expected to compromise scientific integrity to appease the president. This puts us in dangerous territory far from an accountable and reality-based government."

***GRETCHEN GOLDMAN**, UCS president and CEO, in a* New York Times *story on the Trump administration's attacks on data and evidence*

"That type of waste could persist for hundreds of years. It's going to be a mess frankly."

***EDWIN LYMAN**, UCS director of nuclear power safety, in a* Washington Post *article about a proposal by Acting Administrator of NASA Sean Duffy to site a nuclear reactor on the moon, on the question of what might be done with the radioactive waste*

"It is a staggering affront to the public to see such a flawed product put forward as an official US government document."

***UCS**, in comments to Energy Secretary Christopher Wright, addressing an error-filled, unscientific report from his agency that attempts to downplay the effects of climate change (see p. 5)*

These spikes [in particulate matter] are especially dangerous to people with preexisting conditions, or people who use their lungs more, like athletes, and children with smaller lungs."

***MARIA CECILIA PINTO DE MOURA**, scientist in the UCS Clean Transportation Program, in an interview with* Runner's World *about air pollution from cars and trucks, and its effects on athletes and others who are active outdoors*

UCS SUPPORTERS SUBMITTED **MORE THAN 12,200 COMMENTS** DIRECTLY TO THE EPA ON THE PROPOSED ROLLBACK OF ITS "ENDANGERMENT FINDING," WHICH SERVES AS THE BASIS FOR CLIMATE ACTION TO PROTECT PUBLIC HEALTH (SEE P. 5).

[FEATURES]

[ALSO IN THIS ISSUE]

California Governor Gavin Newsom with UCS Western States Policy Manager Daniel Barad at a September event where the governor signed UCS-backed legislation into law.

Years of UCS Work Lead to New Climate and Energy Laws in California

Three new bills signed into law by Governor Gavin Newsom this September should bring relief to Californians facing high electricity bills by reducing energy costs, increasing reliability, and investing in clean energy.

One law reauthorizes and updates the state's Cap-and-Invest program, setting stricter limits on carbon emissions. Another creates public financing mechanisms to expand California's electric grid transmission.

"Increasing transmission capacity is crucial to getting more clean electricity onto the grid and facilitating the clean energy transition, including retiring the state's gas-fueled power plants faster," says UCS Western States Energy Analyst Vivian Yang. "This bill establishing public financing will allow critical transmission projects to access low-cost financing options that can provide relief to customers' electricity bills."

The third law establishes a pathway to independent governance for western energy markets, which are currently fragmented among multiple authorities that control the supply of energy in various regions. In the eastern United States, these authorities work together like air traffic controllers to manage costs and direct the flow of electricity on transmission systems. The new law will enhance California's opportunities to buy and sell energy from neighboring states, keeping prices down for consumers and providing more clean energy into the state's electricity mix.

"Regional coordination will bolster grid reliability during extreme weather, reduce the costs of electricity, and facilitate a speedier transition to clean energy," says Mark Specht, UCS western states senior manager.

This is a win for UCS scientists and analysts, who have been making a case for improving coordination across western energy markets for several years, in a way that empowers California to stay committed to its clean energy goals.

And most importantly, notes UCS Western States Policy Daniel Barad, "Altogether, these new laws are going to make energy more affordable for consumers at a time when people are struggling to cope with rising costs of living."

Photos: Daniel Barad/UCS; 4kodiak/iStock (wind and solar field)

UCS Sues the Trump Administration (Again)

In partnership with the Environmental Defense Fund, UCS filed a new lawsuit this summer against the Trump administration. The suit challenges the administration's use of a secretly convened group of climate skeptics that prepared a now widely disparaged report in an attempt to undo a longstanding scientific finding that has served as the basis for federal climate action. The Environmental Protection Agency's (EPA's) so-called Endangerment Finding was upheld by the Supreme Court in 2009, providing a scientific and legal basis for the agency's efforts to address the pollution that drives climate change and harms our health and well-being. Overturning it, as the administration is trying to do, could lead to government decisions that increase pollution and the risks posed by climate change.

The lawsuit, filed against the EPA, the Department of Energy (DOE), and agency leadership, challenges the secret formation and hidden activities of the "Climate Working Group"—five known climate skeptics convened by DOE Secretary Christopher Wright. The group's report uses scientific data inaccurately, misrepresents many of the findings it cites, and has been denounced by scientists whose research it contorts. Under the Federal Advisory Committee Act, federal law does not permit agencies to create or rely on secret, unaccountable groups when engaged in policymaking.

Shortly after UCS and EDF filed this suit, the government moved to disband the Climate Working Group.

As stated by UCS President and CEO Gretchen Goldman, "The shady development of this corrupted report—and EPA Administrator Lee Zeldin's use of it to undermine pollution protections—puts the American people in harm's way and violates federal law. We all deserve transparent climate policy decisions informed by the best available science advice from the nation's top experts. This report is anything but that."

The EDF-UCS lawsuit asks a federal district court to swiftly block the use of the Climate Working Group's report. Previous UCS legal efforts include a suit against the so-called Department of Government Efficiency for acting beyond its power to slash federal funding and fire employees; and against the administration for removing public information about environmental justice from federal agency websites.

ExxonMobil CEO Darren Woods looks on approvingly as Department of Energy Secretary Chris Wright speaks at an energy summit in Pennsylvania. Repealing the Endangerment Finding would embolden fossil fuel companies like ExxonMobil to pollute with impunity.

Photo: Jeff Swensen/Getty Images

You're Invited!

Evidence-Based Advocacy in Action: UCS Federal Response Strategy

Thursday, November 13, 2025 | 12:30 p.m. EST

This webinar will feature updates from members of the UCS Federal Response Team on strategic work we undertook during the congressional summer recess, attacks on science we've documented during the first year of President Trump's second term, and actions we're taking to support science advocacy and defend democracy.

Join UCS experts Taylor Pendergrass, director of policy and advocacy; Marisa Vertrees, campaign director for the UCS Clean Transportation Program; and Jennifer Jones, director of the Center for Science and Democracy at UCS, as they discuss efforts to fight back against attacks on science, and to stay on offense with a proactive, pro-science agenda focusing on our bipartisan allies in Congress.

The event is free for all UCS members, and registration is required. To register, visit **www.ucs.org/fa25-webinar**.

International Court Rulings Support Making Polluters Pay

UCS Scientist Carly Phillips (left) and Maria Alejandra Serra, a lawyer from Greenpeace International, prepare to provide testimony to the Inter-American Court of Human Rights in Bridgetown, Barbados, in April. They made the case for why the fossil fuel industry should be held accountable for its role in climate change.

The Union of Concerned Scientists' campaign to hold fossil fuel corporations accountable for the harm their products cause was bolstered by two landmark international court findings this year. In early July, the Inter-American Court of Human Rights released its opinion that affirms the right to a healthy climate. Weeks later, the International Court of Justice issued an advisory opinion declaring that climate inaction is a violation of international law, and clarifying that nations must regulate fossil fuel companies. It also emphasized everyone's right to reliable, evidence-based information about climate change.

UCS Research Scientist Carly Phillips attended the Inter-American Court proceedings, presenting to the court on behalf of a coalition of scientists and legal professionals and making the case for corporate accountability in addressing climate change.

In its opinion, Phillips says, the court clearly stated that the fossil fuel industry has played an outsize role in driving climate change, and must work toward reducing its emissions. "It's unambiguous to me," she says. "The opinion even names different mechanisms for holding Big Oil companies and other polluters accountable, such as supporting loss and damage funds."

The advisory opinion issued by the International Court of Justice, the world's highest court, affirms that governments have legal obligations to address climate change under international law, including regulating private actors, and that they could bear legal responsibility if they fail to do so.

"This is a big deal," says Delta Merner, lead scientist for the UCS Science Hub for Climate Litigation. "While it's not a legally binding opinion, it will shape international law, national policy-making, and courtroom strategy for years to come."

As the Trump administration works to expand fossil fuel development, dismantle environmental protections, and shield polluters from legal accountability, this opinion makes it clear that no government or country can opt out of international law.

"It plainly establishes that delaying action on climate change is unlawful," says Merner.

UCS Represents at NYC Climate Week

In late September, UCS staff attended Climate Week NYC, an annual climate action event coinciding with the United Nations General Assembly meeting. In addition to hosting panel discussions with UCS climate experts and sponsoring a billboard ad in Times Square urging viewers to hold fossil fuel companies accountable for their climate emissions, we joined thousands in a "Make Billionaires Pay" march.

Photos: Upasana Khatri (Carly Phillips); Ryan Fleischer/UCS (Climate Week); Jeremy Monroe (Judy Li)

Judy Li: Charting a Course for Future Scientists

As a child, Judy Li didn't know she could grow up to become a biologist. She did know that she was fascinated by the natural world and the creatures she found while exploring the outdoors.

"No one in my family had been a research scientist," she says. "It was more traditional for people like me to pursue careers in medicine or law. But even though they found it a bit unusual, my family encouraged me to pursue whatever I liked."

Their encouragement helped Li set her own course in life, including a career as a stream ecologist and an associate professor in the Department of Fisheries and Wildlife at Oregon State University. Along the way, she has also become a children's book author, a science advocate, and a parent to the two children she shares with her husband, Hiram. Now retired, Li says she's still thinking about the natural world—and the threats to it posed by climate change.

"It's probably my greatest worry," she says. "We need to turn the ship around so that the following generations will have a world that resembles the one we love. For people in my demographic, it's about the future."

AN EYE ON HAVING THE BIGGEST IMPACT OVER TIME

She considers her family's support of the Union of Concerned Scientists as an investment in the future—and a way to ensure that scientists' interests are represented in policy. "The range of what we do in science is enormous, and many of us focus narrowly on our fields," she explains. "As individuals, we may not have the opportunities to address issues on a larger scale, or make an impact on decisions with the effectiveness of UCS. Hiram and I realized that it was important to find an organization that could act on a wider, broader scale, with the resources to make a difference. And that was UCS."

The Lis have been contributing to UCS for more than 25 years, and switched to donating through a charitable gift annuity several years ago. A charitable gift annuity provides income for the giver for the rest of their lives, with any balance of their initial investment going to the organization they've chosen to support.

Of the annuity, Li says, "It gave us a chance to make a larger gift within our range, on a bigger scale. We had a choice about what we could do with our great luck and resources. And UCS reflects what's important to us, so we thought this would help more than just a yearly contribution."

While Li charted her own path to her career in science, she's hopeful the books she's written can help guide young future scientists. "I would love for children and families to take my books outside," she says. "There's a journal after each chapter that kids can write in, so they can observe and recognize what's in their backyard and in their neighborhoods. I hope they realize that the natural world is all around us, and there are things we can do to help make it a better place." {C}

FINALLY, RELIEF FOR NUCLEAR WORKERS AND DOWNWINDERS

People exposed to radiation have been demanding justice for decades. UCS helped get it for them.

BY BRYAN WADSWORTH

Hidden inside the massive budget bill that President Trump signed on July 4—a disastrous bill for many people in this country—was a victory for the Union of Concerned Scientists, our allies, and people harmed by the production and testing of nuclear weapons. UCS has been working in coalition for years to push Congress to renew and expand the Radiation Exposure Compensation Act (RECA) and, thanks to the steadfast support of members like you, we prevailed.

With an estimated $8 billion being authorized by Congress over two years, the expanded act provides triple the amount of previous funding, and raises the level of compensation a person can receive to $100,000—up from earlier limits of $50,000 or $75,000. The act also expands eligibility geographically, to cover any affected resident of Idaho, New Mexico, and Utah, plus more of Arizona. And it expands eligibility to cover more types of jobs and medical conditions—and, for the first time, covers exposure to waste created by the Manhattan Project in parts of Alaska, Kentucky, Missouri, and Tennessee.

BUILDING MOMENTUM

The original RECA, passed in 1990, was intended to provide compensation to people who developed illnesses that could reasonably be attributed to exposure to radiation from uranium mining and aboveground nuclear tests in Nevada and the Pacific. But RECA excluded people living downwind of the 1945 Trinity test (the world's first nuclear detonation, conducted in New Mexico), "downwinders" exposed to fallout in various other locations, communities near weapons production and waste storage facilities, veterans who cleaned up nuclear waste, and uranium mining and milling workers employed after 1971—many of whom are from Indigenous communities in the Southwest.

> ***Congressional sources estimate some 125,000 people, who had previously held out little hope, will now be eligible for benefits.***

In 2021, Lilly Adams had already been working to stave off RECA's 2022 expiration when she opted to continue this work at UCS as a senior outreach coordinator. She began organizing what would become the first of many lobby days on Capitol Hill, this one scheduled three months before the compensation program would end. Her RECA Working Group (originally established in 2020) brought coalition partners and community members, including from the Navajo Nation and Pueblo communities, to meet with nine congressional offices and tell their stories. These often involved clear examples of environmental racism: disenfranchised, low-income communities of color that were never told of the risks of their involvement with nuclear materials, or of their proximity to aboveground tests. This and other advocacy helped recruit more than 100 bipartisan congressional co-sponsors of RECA legislation, and two weeks later, the Senate voted unanimously to extend the program for two years. President Biden signed the extension that June of 2022.

Soon after, UCS and its allies sought an even more ambitious goal: expand RECA to cover more people and more conditions. Another series of "fly-ins" to Washington, DC, brought Navajo uranium miners, downwinders, and "atomic veterans" into nearly 70 total meetings with their elected officials and many interviews with the media. Beginning on July 16, 2023—the anniversary of the Trinity test—the film *Oppenheimer* renewed public interest in nuclear weapons, and UCS highlighted the film's failure to address the human impacts of weapons production and testing. We also held a candlelight vigil outside a New York City film screening to coincide with the vigil that Trinity downwinders hold in New Mexico every year on that date. The Associated Press reported on the vigil, resulting in coverage in more than 300 media outlets.

EFFECTIVE ADVOCACY REQUIRES EXPERTISE—AND HUMILITY

UCS Senior Outreach Coordinator Lilly Adams facilitated the working group that remained united during the yearslong fight for RECA expansion. We asked her about her experience working at the nexus of advocacy and science.

Along the road to this victory, you lived through a lot of highs and lows. What did you learn about yourself in the process?

Relationships with people who have been affected by the issue are so vital to my work. They are the primary force motivating me each day, and they remind me what's truly important. I've learned that, while in some ways I'm an expert on RECA, expertise comes in many forms, and in any given room I may not be the expert. Expertise and good ideas came from all corners of our coalition, and there were many times when my best role was to step back and listen. That taught me a lot of humility.

What role did science play in making this victory possible?

As we advocated to expand RECA, we were often asked, "What's the science behind this issue?" The foundation to our advocacy was a 1997 study by the National Cancer Institute that examined exposure to fallout from nuclear testing in Nevada, and studies of uranium miners who worked in the 1970s and later. That information demonstrated the need for RECA to cover additional communities. More recent studies have bolstered our case.

How has working for a science-based organization like UCS served your needs as a policy advocate?

Having the facts is not enough—they need to be paired with human stories, which allow decisionmakers to connect with an issue on a personal or emotional level. But once that happens, we need the facts to move forward from there. UCS has a lot of ways to bring the facts forward in the most credible and impactful way.

Read more from Lilly on our blog, *The Equation*, at https://blog.ucs.org.

Photo: Joe Newman

Photo: Nick Lyell

On July 27, 2023—just over a year from our success in getting RECA extended—the Senate passed an amendment to a defense bill that would further extend and expand RECA. President Biden voiced his support.

Then came a crushing blow.

ONE SETBACK AFTER ANOTHER

In December 2023, House and Senate leadership opted to drop RECA expansion from the defense bill without comment. A year of hard work and hope seemed to have hit a dead end. "Some of the advocates we work with said they felt like the government was simply waiting for them to die so the problem would go away," says Adams.

Once again faced with RECA's imminent expiration (this time in June 2024), UCS returned to the struggle. Senator Josh Hawley (R-MO) proposed a compromise reauthorization bill that, while offering far less than what we came close to securing the previous year, would keep the program alive and expand it.

We again brought community members to the Capitol to put human faces on the legislation. They attended the vote in March of 2024, which won Senate approval with a strongly bipartisan 69-30 majority, and were invited to attend the State of the Union address that same night. House Speaker Mike Johnson initially stated he would support reauthorization, but refused to meet with the community members and ultimately allowed RECA to expire without bringing the matter to a vote.

PERSISTENCE PAYS OFF

Even though Congress appeared to have turned its back on the people harmed by the production and testing of nuclear weapons, our coalition refused to give up. In September of last year, Indigenous members of the coalition took a bus from Albuquerque to Washington, DC, to force Congress to listen. They were determined to show they weren't going away without justice. The grueling bus trip and powerful events in DC succeeded: reporting called RECA "unfinished business" for Congress, and the coalition flipped the final holdouts in the House to support an expansion.

Ultimately, we had built enough positive momentum to get RECA expansion over the finish line in 2025. UCS spent almost five years building a broad and diverse coalition of supporters, pushing the issue in more than 100,000 media stories, bringing together strange bedfellows in Congress, and looking for any legislation that could pass with RECA attached to it. Congressional sources estimate some 125,000 people will now be eligible for benefits who had previously held out little hope.

The expanded RECA is not without its flaws. It was passed as part of the budget bill that UCS otherwise condemned. It does not allow recipients of compensation at the earlier limits to receive any additional money, and it excludes all residents of Colorado, Guam, and Montana, as well as parts of Arizona, Nevada, Ohio, Pennsylvania, and Washington State, despite these areas' involvement in nuclear weapons production. As Lilly Adams said after RECA passed, "Today we celebrate, but tomorrow we continue the fight." {C}

***Bryan Wadsworth** is managing editor at UCS.*

At a press conference with members of Congress co-organized by UCS, Navajo community leader Carol Etcitty-Rogers describes the impacts of uranium mining on her family, while US Representative Teresa Leger Fernández (D-NM) listens on her right. Etcitty-Rogers passed away this summer, just after RECA was re-extended and expanded.

Above: A group including Tribal members from the Acoma Pueblo Nation, Hopi Tribe, Laguna Pueblo Nation, and Navajo Nation traveled across the country by bus to Washington, DC, to hold a candlelight vigil to honor loved ones lost to illnesses likely caused by radiation exposure.

Standing Strong Against Authoritarianism

(continued from p. 2)

At the Union of Concerned Scientists, we're following our own advice. We won't stop speaking the truth, as you'll see from our report documenting the more than 400 attacks on science this administration perpetrated in its first six months (p. 14). This report also includes our recommendations for how lawmakers and others can push back. We will continue documenting the administration's attacks on science because keeping a record of misdeeds helps hold the perpetrators accountable.

With your partnership and support, we're going to keep envisioning and working toward evidence-based systems and policies that work for all of us, such as stronger protections for federal science and the scientific workforce (p. 12). And we'll continue working to make progress however and wherever we can (p. 18), fighting alongside the people who are at the greatest risk from this administration's destructive policies and actions (p. 8).

Together, we are not powerless against the Trump administration's attacks on science and evidence-based policy. A full authoritarian regime is not an inevitability. If we rally the power of the scientific community to do its part, I know we will see results. Thank you for helping us give our all to this fight. {C}

Gretchen Goldman *is president and CEO of UCS. Read more from her on our blog,* The Equation*, at https://blog.ucs.org. Her op-ed with Erica Chenoweth can be found at www.ucs.org/fa25-science.*

Photos: Joe Newman

Defending Democracy Begins with Upholding Scientific Integrity

INTERVIEW WITH JENNIFER JONES

What is scientific integrity and why is it so important?

JENNIFER JONES: Scientific integrity is about ensuring the best available science is produced independently, free of political interference. At the federal level, in agencies like the Centers for Disease Control and Prevention, the Environmental Protection Agency, the National Institutes of Health, and others, science and research are conducted with public funds, for the public good. Scientific integrity is a crucial principle for these agencies and the scientists who work there—to truly serve the public, their work must not be subject to the whims of the powerful. It's worth noting that the groups that suffer the most when scientific integrity is violated are the *least* powerful: Black, Brown, and Indigenous communities.

Unfortunately, under both Trump administrations, and especially during this second term, scientific integrity is scarce. The administration is firing scientists, elevating political appointees as arbiters of science, and telling scientists they cannot speak to the media or publish their research in peer-reviewed journals. Unqualified political appointees are spouting lies and disinformation, and turning conspiracy theories into policy. It's scary and awful. Federal science in the United States used to be held up as the world leader, setting a standard for other countries. And now our science is being discredited, undermined, and buried.

What is UCS doing to try to restore scientific integrity?

JENNIFER JONES: We're pushing for legislation that's in Congress right now: the Scientific Integrity Act. The current iteration of the bill, which was informed in part by UCS expertise and recommendations, has more than 100 co-sponsors in the House. We look forward to its introduction in the Senate and working to expand its bipartisan support.

The act would ensure that federal scientists (i.e., those employed by agencies and the federal government) can do their work free of political harassment, political intimidation, political censorship, and manipulation. It would require that agencies employ a professional scientific integrity officer who would be responsible for maintaining scientific integrity policies.

Beyond that narrow channel of work, we're maintaining our defense of science work and cataloging the various attacks on science, as laid out in our report on the first six months of President Trump's second term [see p. 14]. We're holding him and his administration accountable, as we've done for every recent administration. And we continue to defend the scientists who are still attempting to uphold scientific integrity in the federal government.

Does it feel quixotic at this moment to pursue legislation that may not pass in today's Congress?

JENNIFER JONES: Often, legislation and policymaking of all kinds at the federal level require an investment of years. This is the work that we must do to build support for the law, to show its value, and to inform the public of its benefits. It's critical to develop policy ideas and draft bills even if they don't have an immediate path to passage. Politics can change quickly: sometimes bills can hitch a ride on other legislation, as the successful passage of RECA illustrates [see p. 8]. Also, state and local legislatures can pick up and implement proposed bills.

We will get the Scientific Integrity Act passed one day. In the meantime, we cannot cede ground on the movement that we have. This is just one part of a multipronged strategy to make progress and defend it under this administration.

The last nine months have shown us that people in the United States really do care about science. We've seen that in the polls. We have to leverage the momentum we have created in defending science and scientists right now.

JENNIFER JONES is the director of the Center for Science and Democracy at the Union of Concerned Scientists. Her work at the intersection of science and democracy has sought to increase climate literacy with marginalized communities and build systems to increase diversity and equity in public science. She currently serves on several commissions for the International Union for the Conservation of Nature (IUCN). Read more from Jennifer on our blog, *The Equation*, at https://blog.ucs.org.

Photos: Tara Rice (Jennfier Jones); Cavan Images/Getty Images (ad)

> ***We need to reimagine the future of independent federal science—and we need to dream big, since we're in grave danger of losing the next generation of scientists.***

What are the ramifications of attacks on science for scientists themselves?

JENNIFER JONES: The federal scientific workforce has a long and proud tradition of attracting some of the top talent from around the country and around the world. Scientists have often chosen to work for the government for lower pay than they could in the private workforce because they understand the importance of their work and believe in public service. It will become even harder to attract and retain talent if they do not have protections to do that work. It's hard to tell a young scientist, "Go into the line of fire and be prepared at any minute for President Trump and his appointees to come after you."

Scientists are also at risk outside the federal government; I've experienced the chilling effects of this kind of political harassment myself. As a professor of environmental studies at a state university in Florida, I received federal grants that I used to fund climate justice programs, including paying graduate students to do research.

This is standard practice—it's how federal money gets dispersed across disciplines, supporting students in genetics, ecological field studies, engineering, et cetera. So many students get their first lab and field experiences from these federal grants, and the financial support and mentorship allows them to grow into science careers. Many of those grants and awards also help ensure diversity in science, which is important because the questions that we ask in science are often driven by and reflect the people doing it.

Florida Governor Ron DeSantis pioneered the assault on diversity, equity, and inclusion that we're seeing across the country now. I left my university position to come to UCS so I could talk about it out loud and try to change it—and not be told to shut up and just do my work quietly. The continued attacks on science in federal government and at universities paints a very worrisome picture for the future of science and scientists in the United States.

In difficult times like these, how do you keep an eye toward the future?

JENNIFER JONES: UCS is already making plans for what comes next and asking, "How will we rebuild trustworthy federal science after this administration? What should the future of independent science look like? How do we get there?"

We need to reimagine the future of independent federal science—and we need to dream big, since we're in grave danger of losing the next generation of scientists. I am thankful and proud to be at UCS where we can work with our supporters and partners to build an equitable future together. {C}

TRACKING THE DAMAGE

UCS monitors attacks on science to hold the Trump administration accountable

BY JULES BARBATI-DAJCHES

It feels like every day there's some new headline about an abuse of power by the Trump administration targeting science, scientists, or science-based policies. It's daunting to take it all in. But here at the Union of Concerned Scientists, we know the value of data in making sense of the bigger picture.

Even before President Trump returned to the White House in January, we expected this administration would create challenges for science advocates and supporters. After all, tracking and responding to attacks on science was a major effort for UCS the first time Trump held power. And the Project 2025 playbook developed by Trump administration staffers and political allies of the president presaged an even more hostile attitude toward science. So we knew we'd be busy—and it's good that we prepared ourselves, because these attacks are happening with a pace and intensity, to use one of the president's favorite phrases, "like no one's ever seen."

This summer, my colleagues and I worked to quantify these attacks and understand exactly what they'll mean for millions of people across the country. Our initial report, *Science and Democracy Under Siege: Documenting Six Months of the Trump Administration's Destructive Actions* (which you can read online at www.ucs.org/fa25-science-attacks), takes a broad look at what's happening inside the federal government. We wanted to examine these abuses of power to understand how they are different from previous administrations and how they violate the public interest.

PEOPLE'S LIVELIHOODS—AND LIVES—ARE AT RISK

Our definition of an attack on science is "an action, statement, or decision that originates from an elected official or political appointee at a federal agency that results in the censoring, manipulation, forging, or misinforming of scientific data, results, or conclusions, conducted within the government or with federal funds." And there's no shortage of attacks that fall within those parameters. Relying on a variety of media sources, we're collecting and analyzing new attacks on science every week.

These aren't trivial incidents. Tens of thousands of federal employees have been forced out of their jobs, making it harder to create, implement, and enforce public protections. Thousands of research grants have been canceled, many of which were targeted because they address topics the Trump administration is trying to suppress, including environmental justice, climate change, vaccines, and LGBTQ+ health. Advisory boards are being disbanded or replaced with unqualified appointees chosen for their political alignment with the administration. And data that our tax dollars have already paid for are being buried or removed.

We can't make good decisions or good policies without scientific input, but Trump and his cronies are doing their best to strip science—and the public interest—out of the process. At the same time, the administration is filling the void with misinformation, cherry-picked data, and messaging that aligns with its political priorities, benefiting the administration's allies over the health and safety of people and the planet.

Every administration has abused science in some ways, but this one has targeted science broadly and systematically, with political appointees at many agencies overriding and silencing scientists, hiding or refusing to collect data, and keeping information from the public. Attacks on science are a hallmark of authoritarian regimes that want to control the public conversation and shield themselves from accountability.

JUSTICE REQUIRES VIGILANCE

When we released our report this summer, we had already tracked more than 400 attacks on science since Inauguration Day. That number has continued to increase in months since. It's important for UCS to continue to track these attacks and the impacts they're having on people across the country. It's not just about what any one incident means in a vacuum—it's about a pattern. Our research illustrates that attacking science is a consistent strategy across this executive branch.

By methodically and carefully documenting these attacks, we're helping counter the authoritarian effort to bury the truth. Our database helps bring transparency and accountability back. We at UCS are using these attacks to mobilize scientists and help them understand the threat they're under. We're also using this information to move members of Congress, who can use our research to provide oversight of the administration and push legislation that can protect science and science-based policies. Indeed, we brought this research to their literal doorsteps over the summer, when we coordinated a set of meetings on Capitol Hill with elected officials and their scientist constituents from across the country, who asked them to protect science in budgets and legislation.

Monitoring and keeping track of this administration's attacks on science is not an easy task, but it's a necessity. As long as President Trump and his followers are trying to hide the truth in the shadows, UCS will be here to shine a light. {C}

***Jules Barbati-Dajches** is an analyst with the Center for Science and Democracy at UCS. Read more from Jules on our blog,* The Equation, *at https://blog.ucs.org.*

EXTREME RISE IN DOCUMENTED ATTACKS ON SCIENCE

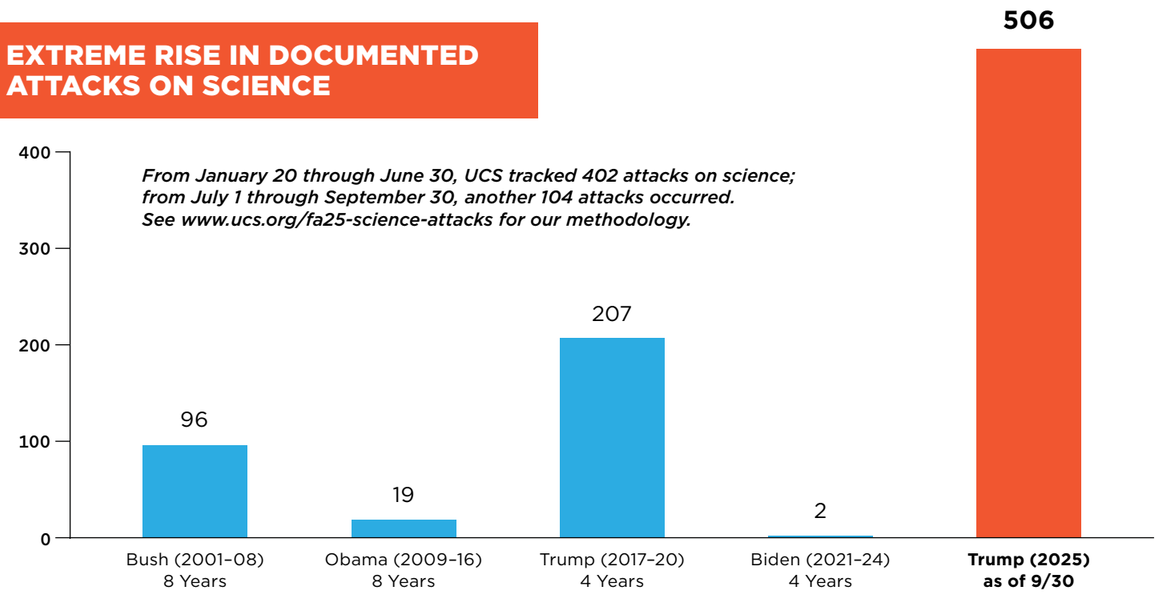


Photo: Elijah Nouvelage/Stringer/Getty Images

AI Is Using Your Energy and Water—and Polluting Your Air

By Pablo Ortiz Partida

In Stone Ridge, Virginia, an Amazon Web Services data center abuts a neighborhood of single-family homes. Northern Virginia is home to the largest concentration of data centers in the world.

Across the country, massive facilities called data centers are filled with thousands of computers that process billions of artificial intelligence (AI) requests all day, every day.

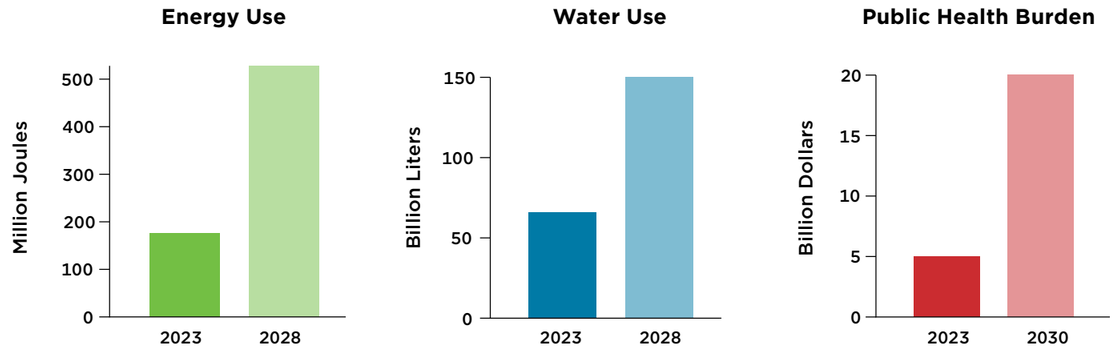
When a user inputs a prompt into a generative AI tool such as Google Gemini, Microsoft Copilot, Open AI's ChatGPT, or X's Grok, that request goes to a server located in one of those data centers. Powerful computer processors then generate the text, images, or videos requested and send the data back to your phone or computer.

There are public health and environmental implications of this technology at every step of the process. A single AI-focused data center can use as much electricity as a small city. Communities breathing polluted air near data centers or those paying higher energy bills are at the front line of the technology's impacts, and often the last to receive its benefits. And because data centers use water to keep their equipment cool, they often strain local communities' water resources, particularly in drought-prone regions such as Arizona, California, and parts of Texas. Data centers that process AI requests can use as much water as a large neighborhood!

As the use of AI increases, its direct impacts on energy, water, and pollution are on the rise as well. So, while reactions to AI use may vary—some people are enthusiastic adopters, while others remain unimpressed by its day-to-day applications, and still more fear its capacity to displace jobs—a recent Pew Research Center report said there is one area where the public and experts agree: there is a need for more control and regulation of AI.

AI'S IMPACTS BY THE NUMBERS

Data centers are fueling the AI boom. Both are expected to keep growing and consuming more resources—diverting energy and water from communities.



ENERGY USE

Electricity consumption by data centers is increasing quickly. The US Data Center Energy Usage Report said that in 2018 data centers used 1.9 percent of all US electricity. In 2023, that consumption increased to 4.4 percent. Some experts estimate electricity consumption by data centers could nearly triple in the next three years. ChatGPT alone is estimated to receive more than a billion requests per day for generating text, and tens of millions for generating images.

According to a report in *MIT Technology Review,* a single query to a small AI text model uses about 114 joules, roughly equivalent to running a microwave for one-tenth of a second. However, more powerful models can use 6,706 joules per text response, or enough energy to run that same microwave for eight seconds.

Generating a standard-quality image requires about 2,282 joules, while creating a high-quality five-second video can consume more than 3.4 *million* joules, equivalent to running a microwave for longer than an hour.

WATER USE

Similar to your phone or computer, the servers processing AI requests get hot. Data centers use water-based cooling methods to prevent their servers from overheating.

The US Data Center Energy Usage Report found US data centers consumed *66 billion liters* of water in 2023, much of which was lost to evaporation. That's the same amount needed to irrigate about 11,000 acres of almonds for a year—or the amount consumed by more than half a million people in the United States in one year.

Even more concerning is the dramatically accelerating *trend* in water consumption: Ten years ago, data centers used 21.2 billion liters of water, so their water use has tripled in that time.

READ MORE IN OUR SERIES *COSTS OF THE AI BOOM* AT **WWW.UCS.ORG/FA25-DATA-CENTERS**.

AIR POLLUTION AND PUBLIC HEALTH

The energy consumed by the AI industry—from chip manufacturing to data center operation—doesn't just contribute to heat-trapping carbon emissions, it also generates significant amounts of air pollutants that harm human health.

Many data centers are powered by electricity from fossil fuel–powered plants, use diesel backup generators for emergency power, and are built with cement and steel—all of which generate toxic substances in the air people breathe.

Scientists at CalTech and the University of California, Riverside valued the public health burden of US data centers in 2030 at more than $20 billion per year, comparable to the health costs associated with emissions from all the vehicles on California's roads, and four times the public health burden of AI in 2023. These costs come from the increasing number of asthma cases and other cardiopulmonary diseases caused by poor air quality. {C}

Pablo Ortiz Partida *is director of innovation and collaboration at UCS. Read more from Pablo on our blog,* The Equation*, at https://blog.ucs.org.*

Photo: Nathan Howard/Getty Images

We Must Start at the Source to Clean Up Freight and Reduce Emissions

By Sam Wilson

Lose your earbuds? Run out of your dog's favorite treat? Need a new winter coat?

The convenience of online shopping, especially for items like these, can't be beat, and maybe even more so for the roughly one in four people in rural areas who have to go farther to shop. But as time-saving as shopping online is, there are downsides: The e-commerce boom has created mega-warehouses that are air pollution magnets.

Between 2010 and 2021, not only did the frequency of new warehouse construction rise, but these new warehouses also increased in size by nearly 150 percent compared with the previous norm. Whereas the size of new warehouses typically hovered around 35,000 square feet since the 1980s, the warehouses of today are often nearly three times larger. These new warehouses have led to significant increases in the number of freight trucks on our roads.

A COMPLEX JOURNEY

The climate and environmental impacts of a typical online purchase are tough to grasp without first knowing about its journey:

- Your new earbuds likely traveled on an international container ship that docked at a US seaport.
- Once the container was taken off the ship, it probably went onto a trailer truck or freight train to travel a few hundred miles to a local distribution center. If it was on a train, it probably moved to a truck for the last leg of its trip.
- Once the container arrived at the distribution center, workers opened it, sorted its contents, repackaged the earbuds, and put them on a delivery van headed to your home or office.

It's highly likely that your new earbuds made their entire trip on polluting, fossil fuel–powered container ships and tractor-trailers. Added to that, warehouse distribution centers—like those in Chicago, Houston, and Los Angeles—attract high concentrations of big rigs and the diesel pollution they emit. This creates a host of serious health problems for those who live, learn, work, or play anywhere near these warehouses. But it doesn't have to be that way.

AN INDIRECT TARGET

Trucks are often the largest source of air pollution near warehouses, and warehouses are the reason so many trucks are concentrated in one area. Hence, the warehouse is considered the "indirect source" of pollution.

So-called indirect source rules are one of the most promising ways state regulators, clean air advocates, and affected communities can address the issue of freight pollution. These rules require warehouse owners to reduce the pollution that the warehouses attract. Facility owners can meet these requirements through a list of actions such as installing electric truck chargers or on-site solar power, and transitioning their fleets to zero- and low-emissions trucks. Notably, indirect source rules give state and local leaders a way to make progress despite the Trump administration's focus on dismantling environmental protections.

While indirect source rules show potential for targeting pollution in communities that bear the brunt of harmful diesel emissions, it is essential that the process for shaping these policies includes members of the affected communities. Follow the progress my colleagues and I have made on cleaning up the freight system at www.ucs.org/fa25-freight. {C}

***Sam Wilson** is a senior vehicles analyst in the UCS Clean Transportation Program. Read more from Sam on our blog,* The Equation*, at https://blog.ucs.org.*




When you order products online, they often travel from their point of origin via container ship to a distribution center, where they're trucked to your region and handed off to local drivers for delivery.

Photos: Matt Marino (Sam Wilson); Nick Davis-Iannaco/UCS (ship and trucks); 1933bkk/Getty Images (dock); halbergman/Getty Images (delivery); simonkr/Getty Images (ad)

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