ARTICLE

ENVIRONMENTAL LAW IN THE TWENTY-FIRST CENTURY

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I. INTRODUCTION

It is a particular pleasure for me to participate in the Virginia Journal of Environmental Law's Twenty-Fifth Anniversary Symposium because I began my career practicing environmental law twenty-five years ago, the same year that the Journal was founded. I began my career as a young attorney with the Environmental Defense Fund, while the Journal began as the Virginia Journal of Natural Resources Law. At the time, a new administration had just arrived in Washington bringing with it a distinctly different vision of environmental policy than its predecessors.

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The three previous administrations, from both political parties, had presided over a remarkable, bipartisan burst of legislative activity that created the regulatory infrastructure that protects the environment today. Yet the new president, who had been famously quoted as saying that trees cause more pollution than automobiles do,\(^1\) seemed determined to roll back environmental regulation. Despite the new president's personal popularity, he had little public support for this crusade, so his administration tried to implement it outside of public view. Rather than proposing legislation to relax the environmental laws, the administration quietly used the Office of Management and Budget (OMB) in an aggressive campaign to block the issuance of environmental regulations.\(^2\) The very best early scholarship exposing this campaign was written by a University of Virginia law student in this journal.

Erik Olson, now a senior attorney with the Natural Resources Defense Council, wrote *The Quiet Shift of Power: Office of Management and Budget Supervision of Environmental Protection Agency Rulemaking Under Executive Order 12,291.*\(^3\) This article did such a thorough job of documenting abuses of regulatory review by OMB that it inspired me to consult the author when I prepared the first successful lawsuit challenging the program.\(^4\)

The field of environmental law changed substantially in subsequent decades, though it is striking how durable its foundations have proven to be. Ironically, the Reagan administration's misguided assault on environmental regulation provoked a backlash in Congress that resulted in considerable strengthening of the environmental laws during the decade of the 1980s. The fact that the field changed in many unanticipated ways should counsel caution by anyone foolish enough to venture predictions for its next twenty-five years. Thus, what I propose to do in this essay is to paint with broad brush strokes a picture of where the field has been and where I see it heading.

Twenty-five years ago environmental law was viewed as a new and exciting field that was rapidly growing. With overwhelming

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\(^2\) Every president beginning with Richard Nixon had some form of regulatory review program, but the Reagan administration's program was unprecedented in the degree of power it centralized in OMB and its aggressive efforts to block environmental regulations. Robert V. Percival, *Checks Without Balance: Executive Oversight of the Environmental Protection Agency,* 54 LAW & CONTEMP. PROBS. 127, 149 (1991).

\(^3\) 4 VA. J. NAT. RESOURCES L. 1 (1984).

bipartisan majorities, each Congress would try to outdo its predecessor in strengthening federal regulatory programs to protect the environment that had been launched at the dawn of the decade. Continued environmental progress seemed inexorable and the United States was the leader in what was rapidly becoming a global crusade.

Today things look very different. The current administration has been hostile to many environmental concerns and some voices in the environmental community itself now argue that "environmentalism is dead" or that it no longer is capable of capturing the imagination of the public. They maintain that the movement that spawned our vast body of environmental laws has lost its vision and that it should be subsumed within a larger social agenda of a single political party. Until he was forced to resign, the most powerful man in Congress was a former exterminator who launched his political career because he was outraged that the Environmental Protection Agency (EPA) had the authority to ban some of his favorite pesticides. Rather than strengthening our environmental laws during the past decade, Congress has been gridlocked by fierce partisan splits over environmental policy. It has been more than a decade since a significant federal environmental statute was updated or reauthorized. Because the original tax funding the Superfund program has long since expired, the ambitious program to clean up the toxic legacy of our past mistakes limps along, starved of funds. Only the threat of a filibuster has prevented opening up the Arctic National Wildlife Refuge to oil drilling or the confirmation of some radically anti-environmental judges. Instead of being the global leader on most important environmental issues, the United States has now become a global outcast on some issues.

Despite all these unfortunate developments, there are many reasons for remaining optimistic about the future of environmental law. As bad as things may seem in Washington today, it is becoming apparent that there are larger forces at work that ultimately

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will overcome our current domestic gridlock. When one takes a long view of the history of environmental law—and a remarkable history it is—it is apparent that the field has established certain foundational principles that cannot be cast asunder by any administration, no matter how much antipathy they harbor toward environmental protection measures. Moreover, anyone who ventures outside of the United States today will quickly discover that the importance of environmental law is well understood by the rest of the world. The forces of globalization are transforming the world's economy today. These same forces ultimately will compel the United States to resume a leadership role in the field of environmental law simply by making the costs of not doing so unacceptably high.

II. ENVIRONMENTAL LAW IN HISTORICAL PERSPECTIVE: PRINCIPLES AND POLICY LESSONS

A. The Common Law Roots of Environmental Law

Environmental law has a much longer and richer history than most people realize. Conventional accounts of the history of environmental law generally trace its emergence from the tremendous growth of regulatory legislation to protect the environment adopted by Congress in the early 1970s. This usually is viewed as rooted in the enormous public concern for the environment triggered in part by the publication of Rachel Carson's Silent Spring in 1962. Carson, who had been a professor of zoology at the University of Maryland, warned that a buildup of toxic residue from the use of persistent and bioaccumulative pesticides would cause long-term environmental damage. Carson's warning struck a chord with an increasingly environmentally conscious public that eventually overwhelmed a vicious campaign by the chemical industries to discredit her. The growth of public concern for the environment culminated in the celebration of the first Earth Day in 1970.

But the roots of environmental law run much deeper than this conventional account emphasizes. My own research, which has focused on the history of the federal common law of nuisance, has examined the fierce environmental disputes over transboundary pollution that were waged before the United States Supreme Court

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during the first four decades of the twentieth century. The Court, exercising its original jurisdiction to hear disputes between states, actually issued injunctions to restrict air pollution from copper smelters, to require New York City to stop ocean dumping of its garbage, and to require the City of Chicago to treat its sewage to reduce the amount of water it needed from Lake Michigan to flush the effluent away.

The Court decided these cases by applying principles of the common law of nuisance, which by then had been under development for more than 300 years. These principles held that even non-trespassory interferences with one’s quiet use and enjoyment of land could be actionable as nuisances and that no one had the right to use his or her own property in a manner that caused significant, foreseeable harm to others. Common law courts understandably vacillated at times over how significant or how foreseeable environmental harm had to be before it was actionable, and over what the appropriate remedy was to redress it. But the common law established firm foundational principles for what became known in the last three decades of the twentieth century as the field of environmental law.

Initially the common law performed a kind of zoning function by encouraging uncontrolled sources of pollution to locate in areas more remote from people and property. Eventually it provided incentives for the development of pollution control technology, including technology to remove pollutants from the air emissions of industrial plants and technology to treat sewage that formerly had been dumped in the nearest body of water downstream from its city of origin.

The common law was best suited for responding to environmental problems caused when large, single sources of uncontrolled pollution (such as copper smelters) caused visible damage to their

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14 Tenant v. Goldwin, 92 Eng. Rep. 222, 224 (1702) (articulating the principle that “every man must so use his own as not to damnify another,” which has come to be known as the sic utere tuo ut alienum nonlaedas).
surroundings. But its requirement that plaintiffs demonstrate individualized proof of causal injury was a significant obstacle to its ability to respond to the multiple-source, multiple-pollutant problems that we encounter far more typically today. Even the deadly toxic substance asbestos that killed hundreds of thousands of workers through diseases uniquely linked to it escaped the common law's notice for decades due to the long latency period between exposure and the onset of the ultimately fatal diseases it causes. Beginning in the mid-1920s, gasoline additives spewed lead into the environment for more than six decades, poisoning generations of Americans, despite an initial public outcry and a Surgeon General's conference convened when workers manufacturing the additives were killed by acute exposure to lead. The common law did not respond well to the hidden dangers posed by a chronic buildup of toxic substances in the environment. But after Rachel Carson's wake-up call in the early 1960s and the first Earth Day in 1970, Congress sought to overcome the deficiencies of the common law by creating comprehensive federal regulatory programs to protect the environment.

B. The Federal Regulatory Infrastructure

In a remarkable burst of legislative activity during the 1970s, Congress enacted legislation creating the federal regulatory infrastructure that protects the environment today. These new statutes helped spawn a revolution in administrative law by dramatically expanding the regulatory responsibilities of federal agencies. In an effort to ensure that the general public—the intended beneficiaries of this legislation—enjoyed its fruits, Congress provided for citizen suits not only to enforce the new laws against polluters, but also to force agencies to carry out their ambitious responsibilities under the acts. These proved critical to the implementation of the new regulatory statutes as time and time again regulations were issued as the product of citizen suits against the EPA and other agencies.

The new laws also sought to transform the culture of the federal bureaucracy from within by making environmental protection an

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18 See, e.g., 42 U.S.C. § 7604 (Clean Air Act citizen suit provision).
integral part of every agency's mission. The requirement that agencies prepare and consider detailed environmental impact statements before taking any major action that would significantly affect the environment has become a model for the world. Most countries now require some form of environmental assessment and some have made it the centerpiece of their system of environmental regulation by integrating permit requirements into forecasts of projected impacts.

During the 1980s, when Congress reauthorized and amended the first generation of the new federal regulatory programs, it regularly strengthened their requirements and the associated penalties for noncompliance. It also embraced new strategies for influencing corporate behavior by imposing strict joint and several liability for the costs of cleaning up releases of hazardous substances and by adopting right-to-know provisions that require companies to inform the public annually of the types and amounts of toxins they discharge into the environment.

The federal environmental laws represented a departure from common law norms by authorizing agencies to issue regulations to prevent harm without requiring detailed proof of causal injury. The regulatory infrastructure created by our environmental laws has been an enormous success. Today we enjoy an environment that is cleaner, safer, and healthier than it was before. Our investments in environmental protection measures have made the nation far better off than other countries where environmental concerns were neglected for far too long, until their devastating consequences became obvious to ordinary citizens.

C. Principles and Policy Lessons

Some have questioned whether environmental law should be considered a coherent discipline. To the untrained eye it can seem at times to be an eclectic mishmash of principles borrowed from other areas of law upon which a heavy layer of regulatory legislation has been laid. Its architecture has been described as like a

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“shack on Tobacco Road,” but inside that modest exterior are important principles. These include the ancient *sic utere* principle that no one has the right to cause significant harm to others, the polluter pays principle that seeks to require actors to bear the full social costs of their actions, the “look before you leap” principle embodied in the National Environmental Policy Act (NEPA) environmental impact assessment requirement, and the precautionary principle that endorses reasonable measures to prevent harm in the face of scientific uncertainty. Taken together, these and other principles of environmental law, as Dan Tarlock has observed, do not represent a system of “transformative nature-centered rules” likely to “tame the drive to exploit and modify all planetary life support systems.” But they do have enormous practical significance even if the discipline of “environment law will for the foreseeable future be a messy process of adapting the contingencies and limitations of science to ‘wicked’ problems informed by rebuttable principles.”

To be sure, these principles are not always respected when environmental policies are adopted or implemented in the United States. Despite powerful early endorsements of precautionary regulation by some U.S. courts, U.S. regulatory policy rarely is driven by the precautionary principle. This principle dictates that society should seek to prevent harm before it occurs by being willing to take precautions to control activities that generate environmental risks even in the face of scientific uncertainty. Given that regulatory policy always operates in the face of uncertainty, the principle seems eminently sensible and is afforded great respect, particularly in Europe. Yet some fear that the precautionary principle is dangerous because it inevitably will encourage overregulation, a fear that seems foolishly overblown to students of

24 Ronald Outen, *Environmental Pollution Laws and the Architecture of Tobacco Road*, in [NATIONAL RESEARCH COUNCIL, MULTIMEDIA APPROACHES TO POLLUTION CONTROL: SYMPOSIUM PROCEEDINGS 139 (1987)].


27 Id.

28 Ethyl Corp. v. EPA, 541 F.2d 1, 13 (D.C. Cir. 1976) (en banc); Reserve Mining Co. v. EPA, 514 F.2d 492, 520 (8th Cir. 1975) (en banc).
regulatory history.\textsuperscript{29} For even in a society that pays homage to the importance of preventing harm before it occurs, it is rare that U.S. environmental policy has been truly precautionary. Instead, regulatory policy has been largely reactive – seeking to control activities that cause harm to human health or the environment only after substantial harm has become manifest.\textsuperscript{30}

It also is possible to discern some important policy lessons from the history of environmental regulation. We now know that it is far easier and less expensive to prevent environmental harm than to attempt to remediate it once it has occurred. We know the importance of public participation to the implementation and enforcement of regulatory schemes. We also have learned that right-to-know provisions can create powerful incentives for companies voluntarily to reduce risks they generate.

We also have learned some important lessons from regulatory strategies that have not been so successful. Many environmental laws stringently regulated new sources of environmental risk while permitting existing sources to continue their pollution.\textsuperscript{31} This "grandfathering" strategy defused some industry opposition to the first generation of environmental laws, but only at the cost of greatly prolonging the operation of some of the oldest and most inefficient pollution sources. By contrast, the Oil Pollution Act's congressionally-mandated phase-in of double hull requirements for oil tankers has proven to be a great success that has been embraced internationally.\textsuperscript{32}

III. THE CONTINUED INFLUENCE OF COMMON LAW NOTIONS OF CAUSAL INJURY ON THE ADMINISTRATIVE STATE

While regulatory legislation was adopted largely in response to the inadequacies of the common law, the transition from the common law to the administrative state has been rocky at times. The common law of torts proved to be woefully inadequate to combat chronic, multi-source pollution problems and many traditional principles of property law seem antithetical to protecting ecosys-

\textsuperscript{29} See Percival, supra note 17.
\textsuperscript{30} Id. at 36-37. One the very few instances of regulations adopted in the absence of clear proof of substantial harm is the phase-out of chlorofluorocarbons to protect the ozone layer. Id. at 63-64.
\textsuperscript{31} See, e.g., Clean Air Act § 111, 42 U.S.C. § 7411 (2000) (specifying stringent standards of performance that apply only to new stationary sources).
tems. A common thread that seems to run through much of the criticism of contemporary environmental regulation is concern that it is unfair to make people take precautions without proof that their activities have caused significant harm to identifiable victims. Much of the recent ferment over environmental policy can be viewed as the product of clashes between two competing worldviews: a precautionary approach that seeks to prevent harm to health or the environment by regulating activities science believes contributes to such harm, and a reactive approach that seeks to forestall precautionary measures until detailed evidence proves that significant harm is occurring that cannot be attributed to other causes.

These two worldviews can be illustrated by examining their influence on contemporary controversies in environmental law. These controversies increasingly have played out in the courts as legislative gridlock has prevented Congress from adopting substantial amendments to the environmental laws. They include the reach of federal jurisdiction to protect the environment, regulatory takings issues, environmental standing, and the debate over what decision rules should govern regulatory policy. For each set of issues, the reactive approach insists on more demanding, and more individualized, factual showings of causal connections before federal regulations are upheld or enforced, while the precautionary approach is more tolerant of regulatory decisions founded on wholesale assessments of risk.

Controversy over federal authority to protect the environment has been inspired by the Supreme Court’s revival of constitutional limits on Congress’s power to regulate commerce. Various industry groups have pressed the courts to declare unconstitutional the Superfund legislation, the Endangered Species Act, the Clean Water Act, and the Safe Drinking Water Act. In each of these

35 United States v. Olin Corp., 107 F.3d 1506 (11th Cir. 1997).
38 Nebraska v. EPA, 331 F.3d 995 (D.C. Cir. 2003).
cases business interests argued that the laws unconstitutionally regulated purely intrastate activities that could not be shown to have a substantial effect on interstate commerce. In another case industry groups sought to have the Clean Air Act declared unconstitutional under the long-dormant non-delegation doctrine.\textsuperscript{39} As a fallback position, plaintiffs in these cases also argued that the courts, to avoid difficult constitutional issues, should interpret the jurisdictional reach of the environmental statutes more narrowly to limit the scope of federal regulation.

Aside from a few lower court judgments that were reversed on appeal,\textsuperscript{40} courts have rejected (or declined to reach) virtually every constitutional challenge to the federal environmental laws.\textsuperscript{41} In doing so, they have relied on generalized judgments made by Congress concerning the importance of national regulatory programs to prevent harm to the environment. This has confirmed the constitutional propriety of an administrative state in which Congress authorizes agencies to exercise substantial discretion in implementing sweeping regulatory schemes. By contrast, the reactive approach insists on more demanding, individualized showings of substantial effects on interstate commerce before federal environmental regulations constitutionally can be applied. This approach is illustrated by a dissenting judge who argued that the Endangered Species Act could not be constitutionally applied to protect the last remaining members of an endangered fly species that lives entirely in California.

Because of some undetermined and indeed undeterminable possibility that the fly might produce something at some


\textsuperscript{41} See Olin Corp., 107 F.3d 1506; Nat'l Ass'n of Home Builders, 130 F.3d 1041; SWANCC, 531 U.S. 159 (declining to reach the constitutional question, instead deciding the case on statutory interpretation grounds); Nebraska, 331 F.3d 995; Am. Trucking Ass'ns, 531 U.S. 457. The only exception appears to be New York v. United States, 505 U.S. 144 (1992), where the Supreme Court struck down, as a violation of states' Tenth Amendment rights, a provision in the Low-Level Radioactive Waste Policy Act that required states that failed to make arrangements for disposal of low-level radioactive waste generated within their borders to "take title" to it after a certain date. See also ACORN v. Edwards, 81 F.3d 1387 (5th Cir. 1996) (invalidating a provision in the Safe Drinking Water Act that gave states no choice in requiring them to set up programs to find and remove lead-contaminated water supplies in schools); Lujan v. Defenders of Wildlife, 504 U.S. 555 (1992) (holding that plaintiffs filing suit under the ESA citizen suit provision are still subject to Article III standing requirements, rejecting the lower court view that Congress granted standing despite plaintiffs' failure to meet Article III requirements).
undefined and undeterminable future time which might have some undefined and undeterminable medical value, which in turn might affect interstate commerce at the imagined future point, Congress can today regulate anything which might advance the pace at which the endangered species becomes extinct.\textsuperscript{42}

The dissenter's approach would leave federal constitutional power to protect endangered species at its weakest precisely when it is needed most -- the more imperiled a species is, the less likely that it could be demonstrated to have substantial effects on interstate commerce. Moreover, species could be harmed without federal recourse if the activities that caused the harm could not be shown to have a sufficiently significant impact on interstate commerce. The U.S. Supreme Court has, at least implicitly, rejected such an approach because it recently declared that even purely intrastate activity can constitutionally be regulated by Congress when necessary to preserve the integrity of a larger regulatory scheme.\textsuperscript{43}

The contrast between the precautionary and reactive approaches surfaces even more clearly in battles over the scope of federal statutory authority. While reluctant to set constitutional limits on federal regulatory authority to protect the environment, the U.S. Supreme Court has been more receptive to arguments for construing federal statutory authority more narrowly. In 2001 the Court held by a 5-4 vote that the Clean Water Act does not extend federal authority to wetlands whose only connection with interstate commerce is their potential to attract migratory birds.\textsuperscript{44} The majority was unimpressed by the federal government's claims that it was ecologically important to protect such wetlands and it justified its narrow construction of federal jurisdiction by stating that it was necessary to avoid difficult constitutional questions that would arise if Congress intruded on state and local authority to regulate land use.\textsuperscript{45}

\textsuperscript{42} Nat'l Ass'n of Home Builders v. Babbitt, 130 F.3d 1041, 1064 (D.C. Cir. 1997) (Sentelle, J., dissenting).

\textsuperscript{43} See Gonzalez v. Raich, 545 U.S. 1 (2005) (holding that Congress has the power to regulate cultivation of marijuana for legal, personal medical use because it had a rational basis for concluding that failure to do so could substantially undermine implementation of a comprehensive scheme of federal drug regulation).

\textsuperscript{44} Solid Waste Agency of N. Cook County v. U.S. Army Corps of Eng'rs, 531 U.S. 159 (2001).

\textsuperscript{45} \textit{Id.} at 174.
The Court’s most recent decision on this subject, handed down in June 2006, illustrates the stark divide between competing approaches to regulatory policy judgments. In *Rapanos v. United States* the Court split 4-1-4 in deciding whether federal Clean Water Act jurisdiction extends to wetlands adjacent to non-navigable tributaries of navigable waters. Four Justices agreed that the Clean Water Act provides such authority, deferring to the federal agency’s conclusion that “wetlands adjacent to tributaries of traditionally navigable waters preserve the quality of our Nation’s waters by, among other things, providing habitat for aquatic animals, keeping excessive sediment and toxic pollutants out of adjacent waters, and reducing downstream flooding by absorbing water at times of high flow.” Four other Justices sharply disagreed, arguing that this approach “would authorize the Corps to function as a de facto regulator of immense stretches of intrastate land—an authority the agency has shown its willingness to exercise with the scope of discretion that would befit a local zoning board.” The Justice in the middle—Justice Kennedy—understood the importance of broadly protecting wetlands, but concluded that the government must show that “the wetlands, either alone or in combination with similarly situated lands in the region, significantly affect the chemical, physical, and biological integrity of other covered waters more readily understood as ‘navigable.’” He noted that if the effects are only “speculative or insubstantial” the wetlands will not be subject to federal jurisdiction, but he concluded that a “reasonable inference of ecological interconnection” can be drawn for wetlands adjacent to navigable waters and that he would defer to “regulations defining for what wetlands adjacent to non-navigable tributaries of navigable waters such inferences reasonably can be made.”

The *Rapanos* decision starkly highlights the differences between a precautionary approach to regulatory policy and a reactive one. The four Justices who voted to uphold federal regulation in the case were willing to defer to the judgment of a federal agency that it is essential to regulate wetlands adjacent to tributaries of navigable waters in order to prevent degradation of water quality. The four Justices who voted against the government were skeptical that

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46 126 S.Ct. 2208 (U.S. 2006).
47 Id. at 2252 (Stevens, J., dissenting).
48 Id. at 2224 (Scalia, J., plurality opinion).
49 Id. at 2248 (Kennedy, J., concurring in the judgment).
50 Id. at 2248 (Kennedy, J., concurring in the judgment).
such regulation would prevent ecological harm, but also fearful that this approach would allow federal agencies to regulate virtually anything. The influence of common law notions of causation is apparent in Justice Kennedy’s concurrence in the judgment. While acknowledging the importance of a precautionary approach, Justice Kennedy insisted on some factual demonstration that regulated activities were connected to substantial environmental harm.

The differences between the precautionary and reactive approaches to regulation also were highlighted in a controversy over the Endangered Species Act. In Babbitt v. Sweet Home Chapter of Communities for a Great Oregon, a lower court reinterpreted the Endangered Species Act’s prohibition on harming endangered species to prohibit only the direct physical application of force to them. The Supreme Court reversed, upholding regulations that also barred the destruction of the species' critical habitat if it caused harm to their members. Justice Kennedy, who joined the majority, noted at oral argument that actions that foreseeably kill a person would give rise to common law criminal liability even if the harm was caused by means other than direct physical application of force. Justice O'Connor, also in the majority, thought it important to temper the Court's endorsement of precautionary regulation by authoring a concurring opinion expressing concern about the potential unfairness of holding a person strictly liable for harm caused directly or indirectly to a species. Thus, she emphasized her view that the statute did not alter normal principles of proximate cause that require the harm to an endangered species to be foreseeable before liability could be imposed.

Decisions involving regulatory takings claims have illustrated the continuing influence of common law notions of property law. In Lucas v. South Carolina Coastal Commission, the Supreme Court insisted that legislative findings that regulation is necessary to prevent environmental harm are insufficient in themselves to preclude takings liability. Instead the Court held that only regulations forbidding activities that were common law nuisances at the time the Constitution was adopted could qualify for the nuisance exception to takings liability. In a significant concurring opinion, Justice Kennedy expressed his discomfort with this approach by opining that “[t]he common law of nuisance is too narrow a confine for the exercise of regulatory power in a complex and interdependent soci-

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51 515 U.S. 687 (1997)
52 Id. at 708-09.
He concluded that "nuisance prevention" is not the "sole source of state authority to impose severe restrictions" given the state's interest in "enacting new regulatory initiatives in response to changing conditions . . ." In takings cases involving regulatory exactions, the Supreme Court has held that it is not enough for local officials to demonstrate a nexus between the environmental effects of a proposed development and the exaction sought as a condition of permit approval. Instead, local officials must quantify the effects to prove that requested exactions are "roughly proportional" to the environmental harm the development would produce.

Judges unsympathetic to citizen suits to enforce environmental regulations have sought to import common law requirements for proving causal injury into such suits through restrictive interpretations of standing doctrine. In a series of decisions in the 1990s, the Supreme Court restricted the standing of environmental plaintiffs by demanding they demonstrate that they recreated on specific parcels of public lands subject to development or that they were more directly harmed by agency regulatory changes. These decisions reflected the influence of traditional common law notions of standing, which initially would have barred the beneficiaries of regulation from having standing while providing regulated entities access to the courts. The Supreme Court halted this trend in *Friends of the Earth, Inc., v. Laidlaw Environmental Services, Inc.*, where it declared that insisting on plaintiffs demonstrating "injury to the environment" would "raise the standing hurdle higher than the necessary showing for success on the merits in an action alleging noncompliance with [a Clean Water Act] permit." The Court rejected this approach and endorsed standing for plaintiffs with reasonable concerns about the effect of environmental violations on the environment in areas where they live or recreate.

Perhaps the sharpest delineation of the difference between the precautionary and reactive world views surfaces in debates over how precautionary regulatory policy should be. While there is

54 Id. at 1035.
55 Id.
60 Id. at 181-89.
broad support for the precautionary principle – the notion that lack of scientific certainty should not forestall efforts to prevent harm before it occurs – the principle in itself does not address the critical question of how precautionary environmental policy should be.\textsuperscript{61} Those who subscribe to the reactive world view are reluctant to endorse precautionary regulation for fear that it will require regulated entities to incur unnecessary costs in the absence of clearer proof that their actions cause harm. Supporters of cost-benefit analysis have argued that it is not necessarily antithetical to precautionary regulation, while insisting on detailed demonstrations that such regulations are likely to generate monetized benefits in excess of projected costs.

Both approaches were reflected in a decision striking down EPA’s effort to phase out all remaining uses of asbestos. In \textit{Corrosion Proof Fittings v. EPA},\textsuperscript{62} the Fifth Circuit purported to endorse the concept of multi-media precautionary regulation, but it insisted that the Toxic Substances Control Act required the EPA to conduct such detailed, product-by-product analyses of the risks posed by asbestos, the risks of substitute products, and intermediary regulatory alternatives as to make such regulation impossible. While striking down the EPA’s asbestos phase-out regulations as insufficiently supported by such analyses, the court upheld the EPA’s decision to ban all new products containing asbestos, without requiring any detailed analyses of their risks or the costs of such regulation.\textsuperscript{63} The latter judgment reflects a truly precautionary approach to regulation in circumstances where it is impossible to weigh costs and benefits because the nature of such future products is largely unknown.

Thus, even as environmental law has been transformed from its common law roots into a system of comprehensive regulatory programs implemented by federal and state agencies, common law notions continue to influence judicial oversight of regulatory decisions. The administrative state is here to stay, but fear of agency overreaching has led the judiciary to reimport common law concepts into decisions reviewing agency actions. The result has been the creation of a kind of “regulatory common law” that endorses

\textsuperscript{61} See Percival, \textit{supra} note 17 (criticizing critics of the precautionary principle for claiming without justification that it will produce massive overregulation).

\textsuperscript{62} 947 F.2d 1201 (5th Cir. 1991).

\textsuperscript{63} See Percival \textit{supra} note 17, at 74.
precautionary regulation\textsuperscript{64} and purports to defer to agency expertise,\textsuperscript{65} while insisting that agencies convince reviewing courts that the risks they seek to control are significant and can be appreciably reduced by regulation.\textsuperscript{66} Although efforts to persuade courts to rewrite the environmental laws to require rigid adherence to a particular decision rule, such as the use of cost-benefit analysis, have been roundly rejected,\textsuperscript{67} the aggressive use of regulatory review programs by the executive\textsuperscript{68} has greatly increased the analytical burden on agencies, contributing to ossification of the regulatory process.

Environmental regulation is one of the most important things any society does. It reflects and expresses some of our most fundamental values concerning respect for life, fairness, and the kind of world we aspire to leave generations to come. Fears that a shift toward precautionary regulation would burden industries with unsustainable compliance costs have proven to be unfounded. Time and time again, regulation has proven to be far more valuable\textsuperscript{69} and far less costly to industry\textsuperscript{70} than initially forecast. This is a product of both strategic behavior by regulatory targets who have an incentive to exaggerate ex ante predictions of compliance costs, as well as the benefits of technological innovation that occurs when regulatory mandates spur investment in development of improved pollution control technology. Indeed, some technological optimists predict that environmental problems will soon become a distant memory in the developed world as green technology rides to the rescue.\textsuperscript{71} If these predictions prove accurate, it surely will be due

\textsuperscript{64} Ethyl Corp. v. EPA, 541 F.2d 1 (D.C. Cir. 1976) (en banc) ("Where a statute is precautionary in nature, the evidence difficult to come by, uncertain, or conflicting because it is on the frontiers of scientific knowledge, the regulations designed to protect public health, and the decision that of an expert administrator, we will not demand rigorous step-by-step proof of cause and effect. Such proof may be impossible to obtain if the precautionary purpose of the statute is to be served.").


\textsuperscript{67} See Whitman v. Am. Trucking Ass'ns, 531 U.S. 457, 464-72 (2001) ("Were it not for the hundreds of pages of briefing respondents have submitted on the issue, one would have thought it fairly clear that [the] text [of the Clean Air Act] does not permit the EPA to consider costs in setting the standards.").


in large part to the success of regulatory programs to control environmental risks.

IV. THE GLOBALIZATION OF ENVIRONMENTAL CONCERNS

Perhaps the most stunning development in the last twenty-five years of environmental law's evolution has been the globalization of environmental concerns. Environmental law initially may have seemed like a luxury good that only rich countries could afford. However, today it is considered a critical part of efforts to improve living conditions in developing countries. Environmental problems increasingly are viewed as transcending national borders and some – including global warming and climate change – are considered to pose significant risks to the health of the planet that could cause substantial economic and social dislocation worldwide.

The globalization of environmental concerns is driven by several factors. These include worldwide population growth, the expansion of global trade and worldwide economic activity, and improvements in communication technology and scientific understanding. Every multinational corporation is now on notice that its activities in the developing world quickly can become a focus of protests at corporate headquarters by global networks of environmental activists. Human rights groups are now embracing environmental concerns\(^\text{72}\) and multinational corporations are finding it difficult to justify adherence to lower environmental standards in developing countries when placed under the spotlight of international attention.

Global economic development is a two-way street. Even as some developing countries upgrade their environmental standards, we have discovered that developed countries are now on the receiving end of significant pollution from the developing world. Due to improvements in our ability to trace the fate and transport of pollutants, it is now estimated that 30% or more of the mercury found in the western United States originates in China, most of it in emissions from coal-fired power plants there.\(^\text{73}\) In 1999 coal-

\(^{72}\) See Doe v. Unocal Corp., 395 F.3d 932 (9th Cir. 2002) (class action filed against a U.S. oil company for complicity in the forced labor, murder, rape, and torture of natives of Burma by the country’s military in the course of constructing an oil pipeline); Doe v. Exxon Mobil Corp., 393 F. Supp. 2d 20 (D.D.C. 2005) (lawsuit by Indonesian villagers against U.S. oil company charging human rights abuses by Indonesian military guarding oil facilities).

fired power plants in China emitted 600 tons of mercury into the air, while such plants in the United States emitted only 120 tons.

Just as China's mercury emissions affect other countries, nearly two-thirds of mercury emissions from U.S. power plants reached beyond U.S. borders. The EPA has issued regulations that will require significant reductions in mercury emissions by U.S. power plants over the next decade. But much of the benefits of these reductions to U.S. residents could be lost if mercury transport from China continues to increase. China is expected to double its production of electric power by the year 2020, in large part by building new coal-fired power plants. If these plants are not required to reduce their mercury emissions, long-range transport of mercury from China will become an even larger source of mercury exposure in the United States.

The United States pioneered some of the most important innovations in environmental law – the creation of national parks, environmental impact statement requirements, freedom of information and right-to-know legislation – but it now has sacrificed its leadership role in global environmental matters by withdrawing from the Kyoto Protocol to the Framework Convention on Climate Change. The principal reasons given by U.S. officials for rejecting the Kyoto Protocol are that compliance would be expensive for the United States and the agreement does not also require developing countries such as China to reduce their growing emissions of greenhouse gases. Yet the reason developing countries were not required to participate in the initial regime of emissions reductions is because the vast bulk of the global warming problem had been caused initially by emissions from the developed world. While China's rapidly growing economy now generates more greenhouse gas emissions than any country other than the United States, on a per capita basis its emissions are only roughly one-sixth that of the United States. When the Kyoto Protocol was negotiated in 1997, it was well understood that developing countries would not agree to restrict their emissions until after the countries that caused most of the problem made significant reductions in their own emissions as a simple matter of fairness.

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75 Keith Bradsher, China to Pass U.S. in 2009 In Emissions, N.Y. TIMES, November 7, 2006 at C1; Keith Bradsher, China's Boom Adds to Global Warming Problem, N.Y. TIMES, October 22, 2003 at A1.

Even though the governments of the United States and Australia - the countries responsible for the two largest per capita emissions of greenhouse gases - have rejected the Kyoto Protocol, several states and all the Australian provinces have launched their own ambitious initiatives to cut greenhouse gas emissions.\(^\text{77}\) California, the world's fifth largest economy, has imposed the first limits on emissions of carbon dioxide from mobile sources and in September 2006 it enacted legislation creating comprehensive statewide controls on greenhouse gas emissions.\(^\text{78}\) In December 2005, seven northeastern states announced that they would participate in a Regional Greenhouse Gas Initiative (RGGI) designed to create a cap-and-trade program to efficiently control greenhouse gas emissions from power plants in the region.\(^\text{79}\)

These state initiatives are in the best traditions of U.S. environmental law, which generally permits states to adopt their own more stringent environmental protection measures if they so choose, so long as states meet minimum national standards. Federal standards are meant to establish a floor, and not a ceiling, to guarantee that U.S. residents will enjoy a clean and healthy environment no matter where they go in the country. But what is striking about these new initiatives is that they represent action by states to tackle a global problem by filling a policy vacuum at the national level. The states have been inspired by a growing appreciation that some controls on U.S. greenhouse gas emissions are inevitable, and will become even more so, as the impact of global warming becomes more manifest. When the Kyoto Protocol entered into force in February 2005 without the participation of the United States, it was striking how many U.S. business leaders were quoted as saying that it was only a matter of time before the United States would have to control greenhouse gas emissions.\(^\text{80}\)

The globalization of environmental concerns has spurred many business leaders to participate in voluntary initiatives to minimize the environmental harm caused by the operations of their busi-


nesses. Many of these initiatives are the outgrowth of pressure applied by non-governmental organizations (NGOs). For example, the Rainforest Action Network initially targeted individual companies seeking agreements to govern their activities in developing nations and then later leveraged initial, company-specific agreements into broader industry campaigns. Socially responsible investors have pressured corporations to improve their environmental policies by threatening to divest their holdings in companies that do not develop policies to improve their environmental practices. Insurance companies and banks also have sought to improve the environmental performance of companies that they insure or finance.

In June 2003, several large private banks announced the adoption of the Equator Principles that commit them to follow environmental guidelines developed by the International Finance Corporation and the World Bank when lending to development projects. These principles require the banks to analyze the environmental risks created by projects that they finance, to consider alternative mitigation measures and to establish environmental management plans for the projects to ensure that their project lending does not contribute to environmental harm. A total of forty banks, accounting for three-quarters of the world’s project financing, have now agreed to abide by the Equator Principles. Because private, multilateral investment flows now dwarf intergovernmental lending, private initiatives like the Equator Principles could be particularly significant to improving environmental conditions in the developing world. However, because they are voluntary initiatives, some question whether the commitments they embody can be effectively enforced.

Many companies are now taking environmental concerns into account when they design new products or contract with suppliers, and some nations are requiring them to take responsibility for ensuring the safe disposal of their product. Globalization of envi-

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83 Id.

rnonmental concerns has made it more difficult for industries to export hazardous products or chemicals to the developing world, particularly after they have been banned or restricted in developed countries. Leaded gasoline is starting to disappear from the developing world, not long after developed countries phased out its use. Fifteen years after a U.S. court struck down the EPA’s asbestos ban, many other countries with far more relaxed systems of environmental regulation have had no difficulty in deciding to ban asbestos, despite aggressive opposition from the asbestos industry and the Canadian government. Even an institution notoriously unsympathetic to environmental regulation – the World Trade Organization – has declared that the health risks of asbestos are so great that its import can be banned without infringing free trade laws, rejecting an argument the asbestos industry had emphasized in the U.S. proceedings. While tobacco use continues to increase in the developing world, the World Health Organization has successfully completed a Framework Convention on Tobacco Control, raising global awareness of the risks of tobacco use.

Rapid development in China has caused truly appalling pollution in many parts of the country. This, in turn, has been a source of considerable public unrest. Violent protests have broken out in several Chinese cities as residents demand action to stop horrendous air and water pollution that threatens their health. During several visits to China last year I was struck by the high level of public awareness of the necessity of making environmental issues among the most important priorities of that rapidly growing country. On one day alone I counted five articles in the China Daily, an English-language newspaper, that reported extensively on environmental problems – air pollution, sewage disposal, wetlands preservation, contaminated drinking water. Years of neglect of environmental controls have given rise to environmental problems that now present serious threats to public health in China.

Fearing that popular unrest may threaten their hold on power, China’s leaders have made environmental protection a top national

priority. They have moved aggressively to strengthen the nation’s environmental laws and to encourage the development of green technology. Despite the communist party’s tight grip on power at the national level, China’s leaders have found it very difficult to stop local practices that protect polluting industries.\footnote{89 See, e.g., Jim Yardley, Rules Ignored, Toxic Sludge Sinks Chinese Village, N.Y. Times, Sept. 4, 2006, at A1 (“There is no shortage of environmental laws and regulations in China, many of them passed in recent years by a central government trying to address one of the worst pollution problems in the world. But those problems persist, in part, because environmental protection is often subverted by local protectionism, corruption and regulatory inefficiency.”)} Chinese officials are eager to import legal and technical expertise from abroad to prevent environmental degradation from undermining the nation’s booming economy. Yet despite the Chinese government’s recent enthusiasm for environmental protection measures, environmental catastrophes still occur, such as the massive benzene spill in the Songhua River in November 2005. Caused by an accident at a chemical plant in Jilin, the spill required authorities to shut down public water supplies to the city of Harbin, with four million residents, and it caused international protest when the pollutants crossed the border into Russia.\footnote{90 Michael Sheridan, China Sends Troops into Its Poisoned City, Sunday Times (London), Nov. 27, 2005, available at http://www.timesonline.co.uk/article/0,,2089-1892409,00.html.}

The eagerness of Chinese leaders to borrow from foreign environmental law to upgrade their country’s environmental protections can be viewed as another illustration of how globalization is contributing to what Dean Harold Koh has called the development of “transnational law.”\footnote{91 Dean Harold Hongju Koh, Remarks to the American Law Institute (May 17, 2006), available at http://www.law.yale.edu/news/2764.htm.} Now that environmental protection has become an urgent priority of the Chinese government, China has not hesitated to import into its environmental laws regulatory policy innovations from other countries, such as emissions trading, effluent charges, green labeling and environmental performance grading.\footnote{92 Gary McNeil & David Hathaway, Green Labeling and Energy Efficiency in China, 7 China Envt Series 72 (2005); Hua Wang et al., Environmental Performance Rating and Disclosure: China’s Green-Watch Program, (World Bank Policy Research Working Paper Series, Paper No. 2889, 2002), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=636252#PaperDownload.} Despite substantial upgrading of China’s environmental laws, gaps continue to be discovered. The Songhua River benzene spill highlighted the fact that China had no national, mandatory reporting system for chemical releases like that contained in the
U.S. Superfund legislation. The Chinese government has acted to close this gap in Chinese environmental law, though like most other countries it has not borrowed Superfund’s liability provisions.

In the United States, the environmental movement has benefited from the participation of some remarkable citizen activists who formed grassroots organizations to bring attention to pressing problems. The same phenomenon is now occurring in many countries around the globe. Some grassroots activists have become well known, such as Wangari Matathai, the founder of the Green Belt Movement in Kenya who was awarded the 2004 Nobel Peace Prize for her work on behalf of the environment. Many others continue to perform truly heroic work outside the spotlight of international attention.

A few courageous public interest lawyers in China are now bringing citizen suits to stop environmentally destructive activities. When I visited China in March 2005, I met Wang Canfa, the director of the Center for Legal Assistance to Pollution Victims in Beijing. He is only 4’10” tall in a country that had decreed that to be a lawyer one had to be at least 5’ tall. Canfa sued to get the regulation changed and he now is China’s top public interest environmental lawyer. His group runs a “hot line” that takes calls from all over China from people complaining about violations of the environmental laws. Some observers take a cynical view of the growing public interest law movement in China by arguing that the cases it brings must not be very important if the government is allowing them to go forward. While that may be true with respect to human rights litigation, no one has been heard to say this about the lawsuits Wang Canfa has brought against polluting copper smelters and factories. His cases, which have been written up in a remarkable book, sound much like the early days of common law litigation in the United States with citizens seeking to convince judges to stop largely uncontrolled pollution by economically important industries.


95 WANG CANFA, XU KEZHU, HU JING, LIU MIN, TADAYOSHI TERAO & KENJI OTSUKE, STUDIES OF ENVIRONMENTAL POLLUTION DISPUTES IN EAST ASIA: CASES FROM MAINLAND CHINA AND TAIWAN (Inst. of Developing Economies 2001).
Canfa is a professor at the China University of Political Science and Law in Beijing where he runs an environmental law clinic. He has ambitious plans for expanding his operations, including the establishment of a mobile environmental law center on a bus that would travel to rural areas of China to provide legal assistance to people who currently do not realize that law can be used to improve their environment.

While visiting Nanjing, China, I met Yuanlin Xue, director of the Wujing Environmental Protection Bureau, a provincial agency that is struggling to enforce strict new environmental regulations designed to make the province a model environmental zone. Among the most difficult challenges he faces is how to bring state-owned enterprises into compliance with the environmental laws. Often he receives little assistance from China’s central government, though last year China’s EPA – the State Environmental Protection Agency (SEPA) – surprised everyone. In what has become known as the “environmental storm,” the agency halted construction of 22 major energy projects that had failed to prepare adequate environmental impact statements.96

What is happening in China is echoed in other parts of the world outside the spotlight of international attention. Five years ago I helped present an environmental workshop at the University of Tehran. I was astounded to discover a large public interest environmental movement in Iran that is at the heart of a thriving civil society. I learned that there were more than 230 environmental groups working against incredible odds to get a repressive government to reverse decades of environmental neglect. I met the leaders of the oldest of these groups, the Women’s Society Against Environmental Pollution. The organization was founded in the early 1970s by a librarian who discovered environmental law after realizing that the university library where she worked had no category established for filing books about it.

In Costa Rica a new environmental court is bolstering environmental protection by courageously and independently exercising its new powers to close companies that have been persistent violators of the environmental laws. Costa Rica’s Environmental Administrative Tribunal is building renewed respect for environmental law in a country that has made environmental protection a foundation

of an economy fueled by eco-tourism.\textsuperscript{97} Further south in Paraguay, Alberto Janosky is waging a determined campaign to save the last remaining rainforest in the country. As the executive director of the environmental group GUYRA Paraguay, Janosky has worked with international organizations to raise funds to purchase rainforest land to spare it from clearing by soybean farmers.\textsuperscript{98}

In Chile, Fernando Dougnac is the president of Chile’s premier public interest environmental law group, the Fiscalía del Medio Ambiente (FIMA). In 1985 he won Chile’s first public interest environmental lawsuit, preventing the country’s then-military government from destroying a biosphere reserve.\textsuperscript{99} He has won many other legal victories since then, including a case that established legal protection for Chile’s ancient forests in Tierra del Fuego under the environmental rights provision in Chile’s constitution.\textsuperscript{100}

Antonio Oposa, Jr., is a Philippine lawyer who is the chair of the National Environmental Action Plan of the Integrated Bar of the Philippines.\textsuperscript{101} As in many developing countries, lax enforcement of the environmental laws has severely undermined their effectiveness. To stop illegal fishing from destroying the incredible marine resources in the Visayan Sea, Oposa created a Marine Enforcement Center and Youth Camp that trains community leaders, students and teachers to help change environmentally destructive fishing practices. Oposa donated his family beach house to the Bantayan Island Marine Sanctuary to house the center. He organized a team of volunteers called the Visayan Sea Squadron to patrol a water body with some of the world’s richest biodiversity. Oposa’s squadron documents illegal fishing practices, including blast fishing and cyanide fishing, and helps organize raids by


\textsuperscript{100} Id.

enforcement officials that have resulted in criminal convictions for violations of the environmental laws. The group filmed the government raids to arrest environmental violators in order to spread the word that destructive fishing practices no longer would be tolerated. In April 2006, Oposa’s chief assistant, Jojo de la Victoria, was murdered. Oposa himself was threatened with death if he did not give up his campaign to protect the Visayan Sea. In response to these threats, hundreds of environmentalists from around the globe contacted the Philippine government to demand it ensure his safety.

While in Africa in 2004, I met a Nigerian environmental law professor, Bibobra Bello, who is working to stop pollution caused by the operations of multinational oil companies. More than a decade ago, Professor Bello was arrested during an environmental protest and imprisoned, along with environmentalist Ken Saro-Wiwa, by Nigeria’s former military dictatorship. Saro-Wiwa was executed, but Professor Bello managed to escape and he fled to the United States where he earned an L.L.M. in environmental law. After political conditions in Nigeria improved, he returned to his country where he became a law professor at Delta State University Law School. When his university refused to let him develop an environmental law program, so many students protested that the university was shut down until the administration relented. Professor Bello, who now directs the university’s environmental law program, understands better than almost anyone else the linkage between environmental protection and global human rights issues.

Each of these individuals had to overcome what at times seemed like overwhelming odds against them, but they persevered and are now part of a dynamic global movement that is helping to improve environmental conditions in many countries. The work of such courageous people around the world gives cause for considerable optimism about the future of environmental law.

V. The Future of Environmental Law

Looking back on the last twenty-five years in the evolution of environmental law and policy there have been several important developments that were not widely anticipated. These do not include the growth of concern over global warming or efforts to challenge environmental controls as regulatory takings, issues that

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102 Information in this paragraph is from Interview with Bibobra Bello, in Nigeria (2004).
were thoroughly discussed in the first and third annual reports of the Council on Environmental Quality. But they do include the rise of the environmental justice movement, the disappearance of bipartisanship on environmental issues, and the enormous growth in the depth of environmental concern in developing countries. Looking forward to the future, what developments are likely to occur in the next twenty-five years of evolution in the environmental law field?

Because domestic environmental law is now primarily the product of regulatory legislation, rather than common law, its future depends largely on who captures or retains control of Congress and the White House, questions that are not likely to be determined based solely on how the public feels about environmental protection. For now legislative gridlock prevails because the President and the Republican leadership in Congress are hostile to many environmental concerns, though they lack popular support to substantially relax the environmental laws. A different president and a different Congress eventually will substantially update the federal environmental laws, a task that is long overdue in many areas.

The common law now serves primarily as a backstop to be invoked when regulation fails, but common law concepts retain a powerful influence on judges distrustful of regulatory agencies. The courts are likely to continue to be a battleground for groups seeking to change the environmental laws through judicial interpretation or to discipline agencies when they seek to bend the law too far in one direction or another. For now, questions concerning the constitutional authority of Congress to protect the environment seem to have been settled and should gradually fade from the scene. However, the U.S. Supreme Court remains sharply divided on environmental issues, as illustrated by its most recent environmental decision in the Rapanos case. As this decision illustrates, issues that turn on how to interpret the environmental statutes will be sharply contested with Justice Kennedy probably wielding the decisive vote in most cases for the foreseeable future. The retirement of Justice Sandra Day O'Connor also opens up the possibility that the Court will revive Justice Scalia's long-standing campaign to restrict the standing of environmental plaintiffs or revisit efforts


104 See Antonin Scalia, The Doctrine of Standing as an Essential Element of the Separation of Powers, 1983 Suffolk U. L. Rev. 881, 897 (1983). The Court's Laidlaw decision broadly upholding the standing of environmental plaintiffs was decided by a 7-2 vote.
to broaden the circumstances under which environmental regulations will be deemed to be regulatory takings for which compensation must be paid.\footnote{105}

Claims that the administrative state has transfigured into a cost-benefit one\footnote{106} have largely proven to be wishful thinking by critics of environmental regulation. Regulations to protect the environment have become smarter, more flexible, and more efficient and are likely to continue to do so in the future. However, efforts to impose some kind of cost-benefit “super mandate” on regulatory agencies have floundered for the simple reason that it is a bad idea. To appreciate why, one need look no further than the Corrosion Proof Fittings decision in which a federal appeals court transformed what was intended by Congress to be a very soft version of a cost-benefit balancing mandate into a vehicle that effectively has paralyzed EPA’s ability to regulate under the Toxic Substance Control Act.\footnote{107} The Supreme Court’s unanimous rejection in Whitman v. American Trucking Associations\footnote{108} of pleas from proponents of the cost-benefit state to rewrite the Clean Air Act to incorporate their favored decision rule preserved the integrity of one of the most valuable national regulatory programs. Environmentalists’ antipathy to cost-benefit analysis may moderate as they seek to embrace the conclusions of ecological economics concerning the enormous value of “ecosystem services,”\footnote{109} which have been largely ignored by conventional economic analyses.\footnote{110} But rather than striking a blow in favor of cost-benefit analysis as a decision rule, this may serve instead to illuminate the enormous uncertainties that inevitably afflict its use as a decision-making tool.

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\footnote{105} Because substantial windfalls can be garnered whenever regulation is relaxed, powerful incentives always will exist for regulated entities to push for more expansive interpretations of regulatory takings doctrine.


\footnote{107} Corrosion Proof Fittings \textit{v.} EPA, 947 F.2d 1201 (5th Cir. 1991).


\footnote{109} See Robert Costanza et al., \textit{The Value of the World’s Ecosystem Services and Natural Capital}, 387 Nature 253 (May 1997) (calculating the global value on everything that the world’s ecosystems do for humans at $33 trillion per year).

Efforts by states to design and coordinate their own responses to environmental problems neglected by the federal government are challenging conventional wisdom concerning both the "tragedy of the commons" and environmental federalism. In the long run, ambitious programs by states to reduce emissions of greenhouse gases seem hopelessly altruistic unless they spur other states and other nations to follow suit. While a critic of environmental regulation dismisses these initiatives as "the ultimate in political symbolism," the initiatives may reinforce the perception that controls on greenhouse gas emissions are a categorical imperative of Kantian proportions. Not surprisingly, state regulatory actions to control greenhouse gas emissions have generated legal challenges from industry, even as other states band together to enlist the old federal common law of nuisance in a fight to reduce such emissions from Midwestern power plants. Claims that the federal government has preempted such state actions seem disingenuous in light of EPA's previous decision to disavow any legal authority to regulate in this area. Once initial legal challenges are overcome, state initiatives could proliferate, which ultimately would increase pressure on Congress to create a comprehensive national program to control emissions of greenhouse gases. Much will depend upon how successful environmentalists are in constructing creative coalitions, as they have done at times in seeking to more closely integrate environmental concerns into federal policies dealing with agriculture and transportation.

It would be nice to be able to confidently predict, as some have done, that the development of new technology will largely solve environmental problems in the future, leading to the dawn of a zero-emissions society. But the history of environmental law demonstrates that innovations in pollution control technology are largely a product of the perceived future stringency of emissions

111 See Garrett Hardin, The Tragedy of the Commons, 162 SCI. 1243 (1968).
114 In Central Valley Chrysler-Jeep, Inc. v. Witherspoon, No. CIV-F-04-6663-REC-LJO (E.D. Cal., filed Dec. 10, 2004), the auto industry argues that the emissions limits on carbon dioxide from automobiles that California adopted in 2004 are preempted by federal fuel economy standards.
116 See, e.g., Easterbrook, supra note 71.
controls.\textsuperscript{117} If the United States continues to demand cleaner and more efficient production processes and means of transportation, we can expect considerable further progress along the road towards a green society. That progress will by no means occur with respect to all environmental problems. Non-point source pollution is widely, and properly, understood as one of the top problems that regulatory policy has failed to come to grips with. So long as most land use management decisions remain the fiercely guarded province of state and local authorities, solutions to non-point source pollution problems will remain elusive, just as pressures to develop in sensitive coastal areas are likely to continue to overwhelm environmentally-minded voices. Disasters like Hurricane Katrina and the flooding of New Orleans that grip the nation for a time often create the momentum to make fundamental changes in the environmental law (sometimes for better, and sometimes for worse). For now, it is too early to tell what the long-term legacy of these events will be.

Around the globe environmental law already is changing rapidly in response to public concern over the environment and the expansion of global trade and communication. While some environmentalists feared that trade liberalization would harm the environment, it actually has spurred countries like Chile and China to upgrade their standards so that environmental concerns could not be used as an excuse to restrict their access to foreign markets. Ironically, Russia's desire to win the European Union's support for its becoming a member of the World Trade Organization reportedly was a crucial factor in Russia's decision to ratify the Kyoto Protocol, which was the ratification necessary to bring the Protocol into force.\textsuperscript{118}

Improvements in global communication and transportation have contributed to the rise of international networks of environmental activists, as discussed above. Grassroots environmental groups in developing countries are now gaining access to the resources and expertise of their counterparts in the developed world. This trend will continue to increase pressure on multinational corporations operating in the developing world to clean up their acts even in countries where they are not legally required to do so. No longer will it be easy for any country or corporation to export its environmental problems by dumping them on less-developed countries.

\textsuperscript{117} See Robert Percival et al., supra note 69, at 140-41.

Environmental standards can be expected to improve dramatically in the developing world as less-developed countries devote greater effort to creating legal infrastructures to respond to environmental degradation. Unfortunately, this often occurs only after such enormous damage is done to the environment that its long-term impact no longer can be ignored. But international networks, such as the IUCN Academy of Environmental Law and the International Network for Environmental Compliance and Enforcement (INECE), are now greatly accelerating developing nations’ learning curves concerning how to establish and enforce effective environmental laws. As these laws become more effective in the future, at some point U.S. corporations may prefer to have foreign victims of environmental harm sue them in U.S. courts, rather than the reverse pattern that heretofore has prevailed in Alien Tort Claims Act litigation. Plaintiffs in such litigation have failed to win judgments in court because the actions they seek to redress are not considered violations of “the law of nations.”

But by shining the glare of international publicity on the activities of multinational corporations, these lawsuits have increased pressure on companies to upgrade their environmental practices in developing countries.

As discussed above, improvements in science’s ability to trace the fate and transport of pollutants have alerted us to the global significance of transboundary pollution problems. But efforts to develop legal regimes to control global environmental problems are likely to become even more challenging in the future as the extent of such problems becomes more apparent. Most transboundary pollution problems are difficult to resolve because the upwind or upstream state is reluctant to make costly investments that primarily benefit downwind or downstream states. When EPA Administrator Stephen Johnson visited China in April 2006, his simple mention of the problem of transboundary mercury pollution set off a political firestorm there.

Global warming and climate change now appear likely to be the problems that will pose the greatest challenge to the future development of international environmental law. As they continue to emerge as urgent, planetary concerns, it will be necessary for the

nations of the world to develop a post-Kyoto regime that will respond to the fairness concerns of developing countries and the economic concerns of the developed world. While some have argued that countries like China have little incentive to take action to control its greenhouse gas emissions,\textsuperscript{122} the fact that China ultimately will pass the United States as the largest contributor to world emissions means that it is capable of taking actions that can have more impact on the global problem than any other country. Chinese scientists are very concerned about the impact of global warming on China's environment. Thus, self-interest alone may bring the world's most populous country to the bargaining table.

This cannot happen, however, if the United States continues to ignore the developing world's concerns about the unfairness of the U.S. refusal to take the lead in responding to a problem to which it has been the largest contributor. Greenhouse gas emissions from the developed world have been the primary cause of the global warming and climate change problems. While developing countries now account for a substantial, growing share of such emissions, the Kyoto Protocol only required emission reductions by the developed world because it was viewed as necessary first for the countries that had done most to cause the problem to take the lead in addressing it. Instead President Bush has rejected the Kyoto Protocol and U.S. emissions have continued to increase.\textsuperscript{123}

The contemporary environmental movement was heavily influenced by concerns that pollution would harm public health. Concern for public health continues to be the trigger that drives much of what the EPA does on a daily basis. Because environmental conditions can play a significant role in the development and spread of new diseases, it seems logical to believe that the fields of environmental law and health law will begin to converge. So many issues of public health and preventive medicine already revolve around environmental conditions that it seems like a logical progression for both fields of law. Both fields confront difficult questions concerning how precautionary regulatory policy should be. These challenges will only increase as biomonitoring documents wide human exposure to toxics, and the consequences of global


\textsuperscript{123} \textit{See}, e.g., Andrew C. Revkin, \textit{Talks to Start on Climate Amid Split on Warming}, \textit{N.Y. Times}, Nov. 5, 2006, at § 1.
warming and climate change continue to emerge. The World
Health Organization’s establishment of a Framework Convention
on Tobacco Control is a significant step that seeks to reduce the
impact of diseases caused by the use of deadly and addictive
products.

Regardless of the pace of future technological change, certain
features of U.S. environmental law should hold broad appeal for
the citizen movements emerging in developing countries. The
Emergency Planning and Community Right-to-Know Act’s toxic
substance inventory gives U.S. residents the ability to remotely
determine a great deal about the kinds of chemicals to which they
are being exposed on a daily basis. If U.S. companies routinely
comply with this legislation in the United States, they also should
be able to do so in Europe and other continents where regulatory
authorities are bold enough to require it. In addition to providing
the public with information about chemicals to which they are
exposed, government also should determine whether new chemi-
cals pose unreasonable risks by requiring some form of tiered, pre-
market testing as the European Union (EU) is doing with its
REACH Program.124

While environmental concerns continue to command broad popu-
lar support, it has not always been easy to shepherd new environ-
mental legislation through Congress. In particular, the received
political wisdom is that energy taxes are political suicide, following
the ill-fated effort in the early days of the first Clinton administra-
tion to interest Congress in adopting a BTU tax. Yet it makes
enormous sense to consider shifting much of the tax burden away
from productive labor and toward discouraging environmentally
damaging production and consumption decisions. Energy taxes
can create powerful incentives to improve energy efficiency and to
reduce overall energy consumption and they need not increase the
overall tax burden if they are rebated in a proper manner.

Finally, proponents of environmental law need to work on build-
ing creative, bipartisan coalitions to win the political battles of the
future. For example, economic conservatives who oppose federal
subsidies have proven to be strong supporters of efforts to elimi-
nate some of the most environmentally destructive subsidy pro-
grams. It also may well be time to rethink some of the basic
assumptions of the national environmental movement. However,

the view expressed in the *Death of Environmentalism* that environmentalists should abandon any "pretense" of bipartisanship is a counsel of folly.\(^\text{125}\) Virtually every significant legislative advance environmental law has ever made has been the product of bipartisan support. Reports of the demise of environmentalism are not simply premature; they are wrong. But it will be necessary for environmental interests to think creatively about how to deal with a changing political climate.

Initially environmental law responded to polluting industries by encouraging them to locate away from populated areas. This "zoning function" of the early common law later gave way to a kind of "technology-forcing" one as fear of liability inspired industry to develop new pollution control technology. Responding to new controls on various environmental risks in developed countries, industry exported them abroad. Today, this pattern is rapidly changing as developing countries upgrade their environmental standards and NGOs shine the spotlight of international publicity on companies who degrade the environment, even if such degradation is legal under domestic law. The United States once served as the catalyst for the rapid evolution of regulatory policy to protect the environment. Although the United States has sacrificed its leadership role on international environmental issues, it seems inevitable that our own self-interest eventually will force us to resume playing a more aggressive role in efforts to protect the planetary commons.

Twenty-five years from now, environmental law will have evolved in many ways we cannot now anticipate. But we know enough today to be able to predict with some confidence that the field will be alive and well long after we have retired from its practice.

\(^\text{125}\) Nordhaus & Schellenberger, *supra* note 5.