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Federal scientist Linda Birnbaum says she was sometimes blocked from speaking to the press.

THE QUEST TO RESTORE SCIENTIFIC INTEGRITY

US federal whistle-blowers share stories about political interference in science as new measures to tackle it are announced. **By Virginia Gewin**

In September 2019, then-president Donald Trump falsely stated that Alabama was under threat from Hurricane Dorian as it approached the US mainland.

Three days later, despite assurances from local weather bureau officials that the claim was false, Trump showed reporters a map in which the storm's projected path seemed to have been altered with a Sharpie permanent marker. The National Oceanic and Atmospheric Administration (NOAA), a federal agency, endorsed Trump's assertion.

In June 2020, a NOAA review panel found that Neil Jacobs, an atmospheric scientist and the agency's acting administrator, and Julie Roberts, its deputy chief of staff and communications director, had "engaged in misconduct intentionally, knowingly or in reckless disregard" for the agency's scientific-integrity policy by backing Trump's incorrect assertion.

The incident, dubbed Sharpiegate, features in 'Protecting the Integrity of Government Science', a long-awaited report that the Biden administration's Task Force on Scientific Integrity released last week (see go.nature.com/3ztsjv6; see also *Nature* **601**, 310–311; 2022). Ordered by the current US president seven days after his inauguration in January last year, the task force's review of scientific-integrity policies at federal agencies sets out how trust in government can be restored through scientific integrity and evidence-based policymaking.

The report calls for an overarching body that works across federal government agencies to ensure and promote best practices, and to tackle scientific-integrity violations by senior officials that cannot be handled at the agency level. These include political interference and suppression or distortion of data.

According to the Silencing Science Tracker, Sharpiegate is one of some 500 documented attempts to restrict, prohibit or misuse scientific research, education or discussion since Trump's election win in November 2016. The tracker is a joint initiative of the Climate Science Legal Defense Fund (a non-profit organization that assists climate scientists who are silenced or face legal action because of their findings or fields of study) and Columbia University's Sabin Center for Climate Change Law, both based in New York City.

Concerns about political interference have plagued many US administrations, says Lauren Kurtz, the Climate Science Legal Defense Fund's executive director. Kurtz says that 2021 – when the fund helped 41 scientists with legal issues including censorship, open records and scientific advocacy – was one of its busiest

years. A 2018 analysis found that scientific-integrity violations in the US government had increased in breadth and number in recent years (see go.nature.com/34pcjxv). Most agencies don't have robust scientific-integrity policies, she adds; nor are the policies they do have applied consistently among employees and the contractors who are hired to work on specific government projects.

The task force's 67 members, appointed from 29 government agencies, reviewed agency policies, plus comments and suggestions from more than 200 individuals and organizations. Its focus was on how to prevent political interference in the communication of science, and how to improve the transparency of scientific-integrity policies. Also, more than 650 individuals attended 3 listening sessions last summer – indicating, says Kurtz, “the wide variety of groups that care deeply about the issues”. She commends the report for identifying problems and potential solutions, but points to some shortcomings. For example, although the report says that agencies should establish clear consequences for scientific-integrity violations, it contains “no mention of what sorts of consequences might be considered, how those might be applied, or even what is the goal of having consequences”.

Escalating attacks

Boosting scientific integrity and transparency will take a concerted effort from all researchers – both inside and outside federal agencies.

In October 2019, after 40 years as a federal scientist, toxicologist Linda Birnbaum retired from her post as a director of the National Institute of Environmental Health Sciences (NIEHS) in Durham, North Carolina, part of the National Institutes of Health. She says that politically motivated assaults on scientific research and findings reached new depths in March 2020.

“The overt attacks on science clearly came to a head with COVID-19,” Birnbaum says, citing as an example the tight controls placed on what officials from the Centers for Disease Control and Prevention (CDC) could and could not say about it.

During the Trump administration, Birnbaum says, she was discouraged, even blocked, from speaking to the press. Previously, she asked for clearance, but that never posed a problem, she says. It was standard procedure for her to get an internal policy review of manuscripts before submitting them to a journal for publication, and to get clearance from agency communications teams for interviews with reporters. But under Trump, she says, everything she wrote, even slides for conference presentations, had to be cleared.

Birnbaum says that she would make changes requested by deputy administrators, but that their interference could go only so far. “I would say whatever the hell I wanted to during my talk,” she says, and she told reporters that if

they came up to her afterwards, she wouldn't need clearance to speak to them. “There are certain workarounds, but it takes a lot of mental and emotional energy,” she says. Political interference in the work of federal scientists “violates the trust that the public places in government to best serve its collective interests”, says the task force report. It warns that federal agencies in which scientific integrity is not protected will struggle to recruit and retain scientists. And it distinguishes between a supervisor's edits to a scientific report, prompted by valid concerns about analytical techniques, and the distortion of outcomes to meet preferred policy objectives, which it describes as interference.

The report recommends mandatory scientific-integrity training for federal-agency staff whose roles require them to use science to make policy decisions. And a raft of proposed measures on building trust, openness and transparency between scientists and communications staff include media training for federal scientists, and a recommendation that a scientist whose research features in a press release should enjoy the “right of last review” of scientific content.

Integrity complaints

In September 2017, marine biologist Peter Corkeron and his colleagues published data on a significant decline in numbers of the North Atlantic right whale¹. But he alleges that his NOAA superiors ignored his findings until they were published, despite his repeated warnings about the severity of the situation, dating back to February 2016. North Atlantic right whale (*Eubalaena glacialis*) recovery had been a point of pride at NOAA, Corkeron says.

“The overt attacks on science clearly came to a head with COVID-19.”

But once the agency anticipated being sued by conservation and animal-protection groups for failing to prevent whale numbers decreasing, he declined to fall in line with the decision by NOAA's National Marine Fisheries Service to stop putting information on the whales' status in e-mails or internal memos. In March 2018, after e-mailing his frustrations that the fisheries services was doing too little to protect the whales from extinction, Corkeron received a formal letter of reprimand to caution him that “professionalism and courtesy will be expected in all further communications”.

One option open to him was to file a formal scientific-integrity complaint, he says. Such complaints can include allegations of mismanagement, misconduct, abuse of authority, or censorship that compromises an agency's scientific record. At NOAA, this involves a

written allegation including the names, facts, documents, witnesses and an explanation of the alleged misconduct; the complainant can remain anonymous. For various reasons, including that his complaint involved members of the body overseeing the process, Corkeron sought a new job, and since October 2019 he has led the whale-research programme at the New England Aquarium in Boston, Massachusetts.

“All you can do is decide what your ‘red line’ is,” he says, and understand that pushing back when that line is crossed will be a stressful experience. *Nature* asked NOAA to comment on Corkeron's claims about the lack of support for his research, his letter of reprimand and the decision to avoid discussing whale declines with him in writing. A spokesperson said the agency did not comment on personnel matters, but confirmed that Corkeron and his North Atlantic right-whale research were never the subject of a scientific-integrity allegation at the agency.

In his submission to the task force, Corkeron points to a loss of public trust in federal science when large numbers of staff leave in a short time frame. He also called for an office overseeing integrity across all federal government agencies, and highlighted problems with the internal policy-review process.

Whistle-blower insights

Evi Emmenegger spent 28 years as a research microbiologist at the Western Fisheries Research Center in Seattle, Washington, a biosafety laboratory operated by the US Geological Survey (USGS). It was home to numerous pathogens, including exotic and invasive viruses. Emmenegger says that, in July 2017, she raised concerns to her supervisors about contaminated waste water being released in nearby wetlands over a six-month period, but that no immediate corrective actions were taken. She filed a scientific-integrity complaint in mid-September, according to Jeff Ruch, a director at Public Employees for Environmental Responsibility (PEER), a non-profit organization in Silver Spring, Maryland, that supports potential government whistle-blowers. In February 2020, PEER highlighted Emmenegger's case on its website. It claimed that the USGS had dismissed her complaint and sought to fire her because of alleged issues with the quality of a research paper that she had prepared. She was placed on administrative leave for 13 months, but was officially reinstated on 10 May 2021.

Before her reinstatement, Emmenegger told *Nature* she thought that the US Whistleblower Protection Act – passed in 1978 and updated in November 2012 to permit whistle-blowers to collect compensatory damages – lacks teeth.

The current system, she said, is concerned mainly with damage control and does little to protect those who reveal alleged wrongdoings. The task force report urges agencies to post



Microbiologist Evi Emmenegger faced dismissal after raising concerns about waste water.

its scientific-integrity policies online, along with instructions for reporting concerns, and to publish regular public reports on integrity violations and how they are addressed.

Emmenegger also advised whistle-blowers to hire a lawyer and to contact government-accountability groups. In the United States, these include PEER; the Union of Concerned Scientists (UCS), a science-advocacy non-profit organization based in Cambridge, Massachusetts; and the Environmental Protection Network, a group of more than 550 former Environmental Protection Agency (EPA) staff and political employees formed in January 2017. The task force report stresses the importance of protecting those who report alleged scientific-integrity violations.

Ruch is representing Emmenegger in negotiations with the USGS over her return to work; the agency declined to comment for this story. PEER describes the task force report as “underwhelming” and lacking specifics, “all but ensuring the Biden administration will fall short on its effort to strengthen federal scientific-integrity policies”.

Employability

Kurtz advises people who are considering filing a formal complaint to “see if the scientific-integrity office of their agency has put any reports out, to see how previous complaints have been resolved”. It’s also a good idea to gauge the level of internal support for a complaint. “Still, the best option is to go to the [agency’s] scientific-integrity official,” says Jacob Carter, a senior scientist at the UCS. Sometimes, that person will schedule a meeting off the record to explore whether a formal complaint has merit, he adds.

In 2017, Joel Clement, a former climate-policy adviser at the Department of the Interior, filed a whistle-blower complaint after being moved to an accounting post from his

role helping Alaska Native communities to adapt to climate change. Clement claims that the move was triggered after he spoke out publicly – including at a United Nations conference – about the dangers these communities face from a changing climate. He described what happened to him in an opinion piece in *The Washington Post*. *Nature* asked the Department of the Interior to comment on why Clement was moved to an accounting post, but it declined.

Clement says that some organizations – including his current employer, the Belfer Center for Science and International Affairs at the Harvard Kennedy School in Cambridge – will hire former whistle-blowers. “You don’t have to wear a scarlet W [for whistle-blower] – showing that you care about ethics of the workplace is valuable to employers,” he says.

Soon after Trump’s election, about ten environmental researchers in academia and non-profit organizations brainstormed ways to monitor government data integrity and website information as a pre-emptive strike against possible data loss. The result was the formation of the Environmental Data & Governance Initiative (EDGI), which archived government data and also monitored federal websites and created a new academic field, environmental data justice.

“We were very concerned about the possibility of data loss,” says the EDGI’s co-founder Sara Wylie, a researcher studying large-scale environmental-health issues at Northeastern University in Boston.

“What we did see was more subtle than that; it was the removal of key data and background information – the biggest shift being the removal of the EPA’s climate-change page from its website in January 2017, which was a clear signal about the administration’s priorities, she says.

“There is an enormous space for researchers from all different fields to gather and pool

their expertise and approaches to do work in the public interest rapidly.”

Stony Brook University in Long Island, New York, hosts the EDGI’s mirror of an EPA database whose records track the agency’s enforcement of federal environmental laws. This mirroring makes the information more accessible and understandable to the public. “We are actively building partnerships with academics and NGOs to use these tools to share EPA enforcement data in meaningful ways to engage the public,” Wylie adds.

The team also interviewed 50 long-term federal-agency employees and wrote ‘The First 100 Days and Counting’ (see go.nature.com/3t-mxa2f). This report documented the fossil-fuel industry’s influence on the Trump administration, changes in how climate science was presented to the public and the administration’s hostility to scientific research and evidence.

The researchers followed that up with two peer-reviewed articles – the first looking at the EPA early in the Trump administration²; the second recounting US presidential interventions on environmental health protection³. They also produced a report entitled *A Sheep in the Closet*⁴. The authors testified before Congress about declines in the Trump administration’s enforcement of EPA regulations.

The Wayback Machine Internet archive has implemented EDGI-developed software to let others track changes to websites, says Wylie. “The key element is to make it possible for others to build on and iterate on [the software], with a clear set of guiding values that are shared publicly,” she says, adding that a high level of transparency is crucial for organizations aiming to hold federal agencies accountable.

Leif Fredrickson, an environmental-policy historian at the University of Montana in Missoula and an EDGI member, says that the convoluted presentation of government information obscures the EPA’s overall mission. The EDGI has therefore created what it calls A People’s EPA, an attempt to make the agency’s data and policy clearer for the public.

“We’re going to put up long-term data sets on stuff like budget and staffing for EPA so that when budget numbers come out, they can be quickly contextualized in a broader history,” says Fredrickson, who has interviewed 90 former and current EPA staffers. “It’s going to take a lot of different organizations to move in this direction” to ensure a better public understanding of government science.

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1. Pace, R. M. III, Corkeron, P. J. & Kraus, S. D. *Ecol. Evol.* **7**, 8730–8741 (2017).
2. Dillon, L. et al. *Am. J. Public Health* **108**, S89–S94 (2018).
3. Fredrickson, L. et al. *Am. J. Public Health* **108**, S95–S103 (2018).
4. Fredrickson, L. et al. *A Sheep in the Closet: the Erosion of Enforcement at the EPA* (Environmental Data & Governance Initiative, 2019).

Correction

This Career feature erroneously stated that federal agencies would struggle to retrain scientists. It should have said the agencies would struggle to retain them. It also mis-named the EDGI's initiative as the People's EPA. The initiative is A People's EPA.