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Natural Resource Systems and the Evolution of Environmental Law

Monika Ehrman

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ARTICLE

Natural Resource Systems and the Evolution of Environmental Law

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INTRODUCTION

Aspirational vision is critical to human advancement. The ability to dream and drive achievement is a trait responsible for both the prodigious monuments of early civilizations and the stunning technological advances of modernity. In 1961, President John F. Kennedy delivered a speech to a Joint Session of Congress, where he announced his goal to land a man on the Moon by the end of the decade. Kennedy acknowledged that: "No single

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space project in this period will be more impressive to mankind, or more important for the long-range exploration of space; and none will be so difficult or expensive to accomplish."[1] Motivated mainly by Cold War geopolitics, Kennedy's goal would require billions of dollars and nearly a decade to accomplish; public support for the project rarely rose over 50 percent.[2] But 50 years after Apollo 11's successful mission, the National Aeronautics and Space Agency (NASA) is participating in international cooperative efforts and planning additional missions to the Moon and to Mars; commercial space flight has begun; and, the acquisition of space resources is in its early infancy. The original moonshot—a lofty and monumental goal[3]—was a catalyst for a new and better future.

In *The End Environmental Externalities Manifesto: A Rights-Based Foundation for Environmental Law*, Don Elliott and Dan Esty propose an environmental law moonshot, calling for an end to negative environmental externalities.[4] Their ambitious proposal involves the elimination of pollution with the "requirement that emitters pay compensation for any residual emissions that remain after technologically feasible pollution controls have been implemented."[5] Elliott and Esty also examine the current benefit-cost analysis that is central to traditional environmental regulation, arguing that their alternative rights-based approach is a better framework for protections.[6] They advance an adoption of a Pigouvian tax model to address negative externalities in environmental transactions, moving away from Coasian bargaining.[7]

Acknowledging the importance of regulatory examination and its various models, benefit-cost analysis remains a technique that attempts to quantify the effects of prospective policy changes. First formulated for

1. John F. Kennedy, U.S. President, Special Message to the Congress on Urgent National Needs, Excerpt of Section IX: Space 1 (May 25, 1961), https://www.nasa.gov/pdf/59595main_jfk.speech.pdf [https://perma.cc/Y44B-HKMG].

2. *Id.* at 2; Jeremy Hsu, *The Myth of America's Love Affair with the Moon*, SPACE (Jan. 13, 2011), https://www.space.com/10601-apollo-moon-program-public-support-myth.html [https://perma.cc/WDZ5-XT6A].

3. *A New Meaning of 'Moonshot,'* MERRIAM-WEBSTER (Jan. 2020), https://www.merriam-webster.com/words-at-play/moonshot-words-were-watching [https://perma.cc/KH8R-FVCA].

4. *See* E. Donald Elliott & Daniel C. Esty, *The End Environmental Externalities Manifesto: A Rights-Based Foundation for Environmental Law*, 29 N.Y.U. ENV'T L.J. 505, 507 (2021).

5. *Id.*

6. *Id.*

7. *Id.*

French civil engineering projects,[8] benefit-cost analysis should be just one input in decision-making.[9] Problems arise when the analysis becomes the foundation for decision-making. I leave the discussion of benefit-cost analysis and Pigouvian taxes to my colleagues; instead, I focus on several of Elliott and Esty's assumptions that underlie their thesis and introduce the pragmatist perspective on application of their manifesto. Following, I briefly discuss larger structural challenges facing environmental law, including siloed systems and agency, and the need for transformation.

I. Comments on the Elliott-Esty *Manifesto*

A. The Wizards are Coming

In Ancient Greece, dramatic plays often involved the descent of a god to the stage using a large piece of mechanical equipment—a *Deus Ex Machina*, literally "god from the machine."[10] In these dramas, a god intervened in the hero's plight, offering guidance, support, or salvation. No longer gathering to watch the great works of Homer or Sophocles, *Deus Ex Machina* now often refers to a literary plot device used when a seemingly impossible conflict is resolved by the sudden appearance of an unexpected person or occurrence of an unexpected event. In technological terms, these are the wizards. With their appearance, brandishing wands of superior technology or process, they solve a current problem and resolve all related conflicts.[11]

Elliott and Esty call for the wizards. They propose that "emissions be reduced to the greatest extent *technologically feasible*,"[12] which differs from the best available technology standard currently employed. Rather, their definition of technological feasibility refers to "what might be possible

8. *See* Wei Jiang & Rainer Marggraf, *The Origin of Cost-Benefit Analysis: A Comparative View of France and the United States*, 19 COST EFFECTIVENESS & RES. ALLOCATION, Nov. 2021, at 1, 9.

9. Naturally, to be effective as an input, the benefit-cost analysis must also be done well. *See, e.g.*, Robert W. Hahn & Patrick M. Dudley, *How Well Does the U.S. Government Do Benefit-Cost Analysis?*, 1 REV. ENV'T. ECON. & POL'Y 192, 193 (2007); Caroline Cecot & Robert W. Hahn, *Transparency in Agency Cost-Benefit Analysis*, 72 ADMIN. L. REV. 157, 164 (2020); MICHAEL A. LIVERMORE & RICHARD L. REVESZ, REVIVING RATIONALITY: SAVING COST-BENEFIT ANALYSIS FOR THE SAKE OF THE ENVIRONMENT AND OUR HEALTH (1st ed. 2020).

10. Thomas G. Chondros, *"Deus-Ex-Machina" Reconstruction and Dynamics*, *in* INT'L SYMP. ON HISTORY OF MACHINES AND MECHANISMS 87, 87 (Marco Ceccarelli ed., 2004).

11. *See, e.g.*, Stephen J. Dubner, *Two (Totally Opposite) Ways to Save the Planet (Replay)*, FREAKONOMICS (July 28, 2021), https://freakonomics.com/podcast/two-totally-opposite-ways-to-save-the-planet-ep-346-rebroadcast/ [https://perma.cc/R7M5-PKUF].

12. Elliott & Esty, *supra* note 4, at 509.

with an assiduous commitment to innovation."[13] There are several challenges with reliance on the technological wizards and the Elliott-Esty "might-be-possible" standard. First, technological developments pertaining to environmental protection may emerge from government research or government-funded projects; but advances in technology heavily flow from the private sector, which has different organizational goals than a governmental body. For example, US energy infrastructure is more than 80% owned by the private sector;[14] thus advances in technology or research pursuits are heavily influenced by economic returns on the project.[15] Under the Elliott-Esty manifesto, incentives to perform research and produce environmentally beneficial technologies are likely needed. Commonly in the form of tax credits, incentives have been a successful market-based strategy to encourage development of projects, such as renewable energy, but can be exploited to capitalize on short term gain over long term development and responsible abandonment.[16] The emergence of private capital in investor markets has also influenced the acquisition or development of projects that may be subject to technological feasibility.[17] While traditional engineering and infrastructure projects were planned over project lifetimes, private equity often seeks a return of (and on) its capital within a short term, such as ten years.[18] This short-term focus may encourage project investment to focus superficial attention on technologies.

The greater challenge to the technocrat solution, is not the ability to encourage innovation, but what to do in case of failure. We need only revisit the episodes of *The Jetsons* or watch *Back to the Future* to see that advanced technologies do not evolve as quickly as envisioned.

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13. *Id.*

14. *Energy Sector*, CYBERSECURITY & INFRASTRUCTURE SEC. AGENCY, https://www.cisa.gov/energy-sector [https://perma.cc/42ZD-L4WY].

15. *See generally* James W. Coleman, *Energy Market and Policy Revolutions: Regulatory Process and the Cost of Capital*, *in* 5 ENERGY L. & ECON. 1, 2 (Klaus Mathis & Bruce R. Huber eds., 2018).

16. *See generally* SANDRA SATTLER ET AL., FEDERAL CLEAN ENERGY TAX CREDITS: A VITAL BUILDING BLOCK FOR ADVANCING CLEAN ELECTRICITY (2021).

17. *See generally* VINSON & ELKINS, POWER PLAY: HOW PRIVATE CAPITAL IS SHAPING THE ENERGY EVOLUTION (2021), https://media.velaw.com/wp-content/uploads/2021/12/13110452/FINAL-VinsonandElkins_F2.pdf [https://perma.cc/U8EQ-RH8W].

18. *See* James Chen, *Private Equity Explained with Examples and Ways to Invest*, INVESTOPEDIA (July 28, 2022), https://www.investopedia.com/terms/p/privateequity.asp [https://perma.cc/BQ23-NMPG].

B. The Compensation Conundrum

Elliott and Esty propose payments to the environmentally harmed, stressing that the payments would promote environmental justice, particularly among communities of color.[19] Compensation for harm is a traditional legal remedy that has been pursued in tort and certain other causes of action. But it also arises under environmental statutes setting forth private party rights to pursue litigation against potentially responsible parties. What is commendable about the Elliott-Esty approach is that actual monetary damages would be awarded to those harmed, who are often in historically marginalized communities. One question the authors may consider is how those harmed would pursue remedy or bring a cause of action. As noted, those most likely to suffer the negative externalities of pollution are equally those least likely to have resources sufficient to investigate and pursue claims against the polluters. Would the harmed parties pursue an administrative process and simply report the harm? Would they require representation by legal counsel? What is the framework for investigation and adjudication of harms—a traditional trial or some other alternative dispute resolution process? Although noble, any goal to address environmental justice requires providing access to justice and should seek to remove inequitable (and often systemic) barriers,[20] like those illustrated by Shingle Mountain.

Shingle Mountain is an illegal dump site in South Dallas that stretches for over one city block[21] and is composed of 70,000 tons of toxic waste.[22] The dump, formed only six years ago (in 2017), is located in one of Dallas's many predominantly Black and Latino communities.[23]

> When two White business partners looked at the area in 2017, they figured it was an ideal place to start a dump. They redirected truckers hauling shingles to the landfill and charged them a fee to unload their cargo on their vacant land instead. One of the partners set up an illegal recycling operation

19. Elliott & Esty, *supra* note 4, at 519.

20. *See* Sarah Krakoff, *Environmental Justice and the Possibilities for Environmental Law*, 49 ENV'T L. 229, 232 (2019); *see also* Richard L. Revesz, *Air Pollution and Environmental Justice*, 49 ECOLOGY L.Q. 187, 187–88 (2022).

21. Darryl Fears, *Shingle Mountain*, WASH. POST (Nov. 16, 2020), https://www.washingtonpost.com/climate-environment/2020/11/16/environmental-racism-dallas-shingle-mountain/ [https://perma.cc/N44M-BXZP].

22. Robert Wilonsky, *Here's How Shingle Mountain Was Born – and Why Dallas Won't Pay to Destroy the 70,000-ton Monster*, DALLAS MORNING NEWS (Feb. 13, 2020), https://www.dallasnews.com/news/commentary/2020/02/14/heres-how-shingle-mountain-was-born-and-why-dallas-wont-pay-to-destroy-the-70000-ton-monster/ [https://perma.cc/5CEY-K7RB].

23. Fears, *supra* note 21.

> that ground black shingles into dust, a process that spewed toxins and fine particulate matter into the air around [Ms.] Jackson and about 100 of her neighbors.
>
> With so much industry already in south Dallas, city officials didn't notice even when it reached the height of a six-story building. Over the course of seven months starting in January 2018, Jackson complained to the city, and no one answered.[24]

Under Elliott and Esty's ambitious compensation structure, residents harmed by Shingle Mountain may be entitled to actual payment for environmental harms they suffered. If individual residents cannot be located, the authors [encourage] payment to the community, or in the case of broader harms, to the appropriate government.[25] Almost certainly, payment is helpful to remedy harms, including those to health; to deter future polluter behavior; and to acknowledge the wrong to those harmed. But compensation does not address the systemic barriers and historic wrongs that gave rise to these environmental harms.[26] Shingle Mountain is in a community that was settled by "formerly enslaved people, an area that for more than a century has been zoned for everything White citizens didn't want in their neighborhoods: industrial rail yards, chemical plants, concrete mixing facilities, warehouses that lure up to 100 diesel trucks per day and a massive landfill."[27] That zoning flowed from the destructive property practices of redlining and other race-based and race-influenced land use decisions made decades earlier.[28]

Compensation is an altruistic goal and one central to tort law, which is a traditional vehicle to address pollution claims. But the compensatory process must be simple enough so that it is not mired in legal process that inevitably favors the heavily resourced. And compensation that flows to the government may not flow (1) to those individuals or communities harmed or (2) in a timely fashion. One option to build on the Elliott-Esty compensation model and their example of an end-of-life funding requirement,[29] would be for project permitting to require identification of at-risk communities and to then set aside a certain percentage of the project

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24. *Id.*

25. Elliott & Esty, *supra* note 4, at 519–20.

26. *See* Jonathan Skinner-Thompson, *Procedural Environmental Justice*, 97 WASH. L. REV. 399, 404 n.28, 406 (2022) (discussing how a lack of avenues for meaningful involvement in administrative and decision-making processes is a systemic barrier that cannot be solved by merely providing funds to marginalized groups).

27. Fears, *supra* note 21.

28. *See id.*

29. Elliott & Esty, *supra* note 4, at 520.

development budget to pay those communities upon project completion and/or operation.[30] Identification of potentially harmed parties and future compensation funds invested in a low-risk investment vehicle, such as a Treasury Inflation-Protected Security, issued by the US Treasury, or a type of trust account, ensures that the money is available for previously identified groups. For non-permitted projects, licensing applications and renewals could also require the same retention of compensation funds and identification of harmed parties. Illegal projects could include punitive damages that would be directed to the fund. But as with any compensatory scheme, enforcement remains a substantial challenge. Other alternatives to a compensation methodology include instituting a tax-fee system, such as a carbon tax or increasing state regulatory fees on projects.[31]

C. Precautionary Principle Premiums

Elliott and Esty raise an excellent question with respect to those risks that are yet uncertain by referencing the precautionary principle.[32] This question is particularly important in that it may intersect with the use of the novel, technologically feasible solutions outlined earlier in their paper.[33] For example, the use of geographic information systems ("GIS") in agricultural operations can assist farmers who use sensors to determine crop health, which is related to the application of fertilizer and chemicals. More accurate and real-time data may decrease the amount of fertilizer and chemical needed and simultaneously increase crop yields.[34] However, GIS and remote-sensing applications could also allow polluters to hide their

30. Elliott & Esty, *supra* note 4, at 519–20 (explaining the goal of end-of-life funding requirements and compensation directed to communities where victims cannot be identified); *see* ANDERS ENETJÄRN ET AL., ENVIRONMENTAL COMPENSATION: KEY CONDITIONS FOR INCREASED AND COST EFFECTIVE APPLICATION 48–49, 54–57 (2015) (describing the process of calculating compensation costs and the factors to be analyzed if the project were to consider including environmental harm-related compensation cost burdens in this initial assessment).

31. *See* E. Donald Elliott, *EPA's Existing Authority to Impose a Carbon "Tax*,*"* 49 ENV'T L. REP. NEWS & ANALYSIS 10919 (2019); Joe Wertz, *Why Oklahoma Gets a Bill When the Oil and Gas Industry Abandons a Well*, STATEIMPACT OKLA. NPR (Nov. 26, 2012), https://stateimpact.npr.org/oklahoma/2012/11/26/why-oklahoma-gets-a-bill-when-the-oil-and-gas-industry-abandons-a-well/ [https://perma.cc/XR6W-2A2W] (explaining that the State of Oklahoma bears the brunt of well abandonment costs because only one cent of every $100 of oil and gas produced goes to the state abandonment fund).

32. *See* Elliott & Esty, *supra* note 4, at 528–32.

33. *Id.* at 509–10, 530–31.

34. David Austin & Molly K. Macauley, *Cutting Through Environmental Issues: Technology as a Double-Edged Sword*, BROOKINGS (Dec. 1, 2001), https://www.brookings.edu/articles/cutting-through-environmental-issues-technology-as-a-double-edged-sword/ [https://perma.cc/WMJ8-9CC4].

pollution by claiming privacy infringement or manipulating data. In another example, bioremediation technology uses naturally occurring microorganisms to break down various wastes (municipal, agricultural, industrial, etc.).[35] Users and polluters favor bioremediation for its cost effectiveness—one only need deliver the bacteria to the site.[36] However, there are risks to its use, including a failure to fully treat the waste; the possibility of an unexpected transformation of the waste product; and—in true precautionary principle fashion—the unknown risk of introducing biological or genetically modified organisms to the environment.[37]

But there is a longstanding solution to guarding against risks (known and unknown)—insurance. Insurance is a traditional risk mitigation strategy to protect against risks and losses from specific or uncertain perils and hazards. Elliott and Esty could advance a requirement for polluters to purchase an environmental harm policy for some predetermined policy limit that would cover previously identified harmed parties or later identified parties. These insureds (identified or non-identified) would have the direct ability to file a claim on the insurance policy for environmental harms caused by the policyholder (the polluter), who would be responsible for the premiums. Although many firms carry insurance policies with environmental coverage or separate contracts with indemnification, this policy would be specific to those harmed as identified by Elliott and Esty. Moreover, this insurance could be added to known sources of pollution via purchase—think of paying a bottle deposit (but without possibility of refund!) when you purchase a can of soda or bottle of wine. In this context, "insurance" is equivalent to an operational fee. Although an opportunity for public insurance is possible (e.g., Federal Crop Insurance Program), private insurance has a better likelihood of success in this fractured political environment. Nevertheless, it is not without its drawbacks.

Although almost every state requires drivers to carry auto insurance, troubles arose during the Affordable Care Act's early implementation allowing individuals to purchase health care insurance.[38] Insurers may not want to participate or may seek carve outs, exceptions, and challenge claims. Policy holder polluters may rely on the safety net that insurance provides and not change their behavior. However, I believe it benefits

35. *Id.*

36. *Id.*

37. *Id.*

38. Mark A. Hall & Michael J. McCue, *How Has the Affordable Care Act Affected Health Insurers' Financial Performance?*, COMMONWEALTH FUND (July 20, 2016), https://www.commonwealthfund.org/publications/issue-briefs/2016/jul/how-has-affordable-care-act-affected-health-insurers-financial [https://perma.cc/HX8E-YYAT].

insurers to participate. Insurance companies have been and are acutely aware of the financially devasting impacts of climate change.[39] If they participate in an Elliott-Esty compensation plan, they can change polluter behavior, which would decrease associated climate risks. Additionally, the insurance industry is a large lobbyist[40] and can influence legislation and policymaking in a positive fashion to reduce pollution. Of course, the risk remains that the insurance lobby uses its influence to call for limits on claims; impose other legislative restrictions (e.g., tort reform); or delay environmental regulation.[41] However, as mentioned above, insurers face claims that are potentially devasting in a climate-changed future and addressing polluter behavior would be beneficial to them. After analysis of claims and actuarial data, the insurance industry could require certain standards of operation or ownership, which would result in less pollution. And it could incentivize better behavior, which would allow it to reap the monetary rewards of lower claim costs, improved risk pools, and a resulting lower risk premium, which increases its market competitiveness.[42]

II. Siloed Systems and Agencies

In advancing their approach, Elliott and Esty rightfully seek a reexamination of environmental law. For although pollution torts and utilitarian environmental law (e.g., Rivers and Harbors Act of 1899) are not new; modern US environmental law essentially only began in 1970 with the

39. Bradley Hope & Nicole Friedman, *Climate Change Is Forcing the Insurance Industry to Recalculate*, WALL ST. J. (Oct. 2, 2018, 10:30 AM), https://www.wsj.com/graphics/climate-change-forcing-insurance-industry-recalculate/ [https://perma.cc/7ZAC-PN4S]; Allie Wilkinson, *Climate Change is Big Business (for the Insurance Industry)*, ARSTECHNICA (Dec. 24, 2012, 11:12 AM), https://arstechnica.com/information-technology/2012/12/climate-change-is-big-business-for-the-insurance-industry/ [https://perma.cc/3JR8-27AG].

40. Olivier J. Wouters, *Lobbying Expenditures and Campaign Contributions by the Pharmaceutical and Health Product Industry in the United States, 1999-2018*, 180 JAMA INTERNAL MED. 688, 690 (2020).

41. *Compare The US Insurance Sector and Climate-Related Financial Regulation*, INFLUENCEMAP (May 2022), https://influencemap.org/report/The-US-Insurance-Sector-and-Climate-Related-Financial-Regulation-18203 [https://perma.cc/KW7L-DYGJ] (discussing how insurance industry associations have attempted to weaken regulations and delay implementation of policies related to climate risks), *with* Don Jergler, *Activist Group Says U.S. Insurers Trying to Weaken Climate-Related Regulations*, INS. J. (May 12, 2022), https://www.insurancejournal.com/news/national/2022/05/12/667541.htm# [https://perma.cc/6LGL-5F7Q] (describing industry reaction to allegations that industry associations have tried to weaken and slow policy implementation).

42. Adrian Gore et al., *Can Insurance Companies Incentivize Their Customers to Be Healthier?*, HARV. BUS. REV. (June 23, 2017), https://hbr.org/2017/06/can-insurance-companies-incentivize-their-customers-to-be-healthier [https://perma.cc/H8XN-4P7E].

National Environmental Policy Act and the creation of the EPA.[43] And as my wise Environmental Law professor, Don Elliott, explained in class—US environmental law is inherently reactionary. Amidst the turbulence of the Civil Rights movement and the Vietnam War protests, the Cuyahoga River caught fire (again) in 1969.[44] The images of the burning river represented the dissonance of industrial downturn alongside the disconnect between the people and those who governed.[45] Seven months later, in 1970, NEPA, and its creation, the Council on Environmental Quality within the Executive Office of the President, was passed and the EPA quickly established. Also following Cuyahoga, the Clean Water Act was passed, in 1972. In 1989, the *Exxon Valdez* oil tanker struck a reef and spilled 10.8 million gallons of crude oil into Prince William Sound.[46] Images of oil-covered seabirds, sea otters, and other wildlife spurred congressional action, resulting in the 1990 Oil Pollution Act.[47] But a constantly backward-looking legislative program fails to provide guidance and establish a framework to eliminate pollution, as Elliott and Esty propose.

Another challenge is the deliberate siloing of naturally connected systems. Environment is part of natural resource systems and affected by a multitude of natural and artificial processes. Legislation and policy that segregates water from air and from land deliberately ignore those interrelationships and impacts. Scholars such as Barb Cosens, Robin Craig, Rhett Larson, J.B. Ruhl, Froukje Maria Platjouw, and many others use various approaches to conclude that natural resource and environmental systems are complex, adaptive systems requiring unique forms of governance.[48] But

43. William Kepner, Presentation at the International Visitor Leadership Program on EPA and a Brief History of Environmental Law in the United States (June 15, 2016).

44. Lorraine Boissoneault, *The Cuyahoga River Caught Fire at Least a Dozen Times, but No One Cared Until 1969*, SMITHSONIAN MAG. (June 19, 2019), https://www.smithsonianmag.com/history/cuyahoga-river-caught-fire-least-dozen-times-no-one-cared-until-1969-180972444/ [https://perma.cc/J9UL-LN39].

45. "That the Cuyahoga fire evolved into one of the great disasters of the environmental crisis tells us something about Americans' growing suspicion of industrial landscapes, a suspicion encouraged by the decreasing benefits they derived from such places." *Id.*; *see* Jonathan H. Adler, *Fables of the Cuyahoga- Reconstructing a History of Environmental Protection*, 14 FORDHAM ENV'T L. REV. 89, 145–46 (2002).

46. *Exxon Valdez Oil Spill Facts*, OCEANA, https://usa.oceana.org/exxon-valdez-oil-spill-facts/ [https://perma.cc/4AN8-GFVD].

47. *1912-2020 Ecological Disasters*, COUNCIL ON FOREIGN RELS., https://www.cfr.org/timeline/ecological-disasters [https://perma.cc/EVE2-C29R].

48. Barbara Cosens et al., *Governing Complexity: Integrating Science, Governance, and Law to Manage Accelerating Change in the Globalized Commons*, 118 PROC. NAT'L ACAD. SCI. 1, 1 (2021); Brian C. Chaffin et. al., *Transformative Environmental Governance*, 41 ANN. REV. ENV'T RES. 399, 400 (2016); *see generally* FROUKJE MARIA PLATJOUW, ENVIRONMENTAL LAW AND THE ECOSYSTEM APPROACH (2016).

siloing also occurs at the agency level. The EPA focuses on protection of human health and the environment. But does it actively engage with other agencies? Who does it partner with it and how within the Department of Interior? EPA states it provides "technical assistance to support recovery planning of public health and infrastructure, such as waste water treatment[;] . . . technical assistance for long-term cleanup to minimize public health threats, including environmental sampling and monitoring, site assessment, decontamination, and disposal[; and] environmental surveillance."[49] Although necessary, these provisions seem mundane and slightly dated. What are EPA's interactions with the Department of Energy (aside from Energy STAR) and the Department of Transportation? The EPA's Strategic Plan (FY 2022–2026) only establishes separate goals of ensuring "clean and healthy air for all communities" and "clean and safe water."[50] But solving for environmental outputs undoubtedly requires management of energy inputs.

III. The Eyores of Law and Agencies

In A.A. Milne's beloved Winnie the Pooh stories, the title character is portrayed as a kind, sensible, and caring bear. Tigger, the tiger, by contrast, is an energetic, optimistic, and spirited creature. These two beloved animals are contrasted with Eyore—the pessimistic and gloomy donkey. Environmental Law and EPA are the Eyores of the Hundred Acre Wood. It is surprisingly easy to become disillusioned and disheartened when working with statutes and policy that center on loss of wildlife, habitat, and conditions suitable for human existence. The constant specter of climate change and a congressional and national public failure to address same directly is at best daunting, at worst, depressing. Despondency does not result in financial and public support, which translates into underresourced environmental programs and inefficient legislative and enforcement processes.

But if EPA is an Eyore, NASA is a Tigger. The space agency lacked vision after its Apollo program, settling into a comfortable role as an international space station shuttle.[51] Funding and interest dropped after shuttle retirement, and many questioned the continued viability of the agency.

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49. *U.S. Environmental Protection Agency*, DOI, https://www.doi.gov/recovery/about-us/primary-agencies/EPA [https://perma.cc/EJ3B-FS4J].

50. *See* EPA, FY 2022–2026 EPA STRATEGIC PLAN (2022), https://www.epa.gov/system/files/documents/2022-03/fy-2022-2026-epa-strategic-plan-overview.pdf [https://perma.cc/F5X2-HMRP].

51. Loizos Heracleous et al., *The Reinvention of NASA*, HARV. BUS. REV. (Apr. 23, 2018), https://hbr.org/2018/04/the-reinvention-of-nasa [https://perma.cc/VS6F-UNST].

What reinvigorated interest and congressional support was agency reinvention.[52] "NASA has moved from being a hierarchical, closed system that develops its technologies internally, to an open network organization that embraces open innovation, agility, and collaboration."[53] It added new objectives, such as delivery of crucial technology delivery, such as "water filtration systems, satellite-based search-and-rescue, and UV coating on eyeglasses."[54] One large catalyst in its transformation was the entrance of commercial space venturers.[55] As a result, NASA was able to shift its focus to extraplanetary and deep space missions. These missions resonate with Congress and the public, struck with wonder and thrilling to stunningly clear images of an interstellar artist's palette. Americans love NASA and space exploration:

> It turns out, it is one of the few areas where Americans largely agree. In a July 2021 poll from YouGov/The Economist, a majority of Americans said the U.S. should send astronauts to the moon and Mars. This was true across political parties, with slim majorities for Democrats, Republicans and independents.
>
> Most Americans are on the same page about funding space exploration, too. About a third of Democrats, Republicans and independents said government funding of space exploration should be kept the same, and about 40 percent of each group said funding should be increased. Find me another issue where roughly the same share of Republicans and Democrats agree that the government is not spending enough money.56

But NASA scientists also pursue Earth-focused projects, including development of the Earth System Observatory to "provide critical data on climate change, severe weather and other natural hazards, wildfires, and global food production;"[57] developing climate and wildfire tools;[58] pursuing environmental justice goals; and even sponsoring humanities-focused

52. *Id.*; *see* LORI GARVER, ESCAPING GRAVITY: MY QUEST TO TRANSFORM NASA AND LAUNCH A NEW SPACE AGE (2022).

53. Heracleous et al., *supra* note 51.

54. *Id.*

55. *Id.*

56. Kaleigh Rogers & Zoha Qamar, *How Americans Feel About Space*, FIVETHIRTYEIGHT (July 15, 2022, 6:00 AM), https://fivethirtyeight.com/features/one-of-the-few-things-americans-agree-on-space-is-cool/ [http://perma.cc/N2NM-TDSK].

57. *NASA Earth Science: NASA Earth System Observatory*, NASA SCI., https://science.nasa.gov/earth-science [https://perma.cc/P5Z2-T32H].

58. *Earth: Understanding Climate and Wildfires,* NASA SCI., https://science.nasa.gov/earth-science/climate-and-wildfires [https://perma.cc/M648-YXB3].

projects like its "Sounds of the Sea," which "put[s] musical notes of imagery from [NASA's] Earth-observing satellites."[59] However, unlike adorable robots wandering the surface of Mars and posting to their Twitter accounts,[60] many in Congress do not believe in the urgency of climate change, even when the data and science flow from their beloved agency.[61] They prefer to turn their backs on the earth. To them, satellite data and scientist interpretation facing outward must be more reliable than that turned inward.

Environmental law and its supportive agencies like the EPA require transformation.[62] Elliott and Esty's vision is an important step toward that transformation—it asks us to question the current state of the law and seeks to build a broader framework. We need more questioners. Questions are the literal foundations of science. But what we also require is applied realism and practicality. As the engineer informs the scientist, at the end of the day, it needs to work.

So what does that mean? In the wise words of Michael Vandenbergh, we are not doing future generations any favors by following Disney's Law when it comes to major federal actions: "wishing will [not] make it so."[63] Vandenbergh highlighted the tensions between theory and practice in his email to the Environmental Law Professors listserv:

> My hope in all of this is that we pursue every viable option but don't engage in willful blindness about the level of support that exists in the US population v. the level necessary for major federal action. Roughly 18% of the US population lives in a state that controls 50 votes in the US Senate. The Electoral Collect reflects this bias. Gerrymandering has a substantial

59. *Water: Hear 'Sounds of the Sea' in Ocean Scientists' Music Project*, NASA (June 8, 2022), https://www.nasa.gov/feature/goddard/2022/hear-sounds-of-the-sea-in-sonifications [https://perma.cc/8PMN-FVMQ].

60. The Perseverance Mars Rover has three million Twitter followers and NASA has 60.4 million followers. *See* NASA's Perseverance Mars Rover (@NASAPersevere), TWITTER, https://twitter.com/NASAPersevere [perma.cc/J8AT-X6A6]; NASA (@NASA), TWITTER, https://twitter.com/NASA [http://perma.cc/8Q7X-QJAV]. By comparison EPA has 628,100 followers. U.S. EPA (@EPA), TWITTER, https://twitter.com/EPA [https://perma/cc/BTQ8-SAV3].

61. Jim Norman, *Democrats Drive Rise in Concern About Global Warming*, GALLUP (Mar. 17, 2017), https://news.gallup.com/poll/206513/democrats-drive-rise-concern-global-warming.aspx [https://perma.cc/YEQ9-3H89].

62. *See, e.g.*, Daniel Esty, *Regulatory Transformation: Lessons from Connecticut's Department of Energy and Environmental Protection*, 76 PUB. ADMIN. REV. 403, 403 (2016) (providing framework for regulatory best practices and examining transformation within agency).

63. Michael P. Vandenbergh, *Environmental Law in a Polarized Era*, 37 J. LAND USE & ENV'T L., 1, 22–23 (2022).

> effect on Congress and the state legislatures. The Supreme Court reflects the asymmetric influences on the Senate and White House. Remedies like doing away with the filibuster or adding Supreme Court seats all require political support that does not exist. In my view, if we really care about climate change, we'll be realistic about the state of play of public preferences in light of the democratic design and focus on responses that are viable, even if those responses don't fit comfortably with our mental models or don't provide complete solutions.[64]

I certainly do not presume to have a workable solution going forward. What I do know we need are more conversations that question the status quo and more dialogues discussing how to advance or even rebrand environmental law. Elliott and Esty's manifesto, this Symposium, and others exploring the future of environmental law are just a beginning.[65] These discussions should occur insularly, but also collaboratively with multidisciplinary academic groups and stakeholder gatherings, including the public, industry, and government. We need big proposals and solutions; after all, climate change is "the biggest threat to security that modern humans have ever faced."[66]

CONCLUSION

Over half a century has passed since the lunar gauntlet was thrown. Kennedy's address at Rice University is now remembered as iconic—a clarion call that would summon project investment and public interest.

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64. E-mail from Michael Vandenbergh, Professor of Vand. Univ. Law Sch., to Env'tl L. Professors listserv (July 1, 2022, 4:04 PM) (on file with author) (permission to cite obtained by author).

65. *See* Scott Fulton, *Forward* to ENV'T L. INST. & GEORGE WASHINGTON UNIV. SCH. OF L., REIMAGINING ENVIRONMENTAL AND NATURAL RESOURCES LAW: A SYNTHESIS REPORT EXPLORING THE NEXT 50 YEARS OF ENVIRONMENTAL LAW 2 (2021), https://www.eli.org/sites/default/files/files-pdf/Reimagining%20Environmental%20Law_2021_1.pdf [https://perma.cc/MNW7-SLCC]; Jonathan H. Adler, *Conservative Principles for Environmental Reform*, 23 DUKE ENV'T L. & POL'Y F. 253, 254 (2022) (discussing whether politicians are ready to bring in environmental policy); Jonathan H. Adler, *Back to the Future of Conservation: Changing Perceptions of Property Rights & Environmental Protection*, 1 N.Y.U. J. L. & LIBERTY 987, 990 (2005) (discussing how private property has implication on transforming future environmental policies); Frank Biermann, *The Future of 'Environmental' Policy in the Anthropocene: Time for a Paradigm Shift*, 30 ENV'T POL. 61, 61 (2020) (discussing the future of environmental policy); Ted Gayer & W. Kip Viscusi, *Overriding Consumer Preferences with Energy Regulations*, 43 J. REGUL. ECON. 248, 248 (2013) (supporting the claim that such reexamination includes improving or enforcing existing mechanisms).

66. Press Release, Security Council, Climate Change 'Biggest Threat Modern Humans Have Ever Faced', World-Renowned Naturalist Tells Security Council, Calls for Greater Global Cooperation, U.N. Press Release SC/14445 (Feb. 23, 2021) (quoting David Attenborough), https://press.un.org/en/2021/sc14445.doc.htm [https://perma.cc/8TVY-LKXY].

> "We choose to go to the moon," the president said. "We choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard, because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one which we intend to win, and the others, too."[67]

Environmental protection, natural resource conservation, and solving climate change are hard and uncomfortable issues to embrace. They force us to acknowledge our failures, our loss,[68] and even our potential demise. So, borrowing from teenage armchair psychology (aka "what my dad told me when I was 16")—we need an attitude adjustment. Reframing environmental law is not enough—what will our moonshot be? Elliott and Esty dare us to dream big.

67. Mike Wall, *JFK's 'Moon Speech' Still Resonates 50 Years Later*, SPACE (Sept. 12, 2012), https://www.space.com/17547-jfk-moon-speech-50years-anniversary.html [https://perma.cc/4V39-YLK7].

68. Robin Kundis Craig, Robert C. Packard Tr. Chair in L., Univ. of S. Cal. Gould Sch. of L., 4th Annual Natural Resources Law Teachers Workshop, The Foundation for Natural Resources & Energy Law (July 23, 2022) (discussing her and Katy Kuh's work in progress).