

DEREGULATION USING STEALTH “SCIENCE” STRATEGIES

THOMAS O. MCGARITY & WENDY E. WAGNER†

ABSTRACT

In this Article, we explore the “stealth” use of science by the Executive Branch to advance deregulation and highlight the limited, existing legal and institutional constraints in place to discipline and discourage these practices. Political appointees have employed dozens of strategies over the years, in both Democratic and Republican administrations, to manipulate science in ends-oriented ways that advance the goal of deregulation. Despite this bald manipulation of science, however, the officials frequently present these strategies as necessary to bring “sound science” to bear on regulatory decisions. To begin to address this problem, it is important to reconceptualize how the administrative state addresses science-intensive decisions. Rather than allow agencies and the White House to operate as a cohesive unit, institutional bounds should be drawn around the scientific expertise lodged within the agencies. We propose that the background scientific work prepared by agency staff should be firewalled from the evaluative, policymaking input of the remaining officials, including politically appointed officials, in the agency.

TABLE OF CONTENTS

Introduction	1720
I. Deregulatory Strategies	1724
A. Adjusting the Substance of the Science	1724
1. <i>Censoring Science</i>	1725
2. <i>Limiting Scientific Input</i>	1728
3. <i>Safety in Models</i>	1729
4. <i>Studying Rather than Acting and Raising the Burden of Proof</i>	1733

Copyright © 2019 Thomas O. McGarity & Wendy E. Wagner.

† McGarity is Joe R. and Teresa Lozano Long Endowed Chair in Administrative Law, University of Texas School of Law; Wagner is Richard Dale Endowed Chair, University of Texas School of Law. We are grateful to Jennifer Nou, Arti Rai, and the participants at the *Duke Law Journal* 2019 spring symposium for helpful comments and suggestions. Special thanks go to the *Duke Law Journal* editors, particularly Scott Grundei, for their wonderful work on this piece.

5. <i>Rewriting Reports Relevant to Regulatory Issues</i>	1740
6. <i>Substituting Deregulatory Policy for Science</i>	1743
B. <i>Adjusting Internal Resources and Procedures</i>	1747
1. <i>Cutting the Budgets for Technical Staff and Scientific Research</i>	1748
2. <i>Changing Organizational Charts and Shifting Personnel</i>	1752
C. <i>Changing the Rules for Scientific Deliberations</i>	1756
1. <i>Marginalizing External Review of Agency Science</i>	1757
2. <i>Constraining the Staff's Analysis of the Best Available Science</i>	1767
II. <i>Analysis</i>	1769
A. <i>Courts</i>	1772
B. <i>Congress</i>	1773
C. <i>Agency Counter-Pressure</i>	1774
1. <i>Science Integrity Policies</i>	1775
2. <i>Science Advisory Boards</i>	1778
3. <i>Staff</i>	1779
D. <i>The Scientific Community and the Media</i>	1781
III. <i>Reform</i>	1783
A. <i>Firewalling the Scientific Literature Review and Analysis from Policy Input</i>	1785
1. <i>Support for Firewalls</i>	1787
2. <i>Precedent for a Firewall</i>	1789
3. <i>Practical Implementation</i>	1791
B. <i>Reinforcing Reforms</i>	1800
1. <i>Science Advisory Boards</i>	1800
2. <i>Deliberative Process Privilege</i>	1802
Conclusion	1802

INTRODUCTION

Any new president who, like President Trump, campaigns on a deregulatory platform is in for some unpleasant surprises after the election. Undoing regulation, particularly in the areas of health, safety, and the environment, is not as easy as it might appear. Rolling back most major rules is tedious because it requires notice-and-comment rulemakings under the Administrative Procedure Act (“APA”),¹ with

1. See 5 U.S.C. §§ 553(c), 706(2)(a) (2012) (requiring notice and comment on informal

all its attendant headaches and delays. But it is also difficult because protective rules tend to be in place for reasons that transcend the politics of a single election year. A legally solid case for less regulation must surmount at least three significant hurdles that are endemic to federal regulation.

First, the president’s agenda may be blocked by statutory mandates that, in some instances, unambiguously direct agencies to protect the public health and welfare, with uncertainties resolved on the side of reducing risks.² To implement deregulatory health and environmental rules and policies, the president’s appointees will usually need to demonstrate, as a legal matter, that the deregulatory action is within the permissible range of actions allowed by an agency’s statute.³

Second, the president may encounter a public that is not as excited about deregulation as industry stakeholders. A large majority of Americans, when asked, support existing health, safety, and environmental protections. If anything, these Americans would like to see them *strengthened*. For example, in a recent Pew Research Center poll, 74 percent of adult respondents (90 percent of Democrats and 52 percent of Republicans) agreed with the statement that “the country should do whatever it takes to protect the environment,” while only 23 percent agreed with the statement that “the country has gone too far in its efforts to protect the environment.”⁴ If voters find that their highly valued health, safety, and environmental protections are being compromised to line the pocketbooks of a handful of rich corporations, some may shift allegiances and oppose deregulation.

Third, once the president enters the oval office, he becomes the head of a large bureaucracy that may not share his deregulatory goals. Turning that ship around takes a much heavier hand than simply putting into place a cadre of high-level appointees and articulating a deregulatory agenda. If the agency career staff is resistant, effectuating change may prove challenging because redirecting the bureaucracy is difficult.

rulemakings and providing opportunity for judicial review of final agency action).

2. *See, e.g.*, 42 U.S.C. § 7409(b)(1) (2012); 16 U.S.C. § 1533.

3. *See, e.g.*, *Sierra Club v. EPA*, 479 F.3d 875, 876 (D.C. Cir. 2007) (reversing and remanding EPA air toxics standard promulgated under the George W. Bush administration because the agency’s rule violated the legal constraints imposed by the authorizing statute, the Clean Air Act).

4. Monica Anderson, *For Earth Day, Here’s How Americans View Environmental Issues*, PEW RES. CTR. (Apr. 20, 2017), <http://www.pewresearch.org/fact-tank/2017/04/20/for-earth-day-heres-how-americans-view-environmental-issues> [<https://perma.cc/3PL6-5LTL>].

One viable solution to this dilemma is to adopt stealth “science” strategies. By reaching into the science supporting past or ongoing regulatory actions and changing what the record says, a deregulatory president can sidestep at least the first two problems.⁵ Changing the science underlying a regulation allows the president to stay within the constraints of protective statutes. The president can show that the deregulatory action does not, on the face of things, compromise the statute’s protective goals, because the modified science demonstrates that his policies remain comfortably within those mandates. Equally important, manipulating the underlying science gives the public a false assurance that their health and environment are being protected. To this end, invoking “sound science” on behalf of an agency decision that in fact may be based on ends-oriented manipulations of the record can lend the patina of objectivity.

Even if hurdles one and two can be overcome by playing games with science, the chief executive will still need to devise clever ways to grapple with hurdle three—the large number of career staffers, many of whom are scientists, who will most likely push back against efforts to manipulate science. Although overcoming this third hurdle can sometimes be difficult, some well-worn paths by previous administrations to manipulate science to advance deregulation are becoming evident.⁶ This Article explores these strategies, uncovering a playbook of sorts that shows how deregulation-minded presidential administrations, including the current one, have reconfigured the science underlying regulations to advance deregulatory policies.

In this Article, we trace out these stealth “science” strategies used to advance deregulation and assign them to three general categories.⁷ First, some political manipulation of science occurs deep within the

5. Note that this tactic of covertly manipulating the science to reach a predetermined policy result parallels in many ways the ends-oriented, legal strategy of statutory abnegation explored by Bill Buzbee in this issue. *See generally* William W. Buzbee, *Agency Statutory Abnegation in the Deregulatory Playbook*, 68 DUKE L.J. 1509 (2019) (exploring agency abnegation and its legal implications).

6. *See* Gretchen T. Goldman, et al., *Ensuring Scientific Integrity in the Age of Trump: Policies to Protect Government Scientists Must Be Defended*, 355 SCIENCE 696, 696 (2017) (observing that “[a]ll modern presidents—both Republicans and Democrats—have politicized science in some way”).

7. For purposes of this Article, we define “deregulation” broadly to include not only the revision or retraction of existing rules, as Caroline Cecot discusses, but also deliberate efforts to forestall the issuance of protective regulations as discussed by Sid Shapiro. *See* Caroline Cecot, *Deregulatory Cost-Benefit Analysis and Regulatory Stability*, 68 DUKE L.J. 1593 (2019); Sidney A. Shapiro, *Rulemaking Inaction and the Failure of Administrative Law*, 68 DUKE L.J. 1805 (2019).

record of individual decisions where the stakes for deregulation are high. In these cases, the political manipulation targets individual studies, model algorithms, or other basic features of the scientific record. These manipulations sometimes, although not always, put the administration in direct conflict with staff by dictating changes to the staff’s expert analysis. This can result in embarrassing leaks to the press or whistleblower complaints that are inconsistent with the stealth nature of the enterprise. But even when the staff publicizes the transgressions, the administration has the final say and, in some cases, can prevail with a revised, less protective policy based on questionable science that is not objectively “sound” or “good.”

Second, a new administration can attempt to deplete the scientific staff and its funding and adjust the lines of authority so that the administration makes the calls on developing the scientific record itself. When career staff impede top-down changes to existing projects, this second strategy reminds agency civil servants that, though the chief executive may not be able to fire them outright, he can most assuredly eliminate their positions. Staffers who do not fall in line are at least alerted to the reality that they must choose their battles carefully.

Third, the administration can lay down new ground rules for how science is used in agency decisionmaking. If designed carefully, these rules can lead to biased outcomes. For example, an administrator can revise procedures to ensure that peer review is done only by favored experts. Likewise, the administrator can dictate that career staff only consider research that meets narrow criteria established to tip the ultimate analysis in favor of a deregulatory policy. The political appointees can also ensure that the computational models developed or used by the agency are only those that move the analysis in the desired direction. These tactics are different because they attempt to change the ground rules for all the work that the staff does, not just the work on individual projects.

Part I considers each of these techniques in the context of presidential administrations, both Democratic and Republican, that have employed them in the past to advance deregulatory policies. Then, Part II analyzes these incidents before considering approaches to reform in Part III.

An important limitation of our analysis, evident from this Article’s title and the Symposium’s theme, is that it focuses exclusively on how this playbook has been used by administrations interested in

deregulation.⁸ However, the underlying problems in institutional design that allow for the manipulation of science could be deployed by any administration regardless of the desired policy. Thus, if a president wishes to implement overly stringent regulatory policies, he or she could deploy many of these strategies to manipulate science to advance that agenda as well.

I. DEREGULATORY STRATEGIES

Over the years, agency heads in administrations favoring deregulation have devised various strategies for overcoming federal regulatory hurdles through the stealth use of science. Administrations often present those strategies as necessary to bring “sound science” to bear on regulatory decisions. In this first Part, many of those strategies are identified. Examples are provided from past presidencies as well as the Trump administration. These strategies can cloak policymaking in the mantle of science to minimize opposition to what would otherwise be an unpopular resolution of a regulatory issue. The public, Congress, and even the courts may be wholly unaware that a model algorithm has been tweaked, one or more studies have been dropped from the analysis, or the peer review process has been manipulated to lead to the more hospitable oversight of deregulation.

A. *Adjusting the Substance of the Science*

Political appointees in agencies and the White House can change the outcome of regulatory initiatives by quietly manipulating the substance of the science upon which the initiatives necessarily rely. Upper-level political appointees have employed several strategies for accomplishing this result, including censoring agency scientists, limiting staff scientists’ input into agency decisions, tinkering with the models that the staff employs, putting off protective regulations to await further scientific input, rewriting reports used to support regulations, and substituting deregulatory policy for science. These will be taken up in roughly the order that they are applied in the decisionmaking process.

8. Several other limitations of this Article deserve highlighting: Rather than examine all forms of technical information used by agencies, this Article focuses only on the way natural science is (mis)used for rules and agency policies. We do not explore, for example, possible agency manipulation of social science and economic information. This Article also does not trace how stealth science strategies might impact governmental funding of research, focusing instead on regulatory decisionmaking.

1. *Censoring Science*. Politically appointed officials can achieve deregulatory ends by preventing the dissemination of scientific information, thereby reducing the probability that outsiders will use that information in regulatory decisionmaking.⁹ The easiest way for upper-level agency decisionmakers to implement this approach is to promulgate policies requiring government scientists to obtain upper-level approval before releasing scientific findings to Congress or the public. They can avoid censorship criticism by claiming that preapproval is necessary to ensure that the agency speaks with “one voice.”¹⁰ For example, the Inspector General of the National Aeronautics and Space Administration (“NASA”) concluded that from 2004–06, the agency’s Office of Public Affairs had “managed the topic of climate change in a manner that reduced, marginalized or mischaracterized climate change science made available to the general public” and that politics were “inextricably interwoven” into the agency’s pronouncements in a way that violated NASA’s basic charter.¹¹ Similarly, during the Trump administration, the Department of the Interior (“DOI”) required news releases on scientific studies undertaken by the U.S. Geological Service (“USGS”) to undergo a “policy review” by nonscientist upper-level officials in the Department.¹²

9. Goldman et al., *supra* note 6, at 696 (noting that political appointees have “prevented federal scientists from publicly sharing their research and expertise”).

10. See, e.g., UNION OF CONCERNED SCIENTISTS, SCIENTIFIC INTEGRITY IN POLICYMAKING, app. B at 39 (Mar. 2004) (describing a Department of Agriculture directive that required staff scientists to seek approval prior to publishing any research or speaking publicly on “sensitive issues,” a term that included “[a]gricultural practices with negative health and environmental consequences”); Susan Okie, *Tensions Between CDC, White House; Health Officials Say Low Morale Could Threaten Agency’s Ability to Handle Crises*, WASH. POST, July 1, 2002, at A15 (indicating communications between scientists in the Centers for Disease Control and the public were closely monitored by policymakers in the Department of Health and Human Services during the George W. Bush administration); Andrew C. Revkin, *Cheney’s Office Said to Edit Draft Testimony*, N.Y. TIMES, July 9, 2008, at A12 (reporting that Vice President Dick Cheney’s office and the White House Council on Environmental Quality sought deletions of sections of draft congressional testimony).

11. Andrew C. Revkin, *NASA Office Is Criticized on Climate Change Reports*, N.Y. TIMES, June 3, 2008, at A16.

12. Dino Grandoni & Juliet Eilperin, *Trump Official Said Scientists Went “Beyond Their Wheelhouse” by Writing Climate Change “Dramatically” Shrank Glaciers*, WASH. POST (Mar. 7, 2018), <https://www.washingtonpost.com/news/energy-environment/wp/2018/03/07/trump-official-said-scientists-went-outside-their-wheelhouse-by-writing-climate-change-dramatically-shrunk-montana-glaciers> [https://perma.cc/2ZQV-Q2JG]. In one case, the Department’s Assistant Secretary for Insular Affairs objected to a USGS press release stating that climate change had “dramatically reduced” glaciers in Montana in connection with a study showing that thirty-nine glaciers in Montana had diminished in size by as much as 85 percent since 1966. *Id.*

Another strategy is to prevent the staff from releasing staff-prepared reports that are likely to stimulate demands for regulatory action. For example, an unnamed Environmental Protection Agency (“EPA”) official reported in July 2018 that political appointees at the agency, including a former consultant to the chemical industry, were indefinitely delaying the release of a completed draft of a risk assessment that contained a troubling conclusion: the widely used chemical formaldehyde posed a risk to human beings of contracting leukemia and other diseases at exposure levels typically encountered in buildings in which formaldehyde-treated wood was present.¹³ The EPA official reported that upper-level political appointees were avoiding creating a record of their activities by eschewing written memos and emails and relying on “a children’s game of telephone.”¹⁴

Officials in agencies that fund scientific research can ensure that policy-relevant scientific questions remain unanswered by failing to write grants for projects aimed at answering those questions or canceling existing grants.¹⁵ In August 2017, for example, the DOI’s Office of Surface Mining Reclamation and Enforcement (“OSMRE”) ordered the National Academy of Sciences (“NAS”) to halt all work on a study that it had almost completed on the health risks posed by mountaintop removal mining operations to residents of nearby communities.¹⁶ OSMRE had commissioned the NAS study toward the end of the Obama administration to evaluate several epidemiological studies concluding that such operations caused cancer and birth defects and to suggest new approaches to reducing those health risks.¹⁷ The DOI’s Office of Inspector General concluded that OSMRE had wasted almost \$500,000 that it had already spent on the never-completed

13. Annie Snider, *Sources: EPA Blocks Warnings on Cancer-Causing Chemical*, POLITICO (July 6, 2018, 5:07 AM), <https://www.politico.com/story/2018/07/06/epa-formaldehyde-warnings-blocked-696628> [<https://perma.cc/H98N-LW3Y>].

14. *Id.*

15. See, e.g., Michael Doyle, *Department’s Political Grant Screening Could Get Tricky*, E&E NEWS (Jan. 11, 2018), <https://www.eenews.net/greenwire/stories/1060070789> [<https://perma.cc/74LX-LNK5>] (reporting on the Trump administration’s new Interior policy of subjecting grants to universities above \$50,000 to review by politically appointed Department officials to “better align” the grants with the Trump Administration’s “priorities”).

16. Phil McKenna, *Trump Admin. Halts Mountaintop Mining Health Risks Study by National Academies*, INSIDECLIMATE NEWS (Aug. 21, 2017), <https://insideclimatenews.org/news/21082017/mountaintop-mining-coal-health-study-scrapped-trump> [<https://perma.cc/G5C8-3RC6>].

17. *Id.*

study.¹⁸ In addition, the decision blocked the NAS from illuminating these risks for the general public and decisionmakers in other agencies.

Upper-level officials can prevent agency scientists from sharing their research with other scientists and the public by denying permission to publish their scientific conclusions in scientific journals and by withholding funds for attending scientific meetings. For example, upper-level officials at the Department of Agriculture (“USDA”) and the USGS in October 2017 refused to allow scientists from those agencies to make presentations at a conference on the role that climate change plays in causing conditions conducive to the spread of wildfires, information of obvious relevance to the public and decisionmakers attempting to deal with wildfires throughout the West.¹⁹

Finally, in the age of the internet, political appointees have influenced how their agencies communicate with the public by deleting information from agency websites. Early in the Trump administration, political appointees at EPA removed the climate change website that the agency had been curating for twenty years.²⁰ The website reflected the conclusion of EPA’s scientists that emissions of greenhouse gases contributed to climate disruption.²¹ EPA’s public affairs office explained that the Agency was “updating” the website to reflect its new priorities, but as of late September 2018, the update was nowhere to be found.²² A former EPA employee, who had been responsible for the website, complained that “one of the world’s best climate science sites has vanished.”²³ At the same time, several other agencies were—

18. Letter from Mary L. Kendall, Deputy Inspector General, DOI, to Raul M. Grijalva, Ranking Member, H. Comm. on Natural Resources (June 7, 2018).

19. Brittany Patterson, *Govt. Scientist Blocked from Talking About Climate and Fire*, E&E NEWS (Oct. 31, 2017), <https://www.eenews.net/climatewire/2017/10/31/stories/1060065143> [<https://perma.cc/EU6Y-4DPD>]; see also David Willman, *Risk Was Known as FDA OKd Fatal Drug*, L.A. TIMES, Mar. 11, 2001, at A1 (reporting FDA officials prevented agency scientist from discussing the scientific information relevant to the risk that the diabetes drug Rezulin caused liver damage).

20. Jason Samenow, *I Worked on the EPA’s Climate Change Website. Its Removal is a Declaration of War*, WASH. POST (June 22, 2017), https://www.washingtonpost.com/outlook/i-worked-on-the-epas-climate-change-website-its-removal-is-a-declaration-of-war/2017/06/22/735f0858-5697-11e7-a204-ad706461fa4f_story.html [<https://perma.cc/F54G-B3UW>].

21. *Id.*

22. *Id.* A Google search for “EPA Climate Change” yields a page on the EPA website stating, “[w]e want to help you find what you are looking for. You can view an archived version of this content on the January 19, 2017, snapshot.” *Help Finding Information*, EPA (July 23, 2018), <https://www.epa.gov/sites/production/files/signpost/cc.html> [<https://perma.cc/7U7V-CL7K>].

23. Samenow, *supra* note 20. Several cities have posted an archived version of the EPA

presumably at the direction of new management—making scientific data related to climate change less accessible on their websites.²⁴

2. *Limiting Scientific Input.* Another strategy for achieving stealth deregulation is to sideline science by diluting, limiting, or even ignoring input from the agency’s scientific and technical staff. During the Reagan administration, the head of the Food and Drug Administration (“FDA”) effectively diluted the input of agency scientists and scientific advisory committees by allowing scientists and other advocates from pharmaceutical companies to play a larger role in determining how their drugs were developed, marketed, and advertised than in previous administrations.²⁵

Although the White House touted the need for “sound science” in environmental decisionmaking at the outset of the George W. Bush administration, it nonetheless consistently ignored the advice of independent scientific bodies in formulating its global warming policies.²⁶ For example, in early June 2002, an EPA-chaired federal task force published the *U.S. Climate Action Report 2002* laying out the scientific basis for its conclusion that anthropogenic greenhouse emissions contributed to global warming.²⁷ It predicted that continued increases would “very likely” have severely disruptive effects in the United States.²⁸ President Bush, however, dismissed the report as something that had been “put out by the bureaucracy.”²⁹ The Director

climate change page on their websites, but they are not being updated. *Id.*

24. See Coral Davenport, *How Much Has ‘Climate Change’ Been Scrubbed from Federal Websites? A Lot*, N.Y. TIMES (Jan. 10, 2018), <https://www.nytimes.com/2018/01/10/climate/climate-change-trump.html> [<https://perma.cc/4APS-HNSF>]; Juliet Eilperin, *Under Trump, Inconvenient Data Is Being Sidelined*, WASH. POST (May 14, 2017), https://www.washingtonpost.com/politics/under-trump-inconvenient-data-is-being-sidelined/2017/05/14/3ae22c28-3106-11e7-8674-437ddb6e813e_story.html [<https://perma.cc/M9YM-JQ87>].

25. PHILIP J. HILTS, PROTECTING AMERICA’S HEALTH: THE FDA, BUSINESS AND ONE HUNDRED YEARS OF REGULATION 216–17 (2003).

26. Andrew C. Revkin, *Bush vs. the Laureates: How Science Became a Partisan Issue*, N.Y. TIMES, Oct. 19, 2004, at F1.

27. Andrew C. Revkin, *U.S. Sees Problems in Climate Change*, N.Y. TIMES, June 3, 2002, at A1.

28. *Id.*

29. Katherine Q. Seelye, *President Distances Himself from Global Warming Report*, N.Y. TIMES, June 5, 2002, at A19. Documents obtained under the Freedom of Information Act from the Cheney energy task force showed that Bush administration officials had been closely following the report for months prior to its appearance on the internet. See ROBERT S. DEVINE, BUSH VERSUS THE ENVIRONMENT 176 (2004). In an email to Phil Cooney, the Chief of Staff of the White House Council on Environmental Quality, the head of the Competitive Enterprise Institute (“CEI”), an industry-supported think tank, had promised to help “drive a wedge

of the White House Office of Science and Technology Policy (“OSTP”) later assured an appropriations subcommittee that the EPA report did not represent official administration policy.³⁰ And EPA took little action during the Bush administration to reduce greenhouse gas emissions.³¹

After Dr. Andrew Mosholder, a staff scientist at the FDA during the George W. Bush administration, combined the data from published and unpublished studies into a large “meta-analysis” of the suicidal side effects of FDA-approved antidepressants, his analysis showed that children given the drugs were almost twice as likely to become suicidal as children on placebos.³² Although high-level FDA officials had originally agreed to allow Dr. Mosholder to present his findings at a meeting of the external scientific advisory committee charged with reviewing the relevant studies and making recommendations to the agency, they changed their minds.³³ The science advisory committee therefore did not hear from Dr. Mosholder or review his internal report.³⁴

3. *Safety in Models.* Many public health and environmental rules rest, in part, on analyses supported by computational models. Models are useful in this context because they synthesize a great deal of information in a rigorous and consistent way—and do so quickly. But models are by no means perfect. Because so little is known about mechanisms of toxicity for most chemicals, for example, chemical risk assessment models are necessarily premised on a variety of assumptions that often cannot be validated with experimental data. For

between the President and those in the administration who think that they are serving the President’s best interests by pushing this rubbish.” Myron Ebell, *White House Effect*, HARPER’S MAG., May 2004, at 26.

30. *White House Promises to Limit Legitimacy of EPA Climate Assessment*, INSIDE EPA (Mar. 7, 2003), <https://insideepa.com/inside-epa/white-house-promises-limit-legitimacy-epa-climate-assessment> [<https://perma.cc/6TKZ-994X>].

31. THOMAS O. MCGARITY, *FREEDOM TO HARM: THE LASTING LEGACY OF THE LAISSEZ FAIRE REVIVAL* 108 (2013).

32. Elizabeth Shogren, *FDA Sat on Report Linking Suicide, Drugs*, L.A. TIMES, Apr. 6, 2004, at A13; see also Gardiner Harris, *Antidepressants Restudied for Relation to Child Suicide*, N.Y. TIMES, June 20, 2004, at N20 (“Dr. Mosholder concluded that children given antidepressants were almost twice as likely as those given placebos to become suicidal.”).

33. See, e.g., Shogren, *supra* note 32 (discussing the FDA officials’ decision to change plans regarding Dr. Mosholder’s presentation to the FDA advisory committee).

34. See, e.g., Harris, *supra* note 32; Shogren, *supra* note 32.

that reason, experts in modeling concede that “all models are wrong, but some are useful.”³⁵

From the standpoint of a deregulatory president swimming against both legal and political tides, however, an analytical tool that provides so much scientific leeway and, at the same time, appears technical and esoteric offers a clear pathway for reversing course. A political appointee can slip behind the technocratic curtain and tweak model inputs, assumptions, outputs, and interpretations in ways that withstand public and even scientific scrutiny, but are in fact nothing more than raw politics and ends-oriented decisionmaking.³⁶

President Reagan’s political appointees pioneered many of the modeling maneuvers that are still in use today to advance a deregulatory agenda. Rather than advertise these changes as necessary to advance the goal of deregulation, however, they portrayed the modeling maneuvers as differences in scientific judgments.³⁷ The Reagan administration’s efforts to protect the formaldehyde industry from regulation illustrate some of the techniques refined during that era. By the late 1970’s, the profitable production of formaldehyde was put at risk by a series of scientific studies reporting on the carcinogenicity of formaldehyde in mice, rats, and humans.³⁸ Departing from its long-established assumptions for conducting carcinogen modeling, EPA concluded that there were insufficient data on the risks of formaldehyde to humans to provide a scientific justification for regulating formaldehyde.³⁹ At the same time, the Occupational Safety

35. GEORGE E.P. BOX & NORMAN R. DRAPER, *EMPIRICAL MODEL-BUILDING AND RESPONSE SURFACES* 424 (1987).

36. See generally Wendy Wagner, Elizabeth Fisher & Pasky Pascual, *Misunderstanding Models in Environmental and Public Health Regulation*, 18 N.Y.U. ENVTL. L.J. 293 (2010) (describing, among the challenges of using models for regulation, the political manipulation of models).

37. See, e.g., MARK E. RUSHEFSKY, *MAKING CANCER POLICY* 175 (1986) (describing the “political use of science” during the Reagan Administration); Nicholas A. Ashford, C. William Ryan & Charles C. Caldart, *A Hard Look at Federal Regulation of Formaldehyde: A Departure from Reasoned Decisionmaking*, 7 HARV. ENVTL. L. REV. 297, 328 (1983) (describing EPA’s decision to not regulate formaldehyde under Reagan as one reached “long before any ‘decisionmaking process’ had been completed”); Howard Latin, *Good Science, Bad Regulation, and Toxic Risk Assessment*, 5 YALE J. ON REG. 89, 96 (1988) (concluding similarly that social policies and values adopted by agencies under the Reagan administration which lead to greater risks were typically not “made explicit nor applied in a consistent manner”); Eliot Marshall, *EPA’s High-Risk Carcinogen Policy*, 218 SCIENCE 975, 975 (1982) (quoting then-Representative Albert Gore, Jr. who similarly criticized the Reagan administration’s tendency to use science to justify political decisions to relax regulatory standards in order to reduce the burden on industry).

38. Ashford et al., *supra* note 37, at 327–28.

39. *Id.* at 326–28; see also H.R. REP. NO. 98-216, app. B at 108 (1983). After President

and Health Administration (“OSHA”) administrator appointed by President Reagan rejected a labor union petition for an emergency standard for formaldehyde supported by a substantial technical bulletin by OSHA and the National Institute for Occupational Safety and Health (“NIOSH”) as well as a scientific consultant report by researchers at the Massachusetts Institute of Technology.⁴⁰ Both reports concluded that workers were at risk and additional controls were needed to protect workers.⁴¹ In rejecting the petition, the new, deregulatory administrator relied on two in-house evaluations that were prepared after he had taken office—one drawing heavily on the industry’s analysis of the available evidence and the other an internal assessment that was “prepared in written form sometime *after*” the administrator’s actual decision to reject the labor petition.⁴² As detailed by Dr. Ashford and coauthors, the administrator’s decision rejecting the petition “depart[ed] from prevailing scientific opinion” and diverged from the agency’s own generic cancer policy for conducting risk assessments.⁴³

Appointees of President George W. Bush continued the Reagan administration’s tradition of manipulating modeling to achieve deregulatory results.⁴⁴ In assessing the risks of mercury emissions from power plants, for example, an EPA Assistant Administrator instructed staff to run the models in different ways until one of them produced an outcome that was consistent with the administration’s “Clear Skies” legislative initiative.⁴⁵

Reagan replaced Administrator Anne Gorsuch with Bill Ruckelshaus following a series of scandals at the agency. Ruckelshaus agreed with the staff that formaldehyde did present a major health risk and should be regulated. Formaldehyde; Determination of Significant Risk, 49 Fed. Reg. 21,870, 21,874 (May 23, 1984) (to be codified at 40 C.F.R. pt. 765) (“EPA has determined that by its 1976 criteria there is sufficient evidence to conclude that formaldehyde is a potential carcinogen in humans.”).

40. Ashford et al., *supra* note 37, at 346–47, 348.

41. *Id.*

42. *Id.* at 349–50, 353 (emphasis in original).

43. *Id.* at 351.

44. See Linda Greer & Rena Steinzor, *Bad Science*, 19 ENVTL. F., Jan./Feb. 2002, at 28, 34 (outlining how EPA’s risk assessment for vinyl chloride contained methodological errors, such as ignoring studies that covered cancers other than liver cancers).

45. Felicity Barringer, *E.P.A. Accused of a Predetermined Finding on Mercury*, N.Y. TIMES, Feb. 4, 2005, at A16; Jennifer 8. Lee, *White House Downplayed the Risks of Mercury in Proposed Rules, Scientists Say*, N.Y. TIMES, Apr. 7, 2004, at 7A; John Shiffman & John Sullivan, *EPA’s Court Follies Sow Doubt, Delay*, PHILA. INQUIRER, Dec. 8, 2008, at A1; Shankar Vedantam, *EPA Distorted Mercury Analysis, GAO Says*, WASH. POST, Mar. 8, 2005, at A9. In an opinion that found EPA’s logic comparable to that of the Queen of Hearts in Lewis Carroll’s *Through the Looking Glass*, the D.C. Circuit in 2008 vacated the regulations, but the court did not reference

The George W. Bush administration took the effort to a new level when its Office of Management and Budget's ("OMB") Office of Information and Regulatory Affairs ("OIRA") drafted "risk assessment" guidelines aimed at regularizing all agency assessment practices across all regulatory agencies.⁴⁶ When the proposed guidelines became controversial, OIRA requested that the NAS review them.⁴⁷ Noting that the project itself departed from scientific practice by attempting to create a one-size-fits-all template for risk assessment models,⁴⁸ the NAS's evaluation underscored how OIRA's guidelines were poised to slow down the already ossified risk assessments process and to move the agencies from protective endpoints towards more centralized estimates of risk.⁴⁹ The NAS report substantially reined in this initiative, producing final guidelines that were considerably less prescriptive.⁵⁰

The Trump administration appears to be continuing many of these model maneuvers. But it is also innovating new techniques. One of the most creative is EPA's "transparency" proposal that would, inter alia, require staff to go through a long punch list of alternative assumptions and model runs for every regulatory initiative.⁵¹ There is no explanation in the proposal of the scientific appropriateness of these requirements, why this resource-intensive and time-consuming exercise is being required, or how the requirements dovetail with existing agency practices. Still more significant is the proposal's open invitation to private parties to create alternative risk assessment

the machinations of the Assistant Administrator and White House officials. *New Jersey v. EPA*, 517 F.3d 574, 582 (D.C. Cir. 2008).

46. See generally Sally Katzen, OMB, Memorandum for Regulatory Working Group, *Principles for Risk Assessment* (Jan. 12, 1995), https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/assets/regulatory_matters_pdf/jan1995_risk_analysis_principles.pdf [<https://perma.cc/RK22-99ZP>].

47. Sidney A. Shapiro, *OMB and the Politicization of Risk Assessment*, 37 ENVTL. L. 1083, 1084 (2007).

48. NAT'L RESEARCH COUNCIL, SCIENTIFIC REVIEW OF THE PROPOSED RISK ASSESSMENT BULLETIN FROM THE OFFICE OF MANAGEMENT & BUDGET 1 (2007).

49. *Id.* at 6–8.

50. See generally Memorandum from Susan E. Dudley, Adm'r, Office of Mgmt., & Budget & Sharon L. Hays, Assoc. Dir., Office of Sci. & Tech. to the Heads of Exec. Dep'ts and Agencies (Sept. 19, 2007), <https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/memoranda/2007/m07-24.pdf> [<https://perma.cc/B7TW-XR6G>].

51. Strengthening Transparency in Regulatory Science, 83 Fed. Reg. 18,768, 18,774 (Apr. 30, 2018) (to be codified at 40 C.F.R. pt. 30). The list of generically imposed requirements includes, among other things, "clearly explain[ing] the scientific basis for *each* model assumption used and present[ing] analyses showing the sensitivity of the modeled results to alternative assumptions." *Id.* at 18,774 (emphasis added).

models, along with a requirement in the proposal that the agency “give explicit consideration” to all of these private models.⁵² By inundating the agency with dozens of models for a particular regulatory project and forcing EPA to extract and evaluate the dozens and often hundreds of underlying assumptions and algorithms buried in each model, private parties can slow the staff’s progress to a crawl. Whatever signals might have been produced by several high quality, rigorously vetted agency models are at risk of being lost in the cacophonous noise of unlimited, unrestricted industry-created models.

4. *Studying Rather than Acting and Raising the Burden of Proof.* President Reagan originated the “study-rather-than-act” move.⁵³ This tactic forestalls government action by highlighting scientific uncertainties in the underlying scientific research, while waiting until more research can be undertaken to reduce those uncertainties.⁵⁴ In the context of precautionary statutes, this has the practical effect of raising the burden of proof with respect to facts that must be grounded in the rulemaking record. It also puts off regulatory action while scientists conduct additional research and the agency staff incorporates the new research into relevant rulemaking documents. During the early years of the Reagan administration, upper-level political appointees in EPA invoked the need for “Good Science” to demand hard proof that a pollutant was harming human health or damaging the environment before it was willing to take protective action.⁵⁵ Some scientists outside the agency saw this as a “‘covert’ attempt to radically revise and soften regulations.”⁵⁶

This tactic continued into the George W. Bush administration. Despite hundreds of studies and reports demonstrating that emissions

52. *Id.* Unlike the agency’s modeling practices, the private parties submitting alternative models are not bound by any transparency requirements. *Id.*

53. *See, e.g.,* JONATHAN LASH, A SEASON OF SPOILS: THE REAGAN ADMINISTRATION’S ATTACK ON THE ENVIRONMENT 131 (1984).

54. Jonathan Foley & Christine Arena, *How to Defeat Those Who are Waging War on Science*, SCL. AM. (Feb. 27, 2017), <https://blogs.scientificamerican.com/guest-blog/how-to-defeat-those-who-are-waging-war-on-science> [<https://perma.cc/2D8G-QKCJ>] (noting that “[t]he systematic use of so-called ‘uncertainty’ surrounding well-established scientific ideas has proven to be a reliable method for manipulating public perception and stalling political action”).

55. LASH, *supra* note 53, at 131; Howard Latin, *Regulatory Failure, Administrative Incentives, and the New Clean Air Act*, 21 ENVTL. L. 1647, 1662 & n.40 (1991) (“[T]here is abundant evidence that administrators [of EPA under Reagan] frequently chose to ‘study’ uncertain issues as a way to avoid resolving them.”).

56. LASH, *supra* note 53, at 149 (citations omitted).

of “greenhouse gasses,” such as carbon dioxide, were causing global temperatures to rise at an alarming rate, the George W. Bush administration decided to delay any action to reduce those emissions pending further study.⁵⁷ The administration, however, went a step further to edit the technical reports on climate change released by the government.⁵⁸ At least two reports were edited by Philip Cooney, an attorney who had worked for the American Petroleum Institute immediately before joining the White House.⁵⁹ As one expert put it, “The dozens of changes [made by Cooney], while sometimes as subtle as the insertion of the phrase ‘significant and fundamental’ before the word ‘uncertainties,’ tend[ed] to produce an air of doubt about findings that most climate experts say are robust.”⁶⁰ In February 2003, a panel assembled by the NAS criticized the edited draft, finding that it lacked “a guiding vision, executable goals, clear timetables and criteria for measuring progress.”⁶¹ More important, the plan contemplated research aimed at resolving scientific uncertainties in areas where most uncertainties had already been resolved.⁶² Only a few months after the media reported on Cooney’s role in editing the reports, he left his position as chief of staff to the White House Council on Environmental Quality to work for the Exxon Corporation.⁶³

Perhaps the best example of the study-rather-than-act strategy is EPA’s decades-long equivocation over the toxic effects of the pesticide chlorpyrifos (also known as Dursban or Lorsban) on fetuses, infants and children. The most heavily used of the class of “organophosphate” insecticides, chlorpyrifos is a potent neurotoxin that is closely related to the chemical warfare agent sarin.⁶⁴ In the years after Dow Chemical Company (“Dow”) received a registration in 1965, it became one of

57. DEVINE, *supra* note 29, at 175.

58. Andrew C. Revkin, *Bush Aide Edited Climate Reports*, N.Y. TIMES, June 8, 2005, at A1.

59. *Id.*

60. *Id.*

61. Andrew C. Revkin, *Panel of Experts Faults Bush Plan to Study Climate*, N.Y. TIMES, Feb. 26, 2003, at A1.

62. *Whitman Defends Climate Research Plan Against NAS Criticism*, INSIDE EPA (Feb. 28, 2003), <https://insideepa.com/inside-epa/whitman-defends-climate-research-plan-against-nas-criticism> [<https://perma.cc/4RM9-4AFQ>]. According to one panel member, “[i]n some areas it’s as if these people were not cognizant of the existing science.” Revkin, *supra* note 61.

63. Andrew C. Revkin, *Ex-Bush Aide Who Edited Climate Reports to Join ExxonMobil*, N.Y. TIMES, June 15, 2005, at A13.

64. Roni Caryn Rabin, *E.P.A. Lags on Pesticide Action*, N.Y. TIMES, May 16, 2017, at D1; Sharon Lerner, *Poison Fruit*, INTERCEPT (Jan. 14, 2017), <https://theintercept.com/2017/01/14/dow-chemical-wants-farmers-to-keep-using-a-pesticide-linked-to-autism-and-adhd> [<https://perma.cc/RU4M-ZNJC>].

the most heavily used pesticides in the country.⁶⁵ Its registrations for home use, however, were voluntarily cancelled in 2000 after poison control centers in the United States received reports of more than 7,000 acute poisonings attributable to chlorpyrifos.⁶⁶

The ban of chlorpyrifos for home use came at an opportune time for an epidemiological study undertaken by Dr. Virginia Rauh at Columbia University’s Center for Children’s Environmental Health. The study catalogued the effects of home use pesticides on 725 African-American and Dominican mothers and their children living in New York City.⁶⁷ The ban allowed the researchers to compare babies who had been exposed to the higher levels of chlorpyrifos in their homes before the ban with those who had been exposed to the virtually nonexistent levels after the ban.⁶⁸ The results were startling. Babies who were exposed to greater levels of the pesticide were on average smaller than, weighed less at ages two and three than, and did not react as well to stimuli as the babies who were exposed to less chlorpyrifos.⁶⁹ And the dose-related disparities persisted for many years.⁷⁰ As time went on, the highly exposed children lagged in motor and mental development.⁷¹ At age seven, the highly exposed children had lower IQs and higher working memory deficits.⁷² Another study of urban children by epidemiologists at Mount Sinai Hospital in New York observed similar effects.⁷³ Meanwhile, a study conducted by University of California at Berkeley epidemiologists of the effects of chlorpyrifos on mothers and children near agricultural operations in California where chlorpyrifos was heavily used found that highly exposed children had lower IQs and poorer cognitive functions than less exposed children.⁷⁴ Published in 2014, the study also found that the children of women who lived near the fields during their pregnancies had significantly higher autism rates.⁷⁵

65. Lerner, *supra* note 64.

66. Chlorpyrifos; Tolerance Revocations, 80 Fed. Reg. 69,080, 69,082 (Nov. 6, 2015) (codified at 40 C.F.R. pt. 180); Lerner, *supra* note 64.

67. Rabin, *supra* note 64, at D1; Lerner, *supra* note 64.

68. *See supra* note 67 and accompanying text.

69. Lerner, *supra* note 64.

70. Rabin, *supra* note 64, at D1; Lerner, *supra* note 64.

71. *See supra* note 70 and accompanying text.

72. *Id.*

73. *Id.*

74. *Id.*

75. *Id.* Studies on laboratory animals lent credence to the epidemiological studies. Dr. Theodore Slotkin, a scientist at the Duke University Medical Center, published dozens of papers

Several environmental and public health groups had filed a lawsuit in 2007 asking the Ninth Circuit Court of Appeals to order EPA to come to a decision on their longstanding petition to cancel the remaining registrations for chlorpyrifos and to withdraw the “tolerances” that it had established setting permissible levels of chlorpyrifos on food crops.⁷⁶ After EPA studied the matter for another seven years, the court ordered it to respond to the petition by the end of October 2015.⁷⁷ On October 28, 2015, EPA, working under President Obama, proposed to revoke all of the tolerances for chlorpyrifos, having concluded that the existing scientific information did not support a conclusion, required by the 1996 Food Quality Protection Act (“FQPA”), that aggregate exposures to that pesticide from food and drinking water at the existing tolerances presented a “reasonable certainty [of] no harm” to human beings.⁷⁸ The statute in fact required EPA to pay special attention to the risks that pesticides posed to fetuses, infants, and children by employing an additional safety factor to ensure that they would not be harmed by aggregate exposures to pesticides.⁷⁹ In support of its assessment, EPA cited “a considerable and still-growing body of literature on the effects of chlorpyrifos on the developing brain of laboratory animals (rats and mice) indicating that gestational and/or postnatal exposure may cause persistent behavioral effects into adulthood.”⁸⁰ The proposal noted the uncertainties that epidemiological studies encountered in obtaining accurate exposure measures and in controlling for confounding factors.⁸¹ The Agency

detailing the effects of chlorpyrifos on very young rats. He observed a clear cause–effect relationship between exposure and structural abnormalities, behavioral problems, and impaired cognitive function. Even at “exquisitely low doses,” the chemical prevented cells from dividing properly. Rabin, *supra* note 64.

76. Chlorpyrifos; Tolerance Revocations, 80 Fed. Reg. 69,080, 69,083 (Nov. 6, 2015) (codified at 40 C.F.R. pt. 180).

77. *In re* Pesticide Action Network of N. Am. v. EPA, 798 F.3d 809 (9th Cir. 2015).

78. 21 U.S.C. § 346a(b)(2)(A)(i)–(ii) (2012); 80 Fed. Reg. at 69,080. For food uses, the Federal Insecticide, Fungicide and Rodenticide Act incorporates the Food Quality Protection Act’s “reasonable certainty [of] no harm” test for determining whether to allow a pesticide’s registration to remain in effect. 7 U.S.C. § 136(bb); *see* League of United Latin Am. Citizens v. Wheeler, 899 F.3d 814, 818 (9th Cir. 2018) (“A tolerance qualifies as safe if the Administrator has determined that there is a *reasonable certainty* that *no* harm will result from aggregate exposure to the pesticide chemical residue, including all anticipated dietary exposures” (citation omitted)).

79. 21 U.S.C. § 346a(b)(2)(C).

80. 80 Fed. Reg. at 69,090. Although there was some variability among the studies, “behavioral changes of some sort were reported in most studies.” *Id.*

81. *Id.* at 69,091.

concluded, however, that the studies presented “evidence of delays in mental development in infants (24–36 months), attention problems and autism spectrum disorder in early childhood, and intelligence decrements in school age children who were exposed to chlorpyrifos or OPs during gestation.”⁸² Given the uncertainties, the agency elected to apply the full statutory ten-fold additional safety factor to protect children.⁸³ EPA’s pesticide Scientific Advisory Panel (“SAP”) agreed with this assessment.⁸⁴ And dozens of scientists, doctors, and public health professionals also supported the proposal.⁸⁵

The court granted extensions until March 2017 to finalize the proposal, but made it clear to the Obama administration that no further extensions would be forthcoming.⁸⁶ At this point, Dow employed a “science-for-hire” consulting company to conduct further studies on chlorpyrifos and to deconstruct the new epidemiological studies.⁸⁷ The consultants demanded that Professor Rauh allow them and EPA to examine the medical records of the subjects of the Columbia study so that they could determine the validity of her statistics. She declined on the ground that access to the data would allow the company to determine the identities of the subjects and their medical histories, a revelation that would violate her team’s promise to protect their privacy.⁸⁸ She was willing to let EPA see the raw data, but she was unwilling to let Dow’s consultants invade the privacy of her subjects.⁸⁹ After meeting with Rauh and her team in 2014 to discuss questions they had about the study, the EPA’s scientists were satisfied that they did not need to examine the original files for the subjects.⁹⁰

82. *Id.* at 69,093.

83. *Id.* at 69,095.

84. *Id.* at 69,090.

85. Brady Dennis, *Trump EPA Declines to Ban Pesticide that Obama had Proposed Outlawing*, WASH. POST (Mar. 29, 2017), <https://www.washingtonpost.com/news/energy-environment/wp/2017/03/29/trump-epa-declines-to-ban-pesticide-that-obama-had-proposed-outlawing> [<https://perma.cc/HA3G-9AEA>].

86. *In re Pesticide Action Network of N. Am. v. EPA*, 840 F.3d 1014 (9th Cir. 2016); Chlorpyrifos; Tolerance Revocations; Notice of Data Availability and Request for Comment, 81 Fed. Reg. 81,049, 81,0151 (proposed Nov. 17, 2016) (to be codified at 40 C.F.R. pt. 180).

87. Lerner, *supra* note 64.

88. *Id.*

89. Corbin Hiar, *Agency Follows Industry Playbook to Attack Science*, E&E NEWS (Aug. 23, 2018), <https://www.eenews.net/stories/1060095095> [<https://perma.cc/SY6T-SFLE>]; Lerner, *supra* note 64.

90. *See supra* note 89 and accompanying text.

In November 2016, EPA published a notice stating that it had reevaluated the risk assessment underlying the 2015 proposed revocation in light of comments from the SAP.⁹¹ It agreed with the panel that the Columbia study was scientifically reliable and that it should not rely on that study's cord blood data as the point of departure for determining a level of exposure that would give rise to a reasonable certainty of no harm.⁹² At the SAP's suggestion, EPA reestimated peak exposures in a new risk assessment, which ultimately demonstrated that chlorpyrifos exposures from food and drinking water at the existing tolerances did not meet the statute's "reasonable certainty [of] no harm" test.⁹³ The Agency invited further public comment on the revised risk assessment.⁹⁴

After the 2016 election, Dow was in an ideal position to influence upper-level decisionmakers at EPA. One of its lobbyists served on the EPA transition team, which was headed by an employee of a think tank that had received monetary support from Dow.⁹⁵ And President Trump appointed Dow's CEO, Andrew Liveris, to be the head of an advisory committee for the Department of Commerce ("DOC") called the American Manufacturing Council.⁹⁶

Several days after a private meeting with Liveris, EPA Administrator Pruitt formally denied all aspects of the environmental groups' petition.⁹⁷ Pruitt decided to ignore the many studies showing developmental neurotoxicity at exposure levels lower than the existing tolerances because the issue of the neurodevelopmental toxicity of organophosphate pesticides "was, and remains, an issue at the cutting edge of science, involving significant uncertainties."⁹⁸ The industry comments on the 2015 proposal demonstrated "deep disagreement" over how the recent animal and epidemiological studies "should be considered in the EPA's risk assessment."⁹⁹ Pruitt therefore concluded

91. 81 Fed. Reg. 81,049.

92. *Id.* at 81,050.

93. *Id.* at 81,051.

94. *Id.*

95. *Id.*

96. *Id.*

97. See Chlorpyrifos; Order Denying PANNA and NRDC's Petition to Revoke Tolerances, 82 Fed. Reg. 16,581, 16,583 (Apr. 5, 2017); *Pruitt Met with Dow CEO Before Rejecting Pesticide Ban*, E&E NEWS (June 28, 2017), <https://www.eenews.net/greenwire/2017/06/28/stories/1060056731> [<https://perma.cc/QT5Y-2DW7>] (meeting with Liveris).

98. See 82 Fed. Reg. at 16,590.

99. *Id.*

that “the science on this question is not resolved and would likely benefit from additional inquiry.”¹⁰⁰ In addition, Pruitt thought that it might be advisable to “seek additional authoritative peer review” of the EPA’s risk assessment before finalizing it.¹⁰¹ Although the benefits of the pesticide were irrelevant under the FQPA, Pruitt nevertheless thought it was “important to recognize that for many decades chlorpyrifos has been and remains one of the most widely used pesticides in the United States.”¹⁰² Pruitt thus decided to deny the petitions and continue to study chlorpyrifos until the next reregistration deadline in 2022.¹⁰³

In a statement for the press, Pruitt explained that the Trump administration was “returning to using sound science in decision-making – rather than predetermined results.”¹⁰⁴ In reality, however, he was doing just the opposite, and he was doing so in violation of the statute under which he was acting. Documents produced in response to a Freedom of Information Act (“FOIA”) request showed that Pruitt’s political staff had pressured the agency’s scientific staff to write a final regulation supporting Pruitt’s predetermined conclusion that the chlorpyrifos tolerances should remain in effect.¹⁰⁵ The recently retired head of EPA’s chemical safety unit observed that Pruitt and his politically appointed underlings were “ignoring the science that is pretty solid,” and he predicted that farm workers and their children would be put at risk for at least another four years.¹⁰⁶

In August 2018, the Ninth Circuit vacated Pruitt’s action and ordered EPA to “revoke all tolerances and cancel all registrations for chlorpyrifos within 60 days.”¹⁰⁷ Contrary to Pruitt’s statements about using sound science to support his decision, the court found that EPA

100. *Id.*

101. *Id.*

102. *Id.* Since EPA had already canceled the pesticide registrations for chlorpyrifos home uses, withdrawing the tolerances for all of its food uses would have the practical effect of removing it from the market.

103. *See id.*

104. Eric Lipton, *E.P.A. Chief Won’t Ban Insecticide Thought To Be Risky*, N.Y. TIMES, Mar. 30, 2017, at A21.

105. Eric Lipton & Roni Caryn Rabin, *In Memos, E.P.A. Vowed New Day*, N.Y. TIMES, Aug. 19, 2017, at A13.

106. Lipton, *supra* note 104; *New EPA Rule Puts Some Kids at Autism Risk*, E&E NEWS (Apr. 4, 2017), <https://www.eenews.net/greenwire/2017/04/04/stories/1060052559> [<https://perma.cc/ZG9X-HGVY>] (noting that the rule “could affect the mostly Hispanic children of undocumented immigrants who live near the farms where they work to pick the pesticide-covered produce”).

107. *League of United Latin Am. Citizens v. Wheeler*, 899 F.3d 814, 832 (9th Cir. 2018).

did not even attempt to defend the denial of the petition on its scientific merits.¹⁰⁸ Instead, it relied on procedural and jurisdictional arguments, which the court rejected.¹⁰⁹ Professor Dan Farber observed that “Pruitt’s invocation of ‘sound science’ as a way of ignoring all the scientific evidence shows the hollowness of that anti-regulatory buzz phrase.”¹¹⁰

5. *Rewriting Reports Relevant to Regulatory Issues.* Agencies often draft or commission reports on scientific issues that they later rely upon in setting agency priorities or in regulatory initiatives addressed to particular products or activities. Because such reports do not always receive widespread public attention (and sometimes cannot even be reached with FOIA requests),¹¹¹ agency leaders can advance deregulatory policies by manipulating the science that goes into those reports.¹¹² Having altered the scientific record, the policies are much easier to justify.

The oil and gas industry was undoubtedly pleased by a long-awaited draft report on the environmental risks posed by hydraulic fracturing (“fracking”) technologies that EPA published in June 2015 under President Obama.¹¹³ The report’s bottom line conclusion was that while there were “specific instances where one or more mechanisms led to impacts on drinking water resources,” the existing studies did not indicate “widespread, systemic impacts on drinking

108. *See id.* at 828.

109. *See id.* at 829.

110. *See* Dan Farber, *Trump Loses Another Big Court Case*, LEGALPLANET (Aug. 13, 2018), <http://legal-planet.org/2018/08/13/trump-loses-another-big-court-case> [https://perma.cc/UHM3-ZGES].

111. WENDY WAGNER, REPORT FOR ACUS: SCIENCE IN REGULATION: A STUDY OF AGENCY DECISIONMAKING APPROACHES 116–18 (2013), https://www.acus.gov/sites/default/files/documents/Science%20in%20Regulation_Final%20Report_2_18_13_0.pdf [https://perma.cc/N5MX-PHEV] [hereinafter WAGNER, ACUS STUDY].

112. Goldman et al., *supra* note 6, at 696 (stating that public officials have “manipulated scientific reports to help justify policy decisions”). For example, the White House Council on Environmental Quality demanded such extensive changes in the chapter describing anthropogenic climate change in EPA’s 2003 report on the state of the environment that then-EPA Administrator Christine Todd Whitman decided to delete the chapter, rather than attempt to defend it from the “severe criticism” that it would attract from the scientific community. Andrew C. Revkin & Katherine Q. Seelye, *White House Cuts Data on Warming in an E.P.A. Report*, N.Y. TIMES, June 19, 2003, at A1.

113. *See* ENVTL. PROT. AGENCY, ASSESSMENT OF THE POTENTIAL IMPACTS OF HYDRAULIC FRACTURING FOR OIL AND GAS ON DRINKING WATER RESOURCES (External Review Draft 2015), <https://cfpub.epa.gov/ncea/hfstudy/recordisplay.cfm?deid=244651> [https://perma.cc/T28M-9B5S].

water resources in the United States.”¹¹⁴ The industry and its allies in Congress seized on the conclusion to support their contention that fracking did not result in contaminated drinking water and therefore did not need to be regulated by either EPA or the states.¹¹⁵ Environmental groups were mystified, because the body of the report—which spotlighted many instances in which fracking operations had in fact contaminated groundwater—did not seem to support its upbeat conclusion.¹¹⁶ FOIA requests from news organizations later revealed that the conclusion that fracking did not have “widespread systemic” impacts on drinking water did not appear in the draft that EPA scientists sent to the White House for interagency review.¹¹⁷ Instead, the draft had emphasized the fact that fracking had contaminated drinking water in more than twenty instances in support of its conclusion that EPA had identified “potential vulnerabilities” of drinking water supplies to fracking.¹¹⁸ The conclusion regarding a lack of “widespread systemic” effects did not appear in the report until after several meetings between EPA officials, White House staff and high-level officials in the Department of Energy (“DOE”) and DOI.¹¹⁹ A former EPA official believed that the “widespread systemic” effects statement was inserted by political appointees “to ensure that there would not be blowback from the oil and gas industry.”¹²⁰

114. Ellen M. Gilmer & Mike Soraghan, *EPA Study Finds No “Widespread” Impact on Drinking Water*, E&E NEWS (June 4, 2015), <https://www.eenews.net/stories/1060019689> [<https://perma.cc/94CZ-ZS7G>].

115. Ellen M. Gilmer, *Enviros Conflicted After Study Finds Contamination Not Widespread*, E&E NEWS (June 5, 2015), <https://www.eenews.net/energywire/2015/06/05/stories/1060019713> [<https://perma.cc/Q4CA-YQRY>] [hereinafter Gilmer, *Enviros Conflicted*]; Ellen M. Gilmer, *Lawmakers Spar Over EPA Study’s Bottom Line*, E&E NEWS (June 4, 2015), <https://www.eenews.net/eenewspm/2015/06/04/stories/1060019698> [<https://perma.cc/3FZ8-MRJN>]; Myra P. Saefong, *Why Shale Producers Are Happy With this EPA Fracking Study*, MARKETWATCH (June 11, 2015), <https://www.marketwatch.com/story/shale-producers-are-thrilled-with-this-epa-fracking-study-2015-06-11> [<https://perma.cc/8BLP-49SC>].

116. Ellen M. Gilmer, *Enviros Conflicted*, *supra* note 115.

117. Tom Scheck & Scott Tong, *EPA’s Late Changes to Fracking Study Downplayed Risk of Polluted Drinking Water*, APM REPORTS (Nov. 30, 2016), <https://www.marketplace.org/2016/11/29/world/epa-s-late-changes-fracking-study-portray-lower-pollution-risk> [<https://perma.cc/86TN-EMX2>]; Mike Soraghan, *White House Engaged in “Messaging” for EPA Fracking Study*, E&E NEWS (Sept. 21, 2016), <https://www.eenews.net/stories/1060043152> [<https://perma.cc/E4LV-HHVP>].

118. See text accompanying *supra* note 117.

119. See text accompanying *supra* note 117.

120. Scheck & Tong, *supra* note 117 (quoting Dominic DiGiulio). After undertaking a detailed review of the draft report, a panel of the agency’s Science Advisory Board concluded that EPA had not “support[ed] quantitatively its conclusion about lack of evidence for widespread, systemic impacts on drinking water resources.” U.S. EPA SCI. ADVISORY BOARD,

During the Trump administration, politically appointed officials even more aggressively amended staff scientific reports. Internal documents obtained from the National Park Service (“NPS”) pursuant to a FOIA request showed that upper-level officials had deleted every reference to anthropogenic greenhouse gas emissions as a cause of climate change from a draft report on the risks that rising sea levels posed to national parks.¹²¹ At the insistence of political appointees in the White House, EPA’s staff removed passages highlighting the dangers posed by power plant carbon dioxide emissions from the regulatory impact assessment for the Trump administration’s proposed rollback of the Obama administration’s regulations addressing greenhouse gas emissions from existing power plants.¹²² A Sierra Club FOIA request yielded documents showing that upper-level political appointees in the DOE changed a report being prepared by the National Energy Technology Laboratory on the January 2018 “bomb cyclone” cold wave to emphasize the benefits of coal-fired power plants in a misleading fashion.¹²³

SAB REVIEW OF THE EPA’S DRAFT ASSESSMENT OF THE POTENTIAL IMPACTS OF HYDRAULIC FRACTURING FOR OIL AND GAS ON DRINKING WATER RESOURCES, 2, EPA-SAB-16-005 (Aug. 2016). Because the data were insufficiently robust to support a quantitative analysis, EPA scientists deleted the “widespread systemic” conclusion from the final version of the report. U.S. EPA, HYDRAULIC FRACTURING FOR OIL AND GAS: IMPACTS FROM THE HYDRAULIC FRACTURING WATER CYCLE ON DRINKING WATER RESOURCES IN THE UNITED STATES (Dec. 2016); Soraghan, *supra* note 117. The revised report found evidence that fracking contaminated drinking water at all stages of the process. Coral Davenport, *E.P.A. Shifts on Fracking, Citing Harm to Water*, N.Y. TIMES, Dec. 13, 2016, at A19.

121. Elizabeth Shogren, *Wipeout: Human Role in Climate Change Removed from Science Report*, REVEAL (Apr. 2, 2018), <https://www.revealnews.org/article/wipeout-human-role-in-climate-change-removed-from-science-report> [<https://perma.cc/4FF9-6CPG>]. After the censorship was reported in the trade press, the department reinserted references to human-caused climate change in the final version of the report. Adam Aton, *Researchers Say Sea-Level Report Was Censored. Here It Is*, E&E NEWS (May 21, 2018), <https://www.eenews.net/stories/1060082165> [<https://perma.cc/2RAH-EKWS>].

122. Zack Colman & Maxine Joselow, *White House Cut Climate Warnings from Rule on Power Plants*, E&E NEWS (Sept. 5, 2018), <https://www.eenews.net/stories/1060095807> [<https://perma.cc/398K-ZZWF>]; Jennifer A. Dlouhy, *Dire Climate Change Warnings Cut from Trump Power-Plant Proposal*, BLOOMBERG ENV’T (Sept. 4, 2018, 3:06 PM), <https://news.bloombergenvironment.com/environment-and-energy/dire-climate-change-warnings-cut-from-trump-power-plant-proposal> [<https://perma.cc/77YK-HS8T>].

123. Jennifer A. Dlouhy, *Trump Officials Helped Edit “Bomb Cyclone” Report to Boost Coal*, BLOOMBERG (Aug. 9, 2018, 4:00 AM), <https://www.bloomberg.com/news/articles/2018-08-09/trump-officials-helped-edit-bomb-cyclone-report-to-boost-coal> [<https://perma.cc/MRH3-MLJ4>].

6. *Substituting Deregulatory Policy for Science.* Perhaps the most pervasive strategy for deregulation through science is for upper-level political appointees to quietly substitute deregulatory policy for science as they interact with staff scientists during the decisionmaking process. Political appointees in the White House can also substitute policy for science in nontransparent ways when agencies send drafts of regulations to OIRA for review.

Upper-Level Agency Officials. Because the careers of staff scientists and engineers depend on the assessments of upper-level policymakers, they understandably feel pressure to accommodate the desires of their superiors. When the desires of upper-level officials conflict with professional norms, as, for example, when they suggest or demand that scientists select models or interpret data to achieve predetermined outcomes, it may be difficult for agency scientists and engineers to resist.¹²⁴ Politically appointed officials have frequently overruled agency experts without providing credible reasons for doing so.¹²⁵ One of the most striking examples this phenomenon is the history of EPA’s National Ambient Air Quality Standards (“NAAQS”) for fine particulate matter (“PM”) during the George W. Bush administration. The administrator rejected a staff recommendation that the Agency tighten the standard,¹²⁶ even though the Agency’s Clean Air Scientific Advisory Committee (“CASAC”) had agreed with the staff’s recommendation.¹²⁷ To support this less protective standard,

124. See Holly Doremus, *Scientific and Political Integrity in Environmental Policy*, 86 TEX. L. REV. 1601, 1603–17 (2008) (noting that the deputy secretary of the interior interfered with the listing of and determination of critical habitat for several endangered species); 16 BNA, OCCUPATIONAL SAFETY AND HEALTH REPORTER 1064 (1987) (noting that a career scientist who chaired OSHA’s working group dealing with employee exposure to lead was threatened with a letter charging her with insubordination if she did not write a provision that would relax the permissible level for lead in the battery manufacturing industry in accordance with the agency leadership’s policy preferences).

125. See Michael Hawthorne, *EPA Chief Pruitt Overrules Staff, Gives Wisconsin’s Walker, Foxconn Big Break on Smog*, CHI. TRIB. (May 2, 2018, 6:49 AM), <https://www.chicagotribune.com/news/local/breaking/ct-met-smog-pruitt-foxconn-20180501-story.html> [https://perma.cc/RV5G-A57B] (noting that EPA Administrator Scott Pruitt “exempted most of southeast Wisconsin from the latest federal limits on” air pollution, in order to benefit Foxconn’s planned \$410 billion project for a new manufacturing facility in the area); ENDANGERED SPECIES COALITION, SUPPRESSED: HOW POLITICS DROWNED OUT SCIENCE FOR TEN ENDANGERED SPECIES 3 (2017) (reporting many instances during the Trump administration where the DOI’s Fish and Wildlife Service’s politically appointed leadership overruled its scientists “to please special interests”).

126. See *EPA Coarse Particle Decision Sets Stage for Major Legal Battle*, RISK POL’Y REP. (Sept. 26, 2006).

127. See *EPA’s Particulate Rule Draws Only Criticism and Talk of Legal Challenge From All*

some rather substantial meddling in the Agency's analysis was necessary. Over the CASAC's objections, EPA's final analysis dropped several key studies and included edits and opinions that had not been internally reviewed.¹²⁸ The Agency's final analysis set aside the staff's concern about short-term exposures as premature and unrealistic, and the studies supporting a short-term standard were discounted.¹²⁹ The administration's portrayal of these decisions as scientifically compelled sparked a sharp rebuke from the CASAC and the scientific community. Dr. Rogene Henderson, the CASAC chairwoman, told the press that most of the committee members were "very disappointed" that the Administrator had not followed the advice of the staff and the committee.¹³⁰ Later, the committee sent a strongly worded letter to the Administrator, stating that EPA's standard did not meet the statutory requirements¹³¹ and that, to the committee's knowledge, "no science, medical or public health group" disagreed with CASAC's assessment of the scientific record.¹³² The D.C. Circuit Court of Appeals agreed with several states and environmental groups that several of EPA's conclusions deviated significantly enough from past agency practice, scientific advice (particularly by CASAC), and the scientific record that they warranted explanations, but EPA had provided none.¹³³

In preparing the regulatory impact assessment ("RIA") detailing the costs and benefits of repealing the Obama administration's Clean Power Plan ("CPP"), EPA's upper-level decisionmakers determined that the RIA had overestimated the cobenefits of the reductions in PM emissions that would result from controlling CO₂ emissions because it assumed that there was no level at which exposure to PM produced no adverse effects in human beings.¹³⁴ Yet their decision ignored the many studies showing that PM exposures below the primary standard caused

Around, ELECTRIC UTIL. WK. (Sept. 25, 2006).

128. *Advisers Decide to Clarify Call to EPA For Stricter Standard on Fine Particles*, 37 ENVTL. REP. 285 (Feb. 10, 2006).

129. See Robert A. Michaels, *Particulate Matter: The Marines, EPA, and Air Quality*, 11 RISK POL'Y REP. 34 (2004).

130. Janet Wilson, *New EPA Rules on Soot and Dust Set*, L.A. TIMES, Sept. 22, 2006, at B1.

131. *Advisory Panel Warns of Continued Risk Because of EPA's Decision on Fine Particles*, 37 ENVTL. REP. 2031 (Oct. 6, 2006).

132. *Id.*

133. *Am. Farm Bureau Fed'n. v. EPA*, 559 F.3d 512, 521–23 (D.C. Cir. 2009).

134. Niina Heikkinen, *To Kill Climate Rule, EPA Wants to Redefine Danger of Soot*, E&E NEWS (Aug. 6, 2018), <https://www.eenews.net/stories/1060092763> [https://perma.cc/V94R-QEBR].

adverse health effects in human beings.¹³⁵ Indeed, two EPA scientists were coauthors of a study published in the *Proceedings of the National Academy of Sciences* in September 2018 showing that the mortality risk of PM exposures at levels below the primary NAAQS was much higher than previous studies suggested.¹³⁶

Office of Information and Regulatory Affairs. The literature on centralized review of federal agency rulemaking is filled with examples of officials in OIRA (an agency in the White House’s OMB) substituting deregulatory policy for agency scientific conclusions.¹³⁷ During the Reagan administration, OIRA made numerous, nontransparent technical changes to EPA’s high-level radioactive waste disposal rule and its ambient air quality standards for PM and to OSHA’s occupational health and safety standards for ethylene oxide, grain handling facilities and formaldehyde.¹³⁸ President George H.W. Bush’s OIRA rejected an agreement among the OSHA staff, industry, and labor unions to lower the permissible exposure limit for formaldehyde¹³⁹ and disputed OSHA scientists’ assessment of the risks to workers posed by cadmium.¹⁴⁰ OIRA made a concerted effort during the George W. Bush administration to increase its technical and scientific capabilities in an attempt to gain deeper and broader control

135. *Id.*; see also Dino Grandoni, *The Energy 202: The Other Scientific Consensus The EPA is Bucking*, WASH. POST: POWERPOST (Oct. 11, 2017), https://www.washingtonpost.com/news/powerpost/paloma/the-energy-202/2017/10/11/the-energy-202-the-other-scientific-consensus-the-epa-is-bucking/59dcff9230fb0468cea81e52/?utm_term=.4fe63051acb3 [<https://perma.cc/PG8L-JU58>].

136. Richard Burnett et al., *Global Estimates of Mortality Associated with Long-Term Exposure to Outdoor Fine Particulate Matter*, 115 PROCEEDINGS OF THE NAT’L ACAD. OF SCIENCES 9592 (2018); see also Scott Waldman, *EPA Staff Co-Wrote Study Linking Emissions to Death*, E&E NEWS (Sept. 13, 2018), <https://www.eenews.net/stories/1060096863> [<https://perma.cc/86ZU-BJW3>] (“As EPA rolls back emissions regulations, its own researchers are part of a major study that has found that global air pollution kills far more people than has previously been revealed.”).

137. See Alan B. Morrison, *OMB Interference with Agency Rulemaking: The Wrong Way to Write a Regulation*, 99 HARV. L. REV. 1059, 1066 (1986) (describing how OMB employees with little to no scientific background are making decisions that “involve scientific determinations”); Erik D. Olson, *The Quiet Shift of Power: Office of Management & Budget Supervision of Environmental Protection Agency Rulemaking Under Executive Order 12,291*, 4 VA. J. NAT. RESOURCES L. 1, 64–73 (1984).

138. See generally Olson, *supra* note 137 (discussing EPA regulations); THOMAS O. MCGARITY & SIDNEY A. SHAPIRO, *WORKERS AT RISK: THE FAILED PROMISE OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION* 83–88, 89–92, 110–11 (1992) (describing changes made to OSHA health and safety standards).

139. MCGARITY & SHAPIRO, *supra* note 138, at 159–60.

140. *Id.* at 168.

over the substance of agency rules.¹⁴¹ The OIRA staff used this expanded authority quite aggressively to force EPA to drop a proposed stringent secondary ambient air quality standard to protect crops from photochemical oxidants, even though the agency's CASAC had recommended an even more stringent standard.¹⁴² EPA's outraged staff, who hastily rewrote the regulation's preamble to justify the change, called the change a matter of "pure politics."¹⁴³ The CASAC's chairwoman testified in a subsequent congressional hearing that "[w]ilful ignorance" had "triumphed over sound science" in EPA's decisionmaking process.¹⁴⁴ Ultimately, OIRA substituted deregulatory policy for science in a number of other rulemaking initiatives during the George W. Bush administration.¹⁴⁵

OIRA's aggressive interventions into agency rulemakings continued into the Obama administration.¹⁴⁶ For example, the proposed regulations governing the disposal of coal combustion residuals ("CCRs" or "coal ash") that EPA forwarded to OIRA in October 2009 would have characterized CCRs as hazardous wastes subject to the stringent requirements of Subtitle C of the Resource Conservation and Recovery Act.¹⁴⁷ It based that determination on the potential for toxic constituents to migrate from impoundments into groundwater and on the need to avoid catastrophic spills.¹⁴⁸ The OIRA

141. See, e.g., John D. Graham, Paul R. Noe & Elizabeth L. Branch, *Managing the Regulatory State: The Experience of the Bush Administration*, 33 *FORDHAM URB. L.J.* 953, 968–69 (2005).

142. Erik Stokstad, *EPA Adjusts a Smog Standard to White House Preference*, 319 *SCIENCE* 1602–03 (2008); Juliet Eilperin, *Ozone Rules Weakened at Bush's Behest*, *WASH. POST* (Mar. 14, 2008), <http://www.washingtonpost.com/wp-dyn/content/article/2008/03/13/AR2008031304175.html?noredirect=on> [<https://perma.cc/5E2W-KEGW>]; see ENVIRONMENTAL PROTECTION AGENCY, *REVIEW OF THE NATIONAL AMBIENT AIR QUALITY STANDARDS FOR OZONE: POLICY ASSESSMENT OF SCIENTIFIC AND TECHNICAL INFORMATION 8-13, 8-25* (2007) (outlining recent CASAC recommendations).

143. John Sullivan, Tom Avril & John Shiffman, *Politics Choke Clean-Air Efforts*, *PHILA. INQUIRER* (Dec. 10, 2008), http://www.philly.com/philly/news/homepage/20081210_Scientists_criticize_EPA_chief.html [<https://perma.cc/2SUK-ZJ96>].

144. *EPA's New Ozone Standards: Hearing Before the House Committee on Oversight and Government Reform*, 110th Cong. 87 (2008) (statement of Rogene F. Henderson, Chairman, Clean Air Scientific Advisory Committee). The D.C. Circuit later struck down the secondary standard because EPA's justification for it was inadequate, but the court did not mention OIRA's role. *Mississippi v. EPA*, 744 F.3d 1334, 1358–62 (D.C. Cir. 2013).

145. Wendy E. Wagner, *A Place for Agency Expertise: Reconciling Agency Expertise with Presidential Power*, 115 *COLUM. L. REV.* 2019, 2041–42 (2015)

146. *Id.* at 2042–45.

147. Charlotte E. Tucker, *Original Draft Shows Coal-Ash Proposal Substantially Revised During OMB Review*, 41 *ENV'T REP. (BNA)* 1061 (2010).

148. Rena Steinzor, *The Case for Abolishing Centralized White House Regulatory Review*, 1

staff radically changed the content of the draft to provide a set of options that included hazardous waste listing, but also contained two far less stringent options.¹⁴⁹ The draft RIA that emerged from OIRA focused heavily on the “stigma” effects that listing CCRs as hazardous wastes would have on the markets for recycling CCRs into concrete and wallboard.¹⁵⁰ Although EPA’s draft of the RIA did not attempt to quantify the stigma effect, the OIRA version estimated that the stigma affect alone would cost society \$233.5 billion in lost recycled CCRs, based on its unsupported assumption that 51 percent of the market for recyclable CCRs would disappear.¹⁵¹ Not surprisingly, the final coal ash regulations that EPA published in April 2014 did not characterize CCRs as hazardous wastes, even though the staff had by then identified at least 157 coal ash impoundments that had contaminated groundwater or otherwise posed a substantial risk to health or the environment.¹⁵² Instead of a federal regulatory program, the regulations suggested minimum criteria for states to use in their waste disposal programs, if they were so inclined.¹⁵³

B. Adjusting Internal Resources and Procedures

Political appointees can delay or affect the outcomes of regulatory initiatives by adjusting internal agency procedures to make it more difficult for the staff to generate and use the science underlying those initiatives. They can accomplish this by forcing the staff through multiple time- and resource-consuming analytical exercises that are of marginal relevance to the agency’s statutory responsibilities, cutting the budgets and reducing the staff of the offices responsible for providing scientific and engineering input into regulatory initiatives, and changing organizational charts to render staff scientists and engineers subject to supervision by political appointees. Presidents and agency heads can also reduce the role that science plays in agency

MICH. J. ENVTL. & ADMIN. L. 209, 260 (2012).

149. *See id.* at 261–62 (listing the options OIRA offered in its proposal); *see also* Tucker, *supra* note 147 (outlining the changes from the original EPA version to the OMB proposal).

150. *See* Steinzor, *supra* note 148, at 265–66.

151. *Id.*

152. *See* Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities, 80 Fed. Reg. 21,302, 21,302, 21,325–26 (Apr. 17, 2015) (to be codified at 40 C.F.R. pts. 257, 261) (announcing that CCRs will be disposed of “as solid waste under subtitle D of RCRA [the Resource Conservation and Recovery Act],” rather than as hazardous waste); *see also* Joby Warrick, *EPA Imposes Coal-Ash Curbs But Stops Short of ‘Hazardous’ Designation*, WASH. POST, Dec. 20, 2014, at A3.

153. *See* 80 Fed. Reg. at 21,303, 21,309.

decisions by reducing the resources available to agency scientists, making it more difficult for the staff to promulgate regulations, and arranging decisionmaking procedures to ensure that the work product of agency scientists is subject to review and modification by politically appointed officials.

1. *Cutting the Budgets for Technical Staff and Scientific Research.*

Perhaps the most straightforward way to ensure that agency scientists do not get in the way of deregulatory policy is simply to cut their budgets. It would seem far easier to downsize scientific staff by reducing the budget, rather than selecting out the most recalcitrant scientists and firing them outright. In subsequent years, the upper-level officials can, if necessary, seek increases in the budgets and bring in scientists more to their liking. And, in a similar vein, if an outside body like the agency's Science Advisory Board produces a report that does not fit a deregulatory narrative, administrations can cut off funds for future reports.¹⁵⁴ This strategy, of course, requires the cooperation of Congress, and Congress may be reluctant to cut back on popular regulatory programs. Even when unsuccessful, however, efforts by administrations bent on deregulation to cut agency science budgets sends a signal to government scientists that their contribution is not valued.¹⁵⁵

The Reagan White House was anxious to cut EPA's research budget for the simple reason that, in the words of White House Counselor Edwin Meese, "all [research scientists] do is go out and find more problems that need to be solved."¹⁵⁶ After a panel of experts

154. See, e.g., Chris Mooney, *Trump Wants to Slash Funds for the Outside Experts Who Make Sure EPA Gets the Science Right*, WASH. POST (Apr. 4, 2017), https://www.washingtonpost.com/news/energy-environment/wp/2017/04/04/trump-doesnt-just-want-to-cut-the-epas-science-he-wants-to-cut-its-expertise/?noredirect=on&utm_term=.193486e80300 [https://perma.cc/L3M2-BQCK]. There is very little evidence of attempts by OIRA to substitute deregulatory policy for science during the first two years of the Trump administration.

155. See Scott Waldman, *Future Climate Scientists Concerned but Not Cowed by Trump*, E&E NEWS (May 8, 2017), <https://www.eenews.net/climatewire/stories/1060054161/search?keyword=+Future+Climate+Scientists+Concerned+by+not+Cowed+by+Trump> [https://perma.cc/UFE7-9NTL] (discussing an interview with Christine McEntee, the CEO of the American Geophysical Union, wherein "[s]he said the Trump administration's proposed cuts to climate research has sent a clear signal to scientists that their work is no longer valuable to the White House").

156. ANNE M. BURFORD & JOHN GREENYA, ARE YOU TOUGH ENOUGH?: AN INSIDER'S VIEW OF WASHINGTON'S POWER POLITICS 80 (1986); see also DEVRA DAVIS, WHEN SMOKE RAN LIKE WATER 108 (2002) (describing a scientist's interaction with an OMB examiner where the examiner responded to a request for funding by saying "Congress does not need to hear all these details"). For descriptions of agency budget cuts and their effects during the Reagan administration, see MARTHA DERTHICK & PAUL J. QUIRK, THE POLITICS OF DEREGULATION

assembled by the NAS reported in September 1981 that acid rain in the Northeast was probably caused by emissions of sulfur dioxide and oxides of nitrogen from power plants in the Midwest, the Reagan administration cut off federal funds for a second report that would have jointly reviewed the scientific information on acid rain with a panel of the Royal Society of Canada in the hopes of reaching a consensus on the relevant science for purposes of negotiating an acid rain treaty.¹⁵⁷ During President Reagan’s first term, funding for the National Highway Traffic Safety Administration also fell by 22 percent as a result of his budget request.¹⁵⁸ Ultimately, more than a quarter of the agency’s skilled professionals departed¹⁵⁹ and formal auto defect investigations fell from eleven per year to four.¹⁶⁰

The Trump administration launched another major assault on regulatory agency budgets that had the potential to reduce the agencies’ scientific capacity. Early on, the administration set a goal of reducing EPA’s staff by 20 percent through attrition, buyouts, and reductions in force.¹⁶¹ During the first nine months of Trump’s tenure, more than 700 employees retired or resigned, 200 of which were scientists.¹⁶² Work on climate change came to a virtual halt throughout the agency.¹⁶³ In November 2017, DOI announced that it was closing the USGS’s Eastern Geographic Science Center in Reston, Virginia and reassigning its twenty-five employees or allowing them to retire.¹⁶⁴ The department cited cost savings as the reason for closing the facility,

217 (1985); GEORGE C. EADS & MICHAEL FIX, RELIEF OR REFORM?: REAGAN’S REGULATORY DILEMMA 204 (1984).

157. See Robert Reinhold, *Acid Rain Issue Creates Stress Between Administration and Science Academy*, N.Y. TIMES, June 8, 1982, at C1; Philip Shabecoff, *U.S. Slashes Funds for Study on Utilities’ Role in Acid Rain*, N.Y. TIMES, Dec. 2, 1982, at B17.

158. JOHN B. JUDIS, THE PARADOX OF AMERICAN DEMOCRACY 151 (2000).

159. Jeannye Thornton & Clemens P. Work, *Highway-Safety Agency Hits a Rough Road*, U.S. NEWS & WORLD REP., May 2, 1983, at 68.

160. JUDIS, *supra* note 158, at 151; DAVID VOGEL, FLUCTUATING FORTUNES: THE POLITICAL POWER OF BUSINESS IN AMERICA 248–49 (Beard Books 2003) (1989); see also MCGARITY & SHAPIRO, *supra* note 138, at 63 (discussing the Reagan administration’s proposals to make steep cuts in the budget for health and safety standards development).

161. *Workers Leave by the Hundreds After Trump Takes Office*, E&E NEWS (Dec. 22, 2017) <https://www.eenews.net/greenwire/stories/1060069773> [<https://perma.cc/R7WX-YCPX>].

162. *Id.*

163. See *Workers Say Climate Work Quashed Under Pruitt, Trump*, E&E NEWS (June 6, 2017), <https://www.eenews-net.proxy.lib.duke.edu/greenwire/stories/106005596/search?keyword=epa> [<https://perma.cc/2ZM2-2CKV>].

164. Scott Streater & Rob Hotakainen, *USGS Science Center in Va. Set to Close*, E&E NEWS (Nov. 14, 2017), <https://www.eenews-net.proxy.lib.duke.edu/greenwire/stories/1060066503/search?keyword=USGS+Science+Center+in+Va.+Set+to+Close> [<https://perma.cc/TB7R-UVFG>].

which conducted research on geography, remote sensing, biology and computer science as they related to land use and climate change.¹⁶⁵ At the same time that his administration was making these cuts, President Trump flouted his willingness to make decisions that should depend, to a great degree, on science without input from scientists.¹⁶⁶

More generally, the Trump administration's Fiscal Year ("FY") 2018 budget would have slashed EPA's overall budget by 31 percent and cut nearly all of the Agency's budget for research on climate change.¹⁶⁷ It would also have reduced appropriations for the operating costs of EPA's Science Advisory Board by 84 percent and eliminated the interagency United States Global Change Research Program, which had recently received high praise from the NAS.¹⁶⁸ It further proposed deep cuts in environmental monitoring, a critical scientific component of many EPA regulatory programs.¹⁶⁹ The DOE's program for sponsoring biological and environmental research would have declined 43 percent, and its program sponsoring renewable energy and

165. *Id.*

166. See, e.g., Coral Davenport, *In the Trump Administration, Science is Unwelcome. So is Advice*, N.Y. TIMES, June 9, 2018, at A1 [hereinafter *In the Trump Administration*].

167. Niina Heikkinen, *Former Staffers Decry "Draconian" Budget Cuts*, E&E NEWS (Mar. 23, 2017), <https://www.eenews-net.proxy.lib.duke.edu/climatewire/stories/1060051945/search?keyword=Former+Staffers+Decry+%E2%80%9CDraconian%E2%80%9D+Budget+Cuts> [https://perma.cc/GCG4-2XBP]; Stuart Parker, *EPA Officials Defend Agency's Duty to Follow Science on Climate Change*, INSIDE EPA (May 2, 2017), <https://insideepa.com/daily-news/epa-officials-defend-agencys-duty-follow-science-climate-change> [https://perma.cc/52K3-PQR5].

168. John H. Cushman, Jr., *Federal Climate Research, Targeted for Elimination by Trump, Lauded by Scientists*, INSIDE CLIMATE NEWS (Apr. 12, 2017), <https://insideclimate.news.org/news/12042017/climate-change-research-national-academies-sciences-global-warming-donald-trump> [https://perma.cc/LWW4-2XKE]; Heikkinen, *supra* note 167; Mooney, *Trump Wants to Slash Funds for the Outside Experts Who Make Sure EPA Gets the Science Right*, *supra* note 154. Perhaps sensing an impending exodus of highly qualified American climate scientists, French President Emmanuel Macron urged them to come to France, where they would be eligible for four-year grants of up to \$1.7 million apiece to continue their work. *Europe Tries to Lure Spooked U.S. Researchers*, E&E NEWS (June 27, 2017), <https://www.eenews-net.proxy.lib.duke.edu/climatewire/stories/1060056603/search?keyword=Europe+Tries+to+Lure+Spooked+U.S.+Researchers> [https://perma.cc/7QUX-M4VG]. By mid-2018, thirteen scientists from American universities had taken Macron up on his offer. *U.S. Climate Scientists Flee to France*, E&E NEWS (July 16, 2018), <https://www.eenews-net.proxy.lib.duke.edu/climatewire/stories/1060089121/search?keyword=U.S.+Climate+Scientists+Flee+to+France> [https://perma.cc/P8UJ-A3UJ].

169. See Christopher Flavelle, *If Trump Gets His Way, World May Not Know if U.S. Emissions Rise*, BLOOMBERG (June 7, 2017), <https://www.bloomberg.com/news/articles/2017-06-07/if-trump-gets-his-way-world-may-not-know-if-u-s-emissions-rise> [https://perma.cc/ZYK3-SQYB]; Annie Sneed, *Trump Wants Deep Cuts in Environmental Monitoring*, SCIENTIFIC AM. (Mar. 24, 2017), <https://www.scientificamerican.com/article/trump-wants-deep-cuts-in-environmental-monitoring> [https://perma.cc/J989-XPT5].

energy efficiency would have suffered a 70 percent cut.¹⁷⁰ The National Oceanic and Atmospheric Administration’s research budget would have received a 22 percent cut, and its program for sponsoring research on how low-lying communities can adapt to rising sea levels would have been eliminated altogether.¹⁷¹ The USGS would have been cut by 20 percent.¹⁷² NIOSH’s budget would have declined 40 percent, and all support for academic research would have been eliminated.¹⁷³ In an op-ed criticizing the budget cuts, three former EPA administrators who served during Republican administrations concluded that President Trump “ha[d] chosen ignorance over knowledge.”¹⁷⁴

It quickly became clear, however, that Congress was not buying into the Trump administration’s draconian proposals.¹⁷⁵ At the end of the day, Congress left nearly all of the programs in place and reduced the budgets only modestly.¹⁷⁶ Despite the congressional rejection of his first budget cuts, President Trump proposed similar cuts in his FY 2019 budget proposal, but after the warring factions in Congress struck a

170. Christopher Flavelle, *Trump Budget Slashes Climate Spending*, BLOOMBERG (May 23, 2017, 3:03 PM), <https://www.bloomberg.com/news/articles/2017-05-23/trump-budget-slashes-climate-spending-as-crazy-stuff-dropped> [<https://perma.cc/CE29-A55D>]; *What’s in Trump’s 2018 Budget Request for Science?*, SCIENCE (May 23, 2017, 12:45 PM), <http://www.sciencemag.org/news/2017/05/what-s-trump-s-2018-budget-request-science> [<https://perma.cc/TD6V-4WDG>].

171. Flavelle, *supra* note 170; *What’s in Trump’s 2018 Budget Request for Science*, *supra* note 170.

172. Brittany Patterson, *Zinke Touts Science as Trump Pushes Cuts to Research Shop*, E&E NEWS (Feb. 13, 2018), <https://www.eenews-net.proxy.lib.duke.edu/climatewire/stories/1060073663/search?keyword=Zinke> [<https://perma.cc/759N-BYH7>].

173. Sam Pearson, *Budget Proposes Deep Cuts for NIOSH, End to Outside Research*, 47 OCCUPATIONAL SAFETY & HEALTH REP. (BNA), May 24, 2017, at 466.

174. William D. Ruckelshaus, Lee M. Thomas & William K. Reilly, *Three Republican EPA Administrators: Trump is Putting Us on a Dangerous Path*, WASH. POST (May 26, 2017), https://www.washingtonpost.com/opinions/three-republican-epa-administrators-trump-is-putting-us-on-a-dangerous-path/2017/05/26/10060ad2-424b-11e7-9869-bac8b446820a_story.html?noredirect=on&utm_term=.5be470ba9004 [<https://perma.cc/MQK4-X9CE>].

175. See Marianne Lavelle, *Congress to Pruitt: We’re Not Cutting EPA Budget to Trump’s Levels*, INSIDE CLIMATE NEWS (June 15, 2017), <https://insideclimatenews.org/news/15062017/scott-pruitt-epa-budget-hearing-congress-opposes-trump-cuts> [<https://perma.cc/PU36-GVNT>]; Jeffrey Mervis & David Malakoff, *House Lawmakers Balk at Most Trump Science Cuts in Early Bills*, SCIENCE (June 30, 2017), <https://www.sciencemag.org/news/2017/06/house-lawmakers-balk-most-trump-science-cuts-early-bills> [<https://perma.cc/EJ7T-666T>].

176. See, e.g., Julie Hirschfeld Davis, *Spending Plan Passed by Congress Is a Rebuke to Trump. Here’s Why*, N.Y. TIMES, (Mar. 22, 2018), <https://www.nytimes.com/2018/03/22/us/politics/trump-government-spending-bill.html> [<https://perma.cc/XJH4-LH66>]; Scott Waldman, *Trump Seeks Big Cuts to Science Across Agencies*, E&E NEWS (Feb. 13, 2018), <https://www.eenews-net.proxy.lib.duke.edu/climatewire/stories/1060073703/search?keyword=+Trump+Seeks+Big+Cuts+to+Science+Across+Agencies> [<https://perma.cc/PHN5-TNQF>].

budget deal that made more money available for 2019, science budgets did not suffer nearly as much as they had in the original proposal.¹⁷⁷

2. *Changing Organizational Charts and Shifting Personnel.* Politically appointed agency officials can enhance their ability to substitute policy for science by arranging agency decisionmaking procedures to give them multiple opportunities to review the work of the scientists. Early in the Reagan administration, OSHA head Thorne Auchter reorganized the agency's procedures to establish a Regulation Review Committee composed of high-level political appointees, and he charged it with "reviewing documents and issues resulting from the standard development process."¹⁷⁸ Longtime OSHA staffers concluded that "the procedural quagmire that predictably resulted . . . reflected an undisguised desire of upper-level management to slow down the agency's already ponderous internal rulemaking process."¹⁷⁹ Moreover, by positioning appointees as the final step in "reviewing" the technical analyses, this new organizational chart seemed to provide a covert filter for translating the scientific record into policy in ways that were more favorable to the administration's preferred policies.

One of Administrator Lisa Jackson's first actions after President Obama appointed her to head EPA was to limit the authorship of a critical "policy" summary of the technical literature for the NAAQS reviews solely to the technical staff.¹⁸⁰ Previously, for this particular

177. See, e.g., Kevin Bogardus, *Omnibus Would Keep Steady Funding*, E&E NEWS (Mar. 22, 2018), <https://www.eenews.net/stories/1060077195> [<https://perma.cc/45YU-5KUG>]; Kevin Bogardus, *Proposal Would Cut Funding by 23%*, *Ax Hundreds of Jobs*, E&E NEWS, (Feb. 12, 2018), <https://www.eenews.net/greenwire/stories/1060077195/search?keyword=Omnibus+Would+Keep+Steady+Funding> [<https://perma.cc/H38N-FPDG>]; George Cahlink, *Bipartisan Deal Blunts Trump Plan's Impact on Agencies*, E&E NEWS (Feb. 12, 2018), <https://www.eenews.net/greenwire/stories/1060073601/search?keyword=Bipartisan+Deal+Blunts+Trump+Plan%E2%80%99s+Impact+on+Agencies> [<https://perma.cc/GR2R-QF3A>]; Jennifer A. Dlouhy, Christopher Flavelle, Eric Roston & Abby Smith, *Trump Puts Energy Saving, Climate Plans on Chopping Block Again*, BLOOMBERG ENV'T (Feb. 12, 2018), <https://news.bloombergenvironment.com/environment-and-energy/trump-puts-energy-saving-climate-plans-on-chopping-block-again> [<https://perma.cc/4KSZ-92AD>]; Davis, *supra* note 176; Jeffrey Mervis, *Congress Gives Science a Record Funding Boost*, SCIENCE, Mar. 30, 2018, at 1447; *Science Gets Modest Reprieve in Trump Budget*, SCIENCE, Feb. 16, 2018, at 723; Waldman, *supra* note 176.

178. MCGARITY & SHAPIRO, *supra* note 138, at 64.

179. *Id.*

180. Sidney Shapiro, Elizabeth Fisher & Wendy Wagner, *The Enlightenment of Administrative Law: Looking Inside the Agency for Legitimacy*, 47 WAKE FOREST L. REV. 463, 497 (2012); Andrew Childers, *Jackson Reinstates EPA Staff Paper in Review of National Air Quality Standards*, 40 ENV'T REP. (BNA) 1231 (2009); see Memorandum from Lisa P. Jackson, Adm'r, U.S. Env'tl. Prot. Agency, to Elizabeth Craig, Acting Assistant Adm'r, Air & Radiation,

report, political officials could exert a heavy hand in “explaining” what the technical research revealed; now they would be excluded from participating in an effort to ensure that the staff’s assessment was as scientifically robust as possible.¹⁸¹ Jackson concluded that the previous arrangement “complicated and delayed the NAAQS development process and made it vulnerable to the introduction of policy options that are not supported by the relevant scientific information.”¹⁸² The head of the CASAC stated that the change represented “a strong reaffirmation of the importance of the science committee.”¹⁸³ Environmental groups also supported the action.¹⁸⁴ Jackson further cut back some of the formal interagency consultation steps in EPA’s development of Integrated Risk Information System (“IRIS”) standards establishing target exposures for inhalation and ingestion of hazardous substances, and she required all interagency discussions to be made public.¹⁸⁵ Jackson’s changed IRIS process underscored how extensively the previous process, developed during the George W. Bush administration, allowed for repeated interagency negotiations that both impeded rulemaking and led to secret adjustments to the agency’s underlying scientific assessments.¹⁸⁶

In early April 2018, President Trump signed a presidential memorandum ordering EPA to change several aspects of its implementation of the Clean Air Act.¹⁸⁷ EPA responded by changing the procedures for establishing NAAQS one more time. Administrator Pruitt redirected the line of authority for the office conducting the analyses (the Office of Research and Development) from the agency’s science advisor to an office managed by a political appointee (the Office of Air and Radiation), a shift that marked a significant departure from the historic insulation of EPA’s Office of Research and

& Lek Kadeli, Acting Assistant Adm’r, Research and Development (May 21, 2009), <https://www3.epa.gov/ttn/naaqs/pdfs/NAAQSReviewProcessMemo52109.pdf> [<https://perma.cc/AD5H-7KPS>].

181. Childers, *supra* note 180.

182. *Id.*

183. John Sullivan, *EPA to Restore Scientific Review Process*, INQUIRER (May 22, 2009, 3:01 AM), http://www.philly.com/philly/news/homepage/20090522_EPA_to_restore_scientific_review_process.html [<https://perma.cc/D7B7-KA2G>].

184. Childers, *supra* note 180.

185. See EPA, IRIS PROGRESS REPORT 4 (2011), https://www.epa.gov/sites/production/files/2015-06/documents/iris_report_to_congress_2011.pdf [<https://perma.cc/8QGL-7JMY>].

186. WAGNER, ACUS STUDY, *supra* note 111, at 49–51, 116–18.

187. Presidential Memorandum for the Administrator of the Environmental Protection Agency, 83 Fed. Reg. 16,761, 16,761–62 (Apr. 12, 2018).

Development from political controls.¹⁸⁸ Pruitt also directed the CASAC to begin offering advice on the adverse social, economic, and energy impacts of the standards as well as the science underlying the standards and to focus more specifically on the relative contributions of natural and anthropogenic activities when it reviewed the NAAQS, the implication being that EPA would not have to tighten NAAQS to the extent that natural phenomena caused emissions of the relevant pollutant.¹⁸⁹ The memo further directed the staff to focus more heavily on the possibility of thresholds and background levels of the criteria pollutants “for context.”¹⁹⁰ Environmental groups and legal scholars criticized the memo as a backdoor way to allow the agency to consider cost in setting NAAQS, despite a unanimous Supreme Court holding that cost was not a relevant consideration at the standard-setting stage.¹⁹¹

Political appointees can also sideline agency scientists by reassigning them to meaningless positions.¹⁹² Complaining that “‘30 percent of the crew [at the DOI]’ was not ‘loyal to the flag,’”¹⁹³ Secretary Ryan Zinke appointed a board of political appointees to reassign members of the department’s 227 senior executive service employees to new positions.¹⁹⁴ In what became known around the department as the “Thursday-night massacre,” the board reassigned twenty-seven scientists and technical experts from jobs in which they were using their skills to protect the nation’s natural resources to jobs where, in many cases, their expertise was not needed.¹⁹⁵ Several of the

188. Memorandum from Scott Pruitt, Adm’r, U.S. Env’tl. Prot. Agency, to Assistant Adm’rs 1 (May 9, 2018), <https://www.epa.gov/sites/production/files/2018-05/documents/image2018-05-09-173219.pdf> [<https://perma.cc/A5RX-GGVN>].

189. *Id.* at 4–11.

190. *Id.* at 8.

191. Gavin Bade, *Pruitt NAAQS Memo Part of Broad Strategy to Weaken Air Regs, Lawyers Say*, UTIL. DIVE (May 11, 2018) (quoting John Walke of the NRDC and Sean Hecht of UCLA).

192. *See, e.g.*, Davenport, *In the Trump Administration*, *supra* note 166, at A1 (stating that Department of Agriculture Secretary Sonny Perdue moved the scientists in the office devoted to international food safety to a new office he established to encourage greater exports of U.S. agricultural products).

193. Kellie Lunney, *Zinke Advances Overhaul as He Questions Loyalty of Workers*, E&E NEWS (Sept. 26, 2017), <https://www.eenews.net/greenwire/stories/1060061733> [<https://perma.cc/ED7D-ZJD4>]. A spokeswoman for the American Federation of Government Employees noted that civil service employees swore an oath of allegiance to the Constitution and the United States, not to a political party. *Id.*

194. DEP’T OF THE INTERIOR, OFF. OF THE INSPECTOR GEN., REASSIGNMENT OF SENIOR EXECUTIVES AT THE U.S. DEPARTMENT OF THE INTERIOR 9 (2018).

195. Adam Federman, *The Plot to Loot American’s Wilderness: A Little-Known Bureaucrat*

reassigned specialists believed that their reassignments were related to the fact that they were working in the areas of climate change, energy, and resource conservation.¹⁹⁶ One of them, Joel Clement, protested his reassignment in an op-ed in the *Washington Post* and a formal whistleblower complaint against the department.¹⁹⁷ Clement was an expert in forest ecology and had worked in the department for seven years on issues at the intersection of climate science and public lands.¹⁹⁸ At the time of the reassignment, he was serving as the director of the department’s Office of Policy Analysis where he was responsible for the department’s efforts to address climate change resiliency in the Arctic.¹⁹⁹ He was reassigned to a position in the department’s accounting office where he was supposed to be in charge of employees auditing royalty payments.²⁰⁰ Clement admitted that he was wholly unqualified for his new position, and his new boss confirmed that the

Named James Cason Is Reshaping the Department of the Interior, NATION (Nov. 16, 2017), <https://www.thenation.com/article/the-plot-to-sell-americas-wilderness> [https://perma.cc/WV57-SYDD]. The Department’s Office of Inspector General later concluded that the board did not provide any reasons for selecting the twenty-seven officials that were reassigned, “nor did it gather the information needed to make informed decisions about the reassignments.” DEP’T OF THE INTERIOR, OFF. OF THE INSPECTOR GEN., *supra* note 194, at 1.

196. DEP’T OF THE INTERIOR, OFF. OF THE INSPECTOR GEN., *supra* note 194, at 7. The move was supported by the industries that extracted mineral resources from leased federal lands, because they believed that the departments natural resource specialists were “making decisions based on an agenda” and were “oftentimes making things up.” David Schultz & Alan Kovski, *Zinke Preparing to Reshape Interior Through Personnel*, BLOOMBERG ENV’T (June 21, 2017), <https://www.bna.com/zinke-preparing-reshape-n73014453634> [https://perma.cc/PX62-CFNT].

197. Joel Clement, *I’m a Scientist. I’m Blowing the Whistle on the Trump Administration*, WASH. POST (July 19, 2017), https://www.washingtonpost.com/opinions/im-a-scientist-the-trump-administration-reassigned-me-for-speaking-up-about-climate-change/2017/07/19/389b8dce-6b12-11e7-9c15-177740635e83_story.html?noredirect=on&utm_term=.87af5510d0e5 [https://perma.cc/5BW7-2ZAE] [hereinafter Clement, *I’m a Scientist*]; Complaint of Possible Prohibited Personnel Practice or Other Prohibited Activity from Joel Clement to U.S. Office of Special Counsel (July 12, 2017) [hereinafter Clement Complaint].

198. Sabrina Shankman, *Whistleblower Case Shows How Trump Tries to Silence Science*, INSIDECLIMATE NEWS (July 20, 2017), <https://insideclimatenews.org/news/20072017/whistle-blower-trump-intimidation-abuse-power-climate-scientists-joel-clement-zinke> [https://perma.cc/J9KM-KU2T].

199. Brittany Patterson, *Scientist on Adaptation Reassigned to Job with “No Duties,”* E&E NEWS (July 20, 2017), <https://www.eenews.net/climatewire/stories/1060057660> [https://perma.cc/L9WD-D4SJ]; Clement Complaint, *supra* note 197, at 6. Clement also chaired the Community Resilience Working Group of the White House Arctic Executive Steering Committee, which was established during the Obama administration to coordinate and reconcile priorities among the twenty-five federal agencies with responsibilities for Alaska’s arctic regions. Mark Brzezinski, *The Crisis in the Arctic*, POLITICO (Jan. 18, 2017), <https://www.politico.com/magazine/story/2017/01/the-crisis-in-the-arctic-214649> [https://perma.cc/4WSK-WJ3M]; Clement Complaint, *supra* note 197, at 6.

200. Clement Complaint, *supra* note 197, at 12.

office to which he was reassigned had no need for an employee with his expertise.²⁰¹

Clement believed that he was reassigned to a position for which he was unqualified because the department's political leaders did not agree with the scientific consensus amongst the department's experts: that global warming was a serious enough problem to warrant the assistance that Clement's group had been providing to Native villages in Alaska where "the land upon which citizens' homes and schools stand is newly vulnerable to storms, floods, and waves."²⁰² He further concluded that he was being punished for bringing the plight of the Native villagers to the attention of White House officials and, later, to the international community at recent conferences.²⁰³ Noting that other DOI experts were also "being sidelined,"²⁰⁴ he argued that Secretary Zinke's promise to reduce the department's staff through "reassignment" assumed that reassigning professionals to positions in which their talents were irrelevant would induce them to resign.²⁰⁵ Clement himself resigned in October 2017.²⁰⁶

C. *Changing the Rules for Scientific Deliberations*

A final tactic, which is gaining considerable momentum under the Trump administration, is to alter the procedural rules within the agency for conducting the technical analysis and peer review of scientific information. Existing rules for more open-ended, scientifically grounded practices can be altered in ways that lead to more politically desirable outcomes by: stacking scientific advisory committees, altering the role of expert peer review panels or, even more invasively,

201. *Id.*

202. Clement, *I'm a Scientist*, *supra* note 197.

203. *Id.*

204. Brittany Patterson, *Meet the Climate Guy Who Quit Interior*, E&E NEWS (Feb. 6, 2018), <https://www.eenews.net/stories/1060072973> [<https://perma.cc/AVN5-BA8H>].

205. Clement, *I'm a Scientist*, *supra* note 197.

206. Darryl Fears, *Interior Department Whistleblower Resigns; Bipartisan Former Appointees Object to Zinke's Statements*, WASH. POST (Oct. 6, 2017), https://www.washingtonpost.com/news/energy-environment/wp/2017/10/04/whistleblower-resigns-keeping-my-voice-more-important-than-keeping-my-job/?utm_term=.cadd274a5d3f [<https://perma.cc/MF2D-VG39>]. The North American Congress for Conservation Biology presented an award to Clement for "his work on climate change and his 'courage in upholding the highest standards of scientific integrity in government service.'" Katie Langin, *This Trump Administration Whistleblower Has Some Advice for Young Scientists*, SCIENCE (July 30, 2018, 11:30 AM), <http://www.sciencemag.org/news/2018/07/trump-administration-whistleblower-s-message-young-scientists-do-time-federal-service> [<https://perma.cc/J4XC-6NRB>].

dictating how agency staffers are allowed to consider and use evidence in their technical analyses. Each is considered in turn.

1. *Marginalizing External Review of Agency Science.* Since scientific peer review is intended to ensure the reliability of the staff assessments, one way to move the science underlying regulation toward more deregulatory ends is to manipulate or marginalize outside advisory committees.

At first blush, the mammoth size of this “fifth branch” of science advisors seems to limit the ability of a new administration to alter or adjust their role.²⁰⁷ The federal government has created more than 200 scientific advisory committees consisting of outside experts from academia, industry and public interest groups to advise federal agencies on how to bring scientific and technical information to bear on pressing issues at the intersection of science and policy.²⁰⁸ Agencies typically hire scientists and engineers with expertise in the kind of scientific issues they address. But scientific advisory committees allow them to draw on the expertise of highly credentialed researchers who frequently hold prestigious positions in major universities, corporations and other nongovernmental organizations. Serving without pay or with modest stipends, these prestigious scientists and engineers “provide an important vehicle for providing decisionmakers with robust, professional, and up-to-date scientific advice.”²⁰⁹ Scientific advisory committees also provide a valuable educational function because they “provide a transparent and objective eye that helps the public know when the government is making sound, science-based decisions.”²¹⁰ And the objectivity of their advice allows the public to hold agency leaders accountable when they base their decisions on policies that run contrary to agency authorizing statutes.²¹¹

To the extent these that advisory committees do not have a statutory basis, however, agency leaders can simply disband committees that offer advice that runs contrary to their deregulatory

207. SHEILA JASANOFF, *Judgment Under Siege: The Three-Body Problem of Expert Legitimacy*, in SCIENCE AND PUBLIC REASON 151, 157–59 (2012).

208. UNION OF CONCERNED SCIENTISTS, ABANDONING SCIENCE ADVICE 3 (2018), <https://www.ucsusa.org/sites/default/files/attach/2018/01/abandoning-science-advice-full-report.pdf> [<https://perma.cc/P4B2-E87P>].

209. *Id.*

210. *Id.* at 4.

211. *Id.*

policy preferences.²¹² After the National Human Research Protections Advisory Committee of the Department of Health and Human Services (“HHS”) and its Advisory Committee on Genetic Testing attracted opposition from religious groups during the George W. Bush administration, upper-level officials in the department simply abolished them.²¹³ During the Trump administration, Interior Secretary Zinke allowed DOI’s Advisory Committee on Climate Change and Natural Resource Science to expire because the administration was not interested in advice about how to protect the nation’s natural resources from climate disruption.²¹⁴ Similarly, Acting Administrator Andrew Wheeler in October 2018 disbanded two large advisory panels that the seven-person CASAC had relied on for more than thirty years to assist it in reviewing scientific documents that EPA’s staff prepared in connection with its five-year reviews of the NAAQS for PM, thereby depriving CASAC of the particularized expertise that it needed to do its job.²¹⁵

In agencies that rely heavily on scientific advisory committees, political appointees can also increase the probability that committees yield favorable assessments by purging them of scientists who are likely to provide unfavorable assessments and replacing them with scientists who are more likely to provide assessments that are consistent with their policy views.²¹⁶ This strategy is best accomplished discreetly. As President Reagan learned, when “hit lists” of disfavored science advisors are revealed in *Science* magazine, they can generate a strong negative public reaction.²¹⁷

212. THOMAS O. MCGARITY & WENDY E. WAGNER, BENDING SCIENCE: HOW SPECIAL INTERESTS CORRUPT PUBLIC HEALTH RESEARCH 187 (2008).

213. *Id.*

214. Michael Doyle & Brittany Patterson, *Climate Advisory Group Died Quietly*, E&E NEWS (Aug. 17, 2017), <https://www.eenews.net/stories/1060058869> [<https://perma.cc/5D38-PL5N>] (quoting former committee member Paul Beier, Northern Arizona University).

215. Sean Reilly, *EPA Scraps Science Panel: “Your Service . . . Has Concluded,”* E&E NEWS (Oct. 12, 2018), <https://www.eenews.net/stories/1060102455> [<https://perma.cc/PG4V-7MK6>]; Amena H. Saiyid, *EPA Disbands Review Panels for Some Federal Air Quality Standards*, BLOOMBERG ENV’T (Oct. 12, 2018, 3:26 PM), <https://news.bloombergenvironment.com/environment-and-energy/epa-disbands-review-panels-for-some-federal-air-quality-standards-1> [<https://perma.cc/93YL-STN5>]; see also UNION OF CONCERNED SCIENTISTS, *supra* note 208, at 7 (lamenting the FDA’s disbandment of its Food Advisory Committee, which had since 1992 provided expert advice on food science, nutrition and food safety).

216. See Goldman et al., *supra* note 6, at 696 (noting that “[o]fficials chose science advisory committee members based on who they voted for rather than scientific credentials”).

217. Eliot Marshall, *Hit List at EPA?*, 219 SCIENCE 1303, 1303 (1983).

Observers of the George W. Bush administration witnessed several instances of attempts to stack advisory committees with members that were sympathetic to administration positions.²¹⁸ For example, HHS completely revamped the twenty-four-member Board of Scientific Counselors of the National Center for Environmental Health (“BOSC”), an agency that conducts research on the effects of environmental contaminants on human health and provides advice and support to state, federal and international agencies on environmental health issues.²¹⁹ Several of the new appointees were well known for their connections to the chemical industry.²²⁰ At the same time, HHS removed a prominent researcher at Johns Hopkins University who had in the past helped environmental groups in regulatory matters.²²¹ A spokesperson for HHS defended the Department’s “prerogative to hear preferentially from experts who share the president’s philosophical sensibilities.”²²²

However, the EPA’s “hit list” under President Reagan and the stacking of science advisory panels under President George W. Bush look quaint compared to the techniques used in the Trump administration to gain greater political control over the scientific advisory process. Whether these new tactics actually help to move agency decisions in a more deregulatory direction remains an open question.²²³ Still, the tactics are sufficiently dramatic that they have the

218. See MCGARITY & WAGNER, *supra* note 212, at 186 (describing an “epidemic of stacking” advisory committees during the George W. Bush Administration, and noting that public criticism of the practice did not deter the administration); Robert Steinbrook, *Science, Politics, and Federal Advisory Committees*, 350 NEW ENG. J. MED. 1454, 1456 (2004) (criticizing the George W. Bush administration for stacking science advisory committees).

219. *About NCEH, NAT’L CTR. FOR ENVTL. HEALTH*, <http://www.cdc.gov/nceh/Information/about.htm> [<https://perma.cc/AAW7-M3RM>]; Weiss, *HHS Seeks Science Advice to Match Bush Views*, WASH. POST, Sept. 17, 2002, at A1.

220. Dan Ferber, *Critics See a Tilt in a CDC Science Panel*, 297 SCIENCE 1456, 1457 (2002). One new committee member, Dennis Paustenbach, had over the years testified on dozens of occasions for chemical industry defendants in toxic tort litigation. *See, e.g.*, Weiss, *supra* note 219, at A9.

221. Ferber, *supra* note 220, at 1457.

222. Weiss, *supra* note 219, at A8; *see also generally* Chris Clarke, *Bush’s Bizarre Science*, 2 EARTH ISLAND J. 36 (2003) (reporting on the Secretary of Health and Human Services allowing the expiration of terms of the existing members of FDA’s Reproductive Health Drugs Advisory Committee and replacing them with eleven members, four of which were anti-abortion advocates); Karen Tumulty, *Jesus and the FDA*, TIME, Oct. 14, 2002, at 26 (discussing the lack of credentials of one of the new committee members).

223. Scott Waldman, *EPA Advisers Got Oil Funding for Studies Against Car Rule*, E&E NEWS (Apr. 11, 2018), <https://www.eenews.net/stories/1060078707> [<https://perma.cc/5A8F-NU5E>] (discussing the EPA staff’s considerable record that anchors the deliberations).

potential to slow down agency decisionmaking, especially in situations where the agency is statutorily required to get feedback from advisory bodies.

Three particularly noteworthy shifts in the use of science advisory boards taking place under the Trump administration are apparently intended to move the advisory apparatus in a more deregulatory direction: (1) altering the composition of the existing boards, (2) creating policies that make future boards more industry-friendly by eliminating experts, and (3) reducing scientific advisory board influence.

Altering the Composition. Since science advisors typically have fixed terms, it might be expected that altering the composition of the boards would need to happen gradually and incrementally.²²⁴ The Trump administration, however, has devised ways around this challenge. First, in a break with tradition, the administration cleared out dozens of existing science advisors, either by refusing to renew their terms or by removing disfavored members whose terms had not expired.²²⁵ Within a few months, the Trump administration dispatched twelve of the eighteen members of the BOSC.²²⁶ Nine members were terminated before their terms were completed,²²⁷ and another five were not renewed after their terms had expired.²²⁸ In replacing these members, Administrator Pruitt tripled the number of industry representatives on the board.²²⁹ The numbers are startling. In early 2017, 79 percent of the board's members were academics and 6 percent

224. See, e.g., U.S. EPA SCI. ADVISORY BOARD, REORGANIZATION OF THE EPA SCIENCE ADVISORY BOARD (SAB) 3, EPA-SAB-04-001 (Nov. 2003) (discussing fixed terms).

225. Sean Reilly, *38 Science Advisers Get Pink Slips — Internal Email*, E&E NEWS (June 20, 2017), <https://www.eenews.net/greenwire/2017/06/20/stories/1060056308> [<https://perma.cc/B9UJ-5W7H>].

226. Scott Waldman, *Spokesman Defends Removal of 12 Scientists*, E&E NEWS (May 9, 2017), <https://www.eenews.net/climatewire/2017/05/09/stories/1060054232> [<https://perma.cc/4ZJQ-7D7Z>].

227. Georgina Gustin & Marianne Lavelle, *EPA Strips One Science Board, While Likely Eyeing a Bigger Prize*, INSIDECLIMATE NEWS (May 12, 2017), <https://insideclimatenews.org/news/08052017/epa-science-advisory-board-dismissed-scott-pruitt-donald-trump> [<https://perma.cc/VRN3-SEV2>]. The Chairwoman was also terminated after she criticized the termination of these other, valuable members. Kevin Bogardus, *Pruitt Demotes Critic as He Remakes Science Boards*, E&E NEWS (Nov. 1, 2017), <https://www.eenews.net/stories/1060065333> [<https://perma.cc/PDM4-AYYN>].

228. Rachel Leven, *Path of EPA Science Board Unclear Amid Upheaval*, BLOOMBERG ENV'T (May 8, 2017), <https://bnanews.bna.com/environment-and-energy/path-of-epa-science-board-unclear-amid-upheaval> [<https://perma.cc/FQ83-BAFX>].

229. UNION OF CONCERNED SCIENTISTS, *supra* note 208, at 5.

came from industry.²³⁰ By early 2018, only 50 percent of the members were academics and 23 percent came from industry.²³¹ Fourteen of the new members either consulted for or worked directly for the fossil fuel and chemical industries.²³² Administrator Pruitt’s office explained that “[t]he administrator believes we should have people on this board who understand the impact of regulations on the regulated community.”²³³ Pruitt’s successor, Andrew Wheeler, replaced five of the CASAC’s seven members—most of whom had been academics—with employees of state and local agencies, and he appointed a consultant to the oil industry to be its chairman.²³⁴

With dozens of open slots across many other science advisory boards available to fill, a number of academic scientists were replaced by industry professionals²³⁵ or by academics outside of the mainstream, like Dr. Robert Phalen, who believes that “[m]odern air is a little too clean for optimum health.”²³⁶ This had a predictable effect on the remaining academic scientists. With the changed composition of the committees and new chairpersons, the work apparently became less attractive to busy academic scientists. A few respected scientists declined to serve in the current administration and others resigned before their terms expired.²³⁷

Novel Exclusions for Expert Service on Boards. Historically, scientists with financial connections to companies with a stake in relevant proceedings have been disfavored as members of science

230. *Id.* at 6, fig.4.

231. *Id.*

232. Elizabeth Shogren, *Here Are 8 Ways Outgoing EPA Chief Scott Pruitt Suppressed Science*, ALTERNET (July 7, 2018), <https://www.alternet.org/here-are-8-ways-outgoing-epa-chief-scott-pruitt-suppressed-science> [https://perma.cc/D564-LDRC].

233. Coral Davenport, *E.P.A. Dismisses Members of Major Scientific Review Board*, N.Y. TIMES (May 7, 2017) [hereinafter Davenport, *E.P.A. Dismisses Members*], <https://www.nytimes.com/2017/05/07/us/politics/epa-dismisses-members-of-major-scientific-review-board.html> [https://perma.cc/RKJ9-FWP2].

234. Reilly, *supra* note 215.

235. Scott Waldman, *Pruitt Signals an Embrace of Industry Researchers*, E&E NEWS (Nov. 1, 2017), <https://www.eenews.net/climatewire/2017/11/01/stories/1060065271> [https://perma.cc/N7LK-3XUF].

236. Sean Reilly, *New Adviser Suggested Clean Air’s ‘Not Good for the Children,’* E&E NEWS (Nov. 3, 2017), <https://www.eenews.net/greenwire/2017/11/03/stories/1060065617> [https://perma.cc/3W57-9MAB].

237. Kevin Bogardus, *Members of Science Subcommittee Resign in Protest*, E&E NEWS (May 12, 2017), <https://www.eenews.net/stories/1060054502/print> [https://perma.cc/Y2ZK-AR2Q]; Corbin Hiar, *2 Greens Reject Invitations for Seats on EPA Advisory Panel*, E&E NEWS (Mar. 30, 2018), <https://www.eenews.net/greenwire/2018/03/30/stories/1060077847> [https://perma.cc/V7XT-7D2Q].

advisory boards because of the potential conflict of interest.²³⁸ In a directive on science advisory board membership, Administrator Pruitt turned the conflict rules on their head. Industry-associated members were actively solicited to “diversify” the panels.²³⁹ By contrast, scientists with federal grants from EPA were precluded from serving. In the words of the directive, “no member of an EPA federal advisory committee [shall] be currently in receipt of EPA grants.”²⁴⁰

Prohibiting service by scientists with federal grants is unprecedented in the history of science advisory boards and, to our knowledge, in the history of scientific peer review more generally. Rather than “strengthening” membership as the directive claims in the title, excluding talented grant recipients with intimate knowledge of the issues EPA must address is likely to have the opposite effect. One former science adviser and current professor at Johns Hopkins University observed that the policy will “exclud[e] a subset of the best and brightest minds in environmental science from participation in what should be the highest science advisory role in the country.”²⁴¹

The directive will affect the composition of future panels, but the agency leadership is also using it to purge boards of existing members whose research is currently supported in part by EPA funding, thereby tipping future membership toward industry.²⁴² Following the directive, agency managers have asked at least four academic science advisors to choose between continuing future service as advisors or leaving to

238. BIPARTISAN POL’Y CENTER, IMPROVING THE USE OF SCIENCE IN REGULATORY POLICY 19–23 (2009), <http://bipartisanpolicy.org/wp-content/uploads/sites/default/files/BPC%20Science%20Report%20fnl.pdf> [<https://perma.cc/2CBH-2PDJ>].

239. E. SCOTT PRUITT, ADMINISTRATOR, U.S. EPA, STRENGTHENING AND IMPROVING MEMBERSHIP ON EPA FEDERAL ADVISORY COMMITTEES (2017), https://www.epa.gov/sites/production/files/2017-10/documents/final_draft_fac_directive-10.31.2017.pdf [<https://perma.cc/G4TB-NLQZ>]. The directive references diversifying representation. The administration separately indicated that one form of this diversification was increasing industry representation. Davenport, *EPA Dismisses Members*, *supra* note 233.

240. PRUITT, *supra* note 239.

241. Juan Carlos Rodriguez, *Pruitt’s Grant Ban Stokes Concerns About EPA’s Integrity*, LAW360 (Nov. 1, 2017, 9:40 PM), <https://www.law360.com/articles/980575/pruitt-s-grant-ban-stokes-concerns-about-epa-s-integrity> [<https://perma.cc/7253-8FJ7>] (quoting Dr. Thomas A. Burke).

242. Sean Reilly, *Pruitt Sweeps More Scientists Off Advisory Panels*, E&E NEWS (Dec. 22, 2017), <https://www.eenews.net/stories/1060069799> [<https://perma.cc/4QND-RJTR>].

complete the work under their EPA scientific grants.²⁴³ Several chose the latter option.²⁴⁴

Bypassing Existing Science Advisory Boards. Still another strategy for avoiding external review of regulatory decisions is benign neglect of statutorily mandated scientific advisory committees. The agency can cut the budgets for advisory committees or simply decline to schedule advisory committee meetings to review proposed agency actions. As noted earlier, during the first months of the Trump administration, the OMB proposed to cut the budget for EPA’s science advisors by 84 percent.²⁴⁵ During the first year of the Trump administration, the number of scientific advisory committee meetings declined by 20 percent from the last year of the Obama administration.²⁴⁶ According to a survey conducted by the Union of Concerned Scientists (“UCS”), more than 65 percent of the chartered advisory committees in the FDA, EPA, and DOI failed to meet as often as their charters required in 2017.²⁴⁷ EPA failed to convene its Great Lakes Advisory Committee for over a year,²⁴⁸ and others were proceeding so slowly that their role was compromised or sidelined completely.²⁴⁹

243. Brady Dennis & Juliet Eilperin, ‘Mr. Pruitt Is Welcome To Officially Fire Me’ – As EPA Carries Out Controversial Policy, One Scientist Balks, WASH. POST (Nov. 10, 2017), https://www.washingtonpost.com/news/energy-environment/wp/2017/11/10/epa-extends-controversial-conflict-of-interest-policy-to-nearly-two-dozen-advisory-boards/?noredirect=on&utm_term=.945f6dd3dfde [<https://perma.cc/5JVV-82WC>]; Sean Reilly, *Pruitt’s Grant Ban Hits Advisory Panel at Critical Time*, E&E NEWS (Apr. 16, 2018), <https://www.eenews.net/greenwire/2018/04/16/stories/1060079173> [<https://perma.cc/BWU5-RGK7>].

244. See 2 Iowa State Professors Forced off Advisory Panel, E&E NEWS (Jan. 26, 2018), https://www.eenews.net/greenwire/2018/01/26/stories/1060072065?show_login=1&t=https%3A%2F%2Fwww.eenews.net%2Fgreenwire%2F2018%2F01%2F26%2Fstories%2F1060072065 [<https://perma.cc/7H2S-HXNZ>] (noting two professors leaving EPA advisory committees to continue using federal funding).

245. Scott Waldman, *Agency Fires Science Advisers*, E&E NEWS (May 6, 2017), <https://www.eenews.net/stories/1060054154> [<https://perma.cc/8QRT-N7TY>]. Ultimately, Congress rejected most of the Trump administration’s proposed budget cuts. See Timothy Cama, *Spending Bill Rejects Trump’s Proposed EPA Cut*, HILL (Mar. 21, 2018, 9:58 PM), <https://thehill.com/policy/energy-environment/379679-spending-bill-rejects-trumps-proposed-epa-cut> [<https://perma.cc/24GT-NYXM>] (noting that Congress chose to maintain EPA’s 2017 funding in 2018, rather than implementing a 31 percent budget cut).

246. UNION OF CONCERNED SCIENTISTS, *supra* note 208, at 4.

247. *Id.*

248. Ariel Wittenberg, *Once Busy EPA Advisory Panel Languishes Under Trump*, E&E NEWS (May 23, 2018), <https://www.eenews.net/greenwire/2018/05/23/stories/1060082513> [<https://perma.cc/L93C-97ZB>]; News Release, EPA, EPA Re-Establishes Great Lakes Advisory Board, EPA NEWS RELEASES (Dec. 13, 2018), <https://www.epa.gov/newsreleases/epa-re-establishes-great-lakes-advisory-board> [<https://perma.cc/83KF-B5PX>].

249. See Maria Hegstad, *EPA Seeks New Science Advisors, But Delay May Halt CASAC in*

As they pursued their deregulatory agendas, these agencies were apparently not interested in what outside scientists had to say. For example, the National Parks System Advisory Board was established in 1935 to advise the NPS on issues related to the nation's national parks, including in recent years how to mitigate the impacts of climate disruption on important natural and cultural sites.²⁵⁰ Based on a report by the advisory board's science subcommittee, which was comprised of prominent scientists including a Nobel Prize winner and the president of Woods Hole,²⁵¹ the director of the NPS issued a December 2016 order calling for the staff to "[c]onduct and/or facilitate scientific and scholarly inquiry that is directly applicable to current or expected resource management challenges" and to incorporate the precautionary principle and adaptive management into its resource stewardship.²⁵² Early in the Trump administration, however, Interior Secretary Zinke ordered the acting NPS director to rescind the order without consulting the advisory board, several members of which had

Fall, INSIDE EPA (June 26, 2017), <https://insideepa.com/daily-news/epa-seeks-new-science-advisors-delay-may-halt-casac-fall> [<https://perma.cc/ZBV8-FG3Y>] (noting a two-month delay); Jennifer Lu, *Air Pollutant Reviews Stalled: EPA Advisers Haven't Met in Months*, BLOOMBERG ENV'T (Mar. 15, 2018, 4:03 PM), https://www.bloomberglaw.com/document/X1TQ8H0000000?bna_news_filter=environment-and-energy&jcsearch=BNA%2520000001621a75df18a76a9f75ca920000#jcite [<https://perma.cc/K8K4-V5DC>] ("Three required scientific reviews for federally regulated air pollutants are on hold due to EPA delays."); Scott Waldman, *EPA Advisory Board Hasn't Met in 6 Months*, E&E NEWS (Mar. 6, 2018), <https://www.eenews.net/climatewire/stories/1060075513> [<https://perma.cc/K4N2-6EHJ>] ("The U.S. EPA Science Advisory Board has not met in at least six months, and some of its members say it's being sidelined to avoid getting in the way of agency Administrator Scott Pruitt's anti-regulatory agenda."). Even the reformulated science advisory boards, staffed with more industry-based members, found themselves marginalized. The science advisors in the reconfigured Board of Scientific Advisors complained, for example, that the members have received "insufficient information on the science behind several of Pruitt's decisions" and have not been consulted on others. Marianne Lavelle, *In Rebuke to Pruitt, EPA Science Board Votes To Review Climate Policy Changes*, INSIDECLIMATE NEWS (June 1, 2018), <https://insideclimatenews.org/news/31052018/epa-science-advisory-board-review-pruitt-climate-change-clean-power-plan-auto-standards-secret-science-policy> [<https://perma.cc/RF3X-E7X4>].

250. Coral Davenport, *Citing 'Inexcusable' Treatment, Advisers Quit National Parks Panel*, N.Y. TIMES (Jan. 16, 2018), <https://www.nytimes.com/2018/01/16/climate/trump-national-parks.html> [<https://perma.cc/5FT4-VDLX>]; Georgina Gustin, *Trump Administration Deserts Science Advisory Boards Across Agencies*, INSIDECLIMATE NEWS (Jan. 18, 2018), <https://insideclimatenews.org/news/18012018/science-climate-change-advisory-board-epa-interior-trump-administration> [<https://perma.cc/QA75-MTKC>].

251. NAT'L PARK SYS. ADVISORY BD. SCI. COMM., REVISITING LEOPOLD: RESOURCE STEWARDSHIP IN THE NATIONAL PARKS 24 (2012).

252. DEP'T OF THE INTERIOR, NAT'L PARK SERV., DIRECTOR'S ORDER #100: RESOURCE STEWARDSHIP FOR THE 21ST CENTURY §§ 6, 7.2, https://www.nps.gov/policy/dorders/do_100.htm [<https://perma.cc/KT2Z-RZHJ>]. The order was rescinded on August 16, 2017. *Id.*

devoted many hours to crafting it.²⁵³ Although the Department’s press office elected to keep the public in the dark about the rescission, members of the board soon found out.²⁵⁴ One of them, Clemson University professor Gary Machlis, called the rescission an act of “willful ignorance” that was part of the Trump administration’s attempts to pull back any Obama administration actions having to do with climate change.²⁵⁵ Citing the “inexcusable” treatment the committee had received from the administration, nine of the twelve board members resigned to protest administration decisions that had ignored science and belittled DOI’s environmental responsibilities.²⁵⁶ A department spokeswoman said that DOI “welcom[ed] their resignations.”²⁵⁷

* * *

The Good Science Rationale. In justifying these decisions, the Trump administration claims to be endeavoring to “strengthen” the quality of science at the agency.²⁵⁸ In rolling out the proposal barring scientific advisors from holding EPA grants, for example, Administrator Pruitt stated that “[w]hatever science comes out of EPA, shouldn’t be political science.”²⁵⁹ Yet records reveal that neither the agency’s mainstream scientists nor its staff were consulted in

253. Juliet Eilperin, *Nearly All Members of National Park Service Advisory Panel Resign in Frustration*, WASH. POST (Jan. 17, 2018), https://www.washingtonpost.com/national/health-science/nearly-all-members-of-national-park-service-advisory-panel-resign-in-frustration/2018/01/16/b322ef5e-fae3-11e7-ad8c-ecbb62019393_story.html?utm_term=.234d5cecb754 [<https://perma.cc/2PSN-MP7Q>]; Rob Hotakainen, *Emails: How Zinke Scrapped Obama’s Climate Order*, E&E NEWS (Aug. 6 2018), <https://www.eenews.net/greenwire/2018/08/06/stories/1060092837> [<https://perma.cc/Z4V6-T97J>] [hereinafter Hotakainen, *Emails*]; Rob Hotakainen, *Zinke’s ‘Crazy Policies’ Sparked Resignations – Ex Adviser*, E&E NEWS (Jan. 17, 2018), <https://www.eenews.net/stories/1060071205> [<https://perma.cc/ALK7-8SSU>] [hereinafter Hotakainen, *Zinke’s ‘Crazy Policies’*].

254. Hotakainen, *Emails*, *supra* note 253.

255. Rob Hotakainen, *NPS Chief Scraps Climate-Focused Order*, E&E NEWS (Aug. 31, 2017), <https://www.eenews.net/stories/1060059511> [<https://perma.cc/U4W7-HYUA>]. The NPS also failed to consult with the committee regarding its decisions to raise park visitor fees and to reverse an Obama administration ban on plastic water bottles in national parks. Eilperin, *supra* note 253.

256. Davenport, *supra* note 250.

257. Hotakainen, *Zinke’s ‘Crazy Policies’*, *supra* note 253.

258. See PRUITT, *supra* note 239.

259. *Administrator Pruitt Issues Directive to Ensure Independence, Geographic Diversity & Integrity in EPA Science Committees*, U.S. EPA (Oct. 31, 2017), <https://www.epa.gov/newsreleases/administrator-pruitt-issues-directive-ensure-independence-geographic-diversity> [<https://perma.cc/ZH4T-NMJL>].

developing this policy.²⁶⁰ A court order disclosing the underlying documents used to prepare the directive revealed that the policy was produced by Republican politicians working with representatives of various industries.²⁶¹ Likewise, the agency leadership failed to consult with its staff or mainstream scientists in preparing its “transparency” proposal; even EPA’s own reconfigured BOSC “was left in the dark.”²⁶²

Aftermath. These strategies for reorienting the external scientific review process in a more deregulatory direction have not gone unnoticed. Investigative journalists and reporters have been watching and reporting on the weekly and sometimes daily activities governing EPA’s use of science advisory boards.²⁶³ Members of scientific advisory committees have also spoken out in protest;²⁶⁴ members of Congress have requested reports from the Government Accountability Office (“GAO”) and demanded information on scientific decisionmaking processes;²⁶⁵ and at least one House of Representatives hearing has been held on the Trump administration’s unique practices with respect

260. Sean Reilly, *GOP Lawmakers, Industry Had EPA’s Ear on Advisory Panels*, E&E NEWS (May 24, 2018), <https://www.eenews.net/stories/1060082657> [<https://perma.cc/FT39-CRG8>].

261. *Id.*

262. Sylvia Carignan, *Pruitt’s Science Advisers Left in the Dark on Transparency Proposal (2)*, BLOOMBERG ENV’T (June 29, 2018, 11:36 AM), <https://news.bloombergenvironment.com/environment-and-energy/pruitts-science-advisers-left-in-the-dark-on-transparency-proposal-2> [<https://perma.cc/9QCB-6322>].

263. McGarity has collected a two-inch thick pile of news reports generated just on advisory boards at EPA over the last eighteen months.

264. Kevin Bogardus, *Pruitt Demotes Critic as He Remakes Science Boards*, E&E NEWS (Nov. 1, 2017), <https://www.eenews.net/stories/1060065333> [<https://perma.cc/A5LM-EK4H>]; Niina Heikkinen, *Lawyer Calls Pruitt’s Science Shake-up Illegal*, E&E NEWS (Nov. 8, 2017), <https://www.eenews.net/climatewire/2017/11/08/stories/1060065927> [<https://perma.cc/X294-2THF>]; Rodriguez, *supra* note 241.

265. Kevin Bogardus, *Carper Sharply Questions Move on Scientific Advisers*, E&E NEWS (May 9, 2017) <https://www.eenews.net/stories/1060054267> [<https://perma.cc/R4BY-DXZS>]; Sylvia Carignan, *EPA Science Advisers Defend Industry Ties, Despite Democrat Doubts*, BLOOMBERG ENV’T (Jan. 10, 2018), <https://news.bloombergenvironment.com/environment-and-energy/epa-science-advisers-defend-industry-ties-despite-democrat-doubts> [<https://perma.cc/H5L7-99EU>]; Kyle Jahner, *Sens. Ask GAO To Eye EPA’s ‘Double Standard’ on Advisers*, LAW360 (Nov. 9, 2017, 8:50 PM), <https://www.law360.com/articles/984025/sens-ask-gao-to-eye-epa-s-double-standard-on-advisers> [<https://perma.cc/62V4-CR38>]; Michael Phillis, *EPA Science Board Moves Are Concerning, Dems’ Letter Says*, LAW360 (May 19, 2017, 4:36 PM), <https://www.law360.com/articles/926203/epa-science-board-moves-are-concerning-dems-letter-says> [<https://perma.cc/A56K-2HR6>]; Sean Reilly, *Dems Tout Evidence of Political Meddling in Advisory Posts*, E&E NEWS: E&E DAILY (Feb. 15, 2018), <https://www.eenews.net/eedaily/2018/02/15/stories/1060073965> [<https://perma.cc/N4T9-KQH9>]; Sean Reilly, *Lawmakers Urge Pruitt To Revise Policy on Science Advisers*, E&E NEWS (Nov. 8, 2017), <https://www.eenews.net/eedaily/stories/1060065947> [<https://perma.cc/3EM6-L7SX>].

to outside science advice at EPA.²⁶⁶ More House of Representatives hearings are likely in the 116th Congress as the Democratic leadership probes possible Trump administration abuses. A handful of lawsuits have also been filed by affected groups, including: the expert advisors themselves, the UCS, and the Natural Resources Defense Council (“NRDC”).²⁶⁷ Each of these groups has filed one or more separate lawsuits challenging the administration’s directive prohibiting members from holding EPA grants.²⁶⁸ Whether the courts will intervene into the Trump administration’s unprecedented assaults on the scientific advisory process remains to be seen.

2. *Constraining the Staff’s Analysis of the Best Available Science.*

In the past, career scientists have been relatively unconstrained in how they weigh the evidence or develop methods for assessing the relevant literature.²⁶⁹ In the last two years, however, the Trump administration has developed systemic policies to impose restrictions on how staff scientists analyze and synthesize the available scientific information.

The most overt effort is EPA Administrator Scott Pruitt’s April 2018 “Transparency Rule” proposal, which would exclude from consideration peer reviewed scientific studies if the authors do not make all of the underlying “dose response data and models . . . publicly available in a manner sufficient for independent validation.”²⁷⁰ If finalized, the rule is poised to operate as an enforceable exclusion on any research for which underlying data cannot be produced. The listed exceptions are limited to “privacy, confidentiality, confidential

266. Scott Waldman, *EPA Science Board Purge To Play Role in Hearing*, E&E NEWS (May 22, 2017), <https://www.eenews.net/climatewire/2017/05/22/stories/1060054864> [<https://perma.cc/VPQ7-LNF9>].

267. Different lawsuits raise different objections. One case argues the EPA directive raises the bar too high for service in violation of FACA. Amanda Reilly, *2nd Lawsuit Hits Pruitt’s Advisory Board Directive*, E&E NEWS (Jan. 24, 2018), <https://www.eenews.net/greenwire/stories/1060071815> [<https://perma.cc/6NTD-ZH2B>]. Other suits allege the directive violates the Administrative Procedure Act in multiple ways. Sean Reilly, *NRDC Sues Pruitt Over Advisory Panel Mandate*, E&E NEWS (Jan. 25, 2018), <https://www.eenews.net/greenwire/2018/01/25/stories/1060071971> [<https://perma.cc/3ZUR-FBPV>]; cf. Maria Hegstad, *Critics Float Legal Theories to Challenge Pruitt’s Science Advisor Policy*, INSIDE EPA (Nov. 3, 2017), <https://insideepa.com/daily-news/critics-float-legal-theories-challenge-pruitts-science-advisor-policy> [<https://perma.cc/TS7N-WVSG>] (highlighting potential legal strategies).

268. See text accompanying *supra* note 267.

269. See, e.g., NAT’L RESEARCH COUNCIL, REVIEW OF THE EPA’S DRAFT IRIS ASSESSMENT OF FORMALDEHYDE 155 (2011).

270. Strengthening Transparency in Regulatory Science, 83 Fed. Reg. 18,768, 18,773 (proposed Apr. 30, 2018) (to be codified at 40 C.F.R. pt. 30) (emphasis omitted).

business information, and . . . national and homeland security,” which must be determined by the Administrator, presumably on a case-by-case basis.²⁷¹ Although transparency is generally a desirable scientific practice, the rule ignores the fact that scientists conducting the epidemiological studies that EPA relies upon in promulgating protective standards routinely promise their subjects to keep personal information confidential. As a result, “[t]he EPA rule creates a catch-22 for these researchers. If they disclose the identity of their research subjects, then they could face criminal penalties under federal medical-privacy laws. But if they respect the privacy of their subjects, then their final study cannot be used by EPA.”²⁷² In fact, it appears that the primary purpose of the policy is to target these studies to ensure they are not allowed to be used in the EPA’s future analyses.²⁷³ The policy also appears to retroactively exclude all research that does not meet its test.²⁷⁴ For example, highly acclaimed studies on lead toxicity—like Herbert Needleman’s landmark paper,²⁷⁵ along with likely thousands of other studies that have been used in the past by EPA in support of regulatory standards—do not meet the proposal’s requirement for data transparency because, for example, 30-year-old records no longer exist.

Although the EPA leadership argues that the prohibition will “strengthen” the quality of the agency’s science, the scientific community strongly disagrees. The editors of top scientific journals, including *Science* and *Nature*, observe that although transparency is critical to science, “in not every case can all data be fully shared.”²⁷⁶ Rather, “it is paramount that the full suite of relevant science vetted through peer review, which includes ever more rigorous features, inform the landscape of decisionmaking.”²⁷⁷ By excluding some of the

271. *Id.* at 18,774.

272. Robinson Meyer, *Even Geologists Hate the EPA’s New Science Rule*, ATLANTIC (July 17, 2018), <https://www.theatlantic.com/science/archive/2018/07/scott-pruitts-secret-science-rule-could-still-become-law/565325> [<https://perma.cc/H2NG-PU9X>].

273. *Id.*

274. 83 Fed. Reg. at 18,771 (“Agency’s offices should be guided by this policy to the maximum extent practicable during ongoing regulatory action, even where such research has already been generated, solicited, or obtained.”).

275. Herbert L. Needleman et al., *Deficits in Psychologic and Classroom Performance of Children with Elevated Dentine Lead Levels*, 300 NEW ENG. J. MED. 689 (1979) (finding compromised classroom performance among children with higher blood lead levels).

276. Jeremy Berg, Philip Campbell, Veronique Kiermer, Natasha Raikhel & Deborah Sweet, Letter, *Joint Statement on EPA Proposed Rule and Public Availability of Data*, SCIENCE MAG. (May 4, 2018), <http://science.sciencemag.org/content/360/6388/eaau0116> [<https://perma.cc/P7JB-ZVVF>].

277. *Id.*

most important and informative studies—studies that have been rigorously reviewed and rereviewed over time—the current administration will produce impoverished and incomplete records that in turn can be used to justify weakening protective standards and failing to strengthen weak standards.

As if on cue, the DOI has recently published its own proposal for limiting the scientific evidence that its scientists may consider in much the same way as EPA’s transparency proposal.²⁷⁸ Politically motivated process rules that alter what and how science can be used by agency staffs at the earliest stages of technical deliberation are by far the most worrisome of the Trump administration’s recent innovations. It remains to be seen whether they will withstand the test of time.

II. ANALYSIS

The political manipulation of agency science appears widespread, but perhaps these interventions can be justified on the ground that they occur at the behest of a committed President eager to follow through on the public commitments he made during the election season. As long as the changes are made at the direction of an elected official, the argument goes, they line up with the basic principles of our constitutional democracy. Yet, even putting aside the hotly debated desirability of the President’s control of agency decisions through a unitary executive,²⁷⁹ most of the political manipulations of science detailed in Part I still fail basic tests of administrative legitimacy.

First, the strategies discussed here are not transparent. Although they are advertised as efforts to “strengthen” the agency’s science and to use “good science” for regulation, they typically hide their substitution of policy preferences for rigorous scientific research from public view.²⁸⁰ When the manipulation is accomplished by presidentially appointed officials in the agencies or in OMB, the

278. See Dep’t of Interior, Order No. 3369, Promoting Open Science (Sept. 28, 2018), https://www.doi.gov/sites/doi.gov/files/elips/documents/so_3369_promoting_open_science.pdf [<https://perma.cc/W7YY-6LV9>]; see also Michael Doyle, *It’s No Secret: Dems Distrust New “Open Science” Policy*, E&E News, Oct. 12, 2018, <https://www.eenews.net/greenwire/2018/10/12/stories/1060102447> [<https://perma.cc/9XW3-3TMW>].

279. For critical commentary on the unitary executive theory itself, see, e.g., HEIDI KITROSSER, RECLAIMING ACCOUNTABILITY: TRANSPARENCY, EXECUTIVE POWER, AND THE U.S. CONSTITUTION (2015); Cynthia R. Farina, *False Comfort and Impossible Promises: Uncertainty, Information Overload, and the Unitary Executive*, 12 U. PA. J. CONST. L. 357, 360 (2010).

280. See, e.g., text accompanying notes 241, 258–62.

president's hand in the decisionmaking process is invisible. Even strong theories of executive power stop well short of suggesting that this type of scientific manipulation by political officials is appropriate. For example, then-Professor Kagan, a proponent of a strong executive branch, opined that political meddling in the underlying scientific record of agency rules is troubling, and stated that it “would threaten a kind of impartiality and objectivity in decisionmaking that conduces to both the effectiveness and the legitimacy of the administrative process.”²⁸¹

Second, the strategies undermine the rigor and integrity of the scientific information that are the basics of agency regulations. As Professor Doremus notes, “[g]overnment cannot make good policy decisions unless the decision makers have access to, and appropriately use, the best available understanding of the relevant facts.”²⁸² To the extent that the stealth science strategies described in Part I move agencies in the opposite direction, they compromise the objectivity of government decision making, pervert the public's understanding of the reasons for agency decisions, and undermine the legitimacy of government action.

Finally, the strategies have real world consequences. Substitution of deregulatory policy for science has, in the past, resulted in higher pollution loads and workplace exposures than Congress was willing to tolerate in the authorizing statutes.²⁸³ Although it is difficult to draw a direct line between manipulation of science and a particular death or injury, epidemiological studies like the “Six Cities” study strongly suggest less protective standards for PM will increase the number of adverse health effects in exposed populations.²⁸⁴ Likewise, existing epidemiological studies suggest that some children of farmworkers who continue to be exposed to chlorpyrifos will suffer neurological impairment.²⁸⁵ If EPA's manipulation of a regulatory impact assessments to limit the indirect effects of reducing greenhouse gas

281. Elena Kagan, *Presidential Administration*, 114 HARV. L. REV. 2245, 2356–58 (2001) (urging self-restraint in White House review of agencies' science-intensive rules).

282. Doremus, *supra* note 124, at 1639.

283. *See, e.g., supra* Part I.A.5.

284. *See, e.g.,* Qian Di, Yan Wang, Antonella Zanobetti, Yun Wang, Petros Koutrakis, Christine Choirat, Francesca Dominici & Joel D. Schwartz, *Air Pollution and Mortality in the Medicare Population*, 376 NEW ENG. J. MED. 2513, 2513 (2017) (“In the entire Medicare population, there was significant evidence of adverse effects related to exposure to PM_{2.5} and ozone at concentrations below current national standards.”).

285. *See supra* notes 67–75 and accompanying text.

emissions from power plants successfully justifies the Trump administration’s drastic limitation of the scope of the Obama Administration’s greenhouse gas controls, we will all suffer from the effects of global warming to which the added emissions will contribute.

To the extent that the political manipulation of science is a serious matter, then, why is it so prevalent? Should not the Administrative Procedure Act and the maze of good government laws and processes that are currently in place prevent this kind of political meddling? It is important to consider the limited reach of existing tools for discouraging political manipulation of science in the discussion that follows. As an initial matter, however, the reality of the unitary agency must be recognized—agencies engaged in health and environmental regulation typically operate as united, cohesive units of governance.²⁸⁶ The current design of most internal agency decisionmaking processes provides few, if any, proactive barriers to prevent politically appointed officials from tinkering with the agency’s scientific record. Instead, the agency speaks with one voice to the public and the reviewing courts in a way that commingles the work of the technical staff with that of the political appointees. Political appointees and policy staff regularly work side by side with the technical staff to prepare an agency’s combined analysis and decision document. Even concepts of authorship and attribution within the agency are generally, but not always, foreign to how agencies work; indeed, the list of agency authors of a rule or preamble or even the supporting technical analyses may not even be available.²⁸⁷ In this institutional setting, the “[c]ivil servants . . . are not directly protected against political interference with or overriding of their professional judgments.”²⁸⁸

With that understanding, the courts, Congress, the agencies themselves, and the scientific community and media are examined to determine how well they discourage the political manipulation of science in practice.

286. WAGNER, ACUS STUDY, *supra* note 111, at 123 (observing that “the agencies under study generally did not disaggregate their analyses into . . . separate steps”). This unitary agency description may less accurately describe multimember agencies like the Federal Trade Commission, the Consumer Product Safety Commission, and the National Labor Relations board where each commissioner has his or her own staff in addition to the general agency staff.

287. *Id.* at 130–31 (observing that, at least at the Fish and Wildlife Service and the Nuclear Regulatory Commission, there is no meaningful form of authorship or attribution for agency staff).

288. Doremus, *supra* note 124, at 1637.

A. Courts

In theory, the courts should be capable of providing the most direct check on the politicization of science in regulatory decisionmaking. But in practice, courts have rarely intervened to address the incidents reported in Part I (less than 15 percent of the time). What accounts for this apparent failure of the courts to protect the agencies' use of science against political manipulation? One important reason is the expense of litigation. For thinly financed public interest groups, litigation has high opportunity costs and involves delicate priority setting. Despite the reports of considerable public interest litigation in the 1970s,²⁸⁹ current rates of challenges by public interest groups to health and environmental regulations appear to be relatively low. In an empirical analysis of all rules promulgated in the air toxics program, one of this Article's coauthors reported public interest litigation rates of less than 10 percent.²⁹⁰ Public interest groups readily concede that this low rate is a reflection of limited resources and not an indication that the other rules were considered acceptable.²⁹¹

For litigation to serve as an effective deterrent to the politicization of science, public interest groups must also have the investigatory firepower to learn of this political manipulation in the first place. There is little indication that these resources are available in most settings. One public interest attorney conceded that even the choice of which rules to read and comment on involves back-of-the-envelope, triage-like decisions made necessary by scarce resources.²⁹² In a number of studies, half of the health and environmental protection rules were not commented on by anyone other than industry and some states, even though the rules involved issues of considerable public importance.²⁹³

But even in a hypothetical world in which richly subsidized public interest groups are able to investigate and use the court system to full advantage, litigation is a limited tool at best for discouraging the stealth use of science as a deregulatory strategy. It is very difficult to persuade a reviewing court to set aside an agency deregulatory action under the

289. Wendy Wagner, *Revisiting the Impact of Judicial Review on Agency Rulemaking: An Empirical Investigation*, 53 WM. & MARY L. REV. 1717, 1727 (2012).

290. *Id.* at 1745.

291. *Id.* at 1746–47.

292. *Id.*

293. *Id.* at 1785–86 (summarizing this literature).

deferential “arbitrary and capricious” test of the APA.²⁹⁴ Perhaps more limiting is the stark reality that litigation tends to drag on for years, which could be consistent with deregulatory goals in some cases. Consider, for example, a statute mandating that the agency promulgate standards for air toxins by a deadline.²⁹⁵ If the administration develops a legally risky deregulatory approach to the technical analysis that faces a risk of being upended in litigation, the consequence of failure is that no rule is in place until the agency writes a legally supportable regulation.²⁹⁶ Either way, an administration bent on deregulation wins.

Several of the examples cited in Part I also suggest that when they do become aware of deregulatory manipulation of science, courts are reluctant to point fingers at the political process in concluding that the actions are “arbitrary and capricious.”²⁹⁷ Indeed, even when the record and briefs are rife with evidence of political tinkering as the cause of the alleged agency transgressions, the courts seem to focus instead on the agency’s explanations and not on the individual actors within and—in the case of White House intervention—external to the agencies.²⁹⁸ It is the unitary agency’s work that is arbitrary and capricious, and it is up to the agency to fix the problem as the agency is the author. The political actors are spared the bad publicity.

B. Congress

Congress can also become an adversary when it discovers the political manipulation of science in regulatory agencies. When Congress is interested in conducting effective oversight, the tools are many and include: letters of concern to agencies; subpoenas of documents; brutal oversight hearings; requests for NAS, GAO, and inspector general review; documenting abuses in reports and other forms of embarrassing publicity; and amendments to statutes that reduce agency discretion. Yet in our accounts, the role of Congress was generally effective only when at least one house of Congress was

294. See, e.g., Albert C. Lin, *President Trump’s War on Regulatory Science*, 43 HARV. ENVTL. L. REV. (forthcoming 2019) (analyzing these challenges in detail).

295. See, e.g., 42 U.S.C. § 7412(e) (2012).

296. Wagner, *supra* note 289, at 1750–59.

297. See, e.g., note 133 and accompanying text.

298. In *Mississippi v. EPA*, 744 F.3d 1334 (D.C. Cir. 2013), the court reversed and remanded one of EPA’s secondary standards for lack of support in the record. In doing so, however, the court never mentioned the extensive evidence in the briefs that it was OIRA’s intervention that created the problem, as opposed to EPA itself. See, e.g., Final Opening Brief of State Petitioners at 32, *Mississippi v. EPA*, 744 F.3d 1334 (D.C. Cir. 2013) (No. 08-1200).

controlled by a party other than that of the president. Democrat-controlled Congresses during the Reagan administration and the final two years of the George W. Bush administration went to great lengths to spotlight and condemn the ways that political appointees had manipulated science.²⁹⁹ Some of these congressional interventions even took the form of amendments to the authorizing legislation to limit discretion of the agency.³⁰⁰

On the other hand, when the parties controlling the White House and Congress are aligned, the tools available to Congress are more limited—primarily consisting of the minority’s documentation of problems (for example, through committee staff reports, GAO studies, and inspector general reports).³⁰¹ The information gathering tools available to the minority are still very valuable, but they are insufficient to ultimately reverse or even significantly expose deregulatory manipulations of science.

C. Agency Counter-Pressure

Agency career employees have not always taken political manipulation of agency science lying down. Put simply, alterations to the scientific record cut right to the heart of the staff’s role and the agency’s mission. And many career staffers are deeply committed to the agency’s mission, or they would have sought higher paying or more prestigious jobs. Indeed, as we detail above, in many cases the manipulations were publicized only because agency staffers were willing to call out the clandestine activities of politically appointed officials.

The ability of an agency’s career staffers to serve as a check on political manipulations, however, is only as strong as the external oversight mechanisms available to them. And in the case of the

299. See, e.g., Doremus, *supra* note 124, at 1634–35 (describing the backlash against the Reagan administration’s manipulation of scientific information concerning endangered species); see also generally MAJORITY STAFF OF THE SUBCOMM. ON INVESTIGATIONS & OVERSIGHT FOR SUBCOMM. CHAIRMAN BRAD MILLER, COMM. ON SCI. & TECH., 110TH CONG., NIPPING IRIS IN THE BUD: SUPPRESSION OF ENVIRONMENTAL SCIENCE BY THE BUSH ADMINISTRATION’S OFFICE OF MANAGEMENT AND BUDGET (June 11, 2009), https://www.ucsusa.org/sites/default/files/legacy/assets/documents/scientific_integrity/miller-iris-report-june-09.pdf [<https://perma.cc/5GHR-X2F8>] (describing Bush OIRA’s effort at undermining EPA’s initiative to establish the scientific database Integrated Risk Information System).

300. See, e.g., James J. Florio, *Congress as Reluctant Regulator: Hazardous Waste Policy in the 1980’s*, 3 YALE J. ON REG. 351 (1986) (describing Congress’ efforts to legislatively force EPA to regulate under the Resource Conservation and Recovery Act).

301. See *infra* Part II.C.

political manipulation of the scientific record, there are only limited oversight tools, such as congressional oversight hearings and the agency’s Office of Inspector General (which can sometimes be compromised itself by politics).³⁰² Most remaining enforcement and oversight mechanisms are housed within the executive branch and subject to control by the same political officials the agency staff seeks to expose and possibly discipline. We examine the effectiveness of the most promising tools—science integrity policies, the use of science advisors, and staff whistle-blowing—below and conclude that, while important, they are not sufficient to counteract most of these scientific manipulations.

1. *Science Integrity Policies.* Most agencies now have scientific integrity policies in place to explicitly protect against the political manipulation of science.³⁰³ Reacting to perceived abuses of science during the George W. Bush administration, President Obama signed a memorandum in March 2009 asking the director of the OSTP to develop policies for ensuring scientific integrity in federal agency decisionmaking.³⁰⁴ In addition, each agency was to craft “rules and procedures to ensure the integrity of the scientific process within the agency.”³⁰⁵ Among the requirements are the commands that political appointees “should not suppress or alter scientific or technological findings,”³⁰⁶ and “[t]o the extent permitted by law, there should be transparency in the preparation, identification, and use of scientific and technological information in policymaking.”³⁰⁷ Finally, agencies should put “in place procedures [for] identify[ing] and address[ing] instances in which the scientific process or the integrity of scientific and technological information may be compromised,” procedures to protect whistleblowers, and additional procedures “to ensure the integrity of scientific and technological information and processes” relied on by the agency.³⁰⁸

302. See, e.g., Doremus, *supra* note 124, at 1646 (discussing the potential politicization of OIGs).

303. For an excellent review of these policies, see Lin, *supra* note 294, at 37–40.

304. Memorandum from President Barack Obama to the Heads of Exec. Dep’ts & Agencies (Mar. 9, 2009).

305. *Id.*

306. *Id.*

307. *Id.*

308. *Id.*

It took over a year for the OSTP to develop scientific integrity policies for the agencies to use in crafting their own policies. The OSTP memorandum told the agencies to develop policies that “[e]nsur[ed] a culture of scientific integrity.”³⁰⁹ Among other things, the memorandum stressed that “[i]n no circumstances may public affairs officers ask or direct Federal scientists to alter scientific findings.”³¹⁰ Additionally, agency selection of members of advisory committees had to be “based on expertise, knowledge, and contribution to the relevant subject area.”³¹¹

Twenty-four departments and agencies promulgated scientific integrity policies in response to the memorandum.³¹² EPA published its policy in May 2011, and established a “Scientific Integrity Official to champion scientific integrity throughout the Agency.”³¹³ Among other commitments, the EPA policy declared that it was “essential that political or other officials not suppress or alter scientific findings.”³¹⁴ It further “[p]rohibit[ed] all EPA employees, including scientists, managers, and other Agency leadership, from suppressing, altering, or otherwise impeding the timely release of scientific findings or conclusions.”³¹⁵ It demanded that agency employees “act honestly and refrain from acts of scientific misconduct,” which included “fabrication, falsification, or plagiarism.”³¹⁶ The policy “[r]ecognize[d] the distinction between scientific information, analyses, and results from the policy decisions made based on that scientific information,”

309. Memorandum from John P. Holdren to the Heads of Exec. Dep’ts & Agencies 1 (Dec. 17, 2010). Agencies were to “[s]trengthen the actual and perceived credibility of Government research” by ensuring that the data used in decisionmaking underwent peer review, setting clear standards governing conflicts of interest, and “adopting appropriate whistleblower protections.” *Id.* at 1–2. Other goals were to “[f]acilitate the free flow of scientific and technological information” and “[e]stablish principles for conveying scientific and technological information to the public.” *Id.* at 2.

310. *Id.*

311. *Id.* at 3.

312. RASHIDA NEK & ANITA R. EISENSTADT, SCI. & TECH. POL’Y INST., REVIEW OF FEDERAL AGENCY POLICIES ON SCIENTIFIC INTEGRITY III (2016).

313. U.S. EPA, SCIENTIFIC INTEGRITY POLICY 1 (2012); see also Hannah Hess, *Science Watchdog Investigating Pruitt’s CO2 Remarks*, E&E NEWS (Apr. 3, 2017), <https://www.eenews.net/eedaily/stories/1060052478/search?keyword=Science+Watchdog+Investigating+Pruitt’s+CO2+Remarks> [https://perma.cc/7SJT-MZLF]. The policy “reaffirm[ed] and promot[ed] scientific integrity” by “supporting the culture of scientific integrity, enhancing transparency within scientific processes, and protecting Agency scientists.” U.S. EPA, SCIENTIFIC INTEGRITY POLICY, *supra* 313, at 3.

314. U.S. EPA, SCIENTIFIC INTEGRITY POLICY, *supra* note 313, at 1.

315. *Id.* at 4.

316. *Id.*

and it insisted that “quantitative conclusions . . . not be influenced by possible risk management implications of the results.”³¹⁷ Finally, the policy extended the agency’s existing whistleblower protections to all “employees who uncover or report allegations of scientific and research misconduct, or who express a differing scientific opinion, from retaliation or other punitive actions.”³¹⁸

EPA’s program is considered a particularly rigorous one, in part because it is one of the few that establishes an independent scientific officer.³¹⁹ EPA’s program also prohibits precisely the activities of concern here that contribute to the political manipulation of science.³²⁰ However, enforcement of EPA’s scientific integrity policy is limited. As Professor Lin observes, “EPA’s policy expressly states that it offers internal guidance and creates no enforceable obligations.”³²¹ Lin also details a recent, failed effort to apply the policy against false statements made by Administrator Pruitt.³²² Lin concludes from this experience that—aside from the lack of meaningful sanctions—even “establishing a violation of EPA’s scientific integrity policy may not be easy.”³²³

As long as implementation of these scientific integrity policies is triggered by self-policing and self-enforcement by agency employees, their ability to protect against the manipulations described in Section I will be limited at best. The scientific integrity officer can focus public attention on violations of the policy through reports that are amplified in the news media, but that appears to be the extent of their power. As one USDA scientist candidly reported, its scientific integrity policy was “kind of a nicety with no real meaning.”³²⁴

317. *Id.* at 3–4.

318. *Id.* at 5.

319. Kimberley A. Strassel, *Anatomy of a Deep State*, WALL STREET J., May 26, 2017, at A15. The current occupant of that position, Francesca Grifo, a former advocate at the Union of Concerned Scientists, has proactively promoted that topic by holding well-attended meetings and workshops for agency employees and stakeholders. Zack Colman, *Phone Lines Maxed Out for Scientific Integrity Meeting*, E&E NEWS (Oct. 2, 2017), <https://www.eenews.net/climatewire/2017/10/02/stories/1060062275> [<https://perma.cc/W48A-YMY6>].

320. *See supra* notes 313–18 and accompanying text.

321. Lin, *supra* note 294 (manuscript at 48).

322. *Id.* (manuscript at 48–49).

323. *Id.* (manuscript at 48).

324. *Some Scientists Say Their Work Has Been Altered*, E&E NEWS (Apr. 21, 2017), <https://www.eenews.net/greenwire/stories/1060053414/search?keyword=Some+Scientists+Say+Their+Work+Has+Been+Altered> [<https://perma.cc/YM6R-V3RX>].

2. *Science Advisory Boards.* Several regulatory statutes create scientific advisory committees to review the work of agency scientists and provide advice on regulatory issues, and agencies frequently create science advisory boards on their own.³²⁵ A scientific advisory committee can lend the patina of objectivity to science-based agency decisions that can be very useful to an agency that is under attack in the political arena.³²⁶ At the same time, we have observed a number of instances—more than 30 percent of our accounts—in which scientific advisory committees have blown the whistle on low visibility attempts by upper-level decisionmakers to manipulate science to achieve predetermined outcomes.³²⁷ In the course of judicial review, courts in fact sometimes rely on criticisms by scientific advisory committees to support conclusions that agency actions are arbitrary and capricious.³²⁸

EPA's Clean Air Scientific Advisory Committee, for example, has on several occasions complained rather loudly that the administrator ignored its advice on NAAQS in an effort to make the standards less burdensome for the affected industries.³²⁹ A working group of EPA's Science Advisory Board circulated a memorandum in May 2018 containing recommendations for full board review of several of the agency's proposed deregulatory actions during the Trump administration.³³⁰ The memorandum, which was reported in the trade press,³³¹ contained several rather strong criticisms of pending EPA actions, including the Agency's reconsideration of its final determination of emissions standards for automobiles, national emission standards for hazardous air pollutants for hydrochloric acid production residual risk, and the repeal of emissions requirements for

325. See generally JASANOFF, *supra* note 207 (providing book-length treatment of the operation of science advisory boards in the United States).

326. *Id.* at 206.

327. We categorized and tabulated all of our accounts in Part II that involved public reprimands or sanctions for the executive branch's manipulation of science. Of the twenty-two documented incidents that involved public reprimands of some form by Congress, the courts (through litigation), agency staff, or science advisory boards, seven (or 30 percent) involved criticism from a science advisory board.

328. See, e.g., *Am. Farm Bureau Fed'n v. EPA*, 559 F.3d 512, 521–24 (D.C. Cir. 2009).

329. See, e.g., *supra* notes 130–32, 144 and accompanying text.

330. Memorandum from Alison Cullen, Chair, Science Advisory Board (SAB) Work Group on EPA Planned Actions for SAB Consideration of the Underlying Science, to Members of the Chartered SAB and SAB Liaisons (May 18, 2018) [hereinafter Cullen Memorandum].

331. E.g., Marianne Lavelle, *Pruitt's Anti-Climate Agenda is Facing New Challenge from Science Advisers*, INSIDECLIMATE NEWS (May 23, 2018), <https://insideclimatenews.org/news/23052018/scott-pruitt-epa-climate-change-clean-power-plan-scientific-review-board-trump-administration> [http://perma.cc/9R64-WD6S].

“glider” trucks.³³² The working group pointedly noted a “trend” in which the agency’s air office was providing less information to the Scientific Advisory Board about planned actions³³³ in an apparent effort to limit the Board’s input.

Yet once again, this particularly important shield against politicization of science is limited by the reality that political appointees usually though not always control when a science advisory board is consulted and how that board is staffed. With the exception of a few statutory programs,³³⁴ there are virtually no legal constraints over these decisions. Even the composition of such boards is largely subject to political manipulation.³³⁵

3. *Staff.* Career agency scientists provide another valuable institutional check on manipulation by upper-level political appointees. These career staffers can serve as the ballast that keeps the agencies operating in accordance with professional norms that resist ends-oriented political intrusions. The staff, whether or not its work is disclosed to the public, still creates the initial scientific record to inform policy; this record at least creates a speed bump that political appointees must find a way around to advance ends-oriented policies.

In nearly half of the stealth tactics discussed in Part I, the role of staff was pivotal in calling attention to the political manipulation of science.³³⁶ Some career scientists have resisted political changes to their analyses or conclusions.³³⁷ Other scientists have called attention to attempted manipulations, sometimes by leaking the evidence and documents to the press or posting them on the internet and sometimes by formally blowing the whistle on inappropriate actions.³³⁸ Moreover,

332. Cullen Memorandum, *supra* note 330, at 3, Table 1.

333. *Id.* at 7.

334. *See, e.g.*, 42 U.S.C. § 7409(d) (2012).

335. *See, e.g.*, Robert Steinbrook, *Science, Politics, and Federal Advisory Committees*, 350 NEW ENG. J. MED. 1454, 1456 (2004) (discussing criticisms of the George W. Bush administration for stacking science advisory committees).

336. In our categorization and tabulation referenced in *supra* note 327, ten out of the twenty-two documented incidents involved some form of public reporting or whistleblowing by the agency staff themselves.

337. *See, e.g.*, *supra* note 39 and accompanying text.

338. Zack Colman, *Climate Study Quietly Underway Warns of Severe U.S. Impacts*, E&E NEWS (Aug. 8, 2017), <https://www.eenews.net/climatewire/stories/1060058498/search?keyword=Climate+Study+Quietly+Underway+Warns> [http://perma.cc/NV65-KEU4]; John H. Cushman, Jr., *Speaking Truth to Power on Climate Change: Why the U.S. Report Leaked*, INSIDECLIMATE NEWS (Aug. 9, 2017), <https://insideclimateneeds.org/news/09082017/climate-change-science-report-leaked-truth> [http://perma.cc/NAU9-659L].

when career staffers are called upon for explanations by Congress, some have been quite forthright in acknowledging efforts by political officials to meddle with the scientific record underlying regulations.³³⁹

The group Public Employees for Environmental Responsibility (“PEER”) also uses reports from existing staff to probe into agency decisions. PEER files a FOIA request about once every three weeks, often to probe matters brought to its attention by government employees.³⁴⁰ Another group, called “314 Action,” has established a secure hotline and an encrypted email drop through which government scientists can report abuses to lawyers and receive advice on their legal options.³⁴¹

In some cases, these staff reports can lead to adverse consequences for the offending political appointees. When Assistant Interior Secretary Julie MacDonald was caught bullying scientific staff into changing their scientific analyses involving endangered species, for example, the DOI’s Inspector General documented her activities and she resigned.³⁴²

Former agency staffers can also serve as valuable informants on the manipulation of science after they retire from service. One group of former EPA staffers, for example, has formed an organization called the “Environmental Protection Network” to keep an eye on that agency’s activities and comment publicly on abuses when its members detect them.³⁴³ Among other things, it wrote a lengthy critique of Administrator Pruitt’s “transparency” proposal.³⁴⁴

But even with these important innovations, there are limits to what the career staff can accomplish. Political bullying of agency

339. One EPA senior science adviser testified before Congress, for example, that EPA Assistant Administrator for Pesticides and Toxic Substances asked her to employ a risk assessment model based on a scientific theory that she had never heard of to ensure a smaller risk estimate for the fumigant ethylene dibromide. LASH, *supra* note 53, at 173.

340. Amanda Reilly, *Group, Firm Offer Pro Bono Help for Federal Scientists*, E&E NEWS (Oct. 25, 2017), <https://www.eenews.net/greenwire/stories/1060064627/search?keyword=Group%2C+Firm+Offer+Pro+Bono+Help+for+Federal+Scientists> [http://perma.cc/TD9W-ZY3J].

341. Nick Bowlin, *Political Group Seeks Federal Whistleblowers*, E&E NEWS (Nov. 2, 2017), <https://www.eenews.net/edaily/stories/1060065401/search?keyword=Political+Group+Seeks+Federal+Whistleblowers> [http://perma.cc/M2NX-ED6W].

342. OFF. OF INSPECTOR GEN., U.S. DEP’T OF INTERIOR, INVESTIGATIVE REPORT: THE ENDANGERED SPECIES ACT AND THE CONFLICT BETWEEN SCIENCE AND POLICY 1–8 (2008).

343. *About Us*, ENVTL. PROTECTION NETWORK, <https://www.environmentalprotectionnetwork.org/about> [http://perma.cc/2R7V-XEE6].

344. ENVTL. PROTECTION NETWORK, COMMENTS ON EPA’S CENSORED SCIENCE PROPOSAL (2018), <https://www.environmentalprotectionnetwork.org/wp-content/uploads/2018/08/EPN-Censored-Science-Summary.pdf> [http://perma.cc/K7TY-BCHA].

scientists can still lead to scientifically compromised decisions. The White House has demanded changes to scientific records that even strong career staffers were not able to prevent.³⁴⁵ Moreover, since the political officials decide what counts as “deliberative process” privilege, the staff would seem relatively helpless—short of filing formal whistleblower complaints—to expose these tactics to the light of day.

D. *The Scientific Community and the Media*

The scientific community has been heavily involved in publicizing and disciplining political manipulation of science in the agencies.³⁴⁶ The UCS, editors of top scientific journals, and respected scientists have penned reports, articles, commentaries, and editorials that document numerous problems.³⁴⁷ Soon after the 2016 elections, for example, “[m]ore than 2,300 scientists, including twenty-two Nobel Prize winners, [wrote] an open letter to President-elect Donald Trump and the 115th Congress, urging them to adhere to high standards of scientific integrity and independence” in addressing environmental problems.³⁴⁸ Scientists are working with public relations experts to hone their communications skills to facilitate interactions with the public and the media.³⁴⁹ The annual meeting of the American Association for the Advancement of Science in February 2017 featured a panel on “Defending Science and Scientific Integrity in the Age of Trump.”³⁵⁰

345. See *supra* notes 26–34 and accompanying text.

346. Goldman et al., *supra* note 6, at 697–98. See generally David P. Clarke, *Sound Science or Political Science? Federal Agencies Respond to Trump*, 34 ENVTL. F., Sept./Oct. 2017 (noting scientists’ attempt at pushing back against Trump Administration’s attempt at politicizing and ignoring science).

347. See, e.g., Berg et al., *supra* note 276; Goldman et al., *supra* note 6, at 696–97; Jonathan M. Samet, Thomas A. Burke & Bernard D. Goldstein, *The Trump Administration and the Environment — Heed the Science*, 376 NEW ENG. J. MED. 1182, 1186 (2017).

348. Juliet Eilperin & Chris Mooney, *Over 2,000 Scientists Urge Trump to Respect ‘Scientific Integrity and Independence’*, WASH. POST (Nov. 30, 2016) (quoting Letter from Union of Concerned Scientists to President-Elect Trump and the 115th Congress (Nov. 30, 2016)), https://www.washingtonpost.com/news/energy-environment/wp/2016/11/30/22-nobel-prize-winners-urge-trump-to-respect-scientific-integrity-and-independence/?noredirect=on&utm_term=.7c7fe8b38788 [<http://perma.cc/QYT3-WRG7>].

349. Debra Kahn, *Scientists Fearing Trump ‘Lobotomy’ Clamor to Speak Out*, E&E NEWS (Jan. 27, 2017), <https://www.eenews.net/climatewire/stories/1060049090/search?keyword=Scientists+Fearing+Trump+%E2%80%9CLobotomy%E2%80%9D+Clamor+to+Speak+Out> [<http://perma.cc/7XMA-TZPR>].

350. Lindzi Wessel, *Hundreds Rally for Science at Demonstration near AAAS Meeting*,

The March for Science that took place on Earth Day, 2017 in Washington D.C.—in the pouring rain—and 600 other cities throughout the world demonstrated a willingness of scientists and their supporters to defend the integrity of government science despite their historic reluctance to engage in politics.³⁵¹ The clear message of the march—which was sponsored by a number of mainline scientific organizations, including the American Geophysical Union—was that many people “want government policies built on evidence and reason, not ideology.”³⁵² A recent study showed that speaking out against abuses of science does not undermine the credibility of the scientists who do so.³⁵³

Persistent investigative journalists in the mainstream media and the trade press are responsible for documenting most of the instances of manipulation identified in Part I. Even here, however, there are limits to what journalists can accomplish. In some cases, reporters for certain news outlets have been barred from covering government events.³⁵⁴ In any event, like the proverbial tree that falls unheard in the forest, if there is no attentive or powerful audience to hear the stories, adverse news coverage will not go very far in disciplining these practices.

Even if scathing criticisms of the political manipulation of science and publication of abuse in the media activate a larger public to clamor for change, the elected president and sitting Congress can nonetheless choose to ignore or even discredit such efforts as “junk science” and

SCIENCE (Feb. 19, 2017, 6:00 PM), <http://www.sciencemag.org/news/2017/02/hundreds-rally-science-demonstration-near-aaas-meeting> [<http://perma.cc/BTQ2-RK8M>] (emphasis omitted).

351. See Joel Achenbach, Ben Guarino & Sarah Kaplan, *Why People are Marching for Science: ‘There is No Planet B’*, WASH. POST (Apr. 21, 2017), https://www.washingtonpost.com/national/health-science/big-turnout-expected-for-march-for-science-in-dc/2017/04/21/67cf7f90-237f-11e7-bb9d-8cd6118e1409_story.html?utm_term=.21499f7a93bb [<https://perma.cc/D395-PULK>]; John H. Cushman, Jr., *Tens of Thousands March for Science and Against Threats to Climate Research*, INSIDECLIMATE NEWS (Apr. 22, 2017), <https://insideclimatenews.org/news/22042017/march-for-science-scientists-climate-change-donald-trump-climate-denial> [<http://perma.cc/SA3F-DND5>].

352. Cushman, Jr., *supra* note 351; Wessel, *supra* note 350.

353. Hannah Hess, *Clarion Call for Scientists: ‘Use Your Voice . . . Or Lose It’*, E&E NEWS (June 22, 2017), <https://www.eenews.net/greenwire/stories/1060056452/search?keyword=Clarion+Call+for+Scientists%3A+%E2%80%9CUse+Your+Voice+.+.+.+Or+Lose+It> [<http://perma.cc/354R-9J5G>] (citing John E. Kotcher, Teresa A. Myers, Emily K. Vraga, Neil Stenhouse & Edward W. Maibach, *Does Engagement in Advocacy Hurt the Credibility of Scientists? Results from a Randomized National Survey Experiment*, 11 ENVTL. COMM. 415 (2017)).

354. See, e.g., Coral Davenport & Jaelyn Peiser, *Three Reporters Are Turned Away from an E.P.A. Event*, N.Y. TIMES (May 22, 2018), <https://www.nytimes.com/2018/05/22/business/reporters-epa-event.html> [<http://perma.cc/AKV3-CBEN>].

“fake news.” As with all of the tools described above, change can only come after the public reacts to reports of abuse and demands change. Even then, change may have to await the next election cycle, at which point dozens of other critical issues may have crowded out regulatory agency abuse of science on the electorate’s policy agenda.

III. REFORM

Given the limited deterrents to political manipulation of science in regulatory decisionmaking, the fact that it sometimes occurs should not be surprising. Indeed, the accounts detailed in Part I may only represent the tip of the iceberg since, from the standpoint of most political appointees, the choice between failing the president and risking censure for politicizing science is often a simple one. Appointees’ careers suffer if they cannot advance the administration’s agenda and their professional ambitions often appear to dovetail with their own ideological commitments. As Phil Cooney, the former chief of staff of the White House Council on Environmental Quality under George W. Bush who edited climate change reports,³⁵⁵ observed: “When I came to the White House, my loyalties – my sole loyalties – were to the President and his administration.”³⁵⁶ Political appointees also generally plan to work in the agency for a limited time and find it easy to move to lucrative opportunities in private sector jobs when their government service is over.³⁵⁷ Even appointees who are terminated early for violating a scientific integrity policy to advance a

355. See *supra* note 59 and accompanying text.

356. *Allegations of Political Interference with Government Climate Change Science: Hearing Before the H. Comm. on Oversight and Gov’t Reform*, 110th Cong. 327 (2007) (statement of Philip Cooney, former Chief of Staff, White House Council on Environmental Quality). Even when the results are personally embarrassing, the terminated appointee can remain loyal to the mission, although perhaps not to the president. As Anne Gorsuch, a former EPA administrator who resigned in the wake of scandals occurring during her tenure, observed in her memoir: “When congressional criticism about the EPA began to touch the presidency, Mr. Reagan solved his problem by jettisoning me and my people, people whose only ‘crime’ was loyal service, following orders.” Patricia Sullivan, *Anne Gorsuch Burford, 62, Dies*, WASH. POST (July 22, 2004), https://www.washingtonpost.com/archive/local/2004/07/22/anne-gorsuch-burford-62-dies/78b89129-728a-404e-8550-7b5617d5f291/?noredirect=on&utm_term=.1c2eddf337c [https://perma.cc/GK95-FTN3]

357. See, e.g., Thomas Philippon & Ariell Reshef, *Wages and Human Capital in the U.S. Financial Industry: 1909-2006*, at 31 (Nat’l Bureau of Econ. Research, Working Paper No. 14644, 2009), <https://www.nber.org/papers/w14644.pdf> [https://perma.cc/2MCV-G3T3] (observing that “[g]iven the wage premia that we document, it was impossible for regulators to attract and retain highly-skilled financial workers, because they could not compete with private sector wages”).

deregulatory agenda may be greeted with open arms in the private sector.

These strong incentives operating on political appointees to manipulate science make it difficult to devise penalties that adequately change their behavior. Self-restraint and after-the-fact sanctions, including termination of appointees, seem insufficient to deter the temptation to meddle with the technical analysis to advance the president's agenda.

The most promising antidote thus involves fortifying agency decisionmaking processes *proactively* to impede this ends-oriented manipulation of science. Politically appointed officials seeking to adjust the scientific record must not be allowed simply to pick up the phone, walk down the hall, or issue a directive ordering the agency's scientists to adjust analyses to support predetermined outcomes. Instead, agency decisionmaking procedures should insulate the career staff from political interference at this particularly crucial stage of its expert work.

To help ensure that regulatory decisionmaking reflects the best available science, we therefore recommend that the decisionmaking process be reconceptualized in a way that provides scientific independence for the expert staff at the first stage of literature synthesis.³⁵⁸ In this reimagined institutional blueprint, the scientific and technical staffs' analysis of the relevant scientific information would be published as an initial assessment, and the staff would be separated by firewalls from the rest of the decisionmaking process while preparing that analysis. Political appointees attempting to influence the initial assessment in violation of the firewalls would suffer significant adverse consequences for their reputations and future employment.

A bifurcation of the decisionmaking process and firewalling of the initial scientific analysis does not require the staff to separate "science" from "policy," because the technical analysis will usually uncover significant uncertainties, the resolution of which will involve a combination of scientific and policy judgment.³⁵⁹ But a rigorous

358. For some literature in accord with this view, see, e.g., Doremus, *supra* note 124, at 1640–48, and David B. Spence, *A Public Choice Progressivism, Continued*, 87 CORNELL L. REV. 397, 439 (2002).

359. See generally Thomas O. McGarity, *Substantive and Procedural Discretion in Administrative Resolution of Science Policy Questions: Regulating Carcinogens in EPA and OSHA*, 67 GEO. L.J. 729 (1979) (discussing the significant policy choices in science-intensive regulatory questions); Wendy E. Wagner, *The Science Charade in Toxic Risk Regulation*, 95 COLUM. L. REV. 1613 (1995) (same).

technical analysis does involve separating out the understanding of the “facts” in the existing record and identifying the uncertainties in the scientific data and models. In our reformed process, the career staff would become insulated, like other neutral advisors (for example judges and prosecutors), from outside influence so they can do this work in as “neutral” a fashion as possible. Moreover, these firewalls would be clear, visible, and enforced to impede efforts at tweaking the science or dictating new procedures at the outset. Political appointees, policy staff, and the White House would still be able to reject, distinguish, correct, or ignore this scientific record. And they would still determine the content of the policy that the agency uses in resolving uncertainties in the scientific and technical information. But unlike the current institutional design in most agencies, the staff’s version of the relevant scientific information would be documented and serve as the record for judicial review. Politically appointed officials would have to grapple with this record and could no longer change it.

This final Section discusses the literature that supports the general idea of firewalls that separate the initial technical analysis from the larger policy decision. It then offers preliminary suggestions for how to operationalize this new blueprint for regulatory decisionmaking involving science and policy and identifies various questions and concerns that should be considered moving forward.

A. Firewalling the Scientific Literature Review and Analysis from Policy Input

At the end of her comprehensive analysis of the politicization of environmental science during the George W. Bush administration, Professor Holly Doremus concludes that “[t]he single biggest contributor to the lack of political integrity in this administration’s environmental-policy decisions is the absence of barriers between political appointees who view their mission as the single-minded advancement of the President’s policy agenda and career employees charged with providing scientific advice or analysis.”³⁶⁰ We agree.

Virtually all of the stealth science strategies discussed in Part I involve political manipulations during this early stage of agency analysis, when the staff synthesizes the existing scientific literature that bears on the issues that arise in a rulemaking. In these scientific manipulations, staffers are censored, edited, constrained, depleted, or

360. Doremus, *supra* note 124, at 1640.

their work is reviewed by potentially biased experts. The target in these stealth-science strategies is consistently the underlying scientific record. The object is to alter it so that the “facts” are consistent with deregulatory policies in ways that do not encounter legal impediments or serious public opposition.

The solution must therefore take the form of stronger barriers between the technical analysts and the political appointees at this early step when the scientific and technical analysis is being conducted. Nearly every regulatory decision of any consequence by an agency involved in health, safety, or environmental regulation begins with a literature search and synthesis of the available information that speaks to issues relevant to the decision.³⁶¹ This step—whether separated explicitly in the agency decision process or not—involves characterizing the existing scientific literature and highlighting any remaining gaps, uncertainties, and open questions relevant to the issues raised by the regulation.³⁶²

Given executive incentives, the best way to institute this firewall is through passage of a new “regulatory science” law. The law would be brief and serve as a type of meta-administrative law statute that legally prescribes a bifurcated process for informal rulemakings, guidances, and other formal agency decisions.³⁶³ Specifically, the law would instruct that when agencies integrate scientific information into their assessments, they must provide assurances that the information is assessed and analyzed by agency expert staff with complete independence from the political process, even while the inevitable nonscientific choices and framing in the technical assessments are carefully explicated.³⁶⁴ Equally important, this more specific directive

361. WAGNER, ACUS STUDY, *supra* note 111, at 111–12.

362. *Id.* at 120–23.

363. Several other regulatory science laws have in fact been passed or proposed over the last decade, although these laws are problematic both in their scope and demands on the agencies. *See, e.g.*, Wendy Wagner, Elizabeth Fisher, & Pasky Pascual, *Whose Science? A New Era in Regulatory “Science Wars,”* 362 SCIENCE 636, 636 & 38 (2018) (describing the Honest Act passed by the House in 2017).

364. Such an approach thus sidesteps disagreements about what is “science” and what is “policy.” In the first instance, the technical staff identifies and assesses the entire technical record. This work will necessarily include nonscientific considerations, but the staff (and peer reviewers) will be expected to identify the materials they considered and explain them clearly. There may be disagreements between management and the technical staff about both the science and the other inevitable judgments, but the point is simply to use this bifurcated process to bring them out into the open. Rather than allowing political officials full access to the staff assessments before they are made public, the firewall provides a clearer window inside the sequential process, including identifying authorship and attribution which otherwise is lost under the current nonprocedural

for the use of science would be enforced through judicial review. Courts would be tasked with reviewing challenges to the agency’s fidelity to the firewalls, as well as to the requirement that the agency clearly explain how the agency assessed the relevant scientific information and trace the role it played in the final decision. This legal mandate would thus provide a sharper focus for the courts’ review of science than is currently present in judicial review of agency rulemakings.³⁶⁵

1. *Support for Firewalls.* Diverse prominent committees and theorists converge on the wisdom of insulating the initial staff analysis of the literature and evidence from later decisions about whether or how that scientific record should inform policy. The clearest statement of this principle comes from the NAS’s “Red Book,” published in 1983 and commissioned specifically to speak to the optimal organizational design of agencies with respect to resolving science-policy questions.³⁶⁶ Although the Red Book was most influential in underscoring the many uncertainties and judgments that populate risk assessments, making the separation of science and policy impossible as a practical matter,³⁶⁷ a close look at the report also reveals that the Committee on the Institutional Means for Assessment of Risks to Public Health, in the National Research Council, believed that for purposes of agency decisionmaking, it was still beneficial to conceive of and structure the agency analysis in two distinct steps.³⁶⁸ The first step involves the synthesis and characterization of the scientific literature, a characterization that would include identifying uncertainties,

approach to science integration used in a number of agency programs.

365. See, e.g., Wagner, *supra* note 145, at 2068. Of course, ensuring the judicial remedies are significant enough to change the incentives of the political actors is also important. We discuss sanctions for political officials at *infra* notes 400–03. On the agency side of the ledger, the remedies also need to be sufficient to encourage agency staff compliance. The article by Rob Glicksman and Emily Hammond provides superb attention to this neglected topic. See generally Robert L. Glicksman & Emily Hammond, *The Administrative Law of Regulatory Slop and Strategy*, 68 DUKE L.J. 1651 (2019) (discussing courts’ remedial options in instances of what the authors term “regulatory slop”).

366. COMM. ON THE INSTITUTIONAL MEANS FOR ASSESSMENT OF RISKS TO PUB. HEALTH, COMM’N ON LIFE SCIS., NAT’L RESEARCH COUNCIL OF THE NAT’L ACADS., *RISK ASSESSMENT IN THE FEDERAL GOVERNMENT: MANAGING THE PROCESS 2–3* (1983) [hereinafter NAS, RED BOOK].

367. See, e.g., Ellen K. Silbergeld, *Risk Assessment and Risk Management: An Uneasy Divorce*, in *ACCEPTABLE EVIDENCE: SCIENCE AND VALUES IN RISK MANAGEMENT* 99, 99 (Deborah G. Mayo & Rachele D. Hollander eds., 1991) (discussing artificial separation of risk assessment and risk management, as well as the problems that separation creates).

368. NAS, RED BOOK, *supra* note 366, at 2–3.

variability, and other open questions left for policy judgment.³⁶⁹ This is the “risk assessment.” The second step would then entail decisions about whether or how to use that factual record.³⁷⁰ In the Committee’s view, this separation was vital to ensure the quality of the agency’s science-based decisions:

When a fully documented written risk assessment is *not* produced before an agency’s decision to regulate or not to regulate, it is difficult to understand the process by which an agency made its assessment. The Committee believes that the creation of such a document encourages public understanding of and respect for agency procedures and provides a basis for review by a scientific advisory panel.³⁷¹

The Committee also believed that this type of rigorous two-step process would help make the policy choices clearer. In the Committee’s words, “a detailed risk assessment document that clearly identifies the inference options chosen in the assessment and explains the rationale for those choices will help to maintain a sharper distinction between the science and policy.” This sequential analysis, when done properly, helps to “guard against the inappropriate intrusion of risk management [i.e., overt policy] considerations” into the agency’s assessment of the relevant scientific literature.³⁷²

Work in the academic field known as “public administration,” as well as related legal literature on institutional design, provides similar support for this type of distinction between the initial technical analysis and later policy discussions.³⁷³ As then-Judge Breyer observed, “[a] depoliticized regulatory process [that is based in expertise,

369. *Id.*

370. *Id.*

371. *Id.* at 148 (emphasis added).

372. *Id.* Thus, while the Committee was not enthusiastic about devising a separate, centralized technical unit within government to do this work throughout the report the committee consistently treated and discussed these two steps of analysis and “management” (or policy decisions) as distinct analytically in the decision process. *See id.* at 6, 139–40, 143. Considerable attention was paid, for example, to developing rigorous peer review of the agency’s technical and scientific analyses (but not the “management”). *See, e.g., id.* at 144–45 (discussing the functions of review panels).

373. *SEC v. Chenery Corp.*, 332 U.S. 194, 209 (1947) (discussing how agencies’ experience, appreciation of complexities and policies, and responsible treatment of the facts “justif[y] the use of the administrative process”); *see also, e.g.*, H. GEORGE FREDERICKSON, KEVIN B. SMITH, CHRISTOPHER W. LARIMER & MICHAEL J. LICARI, *THE PUBLIC ADMINISTRATION THEORY PRIMER 2* (2d ed. 2012) (identifying as one of the “elemental features of public administration” individual competence, “which include[s] . . . expertise”).

rationalization, and insulation] might produce better results, hence increased confidence, leading to more favorable public and Congressional reactions.”³⁷⁴ This critical agency independence is generally satisfied by staffing the agency with career professionals and then requiring those professionals to meet high analytical standards, including identifying the question at hand, explaining their analyses, and subjecting their work to review by experts before policymakers are involved.³⁷⁵ In this way, “political influence should not undermine the deliberative benefits that agency rulemaking delivers.”³⁷⁶

Finally, the expert agency—by definition—brings technical tools and expertise to the table that otherwise might be lacking. Although these experts do not have magic answers and their technical analyses are rife with judgments and human biases, the collective work is constrained by professional norms and methodological rules. Their work is also by nature inquisitorial rather than adversarial.³⁷⁷ The technical staff seeks out the best understanding of the problem and the best options. And their work will be scrutinized by other technical experts with similar standards and demands.

2. *Precedent for a Firewall.* Although the notion of a firewall around an initial technical assessment may seem radical and even fanciful, there is considerable precedent for the concept. In one of

374. STEPHEN BREYER, *BREAKING THE VICIOUS CIRCLE: TOWARD EFFECTIVE RISK REGULATION* 55–56, 59–60 (1993).

375. *See, e.g.*, FREDERICKSON ET AL., *supra* note 373, at 2 (identifying as one of the elemental principles of public administration “the organization as distinct from the persons holding positions or offices in it”). “Politics” and “administration,” just like “science” and “policy” cannot be separated cleanly, *id.* at 98, but that is a different issue than separating agency choices from White House choices, which goes to the institutional source of control rather than the nature of the substantive issues at stake. Indeed, the control-of-bureaucracy theory identifies two competing models—one being an agency controlled by political actors and one made by administration actors. *See, e.g., id.* at 16 (elaborating on control-of-bureaucracy theory).

376. Mark Seidenfeld, *The Role of Politics in a Deliberative Model of the Administrative State*, 81 *GEO. WASH. L. REV.* 1397, 1451 (2013); *see also* Colin Scott, *Accountability in the Regulatory State*, 27 *J.L. & SOC.* 38, 55 (2000) (touting the importance of checks and balances in which “opposed maximizers” hold one another in check); *cf.* JACK GOLDSMITH, *THE TERROR PRESIDENCY* 83–89 (2007) (describing a similar, sometimes 100-person intra-agency discourse arising within the executive intelligence community to check against group think and collectively work through difficult security challenges).

377. *See generally* Robert J. MacCoun, *The Epistemic Contract: Fostering an Appropriate Level of Public Trust in Experts*, in *MOTIVATING COOPERATION AND COMPLIANCE WITH AUTHORITY: THE ROLE OF INSTITUTIONAL TRUST AND CONFIDENCE* (Brian H. Bornstein & Alan J. Tomkins, eds. 2015) (developing the concept of adversarial versus inquisitorial approaches in science-policy).

EPA's most successful programs, the NAAQS standard-setting process, EPA divides the scientific analysis of the relevant scientific research into four separate reports that fit neatly within our suggested process.³⁷⁸ Each of these reports provides a different, focused analysis of the existing literature and is prepared by EPA's technical staff.³⁷⁹ And each of the reports is both publicly reviewed and peer reviewed and published as a stand-alone report.³⁸⁰ The scientific staff is also firewalled from political and policy interference; no *ex parte* contact is allowed from political officials while the staff conducts the literature search and analysis, although there can be meetings on the record.³⁸¹

A second analog for the firewall comes from the world of science research, where authorship, attribution, and independence are central prerequisites to publication.³⁸² Some universities are quite vigilant about barring faculty researchers from signing contracts that give funding sponsors a right to control the research.³⁸³ Research independence is paramount to quality science. These "no strings" policies all seek to position researchers in the purest possible inquisitorial mode.

A final analog comes from firewalls instated in institutions with the similar goal of insulating fact finders or "impartial" decisionmakers, like judges, from influence by those who have a stake in the decisionmaking outcome.³⁸⁴ Within the executive branch, entire enforcement units of the Department of Justice are walled off from

378. See WAGNER, ACUS STUDY, *supra* note 111, at 36, 39–40 (detailing EPA's NAAQS process).

379. *Id.*

380. *Id.* at 37, 39.

381. *Id.* at 39–40 (discussing NAAQS alignment with agency policy assessments over political interests).

382. See, e.g., *Defining the Role of Authors and Contributors*, INT'L COMM. OF MED. J. EDITORS, <http://www.icmje.org/recommendations/browse/roles-and-responsibilities/defining-the-role-of-authors-and-contributors.html> [<https://perma.cc/34WZ-67EX>] ("Authorship confers credit and has important academic, social, and financial implications."). See generally *Conflicts of Interest*, INT'L COMM. OF MED. J. EDITORS, <http://www.icmje.org/conflicts-of-interest> [<https://perma.cc/7UGA-FM4X>] (offering an illustration of one of these conflicts of interest forms).

383. See, e.g., Mildred K. Cho, Ryo Shohara, Anna Schissel & Drummond Rennie, *Policies on Faculty Conflicts of Interest at US Universities*, 284 JAMA 2203, 2203 (2000) (finding that 55 percent of policies required faculty disclosures and 19 percent specified limits on faculty financial interests in corporate sponsors of research).

384. See, e.g., MODEL CODE OF JUDICIAL CONDUCT R. 2.9 (AM. BAR ASS'N 2014); see also *Universal Camera Corp. v. NLRB*, 340 U.S. 474, 496–97 (1951) (holding that decisions/factfinding by a hearing officer become part of the relevant record for "substantial evidence" review even if otherwise overtaken by decisions/factfinding by the agency head(s)).

political officials through “limited contacts” policies that bar communications between the White House and enforcement personnel on specific cases.³⁸⁵ As a recent report by the Brennan Center explains:

These policies recognize that political actors are, at least in part, motivated by political concerns that should not affect the application of the law and that law enforcement personnel are better situated to make decisions about specific cases or investigations. They guard against overt direction from the White House, or the use of investigative agencies to punish political foes. They also protect against the inadvertent pressure or bias that may result from a call from a White House official about a specific matter. Even a question about a case can lead an official to presume an interest in its outcome; the official then may try to ensure the desired outcome. As former Attorney General Benjamin Civiletti put it, presidents and other top officials “unintentionally can exert pressure by the very nature of their positions.”³⁸⁶

The Brennan Center report also notes, however, that “[u]nfortunately, it has become increasingly clear that these voluntary policies, without formal legal requirements or enforcement mechanisms, cannot prevent political interference in law enforcement activities.”³⁸⁷ Yet the existence of these policies suggest that it is possible to construct a firewall within the bureaucracy to keep politics out of sensitive matters that demand objectivity.

3. *Practical Implementation.* With the basic concept in place, we now turn to how an agency might actually accomplish the redesign of agency decisionmaking in practice. Although many options are available, we propose three specific reforms to the existing law and agency practice. The reforms consist of: a formal firewall around the agency staff’s initial technical analysis, which would be published

385. See, e.g., Memorandum from Jack Quinn, Counsel to the President, to White House Staff 1 (Jan. 16, 1996) (“Unless you are certain that a particular contact is permissible, you should take care before making the contact to consult with the Counsel’s Office.”); see also Memorandum from Donald F. McGahn II, Counsel to the President, to All White House Staff 1 (Jan. 27, 2017) (“Communications with DOJ about individual cases or investigations should be routed through the Attorney General, Deputy Attorney General, Associate Attorney General, or Solicitor General, unless the Counsel’s Office approves different procedures for the specific case at issue.”).

386. PREET BHARARA ET AL., BRENNAN CENTER, NATIONAL TASK FORCE ON RULE OF LAW & DEMOCRACY, PROPOSALS FOR REFORM 18 (2018).

387. *Id.*

separately; more rigorous legal controls on the establishment of scientific advisory boards and the selection of peer reviewers by political appointees; and revisions to the rules governing the deliberative process exemption to the FOIA. The most important by far is our first suggested reform—proposing a formal firewall for the technical analysis. But all three reforms are important and ideally would be instituted simultaneously. This part closes with a discussion of the future issues and challenges that lie ahead for such a project, including the obvious question of the political feasibility of this reform.

a. Design of the Firewall. Our proposal draws institutional boundaries around agency experts to preserve the integrity of their initial scientific assessment. In proposing this firewall we reiterate that we are not naively assuming that science and policy are cleanly separable. However, the evidence amassed in this Article supports the view that the work of the technical staff and that of the political management are distinctive and distinguishable. At base, then, our proposal simply seeks to keep these two sources of analysis separate in a way that allows others to understand the contributions of technical staff versus the contributions of political officials. This separation is accomplished by introducing mechanisms to ensure the transparency and responsibility of authorship. Moreover, in proposing this kind of firewall, we seek to place primary responsibility for the initial technical assessment with agency staff rather than political officials. This placement of the technical analysis with agency experts still appreciates that the technical synthesis will entail considerable judgment. Indeed, that recognition simply places more onus on the staff to explain their discretionary choices as best they can. Other checks and balances we propose will help hold the expert staff accountable for accomplishing this difficult task honestly.

More specifically, we propose that in any covered agency action, the professional staff's literature search and analysis of the existing scientific literature should be published as a separate report before the agency's policy analysis begins. The work of the agency staff in producing this initial report, but not their work afterwards, would also be firewalled from all political communications. Both features of this reform should be legislated and codified in enforceable rules that create severe sanctions for meddling with this sacrosanct stage of the agency's analysis.

The firewall would include the following steps:

Framing the Charge. The “charge” or factual questions the technical staff needs to research would be driven by the agency’s statute or the subject matter of the regulation being promulgated. The questions that frame the scientific analysis must be stated clearly at the outset, and they will likely be formulated by the policy staff and/or political appointees. To that end, the agency could hold a scoping meeting to assist in crafting the charge for the technical assessment.³⁸⁸ The resulting draft charge to the technical staff could even be subject to notice and comment, as is currently the case currently under the NAAQS process.³⁸⁹

Moreover, although it will also often be useful to engage the technical staff to assist in framing the question, the staff’s role at this stage would be placed on the record. Politically appointed officials could convene meetings protected by the deliberative process privilege, but when technical staff who will be charged with conducting the work are involved at the framing stage, all discussions would have to be recorded and be made public.³⁹⁰

Publishing the Staff’s Technical Report. Once it has received the agency’s charge, the career scientific staff would be solely responsible for conducting a comprehensive literature search and analysis of the information relevant to the questions.³⁹¹ The career staff’s initial report would synthesize the literature as it pertained to the questions at hand, highlighting not only the points of convergence but also the remaining open questions, uncertainties, and variability.³⁹² This analysis could

388. WAGNER, ACUS STUDY, *supra* note 111, at 32 (describing a “kick-off” workshop and planning report).

389. Shapiro, Fisher, & Wagner, *supra* note 180, at 493–94 (outlining this scoping step under the NAAQS process).

390. Wagner, *supra* note 145, at 2066 (describing this step and the supportive literature in more detail).

391. Ideally, a detailed firewall protocol could be crafted by the NAS or some independent group and would itself be firewalled from political officials. The protocol could be codified as a regulation that is binding on the agency and perhaps could even be enforced by third parties. Adjustments to this procedural set of rules would require notice and comment and could be litigated. Congress could even establish the terms of how these firewall-design rules should be prepared to ensure that they are both rigorous and will help protect the independence of staff scientists. However they are created, it is important to have clear rules that define and protect the staff workers from intervention through a relatively specific firewall mechanism. *Cf.* Doremus, *supra* note 124, at 1645 (emphasizing the importance of rules in this context as well).

392. *See, e.g., id.* at 1646 (recommending reforming the politicization of science by “requiring the preparation and release of reports signed by career technical employees at the outset of the regulatory process”).

also include developing computational models that provide different scenarios and identify underlying assumptions. The staff's work would be insulated from any *ex parte* contact from policy officials and political appointees,³⁹³ and written documentation of any communications between technical staff and others within or outside the agency would be placed in the record.³⁹⁴ The staff's final analysis would be published as a publicly available report. To increase accountability and to motivate staff experts, authorship and attribution should be afforded all analysts for individual contributions in the report. The record should also contain the identities of any peer reviewers, along with documentation of their contribution to the review.³⁹⁵ Ideally, opportunities for dissent among staff should also be provided, perhaps at the close of the full report or each section within the report.³⁹⁶

Peer Review of the Technical Report. It is important to gather outside expert reviews of the staff's technical report to ensure complete, rigorous, and accurate use of the literature and identification of uncertainties. This peer review would be conducted by the very top experts with as few ties as possible to the overarching policy outcomes.³⁹⁷ The extent and nature of the peer review will vary. For

393. See, e.g., *id.* (similarly proposing "requiring the preparation and release of reports signed by career technical employees at the outset of the regulatory process, or explicitly requiring that the inputs of scientific staff into decision-making processes be included in administrative records and made subject to FOIA").

394. See, e.g., *id.* at 1646–47 (proposing this type of requirement); see also Lisa Schultz Bressman & Michael P. Vandenbergh, *Inside the Administrative State: A Critical Look at the Practice of Presidential Control*, 105 MICH. L. REV. 47, 96 (2006) (stressing that earlier involvement of OIRA into agency rulemakings requires transparency, ideally implemented as docketed communications).

395. See, e.g., WAGNER, ACUS STUDY, *supra* note 111, at 36, 129–32. Attribution should also be afforded for peer reviewers, and all comments should be on the record. Unlike journal peer review which concerns individual actors and benefits from anonymity, when what is at stake is the integrity of an agency technical analysis that informs public policy, all scientists should be able to stand behind their work and comments.

396. *Id.* at 132–35 (describing a formal dissent process at the Nuclear Regulatory Commission and recommending it be adopted more widely within the Executive branch); see also Doremus, *supra* note 124, at 1645–46 (suggesting a similar type of dissent process for highlighting problems internally).

397. We do not agree with former EPA Administrator Pruitt that experts who have grants or contracts with EPA should be excluded from the pool of peer reviewers for that reason. Letter from E. Scott Pruitt, Adm'r, EPA, to Assistant Adm'rs, Reg'l Adm'rs & Office of Gen. Counsel (Oct. 31, 2017), https://www.epa.gov/sites/production/files/2017-10/documents/final_draft_fac_memo-10.30.2017.pdf [<https://perma.cc/6N4Z-XL53>]. We cannot see how working with EPA to answer important empirical questions relevant to regulatory issues could possibly bias a scientist for or against the staff's position on a particular scientific question, especially in a deregulatory

particularly significant questions, the report could be reviewed by an advisory board. For smaller projects, the agency could solicit individual reviewers to provide reviews.³⁹⁸ In all cases, however, the reviewers should represent the best experts with the least conflicts of interest in the matters at hand.³⁹⁹

Enforcement. As a legal matter, the firewall would need to be a legislative creation that could be rigorously enforced.⁴⁰⁰ Government officials who violate the terms of the firewall must be sanctioned severely.⁴⁰¹ Sanctions would range from public admonishment to termination of employment with civil fines. An investigation that uncovers a violation would also have to consider how to reconfigure the process in a way that protects the firewall against similar intrusions in the future.

Additional mechanisms for institutional oversight will likely be needed, given the difficulty of ensuring compliance. For example, Congress or the agencies may also task science-integrity offices with actively monitoring interactions between politically appointed officials (including White House officials) and scientific and technical staff to ensure staff independence at this initial technical stage. Even informal methods—like leaks to journalists and Congress—can help focus political attention on nontransparent encroachments by upper-level

administration in which the staff and upper-level political decisionmakers may not agree on regulatory outcomes.

398. See WAGNER, ACUS Study, *supra* note 111, at 113–15 (discussing these various options in more detail).

399. The goal of this peer review step is to subject the staff analysis to a second look by a group of experts who are external to the agency. We are cognizant of the fact that this second group, however constituted, will also offer their critique with black-boxed expert judgments that remain hidden from public view. See, e.g., JASANOFF, *supra* note 207, at 157–59. However, precisely for these same reasons, a second expert review of the staff analysis is better than no critical review at all. And, of course, once the staff report (and peer review comments) are introduced to the full range of agency decisionmakers and stakeholders, there will be further scrutiny applied to possible hidden judgments embedded in the analysis because of the adversarial nature of the proceedings.

400. See, e.g., BHARARA ET AL., *supra* note 386, at 17–19 (calling for the same approaches to “limited contacts” policies used as firewalls in enforcement cases).

401. Enforcement would most often be triggered by employee complaints (including anonymous complaints), which would trigger an investigation from a science integrity unit in the agency or the inspector general. Employees whose complaints are judged frivolous by an independent investigator could also be subject to sanctions, including possible termination. *Cf. id.* at 20 (recommending that for limited contacts policies, “Congress should establish a clear mechanism within the executive branch for investigating instances of inappropriate interference with law enforcement for political or personal ends” and suggesting that these offices should be existing offices of inspector generals).

policymakers and White House officials into the staff's scientific analyses. These news leaks have played an important role in disciplining abuses in the past, and they can continue to serve this role in the future.⁴⁰² Because staff self-reporting of inappropriate political interventions is likely to remain an important ingredient to meaningful reform, agencies should vigorously maintain whistleblower protections.⁴⁰³

To further reinforce effective enforcement of the firewall, agency scientific assessment programs should be audited periodically by some independent observer like the NAS. In addition to identifying problems, these independent assessments should help improve how the agencies design and implement firewalls. Particularly in the early years, these audits are likely to be quite important.

The Management Firewall. The entire operation of the scientific and technical staff and the agency's scientific integrity office should be located inside the firewall to protect them from political interference. The management of these technical personnel—their budget, their assignments, and their hiring and firing—should also be protected by the firewall.⁴⁰⁴ Career managers would do the hiring and firing, make the assignments, and propose annual budgets that could be considered, alongside the administration's proposal, by Congress.⁴⁰⁵ These managers would not report to personnel within the agency, but instead to an independent unit, perhaps even a new agency in the Congressional Research Service or the GAO that retains independence from the executive branch. The hiring of these key career managers would also be managed by this outside, independent

402. See Harold H. Bruff, *Presidential Power Meets Bureaucratic Expertise*, 12 U. PA. J. CONST. L. 461, 478 (2010) (suggesting that expert analysts should always be allowed to speak publicly about their work). Again, at least in the area of national security, the use of leaks has been quite valuable in highlighting internal process problems. See GOLDSMITH, *supra* note 376, at 72.

403. See, e.g., KITROSSER, *supra* note 279, at 126–27 (discussing external and internal checks, such as whistleblower protections and less restricted communications between agency scientists and the public, that can be placed to improve information integrity in the executive branch).

404. Managers would also be responsible for filing detailed annual reports that make their decisions transparent, including decisions about staffing priorities, the staff's fidelity to the firewall (along with reports of breaches), the staff's performance, and other details. Staff would be invited to comment on the reports to ensure they are as factually accurate as possible.

405. Thus, while the political officials will ultimately decide budgets for the entire agency, even at this step the career managers will identify their priorities and make their case. This information will be shared with Congress and the public to hold the political officials' requests more accountable.

agency. Managers would also be protected from disciplinary action except through the office that hired them.

b. Concerns and Qualifications. There are both conceptual and practical challenges to our proposal to firewall the technical analysis and related decisions from an agency’s regulatory decisionmaking process. These challenges are considered roughly in order of importance, except for our final discussion of political feasibility.

Where there’s a will, there’s a way. The most obvious concern with the proposals advanced here is that political officials will find a way around this firewalled structure to meddle with the technical analysis of the underlying research if the incentives are powerful enough. In cases where politics can still permeate our suggested approach, the reform will backfire by producing a façade of scientific independence that further misleads onlookers. Alternatively, political appointees who find themselves blocked by these firewalls and related legal prohibitions could give up on science altogether or find a way to eliminate the technical units and devise a much more politically oriented approach to developing the scientific record. This has long been a concern, for example, with the use of ombudsmen to represent underserved communities and interests.⁴⁰⁶ The proposals, under this view, are just stopgaps subject to a kind of nuclear arms race that will find a way to sidestep legal constraints in ways that become ever more dangerous over time.

Given the significance of the problems detailed in this Article and the perverse role that the current unitary blueprint of the agency plays in allowing political appointees to manipulate science, however, at least some experimentation with firewalls seems warranted. In order to provide an early warning of attempts to circumvent the firewalls, some anticipatory measures could be instituted to detect and publicize them. For example, regular audits of the processes could be instituted in the initial design of the firewall or requested by members of Congress or other parties. The audit would investigate how well the firewall is working in practice and trace out complaints or other evidence of problems. Indeed, anticipation of the audit itself may also serve as a partial deterrent against circumvention attempts.

406. WILLIAM T. GORMLEY, JR., *THE POLITICS OF PUBLIC UTILITY REGULATION* 63 (1983) (“An organization that depends exclusively on legislators for funds will not deliberately antagonize its legislative benefactors. In contrast, an organization that has the option of raising funds through a variety of methods will be less constrained.”).

Ensuring Scientific Integrity. A reverse concern holds that the technical staff itself will be badly biased in ways that are difficult to detect or control. In the public health field, there are concerns that the staff could consist of public health missionaries and zealots who err on the side of caution in ways that go well beyond what the evidence suggests is necessary. Such systemic biases in the work of the technical staff could introduce accountability problems because they will be difficult to catch and correct.

Peer review and public notice and comment of each staff report should help to expose some staff bias. To be sure, this will only work if the peer reviewers are selected to be fair and skeptical. Public review is also an important antidote to these concerns; under current administrative procedures, these staff reports would be scrutinized not only by the administration, but also by high stakes groups during the decisionmaking process. This scrutiny will be particularly intense when the staff's findings cut against the interest of stakeholders who have ample resources to engage in the process.

Nevertheless, to provide further assurance that the staff reports are even-handed, an audit of the staff processes by an external scientific body like the NAS might again prove useful in ensuring that the firewall approach is working. Perhaps staff could also be encouraged to present the technical reports at professional meetings or even publish them or some part of them in scientific journals. The more that these staff reports are treated as legitimate reviews of the scientific literature within the profession, the more likely it is that they will meet professional standards of quality and integrity.

Utilization. One of the most significant difficulties with the firewall concept is ensuring that the technical assessment is in fact conducted when needed. To address this risk, an initial scientific assessment could be made mandatory as a prerequisite for all agency rules and guidances that rely on scientific information. This mandate could also extend to other agency science-intensive directives and policies. For example, within one year after the agency launches a new project, it could be considered a breach of the firewall not to convene a firewalled staff assessment. In some matters, the staff may have nothing to add, but consultation would be mandatory. Although this type of trigger may leave some important agency decisions unprotected, experience can hopefully be used to fine-tune the appropriate legal trigger.

Increasing Red Tape. Another worry is that the entire process might become bogged down in red tape so that it becomes little more than a paper tiger. Staff could dally on their technical assessments.

Policy officials could ignore much of what the staff assessments offer. And onlookers might well become too exhausted by the dual filings and technicalities to identify, much less to file comments on or litigate possible abuses. The already protracted and complicated rulemaking process could become more so with little apparent offsetting advantage.

However, if technical staff appreciates that more accessible analyses will serve as a vital means of educating stakeholders and the public, then the firewalls could produce stronger, more comprehensible agency reports that communicate scientific information more clearly than 500-page reports written in technical jargon that few can understand.⁴⁰⁷ The more significant challenge may be the converse—that the policy officials will not take the reports seriously or will attempt to misrepresent the staff analyses in ways that are difficult to catch. One way to make the political officials’ use of the scientific record more transparent is to subject the final policy decision to both staff and scientific review to spotlight these points of manipulation and/or to add a role for staff dissent on the final decision.

Polarization. The firewall idea poses a very real risk of a polarization within the agencies between career staff and political appointees. Although this tension is something that has occurred in past administrations in any event, our proposal could fan existing flames. At least some experimentation to date, however, suggests that this particular concern may not be a problem in at least some agencies. The fact that EPA has successfully experimented with the firewall concept for more than a decade in the NAAQS program, for example, gives some reason to believe that such a structure will in fact prove viable.⁴⁰⁸ In fact, if the rules for staff independence were clearer, the tensions between career and political staff might actually decrease.

Political Feasibility. To be effective, the proposals advanced here must be imposed on the executive branch by Congress through legislation and enforced by the courts. Although the expectation of congressional intervention in this highly polarized age might seem farfetched, improving the scientific integrity of regulatory decisions, at least in the abstract, should not be a partisan matter. In the course of our research on deregulation, we have uncovered more than a few allegations that appointees of Democratic presidents, particularly

407. See, e.g., WAGNER, ACUS STUDY, *supra* note 111, at 123–24 (observing this in the NAAQS policy assessments).

408. See *id.* at 29–40 (describing the NAAQS process).

Presidents Clinton and Obama, engaged in similar manipulative tactics to increase the stringency of regulation. For example, the strict adherence to worst case assumptions, including the protective linear dose response curve in carcinogen risk assessment models, has been of concern to the chemical industry for decades.⁴⁰⁹ At bottom, this concern is driven by the belief that the agency is employing such models in unjustifiably protective ways that do not employ the best scientific evidence.⁴¹⁰

Indeed, all of the affected interest groups from all sides of these issues—affected industries, public interest groups, scientific organizations—purport to want regulatory decisions to be based on sound science. If that is the case, repairing structural deficiencies in institutional design should draw bipartisan support. Legislation that improves the scientific integrity of agency decisions in ways that curb presidential power could also be the type of legislative reform that is attractive to members of Congress who are well aware of the fact that administrations—and hence the scope of a political party’s power—can swing dramatically from one election cycle to another. Finally, if media coverage and reactions of the scientific community to political manipulation are indications of the public’s current sentiment toward these issues, the legislation should draw strong public support. It is possible, in other words, that the merits of instituting processes that deter the political manipulation of science may be so clear that legislation may be politically viable at some point in the future, at least when the sitting president is not likely to veto the bill.

B. Reinforcing Reforms

Beyond the firewall, other reinforcing legal reforms are needed to ensure adequate separation of the staff technical analysis from the policymaking apparatus. We identify two additional reforms below.

1. *Science Advisory Boards.* The Federal Advisory Committee Act (“FACA”) provides the legal rules governing the establishment of

409. See, e.g., *EPA’s Proposed Rule on Transparency in Regulatory Science Gets It Right When It Comes to the Best Available Science and Non-linear Modeling Approaches*, AM. CHEMISTRY COUNCIL: AM. CHEMISTRY MATTERS (May 3, 2018), <https://blog.americanchemistry.com/2018/05/epas-proposed-rule-on-transparency-in-regulatory-science-gets-it-right-when-it-comes-to-the-best-available-science-and-non-linear-modeling-approaches> [<https://perma.cc/7PSB-XART>].

410. See James W. Conrad, Jr., *The Reverse Science Charade*, 33 ENVTL. REP. 10306, 10306–08 (2003).

science advisory boards,⁴¹¹ but with respect to ensuring objectivity, FACA (and its authorizing regulations) only provides that the committee membership must “be fairly balanced in terms of the points of view represented and the functions to be performed.”⁴¹² As a result, the FACA statute and its implementing regulations leave the necessary qualifications, conflict disclosures, and other decisions regarding the selection of scientific peer reviewers unspecified and therefore largely legally unconstrained.⁴¹³

As long as FACA gives political appointees this broad discretion in assembling science advisory boards, some administrations will exploit that freedom to stack or otherwise manipulate peer review bodies to achieve favorable outcomes. As the HHS spokesperson conceded in defending the George W. Bush administration’s stacking of scientists to serve on CDC’s Advisory Committee on Childhood Lead Poisoning Prevention, “it [is] disingenuous to criticize the Bush administration for installing like-thinking individuals [on science advisory boards] when every administration does that. . . . That’s like saying, Gosh, there’s gambling going on in this casino.”⁴¹⁴

More precise legal ground rules governing science advisory boards are long overdue. In addition to amending FACA to constrain agency discretion in selecting scientific advisory committees, Congress should specify rules—perhaps by linking legal requirements to existing scientific practices in force at the biomedical journals—to govern agency selection of individual scientific experts to serve as peer reviewers when there is neither time nor money to create full advisory boards. There are several useful models for devising these reforms.⁴¹⁵ However it is done, a revised process must establish legal guiderails for the design of these science advisory boards and peer reviewers that curb opportunities for political manipulation.

411. 5 U.S.C. app.2 § 3(2) (2012).

412. *Id.* § 5(b)(2).

413. *See generally* GAO, FEDERAL ADVISORY COMMITTEES, ADDITIONAL GUIDANCE COULD HELP AGENCIES BETTER ENSURE INDEPENDENCE AND BALANCE (Apr. 2004) (recommending “promising practices and measures that can better ensure independence and balance and promote transparency in the federal advisory committee system”).

414. Dan Ferber, *Critics See a Tilt in a CDC Science Panel*, 297 SCIENCE 1456, 1457 (2002) (quotations omitted).

415. *See, e.g.*, BIPARTISAN POL’Y CENTER, *supra* note 238, at 17–26 (providing detailed proposals).

2. *Deliberative Process Privilege.* The deliberative process privilege currently protects internal political discussions, including those involving the manipulation of scientific information, from public view through an exception to FOIA.⁴¹⁶ Reform, at a minimum, should legislatively limit this deliberative process protection so that it does not cover political manipulation of science.⁴¹⁷ In her article touting the virtues of presidential administration, Justice Kagan in fact gestured towards the need for greater transparency in the executive's engagement with the scientific record.⁴¹⁸ She suggested, for example, that presidential review should not only "operate with an attitude of respect toward agency experts," but also that "these differences [between the expertise of agencies and the White House] counsel hesitation both in acknowledging and asserting presidential authority in areas of administration in which professional knowledge has a particularly significant and needed function."⁴¹⁹

As a first step, the deliberative process privilege should be revised to exclude any discussions that violate the firewall proposed here. Deliberative process protection should also not extend to any communications that violate scientific misconduct rules or scientific integrity rules promulgated by agencies. Scientific misconduct in most agencies involves the "fabrication, falsification, or plagiarism in proposing, performing, or reviewing scientific and research activities, or in the publication or reporting of these activities; scientific misconduct does not include honest error or differences of opinion."⁴²⁰ These decisions about whether communications violate deliberative process, and hence must be made public under FOIA requests, should be made by the scientific integrity officers, the respective Office of the Inspector General, or some other neutral group.

CONCLUSION

Like playing with fire, politicians playing with scientific information can be dangerous. Part I of this Article has demonstrated how politically appointed officials, on both sides of the aisle, can employ many strategies to manipulate or ignore scientific information

416. 5 U.S.C. § 552(b)(5) (2012).

417. See, e.g., Doremus, *supra* note 124, at 1646 (similarly suggesting that agency scientific recommendations should be subject to FOIA and not exempted as deliberative process).

418. Kagan, *supra* note 281, at 2356.

419. *Id.*

420. U.S. EPA, SCIENTIFIC INTEGRITY POLICY, *supra* note 313, at 4.

in ways that allow agency decisions to reach politically predetermined outcomes. Convinced that such decisions are inconsistent with sound administrative practice and, in most cases, with agency statutes, we argue in Part II that existing legal and cultural constraints on such political manipulation are insufficient to prevent determined political appointees from employing those strategies. We therefore argue in Part III that more rigid rules are needed to constrain how regulatory agencies employ science in their decisionmaking processes. This includes a legally enforceable institutional design that bars some of the basic work of scientific and technical staff from influence by politically appointed officials. Until there are external controls on the manipulation of science by the executive branch, we expect the problems we have identified in Part I to steadily worsen. Our hope is that Congress will recognize the value of regulation based on properly vetted science and statutory policy and take action before fact-free decisionmaking to advance the policies of the chief executive becomes the norm.