

Trump shows his apathy for science

Climate skepticism, budget cuts, and regulatory rollbacks dominated the federal scientific landscape during the first year of his administration.

Whatever one's political views, few would argue that President Trump hasn't left a lasting mark on science, technology, and environmental policies one year into his presidency. From his neglect in appointing a science adviser and other key subcabinet-level officials with science and technology (S&T) responsibilities, to his rejection of the scientific consensus on climate change and his attempts to reverse carbon emissions limits imposed by Barack Obama, Trump's actions have diminished the importance of science in the federal government.

Trump's fiscal year 2018 budget plan, which hewed closely to a blueprint advanced by the conservative Heritage Foundation, proposed big reductions to all nondefense agencies having an S&T mission, save for NASA. (See *PHYSICS TODAY*, July 2017, page 34.) It included a \$5.6 billion, 17% cut to the National Institutes of Health and a \$1.4 billion, 70% rollback to the Department of Energy's energy efficiency and renewable energy programs. For NSF, he proposed an 11% cut, and DOE's Office of Science, which provides most of the funding for basic research in the physical sciences, faced a 16% cut.

John Holdren, Obama's science adviser, noted that absent a capable scientist in the White House, the president might not see the relevance of S&T to the choices before him. He might not know when he needs to ask a question of a science-related agency or what question to ask. Holdren added that it's helpful for the president to have a trusted source of S&T information independent of the agendas of the particular agencies.

The White House science adviser, who also serves as director of the Office of Science and Technology Policy (OSTP), is one of a few dozen presidentially ap-



PRESIDENT TRUMP receives a NASA flight jacket after signing the NASA Transition Authorization Act this past April.

pointed S&T positions that have yet to be filled. Others include the four associate directors at OSTP, the director of the Department of Energy's Office of Science, the director of the US Geological Survey, the administrator and chief scientist at NOAA, the undersecretary of defense for research and engineering, and the deputy director of NSF. (A more precise listing of vacancies would depend on how broadly or narrowly those responsibilities are defined.) Trump has yet to assemble a presidential council of S&T advisers or to convene the National Science and Technology Council, the cabinet-level entity that coordinates federal S&T policy.

Many of the administration's appointments have been controversial. "The list of conflicted or unqualified appointees is extremely long, when they bother to fill the positions at all," says Michael Halpern of the Union of Concerned Scientists. He points to the naming of Albert Kelly, a disgraced Oklahoma banking executive with no environmental background, to head

the Superfund program at the Environmental Protection Agency, and William Wehrum, who was confirmed in November as EPA assistant administrator of air and radiation. Wehrum, a lawyer who represented the oil and gas, chemical, and manufacturing industries in contesting EPA actions, had been forced to withdraw his nomination to that same post by President George W. Bush due to Senate opposition.

The Interior Department ordered the National Academies of Sciences, Engineering, and Medicine in August to end a study already under way on the health risks of surface mining on communities in Appalachia and in December to end another study on Interior's safety inspections of offshore oil and gas operations. Later in December the National Academies issued a statement urging resumption of the surface-mining study and added that some private donors have indicated interest in funding its completion.

Halpern notes that implicit or explicit hiring freezes at the EPA and other

PAUL WILLIAMS, WHITE HOUSE PHOTO



regulatory agencies have left them with diminished scientific and analytic capacities needed to develop and enforce environmental laws.

Climate change and the EPA

Nowhere has the contrast between the Obama and Trump administrations been starker than on climate change and other environmental policies. Trump reaffirmed his personal denial of climate change as recently as 28 December. Commenting on a cold snap gripping the eastern half of the US, he posted to Twitter, "Perhaps we could use a little bit of that good old Global Warming that our Country, but not other countries, was going to pay TRILLIONS OF DOLLARS to protect against. Bundle up!"

On 18 December Trump issued a statement that removed climate change as a national security threat, undoing the Obama-era designation. Yet a week earlier, he signed into law the voluminous FY 2018 National Defense Authorization Act, which included a provision declaring climate change a "direct threat to the national security of the United States." The legislation requires the Pentagon to

prepare a report on how military installations and overseas staff may be vulnerable to climate change over the next 20 years. It's not unusual for a president to assent to must-pass bills containing provisions he objects to. But significantly, 46 House Republicans voted against a GOP-sponsored attempt to remove the climate change measure from the final bill.

Trump has named climate change skeptics to prominent positions in his administration; most notable was his appointment of former Oklahoma attorney general Scott Pruitt as Environmental Protection Agency administrator. Others include Interior secretary Ryan Zinke, Energy secretary Rick Perry, and Office of Management and Budget (OMB) director Mick Mulvaney. His nominee for NASA administrator, Representative Jim Bridenstine (R-OK), and his choice for chair of the White House Council on Environmental Quality, Kathleen Hartnett White, a former chair of the Texas Commission on Environmental Quality, also are acknowledged climate change skeptics.

An exception is Barry Myers, Trump's nominee for NOAA administrator. Myers, the founder of the private weather service AccuWeather, told lawmakers during his nomination hearing that he accepts the peer-reviewed literature showing the scientific consensus that human activity is mainly responsible for climate change.

In June Trump announced that the US will withdraw from the 2015 Paris climate change accord that Obama had helped to secure. That move leaves the US as the only nation not to have backed the pact. Soon thereafter Trump ordered the rescinding of the Clean Power Plan (CPP), which would have imposed limits on greenhouse gas emissions from existing fossil-fuel power plants (see PHYSICS TODAY, December 2016, page 26). Pruitt told the House Energy and Commerce Committee on 7 December that his opposition to the CPP was grounded in his conviction that the EPA had overstepped its constitutional authorities in regulating states. "Rule of law will again take center as we make decisions around the responsibilities that I have as administrator," he told lawmakers.

In April the EPA took down the climate change page of its website to update the language "to reflect the approach of new leadership." The page has yet to be

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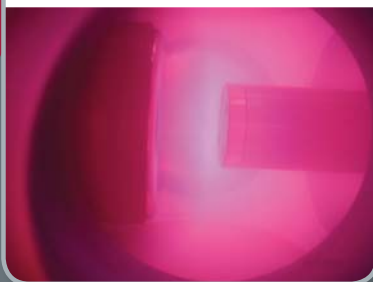
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SCOTT PRUITT, Environmental Protection Agency administrator



MITCHELL RESNICK, WHITE HOUSE PHOTO

restored, though some climate change information remains accessible through a subject index on the EPA site.

The Environmental Data and Governance Initiative, an organization of academics and employees of nonprofits, documented the removal of climate change pages from the Interior Department's websites. Information about international obligations regarding climate change has been excised from the EPA, DOE, and State Department websites, and online descriptions of agencies' priorities have shifted to emphasize job creation and downplay renewable fuels, the group said in a report released last month. On DOE's website, mentions of "clean energy" were removed, as were explanations of the harmful effects of fossil fuels.

Pruitt made a name for himself in Oklahoma by suing the EPA more than a dozen times in attempts to halt implementation of several air and water regulations, notably the CPP. Pruitt has proposed conducting a "red team-blue team" debate-like exercise often used by the military; in a process open to the public, it would pit a team of climate change science skeptics against a team that holds the consensus view. Floated last year by physicist and former undersecretary of energy Steven Koonin, the idea is to identify weaknesses in the scientific consensus where additional research may be desirable before implementing policies that could have negative economic or environmental repercussions.

The administration's undoing of Obama-era climate change efforts isn't limited to the EPA. For example, in December the American Geophysical Union magazine *Eos* reported that DOE will shut down this year what was to be

a \$100 million, 10-year effort to improve the accuracy of modeling how tropical forests will respond to climate change, after just three years.

Pruitt further shook up critics by declaring that scientists who are receiving EPA grants cannot serve on any of the agency's 22 scientific advisory committees. In announcing that decision in October, Pruitt estimated that 20 grantees who sat on three committees had collectively received \$77 million in agency awards while serving on those panels. "That causes a perception or an appearance of a lack of independence," he told the December House hearing; he said that the affected scientists could continue to serve if they terminated their grants.

On 21 December three former EPA advisory committee members joined a lawsuit brought by Physicians for Social Responsibility, the National Hispanic Medical Association, and the International Society for Children's Health and the Environment. The suit challenges the new policy, calling it an "illegal attempt to override federal ethics rules." Charging that the exclusion of grantees "is arbitrarily biased in favor of polluting industries," the plaintiffs warned the policy "will undermine the integrity of EPA science and introduce pro-polluter bias into agency decisions and programs."

Former EPA administrator Gina McCarthy says that to avoid conflicts of interest, the Obama administration followed detailed procedures when identifying scientists to serve on advisory panels. "No scientist who gets funding for their project is able to advise the agency on anything related to that particular work," she says. Industry lobbyists and state officials who serve on the commit-



RICK PERRY, secretary of energy

tees under Pruitt undergo no similar review for vested interests they might have, she and others note.

McCarthy says the Trump administration will find it difficult to roll back some Obama-era regulations, such as the 2015 Waters of the United States rule that Trump ordered to be revisited shortly after taking office. Altering environmental rules requires identifying a flaw in either the underlying science or the law or finding that the administrative procedures weren't followed during the rulemaking process. McCarthy says she can't predict whether courts will accept Pruitt's federal overreach argument on the CPP but adds that the trend to cleaner energy sources is irreversible with or without the plan. Harvard Law School, Columbia Law School, and other groups are tracking the Trump administration's rollback of environmental regulations. A *New York Times* analysis from December reports 29 overturned rules, 24 rollbacks in progress, and 7 rollbacks in limbo.

The *Times* and *ProPublica*, citing information obtained under the Freedom of Information Act, reported in December that more than 700 EPA staff, including more than 200 of its 1600 scientists, had quit, retired, or taken a buyout since the onset of the Trump administration.

McCarthy says the cutbacks in staff and resources to the EPA's S&T programs are what concern her the most. "One thing we all know for sure is that the role of the federal government in terms of science and technology cannot be duplicated at the state level. You need a strong science component and capability at the federal level, and you need good labs and technical folks who can

work through crises, like the Flint water problem."

Department of Energy

Trump's appointment of former Texas governor Perry as secretary of energy was in the mold of his naming Pruitt: Perry had famously pledged during his short-lived 2012 presidential campaign to abolish DOE—but then couldn't remember the agency's name. Perry reassured senators at his confirmation hearing that he had changed that view and that he would do what he could to mitigate Trump's proposed budget cuts.

Aiming to help prop up the ailing coal and nuclear power generation industries, Perry proposed a rule to the Federal Energy Regulatory Commission (FERC) to help them compete in the bulk electricity markets, primarily with low-cost natural gas. The controversial proposal, which FERC commissioners unanimously denied last month, would have provided a subsidy to nuclear and coal generation plants for storing a 90-day supply of fuel onsite. That would supposedly provide resilience to the grid in the event of a crisis, Perry had argued.

Trump proposed eliminating the Advanced Research Projects Agency-Energy, a small DOE office that supports development of innovative, high-risk, high-payoff, clean-energy technologies. Trump did propose maintaining US participation in ITER, the seven-party international effort to construct an experimental fusion reactor in southern France, albeit at a lower level than last year.

NASA

Trump spared NASA from the budget cuts he put forward for other science

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agencies. He reinstated the Moon as the next destination for human exploration beyond low-Earth orbit and thereby rejected the Obama administration's plan to forgo the Moon in favor of sending astronauts to an asteroid that would be brought closer to Earth by a robotic mission. Trump, however, didn't set a timetable or specify the level of funding to be devoted to the Moon mission.

Consistent with his climate change views, Trump proposed cutting NASA's

Earth science program by 9% and canceling multiple Earth-observing missions.

Trump's choice of Bridenstine for NASA administrator appeared in jeopardy at press time. At least one GOP senator, Marco Rubio of Florida, has indicated he may not vote to confirm Bridenstine, who has no science or engineering background. With Republicans now holding a slim one-vote margin in the Senate, another GOP defection would deny Bridenstine the job—a tie

would presumably be broken by Vice President Pence.

Scientists push back

Trump's policies have engendered a new activism among scientists, a community traditionally averse to political participation. "There's a thirst for engagement that I haven't seen in 15 years . . . , and a lot of scientific societies are stepping up to the plate," says Halpern. "Ensuring the federal scientific enterprise continues to thrive has become a big priority of many scientists across the country." Most visibly, hundreds of thousands of scientists and their advocates rallied in April in Washington, DC, and at dozens of other March for Science events held around the world (see physicstoday.org/MarchForScience).

Reacting to Pruitt's ban on grantee participation on EPA science advisory committees, the Association of Environmental Engineering and Science Professors in November announced that it would create a shadow environmental committee to review the work of EPA advisory panels.

In December, 42 scientific societies and universities wrote to OMB director Mulvaney objecting to news reports that the Centers for Disease Control and Prevention had banned the use of certain terms, including "science-based" and "evidence-based" in budget documents. While noting the CDC director's denial that there had actually been a ban, the signatories added, "Our community remains concerned and requests you encourage the heads of all federal agencies to support the use of science in decision making."

The Data Refuge project was organized by librarians, archivists, and scientists to archive terabytes of climate data threatened for removal from the websites of NOAA, the EPA, and other agencies (see *PHYSICS TODAY*, March 2017, page 31).

Through it all, scientists have continued doing science. "In many ways this has been a good year for science. There has been great research with important results," says Rush Holt, CEO of the American Association for the Advancement of Science. That includes yet more evidence that climate change is occurring and, he adds, that "its effects will be on the greater, not lesser, side of the range of expectations."

David Kramer

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