Union of Concerned Scientists

Catalyst

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Exposing Corporate Disinformation

UCS identifies anti-science tactics

Reasons for Optimism

This Year's Science Defenders

[Union of Concerned Scientists

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The Union of Concerned Scientists puts rigorous, independent science to work to solve our planet's most pressing problems. Joining with people across the country, we combine technical analysis and effective advocacy to create innovative, practical solutions for a healthy, safe, and sustainable future.

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Reasons for Hope

Ken Kimmell speaks with a reporter at the Climate March in Washington, DC, in April 2017.

By Ken Kimmell

Let's not mince words: 2017 was a uniquely dark and troubling year. Heightened tensions with North Korea; an EPA administrator taking a wrecking ball to environmental safeguards; racism, homophobia, and misogyny on display from the president himself; disdain for scientists and experts across government; and misguided policies that will take years to fix. Yet, despite all this, I have high hopes for 2018. Why?

First, because a massive grassroots resistance is demonstrating its power. We saw it in three key marches last winter, town hall meetings over the summer, and high turnout, engagement, and participation in two recent off-year elections that powerfully swept new voices into our political system. We see it in the astonishing rise of the #MeToo movement that has turned the tables on the sexual harassment of women. And at UCS, we've seen unprecedented growth of our Science Network, science watchdogs, and Science Champions—testament to the thousands of scientists and others who insist that facts matter and must guide our policies.

> ***UCS continues to play our indispensable role of standing up for science and helping to build a healthier and more equitable society.***

Second, state and local governments, businesses, universities, and others are stepping into the void left by the Trump administration's abdication of environmental stewardship (particularly on climate), taking advantage of the remarkable improvements in technology and lower costs for solar, wind, energy storage, and electric vehicles.

Third, for the most part, our system of checks and balances has held, despite being severely tested. The media continues to expose official untruths, the courts have struck down at least some of the Trump administration's attempted overreaches, and, of course, UCS continues to play our indispensable role of standing up for science and helping to build a healthier and more equitable society.

***Ken Kimmell** is president of UCS.*

Photo: Audrey Eyring/UCS

WHAT OUR MEMBERS ARE SAYING

Here's a sampling of recent feedback from the UCS Facebook page (*www.facebook.com/unionofconcernedscientists*) and Twitter feed (*www.twitter.com/ucsusa*)

ON SAM CLOVIS WITHDRAWING HIS NOMINATION FOR A TOP USDA SCIENCE POSITION

Dan Cohan:
Thank you UCS for helping to make this happen! Perhaps we are beginning to see an end to Trump's anti-science, anti-environmental, and climate change denial agenda.

Judith Broadhurst:
Kudos to the academics and scientists who wrote the letter objecting to his appointment.

Gretchen Henkel Clark:
So appreciate all the advocacy from UCS!

ON THE EPA BANNING SCIENTISTS WITH EPA GRANTS FROM SERVING ON AGENCY ADVISORY BOARDS

Dar Eckert:
So, now who watches the watchdog agency?

@rabbijonathan:
The EPA is [there] to protect citizens and the environment. It is not there to protect the industries that exploit our environment for profit.

Peter Stokdijk:
If you don't use real facts and science, what are you going to use to make decisions regarding health, food safety, climate protection, and environmental safeguards?

ON COAL'S DWINDLING ROLE

David Evans:
I'd rather pay the production cost of pollution prevention as a consumer, than for pollution cleanup as a taxpayer. Polluters shift part of the cost of production from their product to the taxpayer.

Jason Spiller:
If oil, coal, and gas are so awesome, why do they have to be propped up by subsidies?

Tom Laubenthal:
Time to move away from coal . . . it's really clear. But we have to invest in education where these jobs are lost.

ON THE NEED TO PRESERVE STRONG FEDERAL VEHICLE EFFICIENCY STANDARDS

Phillip Valentine:
Efficiency is always cost-effective. The naysayers on pollution and mileage are dead wrong: low-emissions and fuel-saving vehicles have made a huge difference in our economy and health.

@kbjurgens:
The planet will thank you for it. Win-win, people. Driving cleaner and smarter helps all of us. #ClimateAction #ClimateVoter #RegulationsSaveLives

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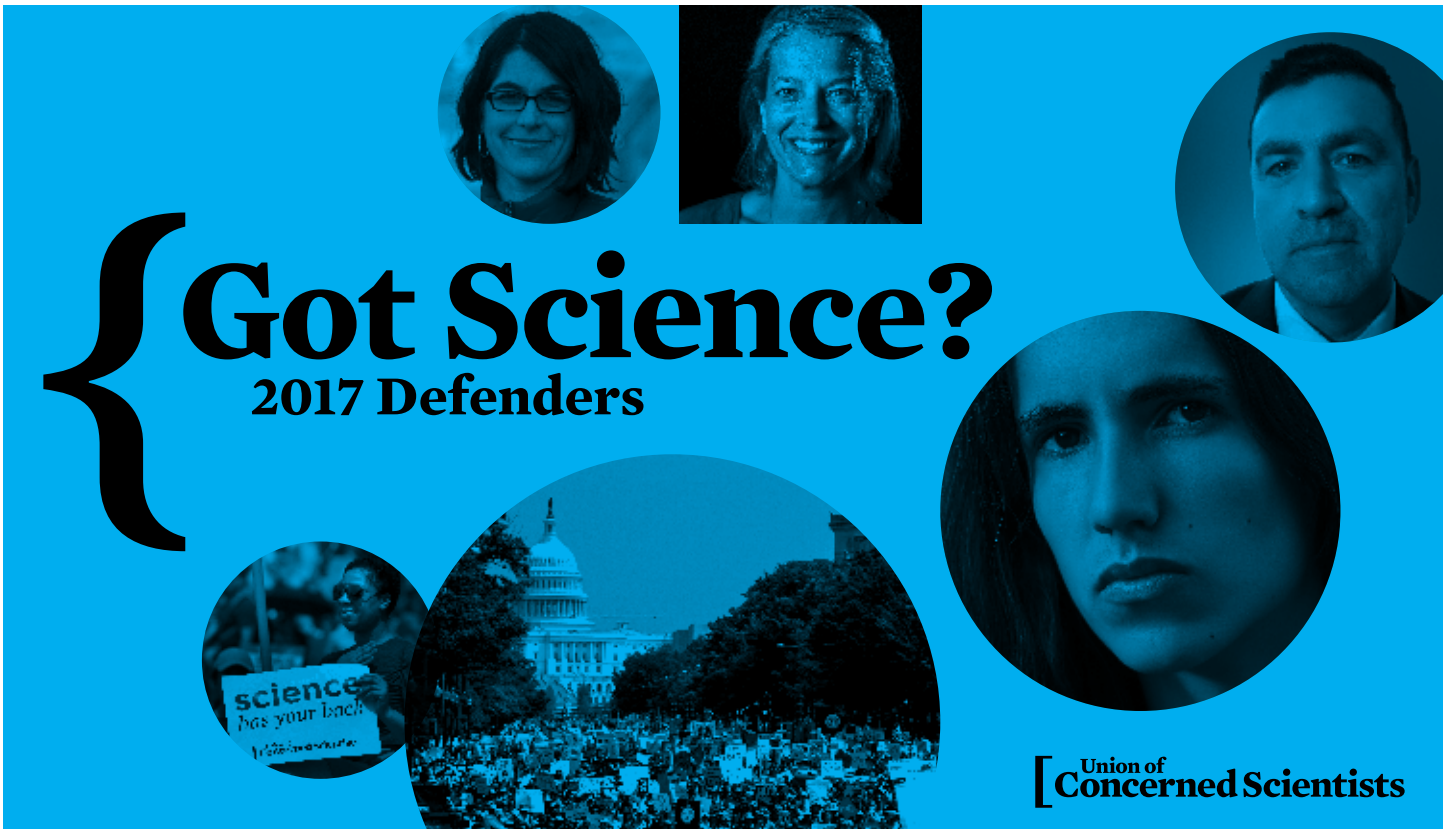


Announcing 2017's Science Defenders

To take a stand for science is always an act of bravery, but it has special resonance today. The Union of Concerned Scientists is proud to announce our Science Defenders for 2017: five people and groups who have refused to be silent.

KEEPING FEDERAL DATA SAFE

Bethany Wiggin: After last year's election, Wiggin's students at the University of Pennsylvania began wondering about whether federal data on climate change might be deleted. Their questions led Wiggin to help launch the DataRefuge project to preserve such data. Wiggin says the project also aims to address larger questions about data preservation and literacy. "It's about preserving our digital heritage for future knowledge," she says.

FIGHTING FOR HIS GENERATION

Xiuhtezcatl Martinez: Martinez, 17 years old, is a plaintiff in a landmark lawsuit against the US government filed by a group of children who claim their constitutional rights have been violated by inaction on climate change. "We're just regular kids," says Martinez. "But we have stories about how we're already seeing the effects of climate change." If the plaintiffs win, the government must implement a climate recovery plan.

"MR. PRUITT IS WELCOME TO FIRE ME"

Robyn Wilson: Wilson received an impersonal email last fall saying her service on the EPA's Scientific Advisory Board was no longer needed. The reason given: Wilson has an EPA grant. She's refused to resign. "It makes no sense," she says. "The policy claims conflict of interest for those who are the least likely to have conflicts of interest. If it's so appropriate, then Mr. Pruitt should fire me."

CLEARING THE AIR IN SOUTHERN CALIFORNIA

Beto Lugo-Martinez: Imperial County, California, grows much of the nation's food—and has some of its most polluted air. One in five children has asthma. To help residents minimize their exposure to pollution, Lugo-Martinez of the nonprofit Comite Civico del Valle has worked to install and maintain 40 low-cost air quality monitors throughout Imperial County—and he teaches residents how to use the data they collect. "They're community scientists," says Lugo-Martinez.

POWER TO THE PEOPLE

Attendees of the Climate March and the March for Science: For two consecutive Saturdays last spring, millions took to the streets to advocate for sound environmental policies, federal funding for science and scientists, and evidence-based policies for the public good. Many participants had never protested, or considered joining a movement to stand up for science. We chose to recognize this mobilization to underscore that each of us has a role in defending science.

Illustration: Farah Khan/House9 Design

UCS Board Chair Emeritus Wins Prestigious Environmental Award

UCS board member James McCarthy has been selected as a 2018 winner of the prestigious Tyler Prize for Environmental Achievement, often described as the "Nobel Prize for the environment."

Dr. McCarthy, Alexander Agassiz Professor of Biological Oceanography at Harvard University and former chair of the UCS board of directors from 2010 to 2016, is being recognized with the $200,000 prize for his work communicating the importance and risks of climate change. It marks the first time in the 40-year history of the prize that it has been given to an oceanographer. Dr. McCarthy is in good company: past winners include primate expert Jane Goodall and Charles David Keeling, who developed the well-known "Keeling curve" that measures atmospheric carbon dioxide.

The Tyler Prize committee lauded Dr. McCarthy's "ability to unite the world's best environmental researchers with international policy leaders through his role in the Intergovernmental Panel on Climate Change assessment report and organizations such as UCS." We couldn't have said it better ourselves. Dr. McCarthy will be officially presented with the Tyler Prize in a ceremony in Washington, DC, on May 3.

UCS Ranked among Best Nonprofits

CHARITY NAVIGATOR
★★★★
Four Star Charity

UCS has always been committed to managing your donations wisely, so we are especially pleased to report that Charity Navigator, the nation's largest independent evaluator of nonprofits' financial performance, has validated our efforts by awarding UCS four stars—its highest rating.

Charity Navigator assesses organizations based on the efficiency of their fundraising efforts, the growth of revenue and program expenses over time, and how expenses are divided among fundraising, administrative, and program work.

Because we do not accept government or corporate funding, our programs are funded by you, our donors. You trust UCS to put your donations to the best possible use, so we hope you will share our pride in this important recognition of our performance.

Photos: Pat Raven (James McCarthy); Audrey Eyring/UCS (UCS Store)

UCS Finds Many Science Advisory Committees Now Sit Idle

After a year in office, President Trump has notably broken with his modern-day predecessors by failing to appoint a presidential science advisor. Equally troubling, as of December 31, 2017, President Trump had filled just 20 of the 83 government posts designated by the National Academy of Sciences as "scientist appointees."

Now a new UCS report finds that the problem of science being sidelined under the Trump administration is even more extensive than previously recognized. A UCS investigative team analyzed data from 73 science advisory committees across 24 agencies and interviewed scores of committee members.

Among the report's findings:

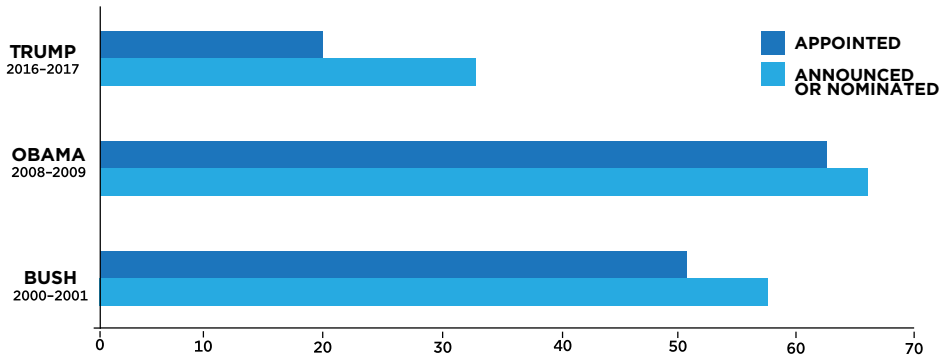
- In 2017, nearly two-thirds (62 percent) of the 73 science advisory committees at the 24 agencies analyzed met less frequently than their charters direct.
- Science advisory committees at the Department of Energy (DOE), Department of the Interior, and the Environmental Protection Agency (EPA) have met less often in 2017 than at any time since 1997, when the government began collecting such data.
- At the Department of Commerce, DOE, and EPA, fewer experts serve on science advisory committees than at any time since 1997.

These figures comport with a wealth of anecdotal data from interviews with committee members who spoke of meetings cancelled (often at the last minute), seats unfilled, committees disbanded, and others stacked with industry representatives instead of independent academic experts.

As the report notes, the government's system of some 1,000 federal advisory committees plays an important role in alerting federal officials to the policy implications of the latest scientific research, which can have major consequences for Americans' health and safety—from the outbreak of deadly diseases to environmental and national security threats. "Independent, up-to-date technical advice is essential to the government's ability to respond to complex challenges," says Genna Reed, a science and policy analyst in the Center for Science and Democracy at UCS and coauthor of the report. "Evidence of widespread sidelining of science across the federal government should be a wake-up call for everyone who cares about our government making smart decisions based on facts and evidence."

Read the full report at *www.ucsusa.org/scienceadvice*.

PRESIDENTIAL FIRST-YEAR APPOINTMENTS TO SCIENCE POSITIONS



Not only has President Trump failed to nominate a presidential science advisor, but he also has filled only 20 of 83 top government science positions, far fewer than his two predecessors in their first year as president.

Photo: sharply_done/iStock

Electric Vehicles Shown to Be Cheaper to Operate and Maintain

Many people know that driving an electric vehicle (EV) is good for the planet. But new UCS analysis has determined that American drivers can also save thousands of dollars in fuel and maintenance costs over the life of their cars by switching from a gasoline-powered vehicle to a new EV.

UCS senior engineer David Reichmuth surveyed standard and off-peak electricity rate plans in more than 50 cities across the country to record annual costs for each one. The savings from driving on electricity ranged from $443 for Houston drivers paying CenterPoint Energy's standard rate to $1,077 for San Francisco drivers charging their EVs with off-peak power from Clean Power SF.

As the report (online at *www.ucsusa.org/EV-savings)* explains, these savings are only part of the story. Industry experts predict gasoline prices will rise in 2018. In addition, EV motors don't require routine maintenance so are likely to spend less time in the repair shop than comparable gasoline-powered vehicles. According to the American Automobile Association, the average EV driven 150,000 miles will save its owner $2,100 in maintenance, repairs, and tires compared with a medium-sized gasoline-powered sedan.

"It's an opportune time to buy an electric vehicle," says Reichmuth. "For many Americans, EVs are cheaper to fuel and cheaper to maintain—and they are now becoming cheaper to buy as well."

UCS Scientist Wins American Physical Society Award

Last fall, the American Physical Society announced that Edwin Lyman, a UCS senior scientist, had won its annual Leo Szilard Lectureship Award "for using his technical expertise and tireless advocacy to maintain and strengthen U.S. policy on nuclear nonproliferation and reactor safety and security."

The award, which was established in 1974 in memory of the Hungarian-American physicist Leo Szilard, recognizes "outstanding accomplishments by physicists in promoting the use of physics for the benefit of society in such areas as the environment, arms control, and science policy."

Since joining the UCS Global Security Program in 2003, Lyman has testified regularly before Congress and the Nuclear Regulatory Commission; written articles for many publications, including *Arms Control Today, Bulletin of the Atomic Scientists*, and *Science;* and has been cited in thousands of news stories. Lyman also coauthored the critically acclaimed book *Fukushima: The Story of a Nuclear Disaster* (The New Press, 2014).

"Dr. Lyman is the perfect example of someone who successfully brings his scientific expertise to bear on important matters of public policy," said Lisbeth Gronlund, codirector of the UCS Global Security Program. "His work has truly made the world a better place."

Photos: Anna Vaczi/Shutterstock (electric vehicle); C-SPAN (Edwin Lyman)

INSIDE THE DISINFORM PLAYBOOK

Illustrations: House9 Design

Most companies play fair. But when they don't, we can help you identify their most-used tactics for undermining science, misleading the public, and putting our health at risk.

ATION

BY BRYAN WADSWORTH

Dow Chemical CEO Andrew Liveris is a powerful guy. Not only does he run one of the world's biggest corporations, but he was also chosen by President Trump in December 2016 to lead the White House's American Manufacturing Council, a group the president said would find "ways to bring industry back to America."

Dow Chemical wrote Trump's inauguration committee a $1 million check and when, on February 24, 2017, the president signed an executive order "to lower regulatory burdens" at federal agencies, Liveris was on hand to receive Trump's congratulations for the "fantastic job" he and the council were doing. Liveris had said he welcomed the opportunity to help "make it easier to do business in this country. Not a 'red tape' country but a 'red carpet' country for American businesses." But the truth is, Dow and Liveris had more specific goals in mind.

Dow spent more than $5 million lobbying the government in the first quarter of 2017, and one of its major priorities was to protect the profitability of its pesticide chlorpyrifos. Widely used on corn, soybeans, and fruit trees, chlorpyrifos has been shown, even in extremely small doses, to hinder the development of children's brains. EPA scientists and the American Academy of Pediatrics have called for it to be banned.

We now know that three days before Trump's inauguration, Dow asked the EPA to reject a ban on chlorpyrifos. On March 1, the new EPA administrator, Scott Pruitt, told agriculture industry representatives that it was "a new day . . . for a commonsense approach to environmental protection." Pruitt's schedule, released only after a Freedom of Information Act request, shows a meeting with Liveris on March 9. The EPA says the meeting was canceled, but before the month was out, Pruitt would overrule his agency's own scientists and announce that the EPA would not seek to ban chlorpyrifos.

> ***Our hope is that, by exposing these underhanded tactics and helping people understand them better, we can make it harder for companies to get away with them.***

Led by Andrew Liveris, Dow Chemical spent millions to persuade the EPA to reject the advice of its own scientists, who wanted to ban a Dow pesticide.

There's no evidence to date that Dow or Liveris acted illegally. But the case smacks of an all-too-common strategy the Union of Concerned Scientists has dubbed "The Fix": using money and/or high-level connections to inappropriately influence policy affecting people's health and safety—policy that *should* be based on science.

The Fix is just one of the strategies identified in the new "Disinformation Playbook" (*www.ucsusa.org/playbook*), a UCS project that seeks to expose the most prevalent tactics powerful companies and trade groups use to distort "inconvenient" science and mislead the public. Our hope is that, by exposing these underhanded tactics and helping people understand them better, we can make it harder for companies to get away with them. Because, when the tactics in the Disinformation Playbook succeed in sidelining science, people are likely to get hurt.

Here are the other major tactics we've identified.

THE FAKE

When scientific studies don't give corporations the data they want, they sometimes manufacture studies that do. These studies may be ghostwritten by company employees rather than independent scientists; they might highlight positive results while ignoring negative results, or be based on flawed methodology.

Georgia-Pacific, in defending itself against lawsuits related to the health problems caused by a product containing asbestos it sold in the 1960s and 1970s, produced 13 studies between 2005 and 2013 that all used some form of counterfeit science to sow doubt about the dangers of asbestos. For example, researchers observed lab animals inhaling asbestos fibers for a mere five days instead of the ideal duration of *two years*. The company also replicated a tobacco industry practice by giving its head of toxicology a role in its legal department, trying to hide all of the work he supervised behind a veil of "attorney-client privilege"—until a court ruled that such privilege does not apply if Georgia-Pacific was attempting to commit fraud.

THE DIVERSION

Instead of undertaking counterfeit science, corporations sometimes choose to undermine legitimate science about their products. They do this by creating uncertainty where little exists, often by getting trade associations and front groups to do the dirty work for them.

The Western States Petroleum Association (WSPA), a key oil industry trade association, employed this tactic when it secretly created 15 fake groups intended to look like grassroots consumer movements, with innocuous names such as California Drivers Alliance and Washington Consumers for Sound Fuel Policy. WSPA had these faux groups sponsor radio ads and billboards opposing climate

(continued on p. 20)

A trade association representing the oil industry created front groups that posed as grassroots organizations objecting to climate and clean energy policies.

Photos: Brendan Smialowski/Stringer (Andrew LIveris); pxhere (refinery)

HOW YOU CAN STAND UP TO POWERFUL INTERESTS

UNDERDOGS TAKE HEART—WE'VE GOT THEIR PLAYBOOK

Professor Jim Holstun exposed conflicts of interest between the fossil fuel industry and a pro-fracking institute started on his university's campus. The institute shut down later that year.

If the odds of beating the Disinformation Playbook and its corporate practitioners seem long, consider a recent example in which pressure applied by individuals working together won the day: in 2012, when the State University of New York (SUNY) at Buffalo's new Shale Resources and Society Institute issued a report on fracking written by researchers previously funded by the oil and gas industry, English professor Jim Holstun joined with other faculty members to draw attention to the conflict of interest. "This report reflects the interests of the gas companies, not scholarship," he said. "We look bad." A petition his group circulated eventually drew 10,500 signatures and, combined with support from some SUNY trustees and media coverage of the controversy, forced the university to shut down the institute later that year.

All of us can play a role to help keep science working in the public interest:

- **SHARE THE DISINFORMATION PLAYBOOK.** The more people know the plays, the less effective they become.
- **BECOME A SCIENCE CHAMPION.** Go to *www.ScienceChampions.org* and we'll help you inform your local media or elected officials about attacks on science when they occur.
- **SET THE RECORD STRAIGHT.** Challenge disinformation in the media by posting comments or writing letters to the editor. See where the "experts" spreading disinformation get their funding at *OpenSecrets.org*.
- **WATCH WHERE YOUR MONEY GOES.** Make conscious consumer choices (e.g., investments, retail purchases) to avoid supporting companies that advance disinformation campaigns.

And if you're a scientist:

- **BE A WATCHDOG.** Join the UCS Science Network (*www.ucsusa.org/sciencenetwork*) and we'll give you tools and training to work with communities affected by disinformation.
- **BLOW THE WHISTLE.** Federal employees are protected by agency policies, and UCS offers ways for you to share information securely and to connect with experienced lawyers.
- **PLAY A VISIBLE ROLE.** Nominate yourself or a colleague to serve on a federal scientific advisory committee.

Why did a former football star decide to speak out against the Disinformation Playbook and become a Science Champion? Read Chris Borland's story on the next page and see the video at *www.ucsusa.org/cte*.

Photo: Brendan Bannon for The New York Times

A Football Player Turned Science Champion

INTERVIEW WITH CHRIS BORLAND

CHRIS BORLAND is a former linebacker for the San Francisco 49ers. After a successful college career at the University of Wisconsin, Borland was named the National Football League's Defensive Rookie of the Month in 2014. The next year, he retired from professional football, citing his concern over the consequences of concussions. Borland has joined UCS in calling out corporate interests—such as the NFL—that attempt to sideline science.

Chris, you walked away from a career that by all early indications was going to be very successful. How did you decide to retire? Was there one event that triggered your choice?

CHRIS BORLAND: While it wasn't a sudden decision, a concussion I sustained prior to my rookie season [with the 49ers] kind of changed my approach.

It was three weeks or so into what's called fall camp, or training camp, where you practice every day. It was a routine play, and I was concussed slightly. I felt a little foggy for the rest of the day. That's not something that's uncommon for an inside linebacker.

However, I was just starting my career, and with some tragic stories that had come out, like Junior Seau, Dave Duerson, Ray Easterling, and others, I thought, "What's going to happen to me if I do this for a long time?"

I was reading about these tragedies and reading about what might be going on in my brain as I'm playing. So, it really took from August 2014 up until the day I called the 49ers in March 2015 to make the decision. Having dedicated my life to something, it was very hard.

At that point, were you concerned about chronic traumatic encephalopathy (CTE)? Had you already been hearing about the possibility that even sub-concussive hits can contribute to the condition?

CHRIS BORLAND: I was ignorant to it all. I'd heard the acronym CTE. Concussions were a hot topic, but I didn't know about sub-concussive hits. I didn't know about the biomechanics behind the injury. I didn't even know that chronic traumatic encephalopathy was what CTE stood for. So, I truly started from square one.

Were you at particular risk for concussions?

CHRIS BORLAND: Yes, I think that factored into my decision. I spent the entirety of my rookie season looking into the consequences of a long career at one of football's most dangerous positions. It was an excruciating exploration.

After you retired, your concern about your brain led you to participate in a couple of scientific studies. What was that like? What did you learn?

CHRIS BORLAND: That was a new experience for me. After I quit, I had a brain SPECT scan [a nuclear imaging test] done at a private institution. I'm also involved in the DETECT study that they're doing at Boston University, which is important to me because it tracks you over a long period of time. There's not much in the way of epidemiological studies of football players. So, it'll be important to see what happens to guys with varying experiences within the game, what happens over the course of their life.

Why are you standing up for science with the Union of Concerned Scientists, and calling out corporate disinformation campaigns such as those conducted by the NFL, which rejected early CTE research and denied any risk from playing football?

CHRIS BORLAND: Well, most simply: for the truth. I think that's important. I've seen research that says the white matter in children's brains changes with one season of football. I've seen research that says the amount of time you play is correlated to the extent to which you have symptoms of CTE. On and on, and yet there's a TV show with five-year-olds playing tackle football. It's sad to see doubt being sown in a field where children are at risk.

The NFL propagates this myth that there's "safe tackling," or that the research is still evolving, which of course it is. But I think there's a slim sliver of a gap between correlation and causation with this issue, and they live in that gap, and blow up that gap and show everybody that gap. But in reality, I think we can draw some conclusions. So that's why it's important to me. I

Photo: Genna Reed/UCS

> *"I don't think you can look to the NFL to make changes. . . . So, clearly we need more public pressure and more science brought to bear if we want to see more done to protect players."*

made a pragmatic decision about my own personal health and found myself cast in this role as an advocate. And I think over the past couple of years, I have been a part of some really great things.

Do you miss being a football player?

CHRIS BORLAND: Yeah. I think I'll always miss playing. But I don't miss being in pain. There's a lot of it I don't miss.

What are you doing today instead of football?

CHRIS BORLAND: For one thing, I've been involved in a documentary film called *Requiem for a Running Back* [in theaters recently]. For my money, it's the best representation of CTE. It follows the journey of a woman and her father, who was a longtime player and coach. It illustrates to me the fact that brain injury happens not only to the player who goes through it, but to everyone within their inner circle, from family to caregivers, to the people they work with. That's not a topic that always gets a lot of attention. You'll hear players asked, "Would you do it all again?" and to a man, most players say yes no matter how they're doing. I think you may get a different answer—at least a more nuanced answer—if you ask their wives or children or brothers and sisters. The film zeroes in on that.

Do you think there's any way to make football safer?

CHRIS BORLAND: One thing I think is imperative is that we mandate that kids wait until high school to play. I think a lot of people who are experts in football would agree that the best thing, if you wanted to turn a seven-year-old boy into an NFL superstar, is to have him wait, play a wide variety of sports, come into football healthy, and learn good technique.

After the 2011 collective bargaining agreement in the NFL, you can only hit once weekly throughout the season. However, in college, we hit two and sometimes three times a week. In high school, we hit two and three times a week. Most brain injuries happen in practice, not games. It makes no sense to me that we're having children as young as five years old hit their heads more than professionals making millions of dollars.

What would you like to see the NFL do to protect players?

CHRIS BORLAND: Waiting, minimizing exposure, and then looking into providing health care and perhaps a fund for former players that do succumb to these struggles. Not every player does, but it's tremendously expensive, and I think the NFL has done a really good job of privatizing the profits and socializing the costs, and a lot of that is passed on to the communities where these people live.

But I don't think you can look to the NFL to make changes. They say they're changing the culture. That sounds profound, that sounds meaningful. But I can tell you, from a player's perspective, spots on the field are worth millions of dollars. You can say, "If you're feeling symptoms, report it." But that's not how it works, because there's a guy right behind you who's hyper-competitive who won't report it. So, clearly we need more public pressure and more science brought to bear if we want to see more done to protect players. {C}

Photo: Fritz Bielmeier/Unsplash

KEEP CALM AND SCIENCE ON

UCS staff members look at the big picture and find reasons for hope amid the current turmoil.

BY PAMELA WORTH

We all know 2017 was a harrowing year politically. But UCS scientists, analysts, and campaign staff work hard to focus on making progress wherever they can. And they see plenty of bright spots for 2018 and beyond.

Six UCS staff members who work on a range of issues look back at the wins they've savored, and ahead to the potential victories that keep them coming to work every day. We hope their perspectives on the fight for our health, safety, and environment help renew your spirit in a time when the news too often seems grim.

ANDREW ROSENBERG, DIRECTOR OF THE CENTER FOR SCIENCE AND DEMOCRACY AT UCS

OPTIMISTIC ABOUT: PARTICIPATORY DEMOCRACY

I am heartened that despite all the problems with our political system, constituency still matters. UCS has encouraged our networks—scientists, activists, and so on—to speak out as constituents. That's been fairly effective, because it matters if you speak out as a voter to the person who's supposed to be representing you, even in the most partisan and difficult of political times. Has it stopped terrible things from happening entirely? Of course not. But it's been the counterweight to a lot of bad stuff. I also feel deeply connected to the rest of the UCS staff and to our supporters who want to fight. These are issues that I've cared about my whole life. So, I'm not willing to give up and allow somebody to wave a Nazi flag. I'm not willing to let somebody spout nonsense about poor communities having illnesses because they have too many barbecues. And I'm not willing to listen to somebody say, "Well, what we really need is to take environmental protections back to the 1960s." It's my motivation as well as my obligation to try to help shape this fight.

I remember the first time I saw an electric car, in college. I told a professor that it was the next step for the industry. He laughed at me and said it would never happen. I had a similar conversation with a friend about renewable energy; he said it was for dreamers. Today in the United States, we have more than 600,000 electric vehicles on the roads. And the number of charging stations in the world increased by more than 60 percent in the past year. The solar power installed last year in the United States is enough to power 2 million homes. And we have now built the first offshore wind farm, off the coast of Rhode Island, with more to come. Just seeing the magnitude of this project is inspiring—how tiny you are in comparison to these wind turbines, and all the power they provide. The costs of clean technology and renewable energy have decreased so drastically that there are places where the market itself is driving the implementation of wind and solar projects. My optimism is not based on being a dreamer, but on facts.

PAULA GARCIA, ENERGY ANALYST

OPTIMISTIC ABOUT: MARKET-DRIVEN CLEAN TECHNOLOGY

Photos: Richard Howard (Andrew Rosenberg); Audrey Eyring/UCS (Paula Garcia)

ELEANOR FORT,
VEHICLES CAMPAIGN MANAGER

OPTIMISTIC ABOUT:
CLEAN AND EQUITABLE TRANSPORTATION

Transportation is the largest contributor of carbon emissions in the United States. We know there's inaction at the federal level—which means states have to step up. Seven Northeast and mid-Atlantic states, plus Washington, DC, recently announced that they're going to develop a market-based plan to reduce transportation emissions. What's awesome is that they're starting by engaging stakeholders and the public. That's the way to go when creating a big program like this: listen to the people.

This new Transportation and Climate Initiative will set strict limits for emissions. It will make polluters pay for the true cost of the pollution that their products emit. And it will raise funds that states can then use to invest in new, clean, equitable, accessible, affordable transportation solutions. Those funds will benefit communities that have been disproportionately affected by transportation emissions. Science can help determine how this program should be designed to achieve maximum benefits. That's part of why UCS is so well positioned to work on this issue. We're hoping that by 2020, we'll have established a new carbon market for transportation.

> ***"We know there's inaction at the federal level—which means states have to step up. . . . We're hoping that by 2020, we'll have established a new carbon market for transportation."***

There are positive signs everywhere that things are moving—even if slowly. On the federal level, the Government Accountability Office recently released a report on how much climate change will likely cost the United States, and it is advising, on the record, that the government act before the problem becomes too expensive to deal with. President Trump's nominated administrator for NOAA [the National Oceanic and Atmospheric Administration] testified that climate change is real and human-caused. The National Defense Authorization Act, signed by President Trump, has a provision declaring that global warming is a national security issue, which means the Department of Defense is required to assess which bases are most threatened by climate change.

Locally, in my own experience, I've been interacting with people in communities affected by sea level rise. They know what's happening, because they see it every day: they drive their old "saltwater car" during tidal flooding instead of their good car, and parents have a phone chain to alert each other when the water is too high for the school bus to come. What UCS does is give them information they can use to take action and to help make better plans. Developments like these may look small by themselves, but they are especially positive signs when taken together.

ASTRID CALDAS,
SENIOR CLIMATE SCIENTIST

OPTIMISTIC ABOUT:
WIDESPREAD ACKNOWLEDGMENT OF CLIMATE CHANGE

Photos: Audrey Eyring/UCS (Eleanor Fort, Shreya Durvasula); Ja-Rei Wang/UCS (Astrid Caldas); Brian Smeets (Adrienne Alvord); Christopher Michel (ad)

ADRIENNE ALVORD,
WESTERN STATES DIRECTOR

OPTIMISTIC ABOUT:
REGIONAL ALLIANCES TO ACT ON CLIMATE CHANGE

For a long time now, action on climate change has been happening at the local, state, and regional levels. The Under2 Coalition started with just California and the German state of Baden-Württemberg, which committed to limit their global warming emissions to between 80 and 95 percent below 1990 levels by 2050. Today, 43 countries—representing 1.3 billion people and almost 40 percent of the global economy—have signed on. On a smaller level, British Columbia, California, Oregon, and Washington are collaborating on clean infrastructure and reducing emissions. And California has set its own goal of reducing emissions 40 percent below 1990 levels by 2030, which is a legally binding target. We're ahead of schedule in some areas.

Another thing to feel optimistic about is that clean technologies are now mature; they're no longer "alternative" or fringe. More and more people are recognizing that the economics of renewable energy and clean transportation make sense. We're in the middle of an energy and transportation revolution, and UCS has been at the forefront. There's reason for concern, but not reason to lose hope. And the concern should spur us on to greater action.

"What gives me hope is that there's been a dramatic shift in the culture of science advocacy: scientists are realizing that their voices are needed. . . . They're bringing so much energy—they're fired up."

My role at UCS is to manage the growth of our Science Network, and to help Science Network members develop their leadership skills. What gives me hope is that there's been a dramatic shift in the culture of science advocacy: scientists are realizing that their voices are needed. The Science Network has grown tremendously, including a surge of early-career scientists. They're bringing so much energy—they're fired up.

This has given our team the opportunity to try different leadership development and scientist engagement projects. For example, working on the Science for Public Good Fund [a small-grant program] has been incredible. One of my favorite projects we funded brought labor organizers and graduate students together to learn how to submit public comments to regulatory agencies. This process is esoteric but important, so now more people will know how to do it. We're working to build long-term infrastructure for scientist-advocates to stay involved. I think the pendulum has shifted in a way that they're not going to retreat into their labs after this administration. And I appreciate that we're thinking beyond this administration. We all need to. {C}

SHREYA DURVASULA,
SENIOR CAMPAIGN COORDINATOR

OPTIMISTIC ABOUT:
THE COLLECTIVE POWER OF FIRED-UP SCIENTISTS

Our Federal Science Agencies Are in Mortal Danger

By Kathleen Rest and Andrew Rosenberg

Our national political landscape is in disarray. As scientists, we watch with dismay as senior positions in our federal science agencies remain unfilled, science advisory panels get disbanded, and science-based policies are undermined. The Union of Concerned Scientists and many other organizations are sounding the alarm and drawing attention to these issues each day. And the science community is mobilized as never before to speak out when the Trump administration or Congress act in ways that sideline science, favor private over public interests, or threaten the role that facts, evidence, and science play in our democracy.

Amid this governmental turmoil, another longer-term development is under way that will affect the lives of everyone in the United States and impact others around the world—likely for decades to come: the loss of critical expertise and capacity in the science agencies of the federal government, including agencies such as the Environmental Protection Agency, the US Fish and Wildlife Service, and others in the Department of the Interior. Or the Centers for Disease Control, the Occupational Safety and Health Administration, the National Oceanic and Atmospheric Administration, and the National Aeronautics and Space Administration, among many others.

Thousands of highly trained scientists across a huge range of disciplines have worked diligently in these agencies for decades. These government scientists—and we were once among them at different stages in our careers—are critical to the missions of these agencies. And these agencies are critical to the health and safety of all Americans, protecting public health; ensuring clean air, water, and the safety of our food and consumer goods; protecting our natural resources; and responding to national emergencies of all kinds from terror attacks to natural disasters. There is no getting around it: to accomplish their missions, these agencies require strong and independent science.

The administration has proposed huge cuts in every one of these agencies, particularly in the science programs that deal with issues the administration opposes ideologically, such as climate change and the use of regulation to reduce pollution. So far, though, Congress doesn't seem inclined to accept most of the shortsighted budget proposals from this White House.

But budget cuts are only one highly visible strategy. Other administrative actions are already eroding the capacity of our nation's science agencies. For one thing, the Trump administration is already taking advantage of other methods to reduce agency staffing that don't require congressional approval. In the fine print of the president's budget proposal are reductions in staffing by 20 percent or more in some agencies (the EPA, for example), often with science programs faring the worst. There are buyout programs for eligible employees and staff transfers to shut down specific areas of work. There are virtual hiring freezes in place for most civilian agencies. And there are ongoing consultations on how to conduct "Reductions in Force,"

Photo: Fiona Goodall/Getty

The Trump administration is threatening to hollow out vital government agencies to the point at which they will cease to function as we need them to. We can't let this happen.

otherwise known as layoffs. These actions have been used in the past by other administrations; what is new is the blatant effort to "deconstruct the administrative state" (i.e., the federal agencies that safeguard our health, safety, and security) and use every tool in the toolbox to do so.

What is the net effect of these actions, from pure rhetoric to actual changes in agency staffing? We are seeing three troublesome developments unfold: the loss of senior scientists in public service, the loss of new scientific and technical talent coming into public service, and the chilling effect on the work of scientists who decide to stay.

A loss of senior scientists means a loss of significant expertise, institutional knowledge, and perhaps even whole programs and areas of work led by those scientists. Science that helps us identify, understand, and deal with existing risks, as well as anticipate and plan for future, unknown risks. Science that spurs innovation and incubates solutions. This loss of decades' worth of experience will take decades to rebuild, precisely as the complexity and pace of the world's science-based challenges increase.

HELP US FIGHT BACK against the administration's efforts to sideline science—visit *www.ucsusa.org/standupforscience* to sign up for our **SCIENCE CHAMPIONS** or **SCIENCE NETWORK**, and learn how you can get involved.

Then there's the pipeline issue—even more concerning from a public service perspective. All the signals seem to be telling scientists (and non-scientists as well) not to go into federal public service. Talented, highly trained scientists early in their careers are turning away from the idea of working in federal laboratories or agencies. Many of these younger scientists tell us they just assume there are no opportunities with federal agencies, historically one of the major employers of scientists in many fields. Or that they worry about working in the current political climate.

Our agencies will need that new talent to draw on in years to come to protect our nation's public health, safety, and environment. Government agencies, like most large organizations in any sector, depend on people. Without the influx of new talent, the Trump administration, whether by strategy or ineptitude or some combination, is threatening to hollow out these vital government agencies to the point at which they will cease to function as we need them to. We can't let this happen.

The best available science is needed to inform policies that protect our health, environment, and safety. Weakening federal science agencies hampers our ability to identify, understand, and prepare for existing risks—such as the 2012 flood that destroyed this Iowa farming family's corn crop—and anticipate future, unknown risks.

Kathleen Rest *is executive director of the Union of Concerned Scientists, and previously served as acting director of the National Institute for Occupational Safety and Health.* ***Andrew A. Rosenberg*** *is director of the Center for Science and Democracy at the Union of Concerned Scientists, and previously served as the northeast regional administrator of the National Marine Fisheries Service. Read more from them on our blog,* The Equation, *at* http://blog.ucsusa.org. *This article is reprinted with permission from* Scientific American. {C}

Photo: AgStock Images/Russ Munn

Inside the Disinformation Playbook

(continued from p. 11)

Dr. Tyrone Hayes found that Syngenta's herbicide atrazine turned male frogs into females. For years, Syngenta harassed Hayes and tried to discredit his research.

and clean energy policies, and in 2015, the California Drivers Alliance undertook a highly dishonest campaign that succeeded in defeating a measure that would have cut California's oil use in half.

WSPA wasn't even the first fossil fuel trade association to use this strategy: back in 1998, the American Petroleum Institute formulated a similar plan to prevent the United States from adopting much-needed limits on global warming emissions by manufacturing doubt about climate science—a plan the oil industry has followed to the present day.

THE BLITZ

Sometimes, corporations make the unfortunate decision to attack not only the science about their products, but the scientists who conducted the research as well.

Syngenta, maker of atrazine (the second most widely used herbicide in the United States), went to disturbing lengths to silence one of its own scientists. Dr. Tyrone Hayes was hired in 1997 to study atrazine's effects on amphibians; instead of finding nothing, which he expected, Hayes discovered that atrazine turned genetically male frogs into functional females. When the company failed to act on his findings, Hayes left in 2000 and replicated his results independently.

Syngenta considered numerous activities to try to discredit Hayes, including investigating his wife. It sent someone Hayes nicknamed "the Axe Man" to mock him at public appearances, filed an ethics complaint with his academic employer, and placed Internet search ads questioning his professionalism. Though subsequent research has implicated atrazine in health problems, Syngenta's tactics have taken their toll on Hayes: "Asking me if I feel vindicated," he said, "is like asking someone who's been in jail for 10 years for something he didn't do whether he feels vindicated when he gets out."

THE SCREEN

Some corporations try to disguise their disinformation behind the respectability of a university. By encouraging research institutions to accept large donations attached to restrictive contracts, corporations can influence the direction the institution's research takes.

In 2015, Coca-Cola funded an institute at the University of Colorado called the Global Energy Balance Network with the purported mission of investigating how to end obesity. Coca-Cola was allowed to draft the organization's mission statement, design its website, and select its executives—several of whom had previously done paid consulting work for Coca-Cola. With sales of soda declining and the pressure to ban sugary drinks rising, the Global Energy Balance Network used studies funded by Coca-Cola to confuse the public with claims that reducing calories is less important in preventing weight gain than exercise combined with *increasing* calories. When Coca-Cola's behind-the-scenes role in the organization and all its conflicts of interest were exposed, the company pulled the plug.

Attendees at a pediatrics conference carry tote bags from Coca-Cola, a conference sponsor. Corporate donations can influence the direction of institutions' research.

DEFENDING AGAINST THE PLAYBOOK

Industries return to these same plays over and over because they have been shown to work. That, however, is where UCS comes in, says Genna Reed, science and policy analyst with the Center for Science and Democracy at UCS. "Exposing these playbook tactics is one of the best ways to thwart these behaviors that undermine science and threaten our health and safety. There are plenty of examples of individuals and communities exposing counterfeit science, defending scientists, and shining a spotlight on undue corporate influence. And we want to see even more of them." See the box (p. 11) for one example—and how you can get involved. {C}

Photos: Annie Tritt/Mother Jones (Dr. Tyrone Hayes); Alan Greene/DrGreene.com (Coca-Cola); Alexander Patton (Genna Reed)

Julia Brown: Providing a Model for Action on Climate Change

UCS National Advisory Board member Julia Brown enjoyed a successful career in the pharmaceutical industry before turning her attention to climate change—and thinking seriously about how she could make a difference. After earning a master's degree in sustainability and environmental management from Harvard University, Brown was appointed to San Diego's Sustainable Energy Advisory Board. She now chairs the group, which is responsible for helping to implement San Diego's far-reaching Climate Action Plan, approved by the city council in 2015. Brown also serves on the board of Cleantech San Diego, and the Director's Council at the Scripps Institution of Oceanography.

"San Diego is the largest US city to commit to 100 percent renewable energy for electricity production," Brown says. She notes that since 2010, San Diego's global warming emissions have been reduced by 19 percent, while the economy has grown by 30 percent. The city is ahead of the schedule laid out in its plan for emissions reductions.

Brown says that her service on the UCS National Advisory Board keeps her up to date with climate change–related legislation and policies at the federal and state level. And the connections she's made help keep her in the fight for sustainability.

"The things UCS cares about are exactly the things I care about," Brown says. "It motivates me to be part of a group with shared values. I can have a bigger impact by supporting a group like UCS."

Brown is enthusiastic about the potential for more US cities and towns to adopt their own climate plans. As she points out, more than 123,000 jobs will be created in San Diego through the implementation of its Climate Action Plan.

"We know that our progress won't move the needle on climate change globally," Brown says. "But we hope to be a model of successful implementation, so that other people will want to follow suit. We want to show that doing what's right for the environment can be good for the economy, and can create good jobs." {C}

> ***Brown makes the point that doing what's right for our planet can be good for the economy as well.***

Automakers Shouldn't Revert to Their "Can't-Do" Philosophy

By Dave Cooke

After the Great Recession of 2008, when the Obama administration bailed out Detroit's Big Three automakers, it looked as though these companies might turn over a new leaf.

Instead of fighting government-imposed safety and efficiency rules—their modus operandi for decades—automakers agreed to work with federal agencies on new fuel efficiency and tailpipe pollution standards that would steadily tighten through 2025. Those standards, implemented in 2012, have worked well so far: the automakers are still in compliance, and American drivers have saved nearly $50 billion at the pump over the last five years. At the same time, the industry made a dramatic comeback, selling a record number of vehicles in 2015 and 2016.

Because the standards were set well in advance, the Environmental Protection Agency (EPA) was required to conduct a "midterm review" in January 2017 to make sure the industry was on track to meet the standards for the years 2022 through 2025. That review confirmed the industry could do so at an even lower cost than initially anticipated, and the EPA announced it would keep the standards in place. After the Trump administration took office, however, automakers saw an opening to push back.

Just a month after the EPA's announcement, automakers sent a letter to President Trump asking his administration to reopen the review, falsely claiming that the cost of continuing to meet the standards would exceed estimates and put a million jobs at risk.

As I pointed out in a December UCS report, *Time for a U-Turn: Automakers' History of Intransigence and an Opportunity for Change*, such claims are in keeping with the kinds of hyperbolic statements automakers have been making for decades to blunt efforts to make vehicles safer and cleaner. In 1970, for example, when Congress was debating the Clean Air Act, Ford CEO Lee Iacocca insisted the legislation "could prevent continued production of automobiles" and "do irreparable harm to the American economy." Thirty years later, Walter Huizenga, president of an auto dealer trade group, was singing the same song. "If Congress mandates an increase in fuel economy," he asserted, "certain models of pickups, minivans, and sport utility vehicles could potentially be eliminated from the market." Many more examples are described in the report, online at *www.ucsusa.org/automaker-uturn*.

Time after time, auto industry arguments have been proven wrong. Automakers have not only been able to comply with new health, environmental, and safety standards, but have consistently outperformed them as well. Instead of clinging to their traditional "can't-do" philosophy, today's automakers need to keep the promises they made to build safer, cleaner cars. {C}

Dave Cooke *is a senior vehicles analyst in the UCS Clean Vehicles Program. Read more from Dave on our blog,* The Equation, *at* http://blog.ucsusa.org.

Lee Iacocca, former CEO of Ford and Chrysler, was one of many automotive executives who pushed back against cleaner, safer cars—as in this quote from a 1985 Chrysler ad attempting to sway public opinion.

Photos: Mike Olliver (Dave Cooke); Timothy A. Clary/Getty Images (Lee Iacocca); Chrysler Corporation (ad); Twinpix/Getty (family)

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