

**Testimony for Mr. Michael Halpern**  
*Deputy Director, Center for Science and Democracy*  
*Union of Concerned Scientists*  
House Committee on Science, Space, and Technology  
Joint Subcommittee on Investigations & Oversight and Subcommittee on Research &  
Technology Hearing

“Scientific Integrity in Federal Agencies”

July 17, 2019

Thank you, Chairwoman Stevens and Chairwoman Sherrill, and also Ranking Member Baird and Ranking Member Norman, for holding this important hearing, and thank you for the opportunity to testify. My name is Michael Halpern, and I am the Deputy Director of the Center for Science and Democracy at the Union of Concerned Scientists. I have been working to protect science in decision making and scientific integrity since 2004 at a national and international level, and have authored numerous articles and reports about the problem of political interference in science and solutions to it.

The Environmental Protection Agency (EPA), Centers for Disease Control and Prevention (CDC), Department of Interior (DOI), and Food and Drug Administration (FDA) are supposed to use independent science to protect and improve public health and the environment. Much of the time, they do. But sometimes presidential administrations want to sideline, manipulate, misrepresent, or suppress information that comes out of federal agencies—especially if it doesn’t support the policies they want to put forward. When that happens, valuable information is kept from the public, and it becomes easier for politicians to justify ill-advised public health and environmental protection decisions. This makes people sicker and degrades the environment.

A lack of protection for science makes it easier for the White House to try to get away with actions like censoring a study on chemical contamination of drinking water<sup>1</sup>, or why employees can be reprimanded for tweeting about climate change<sup>2</sup>. Absent these protections, employees feel the need to self-censor, and avoid talking publicly about their research results. Such a climate of censorship harms the public trust in science-based policymaking, erodes the public understanding of the scientific record, and threatens to fundamentally alter the strength of our democracy.

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<sup>1</sup> Bipartisan Outrage as EPA, White House Try to Cover Up Chemical Health Assessment, Michael Halpern, May 16, 2018 - <https://blog.ucsusa.org/michael-halpern/bipartisan-outrage-as-epa-white-house-try-to-cover-up-chemical-health-assessment>

<sup>2</sup> Joshua Tree National Park Superintendent Reprimanded for Climate Change Science, UCS Staff, Jan 5, 2018 - <https://www.ucsusa.org/center-science-and-democracy/attacks-on-science/joshua-tree-national-park-superintendent-reprimanded>

Since 2004, the Union of Concerned Scientists has regularly monitored agencies for actions that compromise the use of science in policymaking. We have learned about such issues from scientists themselves, having conducted surveys of federal scientists for their views about political pressure on their scientific work during the last three presidential administrations. We have pushed for and participated in congressional oversight related to scientific integrity, and regularly work with reporters to bring abuses of science to light. We developed model good government policies for federal scientific agencies and analyzed and made recommendations about both the content and implementation of federal agency scientific integrity policies since they were developed nearly a decade ago.

I am thrilled to see that legislation to mandate the development of scientific integrity policies, H.R. 1709 the Scientific Integrity Act, is receiving a hearing today. We want to thank Congressman Tonko for leading the way on this legislation, as well as Chairwoman Johnson and Chairwoman Stevens on the Science Committee for their leadership as well. We hope that today will serve as an example to all that there can be a bipartisan commitment to promoting responsible conduct in federal scientific agencies with regard to the development and communication of scientific information.

This testimony can be summarized as follows:

1. Political interference in science happens under all presidential administrations, although the recent level of attacks on science is unprecedented.
2. Scientific integrity standards are essential for government accountability, but current scientific integrity policies are insufficiently written, inadequately implemented, and vulnerable to being ignored or repealed by any administration.
3. The Scientific Integrity Act has support from a wide variety of organizations. With a few improvements, the legislation should make a real bipartisan advance that will broadly impact policymaking for the better. It should be passed and signed into law.
4. There are other steps that must be taken to strengthen the role of science in policymaking that are outside of the scope of this legislation and hearing. The legislation does not address all issues related to science-based policy-making and it should not attempt to do so.
5. This legislation is not directed at the actions of the current or any other administration. It is a good government effort that should transcend partisan politics.

### **Strong Scientific Integrity Standards Are Essential for Government Accountability**

The United States government has long worked to ensure the integrity of the science that is maintained within executive branch agencies. Originally, this meant ensuring that a scientist's research was conducted ethically and in accordance with high scientific standards. Policies were put in place to protect human research subjects, ensure that confidential data is protected against disclosure, promote effective peer review, address scientific misconduct, and more.

In recent years, the definition of scientific integrity has been focused on ensuring that science produced and considered by the federal government is not censored or politically influenced,

that this science fully informs public policy decisions, and that the public is more fully aware of the knowledge and data that are produced by federal scientists that pertains to policymaking.

The importance of safeguarding scientific integrity within our federal government cannot be overstated. Science-informed decisions made by executive agencies have direct impacts on all of our lives. Whether those decisions are determining how safe or clean our waters are to drink, or our air to breathe, or whether certain species are deserving greater protections under law, four fundamental principles should be embraced:

1. Decisions should be fully informed by (but not necessarily proscribed by) science;
2. Scientists working for and advising the government should be unobstructed in providing scientific evidence to inform the decision-making process;
3. The public should have reasonable access to scientific information to be able to understand the evidentiary basis of public policy decisions; and
4. The public and Congress should be able to evaluate whether the above principles are being adhered to.

Clearly, science is not the only factor that goes into many policy decisions. There are often many factors to consider. There are times, however, when determinations must be made *solely* on the best available scientific information. For example, current law requires the Food and Drug Administration to consider only the scientific evidence when determining whether drugs are safe and effective. It is not appropriate or legal to consider how profitable the drug will be. Similarly, when determining what level of air pollution is unsafe for human populations, the Clean Air Act requires the EPA to stick to the science. Economics and other factors can then be taken into account when standards are implemented and enforced.

### **The Scientific Integrity Act is Government Accountability Legislation that Prevents Political Interference in Science**

The attacks on science described in this testimony—including censorship and self-censorship, misrepresentation of findings, improper interference in scientific methods, and delays in publishing research—all could have been prevented had scientific integrity protections been formalized in statute when the attacks took place. At a minimum, there would have been recourse for federal employees faced with such political interference.

The Scientific Integrity Act is good government legislation. It is agnostic on matters of policy; rather, it aims to ensure that policies are fully informed by science. The legislation contains many of the best practices that have been identified for the development and maintenance of a thriving federal scientific enterprise.

The legislation prohibits any employee from manipulating or misrepresenting scientific findings. On issues from endangered species to toxic chemical contamination to worker safety, political appointees have personally made changes to scientific documents (or ordered that changes be made) in order to justify action or lack of action on public health and environmental threats.

The legislation helps ensure that government communication of science is accurate by giving scientists the right of last review over materials that rely primarily on their research. It also gives scientists the right to correct official materials that misrepresent their work. This provision makes it less likely that federal agencies will put out inaccurate information, either intentionally or inadvertently.

The legislation ensures that scientists can carry out their research—and share it with the public—without fear of political pressure or retaliation. It enables scientists to talk about their research in public, with reporters, in scientific journals, and at scientific conferences. The bill empowers federal scientists to share their personal opinions as informed experts, but only in an individual capacity, not as government representatives. This is essential due to the amount of censorship and self-censorship that has been documented on issues from climate change to food safety.

The legislation requires agencies to devote resources to designate scientific integrity officers and provide federal employees with appropriate training to help prevent misconduct. Some agencies have developed policies that have no enforcement mechanisms, rendering them virtually meaningless.

The legislation would *not* empower scientists to speak for their agency on policy matters. It would not enable scientists to circumvent the agency leadership with regard to policy decisions. It would be clearly applied to expressing views with regard to their scientific expertise.

### **Scientists Should Be Free to Speak Publicly Without Asking Permission**

Notably, the legislation extends appropriate free speech protections for agency experts by allowing them to speak about their scientific work without political filters. Many current and former agency leaders initially worry that by extending additional rights for scientists that scientists will confuse the public. Policies are already in place however at several agencies that assert this right and there have been no recorded problems.

The National Oceanic and Atmospheric Administration was the first agency to assert that scientists could speak publicly about their scientific work without prior approval when NOAA released its scientific integrity policy in December 2011. Several other agencies and departments have followed suit, including the Department of Commerce (NOAA's parent department), the Department of Energy, the Department of Interior, the Centers for Disease Control and Prevention, and the Environmental Protection Agency. As noted above, this does not mean that scientists feel free to exercise this right, which is one reason that codification should happen.

It is worth noting that this is one area where the 2010 White House memorandum falls significantly short. The memorandum requires “coordination” with supervisors and public affairs, which introduces significant opportunities for censorship. It also implicitly allows these individuals to instruct scientists to refuse interviews; offer alternative spokespeople who would be more likely to provide more “favorable” messages; or delay interviews until deadlines have

passed and the information is no longer relevant. The past decade has demonstrated that these guidelines are insufficient.

### **Problems with Scientific Integrity Happen Under All Presidents And Hurt People Directly**

In the *Journal of Science Policy and Governance* last year<sup>3</sup>, my colleagues Emily Berman and Jacob Carter explored cases of political interference in science dating back to the 1950s. They write:

*Due to the widespread use of science in policymaking, stakeholders on all sides of scientific issues attempt to manipulate scientific information and/or scientists to achieve their own goals. Such practices introduce political and ideological bias into the science policy process and threaten to undermine protections for both public health and the environment. In recent years, scientists and science advocates have adapted the term "scientific integrity" to describe the proper process through which science informs policy.*

...

*Overall, we find that the Trump administration's violations of scientific integrity are largely a continuation and escalation of patterns built up over the past seven decades as science and the growing federal science apparatus increasingly came into conflict with political, economic, and ideological interests. While many of the Trump administration's actions have origins in the work of prior administrations, others fit with the "unprecedented" narrative, including the uniquely open disregard for the conclusions of its own scientists.*

The paper chronicles several actions that resulted in a loss of scientific integrity in multiple presidential administrations. For example, President Eisenhower fired the head of the National Bureau of Standards after the agency head refused to certify that a battery additive preserved battery life. President Johnson imposed political litmus tests imposed for appointees to a presidential science advisory committee. President Nixon disbanded that same science advisory committee when members were critical of his proposed Supersonic Transport System. The Carter administration buried a report from a task force on natural gas supply and production costs when it disagreed with the task force's conclusions, eventually dismissing the task force's head.

However, while political interference in science happens under all administrations, it does not happen equally under all administrations. The Reagan administration brought a significant increase in scientific integrity violations. The next two presidents, George H.W. Bush and Bill Clinton, oversaw agencies where there were far fewer clashes between scientists and the political appointees leading federal agencies.

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<sup>3</sup> POLICY ANALYSIS: Scientific Integrity in Federal Policymaking Under Past and Present Administrations, Emily Berman, Jacob Carter, *Journal of Science Policy & Governance*, Vol. 13, Issue 1, September 2018 - [http://www.sciencepolicyjournal.org/uploads/5/4/3/4/5434385/berman\\_emily\\_\\_carter\\_jacob.pdf](http://www.sciencepolicyjournal.org/uploads/5/4/3/4/5434385/berman_emily__carter_jacob.pdf)

The George W. Bush administration significantly escalated the tensions between science and policy. My research team and I documented scores of instances of political interference in science during the George W. Bush administration. Among the most egregious examples, taken directly from UCS's *Federal Science and the Public Good* report:<sup>4</sup>

- After the 9/11 terrorist attacks, the Environmental Protection Agency (EPA) informed rescue workers at ground zero that the air was safe without having actually tested the air.
- In 2006, the U.S. Election Assistance Commission reversed the findings of a report on voter fraud prepared by a bipartisan team of experts, replacing evidence that voter fraud is not widespread with language suggesting that it is pervasive.
- The Food and Drug Administration (FDA) cited a fabricated industry study in defense of its decision to approve the drug Ketek, despite widespread concerns among its own scientists that Ketek causes severe liver problems.
- Despite warnings from government scientists, the Federal Emergency Management Agency (FEMA) used faulty testing procedures and failed to correctly test for dangerous levels of formaldehyde in mobile homes provided to victims of Hurricane Katrina.
- The Consumer Product Safety Commission (CPSC) manipulated testing procedures to produce faulty results on the lead content of children's lunch boxes.
- The EPA allowed North Dakota to alter the way it measured air quality in 2004, to bring Theodore Roosevelt National Park into compliance with air quality standards without actually reducing pollution.
- Reports that Julie MacDonald, former deputy assistant secretary for fish, wildlife, and parks, "had bullied, insulted, and harassed the professional staff of the U.S. Fish and Wildlife service" led to an investigation by the inspector general of the Department of the Interior in 2007. The investigation found that MacDonald had circumvented the chain of command "to have reports reflect what she wanted" on numerous occasions, and had "demoralized the FWS program with her interference in endangered species studies."
- The Occupational Safety and Health Administration (OSHA) threatened to suspend a scientist who refused to cite industry-funded science downplaying the dangers of asbestos in a safety warning for auto mechanics.
- The Department of Justice demoted the head of the Bureau of Justice Statistics when he refused to downplay the findings of a study which found statistical evidence of racial profiling by police officers.
- Officials at the OMB heavily edited testimony given by Dr. Julie Gerberding, director of the Centers for Disease Control and Prevention (CDC), at a congressional hearing in October 2007 on the public health risks from climate change. The OMB cut the director's statement in half, deleting her discussion of the potential public health consequences of climate change, and the need to identify vulnerable populations.

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<sup>4</sup> Federal Science and the Public Good, Securing the Integrity of Science in Policy Making, Dec 2008 - [https://www.ucsusa.org/sites/default/files/legacy/assets/documents/scientific\\_integrity/Federal-Science-and-the-Public-Good-12-08-Update.pdf](https://www.ucsusa.org/sites/default/files/legacy/assets/documents/scientific_integrity/Federal-Science-and-the-Public-Good-12-08-Update.pdf)

- Former Surgeon General Richard H. Carmona revealed that the White House extensively censored his public communications, forcing his statements to align with administration policy and pressuring him to participate in partisan political activity.
- For nine months, White House officials suppressed an EPA report detailing the harmful effects of mercury, a known neurotoxin emitted by coal-fired power plants, on children's health while the agency was considering new pollution control rules for power plants. The agency released the report only after it was leaked to the media.
- The Consumer Product Safety Commission's general counsel, who had represented the all-terrain vehicle (ATV) industry as a private-sector attorney, pressured CPSC statisticians to claim that the risks of riding ATVs were declining, even though their findings didn't support that conclusion. When the general counsel was unsuccessful in getting the statisticians to change the report, he delayed its release for three months.

Even while promulgating scientific integrity policies, the Obama administration was not immune to political interference in science. For example, the Secretary of Health and Human Services Kathleen Sebelius ordered the FDA Commissioner to reject an application to approve emergency contraception use for over-the-counter distribution despite the FDA's clear finding that the drug was safe and effective. It was the first time in history that the FDA had ever been overruled on a drug approval decision. Further, the president and Secretary Sebelius misrepresented science to justify their decision.<sup>5</sup>

According to reporting by *Marketplace*, President Obama's EPA misrepresented the conclusions of scientists who were investigating whether there are negative consequences for drinking water from hydraulic fracturing (fracking), leading the public to believe that the EPA was declaring that fracking was safe for drinking water, an unfounded assertion.<sup>6</sup>

### **Now, At Some Agencies, It Has Never Been Worse**

The erosion of scientific integrity in government has hit a fever pitch in the last two years. Barely a week goes by without hearing of scientists who are prevented from sharing their expertise with the public, or analytic work that is censored, or experts who are prevented from communicating with Congress, or data is made less accessible through websites, or science that is misrepresented. Since January 2017, the Union of Concerned Scientists has documented more than one hundred attacks on science under the Trump administration,<sup>7</sup> a mark that George W. Bush did not meet in his two terms.<sup>8</sup> Other organizations, such as the Sabin Center for Climate Change Law, are also tracking attacks on science during the current administration.<sup>9</sup>

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<sup>5</sup> The morning after, *Nature*, 480,413, Dec 22, 2011 - <https://www.nature.com/articles/480413a>

<sup>6</sup> EPA's late changes to fracking study downplay risk of drinking water pollution, Scott Tong, Nov 30, 2016 - <https://www.marketplace.org/2016/11/29/world/epa-s-late-changes-fracking-study-portray-lower-pollution-risk/>

<sup>7</sup> Attacks on science - <https://www.ucsusa.org/center-science-and-democracy/attacks-on-science>

<sup>8</sup> Abuses of Science: Case Studies, UCS Staff, 2009 - <https://www.ucsusa.org/our-work/center-science-and-democracy/promoting-scientific-integrity/abuses-science-case-studies>

<sup>9</sup> Silencing Science Tracker - <http://columbiaclimatelaw.com/resources/silencing-science-tracker/>

In the last few months alone, we have learned of several cases of political interference in science, including the following:

1. Consumer Product Safety Commission scientists had evidence that a type of stroller had defects that led to injuries for more than two hundred children and could lead to “life-threatening injuries” for others. One CPSC commissioner hid this information from other commissioners until other commissioners more friendly to the company could be appointed.<sup>10</sup>
2. White House officials stopped a senior analyst at the State Department’s Bureau of Intelligence and Research from submitting scientific information on climate change in a written testimony to the House Intelligence Committee. The official later resigned from his position.
3. EPA scientists were ordered to soften their analysis to bring several Wisconsin counties into compliance with the Clean Air Act. This would allow the company Foxconn to build a manufacturing plant with lax pollution controls. President Trump has been personally involved in the effort to bring a Foxconn plant to Wisconsin.
4. A proposal from the U.S. Fish and Wildlife Service to remove the gray wolf from the Endangered Species Act (ESA) was found to be full of errors regarding wolf conservation and taxonomy. One member of the scientific panel asked to review the proposal said it seemed as if the proposal was written by cherry-picking evidence that would support de-listing.<sup>11</sup>

Recently, several former EPA administrators expressed concern about political interference in science at the EPA at a hearing in the House Energy and Commerce Committee. Former New Jersey Governor Christine Todd Whitman, who served as EPA administrator under George W. Bush, went on to write an op-ed<sup>12</sup> in The Hill with UCS President Ken Kimmell supporting the Scientific Integrity Act. Whitman and Kimmell wrote:

*We all rely on federal scientists — and we need to be able to trust that we’re getting the best available science.*

*But there’s a problem here: Federal scientists often face political pressure that undermines their research and their ability to share it with the public. Political leaders have buried critical reports, keeping the public in the dark about real threats. They have prevented scientists from publishing their research or attending scientific conferences. They have disciplined scientists for talking about their findings to journalists.*

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<sup>10</sup> After hundreds of crashes, this Britax jogging stroller faced recall. Then Trump appointees stepped in, Todd C. Frankel, Apr 2, 2019 - [https://www.washingtonpost.com/business/economy/after-hundreds-of-crashes-this-britax-jogging-stroller-faced-recall-then-trump-appointees-stepped-in/2019/04/02/faf23c20-4c06-11e9-b79a-961983b7e0cd\\_story.html](https://www.washingtonpost.com/business/economy/after-hundreds-of-crashes-this-britax-jogging-stroller-faced-recall-then-trump-appointees-stepped-in/2019/04/02/faf23c20-4c06-11e9-b79a-961983b7e0cd_story.html)

<sup>11</sup> Scientists Find Serious Flaws in Proposal to Delist Endangered Gray Wolf, Jacob Carter, Jun 24, 2019 - <https://blog.ucsusa.org/jacob-carter/flaws-in-proposal-to-delist-gray-wolf>

<sup>12</sup> Scientific integrity is crumbling under Trump, Ken Kimmell, Christie Todd Whitman, Jul 9, 2019 - <https://thehill.com/opinion/energy-environment/452222-scientific-integrity-is-crumbing-under-trump>



*Most insidiously, this political interference can push scientists to self-censor, hedging their evidence or declining to pursue research entirely if they fear becoming a political target...*

*We need strong, serious checks in place to make sure scientists can do their jobs, and all of us can benefit from their work. The Scientific Integrity Act, introduced this March by Rep. Paul Tonko (D-N.Y.), would go a long way to advancing this goal.*

### **Scientific Integrity in Policymaking Became a Public Issue Fifteen Years Ago**

During President George W. Bush's first term, scientists noticed an uptick in the politicization of science. In 2003, Former Congressman Henry Waxman, then ranking member on the House Oversight Committee, issued a report<sup>13</sup> detailing political interference in science on issues from breast cancer to drug abuse.

Subsequently, 62 prominent scientists signed a statement<sup>14</sup> calling on the George W. Bush administration to restore scientific integrity to federal policymaking. The signatories included many Nobel laureates and senior science advisors to every president dating back to the Eisenhower administration. The scientists wrote, in part:

*Although scientific input to the government is rarely the only factor in public policy decisions, this input should always be weighed from an objective and impartial perspective to avoid perilous consequences...The administration of George W. Bush has, however, disregarded this principle. When scientific knowledge has been found to be in conflict with its political goals, the administration has often manipulated the process through which science enters into its decisions. This has been done by placing people who are professionally unqualified or who have clear conflicts of interest in official posts and on scientific advisory committees; by disbanding existing advisory committees; by censoring and suppressing reports by the government's own scientists; and by simply not seeking independent scientific advice. Other administrations have, on occasion, engaged in such practices, but not so systematically nor on so wide a front. Furthermore, in advocating policies that are not scientifically sound, the administration has sometimes misrepresented scientific knowledge and misled the public about the implications of its policies.*

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<sup>13</sup> Politics and Science in the Bush Administration, U.S. House of Representatives Committee on Government Reform – Minority Staff, Special Investigations Division, Nov 13, 2003 - [https://web.archive.org/web/20031202184233/http://www.house.gov/reform/min/politicsandscience/pdfs/pdf\\_politics\\_and\\_science\\_rep.pdf](https://web.archive.org/web/20031202184233/http://www.house.gov/reform/min/politicsandscience/pdfs/pdf_politics_and_science_rep.pdf)

<sup>14</sup> 2004 Scientist Statement on Restoring Scientific Integrity to Federal Policy Making, Feb 18, 2004 - <https://www.ucsusa.org/our-work/center-science-and-democracy/promoting-scientific-integrity/scientists-sign-on-statement.html>

The scientists quoted President George H.W. Bush in their letter, who said the following in an address to the National Academies of Science on April 23, 1990<sup>15</sup>:

*Science, like any field of endeavor, relies on freedom of inquiry; and one of the hallmarks of that freedom is objectivity. Now, more than ever, on issues ranging from climate change to AIDS research to genetic engineering to food additives, government relies on the impartial perspective of science for guidance.*

It was initially believed that the George W. Bush administration could be successfully pressured to change course a belief that was eventually proved to be incorrect. The Union of Concerned Scientists documented 98 instances of political interference in science between 2001 and 2008<sup>16</sup>, all of which were reported publicly; the number that were never exposed is undoubtedly far higher, as demonstrated by the survey results described below.

During the George W. Bush and Obama administrations, several congressional and Senate hearings in the past have examined political interference in science. This included:

- U.S. House of Representatives Science Space and Technology Committee, Subcommittee on Investigations and Oversight, The Role of Science in Listing Endangered Species, Oct 13, 2011.
- U.S. Senate Committee on Environment and Public Works Subcommittee on Oversight, Scientific Integrity and Transparency Reforms at the EPA. Jun 9, 2009.
- U.S. House of Representatives Committee on Energy and Commerce, Subcommittee on Oversight and Investigations, Science Under Siege: Scientific Integrity at the Environmental Protection Agency, Sep 18, 2008.
- U.S. House of Representatives Committee on Natural Resources, The Danger of Deception: Do Endangered Species Have a Chance? May 21, 2008.
- U.S. House of Representatives Committee on Oversight and Government Reform, EPA's New Ozone Standards. May 20, 2008.
- U.S. Senate Committee on Environment and Public Works, Subcommittee on Public Sector Solutions to Global Warming, Oversight, and Children's Health Protection, Oversight Hearing on Science and Environmental Regulatory Decisions. May 7, 2008.
- U.S. House of Representatives Committee on Science and Technology, Subcommittee on Investigations and Oversight, EPA Library Closures: Better Access for a Broader Audience? Mar 13, 2008.
- U.S. House of Representatives Committee on Natural Resources, Endangered Species Act Implementation: Politics or Science? May 9, 2007.

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<sup>15</sup> President George H.W. Bush addresses the NAS members - April 23, 1990, National Academy of Science YouTube, Sep 8, 2016 - <https://www.youtube.com/watch?v=fqaPhCXxm0>

<sup>16</sup> Abuses of Science: Case Studies, UCS Staff, 2009 - <https://www.ucsusa.org/our-work/center-science-and-democracy/promoting-scientific-integrity/abuses-science-case-studies>

- U. S. House of Representatives Committee on Oversight and Government Reform, Allegations of Political Interference with the Work of Government Climate Change Scientists. Jan 30, 2007.

### **Scientific Integrity Reform Began a Decade Ago**

The Union of Concerned Scientists published a set of solutions to create better scientific integrity standards in February 2008. The report Federal Science and the Public Good outlined five areas of improvement for federal agencies: protecting government scientists, making government more transparent, improving the regulatory process, improving science advice, and strengthening monitoring and enforcement of current laws.

During the 2008 presidential campaign, both major party presidential candidates committed to taking steps to address scientific integrity at federal agencies. The following question was included in a questionnaire from Science Debate, an organization that works to get candidates to address science and technology topics:

*Many government scientists report political interference in their job. Is it acceptable for elected officials to hold back or alter scientific reports if they conflict with their own views, and how will you balance scientific information with politics and personal beliefs in your decision-making?*

Senator John McCain's answer included the following:

*We have invested huge amounts of public funds in scientific research. The public deserves to have the results of that research. Our job as elected officials is to develop the policies in response to those research results. Many times our research results have identified critical problems for our country. Denial of the facts will not solve any of these problems. Solutions can only come about as a result of a complete understanding of the problem. I believe policy should be based upon sound science. Good policy development will make for good politics... Integrity is critical in scientific research. Scientific research cannot succeed without integrity and trust. My own record speaks for integrity and putting the country first, not political agendas.*

Then-Senator Barack Obama's answer included the following:

*I will restore the basic principle that government decisions should be based on the best-available, scientifically-valid evidence and not on the ideological predispositions of agency officials or political appointees.... Policies must be determined using a process that builds on the long tradition of open debate that has characterized progress in science, including review by individuals who might bring new information or contrasting views. I will... [r]estore the science integrity of government and restore transparency of decision-making by issuing an Executive Order establishing clear guidelines for the review and release of government publications, guaranteeing that results are released in a timely manner and not distorted by the ideological biases of political appointees."*

The promised executive order never materialized. But in March 2009, President Obama issued a memorandum on scientific integrity that instructed his science advisor, Dr. John Holdren, to develop a strategy within 120 days to restore scientific integrity to federal policymaking. This was consistent with language in the America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science (COMPETES) Act of 2007, which required OSTP to create scientific integrity principles. When signing the memorandum, President Obama said:

*Promoting science isn't just about providing resources -- it's also about protecting free and open inquiry. It's about letting scientists like those who are here today do their jobs, free from manipulation or coercion, and listening to what they tell us, even when it's inconvenient -- especially when it's inconvenient. It is about ensuring that scientific data is never distorted or concealed to serve a political agenda -- and that we make scientific decisions based on facts, not ideology.*

### **The White House Directive on Scientific Integrity and Agency Responses**

The White House Office of Science and Technology Policy (OSTP), led by Dr. Holdren, issued a directive to federal agencies and departments on December 17, 2010. The memorandum<sup>17</sup> included a set of principles that agencies and departments should follow, and asked agency and department heads to develop and implement policies to meet those principles.

It took 21 months for the memorandum to come out, after extensive pressure from the scientific community, and the final memorandum was weaker than many had hoped. Nevertheless, building off the memorandum, twenty-three federal agencies and departments subsequently developed policies that included provisions such as dispute resolution processes and the right to review scientific publications for accuracy prior to release.

However, while the standards set forth in the memorandum represented a decent framework, they were, in practice, inadequate to fully protect scientific integrity in the executive branch. For example, relying on the memo, agency policies varied widely in terms of comprehensiveness. Further, a minority of organizations contributed significant resources toward developing implementation plans or enforcement mechanisms. As a result, at many agencies, implementation, to this day, remains incomplete.

When developing solutions to fully protect the integrity of the scientific process, the 2010 White House memorandum should be viewed not as an end point, but as a starting point.

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<sup>17</sup> Memorandum for the Heads of Executive Departments and Agencies, Subject: Scientific Integrity, John Holdren, Dec 17, 2010 - <https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/scientific-integrity-memo-12172010.pdf>

## Continued Challenges with Press Access

UCS found that after 2008, many federal agencies made improvements to their media and social media policies that gave more freedoms to federal employees—at least on paper<sup>18</sup>. However, there continued to be inconsistency among these policies from agency to agency. And journalists still reported routinely facing significant obstacles in attempts to speak to federal scientists. Practices regarding media access and scientists' freedom to communicate continued to vary widely across agencies. In research conducted jointly with the Society of Professional Journalists, UCS found four major barriers to effective communication with reporters. From the report *Mediated Access*:<sup>19</sup>

- **Preapproval for interviews is often required.** *While it's valuable for scientists to keep their PIOs and supervisors informed about their media contacts, when they are forbidden to speak to reporters without prior approval of the interview or of the specific questions to be asked, this can amount to de facto censorship.*
- **Interviews are closely monitored.** *PIOs believe that their presence provides needed support for scientists and helps journalists and scientists understand each other. Some of the journalists surveyed agreed that this can be the case. But many reported that the PIO's presence can have a chilling effect; one respondent expressed uncertainty about the trust she could place in her sources, questioning if they would say something different if the PIOs weren't there.*
- **Interviews are denied.** *Sometimes, PIOs simply deny journalists' requests for interviews with scientist. Of course, scientists have no obligation to grant interviews, and it's also true that agencies are often understaffed and lack the resources to respond to every request. But many journalists report that access is denied frequently and often without a reason. They also reported concerns about favoritism, with PIOs tending to favor staff writers at well-known publications over freelancers. This is a growing problem as science desks at traditional news outlets shrink, and freelancers increasingly take their place.*
- **Tough questions are avoided.** *Some of the hurdles writers report facing—having to repeat requests multiple times, being routed to other agency employees, or being given a list of talking points instead of a specific answer—are perceived as an attempt to avoid tough questions. And reporters say this has a direct impact on the quality of their work and their ability to keep the public informed.*

Scientific integrity policies were supposed to alleviate these pressures. Our research shows that they did not fully do so.

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<sup>18</sup> Grading Government Transparency: Scientists' Freedom to Speak (and Tweet) at Federal Agencies, Goldman et. Al, March 2015 - <https://www.ucsusa.org/sites/default/files/attach/2015/03/grading-government-transparency-ucs-2015.pdf>

<sup>19</sup> <https://www.ucsusa.org/sites/default/files/attach/2015/07/ucs-mediated-access-report-2015.pdf>

Dozens of media organizations wrote to and met with White House staff in an attempt to gain more press access to federal government experts. Their efforts were of little consequence. They noted the following<sup>20</sup>:

- *Officials blocking reporters' requests to talk to specific staff people;*
- *Excessive delays in answering interview requests that stretch past reporters' deadlines;*
- *Officials conveying information "on background," refusing to give reporters what should be public information unless they agree not to say who is speaking;*
- *Federal agencies blackballing reporters who write critically of them.*

The problem has become far worse during the Trump administration, where some public affairs officials see journalists as enemies. At the EPA<sup>21</sup>, public affairs officials have gone so far as to attack reporters who write stories that the officials deem are unfavorable to the administration. At the Department of Interior<sup>22</sup>, a National Park Superintendent was reprimanded for allowing his staff to tweet about climate change. And at the CDC<sup>23</sup>, scientists were discouraged from using words and phrases including "evidence-based" in official documents.

In 2018, according to the Los Angeles Times<sup>24</sup>, the U.S. Geological Survey began requiring scientists to ask for permission before speaking to a reporter. USGS isn't a regulatory agency. It doesn't do policy. Yet the desire to control the message is still present. Republican Representative Ken Calvert expressed concern about the move. "We must ensure there's proper access to our federal scientists and the valuable work they do for our country," he said.

### **The GAO Report Evaluated Policies but Did Not Evaluate Effectiveness**

This year, the Government Accountability Office issued a report<sup>25</sup> evaluating the policies of nine federal scientific agencies. It found that all of the nine agencies have some kind of policy in place, but that some failed to have procedures in place for processing allegations of violations of the policy. Further, a minority of the agencies had done any significant monitoring or

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<sup>20</sup> Letter to Mr. Josh Earnest, White House Press Secretary, Sep 12, 2016 - <http://spj.org/pdf/news/earnest-letter-09122016-final.pdf>

<sup>21</sup> The environment for reporters covering the EPA just got a lot more toxic, *Washington Post*, Paul Farhi, Jul 13, 2019 - [https://www.washingtonpost.com/lifestyle/style/the-environment-for-reporters-covering-the-epa-just-got-a-lot-more-toxic/2019/07/12/2d905f2a-a429-11e9-bd56-eac6bb02d01d\\_story.html?noredirect=on&utm\\_term=.48ce95298b18](https://www.washingtonpost.com/lifestyle/style/the-environment-for-reporters-covering-the-epa-just-got-a-lot-more-toxic/2019/07/12/2d905f2a-a429-11e9-bd56-eac6bb02d01d_story.html?noredirect=on&utm_term=.48ce95298b18)

<sup>22</sup> Interior Secretary Zinke reportedly dressed down Joshua Tree superintendent over climate change tweets, *Los Angeles Times*, Scott Martelle, Dec 15, 2017 - <https://www.latimes.com/opinion/opinion-la/la-ol-zinke-twitter-joshua-tree-climate-change-20171215-story.html>

<sup>23</sup> CDC gets list of forbidden words: Fetus, transgender, diversity, *Washington Post*, Lena H. Sun, Juliet Eilperin, Dec 15, 2017 - [https://www.washingtonpost.com/national/health-science/cdc-gets-list-of-forbidden-words-fetus-transgender-diversity/2017/12/15/f503837a-e1cf-11e7-89e8-edec16379010\\_story.html?utm\\_term=.66d407ac90e5](https://www.washingtonpost.com/national/health-science/cdc-gets-list-of-forbidden-words-fetus-transgender-diversity/2017/12/15/f503837a-e1cf-11e7-89e8-edec16379010_story.html?utm_term=.66d407ac90e5)

<sup>24</sup> Trump administration tightens rules for federal scientists talking to reporters, *Los Angeles Times*, Rong-Gong Lin II, Jun 22, 2018 - <https://www.latimes.com/local/lanow/la-me-ln-trump-policy-usgs-scientists-20180621-story.html>

<sup>25</sup> SCIENTIFIC INTEGRITY POLICIES: Additional Actions Could Strengthen Integrity of Federal Research, GAO-19-265, Apr 4, 2019 - <https://www.gao.gov/products/GAO-19-265>

evaluation of their policies. The report made several recommendations to specific agencies to improve their practices.

There are limitations to the GAO's approach to this study. By only measuring the content of scientific integrity policies against the 2010 OSTP guidance, the GAO was not able to determine whether that guidance is sufficient to create a culture of scientific integrity at the affected agencies. Because most agencies do not objectively measure the effectiveness of their policies—only one agency, the Environmental Protection Agency, not included in the GAO report, has surveyed its own workforce about whether the policies are working—the GAO was also unable to evaluate whether policy implementation is meaningful. Thus, the GAO is able to measure whether policies exist with certain content and have enforcement and evaluative mechanisms, but unable to determine whether the policies are actually effective and preventing political interference in science.

The challenge, of course, is that we see even with policies that are strong, political pressures on scientists persist. At some agencies with weak policies, such as NASA and the National Institutes of Health, political interference in science is fairly minimal. At other agencies with relatively strong policies and procedures such as the EPA and the Department of Interior, political interference in science is strong and sustained.

Unfortunately, this is the case because scientific integrity policies are inherently vulnerable. Scientific integrity officials at all agencies must keep politics in mind in all aspects of their jobs, including providing informal advice, investigating allegations of political interference in science, reporting on and evaluating policy effectiveness, advocating for improvements internally, and speaking publicly about their work. At any moment, these policies could be curtailed or eliminated, further demonstrating a need for codification.

### **Surveys of Scientists Demonstrate Sustained Challenges**

Since 2005, the Union of Concerned Scientists has conducted surveys of federal government scientists to measure the level of political, corporate, and other pressures on the conduct and communication of their work. A survey in 2018<sup>26</sup> was conducted in partnership with the Center for Survey Statistics and Methodology at Iowa State University. Responses were received from 4,211 federal government scientists across 16 agencies and departments.

The results of the survey<sup>27</sup> provided evidence of political interference in the science policy process at many federal agencies. At some agencies, the situation for scientists is worse than it was during the Bush or Obama administrations.

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<sup>26</sup> 2018 Federal Scientists Survey FAQ - <https://www.ucsusa.org/our-work/center-science-and-democracy/promoting-scientific-integrity/2018-federal-scientists-survey>

<sup>27</sup> The Good, the Bad, and the Ugly: The Results of Our 2018 Federal Scientists Survey, Jacob Carter, Aug 14, 2018 - [https://blog.ucsusa.org/jacob-carter/the-good-the-bad-and-the-ugly-the-results-of-our-2018-federal-scientists-survey?\\_ga=2.185252906.241573531.1563190776-1087000439.1563190776](https://blog.ucsusa.org/jacob-carter/the-good-the-bad-and-the-ugly-the-results-of-our-2018-federal-scientists-survey?_ga=2.185252906.241573531.1563190776-1087000439.1563190776)

Scientists reported high levels of censorship and self-censorship:

- 631 respondents (18 percent) at agencies that work on climate change agreed or strongly agreed that they had been asked to omit the phrase “climate change” from their work.
- 798 respondents (20 percent) reported that they had been asked or told to avoid work on specific scientific topics because they are politically contentious.
- 1040 respondents (26 percent) reported that they had avoided working on certain scientific topics or using certain scientific terms because they are politically contentious, though they were not told explicitly to avoid them.

(Note that percentages vary because not every respondent answered every question)

Essay responses reinforced these findings.

- From the U.S. Geological Survey: “Senior USGS management has censored scientists on multiple occasions. For example, video of a research talk on earthquake early warning was removed from the USGS website because there was concern that congressional staffers might see it (the research pointed out difficulties with earthquake early warning, which had yet to be funded fully by congress). Often politically contentious scientific results are watered down in the internal review process. If scientists do not accept edits that water down the language, they are not allowed to submit the manuscript to a journal.”
- From the National Park Service: “Consistent removal of references to climate change have hindered our ability to have honest discussions about the potential threats associated with climate change to the National Park System.”
- From the Centers for Disease Control and Prevention: “It is currently virtually impossible for a scientist to openly communicate their work with the media or the public.”

Notably, in the 2018 survey, scientists perceived significantly less political pressure at the Food and Drug Administration and the National Oceanic and Atmospheric Administration, agencies where political leadership has been less likely to interfere with or sideline scientists’ work. This reinforces the understanding that because scientific integrity policies lack the force of law, they are too vulnerable to influence from high-ranking officials. Leadership certainly matters for scientific integrity, but codification of scientific integrity standards would reduce the ability of political appointees to set expectations that enable secrecy and manipulation of science.

### **What Scientific Integrity Polices Have Accomplished**

The implementation of scientific integrity policies has changed agency culture so that more staff have higher expectations regarding their rights and responsibilities. It has enabled scientists to question political interference, consult with supervisors, and in some cases bring forward important information to decision makers and the public. These policies have also enabled many scientists and agencies to head off problems before they occur, through consultation and discussion.



Through the surveys of government scientists, we know that at agencies where scientific integrity policies and allegation resolution procedures are in place, scientists are more likely to possess an understanding of their rights and responsibilities related to scientific integrity. We know that investigations conducted under scientific integrity policies have led to the release of information that should have been public and the clarification of materials that were unethically manipulated.

It is important to look beyond the formal allegation and resolution process to see the most important value of the scientific integrity policies. I have spoken with many individuals who have served in the scientific integrity officer role over the past several years. Notably, they report that one of the most important aspects of their role is to provide informal consultations to employees who are dealing with situations where there may be a loss of scientific integrity. These informal consultations help resolve problems before they become formal allegations, and constitute the majority of interactions that employees have with scientific integrity officers.

As a result, I do not recommend that scientific integrity standards be enforced by an inspector general or other similarly punitive office. Very few federal employees who have felt comfortable consulting with the scientific integrity office would feel comfortable going to an inspector general.

Further, inspectors general investigate specific types of waste, fraud, and abuse, and many scientific integrity violations fall outside of those categories. Inspectors general tend to look for wrongdoing, while scientific integrity policies are designed to set standards by which people *should* behave.

### **The Scientific Integrity Act Does Not Address All Problems with Science and Politics – Nor Should It**

If this bill becomes law, science can still be sidelined in policymaking. The bill does not address attempts to limit the types of science that can be considered in making policy. It does not address attempts to compromise the independence of federal advisory committees, or to eliminate these committees altogether. It does not address problems with workforce reduction and retention. It does not provide funding for professional development.

There is no requirement in the legislation about the weight that science should be given in any given policy decision. We aren't talking about being policy prescriptive. The legislation is designed to ensure that science fully informs the decisions that we make. And that is a very good start.

## The Scientific Integrity Act Should be Further Strengthened

The Scientific Integrity Act as written is excellent legislation. But it should be amended by this committee to give it the teeth it needs to fully protect scientific integrity at the agency. There are three major areas that legislators should consider strengthening the bill:

1. **Develop Enforcement Processes.** While the legislation requires procedures for addressing allegations of loss of scientific integrity, there is no language that ensures that these procedures are consistent with current whistleblower and other worker protection laws. The bill author should work with whistleblower protection experts to ensure that staff who file allegations are fully protected.
2. **Improve Reporting and Policy Assessment.** Reporting numbers of misconduct cases filed, appealed, and pending is insufficient for the public to understand whether policies are being well implemented. The bill author should improve language to increase the substance of public reporting. This could include ensuring that there are career staff in OSTP who are empowered to develop evaluative metrics and set public reporting standards.
3. **Remove or Revise Existing Policy Certification.** The legislation currently allows agency heads to self-certify that existing policies already meet the standards of the legislation. As no agency policy currently meets all standards of the legislation, this could provide a way for agencies to effectively exempt themselves from the law, or at least slow down compliance.
4. **Restrict the Ability of the White House Office of Management and Budget to Misrepresent Agency Science.** Currently, the interagency review process coordinated by the Office of Regulatory Affairs in OMB allows agencies to challenge science conducted by other agencies that has already been through peer review. This allowed, for example, EPA analysis on the toxicity of perchlorate to be challenged and undermined by the Department of Defense (which would be on the hook for clean-up costs associated with the chemical). Agencies should have the option of publishing analysis that has been through internal peer-review before it goes to OMB.

## The Scientific Integrity Act Has Broad Support

It's not just scientists that are behind the Scientific Integrity Act. More than 60 organizations have signed a letter urging members of Congress to co-sponsor the Scientific Integrity Act, representing government accountability, environmental, public health, and science organizations. Signatories include the American Public Health Association, the National Center for Women and Families, Defenders of Wildlife, the Project on Government Oversight, and SEIU. The letter reads, in part:

*S. 775/H.R. 1709, the Scientific Integrity Act of 2019 contains provisions that would address many of these attacks on science. It would prohibit political appointees from altering or suppressing scientific findings and give scientists final review over how agencies portray their research. It also would ensure that federal agencies designate scientific integrity officers and provide federal employees with ethics training to help prevent misconduct.*

*Another important component of the Scientific Integrity Act is its codification of scientists' right to disseminate their work without interference. It would enable scientists to talk about their research - with reporters, in scientific journals, and at scientific conferences as well as directly with members of the public. Such communication is essential both for public understanding and for federal scientists' ability to share their insights for better oversight and accountability of agency decisions.*

*Our nation relies on scientific integrity to maintain the role of best available science in policymaking. This research is critical to improving air and water quality, protecting workers, safeguarding public health and safety, advancing reproductive health, defending civil rights, preserving biodiversity, and responding to threats posed by diseases and extreme weather events.*

Several organizational leaders have explained why they believe that the Scientific Integrity Act is essential for good government:

*"The Scientific Integrity Act is an important step forward for safeguarding scientific integrity at federal agencies, and it improves the legal options available for federal scientists who are facing increasing levels of censorship, research hindrances, and misrepresentation of established facts. As the Scientific Integrity Act recognizes, it is imperative to have legally-protected pathways to challenge and correct scientific integrity violations."*

**-Lauren Kurtz, Executive Director, Climate Science Legal Defense Fund**

*"We have long recognized the critical importance of good, unmanipulated science to inform wildlife conservation, as is so clearly articulated in the Endangered Species Act. The Scientific Integrity Act is a much-needed law to close the gap that has allowed special interests to unduly shape the outcomes of fundamental and applied research that affects the lives of people and wildlife every single day. The sooner this bill is passed and signed into law, the sooner we can stop the Trump administration and future administrations from undermining science."*

**-Jamie Rappaport Clark, President and CEO, Defenders of Wildlife**

*"This legislation would put teeth in the rights of scientific whistleblowers that have been gaining symbolic traction since the Whistleblower Protection Act of 1989. That year Congress created the beach head by protecting those who refuse to violate the law, which occurs when censorship means false statements by government employees. In the 2012 Whistleblower Protection Enhancement Act Congress made it protected speech to challenge obstruction or censorship of scientific research. This legislation is a breakthrough adding accountability and expanding the scope to those principles everywhere they apply. Instead of merely having the right to act legally, the law would make research misconduct or censorship illegal. It would make the free flow of non-political scientific research a protected activity. It even allows government scientists when speaking as individuals to present their official credentials. In the past, agencies have threatened to fire scientists for so-called ethics violations when they disclosed their*

*credentials. The goal of this bill is to counter the growing threat of substituting political science for the scientific method. Our nation already is regularly suffering the consequences of political science that contaminates the laboratory. It is serious legislation that deserves prompt action.”*

**-Tom Devine, Legal Director, Government Accountability Project**

*“Over the past two years, we've seen federal agencies disregard evidence and take apparently politically motivated actions that harm women's health, such as canceling Teen Pregnancy Prevention grants and rolling back the employer contraceptive mandate. Given recent instances where ideology has seemingly supplanted science around women's health, we applaud this bill for promoting the role of science to guide policy decisions on public health.”*

**-Susan Wood, Executive Director, Jacobs Institute of Women’s Health**

*“From environmental protection to women’s health and economic security, we rely on scientific integrity in policymaking to protect public health and well-being. Our government should be using science and evidence-based information to protect public health — but frighteningly, they’re doing the opposite. Nowhere is this more apparent than in the administration’s relentless, anti-science approach to undermining reproductive health care. The Scientific Integrity Act would enact strong scientific integrity policies that protect both research and researchers and would restore public trust in our federal agencies.”*

**-Sarah Lipton-Lubet, Vice President for Reproductive Health and Rights, National Partnership for Women & Families**

*“This bill strives to ensure that agency policies reflect the unadulterated work and opinions of professionally trained scientists. American taxpayers deserve to know that the scientific work they fund is actually informing U.S. policy. Hopefully this law will hold accountable those who try to bury scientific evidence and will prevent such attacks on scientific integrity in the future.”*

**-Rebecca Jones, Policy Counsel, Project on Government Oversight**

*“SACNAS supports the Scientific Integrity Act of 2019 and stresses that the integrity of scientific research, the objective use of scientific evidence in policy-making and the unbiased sharing of scientific information with the public, should be upheld. Only when scientists from all backgrounds are represented, and science is included when public policy decisions are being made, will we be able to mitigate the risk of vulnerable communities being overlooked, their problems ignored, and their unique needs disregarded. These two conditions are particularly salient for ensuring science for the common good and improving public trust in science.”*

**-Dr. Sonia Zárate, President, Society for Advancement of Chicanos/Hispanics & Native Americans in Science**

*“As a former agency scientist and then senior executive (NOAA), I believe it is vital for scientific evidence to come through to both policy-makers and the public directly from scientists themselves. That doesn’t require that decisions are only based on science. Of course other factors come in to play. But it does mean that the justification for decisions can’t falsely lean on science, hiding other considerations. Let the science speak.”*

**-Dr. Andrew Rosenberg, Director, Center for Science & Democracy, Union of Concerned Scientists**

### **Improve and Pass the Scientific Integrity Act**

I am very appreciative of the leadership that Congressman Tonko showed by introducing the Scientific Integrity Act, and I want to thank the members of the committee for giving it their serious consideration.

Ultimately, the Scientific Integrity Act is required for federal agencies to be able to meet their missions and address the complex public health, environmental, and national security challenges we face as a nation. This is true in the day-to-day functioning of an agency, but also for its long-term health. Federal agencies will be unable to attract top scientific talent without protections in place that guarantee scientists’ ability to do policy-relevant research, follow the evidence where it leads, and communicate out the results of that work.

The Scientific Integrity Act is essential good government legislation that is more important now than ever before. Every day that goes by without adequate protections for scientists and scientific information in policymaking leaves the public uninformed and enables policymakers to make arbitrary decisions with inadequate accountability. I encourage the committee to hold additional hearings into these matters and to improve and pass the Scientific Integrity Act.

## Biography

Michael Halpern is deputy director of the Center for Science and Democracy at the Union of Concerned Scientists. For more than 15 years at UCS, Michael has worked to promote solutions that ensure government decisions are fully informed by scientific information, and that the public understands the scientific basis for those decisions. He also oversees efforts to enable scientists to more effectively engage the public.

Michael has extensive expertise in defending scientists from harassment and creating conditions that make science and scientists more resilient to political, industry, and ideological influence. He speaks and writes regularly on the use and misuse of science in decision making, and the forces that drive attacks on science. He has co-authored several reports and articles that detail solutions that would improve scientific integrity and accountability and has advised federal agencies and departments on development of policies to promote scientific independence in the context of policymaking in the United States and Canada.

He has published articles in *Science*, the *American Journal of Public Health*, the *Environmental Law and Policy Annual Review*, and *PLOS Biology*. He has appeared in scores of national and international media outlets, including the *Associated Press*, *The Boston Globe*, *CNN*, *National Public Radio*, *NBC*, *The New York Times*, and *The Washington Post*. Prior to joining UCS, Michael worked as a public awareness director for the *Brain Injury Association of Minnesota*, and as a community organizer in St. Paul, Minnesota. Michael holds a B.A. in sociology and communication studies from *Macalester College*.