LEGAL TIDES: HISTORY'S LESSONS FOR A WARMING PLANET

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As detailed in our book-length historical survey,[1] the story of U.S. law and the environment weaves together numerous contrasts, competitions, overlaps, movements, and tensions. The story is one of exploitation and temperance. Of excess and forbearance. Of destruction and restoration. Of resistance and adaptation. Taken together, the many intersecting narratives provide vital lessons for a nation, and even a world, navigating today's pressing environmental challenges.

I. The Centrality of Law to Environmental History

Even before the Founders established the United States of America, the law often directed humanity's relationship with the environment and primarily drove environmental protection and degradation.

To be sure, other factors also had influence in shaping our environmental history—social, economic, political, philosophical, and scientific developments. Still, law, more than any of these other factors, most directly promoted development and exploitation, rearranged people's relationship with the environment in the eras of major environmental law making, and mediated different objectives in more dormant times of implementation and contestation.

Legal infrastructure also served and likely will serve as *the* fundamental building block in the societal reckoning in relation to environmental harm. At times, the law enabled the exploitation of peoples and resources. In others, laws directly facilitated prevention, abatement, mitigation, or even repair of such harm—sometimes even emerging when legal development may have seemed unlikely.

Despite differences between the past and the present, we can learn from our past—both in its times of progress and in times of unheeded warnings. Looking back, we can see the law's potential and limitations. While the fit is not perfect with today's context, the stakes of current environmental challenges compel a careful review.

II. The Breadth of Law Affecting the Environment

History shows that the law's impact on the environment extends well beyond the boundaries typically assumed and discussed. Environmental law is commonly understood to focus on public pollution control law and natural resources law. However, in our most recent book, we argue that the reach of law affecting the environment is much broader. No other book on the history of U.S. environmental law had taken as broad a view of how law impacts the environment, with most books focused on environmental protections that grew out of the last half of the 20th century, and some going back—at least in a cursory way—to the Progressive Era at the turn of the 20th century.

U.S. law incentivized the consumption, use, and impairment of environmental resources for centuries before Theodore Roosevelt schemed with Gifford Pinchot or John Muir, let alone before the first Earth Day. Sweeping legislative actions and judicial interpretations of property law and other historical doctrines dating back to at least the 16th century sanctioned, even instigated, massive actions of environmental and human exploitation in what is now the United States.[2] In rare cases, early conservation efforts arose, but these efforts became increasingly common and impactful as time marched on.

A core message from our broader examination of the history of environmental law is that major environmental problems often have been caused, influenced, mitigated, or undone by broader legal developments than those generally considered within the conventional environmental law canon. The causes of environmental harms—and the role that the law has played and presumably will play in those problems—very frequently require both observers and change agents to increase their aperture. Indeed, addressing consumption, use, and degradation often begins with changes in legal fields not traditionally considered to be environmental law. This list includes civil rights, property, constitutional, administrative, corporate, local government, consumer protection, employment, or communications law.

Contemporary weighty problems like anthropogenic climate change and emerging artificial intelligence (AI) and biotechnologies are likely to require this wider aperture.

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1. Alejandro E. Camacho & Brigham Daniels, Lessons for a Warming Planet: A Vital History of U.S. Environmental Law (NYU Press 2026) [hereinafter Lessons for a Warming Planet].

2. *See id.* chap. 1.

Understanding the broader legal picture will likely prove necessary to not only understand how important environmental challenges unfolded, but also to assess roadblocks, see pathways forward, and ultimately solve these problems.

III. The Oscillations of Environmental Law

As a descriptive matter, in our book, we characterize legal change related to the environment by eras of ebbs and flows, with dominant currents in each era accompanied by subordinate countercurrents. We identify five major chronological phases of environmental law in the United States: (1) the Allocation Era (1781-1890); (2) the Progressive Era (1890-1920); (3) the Modernization Era (1920-1960); (4) the Environmental Era (1960-1980); and (5) the Contested Era (1980-Present). The last and current era, spanning over five decades—the Contested Era—is unique in that it has relied on incrementalism both in the ebbs and flows, a turbulence of sorts. The ushering in of each new era frequently involved a course correction in which prior undercurrents gained ascendancy, building enough momentum in response to unaddressed harms or prior legal change that the reaction ultimately overwhelms the previously dominant current.

While some marginal countercurrents never fully ascend, the U.S. history of environmental law is largely a history of marginal countercurrents that later—sometimes suddenly—break through and crest into waves; sometimes even tidal waves. Indeed, massive changes to environmental law regularly grew out of earlier frustrations and failures. New incentives and events—too often disasters—recreated the social, political, and (eventually) legal state of play that ushered in legal change. Taking a closer look at those changes and their context seems particularly important.

A. Some Environmental Law Successes

While law enabled the environmental challenges faced today, U.S. law has also made remarkable gains in protecting the environment:

- *Public and Preserved Lands*. In addition to millions of acres of state, local, and private lands, environmental law has conserved as federal more than one-quarter of the lands in the United States, including some of the most beautiful and ecologically important places in the planet.[3]

- *Endangered Species*. The Endangered Species Act (ESA) protects over 1,600 species just in the United States,[4] saving 99% of imperiled species from extinction.[5] At least 227 likely would have gone extinct if not for the law,[6] and over 60 have been recovered.[7] Nearly half have stabilized or improved their populations under ESA protection,[8] despite chronic underfunding.[9] Meanwhile, the ESA provides over $1 trillion in ecological, economic, and other benefits every year that vastly outweigh its costs,[10] with other natural resources laws adding trillions more.

- *Air Pollution*. By most measures, air quality has improved since passage of the Clean Air Act, with dramatic reductions in exposure to ground-level ozone and particulates[11]; lead pollution from cars virtually eliminated; other pollutants at just a fraction of pre-Clean Air Act levels[12]; great strides in acid rain elimination; and virtual elimination of the primary pollutants that created the ozone hole.[13] In contrast with industry assertions before and after passage, studies show the Clean Air Act has led to trillions in net economic benefits annually.[14]

- *Water Pollution*. The Clean Water Act has produced dramatic improvements in water quality, keeping billions of pounds of pollution particularly from industrial "point" sources out of the nation's waters.[15] Dumping of raw sewage into rivers, lakes, and oceans—commonplace just decades ago—is now almost unthinkable.

3. Of the public lands, substantial amounts of land have been set aside as national forests (193 million acres), wildlife refuges (89 million acres), and national parks (80 million acres). Carol Hardy Vincent et al., Cong. Rsch. Serv., R42346, Federal Land Ownership: Overview and Data (2020). Over 111 million acres managed by federal agencies are designated as federal wilderness and protected from further extractive disturbance. *Three Key Environmental Victories From This Year*, Environment America (June 28, 2024), https:// environmentamerica.org/articles/three-key-environmental-victories-from-this-year/.

4. U.S. Fish & Wildlife Service, *Listed Species Summary (Boxscore)*, https://ecos.fws.gov (last visited Mar. 23, 2019).
5. S. Res. 516, 118th Cong. (2023).
6. J. Michael Scott et al., *By the Numbers*, *in* The Endangered Species Act at Thirty 16, 31 (Dale D. Goble et al. eds., 2006).
7. U.S. Fish & Wildlife Service, *Delisted Species*, https://ecos.fws.gov (last visited Mar. 27, 2019).
8. Salvador Rizzo, *Has the Endangered Species Act Saved "Very Few" Plants and Animals?*, Wash. Post (Aug. 16, 2019), https://www.washingtonpost.com/politics/2019/08/16/has-endangered-species-act-saved-very-few-plants-animals/.
9. Benji Jones, *The Ridiculously Stupid Reason the US Is Letting Animals Spiral Toward Oblivion*, Vox (Dec. 18, 2023), https://www.vox.com/down-to-earth/2023/12/18/23989030/endangered-species-act-explained-environment-biodiversity-extinction.
10. Justin Worland, *The Endangered Species Act Is Criticized for Its Costs. But It Generates More Than $1 Trillion a Year*, Time (July 25, 2018), https://time.com/5347260/endangered-species-act-reform/.
11. *See, e.g.*, Mark W. Davis, *Air Quality in the United States*, *in* Environmental Issues Today: Choices and Challenges 53 (Robert J. Duffy & Susan M. Opp eds., 2020).
12. E. Donald Elliott, *A Critical Assessment of the EPA's Air Program at Fifty and a Suggestion for How It Might Do Even Better*, 70 Case W. Rsrv. L. Rev. 895 (2020).
13. Jutta Brunnee, Acid Rain and Ozone Layer Depletion: International Law and Regulation (1988).
14. Simon Mui & Amanda Levin, Clearing the Air: The Benefits of the Clean Air Act (NRDC Issue Brief May 2020), https://www.nrdc.org/sites/default/files/benefits-clean-air-act-ib.pdf (identifying Clean Air Act benefits in 2020 of "up to 370,000 avoided premature deaths, 189,000 fewer hospital admissions for cardiac and respiratory illnesses, and net economic benefits of up to $3.8 trillion for the U.S. economy").
15. Kara Manke, *Clean Water Act Dramatically Cut Pollution in U.S. Waterways*, Berkeley News (Oct. 8, 2018), https://news.berkeley.edu/2018/10/08/clean-water-act-dramatically-cut-pollution-in-u-s-waterways/.

- *Hazardous Waste and Toxic Products*. Many toxic waste sites have been remediated, and meaningful federal restrictions on hazardous waste disposal have radically limited the risks of creating future sites. And while research continues to identify toxic products, many of the most problematic, including lead, dichlorodiphenyltrichloroethane (more commonly known as DDT), and asbestos, have been banned or controlled.[16]

- *Better Government and Decisionmaking*. The National Environmental Policy Act (NEPA) helped improve American democracy and numerous government decisions by providing a governmentwide architecture for integration of environmental concerns and public involvement in federal decisions, interagency coordination, and government accountability.[17] Many state and national governments have followed suit and created similar protections,[18] so much so that international law has begun to treat environmental impact assessment as an enforceable international legal norm.[19]

- *Renewable Energy*. Countries around the globe, notably including the United States, are making substantial progress toward a renewable energy transformation, supported by government investment. Battery storage has grown substantially, with each of the past several years setting a renewable energy generation record.[20] Even without direct government investment, this trend is expected to continue as wind, solar, and storage become increasingly less expensive (substantially less so than fossil fuels).[21]

Governments at various scales continue to push industry to continue this transition.[22] This progress would not have been possible without 1970s-era federal energy laws that helped create the conditions that eventually ignited the explosion of new renewable projects.[23] The Inflation Reduction Act of 2022, which provided financial incentives to move the energy transition ahead, helped spur a major spike in growth in the United States.[24] The One Big Beautiful Bill Act of 2025 terminated or accelerated the phaseout of most of those credits, effectively dismantling the core of the Inflation Reduction Act's clean energy incentive structure within three years of its enactment.[25]

B. The Challenges Ahead

Despite many successes, persistent resource development and exploitation have perpetuated fossil-fuel dependency, resource overuse and scarcity, and habitat and biodiversity loss. As in prior eras, our era's most pressing environmental problems are insufficiently addressed by the law. In attempting to dismantle the ability of the federal government to address environmental and other social problems, the second Donald Trump Administration also has introduced a new set of challenges.

- *Climate*. Global anthropogenic climate change has exacerbated, broadened, and transformed the ecological effects of each of the persistent issues of prior eras. It poses the most complex, profound, and potentially catastrophic set of environmental challenges faced in modern human history.[26] Climate change already has caused harm to human and natural systems, harm which is only expected to increase over the coming decades.[27]

  While there have been some pockets of progress in limiting greenhouse gas emissions, aggressive national and global legal changes are needed to have any hope to keep climate change in check. The acceleration of these harms is documented with increasing precision: in 2025 alone, the United States endured 23 separate billion-dollar weather and climate disas-

16. U.S. EPA, Final Rule, Asbestos Part 1; Chrysotile Asbestos; Regulation of Certain Conditions of Use Under the Toxic Substances Control Act (TSCA), 89 Fed. Reg. 21970 (Mar. 28, 2024).
17. Environmental Law Institute, NEPA Success Stories: Celebrating 40 Years of Transparency and Open Government 3 (2010), https://www.eli.org/research-report/nepa-success-stories-celebrating-40-years-transparency-and-open-government; Robert L. Glicksman & Alejandro E. Camacho, *The Trump Card: Tarnishing Planning, Democracy, and the Environment*, 50 ELR 10281, 10281-82 (Apr. 2020).
18. Daniel R. Mandelker, *Melding State Environmental Policy Acts With Land Use Planning and Regulations*, 49 Land Use L. & Zoning Dig. 3 (1997).
19. Neil Craik, *The Duty to Cooperate in the Customary Law of Environmental Impact Assessment*, 69 Int'l & Comp. L.Q. 239 (2020).
20. Yusuf Khan, *U.S. Renewable Power Growth Is Setting New Records on the Back of Federal Support*, Wall St. J. (Feb. 21, 2024), https://www.wsj.com/articles/u-s-renewable-power-growth-is-setting-new-records-on-the-back-of-federal-support-2f844b66?eafs_enabled=false. A record 31 gigawatts (GW) of solar energy capacity was installed in the United States in 2023, a roughly 55% increase from 2022 installations and substantially more than the previous record in 2021. Lori Bird & Joseph Womble, *State of US Clean Energy Transition: Recent Progress, and What Comes Next,* World Resources Institute (Feb. 7, 2024), *available at* https://www.wri.org/insights/clean-energy-progress-united-states.
21. Lazard, 2023 Levelized Cost of Energy (Apr. 12, 2023), *available at* https://www.lazard.com/research-insights/2023-levelized-cost-of-energyplus/.
22. *See, e.g.*, *Vermont Commits to 100% Renewable Electricity*, Environment America (June 17, 2024), https://environmentamerica.org/updates/vermont-commits-to-100-renewable-electricity/ (describing Vermont law that commits to 100% renewable electricity by 2030 and New York law deploying clean energy home rebates).
23. PURPA §3(4), 16 U.S.C. §2602(4).
24. *See* Roberta F. Mann & Tracey M. Roberts, *The Long and Winding Road: The Inflation Reduction Act's Energy and Environmental Tax Credits*, 70 Nat'l Tax J. 223, 243-49 (2025) (explaining incentives across different sectors of the economy).
25. Pub. L. No. 119-21, 139 Stat. 72 (July 4, 2025) (phasing out most clean energy tax credits by end of 2025 and terminating I.R.C. §§45Y and 48E technology-neutral clean electricity production and investment tax credits for wind and solar facilities beginning construction after July 2026 or in service after December 2027).
26. *See, e.g.*, Joseph P. Tomain, *"Our Generation's Sputnik Moment": Regulating Energy Innovation*, 31 Utah Env't L. Rev. 389, 397 (2011). The nature, timing, and scope of those physical changes and how they will interact with one another remain uncertain. Climate change may generate feedback loops that exacerbate physical changes already occurring. *See* Martin Heimann & Markus Reichstein, *Terrestrial Ecosystem Carbon Dynamics and Climate Feedbacks*, 451 Nature 289 (2008); Robin Kundis Craig, *"Stationarity Is Dead"—Long Live Transformation; Five Principles for Climate Change Adaptation Law*, 34 Harv. Env't L. Rev. 9, 15 (2010).
27. Intergovernmental Panel on Climate Change, Climate Change 2014 Synthesis Report: Summary for Policymakers 6-8 (2014); U.S. Global Change Research Program, Global Climate Change Impacts in the United States 9 (Susan J. Hassol et al. eds., 2009).

ters that claimed at least 276 lives and caused $115 billion in damages—the third-highest annual total on record, and the 15th consecutive year with an above-average number of such events.[28]

- *Emerging Technologies*. As in every other era, new technologies are both a source of environmental risk and a potential strategy for reducing such risks. Technologies like geoengineering, synthetic biology, and AI raise ethical, political, and legal questions that will shape the future of life on the planet, including the environment. Geoengineering (i.e., the use of deliberate and large-scale intervention strategies for manipulating the global climate system)[29] raises catastrophic global risks from potentially unilateral actions to manipulate and alter global climatic processes.[30] Synthetic biotechnologies suggest a range of new but untested ways to promote human and ecological health through human intervention.[31] While a few laws governing biotechnologies consider the wider trade offs of their deployment, most narrowly focus only on keeping technologies and "natural" systems apart.[32] And increased use of AI will lead to considerable pressures on energy[33] and freshwater resources,[34] not to mention unprecedented risks to ecosystems and human health.[35]

- *Environmental Injustice*. Environmental law's inability to address meaningfully the economic and racial injustice of unequal distribution of environmental harms remains a critical limitation.[36] Added to this shortcoming of prior eras are new important questions of intergenerational justice and the state of the planet that will be passed to future generations. The January 2025 Eaton and Palisades fires in Los Angeles—the costliest wildfire events in American history at over $61 billion in damages[37]—illustrated this failure in contemporaneous terms: 18 of the 19 people who died in the Eaton fire lived in the historically Black community of West Altadena, prompting the California Attorney General to open a civil rights investigation into whether delays in notifying and evacuating that community violated state antidiscrimination and disability rights laws.[38] Climate-driven disasters do not merely compound existing environmental harms; they compound existing environmental injustices.

- *Attacks on the Environmental Administrative State and the Rule of Law*. While politicians have long criticized the administrative state, the first and second Trump Administrations took it much further. Leaning on the guise of government efficiency, Trump has sought to starve and hollow out environmental agencies, particularly those focused on climate change, environmental justice, and renewable energy. Forces, particularly outside the government, resisted by bringing lawsuits and rallying allies in the U.S. Congress and within other levels of government. Even when successful, this resistance had difficulty in stemming the barrage of destabilizing actions.

  At a broader level of governance, the Trump Administrations attacked not only political opponents, but also the courts, and they harnessed the power of the administrative state both as a partner in pursuing a policy agenda and as an accomplice in settling Trump's personal and political vendettas. Such attempts to turn the legal system into something less democratic and more autocratic have found some success.[39] The consequences are now quantifiable: in 2025, the Environmental Protection Agency's (EPA's) total workforce was reduced by approximately 3,700 employees—including the elimination of its Office of Research and Development, the agency's primary scientific research arm[40]—and the Administration's fiscal year (FY) 2027 budget proposes to cut EPA's funding by 52% from FY2026-enacted levels and the National Science Foundation's budget by 54%.[41]

  Most consequentially, in February 2026, EPA rescinded the 2009 Endangerment Finding—the

28. *2025 in Review: U.S. Billion-Dollar Disasters*, Climate Central (Jan. 8, 2026), https://www.climatecentral.org/climate-matters/2025-in-review [hereinafter *2025 in Review*]. The Trump Administration discontinued the National Oceanic and Atmospheric Administration's (NOAA's) decades-long tracking of this dataset in 2025; Climate Central, a nonprofit research organization, subsequently assumed that function. *Id.*
29. *See generally* Climate Engineering and the Law: Regulation and Liability for Solar Radiation Management and Carbon Dioxide Removal (Michael B. Gerrard & Tracy Hester eds., 2018); Jay Michaelson, *Geoengineering: A Climate Change Manhattan Project*, 17 Stan. Env't L.J. 73 (1998).
30. *See, e.g.*, Engineering the Climate: The Ethics of Solar Radiation Management (Christopher J. Preston ed., 2012); Joshua B. Horton, *Geoengineering and the Myth of Unilateralism: Pressures and Prospects for International Cooperation*, 4 Stan. J.L. Sci. & Pol'y 56 (2011).
31. *See, e.g.*, International Union for Conservation of Nature, Synthetic Biology and Its Implications for Biodiversity Conservation (2019); Albert C. Lin, Prometheus Reimagined: Technology, Environment, and Law in the Twenty First Century (2017).
32. Alejandro E. Camacho, *Going the Way of the Dodo: Deextinction, Dualisms, and Reframing Conservation*, 92 Wash. U. L. Rev. 849 (2015).
33. Amy L. Stein, *Artificial Intelligence and Climate Change*, 37 Yale J. on Reg. 890, 917-18 (2020).
34. Shaolei Ren & Adam Wierman, *The Uneven Distribution of AI's Environmental Impacts*, Harv. Bus. Rev. (July 15, 2024), https://hbr.org/2024/07/the-uneven-distribution-of-ais-environmental-impacts.
35. *See* California Government Operations Agency, State of California: Benefits and Risks of Generative Artificial Intelligence Report 16 (2023) ("GenAI tools may enable bad actors to design, synthesize, or acquire dangerous chemical, biological, radiological, or nuclear (CBRN) weapons.").
36. *See, e.g.*, Christopher H. Foreman, The Promise and Peril of Environmental Justice (2011).
37. *2025 in Review*, *supra* note 28.
38. Climate Justice Moves to States With California's Fire Probe, Bloomberg Law (Feb. 18, 2026), https://news.bloomberglaw.com/us-law-week/climate-justice-moves-to-states-with-californias-fire-probe.
39. *See* Lessons for a Warming Planet chap. 5.
40. *EPA Eliminates Office of Research and Development, Will Cut Over 3,700 Staff*, Columbia Law School Sabin Ctr. for Climate Change Law (July 18, 2025), https://climate.law.columbia.edu/content/epa-eliminates-office-research-and-development-will-cut-over-3700-staff.
41. *See Trump's 2027 Budget Proposes Massive Cuts for Climate and Environmental Programs*, Inside Climate News (Apr. 6, 2026), https://insideclimatenews.org/news/06042026/trump-budget-proposes-epa-noaa-fema-cuts/.

foundational determination that greenhouse gases endanger public health and welfare and the statutory basis for most federal climate regulation under the Clean Air Act—an action EPA itself characterized as "the single largest deregulatory action in U.S. history."[42] Unlike prior Contested Era rollbacks that reduced the pace or scope of protections, the rescission attempts to strip future administrations of the primary statutory vehicle for federal climate regulation absent new congressional authorization. A coalition of 24 state attorneys general, the District of Columbia, and 12 cities and counties has already challenged the rescission in the U.S. Court of Appeals for the District of Columbia Circuit.[43]

These developments bring into sharp relief the limitations of law created and shaped in prior eras for managing emerging environmental problems. The political and legal ebb and flow of environmental protection will undoubtedly continue, but will the incremental contestation of the current era be enough in an age of rising tides and AI? That seems doubtful. The conflict and stagnancy that characterizes the Contested Era has hindered meaningful legal solutions at a time when incremental progress is unlikely to be enough. It also amplified fissures between environmental pragmatists who stress averting deregulation or scavenging for incremental gains, and idealists focused on ambitious political and even extralegal campaigns for fundamental (though still elusive) transformations in governance.[44]

The second Trump Administration's approach to governance and unwillingness to accept the core problems facing the planet—not just environmental harms, but also unprecedented wealth disparities and basic facts—raise particularly concerning risks to long-term governance. These hazards extend further than failing to reassemble lost expertise, or even the dire and irreparable consequences at risk when ignoring acute and unprecedented environmental problems. Rather, they raise the specter that the next era of governance might prove to be an era dominated by autocratic rule, development, and exploitation of diminishing natural resources.

On the other hand, the second Trump Administration's extreme tactics also set up a real possibility of outrage and backlash that leads to a pendulum swing into a new era that is quite amenable to environmental protection and justice, renewable energy, and significant changes in governance. Looking back at history, there is evidence that such changes are possible even when they seem improbable. Either way, overwhelming evidence today suggests that as the Anthropocene dawns, the United States—indeed the world—is due for another substantial course correction related to the environment. Whether or when a paradigm shift actually occurs may not be clear for some time, and perhaps only in hindsight.

IV. Accretions, Erosions, and Avulsions Through Substantive, Procedural, and Structural Governance

Sometimes, the production or dismantling of law affecting the environment has occurred through accretion and erosion—incrementally and gradually changed in one direction or another over decades. In some eras, however, solutions came in the form of transformative avulsions, remaking the legal landscape and frequently as urgent responses to untenable harms or powerful fears. Particularly when forces of change faced strong resistance, incremental progress proved difficult, and legal change required extreme circumstance or crisis to change the status quo. Whether change came incrementally or radically, environmental law evolved through the successive invention or reinvention of substantive, procedural, and structural law and governance. Changes to protect the environment have almost always involved not only undoing incentives created in the past, but also adopting new goals, strategies, processes, and institutions.

While, looking ahead, any positive incremental change would give us a reason to celebrate, it is hard to imagine that either the planet or nation can overcome many of the environmental challenges they face without some form of transformational change.

A. Adjusting and Transforming Goals and Strategies

In each era, policymakers have adopted new legal goals and strategies that have shaped our relationship with the environment. For more than a century after the formation of the United States, the country's leaders embraced the goals of economic development and job creation almost exclusively. Undoubtedly, these remain core goals today. Yet in each era, the country created and expanded the range of goals policymakers relied upon to address emerging environmental problems and supplanted, or at least reined in, unfettered exploitation. While these goals may seem like obvious precepts of the policy landscape now, it is important to recognize that in our past this was not so. Goals like promotion of public health, historical preservation, natural preservation, sustained yield, and environmental justice all represent major legal innovations of previous eras.

42. Rescission of the Greenhouse Gas Endangerment Finding and Motor Vehicle Greenhouse Gas Emission Standards Under the Clean Air Act, 91 Fed. Reg. 7686, 7688 (Feb. 18, 2026) [hereinafter Endangerment Rescission].

43. Press Release, Mass. Off. of Att'y Gen., AG Campbell Challenges Unlawful Rescission of Landmark 2009 Greenhouse Gas Endangerment Finding (Mar. 19, 2026), https://www.mass.gov/news/ag-campbell-challenges-unlawful-rescission-of-landmark-2009-greenhouse-gas-endangerment-finding. For an analysis of the rule's legal vulnerabilities, see *Eliminating the Foundation: Vulnerabilities in and Implications of EPA's Endangerment Finding Rescission*, Harv. Env't & Energy Law Program (Mar. 2026), https://eelp.law.harvard.edu/wp-content/uploads/2026/03/Eliminating-the-Foundation-Vulnerabilities-in-and-Implications-of-EPAs-Endangerment-Finding-Rescission.pdf.

44. *See* Daniel Farber, Eco-Pragmatism: Making Sensible Environmental Decisions in an Uncertain World (1999); David Manuel-Navarrete, *Power, Realism, and the Ideal of Human Emancipation in a Climate of Change*, 1 WIREs Climate Change 765 (Nov./Dec. 2010), *available at* https://doi.org/10.1002/wcc.87.

Moreover, the law developed a wide range of strategies to advance one or more of these substantive goals. In the earliest era, policymakers relied on strategies exclusively limited to legislative subsidies and development of new (or reinterpretations of old) liability doctrines in the common law. In latter eras, policymakers at every scale invented a constellation of public law strategies for advancing one or more of these substantive goals, including prescriptive standards, planning, information disclosure, bans or use limitations, as well as market-enlisting strategies such as marketable allowances, pollution charges or taxes, and even contracts.

It seems evident that there are great opportunities for transformational legal innovations to both the substantive purposes and tools of environmental law, tailored to meet the distinctive challenges of today. Undoubtedly, past legal goals and tools persist, and some are being partly adapted to try to manage new challenges—such as common-law nuisance,[45] the Clean Air Act, and the ESA to address climate change[46]; or existing environmental law's ability to regulate biotechnologies.[47]

However, it is equally evident that at least some of the foundational goals and strategies of U.S. environmental law have proven to be outmoded for the challenges we face. For example, it is painfully obvious that existing U.S. environmental laws are at best an awkward fit for effectively mitigating climate change through reducing greenhouse gas emissions. Policymakers that created the great body of environmental law did not create these tools to ensure that all responsible for climate change fairly share in developing the solutions. And they also were not established to promote effective adaptation to the inevitable effects of climate change. Despite their many virtues, they were not built for the job. Although (as in prior eras) legal innovations in interpreting and applying the law might accommodate new problems, there is a limit to their legal adaptive capacity for our most pressing modern problems absent some major changes.[48]

So, what might such change in substantive goals and strategies look like? Climate change, for example, will require substantial reductions in, if not elimination of, our reliance on fossil fuels in favor of more renewable and/or sustainable sources, as well as a wide range of planning and regulatory strategies to resist, prepare for, and manage its effects. Long-proposed strategies include cap-and-trade regimes, carbon taxes, renewable energy subsidies, and adaptation planning, with each of these adopted to some degree at state, regional, and federal levels.[49] The history of environmental law suggests that strategies deployed over the coming decades likely will include options that scholars, activists, and policymakers have only begun to imagine.

Yet another potential avenue for innovation might focus on the aims of environmental law. The fundamental goals of current environmental law focus on maximizing productivity or reducing direct harm to human health. Some of these and other legal regimes, however, treat ecological processes as both relatively static and distinct from human action. Some U.S. statutes incorporate the assumption of a static environment, including water law regimes and conservation laws seeking to advance strategies rooted in nonintervention and historical preservation.

Climate change raises questions about the fitness—or possible narrowness—of these objectives. Legal change may need to increase prioritization of ecological and human health as their primary objectives. In the past, other conservation goals—like those embedded in the ESA—were used as surrogates for ecological health. Given the scale of ecosystem collapse expected unless major changes are made quickly, it may prove necessary to embrace a goal focused more on promoting ecological health and congruent with ecological dynamics—despite the hot debates inevitably to come with defining and effectuating such a goal through law.

Changes could take other forms. Policymakers, for example, may need to deemphasize, but not necessarily eliminate, strategies that emphasize wildness/naturalness, as ecological conditions may increasingly call for unprecedented interventions. Historical preservation—meaning maintaining preexisting conditions—may flatly be out of our reach as the planet changes. Moreover, laws that focus on maximizing economic productivity (whether operationalized as sustained or maximizing yield or economic output) may require a broader ecological outlook.

Failing to address current global environmental threats is likely to raise existential threats not only to ecological health, but also to many industries and the fabric of many societies. Because of this, to find a fair solution, law will almost certainly need to be involved actively in developing a fair outcome, one that grapples with racial, ethnic, and economic injustices that to date have largely been neglected.

45. For a general overview of how nuisance law has adapted to address environmental challenges, see Michael C. Blumm, *A Dozen Landmark Nuisance Cases and Their Environmental Significance*, 62 Ariz. L. Rev. 403 (2020). For a more specific discussion about the potential of nuisance law to adapt to address a particular challenge, see, for example, Connor J. Fraser, *The Public Plastic Nuisance: Life in Plastic, Not So Fantastic*, 98 N.Y.U. L. Rev. 2055 (2023); Jack Wold-McGimsey, *Climate Change and Modern State Common Law Nuisance and Trespass Tort Claims*, 94 U. Colo. L. Rev. 815 (2023).

46. Nicholas Bryner, *The Once and Future Clean Air Act: Impacts of the Inflation Reduction Act on EPA's Regulatory Authority*, 65 B.C. L. Rev. 1, 1-41 (2024) (discussing the history of Clean Air Act legal challenges related to climate change); J.B. Ruhl, *Climate Change and the Endangered Species Act: Building Bridges to the No-Analog Future*, 88 B.U. L. Rev. 1 (2008) (discussing challenges of applying the ESA to the problem of climate change).

47. Gregory N. Mandel & Gary E. Marchant, *The Living Regulatory Challenges of Synthetic Biology*, 100 Iowa L. Rev. 155 (2014) (reviewing the reach of various environmental laws to regulate synthetic biology).

48. Alejandro E. Camacho & Robert L. Glicksman, *Legal Adaptive Capacity: How Program Goals and Processes Shape Federal Land Adaptation to Climate Change*, 87 U. Colo. L. Rev. 711 (2016).

49. *See, e.g.*, Corrie E. Clark et al., Cong. Research Serv., R46947, U.S. Climate Change Policy (2021) (providing an overview of bills and actions taken and proposed at the federal level); Brigham Daniels, *Why Stop Grazing the Climate Commons?*, 13 Mich. J. Env't & Admin. L. 88 (2023) (providing an overview of meaningful climate actions at various levels of governance); Jonathan B. Wiener, *Think Globally, Act Globally: The Limits of Local Climate Policies*, 155 U. Pa. L. Rev. 1961 (2007) (discussing and critiquing local climate action).

B. *Adapting Procedural Governance*

It is not just the substance of law that matters. Procedural innovations have proven enormously important for developing modes of deciding among various potential substantive governance strategies. Adopting federal and state constitutions and amendments, legislative statutes, and judicial procedures were the only three alternative paradigms on the table up to the Progressive Era (1890-1920), with administrative processes ascending in both prominence and incidence up to the present day. Yet, these processes were augmented in the Environmental and Contested Eras through a range of procedural innovations including citizen suit provisions, environmental impact assessment, and, to a limited extent, collaborative adaptive management.

One warning gleaned from U.S. environmental legal history, however, is that policymakers have generally neglected to incorporate mechanisms that provide any semblance of systematic and periodic adjustments even as they learn more about the challenges being faced.[50] Despite all the procedural innovations that have pushed environmental protection, changes have typically focused on putting out a particular fire but left plenty of embers burning.

In large part due to the tendency of policymakers to craft policies tailored to each distinctive challenge, the history of environmental law illustrates the procedural rigidity of legal innovations. Add to this that from the Mining Law of 1872 to the persistence of the ESA in withstanding attack, legal innovations were often not only durable, but arguably incredibly rigid. There has been limited investment in procedural innovations that help laws adapt. While rare and often limited in their scope, we do have some examples to the contrary. For example, many of the environmental laws passed during the Environmental Era require regulators to look at the best available science when decisions are made.[51]

Still, most environmental law does not have much give. Climate change particularly increases the need for the development of an adaptive and more resilient climate adaptation infrastructure that reduces the level of harm resulting from climate change.[52] Because most laws assume a world that is static, these same laws are likely to prove increasingly ineffective in averting and managing the effects of increasingly dynamic phenomena like climate change and emerging technologies on ecosystems and markets. Frequently, these problems arise because environmental law and management focus on front-end planning[53] and not on the need to manage uncertainty or adjust for the almost inevitable missteps.[54] The law frequently even fails to incorporate opportunities to revisit decisions to account for change or new information.[55] Further, the monitoring necessary to learn lessons and spot mistakes is typically weak for under-resourced agencies.[56]

As policymakers confront the task of creating a new legal infrastructure, they will have the opportunity to develop measures that integrate increased reliance on more adaptive management and governance processes. Indeed, the uncertainty and volatility of climate-related problems require no less—until the climate stabilizes, change is the new normal. Policymakers need to rely on not only provisional decisions based on existing information, but also incremental policy and decision adjustments at the back end as conditions warrant.[57] Effective adaptive procedures may require not only empiricism and experimentalism in implementing on-the-ground strategies, but also more systematic monitoring, assessment, and adjustment of agency policies, programs, and processes.[58] Learning over time is important because in facing such dynamic problems, even if one gets it right, *rightness* is going to change as new information is gathered and circumstances shift.

Similarly, while emerging technologies raise significant risks, many also offer the potential to reduce ecological harms or improve the implementation of environmental law. Geoengineering and AI may facilitate significant ecological benefits.[59] Remote sensing combined with machine learning may revolutionize environmental enforcement.[60] It will be crucial for legal processes to harness and manage technologies like these to support more effective environmental protection.[61] As always, policymakers will also need to adjust and adapt substantive environmental law strategies to avoid new risks, but the history of environmental law suggests (and our current reality confirms) that it is important for legal processes to adapt, respond to, and remediate ecological and human health harms quickly as new information about them becomes available.

50. Alejandro E. Camacho, *Adapting Governance to Climate Change: Managing Uncertainty Through a Learning Infrastructure*, 59 Emory L.J. 1 (2009).
51. *See, e.g.*, Safe Drinking Water Act, 42 U.S.C. §300g1(b)(3)(A)(i) (requiring EPA to apply the "best available, peer-reviewed science"); Toxic Substances Control Act, 15 U.S.C. §2625(h) (requiring the "best available science"); and Endangered Species Act, 16 U.S.C. §1533(b) (requiring reliance on "best scientific and commercial data available").
52. Camacho, *supra* note 50; Dave Huitema et al., *The Governance of Adaptation: Choices, Reasons, and Effects*, 21 Ecology & Soc'y 37 (2016).
53. *See, e.g.*, Administrative Procedure Act, 5 U.S.C. §§551-559; 5 U.S.C. §§701-706.
54. *See, e.g.*, Craig R. Allen et al., *Adaptive Management for a Turbulent Future*, 92 J. Env't Mgmt. 1339, 1343 (2011).
55. Robin Craig & J.B. Ruhl, *Designing Administrative Law for Adaptive Management*, 67 Vand. L. Rev. 1, 4-5 (2014); Alejandro E. Camacho, *Transforming the Means and Ends of Natural Resource Management*, 89 N.C. L. Rev. 1405, 1414 (2011).
56. *See, e.g.*, Eric Biber, *The Problem of Environmental Monitoring*, 83 U. Colo. L. Rev. 1, 34-52 (2011); Management Systems International, An Independent Evaluation of the Effectiveness of the U.S. Fish and Wildlife Service's National Wildlife Refuge System 20 (2008).
57. *See, e.g.*, J.B. Ruhl & Robert L. Fischman, *Adaptive Management in the Courts*, 95 Minn. L. Rev. 424, 429 (2010) (stating that the adaptive management framework relies on "iterative cycles of goal determination, model building, performance standard setting, outcome monitoring, and standard recalibration").
58. Camacho, *supra* note 50, at 76.
59. Alejandro E. Camacho & Robert L. Glicksman, Reorganizing Government: A Functional and Dimensional Framework 221 (2019).
60. Cary Coglianese, *Deploying Machine Learning for a Sustainable Future*, *in* A Better Planet: Forty Big Ideas for a Sustainable Future 200, 203 (Daniel C. Esty ed., 2019); *see also* Miyuki Hino et al., *Machine Learning for Environmental Monitoring*, 1 Nat. Sustainability 583 (2018).
61. Coglianese, *supra* note 60, at 206.

C. *Rethinking the Structural Relationship Between Legal Institutions*

The history of environmental law shows that successful environmental policy requires careful consideration of not only goals, tools, and processes, but also the design of environmental legal institutions. This is true for both strategies addressing environmental harms and assessing the effectiveness of strategies used to advance environmental protection. The legal institutions that developed for promoting use, management, and eventual protection of the environment evolved across the eras. Since the United States arose, legislative, executive, and judicial branches each played their role, as did federal, state, and local governments, with relationships between these institutions governed by constitutional doctrines including separation of powers and federalism.

Though the focus of attention for environmental law over the past 50 years has rested at the federal level, throughout history, much of public authority over environmental resources has primarily been decentralized to local and state authorities. Even today, local and state governments retain primary control over key environmental authority in the United States, most notably the ownership, development, and regulation of resources such as water and land.[62] As such, many environmental resources remain largely decentralized, with some overlap and only limited coordination over a few governmental functions.[63]

At key political moments, however, new forms of federal law emerged to authorize limited-purpose, often overlapping, centralized institutions to address evident inadequacies of relying on decentralized, independent institutions to address environmental harms. At times, these involved preemptive federal assumption of authority, such as the establishment of federal lands in the Progressive Era or nuclear waste disposal and hazardous waste remediation in the Environmental Era. Under other regimes, federal authority only served as a floor that state regulation could supplement with more stringent regulation but not abrogate.[64] The surfacing of a robust federal and state public administrative state in the Modernization (1920-1960) and Environmental Eras thus led to the development of a complex structural legal infrastructure, in certain contexts decentralized and others centralized—with some exclusive but more commonly overlapping authority, as well as some independently exercised jurisdiction but more often subject to various forms of coordination.[65]

One replicated legal innovation that arose during the Environmental Era took the form of "cooperative federalism" regimes that vested federal authority over key regulatory functions—for example, funding, ambient monitoring, and ambient and even source standard-setting—while maintaining substantial roles for states, particularly over implementation and enforcement.[66] Again, in some regimes authority was not fully centralized, as federal jurisdiction continued to overlap with state authority through floor preemption.[67] These regimes often include federal-state coordination in the performance of their overlapping authority.[68]

Similarly, flexible standards built into common-law doctrines have provided a vital backstop to public law regimes for addressing emerging environmental problems. Even unsuccessful lawsuits have raised awareness and catalyzed action by legislatures and the executive branch. A long list of unsuccessful common-law cases preceded *Massachusetts v. EPA*. As a frontline defense and often a precursor to regulation, the persistence of common law in supplementing public-law regimes has proved invaluable in protecting human health and the environment.

As the Anthropocene emerges, the structural governance of environmental law needs to be reconsidered, even as it is rebuilt to address threats to administrative governance and the rule of law. As in prior eras, the trade offs of allocations of authority are likely to vary depending on the context and risks at hand. Climate mitigation might require more robust governance at scales that so far have been elusive, as illustrated by decades of global diplomacy seeking to create a robust international legal infrastructure to reduce greenhouse gas emissions.

As for climate change adaptation, particularly given the diversity and uncertainty of most climate effects, policymakers are most likely to succeed if planning and implementation strategies are largely addressed at the local level. Federal interventions, on the other hand, are more likely to prove helpful in circumstances in which cross-jurisdictional harms are of particular concern or when uniform standards or economies of scale are especially advantageous. Of course, intergovernmental coordination will frequently pay dividends, and though overlapping authority may be inefficient, it nonetheless might be worth it for protecting resources that are especially precious or irreplaceable.[69] Regardless, the particular configuration of and legal relationship between these institutions ought to vary by context.

Climate geoengineering activities, in contrast, are likely to be spurred by perceived local benefits and could be deployed unilaterally but raise potentially global catastrophic risks. Given that, while research on geoengineering technologies may be suited for independent, decentralized governance, geoengineering risks might appropriately push U.S. environmental governance toward more centralized and overlapping controls on research and deployment to minimize cross-jurisdictional spillovers and access the redundancy benefits of overlapping authority. Interna-

62. *See, e.g.*, Alejandro E. Camacho & Nicholas J. Marantz, *Beyond Preemption, Toward Metropolitan Governance*, 39 Stan. Env't L.J. 125, 131 (2020) (describing provincial and local control over land use in the United States).
63. Alejandro E. Camacho, *In the Anthropocene: Adaptive Law, Ecological Health, and Biotechnologies*, 15 Law, Innovation & Tech. 280 (2023).
64. *See, e.g.*, Robert L. Glicksman, *From Cooperative to Inoperative Federalism: The Perverse Mutation of Environmental Law and Policy*, 41 Wake Forest L. Rev. 719, 747 (2006).
65. Camacho & Glicksman, *supra* note 59.
66. *Id.* at 81-87.
67. *Id.*
68. *Id.*
69. *Id.* at 197-205.

tional coordination may even be necessary to minimize unilateral deployment.[70]

Given the attacks on legal institutions that have become increasingly pronounced, in addition to investing in ideal legal innovations, it seems increasingly prudent to invest in backup plans. Redundancy is the key to reducing disruptions when institutions are under siege.

V. Building Coalitions, Policy Experimentation, and Legal Imagination

Finally, the history of U.S. environmental law offers some lessons for how, and in what form, legal innovations in substantive, procedural, and structural governance may arise. Prior to the eras of major environmental protection, in most part, the United States lacked the interest, will, or capacity to engage in the transformative change necessary to mend its environmental wounds. Yet, various factors served to catalyze a legal transformation. From President Theodore Roosevelt[71] to Richard Nixon,[72] personal leadership, charisma, and resolute political expediency all played a role in instigating change. Change frequently began from people outside of the government. It also came from disciplines other than law: Upton Sinclair's *The Jungle*[73]; Rachel Carson's *Silent Spring*[74]; and public health officers tracing urban ills to deficient waste disposal and treatment. Effective narrative and dissemination of ideas and insights mobilized hearts and minds.

Despite the factors at play creating change, the history of U.S. environmental law suggests three stimulants of legal change particularly worthwhile for closer exploration: building coalitions, legal imagination, and policy experimentation.

A. A Convergence (and Divergence) of Interests

From the American Revolution to the modern day, the coalitions that succeeded at cultivating meaningful environmental law making were diverse, overlapping, and decentralized. The movements often blended the insights of intellectuals and scientists with policymakers, environmental advocacy groups, student organizations, labor unions, and business interests. The Environmental Era combined forces of organizers of a civil rights advocacy network with a growing environmental advocacy network to demand change.[75] These different types of interests were themselves quite diverse, ranging from the local grassroots to the multinational, and they frequently took aim at various governmental scales and relied upon a range of efforts to bring about legal change.

Importantly, at least some key constituencies from industry and commerce were often vital to accepting, if not promoting, conservation of human health and environmental resources and reduction of environmental harms. Undoubtedly, as environmental harms escalated and public awareness swelled, some business interests led antiregulatory forces that opposed legal change, ranging from Progressive Era trusts[76] to today's fossil-fuel industries.[77] Often, business interests found support in resisting change from ideological or grassroots resistance, whether Progressive Era proponents of laissez-faire economics[78]; 1960s neoliberal economics[79]; or the Contested Era's wise-use movement, antigovernment activists like the "Sagebrush Rebels" and Cliven Bundy,[80] and evangelical anti-environmentalism.[81] Additionally, antienvironmental regulation efforts frequently rejected established scientific evidence and even engaged in disinformation campaigns.[82]

Nonetheless, where business interests converged,[83] this often played a notable role in the development of environmental law. The significant political, ideological, and economic barriers to transformative legal change in U.S. environmental history were, when successful, ultimately surmounted not only by savvy news outlets, charismatic political leaders, intellectuals, and grassroots movements, but at times in tandem with business leaders and interests. Indeed, businesses—whether motivated by relative market advantages, economic certainty, entrepreneurism, or social consciousness—were consistently a key component in every era in which incremental or transformational environmental legal change occurred. For example, the Progressive Era relied on organized hunting affinity groups to advocate for conservation; Yellowstone National Park's creation leaned heavily on railroad interests. Similarly, during the Contested Era, regulation of products causing the ozone hole became politically possible with the help

70. *Id.* at 217-26.
71. *See* Lessons for a Warming Planet, chap. 2.
72. *See id.* at chap. 4.
73. *See id.* at chap. 2.
74. *See id.* at chap. 4.
75. *See id.*
76. *See id.* at chap. 2.
77. *See id.* at chap. 5.
78. *See, e.g.*, Thomas O. McGarity, Freedom to Harm: The Lasting Legacy of the Laissez Faire Revival (2013).
79. *See, e.g.*, Henry A. Giroux, *The Terror of Neoliberalism: Rethinking the Significance of Cultural Politics*, 32 Coll. Lit. 1, 2 (2005).
80. *See* Lessons for a Warming Planet, chap. 4.
81. *See, e.g.*, Harvey M. Jacobs, *The Anti-Environmental "Wise Use" Movement in America*, 47 Land Use L. & Zoning Dig. 3, 3-5 (1995) (discussing the wise-use movement); Maxwell T. Boykoff, *Consensus and Contrarianism on Climate Change*, 6 Mètode Sci. Stud. J. 89, 92-93 (2015); Spencer Sunshine & Chip Berlet, *Rural Rage: Right Wing Populism and Patriot Movement in the United States*, *in* Authoritarian Populism and the Rural World 120, 128-34, 138-39 (Ian Scoones et al. eds., 2021).
82. *See, e.g.*, Naomi Oreskes & Erik M. Conway, Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues From Tobacco Smoke to Global Warming (2010); Charles N. Herrick & Dale Jamieson, *Junk Science and Environmental Policy: Obscuring Public Debate With Misleading Discourse*, 21 Phil. & Pub. Pol'y Q. 11 (2001); Jeremy Levy et al., *Science and the Politics of Misinformation*, *in* The Routledge Companion to Media Disinformation and Populism 231, 231-93 (Howard Tumber & Silvio Waisbord eds., 2021).
83. *See generally* Derrick A. Bell Jr., Brown v. Board of Education *and the Interest Convergence Dilemma*, 93 Harv. L. Rev. 518 (1980) (defining "interest convergence" as the principle that social change occurs for disenfranchised groups or perspectives when their interests align with those of more powerful majorities).

of those businesses that profited from these products but could shift to alternatives.[84]

Throughout U.S. history, another consistent thread of environmental social movements has been the tension between two strands of reformers over either the ambition and rigor of conservation goals or the best approach to legal change. From the Transcendentalists to the Sunrise Movement, idealists have sought to fundamentally transform, and even revolutionize, the political, economic, and legal system to advance conservation and public health. On the other side of the tension, pragmatists from Pinchot to President Joseph Biden and the Abundance Movement pushed for environmental protection or conservation as important goals, but either identify other social objectives as similarly important or are willing to compromise the ideal for action regarded as more realistic.

In truth both sides of the tension seem necessary for progress, even as we readily admit that this dichotomy can be a false one, as many individuals likely have both pragmatist and purist impulses, uncertain about whether to shoot for the stars or keep both feet firmly planted on the ground. Many are willing to settle, even if they root for idealism to win the day. Still, it is also important to note key insights from the social science on social movements. When courts are unable to achieve systemic change, more strident social movements can complement litigation to move the needle,[85] even if some might find such radical efforts objectionable. Additionally, more rebellious organizations like Greenpeace and Earth First! have generated attention, time, and space for more mainstream legal actions and advocates to deliver meaningful change.[86]

In thinking about possible pathways to address existing and emerging environmental problems, it is also productive to consider how interests might align across different policy forums. While it is debatable whether, for example, proposals that might appeal to labor interests (like the Green New Deal[87]) and even combine business innovators (like the Inflation Reduction Act[88]) will carry the day, it seems certain that a coalition with labor and/or green entrepreneurs is more likely to be effective than a coalition without either. In determining what is possible, the answer is likely to change depending on the coalitions built. History shows that designing policies that seek to harmonize interests is undoubtedly an important aspect of coalition-building.

Relatedly, advocates for environmental conservation historically have pointed to the co-benefits of addressing a particular environmental problem. This is a form of coalition-building. In some circumstances, climate advocates might want to consider whether policies that do not scream climate action (such as addressing local air pollution or transit mobility) might be more politically viable pathways to address climate change. While existing evidence suggests transformational change is likely necessary to address climate change, AI, and other emerging technologies,[89] it might be that in some fora more might be accomplished to promote environmental protection in the interim if cultural flashpoints like climate change are deliberately not front and center.[90]

Finally, history suggests that often, those pressing for changes might make inroads in some venues more quickly than others. For instance, even as the politics around climate action is fraught at the national level, within many states and cities the politics are less fractious. Even if it might seem logical that a larger scale for mobilization is more appropriate for large-scale issues like climate change, in some instances, the politics of securing change might point to deploying strategies to achieving wins in friendly small-scale venues.

The response to the federal rollbacks of 2025 and 2026 provides a real-time illustration of this principle. While federal climate authority was being dismantled at the administrative level—culminating in the rescission of the Endangerment Finding—a coalition of 24 states and numerous cities simultaneously challenged that rescission in court; at least 34 states introduced legislation in 2026 to reduce barriers to solar and battery deployment; and several states advanced "climate superfund" legislation to hold major fossil fuel companies accountable for climate-related damages.[91] These are not merely defensive holding actions; they are the undercurrents of today—generated in part by the excesses of a deregulatory federal government—that may become the dominant wave of the next era. History counsels neither complacency nor despair on this point: it took decades for state air quality experimentation to catalyze the Clean Air Act, and for state park designations to produce Yellowstone. The preparatory work for the next avulsion is likely already underway.

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84. *See* Lessons for a Warming Planet, chap. 2.
85. *See* Marianne Engelman Lado & Kenneth Rumelt, *Pipeline Struggles: Case Studies in Ground Up Lawyering*, 45 Harv. Env't L. Rev. 377 (2021) ("One of the most important lessons from each case study is that the courts alone are likely unable to drive systemic change. In the DAPL case, success has largely come from the community-driven social movement, which compelled the Obama Administration to reevaluate the Army Corps's actions under NEPA.").
86. *See e.g.*, Ben Kenward & Cameron Brick, *Large-Scale Disruptive Activism Strengthened Environmental Attitudes in the United Kingdom*, 2 Global Env't Psych. e11079, 25 (2024); Rik Scarce, Eco-Warriors: Understanding the Radical Environmental Movement 6 (Routledge updated ed. 2016):
> The tree sitters' presence, like that of the wolf activists, sometimes delays cutting until a judge can hear a request for an injunction. In other instances, the radicals offer extreme proposals for wilderness areas and the like that make those of mainstream environmental groups, such as the Sierra Club, Wilderness Society, and the National Wildlife Federation, look more reasonable.
87. Recognizing the Duty of the Federal Government to Create a Green New Deal, H.R. Res. 109, 116th Cong. (2019).
88. *See* Lessons for a Warming Planet, chap. 5.
89. *See* Gilad Abiri, *Public Constitutional AI*, 59 Ga. L. Rev. 601, 669 (2025); Camacho, *supra* note 63, at 305; Camacho, *supra* note 50, at 16.
90. *See* Debra J. Davidson et al., *Just Don't Call It Climate Change: Climate-Skeptic Farmer Adoption of Climate-Mitigative Practices*, 14 Env't Rsch. Letters 034015, 2 (2019).
91. Center for Am. Progress, State Climate Action in 2026: How States Are Delivering Real Benefits Through Climate and Clean Energy Policy (Apr. 24, 2026), https://www.americanprogress.org/article/state-climate-action-in-2026-how-states-are-delivering-real-benefits-through-climate-and-clean-energy-policy/; Nat'l Caucus of Env't Legislators, 2026 Session Kickoff: Emerging Environmental Policy Trends From the States (Mar. 13, 2026), https://www.ncelenviro.org/articles/2026-session-kickoff/.

B. Legal Imagination

History suggests that the initial capacity to cultivate legal imagination has played another key factor in the successful development of environmental laws. *Legal imagination* refers to "the collective mental constructs that are deployed by lawyers and legal scholars in thinking about law and how it operates."[92] At certain points in the history of U.S. environmental law, scholars and policymakers imagined new substantive goals, legal processes, and legal structures and institutions to address novel or previously unaddressed harms. As stated by Elizabeth Fisher, "[L]egal imagination is a feature of all law. But, . . . the complexity of environmental problems and the institutions needed to govern them, means that legal imagination is a particularly necessary feature of environmental law."[93]

While there undoubtedly were instances in which the deployment of imaginative legal or policy strategies occurred swiftly, the prep work for legal imagination often happened much earlier than their eventual instantiation in policy. Pinchot studied forestry in Europe many years before implementing scientific forestry management in the United States.[94] Muir developed a conservation agenda well before his ideas were implemented[95]; the Wilderness Act, the closest manifestation of Muir's ideas about natural preservation, was adopted 50 years after his death.[96]

Undoubtedly, today advocates for change have offered diverse legal theories for how to best refashion legal goals, processes, or institutions in the United States to better address and repair environmental harm, particularly in light of global climate change and emerging technologies. The most prominent recent social movement discourses in the United States that have made legal inroads include (1) the Green New Deal,[97] which promotes clean energy transition and social justice policies to address climate change and income inequality; (2) environmental rights amendments, which seek to instantiate or reaffirm human rights to a healthy environment in state constitutions[98]; and (3) "rights of nature" jurisprudential theories, which advocate for recognition of legal rights for nonhuman species and ecosystems.[99] Relatedly, a long-overlooked jurisprudential strand in conventional U.S. environmental law that more recently has seen traction among tribal scholars[100] and social movement leaders[101] are Indigenous epistemologies asserting that U.S. law's focus on anthropocentric value is at fundamental odds with Indigenous understandings of the relationship between humans and the nonhuman environment.

These and other perspectives seek to expand what is possible in environmental law. It would be folly, however, to offer concrete legal solutions with the expectation that they would effectively and definitively manage the environmental problems of today and tomorrow. A review of the past also highlights a large degree of unpredictability. Given the inherent difficulty of the task, what seems to offer the most promising avenues for legal innovations? Perhaps, default rules that take into consideration interests of future generations might prove vital.[102] Or public governance processes might rely more heavily on cautious risk assessments of the trade offs of strategies—perhaps combined with rebuttable presumptions of the acceptability of preexisting baseline conditions—rather than reflexive protection of natural and historical phenomena (or prohibition on intentional and novel interventions).[103]

Despite uncertainties, the history of U.S. environmental law makes clear that it is critical to invest in the development of information and creativity both within legal frameworks and beyond. In the past, legal imagination has looked for inspiration from imagination and the development of knowledge in other fields. Developments in economics, politics, philosophy, psychology, chemistry, biology, medicine, sociology, and engineering explored environmental and human health and the causal relationships between humans and the environment. Insights in these fields not only spurred legal change, but also increased legal creativity.

Public health innovations in the Allocation Era followed public health science, particularly after military encampments implemented standards and saw dramatic gains.[104] The Wilderness Act was championed by prominent writings and writers. And *Silent Spring* and a NASA photograph of the earth focused the Environmental Era.[105] Foraging in the realm of ideas requires an initial planting of seeds, however eccentric or outlandish they may initially seem. Without intellectual and creative investments, there is not a potential of dividends.

Accordingly, to increase the adaptive capacity of the law to address new harms in an increasingly complex natural and legal environment, there is a need to invest in scien-

92. Elizabeth Fisher, *EU Environmental Law and Legal Imagination*, *in* The Evolution of EU Law 847 (Paul Craig & Gráinne de Búrca eds., 3d ed. 2021).
93. *Id.* at 853.
94. *See* Lessons for a Warming Planet, chap. 2.
95. *See id.*
96. *See id.* at chap. 4.
97. H. Res. 109, 116th Cong. (2019).
98. *See, e.g.*, N.Y. Const., Art. I, §19 (2022); Mont. Const., Art. IX, §1 (2025). *See also* Held v. Montana, 2024 MT 353 (2024) (holding state-law limitations on considering greenhouse gas emissions when assessing oil and gas permit applications violated the state constitution's right to "a clean and healthful environment in Montana for present and future generations").
99. *See, e.g.*, International Rights of Nature Tribunal, Universal Declaration of the Rights of Mother Earth (Apr. 22, 2010), https://www.rightsofnaturetribunal.org/wp-content/uploads/2018/04/ENG-Universal-Declaration-of-the-Rights-of-Mother-Earth.pdf. *See also* Christopher D. Stone, *Should Trees Have Standing?—Towards Legal Rights for Natural Objects*, 45 S. Cal. L. Rev. 450 (1972).
100. *See, e.g.*, John Borrows, *Indigenous Law and Climate Change*, *in* Law in a Changing World 36 (Jutta Brunnée et al. eds., 2025); Elizabeth Kronk Warner & Jensen Lillquist, *Laboratories of the Future: Tribes and Rights of Nature*, 111 Cal. L. Rev. 325, 328 (2023).
101. *See* The Red Nation, The Red Deal: Indigenous Action to Save Our Earth (2021); Nick Estes, Our History Is the Future: Standing Rock Versus the Dakota Access Pipeline and the Long Tradition of Indigenous Resistance (2019).
102. Richard J. Lazarus, *Super Wicked Problems and Climate Change: Restraining the Present to Liberate the Future*, 94 Cornell L. Rev. 1153, 1158 (2009).
103. Camacho, *supra* note 32, 897-902.
104. *See* Lessons for a Warming Planet, chap. 1.
105. *See id.* at chap. 4.

tific, technological, and legal imagination. Legislative investment in the monitoring or scientific study of environmental harms, whether through statutes directed specifically at researching pollution or health harms or more generally in creating and funding entities like the National Science Foundation and the National Institutes of Health, have played an incalculable role in helping develop environmental law. The targeting of EPA's Office of Research and Development, the National Oceanic and Atmospheric Administration's (NOAA's) core research capacity, and the National Science Foundation by the second Trump Administration compromises the nation's information infrastructure that history identifies as essential to legal imagination.[106] While the severity of the problems and the context of the time might point to focusing on short-term strategies, to surmount what are long-term environmental challenges necessitates tracing long-term alternatives that might eventually serve as the pathway forward.

C. *Regulatory Experimentation*

Beyond the initial planting, ideas need to germinate, sprout, and pollinate. The history of environmental law has illustrated the incredible value of legal experimentation in promoting the study and proliferation of legal innovation. For example, state and local policy often proved important precedent for federal action, with the influence of California's regulation of air pollution on development of the Clean Air Act serving as a key example.[107] Similarly, even as the federal government has experienced the seesaw of environmental policy during the Contested Era, many states and local governments have boldly invested in and made progress toward addressing greenhouse gas emissions.[108] The idea of National Parks, founded on promoting historical preservation as a method of conservation, spurred such nature reserves around the world.[109] NEPA's innovation requiring federal agency planning and analysis for any major federal action significantly affecting the environment not only helped legitimize administrative processes and advance the consideration of environmental harms in decisionmaking; it also led to the proliferation of environmental impact assessment in half the states and over 100 nations worldwide.[110]

Change can happen through the iterative interplay between multiple levels of governance. For this to happen, a social and legal system must be in place that not only allows policy experimentation, but cultivates it. Historically, this has occurred in the United States through its federalist governance system, with change at one level having the potential to alter the state of play at other levels—such as state common-law liability softening up federal regulatory reform, or federal unwillingness to legislate amping up pressure to act at state or local levels.

Despite the examples of experimentation, the United States' current procedural and structural governance remain far from models of regulatory experimentation. There are more systematic and rigorous ways to percolate effective governance than just relying on ideas arising from fragmented, haphazard, and serendipitous regulatory innovations. To maximize the capacity to cultivate legal experimentation, policymakers may need to treat United States governance as a way to coordinate intergovernmental learning to increase information and manage uncertainty about policy experiments—that is, to incorporate *empiricism* (i.e., systematic monitoring, evaluation, of regulatory strategies, processes, and programs) and *experimentalism* (i.e., provisional adoption and periodic adjustment of regulatory strategies, processes, and programs to account for disseminated evidence) into governance itself.[111] Cultivating such a system would help manage the unprecedented challenge of leveraging democratic, market, and regulatory institutions to manage latent, dispersed, unpredictable, and unquantifiable problems—traits that typify the most pressing environmental problems we face today.

VI. Conclusion

As for every prior generation, the choices of current generations will define the kind of world inherited by those who come next. History highlights the importance of legal and policy choices in not only defining people's relationship with the environment, but also in reorienting it when needed. In the face of unprecedented environmental challenges, the law has and will continue to be a primary conduit for change. Given the stakes of the environmental challenges we now face, the directions law pushes us will prove consequential to the planet and to future generations. Our legal system will either promote exploitation, consumption, and pollution; or it will reduce harm, advance conservation, and cultivate effective and fair democratic governance. More than likely, it will do both, but to what extent in either direction is entirely up for grabs.

Whether the public and their policymakers are willing to fundamentally shift governance to address the latest intimidating set of environmental harms remains to be seen. Two ideas made famous by Dr. Martin Luther King Jr. warrant our attention—that "the line of progress

106. Dan Garisto, *How Trump Is Following Project 2025's Radical Roadmap to Defund Science*, Nature (Mar. 27, 2025), https://doi.org/10.1038/d41586-025-00780-2; Chris Sellers et al., *An Embattled Landscape: The Declining Capacity of Federal Environmental Science*, Env't Data & Governance Initiative (Nov. 4, 2025), https://envirodatagov.org/embattled-landscape-series-part-2b-the-declining-capacity-of-federal-environmental-science/.

107. *See* Richard L. Revesz, *Federalism and Environmental Regulation: A Public Choice Analysis*, 115 Harv. L. Rev. 553, 585-88 (2001).

108. Bruce R. Huber, *How Did RGGI Do It? Political Economy and Emissions Auctions*, 40 Ecology L.Q. 59 (2013); Sharmila L. Murthy, *States and Cities as "Norm Sustainers": A Role for Subnational Actors in the Paris Agreement on Climate Change*, 37 Va. Env't L.J. 1 (2019).

109. Roderick Nash, *The American Invention of National Parks*, 22 Am. Q. 726 (1970). For a comparative discussion about parks around the planet, see National Parks Beyond the Nation: Global Perspectives on "America's Best Idea" (Adrian Howkins et al. eds., 2016).

110. Tseming Yang, *NEPA's Conquest of the World*, 37 Nat. Res. & Env't 1 (2023).

111. Camacho & Glicksman, *supra* note 59, at 234-39.

is never straight"[112] and that "the arc of the moral universe is long but it bends toward justice."[113] While there undoubtedly have been rollbacks and complexities, the history of U.S. law and the environment suggests that the arc of law is largely bent toward environmental protection. Whether through a flood of executive actions, judicial relief, or statutes, each period of environmental degradation has been followed by a period of substantial legal restoration and even progression.

Scholars, students, and policymakers must prepare for the moment in which transformational environmental protection is possible. If serious consideration of a legal paradigm shift is in the offing, whether such a transformation occurs will at least partially depend on the available portfolio of potential and practicable legal solutions. Like the drafters of the Wilderness Act, advocates not only need to be ready when the moment arrives, but also work tirelessly to create it.[114]

This history warrants three important qualifications. First, past oscillations and course corrections unfolded over decades or generations, but climate change operates on a timeline that may not accommodate such patience. The historical framework is therefore a spur to urgency, not a counsel of patience: if the undercurrents of today are to crest before critical thresholds are crossed, the preparatory work described in Parts IV and V must happen now.

Second, the history of environmental law offers grounds for cautious hope on reversible harms—air quality, water pollution, toxic waste—but is less reassuring about irreversible ones. Law may eventually correct policy failures that produce climate change, species extinction, and even ecosystem collapse, but it may not be able to undo the harms themselves. The arc of law may bend toward environmental protection, but that arc must arrive before irreversible damage is done. This Comment's call for transformational change thus is not merely aspirational, but temporally urgent.

Third, the framework developed here is primarily a history and prescription for domestic U.S. law. Climate change, however, raises a global coordination problem for which domestic legal history provides only partial guidance. No domestic legal oscillation can substitute for the kind of binding international cooperation that climate physics requires. The legal imagination this essay calls for must therefore attend to development of international legal frameworks that can achieve meaningful emissions reductions even without—and eventually with—U.S. federal participation.

In building this portfolio of change, it is important to keep in mind the lessons of the past. Foraging for explanations and solutions in areas of law not conventionally associated with the environment will likely prove crucial, as will insights from complementary environmental fields. A review of the range of potential strategies, goals, processes, and institutions previously adopted will help cultivate an understanding of what has worked before, what has not, and perhaps what else might be possible. The portfolio should also invest in exploring how the values typically used to protect the environment (such as public health) or emerging values (equity or rights of nature) could be leveraged for change.

For some, building the portfolio will mean pragmatic plotting for incremental change; for others, ardent optimistic ambition seeking to rearrange legal relationships in ways never previously tried; for many it will be both. Building a robust portfolio of change will entail identifying places where interests converge, investing in legal imagination, and participating and learning from legal experimentation. For those working and hoping to create a better world, such investments are vital.

Given the stakes, such investments are hardly optional. For the sake of the planet and all those who currently or will call this home, we have to rise to the occasion. While the hurdles to change may feel insurmountable, the same was true in the past. Perhaps the most important lesson to take from history is that there is reason to work together, to imagine, to experiment, and to pursue many pathways forward. While this idea provides hope, to overcome the challenges ahead of us, hope is not enough. What our era requires is our commitment and work.

112. Dr. Martin Luther King Jr., Where Do We Go From Here: Chaos or Community? 12 (1967).
113. Dr. Martin Luther King Jr., Remaining Awake Through a Great Revolution, Speech at the National Cathedral (Mar. 31, 1968).
114. *See* Lessons for a Warming Planet, chap. 4.