REPORT

Protecting Government Science from Political Interference

A Blueprint for Defending Scientific Integrity and Safeguarding the Public

Anita Desikan

September 2024

www.ucsusa.org/resources/protecting-government-science-political-interference

https://doi.org/10.47923/2024.15597

Highlights

Every day, our government uses science when making decisions affecting communities across the nation, yet decisionmakers sometimes suppress or distort science as a means to a political end. In Spring 2024, the Union of Concerned Scientists (UCS) examined whether agencies that had violated scientific integrity standards in the past were adopting measures, mandated by the Biden administration, to ensure scientific integrity. The examination focused on three metrics of scientific integrity: publishing a recently updated scientific integrity policy; designating and providing contact information for a scientific integrity official; and reporting annually on investigations into potential scientific integrity violations. Out of 38 agencies examined, 27 scored "poor" or "worst." Only five scored "best" or "good."

The goal of basing policymaking on the best, most reliable scientific information deserves overwhelming bipartisan support. UCS has assembled recommendations that the can be used to build a culture of scientific integrity, ensure the robust implementation of scientific integrity policies, and strengthen science-based processes in governance.

Union of Concerned Scientists

Contents

Every day, the US government uses science when making decisions vital to the health and safety of communities across the nation. From monitoring emerging diseases to developing lifesaving vaccines; from investigating foodborne illnesses to regulating the safety of the food supply; from testing the safety of drinking water to cleaning up polluted rivers; from monitoring hazardous air pollutants to reducing emissions from polluting facilities; from forecasting the weather to issuing evacuation orders during severe weather—it is no exaggeration to say that our health, our safety, and our lives depend upon the ability of the government to conduct science-based research and utilize it in decisionmaking. Moreover, the government's reliance on science engenders trust in our public institutions and helps uphold the democratic principles that the nation was founded on (SteelFisher et al. 2023).

Regrettably, science is vulnerable to those who view the suppression or distortion of science as a means to a political end. Violations of scientific integrity—burying reports, disbanding scientific advisory committees, suppressing data, censoring agency scientists—can have outsized impacts that go beyond the specifics of the violations. A 2022 study found that the public's reported trust in federal, state, and local public health agencies during the COVID-19 pandemic depended largely on whether people felt the agencies made clear, science-based recommendations, uninfluenced by politics (SteelFisher et al. 2023). And not only can violations of scientific integrity damage the public's trust in both science and the government, but they also are at odds with core ideals of scientific enterprise: openness, transparency, honesty, equity, and objectivity. Such violations erode the morale of federal scientists (SI-FTAC 2022).

When government officials elevate politics over science, communities across the United States suffer real-world consequences. And when policymakers sideline science, underserved communities—such as Black, Indigenous, people of color (BIPOC) communities, low-income communities, and rural communities—often face disproportionately worse environmental and public health consequences (Desikan et al. 2019; Desikan et al. 2023a).

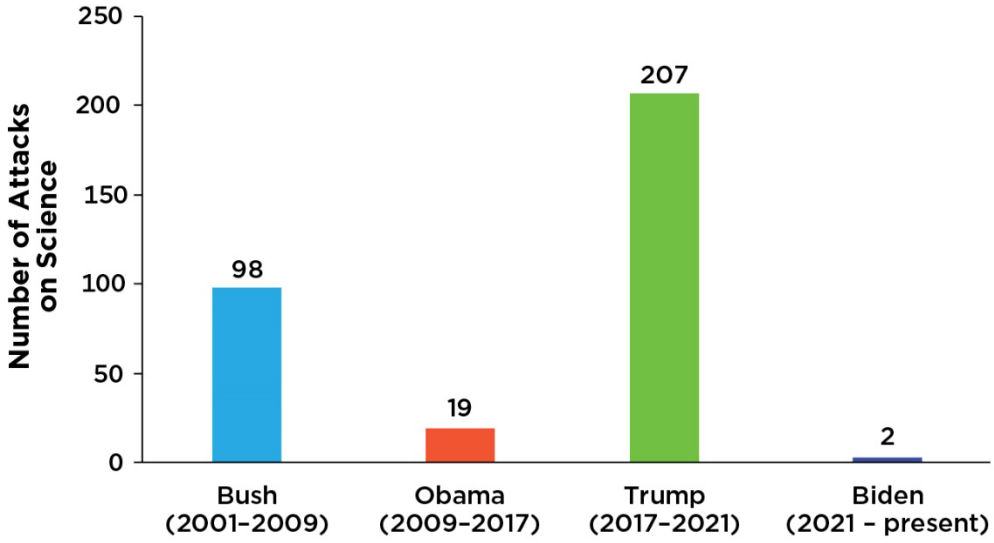
To enhance the state of scientific integrity at federal agencies, UCS has assembled a set of recommendations that the next presidential administration can use. Given the pivotal role of science in our government's ability to fulfill its duties to its people, it is essential to ensure strong protections for scientific integrity at federal agencies.

An Overview of Attacks on Science

That government officials sometimes choose to attack science for their own political gains is nothing new. As the Union of Concerned Scientists (UCS) has documented, such attacks over many years have chipped away at the ability of federal science to safeguard the public from major threats—global warming, pollution, epidemics. Since at least the 1950s and regardless of political party, presidential administrations have violated the integrity of government science many times, even if the frequency of attacks has varied dramatically (Figure 1) (Berman and Carter 2018; UCS 2024).

Even decades earlier, presidential administrations often sidelined science for political purposes. Famously, President Woodrow Wilson and his administration downplayed the seriousness of the 1918 flu pandemic to maintain morale for World War I. This included using the Espionage Act of 1917 and the Sedition Act of 1918 to prevent newspapers from disclosing accurate medical reports (Natale 2022). This form of censorship continued even when several people in the administration—possibly including President Wilson—came down with the life-threatening disease.

Figure 1. Attacks on Scientific Integrity, by Presidential Administration



UCS has documented 326 attacks on science across four presidential administrations. The vast majority (207; 63 percent) took place during the Trump administration—even though the Bush and Obama administrations were twice as long as the Trump administration. For more information, including descriptions of each incident, see the UCS website.

SOURCE: UCS 2024.

Despite such violations, though, federal science has a long and prestigious history, and members of both parties justifiably take pride in that and want to extend it. For instance, Presidents George Washington and Thomas Jefferson both regularly collected and recorded weather data for several years, and the government's systematic collection of US meteorological data started in 1870 (Lawrimore 2018). Since 1869 the government has collected data on the condition and progress of K-12 education (NCES n.d.). The first census of the US population took place in 1790, and it has occurred every 10 years ever since (National Archives 2022). Decisionmakers have used government data to develop evidence-based policies that are in line with the best available science and that can best help their constituents.

For decades, even centuries, science has played a pivotal role in how the federal government operates and makes decisions that can best protect people's health and safety. And today, government science continues to play a central role in the nation's security, economic prosperity, and quality of life (NASEM 2022). Safeguarding scientific integrity at federal agencies is not simply a matter of good policy; it is a fundamental component of how our democracy works and serves its people.

It is particularly important in today's highly polarized political climate to understand that nurturing a culture of scientific integrity across the federal government is not a partisan issue or challenge (Box 1). Such a culture is vital to ensuring that the government carries out its duties to safeguard our health and welfare. A strong culture of scientific integrity includes allowing federal scientists to speak freely with the media and public; establishing a clear process for reporting and investigating violations of scientific integrity; and instituting transparent processes on how science is used in decisionmaking.

Box 1. Violations of Scientific Integrity: A Repeated Occurrence Under Democratic and Republican Administrations

A number of notable violations of scientific integrity occurred during the administrations of George W. Bush, Barack Obama, Donald Trump, and Joe Biden. In these four examples, all widely publicized at the time, the sidelining of science almost certainly harmed communities across the country.

2001: Following 9/11, the White House Repressed Scientific Information on Levels of Air Pollution Near the World Trade Center Site

In the days following the attacks on September 11, 2001, Environmental Protection Agency (EPA) press statements, reviewed by the White House, stated that the air around the World Trade Center was safe to breathe (UCS 2003). However, two years later, the EPA's Office of the Inspector General charged that the agency had lacked the scientific information to make that claim, and that the White House had pressed the EPA to "add reassuring statements and delete cautionary ones" from its press releases (OIG 2003). For instance, a draft EPA press release stated that the agency had found "higher levels of asbestos in EPA tests" near the World Trade Center; this was edited to state that the "EPA has found variable asbestos levels. . . . [T]here is no significant health risk." The collapse of the World Trade Center buildings released 400 tons of pulverized asbestos and other hazardous materials, exposed an estimated 410,000 to 525,000 people to toxic air, and led to higher rates of cancer in first responders (Whitmer 2024).

2011: The White House and the Department of Health and Human Services Restricted Access to the Plan B Emergency Contraceptive Pill

In 2011, the Commissioner of the Food and Drug Administration (FDA) followed a federal court order to remove age limits on the Plan B emergency contraceptive pill due to the weight of scientific evidence showing its safety in all age groups (UCS 2011). However, President Obama and the Secretary of Health and Human Services (HHS) overruled the FDA commissioner, citing a need for an age restriction of 17 years old to prevent younger people from getting access to this medication. For two years, the Department of Justice appealed the federal court order, preventing the FDA from following the best available scientific information to remove the age restriction. Once the Obama administration asked the Department of Justice to drop its lawsuit—mainly in response to a public outcry—the FDA removed Plan B age restrictions within a few days.

2017: The EPA Failed to Ban the Pesticide Chlorpyrifos

Soon after the EPA administrator met with Dow Chemical Company representatives, the agency, in a reversal of its position, decided to no longer ban the outdoor use of the pesticide chlorpyrifos (UCS 2017). Decades of evidence from the agency's own scientists showed that exposure to the pesticide can damage the neurological functioning of children exposed in utero (EPA 2024a; Rauh et al. 2011; Fenske et al. 2002). In 2021, the US Ninth Circuit Court of Appeals ordered the EPA halt the agricultural use of chlorpyrifos unless it could demonstrate its safety (Davenport 2021). The EPA complied and banned the pesticide, a move estimated to have eliminated more than 90 percent of chlorpyrifos use in the country (Davenport 2021).

2024: The EPA Falsified Scientific Records in Connection with the Ohio Train Derailment Disaster

According to a whistleblower report following the May 2024 East Palestine, Ohio, train derailment, an EPA program manager directed a contractor to falsify records (Borst and Bogardus 2024). Specifically, the manager carried out two questionable actions. First, three weeks after the agency's collection of airborne chemical data, the manager directed that official records be falsely backdated to incorporate new procedures. Second, the manager directed the pilot of the EPA airplane collecting that data to turn off chemical sensors when flying over two streams near the train derailment site; both streams were later found to be contaminated. The EPA plane had been deployed to detect levels of airborne chemicals, particularly vinyl chloride, near the train derailment. Vinyl chloride, a colorless gas primarily used to make PVC plastic, can cause cancer and other health problems (EPA 2020). The manager's actions limited the EPA's ability to collect data on the presence of vinyl chloride. While it is difficult to state how the absence of data affected agency decisionmaking, proper data-collection procedures would almost certainly have influenced the EPA's decision to allow a vent-and-burn operation of five train cars, which released more vinyl chloride into the air. According to a National Transportation Safety Board report, the vent-and-burn operation was not only unnecessary, but it was also a very unusual action to take based on incomplete information from the train operator; moreover, it exposed first responders and the public to additional toxic airborne chemicals (McDaniel 2024).

What Is Scientific Integrity?

In January 2023, the White House Office of Science and Technology Policy (OSTP) adopted a government-wide definition of scientific integrity:

"Scientific integrity is the adherence to professional practices, ethical behavior, and the principles of honesty and objectivity when conducting, managing, using the results of, and communicating about science and scientific activities. Inclusivity, transparency, and protection from inappropriate influence are hallmarks of scientific integrity" (SIF-IWG 2023).

This was a momentous step, providing a foundation for all future policy discussions of scientific integrity in government agencies. A set definition can help prevent misunderstandings, articulate what types of science-based practices lead to better research and policy decisions, and dictate what types of action diminish this ideal and chip away at the public's trust in government science.

Over the years, UCS has recommended principles that are in line with and, in some cases, influenced the development of federal practices and policies on scientific integrity (Goldman et al. 2017). Indeed, reports from the White House, the Government Accountability Office (GAO), and the Congressional Research Services (CRS), as well as congressional testimony by UCS experts in 2019, 2021, and 2022, have directly referenced UCS research that helps exemplify the importance of the following principles (SI-FTAC 2022; GAO 2023; CRS 2022; Halpern 2019; Rosenberg 2021; Desikan 2022):

- **Independent Science**. Public policy decisions must be informed by expert scientific advice, free from political or financial pressure. By relying on independent science, the

government ensures that policy proposals are informed by evidence stemming from a credible scientific process.

- **Transparent Decisionmaking**. Scientific integrity requires public access to the science that underlines decisions and to information regarding how decisionmakers used that science. Such access can be granted while maintaining necessary confidentiality and respecting privacy concerns.
- **Scientific Free Speech**. To flourish in their professional activities and to maintain their professional credibility, government scientists must be able to publish their research relevant to their agencies' missions, as well as to communicate their findings to the public in a timely manner. Further, federal scientists should have the right to express personal views on science and policy, provided they make clear when they are and when they are not speaking for their agencies.
- **Statutory Compliance**. Some federal laws require the government to base decisions solely on the best available science, while other laws require that science be a factor but not the only one. In either case, to comply with these statutory measures, decisionmakers should actively seek the best available science when crafting policies; failures to fully do so may be perceived as instances of political interference.

In 2022, an independent task force established by the OSTP and the National Science and Technology Council recommended five additional principles of scientific integrity:

- Protecting the ability of scientists to have rich and dissenting conversations on the science;
- Establishing a strong culture of scientific integrity using a whole-of-government approach;
- Encouraging the inclusion of scientists at the policymaking table;
- Establishing the ability of scientists to speak freely about their work to the public; and
- Considering violations of scientific integrity to be on par with violations of government ethics (SI-FTAC 2022).

2012-2020: The Evolution of Scientific Integrity Policy

During the George W. Bush presidency, public concern rose sharply that administration officials were suppressing and manipulating science. Over 15,000 scientists—including 52 Nobel laureates, 63 National Medal of Science recipients, and 195 members of the National Academies of Science—signed a 2004 letter asking the president to restore the process by which science had previously informed policy and to cease the distortion of scientific knowledge for political ends (UCS 2008). "A violation of scientific integrity" evolved into a term used by the media, nonprofit organizations, and members of Congress to describe actions that constituted political interference within the federal government's science and science policy apparatuses (Goldman et al. 2020). Throughout the 2000s, scientific integrity transformed from a research term to a policy term and, finally, to a policy itself.

Following the 2008 election of Barack Obama, scientific integrity became official government policy. In his inaugural speech, President Obama pointedly promised to "restore science to its rightful place," and his March 2009 memorandum, entitled "Scientific Integrity," instructed the OSTP to create a plan for "ensuring the highest level of integrity in all aspects of the executive branch's involvement with scientific and technologic processes" (Harris and Broad 2009; Office of the US President 2009). In December 2010, a memorandum by OSTP Director James Holdren directed the heads of executive departments and agencies to develop and implement scientific integrity policies incorporating the principles of scientific integrity

(Holdren 2010). These memoranda included concepts now considered core to a culture of scientific integrity, such as relying on well-established scientific practices (like peer review processes) to ensure that the best available science guide policymaking, disclosing scientific findings to the public to the greatest extent possible, and working to identify and address potential instances of compromised scientific integrity.

By the end of the Obama administration, 28 agencies had adopted scientific integrity policies, although these varied widely in scope, strength, and enforcement power (Carter, Goldman, and Johnson 2018). Because Holdren's 2010 memo had been intended to give agencies flexibility in assigning roles and responsibilities and establishing specific procedural aspects of implementation, significant gaps remained in the effectiveness of the resulting policies. For example, White House officials and political appointees at federal agencies still had a great deal of latitude, if they chose, to politicize science-based information.

Many of the violations disproportionately harmed underserved communities, particularly in circumstances where sidelining science led to weakened environmental and public health protections (Desikan et al. 2023a, Desikan et al. 2019). According to a long-running database on science that UCS maintains, 207 attacks on science occurred during the four years of the Trump administration compared with 98 during the eight years of the G.W. Bush administration (Figure 1).

In 2018, a survey sent by UCS to over 63,000 federal scientists at 16 science-based agencies found that perceptions on the state of scientific integrity had dimmed notably under the Trump administration relative to perceptions revealed in surveys conducted between 2005 to 2015 (Carter, Goldman, and Johnson 2018). For instance, twice as many EPA respondents rated morale as either poor or extremely poor in 2018 than in 2007. In 2018, federal scientists reported a large number of challenges, including heightened censorship and self-censorship, increased political interference, low morale, and decreased agency effectiveness. Across the 16 agencies surveyed in 2018, 50 percent of respondents (1,947) agreed or strongly agreed that the consideration of political interests hindered the ability of their agencies to make science-based decisions; among EPA respondents, 81 percent (345) agreed.

The years of the Trump administration also witnessed an uptick in the number of agency scientists leaving or retiring from the federal workforce without being replaced by new hires. From 2016 to 2020, the EPA lost about 219 scientists per year on average; the EPA's research arm, the Office of Research and Development, lost more than 12 percent of its scientific staff (185 staff) (Carter, MacKinney, and Goldman 2021). It took five years for the EPA to recover from this exodus: not until December 2022 did the EPA's number of scientific staff return to the December 2017 level (Desikan et al. 2023b).

A loss of federal scientific capacity not only hinders decisionmaking affecting public health and safety, but it also detracts from the quality of scientific work. Without enough staff, a heavier workload often burdens an organization's employees, and that can result in burnout, higher stress, lower performance, and lower quality (Maslach and Leiter 2016; Desikan et al. 2023b).

Strengthening Scientific Integrity Policies, 2021 to 2024

Scientific integrity returned to the forefront under the Biden administration. In early February 2021, President Biden signed the "Memorandum on Restoring Trust in Government Through Scientific Integrity and Evidence-Based Policymaking" (Office of the US President 2021a).

Addressed to the heads of executive departments and agencies, the memorandum established a task force to review scientific integrity progress and problems at agencies (SI-FTAC 2022). It also charged the OSTP with incorporating the task force's findings into a framework and required all federal agencies to update and strengthen their scientific integrity policies or, if they had none, create new, strong policies (SIF-IWG 2023).

The task force, consisting of 57 representatives of 29 federal agencies, reported in January 2022 on the state of scientific integrity in the federal government (SI-FTAC 2022). The task force had reviewed the academic and government literature on scientific integrity, assessed the effectiveness of scientific integrity policies in federal agencies, and identified best practices for preventing political influence from interfering in the conduct, communication, or use of federal science.

Federal scientists viewed these Biden administration actions positively. In September and October 2022, UCS distributed surveys to more than 46,000 scientists at six science-based federal agencies (Desikan and Carter 2023). The scientists reported mostly positive perceptions of both their agencies and Biden administration efforts to restore science in decisionmaking. They reported higher levels of morale, effectiveness of their offices, and job satisfaction than did surveyed scientists during the George W. Bush, Obama, or Trump administrations.

The 2022 task force report helped form the basis of the OSTP's scientific integrity framework (SIF-IWG 2023). Released in January 2023, that framework has served as a roadmap for strengthening scientific integrity policies and practices across the federal government. It included a government-wide definition of scientific integrity, a model policy, and deadlines and tools to help agencies regularly develop, assess, and improve their policies and practices. Developed with input from 30 federal agencies, the framework incorporated feedback from over 1,000 individuals and organizations, solicited through three listening sessions, three roundtables, and two requests for information.

In 2023 and 2024, federal agencies started implementing the requirements laid out in the official memo, carrying out actions designed to strengthen, enhance, and cultivate a robust culture of scientific integrity across the federal government (Office of the US President 2021a). Although some agencies are still in the process of implementing the memorandum's requirements, certain patterns can be distinguished in how well they are strengthening scientific integrity policies and procedures.

One weakness has involved the collection of public comments. In 2023, OSTP Director Arati Prabhakar laid out a series of deadlines in a memorandum on scientific integrity. She included the following provision regarding public input: "Within 180 days after public posting of the Framework: Agencies should provide an opportunity for public input on their scientific integrity policies and practices, such as through a listening session or request for comment on their draft policy. Agencies are encouraged to publicly post a draft policy for review and comment" (Prabhakar 2023).

That 180-day deadline corresponded to July 2023, by which date only five agencies had released draft versions of their scientific integrity policies for public comment (Table 1). This is a shockingly low number, given the hundreds of federal agencies (the Federal Register listed 439 in 2024) (Federal Register n.d.). In other words, all but five federal agencies either used no public-input process to enhance their scientific integrity policies, or they only used feedback from the OSTP's two listening sessions, held in September 2023. While those two sessions did

Table 1. Agencies Releasing Draft Scientific Integrity Policies for Public Comment

Agency	Public Comment Period
Department of Health and Human Services	7/20/23 to 9/1/23 (44 days)
National Institutes of Health	9/25/23 to 11/9/23 (46 days)
Consumer Product Safety Commission	10/5/23 to 12/4/23 (61 days)
Environmental Protection Agency	1/24/24 to 2/23/24 (31 days)
Social Security Administration	1/25/24 to 2/26/24 (33 days)

Only these five out of over 400 federal agencies opened up a draft of their scientific integrity policies for public comment and followed a strong, transparent practice of soliciting public input to improve their draft policies. All other federal agencies either used no public input or only used feedback from the OSTP's two listening sessions held in September 2023.

SOURCE: COMPILED FROM WWW.FEDERALREGISTER.GOV.

enable the public to give feedback, such input was less likely to be informed by actual text of a draft policy. Also, commenters had reason to doubt that anything aimed at a specific agency would actually reach that agency.

In other words, agencies that relied only on feedback from those listening session met the bare minimum requirements for public input. The paucity of public-comment processes on draft policies was an early indication of the failure of some agencies to employ best practices to engender public trust in the process of strengthening scientific integrity.

Public engagement with agency officials—through public comments, public hearings, and other forms of engagement—is a necessary element in building trust between the public and the government (Desikan 2024). When the Partnership for Public Service surveyed American's perceptions of trust of their government in 2022, about one-third of respondents included being more responsive to the public and being more transparent among their key priorities for improving government (Hitlin and Shutava 2022). A 2022 survey conducted by the Organization for Economic Cooperation and Development found that if people believed their feedback would be used to improve a program, they trusted government 60 percent of the time; if they felt it would not be used, they trusted government only 20 percent of the time (Brezzi and Smid 2022).

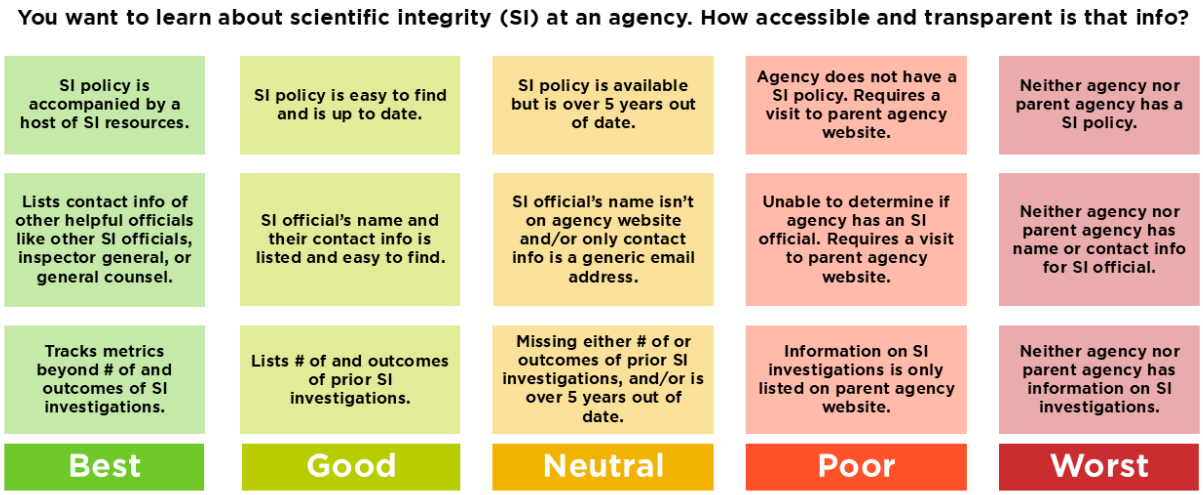
How Well Are Agencies Working to Strengthen Scientific Integrity Protections?

Will an agency that has violated scientific integrity in the past take steps to better protect their scientists in the future? To answer that question, UCS conducted an analysis to test whether agencies with at least one documented violation were acting to strengthen their scientific integrity protections. Using our database of 326 attacks on science compiled over the last four presidential administrations (UCS 2024), we identified 38 federal agencies that had been involved in an attack on science. Of those 38 agencies, 31 fit the Office of Personnel Management's definition of a large agency (1,000 or more employees), five were medium-sized (100 to 999 employees), and two were small (fewer than 100 employees) (OPM n.d.).

To determine whether these agencies were following the basic requirements laid out in President Biden's 2021 memorandum to strengthen scientific integrity, our analysis focused on three metrics that the memo required all agencies to achieve, and to do so in a publicly accessible manner: publication of a recently updated scientific integrity policy; designation of a scientific integrity official, along with a straightforward way to contact that person; and annual reporting of the number and outcomes of investigations into potential violations of scientific integrity (Figure 2). All three metrics are fundamental to establishing a culture of scientific integrity and enhancing transparency at agencies (SI-FTAC 2022).

UCS graded agencies across these metrics on a score of 1 to 5, with 1 considered the best (e.g., the agency went above and beyond the minimum requirements). A score of 2 indicates that an agency has followed through with the requirements in the 2021 memorandum. We compiled final scores by averaging across the three metrics. In addition, if an agency had a period for public comment on its draft scientific integrity policy, we awarded it a bonus on the scientific integrity policy metric, adjusting the score positively (down by one) to reflect this best practice.

Figure 2. How Accessible is Scientific Integrity Information at an Agency?



UCS evaluated 38 agencies across three metrics: publishing an updated or new scientific integrity policy, publicly disclosing the name and contact information of the agency's scientific integrity official, and annually reporting the number and outcomes of investigations into potential violations of scientific integrity. UCS rated agencies "best" to "worst" depending on their level of compliance with each metric. Agencies' performance on each metric had to be completed and publicly reported according to President Biden's 2021 "Memorandum on Restoring Trust in Government Through Scientific Integrity and Evidence-Based Policymaking" (Office of the US President 2021a).

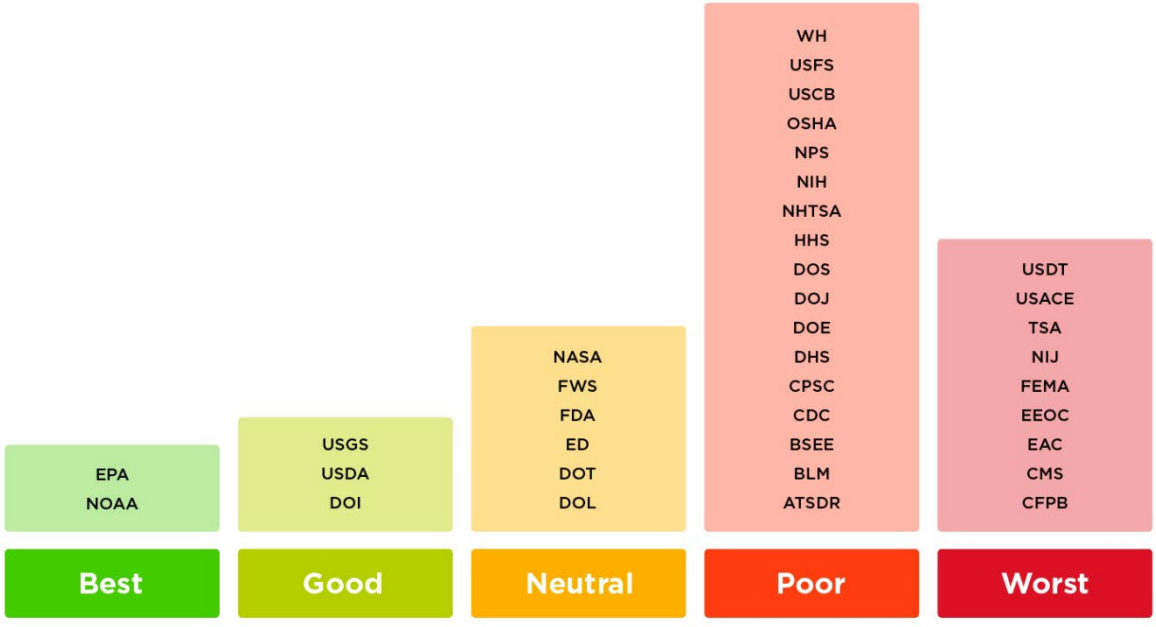
The Results

The UCS analysis indicated which federal agencies took the time to improve their processes to ensure that they protected scientists and their work from political interference, which agencies carried out only the minimum requirements, and which failed to do even the minimum.

Interestingly, our overall results suggest that some of the agencies with the most recorded attacks on science in the UCS database also achieved some of the best scores in working to strengthen scientific integrity protections. For instance, the National Oceanic and Atmospheric Administration (NOAA) (18 attacks), the Department of the Interior (DOI) (40 attacks), and the EPA (92 attacks) earned overall scores of either 1 ("best") or 2 ("good") (Figure 3).

However, not all agencies followed this pattern; we marked the Centers for Disease Control and Prevention (CDC) (30 attacks) and the White House (WH) (54 attacks) with final scores of 4 ("poor"). The poor overall score for the White House is especially surprising considering Biden administration efforts to strengthen scientific integrity, efforts being guided by the White House OSTP. Much of this poor score comes down to the fact that, aside from publishing its new scientific integrity policy, the OSTP has no dedicated website on scientific integrity that its own employees can go to for more information.

Figure 3. Scientific Integrity Quality by Federal Agency



Out of 38 agencies examined, 71 percent (27 agencies) received overall scores of either "poor" or "worst." Thirteen percent (five agencies) received overall scores in the categories of "best" and "good." For a list of the acronyms, see Tables 2 and 3 and the appendix.

Overall, the scores of the vast majority of the agencies examined (27 out of 38; 71 percent) showed low—in some cases, nonexistent—compliance with the requirements of the 2021 memorandum. The only factor separating the "poor" from the "worst" was whether an agency's parent agency had itself carried out the three basic scientific integrity metrics: the websites of all 27 agencies had failed to host some of the most basic requirements needed to safeguard scientific integrity. For instance, the Federal Emergency Management Agency (FEMA) did not mention the phrase "scientific integrity" anywhere on its website, except via a link to the 2021 memorandum at the bottom of a webpage discussing climate resilience (FEMA 2024a). This is particularly startling considering how deeply FEMA's mission of "helping people before, during and after disasters" depends on its ability to conduct and use robust and independent scientific research (FEMA 2023). An example is FEMA's responsibility for mapping out and conducting risk assessments to determine which neighborhoods are at particular risk of flooding (FEMA 2024b).

Of the 14 agencies classified as cabinet-level agencies, eight received overall scores in the "poor" (score of 4) or "worst" (score of 5) categories. The EPA, the DOI, and the US Department of Agriculture (USDA) scored the highest (scores of 1 or 2).

Of the 24 non-cabinet-level agencies, 19 received overall scores in the "poor" or "worst" categories. The NOAA had the highest score among the 24—and also among all 38 agencies—scoring in the "best" category on all three metrics. The United States Geological Survey (USGS) also scored positively, with an overall score of "good" (score of 2).

Table 2. Scientific Integrity Scores by Cabinet-Level Federal Agency

Agency	SI Policy Score	SI Official Score	SI Investigations Score	Overall Score (Averaged)
Department of Agriculture (USDA)	2	1	3	**2.00**
Department of Defense (DOD)	3	3	5	**3.67**
Department of Education (ED)	3	2	5	**3.33**
Department of Energy (DOE)	2	3	5	**3.33**
Department of Health and Human Services (HHS)	2*	5	5	**4.00**
Department of Homeland Security (DHS)	5	3	5	**4.33**
Department of the Interior (DOI)	3	1	1	**1.67**
Department of Justice (DOJ)	3	5	5	**4.33**
Department of Labor (DOL)	2	5	2	**3.00**
Department of State (DOS)	3	5	5	**4.33**
Department of Transportation (DOT)	2	3	5	**3.33**
Department of the Treasury (USDT)	5	5	5	**5.00**
Environmental Protection Agency (EPA)	2*	1	1	**1.33**
White House (WH)	2	5	5	**4.00**

UCS graded agencies across these metrics on a score of 1 to 5, with 1 considered the best (e.g., the agency went above and beyond the minimum requirements), and 5 considered the worst. Out of 14 cabinet-level agencies, eight had final scores of "poor" and "worst." Twelve are cabinet departments. The EPA is not a cabinet department, but the administrator normally has cabinet rank. The White House is not a cabinet department but its head, the president, also heads the presidential cabinet. The UCS database associated each agency with at least one attack on science. See the appendix for a more detailed discussion of the methodology and results.

* *These agencies carried out the best practice of soliciting public comments on their draft policies and therefore, received bonus credit, improving their scores by one point.*

Metric: Publishing an Updated Scientific Integrity Policy

Perhaps the most pressing metric examined was whether an agency had published a scientific integrity policy, either new or updated, on its website. The OSTP's deadline was October 2023 for agencies to publish finalized policies on their websites (Prabhakar 2023). Some agencies experienced delays while adhering to that deadline. For instance, the EPA only solicited public comment for draft policies in January and February 2024, about six to seven months later than the period the OSTP had designated in its timeline.

That said, it is clear that all agencies should have worked to adhere to this important step. Yet 28 out of the 38 agencies examined did not publish a new or updated scientific integrity policy, and the websites of some of the noncompliant agencies are hosting extremely outdated policies. For instance, the current policies of the Department of Justice, US Fish and Wildlife Service (FWS), and National Park Service (NPS) date from 2011 and 2012. Particularly worrisome, 11 of these agencies failed to host a webpage discussing scientific integrity, and eight lack a policy at both their agency and their parent agency. The NPS and the FWS are part of the Department of the Interior.

A failure to publish a scientific integrity policy in a timely manner may indicate that an agency is devaluing the importance of putting scientific integrity protections in place. Inevitably, this means that federal scientists have no policy to rely on or must rely on an outdated policy or a policy on the websites of their agencies' parents.

On the other hand, several agencies that published an updated policy seemed to have gone above and beyond the required minimum. Agencies that implemented the best practice of publishing a draft policy in the Federal Register and inviting public comments ended up extending their process by doing so. When final versions of these policies are published online, they will be stronger for having incorporated the input. Three agencies followed this best practice: the EPA, the HHS, and the NIH. We gave each a bonus point, improving their scores on the scientific integrity policy metric.

Agencies with the best practices actually went further than our metrics considered. They provided resources (e.g., FAQs, factsheets, a list of agency principles of scientific integrity) to help the public understand how they put their scientific integrity policies into practice.

Metric: Publicly Designating a Scientific Integrity Official and Providing Contact Information

The best practices observed for this metric were listing the scientific integrity official's name, multiple ways to contact that officer (e.g., email, phone number, and address), and contact information for other helpful resources (e.g., the office of the agency inspector general).

Of the 38 agencies examined, 24 did not publicly designate a scientific integrity official. Sixteen agencies failed to provide a way to contact the scientific integrity official, which is particularly disconcerting. According to a 2022 White House report, "Staff often desire an informal conversation with an SIO [scientific integrity official] to seek advice on preventing a situation of concern, addressing one before it gets worse, or to determine whether it falls under the scientific integrity policy." The report further states, "Early engagement can also be helpful in raising awareness of situations that may be at higher risk of unintentional or intentional violations, such as challenging work environments, staffing situations, high-profile or controversial scientific topics, and urgent, fast-paced activities" (SI-FTAC 2022). Knowing

the name of and contact information for an agency's scientific integrity official is essential for this type of informal consultation process to work effectively.

The Centers for Disease Control and Prevention, Department of Homeland Security, and Department of Energy failed to name a scientific integrity official, instead providing a generic email address for sending questions or concerns about scientific integrity. It is difficult to assess whether an agency without a publicly named scientific integrity official actively monitors a generic email address. For instance, several UCS personnel over the years have written to the CDC's scientific integrity email address (ScientificIntegrity@cdc.gov) without ever receiving a reply (Desikan 2020).

A few agencies made it hard to find this basic information. To find the scientific integrity official at the Department of Transportation (DOT) required first reading the DOT's scientific integrity policy, which states that its scientific integrity official has the title of DOT Director, Office of Research, Development and Technology. Then it was necessary navigate to the DOT's website of key officials and find contact information for the person with this title. The Census Bureau provided a method of contact but relied on a confusing process of understanding the bureau's structure—that is, knowing that scientific integrity is housed under the Informational Quality Program, then finding the generic email address for this program, quality@census.gov.

Metric: Publishing an Annual Report on Scientific Integrity Investigations

UCS designed the third metric to determine if agencies were publicly releasing an annual report of the number and outcomes of investigations into potential scientific integrity violations. Most agencies failed on this metric; even the agencies that published such lists did not do so recently. Of the 38 agencies examined, 26 had not published this information. Only the Department of the Interior and Department of Labor had published an annual report for the year prior (2023).

The DOI had some of the best practices for reporting up-to-date information: it issued annual reports from 2021 to 2023 and maintained a database of closed-case summaries from 2011 to 2024. Both the EPA and the NOAA had strong practices in annual reporting, such as disclosing the number of times that scientific integrity officials had informally consulted with employees on scientific integrity issues.

Table 3. Scientific Integrity Scores by Non-Cabinet-Level Federal Agency

Agency	SI Policy Score	SI Official Score	SI Investigations Score	Overall Score (Averaged)
Agency for Toxic Substances and Disease Registry (ATSDR)	3	3	5	**3.67**
Bureau of Land Management (BLM)	4	4	4	**4.00**
Bureau of Safety and Environmental Enforcement (BSEE)	4	4	4	**4.00**
Centers for Disease Control and Prevention (CDC)	3	3	5	**3.67**
Consumer Financial Protection Bureau (CFPB)	5	5	5	**5.00**
Centers for Medicare & Medicaid Services (CMS)	4	5	5	**4.67**
Consumer Product Safety Commission (CPSC)	2	5	5	**4.00**
Election Assistance Commission (EAC)	5	5	5	**5.00**
Equal Employment Opportunity Commission (EEOC)	5	5	5	**5.00**
Food and Drug Administration (FDA)	2	2	5	**3.00**
Federal Emergency Management Agency (FEMA)	5	4	5	**4.67**
Fish and Wildlife Service (FWS)	3	2	4	**3.00**
National Aeronautics and Space Administration (NASA)	2	2	5	**3.00**
National Highway Traffic Safety Administration (NHTSA)	4	4	5	**4.33**
National Institutes of Health (NIH)	2*	5	5	**4.00**
National Institute of Justice (NIJ)	4	5	5	**4.67**
National Oceanic and Atmospheric Administration (NOAA)	1	1	1	**1.00**
National Park Service (NPS)	3	4	4	**3.67**
Occupational Safety and Health Administration (OSHA)	4	5	4	**4.33**
Transportation Security Administration (TSA)	5	4	5	**4.67**
US Army Corp of Engineers (USACE)	5	5	5	**5.00**
US Census Bureau (USCB)	3	3	5	**3.67**
US Forest Service (USFS)	4	4	4	**4.00**
US Geological Survey (USGS)	1	2	4	**2.33**

UCS graded agencies across these metrics on a score of 1 to 5, with 1 considered the best (e.g., the agency went above and beyond the minimum requirements), and 5 considered the worst. Out of 14 cabinet-level agencies, eight had final scores of "poor" and "worst." Twelve are cabinet departments. The EPA is not a cabinet department, but the administrator normally has cabinet rank. The White House is not a cabinet department but its head, the president, also heads the presidential cabinet. The UCS database associated each agency with at least one attack on science. See the appendix for a more detailed discussion of the methodology and results.

* *These agencies carried out the best practice of soliciting public comments on their draft policies and therefore, received bonus credit, improving their scores by one point.*

Recommendations

Given the importance of science in how our government fulfills its duties to its people, strong protections for scientific integrity at federal agencies are necessary for good governance. The goal of basing the nation's policy decisions on the best, most up-to-date, and most reliable scientific information, derived independently and unfettered by political interference, deserves overwhelming bipartisan support. Communities across the nation need and deserve the best independent, impartial scientific information the government can provide.

Science is so vital to the functioning of the federal government that many laws state that agencies have a duty to safeguard public health by using the best available science. These laws include the Clean Air Act, the Clean Water Act, the Toxic Substances Control Act, the Food, Drug, and Cosmetic Act, the Safe Water Drinking Act, the Occupational Safety and Health Act, the National Environmental Policy Act, the Endangered Species Act, the Comprehensive Environmental Response, Compensation, and Liability Act, and the Resource Conservation and Recovery Act.

To enhance the state of scientific integrity at federal agencies, and building off of existing OSTP memos, UCS has assembled a set of recommendations that the next presidential administration can use. In addition, while it falls outside the scope of this report, the UCS team of researchers also strongly recommends that Congress pass several pieces of legislation that would aid the executive branch in implementing our recommendations (Box 2).

Box 2. Three Congressional Priorities

There are currently three proposed pieces of legislation that have been introduced in the United States Congress that would improve scientific integrity in the federal government.

- The Scientific Integrity Act (Congress 2023a);
- The Stop Corporate Capture Act (Congress 2023b); and
- The A. Donald McEachin Environmental Justice for All Act (Congress 2023c).

Passage of the Scientific Integrity Act would be particularly powerful. It would help ensure the creation and enforcement of scientific integrity protections across current and future presidential administrations, and it would open the door to stronger forms of enforcement and accountability (Desikan 2023).

Building a Culture of Scientific Integrity

A strong culture of scientific integrity within federal agencies adds resiliency in the face of political interference in science. Such a culture helps protect federal scientists as they seek to fulfill their responsibilities to the US public, and it promotes decisionmaking fully informed by the best available science (SI-FTAC 2022). Elements of such a culture include creating and implementing strong scientific integrity policies and principles; it also consists of practices across and within agencies and a strong commitment by government leadership to invest in scientific integrity standards.

To promote a strong culture of scientific integrity, the next presidential administration should mandate that agencies:

- **Ensure open communication with the press and the public**.

  Many current scientific integrity policies, such as the OSTP's, contain several strong provisions on this front. However, it is difficult to assess how effective these policies will be as agencies implement and enforce them. Agencies should clarify the rights of employees to engage freely with the news media and to communicate about their scientific work on social media when expressing personal views, identified as such.

  Furthermore, agencies should clarify that all staff—including career senior staff, political appointees, and officials from parent agencies—should respect these rights. Rules on disclaimers—when appropriate and when not required—should be clarified to ensure that agency scientists do not self-censor their public communications due to uncertainty over when to use a disclaimer.

  Additionally, agencies should clarify that while they may encourage federal scientists to seek out the expertise of career communication staff, the scientists are not required to go through this step before communicating with the media and the public.

- **Remove language in scientific integrity policies that may unintentionally lead to censorship or self-censorship.**

  Current scientific integrity policies, based on the OSTP's model policy, require permission before "making or publishing statements that could be construed as being judgments of, or

recommendations on . . . policy." This provision should be removed or heavily revised to safeguard the rights of federal scientists. Such a broad statement risks making scientists afraid to talk to reporters, given how easily even appropriate statements could be "construed as" recommending policy. For instance, agency officials have censored federal scientists whose words clashed with false statements issued by the president, such when scientists attempted to communicate accurate scientific information related to the spread of COVID-19, the path of Hurricane Dorian, or the causes of gun violence in the aftermath of the El Paso and Dayton shootings (UCS 2022; UCS 2020; UCS 2019).

- **Educate federal workers on their rights and responsibilities**.

Agencies should train federal employees and contractors on scientific integrity, provide detailed procedures for addressing differences of scientific opinions, and offer opportunities for staff to consult scientific integrity officials. The trainings should include guidance on how to report external or internal harassment, potential scientific integrity violations, and other workplace concerns. While several current scientific integrity policies contain provisions related to training, the strongest policies would mandate trainings and include procedures for updates incorporating evolving best practices.

- **Increase training opportunities on scientific integrity**.

It is a positive step when agencies educate their employees on the contents of scientific integrity policies, yet the avenues for learning should not stop there. Agencies should offer further opportunities that enable scientists to deepen their knowledge on scientific integrity—for example, educational sessions, resources on their websites. Further educational opportunities could include content describing best practices for talking to the media and the public about findings, how to build a robust workplace culture of scientific integrity, and ways to incorporate justice, equity, diversity, inclusion, and accessibility principles into scientific work.

- **Promote justice, equity, diversity, inclusion, and accessibility (JEDIA) in the federal scientific workforce**.

Strengthening scientific integrity is only possible when JEDIA is integral to the scientific process (SI-FTAC 2022). Attention to this can improve the representativeness and eminence of the scientific workforce, foster innovation in the conduct and use of science, and provide for more equitable participation in science by diverse communities (SI-FTAC 2022). Promoting JEDIA in the workforce includes not only hiring scientists from diverse backgrounds but also identifying and addressing the structural inequities that undermine the hiring, promoting, and retention of diverse staff. Agencies should also work to ensure that scientific, programmatic, and policy work incorporates the perspectives of staff from historically marginalized populations.

- **Minimize conflicts of interest**.

Since the public is best served by science that is free of political influence, trust in government is enhanced by minimizing conflicts of interest in government science (SI-FTAC 2022). Minimizing conflicts of interest may also lessen the incentives to manipulate science processes for personal gain. Agencies should fill scientific leadership positions with individuals who have not only relevant expertise but also sufficient independence from

regulated industries. Agencies should enforce timely requirements regarding disclosures of conflicts of interest and resulting recusals, with actionable penalties in case of violations.

- **Establish clearance procedures that are clear, consistent, transparent, and predictable**.

Agencies should establish clearance policies that uphold the right of scientists to publish about their official scientific work. Such policies should ensure that peer review is transparent and free from political interference, with mechanisms to track and deter inappropriate interference in federal science.

- **Provide reasonable time limits for reviewing scientific products and clearing them for public release**.

Agencies should issue clear guidance that scientific products will not be subjected to long, unreasonable delays preventing their release. Supervisors and other reviewing officials should provide written clearance based on making specified changes no later than 30 days after submission. If this deadline is not met, the author of the scientific product should be allowed to submit it for publication or presentation, with an appropriate disclaimer stating that the product does not necessarily represent agency views or policies.

- **Clarify the scope of scientific clearance procedures**.

Agencies should clarify that clearance procedures are not required for the quality control of scientific materials intended for publication or presentation, nor is clearance required for procedures that fall outside this scope, such as interviews or public speaking requests.

Ensuring the Robust Implementation and Enforcement of Scientific Integrity Policies

The suppression or distortion of scientific findings to manipulate policymaking leads to untoward and even dangerous outcomes even as it erodes public trust in government. We cannot afford to backslide on addressing the complex issues and myriad challenges confronting our society today. With federal agencies adopting new and updated scientific integrity policies, it is more important than ever for these same agencies to systematically evaluate the processes for implementing those policies, investigating allegations of compromised scientific integrity, and enforcing penalties for those who violate the policies.

To safeguard scientific integrity, the next presidential administration should mandate that agencies:

- **Hold violators of scientific integrity fully to account.**

While current scientific integrity policies significantly improve procedures related to accountability, agencies should continue to make these clearer and more effective. For instance, the OSTP's model policy specifies procedures for investigating potential scientific integrity violations, mandates that scientific integrity violations should be taken as seriously as government ethics violations, and states the need to encourage and facilitate early communication with the scientific integrity official on an issue. However, even this model policy lacks specifics on how formally to raise scientific integrity violations, whether a determination that an employee has violated the scientific integrity will factor into a

personnel performance review, and how higher-level agency staff—including political appointees—would be held accountable if found to have violated a scientific integrity policy.

- **Clarify the timelines for investigating potential scientific integrity violations**.

Agencies should assure the timely resolution of any allegation of a loss of scientific integrity. For instance, a decision to investigate an allegation could be required within 10 working days, with a determination made within another 45 working days and the appeals process limited to 30 working days. Exceptions to the timeline should be allowed at the request of employees for specified reasons, such as needing more time to hire counsel or build a case, while ensuring that progress continues toward a resolution.

- **Protect employees against retaliation when they report or investigate scientific integrity violations or whistleblower accounts**.

While the Whistleblower Protection Enhancement Act of 2012 established protections for employees who report waste, fraud, and abuse, those protections do not adequately address incidents of retaliation against employees who report or investigate such abuses. Agencies should establish mechanisms to protect employees from a broad array of retaliatory actions and threats. The heads of agencies should periodically communicate to all employees a commitment to scientific integrity and whistleblower protections, encourage employees to report violations, and provide information on anti-censorship and anti-retaliation rights under federal laws.

- **Clarify the responsibilities expected of every agency to uphold scientific integrity**.

The OSTP director should issue guidance that all agencies are expected to follow the requirements of the president's 2021 scientific integrity memorandum. If the OSTP exempts an agency from these requirements, that must be stated clearly so that all parties, including the public and agency employees, can understand the exemption. For instance, the OSTP may want to state that the employees of a small agency (e.g., fewer than 100 employees) are covered and protected under the parent agency's scientific integrity policy. As our UCS analysis shows, this lack of clarity leads some agencies to fail to provide even the most basic protections (e.g., publishing a scientific integrity policy, publicly designating a scientific integrity official).

- **Provide a clear process for investigating potential scientific integrity violations across two or more agencies.**

Violations of scientific integrity often span multiple agencies. Out of 326 attacks on science recorded by UCS, 27 percent (88 incidents) involved two or more agencies (UCS 2024). However, a good deal of uncertainty exists on how an investigation of compromised scientific integrity would be conducted across multiple agencies. The OSTP's framework includes a charter for the newly established National Science and Technology Council (NSTC) Subcommittee on Scientific Integrity, which among other things, will be "charged with carrying out interagency functions related to scientific integrity" (SIF-IWG 2023). However, the charter gives this subcommittee only an advisory role. The OSTP needs to specify the process of how it will use this subcommittee's recommendations to investigate and enforce scientific integrity protections across multiple agencies.

- **Provide a clear process for how an investigation of a potential scientific integrity violation will occur when it involves a high-level official.**

A 2022 White House scientific integrity task force report explicitly states that violations of scientific integrity committed by high-level officials, such as political appointees, are especially difficult to address properly (SI-FTAC 2022). One role of the NSTC Subcommittee on Scientific Integrity is to "provide advisory responses to agency requests . . . such as inquiries related to senior-level officials, political appointees, or SIOs [scientific integrity officials]," along with offering recommendations "regarding public allegations of scientific integrity violations, such as allegations involving senior-level officials, political appointees, or scientific integrity officials" (SIF-IWG 2023). While the subcommittee may play a pivotal advisory role, the OSTP needs to establish a more definitive process for holding high-level officials to account.

- **Establish independent appeals mechanisms for scientific integrity investigations.**

An independent appeals process would reassure agency personnel that investigations and findings are handled appropriately. Each agency should specify an appeal process that is available to all its employees on investigations of compromised scientific integrity. Agencies should state which government entities will be involved with appeals; for instance, the agency's inspector general's office and the Merit Systems Protection Board will probably have a role to play. The appeal process should include those found to have violated scientific integrity policies and those whose allegations were not investigated or remedied.

The OSTP should consider developing an independent mechanism for appeals, such as the ability to appeal to the NSTC Subcommittee on Scientific Integrity. This type of OSTP-administered independent process would be especially helpful in navigating more difficult or complicated circumstances, such as alleged violations that involve multiple agencies or high-level agency officials like political appointees.

- **Safeguard the independence of investigators**.

Scientific integrity officials or others investigating allegations of compromised scientific integrity should be protected from undue pressure from their supervisors or political appointees. Agencies should establish the independence of investigators to investigate thoroughly and withstand any pressure to alter their findings. This could include provisions that investigators are not supervised by the chain of command involving an allegation or that they coordinate with their inspector general's office and/or the NSTC Subcommittee on Scientific Integrity when allegations involve high-level officials.

- **Clarify the shared and unique responsibilities of an agency's scientific integrity official and its office of the inspector general.**

The scientific integrity official and the office of the inspector general have different roles and responsibilities when investigating research misconduct or allegations of a loss of scientific integrity. Agencies need to clarify these roles to ensure that agency employees can navigate the process. For instance, employees are more likely to feel comfortable approaching the scientific integrity official for advice, knowing that reports will go to the office of the inspector general only if an employee makes a formal report.

- **Designate and provide the contact information for an agency's scientific integrity official in a public and transparent manner.**

The president's 2021 memorandum requires that each agency designate a career employee as its scientific integrity official. This official serves as a main point of contact for employees with questions about scientific integrity and for those who want to allege compromised scientific integrity. For instance, in fiscal year 2021, the EPA's scientific integrity official fielded 93 requests for advice from employees (EPA 2024b).

Agencies should make the process of contacting an agency's scientific integrity official easy, transparent, and straightforward by publicly naming the scientific integrity official and providing a public and reliable method to contact that person.

- **Ensure that each agency publish an annual report on the state of scientific integrity.**

In the UCS analysis, the vast majority of agencies failed to meet the requirement to publish an annual report listing the number and outcome of investigations into alleged violations of scientific integrity. Even agencies with track records of publishing these reports mostly failed to publish anything in the last two years. The OSTP should enforce this requirement from the 2021 memorandum. Moreover, the OSTP's model scientific integrity policy describes the annual reports as going beyond the minimum necessary. They should include not only the number of and outcome of investigations but also the number of informal requests for assistance, the number of appeals involving alleged violations, and comparisons to metrics in past years, identifying trends whenever feasible (SIF-IWG 2023).

Additionally, the OSTP states that the annual reports should provide information on the state of scientific integrity. This would include information on "scientific integrity successes, accomplishments, or progress" such as "any new scientific integrity hires, training, enhancements to scientific integrity policies," in addition to "identify[ing] areas for improvement and develop[ing] a plan for addressing critical weaknesses."

- **Monitor the implementation and enforcement of scientific integrity policies.**

The Canadian government actively monitors how effectively departments and agencies are implementing their scientific integrity policies (Government of Canada 2024). This primarily occurs in the form of an annual survey of scientific integrity officials across the federal government, and the Canadian government publishes the results online. In the United States, the White House—specifically, the OSTP—should consider adopting a similar model. The OSTP should interview or survey scientific integrity officials at all federal agencies and ask them to report on the status of implementing their scientific integrity policies for a specific set of compliance criteria. Information about the survey's results, observed trends, and examples of best practices should be published online and transparently. Important compliance criteria would include:

    - The ability of scientists to communicate with the media and the public without experiencing the threat of censorship or self-censorship;
    - The effectiveness of new procedures for investigating compromised scientific integrity;
    - The effectiveness of provisions asserting the right of scientists to have the last review of public-facing products that are based on their work and expertise; and

- The ability of scientific advisory committees to meet and deliberate without political interference.

Strengthening Science-Based Processes to Better Protect and Engage Underserved Communities

Some of the most devastating attacks on scientific integrity sidelined science in decisionmaking processes involving the study or regulation of environmental health hazards. As a result, communities experienced increased risks of health burdens—such as asthma, cancer, or premature death—due to increased exposures to environmental health threats. Evidence continues to build showing that underserved communities often face the brunt of the harms when scientific integrity is violated (Johnston and Cushing 2020; Alvarez 2022).

Under Executive Orders in 2021 ("Advancing Racial Equity and Support for Underserved Communities Through the Federal Government") and 1994 ("Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations"), the government has committed to the collecting and sharing information about harms and solutions in connection with public health problems that disproportionately affect marginalized communities (Office of the US President 2021b, Office of the US President 1994). Strong scientific integrity protections are essential for achieving health equity and environmental justice goals.

To protect communities across the United States from exposure to hazards that can harm their health, the next presidential administration should mandate that agencies:

- **Prioritize research on solutions to health disparities**.

  Prioritize grant solicitations for, and otherwise encourage research on, efforts that can highlight health disparities in underserved communities.

- **Disaggregate data**.

  When studying the distribution of risks or resources, agencies should disaggregate data by race, ethnicity, age, income, and geographic location and make the results publicly available to the extent possible (Equitable Data Working Group 2022). Additionally, agencies should integrate metrics for the structural drivers of inequities and racism, such as geographic information showing redlining or holistic models that conceptualize structural racism using a combination of factors (e.g., social segregation, immigration policy, intergenerational effects) (Swope, Hernández and Cushing 2022; Gee and Ford 2011).

- **Properly inform communities of health and environmental hazards in their neighborhoods and inform workers of risks in their workplaces**.

  Evaluate and improve the processes used to inform communities living near Superfund and brownfield sites about the health and environmental hazards they face; how best to mitigate these risks; the availability of grants and technical assistance that agencies can provide communities; the agency's current plans for prioritizing and cleaning up these sites; and accountability mechanisms for communities to ensure the agency is meeting expectations (Carter and Kalman 2020). These processes should include ways to involve frontline communities.

Additionally, workers should be fully informed of the risks and mitigation strategies for on-the-job hazards. Workers' input should inform rules and best practices.

- **Before rules are solidified, engage historically marginalized communities to deliberately address barriers to public participation.**

In 2023, the Office of Management and Budget (OMB) took the important step of issuing guidance designed to promote greater public participation in the regulatory review process (Berger 2023). However, much remains to be done to improve the public-participation processes for historically marginalized communities. These efforts may require the creation of new entities. For example, task forces could engage directly with community leaders to better understand local impacts. Or engaging trusted intermediaries who represent local needs could help build trust and communication between agencies and communities (Goodwin 2019). Agencies should work with the General Services Administration and the OMB to evaluate and improve existing systems of outreach.

- **Create incentives for agencies to actively engage with historically marginalized communities.**

Individuals from historically marginalized communities bring particular experience that policymakers too often miss or undervalue. Therefore, one of the best ways to incorporate equity into rulemaking processes is to ensure that communities have a seat at the table such that policymaking incorporates their knowledge, viewpoints, and perspectives (Bergstrom et al. 2012). Agencies should seek community input on policy priorities, design choices, policy implementation, and enforcement mechanisms.

The OMB's Office of Information and Regulatory Affairs (OIRA) could offer agencies incentives to carry out these steps by asking them, when submitting rules for review, to check a box indicating that they consulted and solicited feedback from historically marginalized communities (Tucker and Nayak 2020). The rules submitted as part of these community-focused processes could be moved by OIRA into a queue for priority review, absent other circumstances.

- **Tailor engagement opportunities to meeting specific community needs**.

Agencies should hold informational webinars, public information meetings, and town hall sessions outside regular working hours, especially for policy actions that could significantly affect communities of concern. These engagement opportunities should be tailored to the specific needs of the community, such as by offering them at varied times of day, in several convenient locations, and in multiple languages. Agencies should include records of these efforts—including meeting transcripts, scheduled events, and agency deliberations on outreach planning—in the regulatory docket for proposed rules. Agencies that do not provide these records should justify in writing why they choose not to do so or why the records do not apply.

- **Offer translation services when engaging with communities where multiple languages are spoken.**

Public comments, public hearings, and other forms of community engagement need to be issued in the languages most widely spoken in the communities most affected by the

polices under consideration. Agencies should affirm that they take responsibility to cover these translation services and include funds for them in budget requests.

During public hearings and other in-person opportunities, agencies should ensure the sound quality and reliability of translation technologies. For example, the community group Texas Environmental Justice Advocacy Services, in conjunction with Earthjustice and Sierra Club, pressed the Texas Commission on Environmental Quality into adopting a rule in 2021 that requires public engagement sessions on environmental permitting decisions to offer translation and interpretation services (Hidalgo, Parras, and Parras 2021).

Many rules and regulations that safeguard communities from environmental hazards fall under the jurisdiction of the EPA. The EPA should:

- **Implement and enforce the Risk Management Program (RMP) rule**.

The RMP rule requires facilities that use extremely hazardous substances to develop a Risk Management Plan. The EPA's finalized amendments to the Risk Management Program, issued in March 2024, should be monitored to ensure that the rule is implemented and enforced in a way that can achieve its promise of helping protect frontline communities from chemical accidents from nearby facilities. In particular, the EPA should increase enforcement and safety inspections; ensure that companies fully disclose, in a publicly available database, the amount and type of chemicals stored at facilities; ensure that facilities are assessing risks from natural hazards (e.g., flooding, wildfires, hurricanes) in facility risk management plans; ensure the safe storage of chemicals; follow effective cleanup strategies in case of accidental releases; and conduct analyses of safer technology and alternatives at all RMP facilities to prevent future chemical disasters.

- **Monitor air pollutants and chemical hazards**.

The EPA should ensure that its pollution monitors are located in or near the frontline communities most affected by facilities. Frontline and impacted communities should also include those who are affected by pollutants and chemicals that can spread and cause disease far from their original sources. For instance, the diets of Alaskan Native populations traditionally are high in marine mammals and fish; studies have shown that these populations are at risk of cancer and other deleterious health effects from eating marine animals containing high levels of persistent organic pollutants, such as polychlorinated biphenyls (PCBs) (Hardell et al. 2010).

Additionally, the EPA should confirm that its air and chemical monitors are properly maintained and updated, that data are provided in a timely manner to the public, and that frontline communities are properly informed of those data and their relation to health and safety.

- **Regulate chemicals as a class**.

The current policy approach when regulating chemicals found to be harmful to human health and the environment is to consider them one at a time rather than as a class (Ellickson 2023a; Sprinkle and Payne-Sturges 2021; Ellickson 2023b). This leads to an unsustainable and herculean task of trying to carry out a large body of scientific research

on the health effects of each of the thousands of chemicals before the EPA can take the needed steps of banning, restricting, or regulating these dangerous substances.

To prevent this regulatory paralysis, the EPA should work to regulate chemicals together as a class, grouping together chemicals with similar properties. Chemicals could be grouped together in several ways—for instance, by similar molecular structures; similar physical, chemical, or biological properties; similar routes of exposures in the human body; or similar ways the chemicals move through and break down in the environment (known in environmental science as fate and transport) (ATSDR 2022).

- **Use cumulative risk and impact assessments in decisionmaking**.

Cumulative-risk studies and cumulative-impacts assessments are a fundamental component of environmental justice, yet the EPA often fails to carry out these types of assessment or fails to use them in regulatory decisionmaking processes, even when it has authority to do so (Sexton and Linder 2010; Krieg and Faber 2004). The EPA should create an equitable, just, and robust process for developing cumulative-risk and cumulative-impacts studies using a mixed-methods research approach, which includes both quantitative and qualitative analysis, while ensuring the use of these assessments in agency regulatory decisionmaking.

Historically, the EPA has not relied on data on the totality of pollutants already affecting a community before making certain decisions, such as permitting the development of a hazardous chemical facility. This oversight can result in areas with extremely high levels of pollutants and high rates of health disparities, such as those seen in "Cancer Alley," an area of Louisiana along the Mississippi River that houses over 150 petrochemical plants and refineries (Castellón 2021). Policies informed by data representing the cumulative impacts of *all* hazardous substances in an area would be more effective in safeguarding the public health of disenfranchised communities.

- **Use a holistic approach to determining health risks from exposure to toxic chemicals**.

The EPA should move away from a "one pollutant and one environmental medium" frame and use a more holistic framing that better represents population vulnerability, susceptibility, and real-world scenarios. The EPA's health-based standards should incorporate systemic factors that can lead to health harms. These factors include non-chemical stressors (e.g., chronic stress, social adversity, and climate change impacts); the accumulation and/or synergistic interaction of chemicals in the human body to lead to more detrimental health outcomes; multiple exposure routes (e.g., ingestion, inhalation, and skin contact); multiple sources of pollutants (nobody is exposed to one single pollutant at a time); populations, including workers, that may be at a higher risk of exposure and/or health harms; and the clustering of pollution sources near frontline communities, including communities impacted by pollutants that can spread and cause harm far beyond their original source, like persistent organic pollutants (Hardell et al. 2010).

Anita Desikan is a former senior analyst at the Center for Science and Democracy at the Union of Concerned Scientists.

Acknowledgments

The report was made possible by the generous support of Orchard Foundation, Caldera Foundation, The Gunther Family, Democracy Fund, Bernard F. and Alva B. Gimbel Foundation, Wilburforce Foundation, and UCS members.

I would like to thank Liz Borowski for providing excellent feedback to help ensure the report's accuracy and clarity. To my two former UCS colleagues and mentors, Jacob Carter and Andrew Rosenberg, I want to thank you for providing your wonderful feedback and expertise on the report and for once again contributing your deep scientific integrity expertise to a UCS report.

I want to thank the numerous UCS staff who viewed, edited, and otherwise helped shape the direction of the report. Specifically, I want to thank Kristie Ellickson, Jennifer Jones, Michell McIntyre, and Christopher Williams for providing feedback and expertise on the report's contents; Cynthia DeRocco and Bryan Wadsworth for assisting in the report's production process; Andrés Bachelet, Matt Heid, and Seth Michaels for providing valuable input on the report's messaging and direction; and Brenda Ekwurzel, Melissa Finucane, Joy McNally, and Jose Pablo Ortiz Partida for helping ensure that the report follows strong scientific practices. I would also like to thank Marc S. Miller for editing the report.

Organizational affiliations are listed for identification purposes only. The opinions expressed herein do not necessarily reflect those of the organizations that funded the work or the individuals who reviewed it. The Union of Concerned Scientists and author bear sole responsibility for the report's content.

References

Alvarez, Camila H. 2022. "Structural Racism as an Environmental Justice Issue: A Multilevel Analysis of the State Racism Index and Environmental Health Risk from Air Toxics." *Journal of Racial and Ethnic Health Disparities* 10: 244–258. https://doi.org/10.1007/s40615-021-01215-0

ATSDR (Agency for Toxic Substances and Disease Registry). 2022. "Element 2: Environmental Fate and Transport." April 14. https://www.atsdr.cdc.gov/pha-guidance/conducting_scientific_evaluations/exposure_pathways/environmental_fate_and_transport.html

Berger, Sam. 2023. "Promoting Public Engagement in OIRA's Regulatory Review Process." Office of Information and Regulatory Affairs. December 20. https://www.whitehouse.gov/omb/briefing-room/2023/12/20/promoting-public-engagement-in-regulatory-review-process

Bergstrom, Danielle, Kalima Rose, Jillian Olinger, and Kip Holley. 2012. *The Sustainable Communities Initiative: The Community Engagement Guide for Sustainable Communities*. Oakland, CA: PolicyLink. https://www.policylink.org/sites/default/files/COMMUNITYENGAGEMENTGUIDE_LY_FINAL%20%281%29.pdf

Berman, Emily, and Jacob Carter. 2018. "Policy Analysis: Scientific Integrity in Federal Policymaking Under Past and Present Administrations." *Journal of Science Policy & Governance* 13. http://www.sciencepolicyjournal.org/uploads/5/4/3/4/5434385/berman_emily__carter_jacob.pdf

Borst, Ellie, and Kevin Bogardus. 2024. "Whistleblower Alleges Mishandling of EPA Sniffer Plane." *E&E News*. May 15. https://subscriber.politicopro.com/article/eenews/2024/05/15/whistleblower-alleges-mishandling-of-epa-sniffer-plane-00158140

Brezzi, Monica, and Sina Smid. 2022. "What Drives Trust in Public Institutions? Results and Learnings from the First OECD Trust Survey." December 9. https://oecdstatistics.blog/2022/12/09/what-drives-trust-in-public-institutions-results-and-learnings-from-the-first-oecd-trust-survey

Carter, Jacob, and Casey Kalman. 2020. *A Toxic Relationship Extreme Coastal Flooding and Superfund Sites*. Cambridge, MA: Union of Concerned Scientists. https://www.ucsusa.org/sites/default/files/2020-07/a-toxic-relationship.pdf

Carter, Jacob, Gretchen Goldman, and Charise Johnson. 2018. *Science Under Trump: Voices of Scientists across 16 Agencies*. Cambridge, MA: Union of Concerned Scientists. https://www.ucsusa.org/sites/default/files/images/2018/08/science-under-trump-report.pdf

Carter, Jacob, Taryn MacKinney, and Gretchen Goldman. 2021. *The Federal Brain Drain: Impacts on Science Capacity, 2016–2020*. Cambridge, MA: Union of Concerned Scientists. https://www.ucsusa.org/resources/federal-brain-drain

Castellón, Idna G. 2021. "Cancer Alley and the Fight Against Environmental Racism." *Villanova Environmental Law Journal* 32. https://digitalcommons.law.villanova.edu/elj/vol32/iss1/2

Congress. 2023a. *H.R.4893—Scientific Integrity Act*. 118th Congress. House of Representatives. https://www.congress.gov/bill/118th-congress/house-bill/4893?s=1&r=88

Congress. 2023b. *H.R.1507—Stop Corporate Capture Act*. 118th Congress. House of Representatives. https://www.congress.gov/bill/118th-congress/house-bill/1507

Congress. 2023c. *S.919—A. Donald McEachin Environmental Justice For All Act*. 118th Congress. Senate. https://www.congress.gov/bill/118th-congress/senate-bill/919

CRS (Congressional Research Service). 2022. *Federal Scientific Integrity Policies: A Primer*. Washington, DC: CRS. November 9. https://crsreports.congress.gov/product/pdf/R/R46614

Davenport, Coral. 2021. "E.P.A. to Block Pesticide Tied to Neurological Harm in Children." *New York Times*. August 18. https://www.nytimes.com/2021/08/18/climate/pesticides-epa-chlorpyrifos.html

Desikan, Anita. 2020. "Let CDC Scientists Speak to the Public about Coronavirus." *The Equation (blog)*. April 1. https://blog.ucsusa.org/anita-desikan/let-cdc-scientists-speak-to-the-public-about-coronavirus

Desikan, Anita. 2022. “Ensuring Scientific Integrity at Our Nation’s Public Health Agencies.” Testimony to US House Select Subcommittee on the Coronavirus Crisis. April 29. https://docs.house.gov/meetings/VC/VC00/20220429/114682/HHRG-117-VC00-Wstate-DesikanA-20220429-U3.pdf

Desikan, Anita. 2023. “Scientific Integrity Act Re-introduced in Congress to Protect Federal Science.” *The Equation (blog)*. July 25. https://blog.ucsusa.org/anita-desikan/scientific-integrity-act-re-introduced-in-congress-to-protect-federal-science

Desikan, Anita. 2024. “Four Steps Federal Agencies Need to Take for Better Public Engagement.” *The Equation (blog)*. May 20. https://blog.ucsusa.org/anita-desikan/four-steps-federal-agencies-need-to-take-for-better-public-engagement

Desikan, Anita, and Jacob Carter. 2023. *Getting Science Back on Track: Voices of Scientists Across Six Federal Agencies*. Cambridge, MA: Union of Concerned Scientists. https://www.ucsusa.org/sites/default/files/2023-02/getting-science-back-on-track-report-revised.pdf

Desikan, Anita, Jacob Carter, F. Abron Franklin, Raechel McKinley, Jennifer Orme-Zavaleta, and Andrew A. Rosenberg. 2023b. *Diversifying the Federal STEM Workforce*. Cambridge, MA: Union of Concerned Scientists. https://doi.org/10.47923/2023.15242

Desikan, Anita, Jacob Carter, Shea Kinser, and Gretchen Goldman. 2019. *Abandoned Science, Broken Promises: How the Trump Administration’s Neglect of Science Is Leaving Marginalized Communities Further Behind*. Cambridge, MA: Union of Concerned Scientists. https://www.ucsusa.org/sites/default/files/2019-10/abandoned-science-broken-promises-web-final.pdf

Desikan, Anita, Taryn MacKinney, Casey Kalman, Jacob M. Carter, Genna Reed, and Gretchen T. Goldman. 2023a. “An Equity and Environmental Justice Assessment of Anti-Science Actions during the Trump Administration.” *Journal of Public Health Policy* 44: 147–162. https://doi.org/10.1057/s41271-022-00390-6

Ellickson, Kristie. 2023a. “Understanding the Science to Better Protect the Public from Cumulative Impacts.” *The Equation (blog)*. January 23. https://blog.ucsusa.org/kellickson/understanding-the-science-to-better-protect-the-public-from-cumulative-impacts

Ellickson, Kristie. 2023b. “It’s Time for EPA to Regulate Chemicals by Class.” *The Equation (blog)*. April 21. https://blog.ucsusa.org/kellickson/its-time-for-epa-to-regulate-chemicals-by-class

EPA (Environmental Protection Agency). 2020. “Vinyl Chloride.” March. https://www.epa.gov/sites/default/files/2020-05/documents/vinyl_chloride_march_26_2020.pdf

EPA (Environmental Protection Agency). 2024a. “Chlorpyrifos.” February 7. https://www.epa.gov/ingredients-used-pesticide-products/chlorpyrifos

EPA (Environmental Protection Agency). 2024b. *2021 Annual Report on Scientific Integrity*. Washington, DC: EPA. March 15. https://www.epa.gov/scientific-integrity/2021-annual-report-scientific-integrity

Equitable Data Working Group. 2022. *A Vision for Equitable Data Recommendations from the Equitable Data Working Group*. Washington, DC: OSTP. https://www.whitehouse.gov/wp-content/uploads/2022/04/eo13985-vision-ftableor-equitable-data.pdf

Federal Register. n.d. "Agencies Found: 439." https://www.federalregister.gov/agencies. Accessed July 30, 2024.

FEMA (Federal Emergency Management Agency). 2023. "About Us." July 7. https://www.fema.gov/about

FEMA (Federal Emergency Management Agency). 2024a. "Climate Resilience." February 8. https://www.fema.gov/emergency-managers/risk-management/climate-resilience

FEMA (Federal Emergency Management Agency). 2024b. "Flood Maps." January 22. https://www.fema.gov/flood-maps

Fenske, Richard A., Chensheng Lu, Dana Barr, and Larry Needham. 2002. "Children's Exposure to Chlorpyrifos and Parathion in an Agricultural Community in Central Washington State." *Environmental Health Perspectives* 110: 549–553. https://doi.org/10.1289%2Fehp.02110549

42 U.S. Code § 241. 1926. "Research and Investigations Generally." *United States Code*. https://www.law.cornell.edu/uscode/text/42/241

GAO (Government Accountability Office). 2023. *Cares Act: Experts Identified Safeguards to Help Selected HHS Agencies Protect Against Potential Political Interference*. Washington, DC: GAO. September. https://www.gao.gov/assets/gao-23-106529.pdf

Gee, Gilbert C., and Chandra L. Ford. 2011. "Structural Racism and Health Inequities." *Du Bois Review* 8: 115–132. https://doi.org/10.1017/S1742058X11000130

Goldman, Gretchen T., Jacob M. Carter, Yun Wang, and Janice M. Larson. 2020. "Perceived Losses of Scientific Integrity under the Trump Administration: A Survey of Federal Scientists." *PLOS One* 15. https://doi.org/10.1371/journal.pone.0231929

Goldman, Gretchen, Genna Reed, Michael Halpern, Charise Johnson, Emily Berman, Yogin Kothari, and Andrew Rosenberg. 2017. *Preserving Scientific Integrity in Federal Policymaking: Lessons from the Past Two Administrations and What's at Stake under the Trump Administration.* Cambridge, MA: Union of Concerned Scientists. https://www.ucsusa.org/sites/default/files/attach/2017/01/preserving-scientific-integrity-in-federal-policymaking-ucs-2017.pdf

Goodwin, James. 2019. *Regulation as Social Justice: A Crowdsourced Blueprint for Building a Progressive Regulatory System*. Washington, DC: Center for Progressive Reform. https://cpr-assets.s3.amazonaws.com/documents/Regulation-as-Social-Justice-Report-FINAL.pdf

Government of Canada. 2024. "The Status of Federal Scientific Integrity Policies—December 2023." March 22. https://science.gc.ca/site/science/en/office-chief-science-advisor/scientific-integrity/status-federal-scientific-integrity-policies-december-2023

Halpern, Michael. 2019. “Scientific Integrity in Federal Agencies.” Testimony to House Committee on Science, Space, and Technology, Joint Subcommittee on Investigations & Oversight and Subcommittee on Research & Technology Hearing. July 17. https://www.congress.gov/116/meeting/house/109800/witnesses/HHRG-116-SY15-Wstate-HalpernM-20190717.pdf

Hardell, Sara, Hanna Tilander, Gretchen Welfinger-Smith, Joanna Burger, and David O. Carpenter. 2010. “Levels of Polychlorinated Biphenyls (PCBs) and Three Organochlorine Pesticides in Fish from the Aleutian Islands of Alaska.” *PLOS One* 5. https://doi.org/10.1371/journal.pone.0012396

Harris, Gardiner, and William J. Broad. 2009. “Scientists Welcome Obama’s Words.” *New York Times,* January 21. https://www.nytimes.com/2009/01/22/us/politics/22science.html

Hidalgo, Nalleli, Ana Parras, and Bryan Parras. 2021. “Texas Expanding Language Access for Decisions involving Pollution Permits.” Press release, August 26. https://earthjustice.org/press/2021/texas-expanding-language-access-for-decisions-involving-pollution-permits

Hitlin, Paul, and Nadzeya Shutava. 2022. *Trust in Government: A Close Look at Public Perceptions of the Federal Government and Its Employees*. Washington, DC: Partnership for Public Service. March 23. https://ourpublicservice.org/publications/trust-in-government

Holdren, James. 2010. “Memorandum for the Heads of Executive Departments and Agencies: Scientific Integrity.” December 17. https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/scientific-integrity-memo-12172010.pdf

Johnston, Jill, and Lara Cushing. 2020. “Chemical Exposures, Health, and Environmental Justice in Communities Living on the Fenceline of Industry.” *Current Environmental Health Reports* 7: 48–57. https://doi.org/10.1007/s40572-020-00263-8

Krieg, Eric J., and Daniel R. Faber. 2004. “Not So Black and White: Environmental Justice and Cumulative Impact Assessments.” *Environmental Impact Assessment Review* 24: 667–694. https://doi.org/10.1016/j.eiar.2004.06.008

Lawrimore, Jay. 2018. “Thomas Jefferson and the Telegraph: Highlights of the U.S. Weather Observer Program.” *Beyond the Data* (blog). May 17. https://www.climate.gov/news-features/blogs/beyond-data/thomas-jefferson-and-telegraph-highlights-us-weather-observer

Lowell, Natalie, and Ryan P. Kelly. 2016. “Evaluating Agency Use of ‘Best Available Science’ under the United States Endangered Species Act.” *Biological Conservation* 196: 53–59. https://doi.org/10.1016/j.biocon.2016.02.003

Maslach, Christina, and Michael P. Leiter. 2016. “Understanding the Burnout Experience: Recent Research and Its Implications for Psychiatry.” *World Psychiatry* 15: 103–11. https://doi.org/10.1002/wps.20311

McDaniel, Justice. 2024. “Burn-off of Toxics in Ohio Derailment Was Unnecessary, NTSB Says.” *Washington Post*, June 25. https://www.washingtonpost.com/climate-environment/2024/06/25/east-palestine-train-derailment-chemicals-report

NASEM (National Academies of Sciences, Engineering, and Medicine). 2022. *Protecting U.S. Technological Advantage*. Washington, DC: National Academies Press. https://doi.org/10.17226/26647

Natale, Darlene W. 2022. "Propaganda Pandemics: The Use of Misinformation and Disinformation to Obfuscate Pandemics' Impact." *The Florida Communication Journal* 50. https://darlenenatale.com/wp-content/uploads/2023/10/FCJ-Fall-2022-cropped-4.pdf

National Archives. 2022. "Census Records." https://www.archives.gov/research/census

NCES (National Center for Education Statistics). n.d. "Fast Facts: Historical Reports." https://nces.ed.gov/fastfacts/display.asp?id=932. Accessed July 30, 2024.

Office of the US President. 1994. "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." February 16. https://www.federalregister.gov/documents/1994/02/16/94-3685/federal-actions-to-address-environmental-justice-in-minority-populations-and-low-income-populations

Office of the US President. 2009. "Memorandum for the Heads of Executive Departments and Agencies 3-9-09: Scientific Integrity." March 9. https://obamawhitehouse.archives.gov/the-press-office/memorandum-heads-executive-departments-and-agencies-3-9-09

Office of the US President. 2021a. "Memorandum on Restoring Trust in Government Through Scientific Integrity and Evidence-Based Policymaking." January 27. https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/27/memorandum-on-restoring-trust-in-government-through-scientific-integrity-and-evidence-based-policymaking

Office of the US President. 2021b. "Advancing Racial Equity and Support for Underserved Communities Through the Federal Government." January 20. https://www.federalregister.gov/documents/2021/01/25/2021-01753/advancing-racial-equity-and-support-for-underserved-communities-through-the-federal-government

OIG (Office of the Inspector General). 2003. *Evaluation Report: EPA's Response to the World Trade Center Collapse: Challenges, Successes, and Areas for Improvement*. Report No. 2003-P-00012. Washington, DC: Environmental Protection Agency. https://www.epa.gov/sites/default/files/2015-12/documents/wtc_report_20030821.pdf

OPM (Office of Personnel Management). n.d. "Open Government Data: Federal Agencies List." https://www.opm.gov/about-us/open-government/Data/Apps/Agencies. Accessed July 30, 2024.

Prabhakar, Arati. 2023. "Memorandum: Delivery of the Framework for Federal Scientific Integrity Policy and Practice." Office of Science and Technology Policy, January 12. https://www.whitehouse.gov/wp-content/uploads/2023/01/01-2023-Memorandum_on_Framework_Delivery.pdf

Rauh, Virginia, Srikesh Arunajadai, Megan Horton, Frederica Perera, Lori Hoepner, Dana B. Barr, and Robin Whyatt. 2011. "Seven-Year Neurodevelopmental Scores and Prenatal Exposure to Chlorpyrifos, a Common Agricultural Pesticide." *Environmental Health Perspectives* 119: 1196–1201. https://doi.org/10.1289/ehp.1003160

Rosenberg, Andrew A. 2021. “Brain Drain: Rebuilding the Federal Scientific Workforce.” Testimony to US House Committee on Science, Space, and Technology, Subcommittee on Investigations & Oversight Hearing. March 17. https://republicans-science.house.gov/_cache/files/a/a/aa314610-a49b-45bf-b82f-3a5db73985a2/3E212D0B6524001AB0CA7002A788D65A.2021-03-17-testimony-rosenberg.pdf

Sexton, Ken, and Stephen H. Linder. 2010. “The Role of Cumulative Risk Assessment in Decisions about Environmental Justice.” *International Journal of Environmental Research and Public Health* 7: 4037–4049. https://doi.org/10.3390/ijerph7114037

SI-FTAC (Scientific Integrity Fast-Track Action Committee). 2022. *Protecting the Integrity of Government Science*. Washington, DC: National Science and Technology Council. https://www.whitehouse.gov/wp-content/uploads/2022/01/01-22-Protecting_the_Integrity_of_Government_Science.pdf

SIF-IWG (Scientific Integrity Framework Interagency Working Group). 2023. *A Framework for Federal Scientific Integrity Policy and Practice*. Washington, DC: OSTP. January. https://www.whitehouse.gov/wp-content/uploads/2023/01/01-2023-Framework-for-Federal-Scientific-Integrity-Policy-and-Practice.pdf

Sprinkle, Robert Hunt, and Devon C. Payne-Sturges. 2021. “Mixture Toxicity, Cumulative Risk, and Environmental Justice in United States Federal Policy, 1980–2016.” *Environmental Health* 20. https://doi.org/10.1186/s12940-021-00764-5

SteelFisher, Gillian K., Mary G. Findling, Hannah L. Caporello, Keri M. Lubell, Kathleen G. Vidoloff Melville, Lindsay Lane, Alyssa A. Boyea, Thomas J. Schafer, and Eran N. Ben-Porath. 2023. “Trust in US Federal, State, and Local Public Health Agencies during COVID-19: Responses and Policy Implications.” *Health Affairs (Millwood)* 42, no. 3: 328–337. https://doi.org/10.1377/hlthaff.2022.01204

Swope, Carolyn B., Diana Hernández, and Lara J. Cushing. 2022. “The Relationship of Historical Redlining with Present-Day Neighborhood Environmental and Health Outcomes: A Scoping Review and Conceptual Model.” *Journal of Urban Health* 99: 959–983. https://doi.org/10.1007/s11524-022-00665-z

Tucker, Todd N., and Rajesh D. Nayak. 2020. *OIRA 2.0: How Regulatory Review Can Help Respond to Existential Threats*. New York, NY: The Great Democracy Initiative and the Roosevelt Institute. https://rooseveltinstitute.org/wp-content/uploads/2021/08/GDI_OIRA-2.0_202004.pdf

UCS (Union of Concerned Scientists). 2003. “World Trade Center Rescue Workers Believed EPA, Ended Up Sick.” Reports & Multimedia/Attacks on Science, April 8. https://www.ucsusa.org/resources/attacks-on-science/world-trade-center-rescue-workers-believed-epa-ended-sick

UCS (Union of Concerned Scientists). 2008. “2004 Scientist Statement on Restoring Scientific Integrity to Federal Policy Making.” Reports & Multimedia/Activist Resource, July 13. https://www.ucsusa.org/resources/2004-scientist-statement-scientific-integrity

UCS (Union of Concerned Scientists). 2011. "Obama Administration Ignored Science and Restricted Access to Plan B." Reports & Multimedia/Attacks on Science, September 30. https://www.ucsusa.org/resources/attacks-on-science/obama-administration-ignored-science-and-restricted-access-plan-b

UCS (Union of Concerned Scientists). 2017. "How Dow Chemical Influenced the EPA to Ignore the Scientific Evidence on Chlorpyrifos." Reports & Multimedia/Case Study, October 11. https://www.ucsusa.org/resources/how-dow-chemical-influenced-epa-ignore-scientific-evidence-chlorpyrifos

UCS (Union of Concerned Scientists). 2019. "Staff at HHS Were Unable to Talk About Gun Violence Research after Two Mass Shootings." Reports & Multimedia/Attacks on Science, December 6. https://www.ucsusa.org/resources/attacks-on-science/hhs-staff-unable-talk-about-gun-violence-research-after-mass-shootings

UCS (Union of Concerned Scientists). 2020. "Trump Administration Disavows Own Meteorologists for Issuing Factual Statement on Hurricane Dorian." Reports & Multimedia/Attacks on Science, February 3. https://www.ucsusa.org/resources/attacks-on-science/administration-disavows-meteorologists-statement-hurricane

UCS (Union of Concerned Scientists). 2022. "Trump Administration Interfered with CDC's Public Outreach on COVID-19." Reports & Multimedia/Attacks on Science, March 17. https://www.ucsusa.org/resources/attacks-on-science/trump-administration-interfered-cdcs-public-outreach-covid-19

UCS (Union of Concerned Scientists). 2024. "Attacks on Science." May 28. https://www.ucsusa.org/resources/attacks-on-science

Whitmer, Michelle. 2024. "Asbestos, 9/11 and the World Trade Center." March 25. https://www.asbestos.com/world-trade-center

https://doi.org/10.47923/2024.15597