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A Positive Political Economic Theory of Environmental Federalization

Jason Scott Johnston

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A POSITIVE POLITICAL ECONOMIC THEORY OF ENVIRONMENTAL FEDERALIZATION

Jason Scott Johnston[†]

ABSTRACT

This Article sets out a positive theory that explains the late twentieth-century federalization of American environmental law. On this theory, federalization occurred not because states had failed to regulate to reduce air and water pollution, but because older and heavily developed states moving toward such regulation gained a relative competitive advantage by imposing minimum standards on less developed and less polluted states (in the case of air), and by receiving subsidies from such regions (for water pollution reduction). The failure of federalization in the case of climate change is directly explained by this theory: the majority of states would be certain short and medium term net losers from such legislation.

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[†] Henry L. and Grace Doherty Charitable Foundation Professor of Law, University of Virginia School of Law. 580 Massie Road Charlottesville, VA 22903-1789, E-mail: jsj8q@virginia.edu. I am grateful for helpful comments on this Article to participants in the PERC/Law and Economics Center Workshop on Environmental Federalism.

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INTRODUCTION

This Article sets out a positive theory that helps to explain the federalization of environmental law and applies that theory to selected episodes in the recent history of federal environmental law in the United States. On my theory, federalization occurs not because the activities of one State spillover and cause harm in other States. Nor does federalization occur because States are failing to regulate to curb harm from pollution because they fear losing industry. Instead, federalization occurs when a large number of localities have reached a stage of development where their citizens have a level of affluence and leisure time that they demand a cleaner environment and reduced pollution. Such citizens would support local pollution reduction regulations, but federal pollution legislation can make them strictly better off in two ways.

One kind of federal environmental law that dominates local controls, illustrated by the federal Clean Air Act,¹ imposes uniform emission reduction standards on all localities within the federation.² As there is local demand within developed states and localities for pollution control, federal environmental standards are supported by local environmentalists and recreationists in such places. But, crucially, as such laws provide economic protection against competition for industry from lesser developed, less polluted states and localities, the laws also are supported by local industry and labor in the heavily polluted states and localities. There thus emerges a coalition defined by both region and interest that successfully supports the imposition of uniform federal environmental standards.

The second kind of federal law that can make citizens who demand local pollution reduction strictly better off relative to local regulation is one that directly subsidizes pollution reduction in highly industrialized or rapidly industrializing locations. This type of law, illustrated by the federal Clean Water Act,³ enjoys even broader support, as it promises a subsidy both to places that are already industrialized with a pollution problem and those that anticipate rapid industrialization in the future.⁴ In the most straightforward way, the law is paid for by people who reside in less industrialized and polluted areas.

This theory explains a number of important facts about the history of the Clean Air Act. It explains, directly, the imposition of technology-based, facility-specific pollution control standards in less developed, cleaner regions of the country (the Prevention of Significant Deterioration or PSD program). Less directly, it can explain the pattern of implementation of ostensibly uniform national standards. The theory recasts the apparent failure of the Clean Air Act to actually generate national uniformity in air quality not as a problem, but as precisely what Congress intended in passing the law: older and more heavily polluted areas were, on my theory, never intended to be forced to incur the enormous costs achieving unpolluted air.⁵ Finally, the theory explains the gradual but inevitable loss of state authority under the Clean Air Act. Whatever discretion might seem to have been given to the States by the Clean Air Act's regime of "cooperative federalism" to fine tune their environmental

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1. Clean Air Act Amendments of 1970, Pub. L. No. 91-604, 84 Stat. 1676 (codified as amended at 42 U.S.C. §§ 7401-7671q (2006)).
 2. See *infra* Part III.B.1.
 3. Clean Water Act of 1977, Pub. L. No. 95-217, 91 Stat. 1566 (codified as amended at 33 U.S.C. §§ 1251-1387 (2006)).
 4. See *infra* Part III.A.
 5. See *infra* Part III.B.3.b.

regulations in light of local costs and benefits of pollution control is inconsistent with both the regional protectionist and national preservationist objectives, both of which necessitate a drastic curtailment of local regulatory authority to balance costs and benefits.

The first Part of this Article reviews the theory of environmental federalization taken from the field of economics known as public finance. This branch of economics has generated a normative theory that shows how, under certain assumptions, regulatory decentralization generates regulatory outcomes that make everyone in a federation better off than under a system of uniform federal regulation. The most important impact of this theory on public law has been not in this result, however, but in the demonstration that when various assumptions are violated, the case for regulatory decentralization disappears or is greatly weakened. In this way, legal scholars in particular have come to think of normative public finance theory as generating not only a justification for the late twentieth century federalization of American environmental law, but also a positive theory that explains why federalization occurred.

By reviewing the stylized facts of late twentieth-century American regional economic development and state and local air pollution regulation, the second Part of this Article shows that as a positive matter, federal environmental law did not arise because States were *failing* to deal with the air pollution problem, but because wherever there was a problem, the States *were* regulating. Together with the historical fact that many regions of the country were very little developed as of 1970, with no perception of an air pollution problem, the history of effective state and local regulation suggests that an alternative positive theory is required. The third Part of this Article supplies such a theory with recent economic work showing how federal minimum standards can arise as an equilibrium under majority rule in a federal legislature. In such an equilibrium, the federal minimum does not bind in the majority of jurisdictions (who are free to regulate more stringently), but does bind in a minority of jurisdictions. At the state level, federalization is counter-majoritarian, in that it imposes the preferences of minority pro-environmental voters in states whose median voter opposes the federal minimum standard.

This model explains federal environmental law as arising from a coalition among anti-development environmentalist advocates in relatively undeveloped, unpolluted states and a broad-based set of voters including both industry and labor in heavily developed, polluted States. The final Part of this Article extends this same model to explain an important failure to federalize: Congressional inaction on federal climate change legislation. Unlike water and air pollution circa 1970, there are no widely perceived short-term local environmental benefits from a circa 2014 federal law that would impose costs on or otherwise limit carbon dioxide emissions.

Environmental benefits, if any, would be realized in the far distant future, and would be primarily non-local. The demand for such legislation is driven by Congressional representatives who are not just environmentally liberal ideologically and Democrat by party affiliation but, equally importantly, come from the minority of states that are singular in that they rely exceptionally heavily on sources of power, hydro and nuclear, that would be unaffected by a federal law imposing costs on carbon dioxide emissions. Such federal legislation would confer a potentially large relative competitive advantage on such states. But this short term economic advantage would be offset by the short term competitive disadvantage that federal carbon dioxide emission controls would cause in the majority of states that are much more reliant upon burning coal, or natural gas, for electric power. The political economics of carbon dioxide emission controls thus disfavors federalization of such controls.

I. THE APPROACH FROM NORMATIVE PUBLIC FINANCE

A. *The Simple Economic Optimality of Decentralized Environmental Regulation*

The central economic justification for the decentralization of environmental regulation is drawn from the field of public finance economics known as the theory of fiscal federalism.⁶ That theory sets out a “general normative framework for the assignment of functions to different levels of government.”⁷ The foundation of that framework is what has been aptly called⁸ the “matching principle”: the “presumption that the provision of public services should be located at the lowest level of government encompassing in a spatial sense, the relevant benefits and costs.”⁹ This presumption is justified whenever

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6. For a very clear and comprehensive overview of this theory by one of its founders, see Wallace E. Oates, *An Essay on Fiscal Federalism*, 37 J. ECON. LITERATURE 1120 (1999).
 7. *Id.* at 1121.
 8. HENRY N. BUTLER & JONATHAN R. MACEY, USING FEDERALISM TO IMPROVE ENVIRONMENTAL POLICY (1996).
 9. Oates, *supra* note 6, at 1122. For the original statements of this principle, see WALLACE E. OATES, FISCAL FEDERALISM (1972); see also JAMES M. BUCHANAN & GORDON TULLOCK, THE CALCULUS OF CONSENT: LOGICAL FOUNDATIONS OF CONSTITUTIONAL DEMOCRACY 113 (1962); Mancur Olson Jr., *The Principle of “Fiscal Equivalence”: The Division of Responsibilities Among Different Levels of Government*, 59 AM. ECON. REV. 479, 486 (1969). For an alternative statement, see Wallace E. Oates, Commentary, *On Environmental Federalism*, 83 VA. L. REV. 1321, 1323 (1997) (“[S]ervices should be provided by the smallest jurisdiction that encompasses the geographical expanse of the benefits and costs associated with the service.”).

the demand for and costs of local public goods varies across jurisdictions. For then overall or global social welfare is higher when decentralized jurisdictions offer varying levels of such goods than when the national government provides a uniform level.¹⁰

An example will clarify how this theory works, and the assumptions it depends upon. Suppose that the cleanup of a local lake benefits only people who live in the jurisdiction where the lake is located, and the costs are also borne entirely by local residents. Now assume that local political representatives perfectly mirror the preferences of their constituents, and (for simplicity) assume that every local resident gets the same benefits and costs from cleanup. Under these assumptions, any decision in the local legislature will be unanimous, and that legislature will mandate cleanup if and only if the local benefits of cleanup exceed the local costs. If the costs are \$100 but the benefits are only fifty dollars each distributed equally over all local voters, then the legislature will not vote in favor of cleanup. If the benefits are instead \$150, then cleanup will occur.

Now suppose that we have a mix of three types of jurisdictions, (which I'll call states for concreteness) each completely homogeneous across residents, each with a perfectly representative legislature and each with a polluted lake. Now suppose that the cost of cleanup is \$100 in each of the three jurisdictions, but the benefit varies, twenty dollars in First State, \$110 in Second State, and \$150 in Third State. Clearly in simple cost-benefit terms, cleanup of the lake is only cost-benefit justified in Second and Third States. Under decentralized, local legislative control of the cleanup decision, cleanup will only indeed occur in these States, just as basic economics dictates.

Continuing with this three-jurisdiction example, we see the potential economic costs that regulatory centralization could impose. For suppose that the cleanup decision must be uniform across our three-state federation—that is, either all jurisdictions clean up their lakes or none do—and suppose that the decision will be taken by majority decision in a perfectly representative central (federal) legislature. Under majority rule and with proportionate representation in the federal legislature, the centralized majority decision will be to cleanup all three lakes. Cleanup is cost-benefit justified in Second and Third, but not in First State. The uniform, centralized majority rule regulatory decision to clean up all the lakes leads to an economic loss

10. Oates, *supra* note 6, at 1122. Perhaps the earliest demonstration of this point is from Sam Peltzman and T. Nicolaus Tideman. See Sam Peltzman & T. Nicolaus Tideman, *Local Versus National Pollution Control: Note*, 62 AM. ECON. REV. 959 (1972) (“[N]ationally uniform pollution charges could only be optimal in the long run in a very unusual world and particularly are not optimal in this world in the short run (now), and further that a temporally efficient set of charges is more likely to emerge under local rather than federal control.”).

relative to the decision under decentralized control, where cleanup occurs if and only if cost-benefit justified.

This example portrays the basic case for decentralization versus centralization of environmental regulation. If costs and benefits vary across jurisdictions so that the optimal level of environmental regulation (which may include no regulation at all) varies across jurisdictions, then decentralized, variable regulation may be superior to a centrally determined uniform regulation.

B. Complicating the Story, and Justifying Regulatory Centralization

This example hinges on a very large number of both explicit and implicit assumptions. Violation of any one of a number of these can complicate or even destroy the economic optimality of decentralized environmental regulation and provide a justification for regulatory centralization. Here are some of the most important complications.

1. Failure to Internalize the Full Benefits of Pollution Reduction
(Interstate Externalities)

If pollution reduction or environmental cleanup (hereafter, I shall refer simply to pollution reduction) benefits primarily people outside the State that has regulatory authority over the environmental regulatory decision, but the costs fall primarily locally, then the local State will have too weak an incentive (from a federal point of view) for pollution reduction. Its citizens may decide not to clean up the lake, even though from a global point of view, total benefits (local and non-local) exceed total costs.

Of course, the assumption that costs and benefits are entirely borne by citizens of the jurisdiction with regulatory authority can also be violated in the other direction. When the benefits of pollution cleanup are local but the costs can be externalized outside the jurisdiction, then local jurisdictions may have too great an incentive to engage in environmental cleanup.

As a practical matter, the first of these two cases—where the benefits of pollution reduction are externalized—has been the more important. This first case in fact corresponds to the problem of interstate externalities, where pollution from activities in one state causes harm in another. When the costs of pollution reduction are borne primarily in the polluting state, but significant benefits accrue out of state, the polluting state will have too little incentive to reduce its pollution. With such negative interstate externalities, decentralized decision making standing alone will lead to economically suboptimal pollution reduction.

We say standing alone because at least as a theoretical matter, decentralization is not necessarily inconsistent with optimal pollution control even with interstate externalities. Theoretically, if jurisdictions could costlessly bargain with one another, then victim states would have an incentive to pay polluter states to reduce their

pollution. Anytime the benefits of pollution reduction are bigger than the costs, a mutually beneficial deal to reduce pollution is at least in theory possible.

As a practical matter, however, there are numerous impediments to interstate bargaining to reduce pollution. Bargains among American states—interstate compacts—are legally enforceable only if authorized by Congress. Without such authorization, such deals must be self-enforcing to be effective. Even with a framework for the legal enforcement of interstate bargains, there remains the political problem for any politician proposing to tax local citizens to raise the funds to pay a neighboring jurisdiction to reduce its pollution. In the United States, Congress can authorize interstate compacts, and it can also pass federal pollution control legislation. Federal legislation requiring an adjacent state to reduce its pollution shifts the costs of pollution reduction to the polluting state, and it is hard to envision circumstances in which a victim state politician is not better off when the costs are borne by citizens of the polluting state than she would be were she to propose that her own constituents increase their taxes to pay the polluting state to reduce its pollution.

2. Inter-jurisdictional Competition

The argument for decentralized environmental regulation hinges on the intra-jurisdictional internalization of all costs and benefits of pollution control. However, even if all the benefits and costs of pollution reduction are internalized to a jurisdiction, any jurisdiction is part of a larger world, and as part of larger political-economic world, jurisdictions compete against one another. They compete for both businesses—which bring jobs and tax revenues but possibly also pollution—and for residents, who contribute tax revenues but also generate their own costs, in the form of congestion of various local public goods such as parks.

Of the two types of competition, economists have generally looked upon the second type of competition—for residents—as a force favoring strong (sometimes too strong) local environmental protection. For local environmental quality, like parks, police, and fire protection, is a local public good—something that all residents of a jurisdiction are able to enjoy as a right of residency. Mobility of residents across jurisdictions increases the benefits of decentralization. If people sort themselves by choosing to live in jurisdictions that offer their preferred tax—public goods packages, they impose competitive pressure on local jurisdictions to provide high environmental quality at a reasonable tax cost.¹¹ As William Fischel has demonstrated and

11. The conjecture that competition among jurisdictions will generate the globally optimal provision of local public goods in a world where people have heterogeneous tastes for public goods is known as the Tiebout Hypothesis, after Charles Tiebout. *E.g.*, Charles Tiebout, *A Pure*

illustrated concretely, when residents are homeowners, their desire to maximize the value of their homes creates a strong incentive to vote for local governments that minimize the cost of providing high-quality local public goods.¹²

The social welfare consequences of inter-jurisdictional competition for businesses (mobile capital) are more complex. Indeed, such competition has been called a “widespread and fundamental challenge”¹³ to the economic case for regulatory decentralization. In areas ranging far beyond environmental regulation (to include state corporate law, welfare reform, and international tax policy), the “race to the bottom story” has been put forward as justifying regulatory centralization.¹⁴ It is relatively straightforward to show that if local

Theory of Local Expenditures, 64 J. POL. ECON. 416 (1956). The Tiebout Hypothesis holds as a theoretical matter only if a large number of things are true—such as subsidies between communities—so many, in fact, that it is fair to say that the hypothesis is in general false. See Joseph E. Stiglitz, *The Theory of Local Public Goods Twenty-Five Years After Tiebout: A Perspective*, in LOCAL PROVISION OF PUBLIC SERVICES: THE TIEBOUT MODEL AFTER TWENTY-FIVE YEARS 17, 35 (George Zodrow ed., 1983) (identifying five problems with sustaining efficient local public goods equilibrium). There is not much empirical evidence supporting the assumption of preference heterogeneity that underlies the Tiebout hypothesis. See Daniel L. Millimet, *Environmental Federalism: A Survey of the Empirical Literature*, 64 CASE WESTERN RES. L. REV. 1669, 1699 (2014) (“In sum, the empirical evidence regarding preference heterogeneity and its implications on environmental federalism is limited and incomplete.”). However, the Tiebout model’s implication that more heterogeneous resident preferences ought to result in more decentralized policy-making has recently been confirmed. See Koleman S. Strumpf & Felix Oberholzer-Gee, *Endogenous Policy Decentralization: Testing the Central Tenet of Economic Federalism*, 110 J. POL. ECON. 1 (2002) (finding state liquor policy is more likely to be decentralized in states where voters have more extreme tastes).

12. See WILLIAM A. FISCHER, THE HOMEVOTER HYPOTHESIS 39–71 (2001) (applying the Tiebout hypothesis to the real estate market).
13. Oates, *supra* note 6, at 1134–35.
14. For example, Richard B. Stewart discusses the race-to-the-bottom justification in the environmental area. See Richard B. Stewart, *Pyramids of Sacrifice?: Problems of Federalism in Mandating State Implementation of National Environmental Policy*, 86 YALE L.J. 1196, 1211–19 (1977) (explaining four “structural factors” for centralized environmental policy: the Tragedy of the Commons, disparities in effective representation, spillovers, and moral ideals). John Douglas Wilson precisely summarizes and explains the literature on the race-to-the-bottom in tax. See John Douglas Wilson, *Theories of Tax Competition*, 52 NAT’L TAX J. 269 (1999). For a review of the literature on how interjurisdictional competition for business constrains the ability of jurisdictions to pursue redistributive welfare policies, see David E. Wildasin, *Factor Mobility and Redistributive Policy: Local and International Perspectives*, in PUBLIC FINANCE IN A CHANGING WORLD 151 (Peter Birch Sørensen ed., 1998).

governments perfectly represent all the preferences of local residents, then there will be no race-to-the-bottom. Governments will balance off the local benefits of reduced pollution against local costs, including the cost of jobs and taxes lost when tougher environmental standards cause capital flight.¹⁵ Like many other results in theoretical public finance, however, this result depends on a long list of assumptions. These include assuming that: (1) all citizens of the jurisdiction are homogeneous in how they benefit from and bear the cost of pollution reduction; (2) all citizens work for the polluting industry; (3) labor is immobile and in fixed supply; (4) capital is perfectly mobile and competitively supplied; (5) pollution is regulated by a system of pollution taxes with tax revenues returned to local citizens; and (6) that each jurisdiction chooses the level of environmental regulatory stringency that maximizes the utility of the median voter. These assumptions ensure that all the costs and benefits of local pollution control are internalized to the local jurisdictional decision even when the jurisdictions compete against each other for mobile capital. The theoretical literature supplies reasons to think that decentralization itself may generate incentives so that some of the assumptions—such as faithful political representation of local voter preferences—may actually be realized. Such work has shown that under decentralization, politicians may face a bigger electoral penalty for diverting tax revenues to their own purposes,¹⁶ and face a higher probability of being voted out of office for corruption more generally.¹⁷

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15. This basic point was made long ago by Richard O. Zerbe, *Optimal Environmental Jurisdictions*, 4 *ECOLOGY L.Q.* 193, 203–04 (1974). Richard L. Revesz made the argument significant in public law scholarship, *See generally* Richard L. Revesz, *Rehabilitating Interstate Competition: Rethinking the “Race to the Bottom” Rationale for Federal Environmental Regulation*, 67 *N.Y.U. L. REV.* 1210 (1992). The general demonstration that there may be no race-to-the-bottom (the model that Revesz explains for lawyers) was developed by Wallace E. Oates & Robert M. Schwab, *Economic Competition Among Jurisdictions: Efficiency Enhancing or Distortion Inducing?*, 35 *J. PUB. ECON.* 333 (1988). The basic idea underlying Oates and Schwab’s model is that if jurisdictions internalize both the costs—lost taxes on mobile capital—and benefits of tougher local environmental quality, then they ought to set locally optimal environmental quality standards. *Id.* at 350. Their result hinges upon many underlying assumptions: homogeneous populations within jurisdictions, local taxes only on capital that are returned to residents dollar for dollar for residents to use to purchase private consumption goods, no non-environmental local public goods, immobile labor, and the absence of any kind of jurisdictional market power in the market for locations. *Id.* at 336–41.
16. *See, e.g.*, TORSTEN PERSSON & GUIDO TABELLINI, *POLITICAL ECONOMICS: EXPLAINING ECONOMIC POLICY* 228–30 (2000) (concluding that national elections weaken the link between good performance and reappointment); Paul Seabright, *Accountability and Decentralization in*

Still, violation of one or more of these assumptions can generate forces that cause local environmental regulation to be either too lax or too stringent. If, for example, some local citizens, including the median voter, work in the polluting industry while others do not, then local environmental standards may be too lax.¹⁸

3. Scale Economies and the Possibility of
Non-Uniform Centralized Regulation

The economic case for decentralized environmental regulation begins by assuming that the alternative to local environmental standards that perfectly reflect the local costs and benefits of pollution reduction are national (more generally, centralized) standards that are uniform across jurisdictions and so completely insensitive to variation in local benefits and costs. When centralized standards can themselves be varied with local costs and benefits, the case for centralization may become much stronger.¹⁹ Moreover, if there are scale economies in regulation, so that regulatory costs fall as

Government: An Incomplete Contracts Model, 40 EUR. ECON. REV. 61 (1996) (modeling the allocation of rights under incomplete contracts).

17. Jean Hindriks & Ben Lockwood, *Decentralization and Electoral Accountability: Incentives, Separation and Voter Welfare*, 25 EUR. J. POL. ECON. 385, 389 (2009).
18. As is typical of general equilibrium models in public finance, all sorts of results—including too much local environmental protection and too little—are generated when different subsets of these assumptions are relaxed. For an explication, see THORSTEN BAYINDIR-UPMANN, FISCAL POLICY AND ENVIRONMENTAL WELFARE: MODELLING INTER JURISDICTIONAL COMPETITION 89–112 (1998); Arik Levinson, *A Note on Environmental Federalism: Interpreting Some Contradictory Results*, 33 J. ENVTL. ECON. & MGMT. 359, 362–65 (1997); John Douglas Wilson, *Capital Mobility and Environmental Standards: Is There a Theoretical Basis for a Race to the Bottom?*, in 1 FAIR TRADE AND HARMONIZATION: PREREQUISITES FOR FREE TRADE: ECONOMIC ANALYSIS 393, 405 (Jagdish Bhagwati & Robert E. Hudec eds., 1996). The possibility that states might have overly lax environmental regulations in order to attract capital and the jobs and revenues it brings is really just a particular instance of the more general problem that jurisdictions might undersupply costly local public goods in order to keep taxes low. Again, virtually any result is possible depending upon the model's underlying assumptions. See DIETMAR WELLISCH, *THEORY OF PUBLIC FINANCE IN A FEDERAL STATE* 58–87 (2000); David E. Wildasin, *Nash Equilibria in Models of Fiscal Competition*, 35 J. PUB. ECON. 229, 237 (1988).
19. Although, as the caveat indicates, this depends upon the political economics of centralized standard setting—viz. with the way in which central standards actually vary with local costs and benefits. Cf. Ben Lockwood, *Distributive Politics and the Costs of Centralization*, 69 REV. ECON. STUD. 313, 324–25 (2002) (arguing that inefficient project choice and not policy uniformity contributes to the costs of centralization).

a centralized (but possibly locally tailored) standard is adopted in place of independent regulatory decision making by local jurisdictions, then the case for regulatory centralization becomes stronger still.²⁰

C. *The (Inevitable) Failure of Normative Public Finance to Offer a Positive Theory of Environmental Federalization*

While it begins from a presumption in favor of regulatory decentralization, the economic theory of fiscal federalism thus ends up providing a theoretical justification for centralization as a corrective for what seems to be inevitable state regulatory failure. In this, its impact on environmental law scholarship has been all too great. From the theoretical demonstration that interstate externalities and the race-to-the-bottom may make decentralized environmental regulation inefficient, generations of environmental law scholars have come to routinely assume that state regulatory failure was the reason why federal environmental regulation expanded so greatly during the late twentieth century.²¹ Such scholars take it as a matter of faith that federal legislation of the 1970–1980 Environmentalist era, such as the Clean Water Act and Clean Air Act, were made necessary by the failure of the states to do anything about pollution.²² The standard story is that sometime around the first Earth Day in 1970, there was a great awakening of American environmental consciousness, leading

20. See Ben Lockwood, *The Political Economy of Decentralization*, in HANDBOOK OF FISCAL FEDERALISM 33 (Ehtisham Ahmad & Grigorio Brosio eds., 2006).

21. See John P. Dwyer, *The Practice of Federalism Under the Clean Air Act*, 54 MD. L. REV. 1183, 1221–22 (1995) [hereinafter Dwyer, *Practice of Federalism*] (asserting that by 1970, the states had “done little to address the worsening air pollution problem,” and “most states could not be relied upon to establish an adequate environmental policy”). John P. Dwyer argues that:

Even without interstate competition for business, states may have been unreasonably biased against environmental protection. State and local officials may have been unduly sensitive . . . to the relatively concrete, immediate costs of federal regulation and foregone development, and indifferent to the value of the highly diffuse, amorphous, future benefits of environmental regulation.

Id. at 1222 (footnote omitted); See also John P. Dwyer, *The Role of State Law in an Era of Federal Preemption: Lessons from Environmental Regulation*, 60 LAW & CONTEMP. PROBS. 203, 224 (1997) [hereinafter Dwyer, *Lessons*] (“Although they had two decades to address the growing seriousness of environmental problems, states did virtually nothing. Various failed efforts to get states to set and enforce air and water pollution standards convinced federal policy makers in the early 1970s that the only viable solution was federal regulation.”).

22. See Dwyer, *Lessons*, *supra* note 21, at 224; Dwyer, *Practice of Federalism*, *supra* note 21, at 1221–22.

to federal environmental regulation that led to something finally being done about the pollution problem.

For the theoretical explanation for the presumed failure of State regulation, environmental scholars typically look to the two stories supplied by the theory of fiscal federalism: the “race to the bottom” and interstate externalities. On the race-to-the-bottom story, federal environmental legislation emerges as a solution to a nationally disastrous competition among the states for mobile capital and the jobs and taxes it brings. Hence, on that story, one ought to observe the federal environmental regulation arose after States began to weaken their environmental regulations in response to increased interstate capital mobility. On the interstate externalities story, the push for federal environmental regulation should have coincided with an increasing awareness by voters of the extent to which pollution in one state spilled over into other states, and with the failure of states to cooperate via interstate compacts and other arrangements to do anything about such spillovers.

When environmental law scholars have actually looked closely at federal regulatory legislation, they been appalled by the divergence between what public finance theory says should happen and what Congress has actually done. In what remains perhaps the most brilliant work on the political economy of federal environmental regulation, Bruce Ackerman and William Hassler’s *Clean Coal/Dirty Air*, the authors describe in considerable detail how a coalition between environmentalists and Eastern coal industry interests succeeded in amending the Clean Air Act in 1977 to require the use of scrubber technology and high sulfur Eastern coal.²³ This amendment did little or nothing about the problem of sulfur-dioxide pollution that it was ostensibly designed to solve.²⁴ Committed to the social welfare vision of federal environmental legislation as the solution to externalities problems that the states either couldn’t or wouldn’t address, Ackerman and Hassler spend most of *Clean Coal/Dirty Air* developing an almost desperate ad hoc explanation for how Congress could have gone so badly and terribly wrong. In the end, the most striking thing about *Clean Coal/Dirty Air* is not its wonderful description of the politics driving the 1977 sulfur-dioxide amendments, but its revelation of the utter explanatory failure of the existing public finance-inspired paradigm within which federal environmental regulation has come to be understood.

23. BRUCE A. ACKERMAN & WILLIAM T. HASSLER, CLEAN COAL/DIRTY AIR: OR HOW THE CLEAN AIR BECAME A MULTIBILLION-DOLLAR BAIL-OUT FOR HIGH-SULFUR COAL PRODUCERS AND WHAT SHOULD BE DONE ABOUT IT 36–38, 55–56 (1981).

24. *Id.* at 59–78.

Over the last several decades, there has been growing awareness of both the theoretical problems with the existing public finance-inspired account for federal environmental regulation²⁵ and of the striking divorce between the theoretical objective behind federal environmental law and what it has actually accomplished.²⁶ Whatever its value as a general normative guide, the theory of optimal regulatory decentralization has failed as a positive theory explaining American environmental regulatory centralization.

II. SETTING THE STAGE: AMERICAN DEVELOPMENT AND THE DEMAND FOR ENVIRONMENTAL IMPROVEMENT, CIRCA 1970

The great wave of federal environmental legislation passed during the 1970s brought very concrete and sizeable benefits to certain clearly identified States and regions.²⁷ The basic structure of a federal

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25. There are two strands in the literature. Very early on, law and economics critics pointed out that the basic lesson from the economic theory of fiscal federalism was not the decentralization did not work, but that it was presumptively superior given heterogeneous jurisdictions. See Bruce A. Ackerman & Richard B. Stewart, Comment, *Reforming Environmental Law*, 37 STAN. L. REV. 1333, 1355–59 (1985); James E. Krier, Commentary, *The Irrational National Air Quality Standards: Macro- and Micro-Mistakes*, 22 UCLA L. REV. 323, 324–35 (1974). As is typical of general equilibrium models in public finance, all sorts of results—including too much local environmental protection and too little—are generated when different subsets of these assumptions are relaxed. See BAYINDIR-UPMANN, *supra* note 18; Levinson, *supra* note 18, at 359–60; Wilson, *supra* note 18, at 405. The possibility that States might have overly lax environmental regulations in order to attract capital and the jobs and revenues it brings is really just a particular instance of the more general problem that jurisdictions might undersupply costly local public goods in order to keep taxes low. Again, virtually any result is possible depending upon the model's underlying assumptions. See Wildasin, *supra* note 18, at 237; WELLISCH, *supra* note 18, at 58–87.
26. As observed by Jonathan H. Adler, and as detailed below, perhaps the greatest disjunction between the public finance theory and legislative reality is that the federal environmental laws addressed almost entirely local, rather than interstate problems. Jonathan H. Adler, *Jurisdictional Mismatch in Environmental Federalism*, 14 N.Y.U. ENVTL. L.J. 130 (2005). The 1970 Clean Air Act did not address interstate air pollution, and although the 1977 Act did, the provisions it contained were weak and proved ineffective. Dwyer, *Practice of Federalism*, *supra* note 21, at 1220. For one of the most powerful critique of the Clean Air Act's failure to effectively regulate interstate air pollution, see Richard L. Revesz, *Federalism and Interstate Environmental Externalities*, 144 U. PA. L. REV. 2341, 2346 (1996) (arguing that rather than regulating air pollution, the Clean Air Act's inability to control interstate externalities may have exacerbated air pollution).
27. What remains the classic public choice analysis of how such geographic redistribution motivated federal environmental laws is B. Peter

legislature whose members represent geographic (rather than functional or industry) voting units makes it exceptionally responsive to such geographically targeted benefits.²⁸ Federal environmental legislation arose when and because the relatively concentrated costs of economic development in older, more heavily developed parts of the country created overwhelming support for environmental cleanup there and for the preservation of relatively pristine, undeveloped natural environments in newer, less heavily developed parts of the country. Its success was neither puzzling nor paradoxical, but rather the logically inevitable result of the political incentives for federalization created by regionally divergent paths of economic development and environmental degradation.

On this theory, rather than solving a problem of too much competition among the states for mobile capital, or uncontrolled interstate externalities, environmental centralization occurs in order to prevent capital from moving to the relatively clean air and water, and cheap land and labor found in relatively undeveloped regions of the country. Rather than stopping locally undesirable interstate regulatory competition, federal environmental laws prevent locally beneficial interstate economic competition. Likewise, whereas the interstate externality story centers on physical spillovers of pollution across state borders, my account clarifies that whether there are physical externalities or not is really irrelevant.

This theory explains both successful and failed attempts at environmental federalization. In the case of the Clean Air Act, representatives of older and more industrialized states supported federal minimum pollution reduction standards because they believed that those standards were necessary to enable their states to reduce pollution without losing too many factories to newer, less polluted parts of the country. Such centralized minimum environmental standards are a form of economic protectionism, and are locally

Pashigian's study of the Clean Air Act's Prevention of Significant Deterioration Program. See B. Peter Pashigian, *Environmental Regulation: Whose Self-Interests Are Being Protected?*, 23 *ECON. INQUIRY* 551 (1985) (discussing the self-interest hypothesis and other hypotheses to explain votes on the PSD policy). I discuss the distributional politics of the PSD program *infra* text at notes 237–238.

28. Work in empirical political science that has looked at legislative role call voting (as opposed to various indices of legislative positions on particular issues) has found that constituent preferences explain a large and increasing fraction of such votes: that is, legislators from geographic districts represent the preferences of their constituents on virtually all important legislation. See James M. Snyder Jr., *Constituency Preferences: California Ballot Propositions, 1974–90*, 21 *LEGIS. STUD. Q.* 463, 477–81 (1996) (finding constituency preferences are better than party preferences for predicting votes on public goods and regulation issues).

counter-majoritarian, in that they override median voter preferences in lesser-developed jurisdictions. Still, the Clean Air Act succeeded because representatives from older, dirtier parts of the country were a majority in Congress.

The Clean Water Act was another successful attempt at environmental federalization. Unlike the Clean Air Act—key provisions of which were opposed by members of Congress from newer and cleaner states—the Clean Water Act’s key provisions—creating a federal subsidy for new and improved local sewer systems—received universal Congressional support. Those subsidies were a form of political pork, representing a transfer from residents of less industrialized localities to cities that had already developed or which were more rapidly developing polluting industries.

Finally, the history of failed Congressional attempts to enact a federal climate change statute clearly illustrates how when states have diverged significantly—in the case of climate change, in their predominant energy source for electricity generation and therefore level of carbon-dioxide emissions—the variation may be so great as to preclude any general federal regulatory statute from being enacted.

A. *American Regional Economic Development,
and Environmental Regulation, Circa 1970*

1. The Undeveloped, Unpolluted and Accessible South and West

One of the most remarkable features of American legal scholarship about federalism is the certainty with which scholars assert that the United States is really just one big vast homogeneous blob, with few if any significant regional differences.²⁹ However debatable today, this belief was simply incorrect for most of the twentieth century. By 1970, the United States looked very much like a simple two-jurisdiction world with one jurisdiction very highly developed and environmentally degraded, the other relatively little developed with a vast supply of pristine (and cheap) natural resources, and with the two jurisdictions finally linked by a new, very low cost means of mass transportation, the interstate highway system.

Legal scholars seem to forget how much America changed after World War II. Over the period 1939–1964, total U.S. manufacturing employment increased by sixty-nine percent, and even in 1953—after Japan and Europe were well along the route to recovering from the destruction of World War II—the United States accounted for fifty percent of the world’s manufacturing production.³⁰ Although the

29. See Edward L. Rubin & Malcolm Feeley, *Federalism: Some Notes on a National Neurosis*, 41 UCLA L. REV. 903, 944 (1994) (distinguishing the individual states in the United States from Catalonia in Spain).

30. Paul Bairoch, *International Industrialization Levels from 1750 to 1980*, 11. J. EURO. ECON. HIST. 269, 299 (1982).

largest percentage increases in manufacturing employment during this period occurred in Texas, California, and Florida,³¹ the largest absolute increases were concentrated in the region stretching from New York, across Pennsylvania, to the Great Lakes states.³²

Along with a massive increase in the level of manufacturing came a change in its location. Unprecedented migration decreased farm population from thirty million people, or twenty-three percent of the national population, in 1940, to roughly ten million people, or less than five percent of the national population in 1970.³³ This migration was primarily from the farm to the suburb. A 1946–47 Bureau of Labor Statistics report found that in the six metropolitan regions surveyed, suburbs accounted for sixty-two percent of construction while the national suburban growth rate was ten times that of central cities by 1950.³⁴ Manufacturing, which even in the early twentieth century had been concentrated in urban areas proximate to rail lines and/or shipping ports,³⁵ became increasingly dispersed. By 1963, industrial employment was more than half suburban-based, and by 1981, two-thirds of all manufacturing activity took place in suburban industrial parks of the suburbs.³⁶

As late as 1965, American industrial growth was concentrated in newer suburban areas in the old industrial heartland of the country, the upper Midwest and Northeast. The Southern and Western regions of the country remained relatively undeveloped. Between 1940 and 1960, population density increased in every part of the country, but by far the largest increases in density were in the developed Northeast and Midwest. Aside from Florida, Georgia, and Texas, the Southern states had small absolute increases in density, and some states, such as West Virginia and Mississippi actually lost population.³⁷ Even

31. See GUNNAR ALEXANDERSSON, *GEOGRAPHY OF MANUFACTURING* 24 (1967) (with increases of, respectively, 268, 192, and 225%).

32. *Id.* These states thus increased what had been position of regional dominance in manufacturing; as late as 1937, seventy-two percent of all manufacturing in the United States came from the seventeen Northeastern and Midwestern states. BERNARD L. WEINSTEIN & ROBERT F. FIRESTINE, *REGIONAL GROWTH AND DECLINE IN THE UNITED STATES: THE RISE OF THE SUNBELT STATE AND THE DECLINE OF THE NORTHEAST* 58 (1978).

33. DAVID B. DANBOM, *BORN IN THE COUNTRY: A HISTORY OF RURAL AMERICA* 245 (2d ed. 2006).

34. KENNETH T. JACKSON, *CRABGRASS FRONTIER: THE SUBURBANIZATION OF THE UNITED STATES* 238 (1985).

35. *Id.* at 113.

36. *Id.* at 267.

37. U.S. CENSUS BUREAU, DEP'T OF COMMERCE, *STATISTICAL ABSTRACT OF THE UNITED STATES: 1981*, at 10–11 tbl.9 (1981).

though inland Western states added postwar population at a tremendous rate, they remained far less densely developed than the older Northeastern and Midwestern states.³⁸ As late as 1970, when the population of every Northeastern and Midwestern state was heavily concentrated in urban versus rural areas, many Southern states had as many or more people living in rural areas than in urban areas.³⁹

The South is especially important in understanding regional development patterns as they existed around 1970.⁴⁰ With the exception of Florida and Texas, southern manufacturing employment was concentrated in labor-intensive, low wage industries. Indeed, even in 1977, one of the dominant Southern industries, apparel, paid the lowest hourly wage of any of the SIC two-digit industry categories (another regionally important industry, textile, was third lowest at \$4.07).⁴¹ In the South, such low wage industries were the norm, not the exception. Importantly, throughout the early post-war period, Southern wages and incomes continued the long historical pattern of lagging far behind national averages.⁴² In areas where low wage industries such as textiles and lumber dominated—as in east Tennessee—wage differentials between Southern and Northern workers were actually increasing: in eighteen east Tennessee counties, “average annual wages fell from eighty to seventy-seven percent of the national average between 1958 and 1963.”⁴³

38. In 1960, for instance, the most densely developed mountain states of Colorado and Arizona had population densities of only approximately seventeen and eleven persons per square mile, respectively, while the least developed Rust Belt states of Wisconsin and Indiana stood at seventy-three and 180 persons per square mile. *Id.*

39. In 1970, both North and South Carolina had more rural than urban residents. *See* U.S. CENSUS BUREAU, U.S. DEP'T. OF COMMERCE, HISTORICAL STATISTICS OF THE UNITED STATES, COLONIAL TIMES TO 1970, Part I, at 32, 35 (Bicentennial ed., 1975).

40. The great surge in Western economic development did not occur until the 1990s, and in many ways, Western economic development differs from Southern economic development. The inland West has traditionally had a heavy concentration of immobile extractive industries such as mining and timber, and the coastal West developed virtually as a separate economic market centered around California until well after World War II. *See* Carol E. Heim, *Structural Changes: Regional and Urban*, in III THE CAMBRIDGE ECONOMIC HISTORY OF THE UNITED STATES: THE TWENTIETH CENTURY 93, 99–100, 127–28, 154–55 (Stanley L. Engerman & Robert E. Gallman eds., 2000).

41. *Id.*

42. *Id.* at 114–15.

43. JAMES C. COBB, THE SELLING OF THE SOUTH: THE SOUTHERN CRUSADE FOR INDUSTRIAL DEVELOPMENT, 1936–1990, at 114 (2d ed. 1993).

Despite its advantages in attracting labor-intensive industry, the South actually lost population throughout the 1950s and 1960s. By the early 1970s, however, these trends were in the process of dramatic reversal. The economies of the Southern states had begun the famous “sunbelt” take off. These states had a net gain from migration of 2.9 million between 1970 and 1976,⁴⁴ and during the early 1970s, grew by 5.1 million persons, more than the rest of the country combined (with more than one and one half times as many migrants as even the rapidly growing West).⁴⁵ The extent of the regional redistribution is demonstrated by the fact that between 1967 and 1977, the New England, mid-Atlantic, and Great Lakes states all lost manufacturing jobs, with New York and Pennsylvania experiencing declines of more than fifteen percent. During that same period, the Southwest and Mountain states all saw manufacturing employment increase by more than fifteen percent, and manufacturing continued to shift to Texas, Florida, and California, despite already high levels.⁴⁶ During the 1970s, Texas alone added more non-farm jobs than Michigan, Illinois, Ohio, and Massachusetts combined.⁴⁷ Between 1970 and 1975, every southern industry except mining grew faster than the national average.⁴⁸

On the one hand, because it was relatively undeveloped, the South offered industries cheap land, labor and raw materials. Southern states and localities aggressively marketed their abundant and largely unused supply of water and land, a message conveyed by an Orlando, Florida advertisement captioning a healthy orange with the assurance that “there’s profitable growing room in Orlando.”⁴⁹ Petrochemical companies consistently identified the existence of raw materials and cheap barge transportation for access to foreign markets as the key reason for opening new operations in the South and Southwest.⁵⁰ In 1969, for instance, BASF announced that it had chosen to locate a new \$100 million petrochemical plant in Beaufort,

44. *Id.* at 188.

45. WEINSTEIN & FIRESTINE, *supra* note 32, at 3.

46. H.D. WATTS, *INDUSTRIAL GEOGRAPHY* 4 fig.1.3 (1987).

47. JAMES C. COBB, *INDUSTRIALIZATION AND SOUTHERN SOCIETY, 1877–1984*, at 57 (1984).

48. COBB, *supra* note 43, at 188; WEINSTEIN & FIRESTINE, *supra* note 32, at 5. The South received more than half of all new manufacturing jobs created between 1962 and 1978, and although manufacturing decentralized to suburban rings in the South and West, unlike their Northern counterparts, Southern and Western cities actually gained manufacturing jobs in their central cities between 1947 and 1972. Heim, *supra* note 40, at 155.

49. COBB, *supra* note 43, at 93 (internal quotation marks omitted).

50. *Id.* at 213.

South Carolina, because Beaufort offered both cheap land (1800 acres, much of it state-owned) and the five million gallons of fresh water that the plant would need each day.⁵¹

The same was true in the pulp and paper industry. After World War II, pulp and paper production in the Southeastern states skyrocketed, increasing from 2.7 million cords in 1939 to 7.7 million cords in 1951, and by 1956 had almost overtaken cotton growing as the most important Southern industry.⁵² As one industry observer explained:

The whole thing boils down pretty much to wood supply and the costs involved. . . . The South can't be beaten now. . . . [T]he motorized small saws work like a charm, and . . . the country is so flat that [the mills] can be moved about. The saws will work in the north too, but here production per man can never be so great as in the South because of the more difficult terrain. The same thing is going to hurt the West in second growth, too.⁵³

More generally, as the Japanese consul general in Atlanta explained, “[o]lder industries like textiles are being phased out in Japan and exported to other countries. . . . We will put these high-pollution industries where there is space and water enough to handle them . . . like here in the South.”⁵⁴

Even given the huge differences in the cost of land, labor and energy, the late 1960s incentive for industrial relocation to the relatively undeveloped Southern and Western regions of the United States would not have been nearly as strong were it not for the interstate highway system. Authorized in 1956 at an original price tag of twenty-six billion dollars (ninety percent of which would be paid by the federal government), by the early 1970s the 41,000 mile Interstate system was finally nearing completion.⁵⁵ The Interstate system completely altered industrial transportation cost structure. Small towns that had been far from rail heads got freeway interchanges and became for the first time truly part of the interstate and international market. The trucking industry exploded, with goods shipped by truck

51. *Id.* at 240.

52. DAVID C. SMITH, HISTORY OF PAPERMAKING IN THE UNITED STATES (1691–1969) 419 (1971).

53. *Id.* at 549 (citation omitted) (internal quotation marks omitted).

54. COBB, *supra* note 43, at 242 (internal quotation marks omitted).

55. On the ultimately successful political battle for the interstate system, see generally MARK H. ROSE, INTERSTATE: EXPRESS HIGHWAY POLITICS, 1939–1989, at 69–100 (rev. ed. 1990) (discussing the political battle to create American highways during the Eisenhower era).

increasing by 257% between 1955 and 1990.⁵⁶ By 1970, it had become possible to ship goods five hundred miles overnight by truck, and over fifty percent of truck traffic was on the interstates.⁵⁷ The transportation revolution brought by the Interstate had a dramatic effect on development patterns and population distribution. During the 1950s, a net of five million people left non-metropolitan areas, a trend that was especially pronounced in the South, where the mechanization of cotton harvesting and the consequent end of the sharecropper system generated a huge migration to Northern cities of the rural poor.⁵⁸ Outmigration from rural areas began to diminish during the 1960s, but it was not until the 1970–1973 period that population growth in rural counties actually exceeded the growth in urban and suburban counties.⁵⁹ For the first time in the twentieth century, population in rural areas lying outside Census-defined metropolitan areas grew faster than population in metro areas.⁶⁰ Significantly, the greatest shift in population trends occurred in the most rural counties, those that were adjacent to metropolitan areas.⁶¹

Economic incentives for industrial relocation were not the only force driving the accelerating development of the Southern and Western United States. By the late 1960s, the United States had achieved an unprecedented level of mass affluence. Affluence vastly increased the demand for local environmental quality and distant undeveloped natural resources. The ninety-one percent growth in population in the Western states over the 1950–1976 period was the largest for any region of the country.⁶² In Florida (whose 1970s population increase of 1.6 million was bigger than the growth of the twenty-one Northeastern and North-central rust-belt states combined)⁶³ growth was fueled initially by tourism, aerospace, and the relocation of northern retirees.⁶⁴ With rapidly increasing energy and commodity prices, the cost of living advantage of Sunbelt states

56. TOM LEWIS, *DIVIDED HIGHWAYS: BUILDING THE INTERSTATE HIGHWAYS, TRANSFORMING AMERICAN LIFE* 286 (Cornell Paperbacks 2013) (1997).

57. *Id.* at 286–87.

58. CALVIN L. BEALE, *ECON. RES. SERV. ERS-605, THE REVIVAL OF POPULATION GROWTH IN NONMETROPOLITAN AMERICA* 4 (1975).

59. *Id.* at 6.

60. *Id.* Urban centers with more than fifty-thousand people were considered metro areas. *Id.* at 6 n.2.

61. *Id.* at 7.

62. WEINSTEIN & FIRESTINE, *supra* note 32, at 3 tbl.1.1.

63. COBB, *supra* note 47, at 55.

64. *Id.* at 53–56.

became even larger than its already large historical level.⁶⁵ While inherently difficult to measure, surveys around this time consistently showed that the “amenities [quality of life] of the rapidly growing southern and western regions—less environmental degradation, lower population densities, more moderate climates, ease of transportation, access to recreational activities, lower crime rates” were a major attraction both to a burgeoning retirement-age population and younger families.⁶⁶

These stylized facts are crucial in understanding the forces behind environmental federalization in the United States. Federal environmental legislation was passed just as the great takeoff in Southern and Western economic development was beginning, years *before* increases in wealth, income and development increased the demand for local environmental amenities there. As historian James Cobb observes, even in the 1970s, there remained in the South “sparsely populated rural areas where industrial activity was at a minimum. Pollution hardly seemed a problem in such locales where citizens were considerably more interested in jobs and a better standard of living than in the pristine quality of air and water, which they took for granted.”⁶⁷ Employers, employees, and retirees were all racing south and west during the late 1960s, but they were doing so because the Southern and Western states offered a low cost, relatively pristine and undeveloped natural environment. Even as Environmentalism gathered federal momentum, the Southern states continued to furiously compete for capital by exempting new industry from state and local taxes⁶⁸ and remained more interested in recruiting industry than in cleaning up the environment.⁶⁹

The Southern and Western states were competing to attract business through tax breaks, but they were not caught in some kind of downward regulatory spiral. Indeed, as development in the West and South caught up with development in the Northeast and Midwest, the demand for environmental quality and resource preservation grew also. For instance, Southern states made up twelve of the top twenty-five states in the National Wildlife Federation’s

65. *Id.* at 56–57.

66. Bernard L. Weinstein & John Rees, *Sunbelt/Frostbelt Confrontation?*, in *PLANT CLOSINGS: PUBLIC OR PRIVATE CHOICES?* 193, 200–01 (Richard B. McKenzie ed., rev. ed. 1984).

67. COBB, *supra* note 43, at 243.

68. Indeed, five of the seven most aggressive states in granting such exemptions were located in the South, and by the mid-1960s, Alabama, Mississippi, and Louisiana were offering ten-year exemptions on all state and local taxes, while South Carolina and Kentucky were offering five-year exemptions on local taxes. *Id.* at 48.

69. *Id.* at 238.

1979 ranking of state hazardous waste regulatory stringency.⁷⁰ The most significant variable explaining the variation across the states in the intensity of state hazardous waste regulation was the level of state industrialization.⁷¹

Work by Arik Levinson provides even more compelling evidence for the model of anticompetitive federal mandates.⁷² Commerce Department data on industry pollution abatement costs are a widely used measure of state environmental compliance costs and regulatory stringency. Levinson found that the ranking of state environmental regulatory stringency over the 1977–1994 period changed radically when abatement cost data were adjusted to control for the pollution intensity of each industry. Given their concentration of heavy polluting industry, rust-belt states such as Delaware, New Jersey, Pennsylvania, and Ohio were much more lenient than the raw abatement cost numbers would imply. By the same token, Western clean-industry states—such as Arizona, Colorado, Idaho, New Mexico, and Oregon—had very stringent environmental standards.⁷³

2. The Environmental Kuznets Curve Confirmed: Development and the Demand for Local Environmental Protection in Older America

Throughout history, wealth accumulated from early development has increased leisure time and stimulated a new sort of demand among residents of developed communities jurisdiction: the demand for natural recreational opportunities and for a cleaner local environment.⁷⁴ While there are a variety of factors that explain local demand for environmental quality,⁷⁵ there is now strong empirical

70. See James P. Lester et. al., *Hazardous Wastes, Politics, and Public Policy: A Comparative State Analysis*, 36 W. POL. Q. 257, 268 tbl.1 (1983).

71. *Id.* at 269 tbl.2.

72. Arik Levinson, *An Industry-Adjusted Index of State Environmental Compliance Costs*, in BEHAVIORAL AND DISTRIBUTIONAL EFFECTS OF ENVIRONMENTAL POLICY 131 (Carlo Carraro & Gilbert E. Metcalf eds., 2001).

73. *Id.* at 134–39.

74. For a general discussion, see JOHN TOWNER, AN HISTORICAL GEOGRAPHY OF RECREATION AND TOURISM IN THE WESTERN WORLD, 1540–1940 (1996) (discussing the roles of recreation and tourism on land use across time and place), and on the America “city beautiful” movement, an early twentieth century manifestation of this phenomenon, see MARTIN V. MELOSI, GARBAGE IN THE CITIES: REFUSE, REFORM, AND THE ENVIRONMENT, 1880–1980, at 110–12 (1981).

75. For an early discussion of which factors seem to explain environmental preferences, see Kent D. Van Liere & Riley E. Dunlap, *The Social Bases*

evidence that as wealth and income increase, so too does a person's demand for local environmental quality.⁷⁶ At the country level, there has been repeated confirmation of an inverted U-shaped relationship between a country's per capita income and its environmental quality:⁷⁷ as national income increases, the level of conventional pollutants increases, but then, as income continues to increase, pollution falls. While there are clearly both demand and supply (technological) considerations at work in causing this relationship, its existence is well established.⁷⁸

of Environmental Concern: A Review of Hypotheses, Explanations and Empirical Evidence, 44 PUB. OP. Q. 181 (1980).

76. For empirical evidence supporting this assumption, see Robert Deacon & Perry Shapiro, *Private Preference for Collective Goods Revealed Through Voting on Referenda*, 65 AM. ECON. REV. 943 (1975) (finding that income, along with occupation, political preference, education, and location, was an important factor in voting for environmental equality); Mary E. Deily & Wayne B. Gray, *Enforcement of Pollution Regulations in a Declining Industry*, 21 J. ENVTL. ECON. & MGMT. 260, 267–69 (1991) (determining that EPA enforcement is less likely as the plant employs more of the community and enforcement increases the risk of plant closure by more than ten percent); William A. Fischel, *Determinants of Voting on Environmental Quality: A Study of New Hampshire Pulp Mill Referendum*, 6 J. ENVTL. ECON. & MGMT. 107, 115 (1979) (using a survey of individual voter responses to find “income, occupation, and education are rather robust determinants of preferences about environmental equality”); Matthew E. Kahn & John G. Matsusaka, *Demand for Environmental Goods: Evidence from Voting Patterns on California Initiatives*, 40 J.L. & ECON. 137 (1997) (finding demand for environmental goods increases with income except for the demand from the highest income levels).
77. There has been repeated confirmation of the observation that the level of some important pollutants follows an inverted U-shaped pattern relative to national per capita income. See, e.g., SANDER M. DE BRUYN, *ECONOMIC GROWTH AND THE ENVIRONMENT: AN EMPIRICAL ANALYSIS* 77–98 (2000); Gene M. Grossman & Alan B. Krueger, *Economic Growth and the Environment*, 110 Q.J. ECON. 353 (1995); F.G. Hank Hilton & Arik Levinson, *Factoring the Environmental Kuznets Curve: Evidence from Automotive Lead Emissions*, 35 J. ENVTL. ECON. & MGMT. 126, 136 fig.3 (1998); Thomas M. Selden & Daqing Song, *Environmental Quality and Development: Is There a Kuznets Curve for Air Pollution Emissions?*, 27 J. ENVTL. ECON. & MGMT. 147 (1994); Thomas M. Seldon & Daqing Song, *Neoclassical Growth, the J Curve for Abatement, and the Inverted U Curve for Pollution*, 29 J. ENVTL. ECON. & MGMT. 162, 165–67 (1995).
78. For the general notion that the more or less natural process of national economic growth involves a progression from clean self-sustaining economies through dirty industrialization to a clean post-industrial stage, see Kenneth Arrow et al., *Economic Growth, Carrying Capacity, and the Environment*, 268 SCIENCE 520 (1995). James Andreoni and Arik Levinson showed that when there are economies of scale in abating pollution generated as an undesirable by-product of producing private

B. Air Pollution Circa 1970: Effective State and Local Regulation

The environmental Kuznets curve suggests that the radically different levels of economic development and environmental degradation in various American regions circa 1970 should have led to radically different levels of demand for environmental regulation. As of 1970, the majority of states did not even *have* a generalized air pollution problem for which a comprehensive state program made sense.⁷⁹ But, crucially, those states that did have a problem were doing something about it.

1. Effective Local Regulation to Curb the Black
Carbon (Coal Smoke) Problem

During the early twentieth century, the major air pollution problem confronting large American cities was the smoke from coal burned in residential and industrial uses. The problem appeared in those cities that relied upon dirty bituminous coal, such as St. Louis (which burned cheap but highly impure coal mined from southern Illinois)⁸⁰ and Pittsburgh (burning local southwestern Pennsylvania coal).⁸¹ Thirty or forty years ago, historians and political scientists were quick to conclude that these cities had very little success in dealing with their smoke problem.⁸²

More recent work reveals to the contrary a history of active and ultimately effective local regulation to reduce smoke.⁸³ Antismoke activism in cities such as Chicago, Cincinnati, Cleveland, St. Louis,

consumption goods, increases in income will alone eventually generate a demand for higher levels of abatement and less pollution. James Andreoni & Arik Levinson, *The Simple Analytics of the Environmental Kuznets Curve*, 80 J. PUB. ECON. 269, 279–81 (2001). Still there remains some dispute in the literature as to the theoretical explanation for why the environmental Kuznets curve exists. For a survey, see Masashi Kijima, Katsumasa Nishide & Atsuyuki Ohyama, *Economic Models for the Environmental Kuznets Curve: A Survey*, 34 J. ECON. DYNAMICS & CONTROL 1187 (2010).

79. This is clearly demonstrated by INDUR GOKLANY, *CLEARING THE AIR: THE REAL STORY OF THE WAR ON AIR POLLUTION* 27–29 (1999).
80. R. Dale Grinder, *The Battle for Clean Air: The Smoke Problem in Post-Civil War America*, in *POLLUTION AND REFORM IN AMERICAN CITIES, 1870–1930*, at 83, 100–01 (Martin V. Melosi ed., 1980).
81. CHARLES O. JONES, *CLEAN AIR: THE POLICIES AND POLITICS OF POLLUTION CONTROL* 22 (1975).
82. See, e.g., J. CLARENCE DAVIES III, *THE POLITICS OF POLLUTION* 128 (1970); JONES, *supra* note 81, at 23–35; Grinder, *supra* note 80, at 100–01.
83. See generally DAVID STRADLING, *SMOKESTACKS AND PROGRESSIVES: ENVIRONMENTALISTS, ENGINEERS, AND AIR QUALITY IN AMERICA, 1881–1951* (1999).

and Pittsburgh was a constant during the early twentieth century.⁸⁴ By the mid-twentieth century, such local activism had produced clear positive results. Despite continuing opposition from the producers of high sulfur (or soft) coal, by 1946, St. Louis, Pittsburgh, and Cincinnati had all passed ordinances requiring the use of either clean (low sulfur and fly ash) coal or mechanical stokers.⁸⁵ Studies by independent bodies showed that the ordinances produced dramatic reductions in soot fall (Cincinnati)⁸⁶ and periods of thick smoke (St. Louis).⁸⁷ Even in cities where lobbying and public relations efforts by soft coal producers and coal-bearing railroads kept high-volatile coal (soft coal) in use in a number of cities (such as Cleveland, Philadelphia, and Providence),⁸⁸ smoke was eventually made subject to local regulation.⁸⁹ More municipalities passed air-pollution-control ordinances during the 1940s than during any other decade between 1880 and 1980.⁹⁰ Along with a shift away from coal and toward other heating fuels, such as oil and natural gas, by the early 1950s, local regulation had effectively ended the problem of smoke pollution in American cities.⁹¹

A constant theme in local efforts to curb the smoke problem was the race-to-the-top rationale. Reacting to a large increase in soot between 1936 and 1947 as a consequence of its shift from bituminous to anthracite coal, New York City activists and political leaders argued in the late 1940s that New York should not be left behind Pittsburgh and St. Louis.⁹² Arguments in Pittsburgh centered not only around smoke's health and cleanliness effects, but also how these led to the residential exodus to the suburbs.⁹³ Rather than competing to cut smoke regulation, cities hurried to match the dramatic reductions achieved elsewhere.

84. *Id.* at 37–151.

85. *Id.* at 163–75.

86. The Smoke Abatement League found that during the first eight years of Cincinnati's ordinance restricting high-volatile coal, there was fifty percent less soot fall in Cincinnati. *Id.* at 175.

87. *See id.* at 167 (reporting an 83.5% reduction in hours of thick smoke from the previous year in St. Louis).

88. *Id.* at 174.

89. *See id.* at 179–80 (noting Cleveland's decision to reorganize its regulators and to form the Division of Air Pollution Control in lieu of adopting new regulations).

90. Arthur C. Stern, *History of Air Pollution Legislation in the United States*, 32 J. AIR POLLUTION CONTROL ASS'N. 44, 47 (1982).

91. *See* GOKLANY, *supra* note 79, at 21.

92. STRADLING, *supra* note 83, at 178.

93. *Id.* at 169.

2. State and Local Responses to Sulfur Dioxide and Smog Pollution

By the 1950s, the air pollution problem was perceived not as smoke but “smog.” By the end of the 1940s, journalistic accounts increasingly portrayed the health effects of chemical fumes as problem with national scope, from the “nauseating gases” from the San Francisco bay area oil refineries to the “sickening odor of oil or gas” in New Orleans.⁹⁴ A highly publicized incident of toxic smog on Halloween, 1948 in Donora, Pennsylvania, that left nineteen people dead from asphyxiation was ascribed to emissions from a local zinc smelting plant.⁹⁵

Cities and localities reacted to the new industrial air pollution problem in ways that were rational and, given the state of knowledge regarding the various causes of air pollution, relatively effective. The fact that air pollution spilled over across the separate political jurisdictions making up industrial metropolitan areas was clearly recognized by local government, and by 1965, half of all local air control programs had jurisdiction over an entire county or several counties.⁹⁶ Moreover, recognizing that the urban air pollution problem was a health problem, over eighty percent of the local air pollution control agencies created between 1961 and 1965 were placed within health departments.⁹⁷ During the 1960s, a number of cities and counties enacted stringent air pollution emissions ordinances.⁹⁸ And, as was often the case, when highly developed urban population centers within a state that had acted locally to control pollution also had majoritarian control at the centralized (state level), they pushed for state standards to complement local regulations. In Pennsylvania, for instance, the state Air Pollution Control Commission, chaired by a Bethlehem Steel official, recommended a very lax state sulfur dioxide standard of 100 $\mu\text{g}/\text{m}^3$. Public meetings in Pittsburgh and Philadelphia generated widespread public support for a stricter standard; support also came from the United Steelworkers, the congressman from the Pittsburgh steel area, and the governor of Pennsylvania.⁹⁹ In New York City, the adverse health effects of sulfur dioxide emissions from coal combustion led the City Council in 1965

94. *Id.* at 188 (internal quotation marks omitted).

95. Lynne Page Snyder, “The Death-Dealing Smog Over Donora, Pennsylvania”: Industrial Air Pollution, Public Health, and Federal Policy, 1915–1963, at 20–30 (1994) (unpublished Ph.D. dissertation, University of Pennsylvania).

96. DAVIES, *supra* note 82, at 128.

97. *Id.*

98. SAMUEL P. HAYS, *The Politics of Environmental Administration, in EXPLORATIONS IN ENVIRONMENTAL HISTORY* 418, 438–39 (1998).

99. *Id.* at 439.

to pass an ordinance with a five-year schedule for reducing sulfur emissions.¹⁰⁰ The next year, the states of New York, New Jersey, Pennsylvania, and Connecticut all announced a plan to combat air pollution from coal.¹⁰¹ In 1967, the Secretary of HEW reported that virtually all American cities had unhealthy levels of sulfur dioxide and recommended reducing reliance on soft coal.¹⁰² The threat of increasingly strict regulation in the older, developed Northeastern states caused the coal industry coalition—especially coal users—to revise their traditional opposition to federal regulation. As Fred Tucker, manager of pollution control services for National Steel Corporation complained in Congressional testimony, “people . . . appear to be playing a numbers game with [state] air quality standards, by setting lower and lower allowable pollutant levels in state standards.”¹⁰³

Smog caused by lower tropospheric ozone, had first become a headline problem with several notorious incidents during the 1940s in the Los Angeles basin.¹⁰⁴ By 1959, California had not only funded the research that identified automobile emissions as the cause of smog, it had also passed a statute regulating such automobile emissions.¹⁰⁵ During the 1940s and 1950s, however, smog was a problem confined to California and a few other major American metropolitan areas.¹⁰⁶ Although the entire California delegation pressed annually for federal legislation to deal with automobile exhaust emissions, they did not succeed until the 1960s, by which time the smog problem had spread to a number of other major metropolitan areas.¹⁰⁷

100. RICHARD H.K. VIETOR, ENVIRONMENTAL POLITICS AND THE COAL COALITION 138–40 (1980).

101. CHRISTOPHER J. BAILEY, CONGRESS AND AIR POLLUTION: ENVIRONMENTAL POLICIES IN THE USA 129 (1998).

102. *Id.*

103. HAYS, *supra* note 98, at 567 n.94.

104. Most notorious of all was the “daylight dimout” of September 8, 1943, when “[t]housands of eyes smarted, many wept, sneezed and coughed[and] [t]hroughout the downtown area and into the foothills the fumes spread their irritation.” JAMES E. KRIER & EDMUND URSIN, POLLUTION AND POLICY: A CASE ESSAY ON CALIFORNIA AND FEDERAL EXPERIENCE WITH MOTOR VEHICLE AIR POLLUTION 1940–1974, at 53 (1977) (citation omitted) (internal quotation marks omitted).

105. *Id.* at 127–32.

106. BAILEY, *supra* note 101, at 86–89.

107. *Id.* at 89–108.

C. *How Development Created Local Demand for Pollution Reduction:
The Postwar Water Pollution Story*

By the late 1960s, postwar economic development had had the ironic effect of both generating some infamously polluted waterways and creating economically affluent citizens who wanted to use those waterways for leisure time pursuits such as fishing and boating. In addition, given the importance of clean water as an input in the production process, heavily polluted rivers stood as an obstacle to further local industrial development. Thus by 1970, in industrialized localities, there was both a problem—polluted waterways—and multi-pronged demand for cleanup on the part of both producers of private goods and would-be consumers of the local public good of clean water. This Part recounts those developments.

By the late 1960s, the Great Lakes and Northeastern regions, with old industrial facilities that had been operating near capacity for two decades, and old wastewater and water treatment plants, suffered most acutely, and most visibly from water pollution. It was, after all, the burning Cuyahoga River in Cleveland that made the front page of the *New York Times* as the cover story dramatizing the nation's water pollution woes.¹⁰⁸ In the Southeast, paper mills had become a major industrial presence and a serious pollution problem.¹⁰⁹ Coal, steel, and other industrial raw materials were transported along Eastern and Midwestern rivers; major oil refineries were concentrated in that region of the country as well.

Matters were far different west of the Mississippi. In the arid West, water quantity and fears of water shortage have always been a much greater concern than water quality. What water quality issues existed in the West centered around the effect of alternative timber harvest and grazing practices on runoff.¹¹⁰ Prior to the federal reclamation movement, major Western rivers were far too unreliable—flooding in the spring, and drying up in the summer—to be useful for navigation and commerce. As a consequence, for the most part, the largest Western cities are not located on major rivers. In the late 1960s, few if any Western cities had water treatment problems.

108. The burning of the Cuyahoga, used as an example of the need for federal action, was especially ironic, for as observed by Jonathan H. Adler, *Fables of the Cuyahoga: Reconstructing a History of Environmental Protection*, 14 *FORDHAM ENVTL. L.J.* 89, 108 (2002), local voters had already approved spending over \$100 million to clean up the Cuyahoga. In fact, the Cuyahoga story illustrates the point made here: in heavily industrialized and polluted localities, citizens were already approving costly local action to reduce pollution.

109. SUSAN HUNTER & RICHARD W. WATERMAN, *ENFORCING THE LAW: THE CASE OF THE CLEAN WATER ACTS* 15, 20–21 (1996).

110. To a substantial degree, this remains true today. *See id.* at 16–18.

1. Subsidies and the Demand for Clean Water: The Maine Example

East of the Mississippi, water pollution had become a serious obstacle to further economic growth. A wonderful illustration of the Eastern dilemma is provided by the state of Maine.¹¹¹ By the 1920s, there were “thirty-seven pulp and paper mills, eighty textile mills, and eleven tanneries . . . dumping thousands of tons of tanning liquors, sulfite, bleach, dye, and . . . wood fiber into [Maine] rivers . . .”¹¹² Post-World War II economic expansion meant higher levels of pollution than ever before, and in 1941 pollution along the Androscoggin Valley became so severe that a group of fifty-two Lewiston businessmen organized and petitioned the State Legislature for action to halt sulfite dumping by upstream paper mills and tanneries. According to environmental historian Richard Judd:

Their complaints were primarily economic: pollution threatened rental, commercial, and agricultural property along the river; caustic fumes discolored buildings and tarnished and etched displays of kitchenware and jewelry; and the stench distracted and debilitated people working near the river, undermined pride in the community, damaged the town’s commercial reputation, and devastated the local tourist trade.¹¹³

During the 1950s, however, cities such as Lewiston realized that the city’s economic interest in water pollution control was ambiguous. Upstream pollution had actually limited the city’s ability to attract similar industrial users because it cut the supply of industrial grade soft water (a production input) and the stench made the city unattractive for industries that might have diversified its economic base.¹¹⁴ But as grassroots concern with water pollution mounted during the early 1950s, cities themselves became targets, for their universal practice was to dump raw sewage into rivers. The cities argued that wastewater treatment would be wasted without pollution control by upstream mills.¹¹⁵ But the textile industry was in the process of moving to the South, and competition from Southern mills began to create excess capacity in the generally healthy pulp and paper industry. Manufacturing employment in Maine fell by 6600 persons in the year 1954 alone.¹¹⁶

111. The following account is drawn entirely from Richard W. Judd, *The Coming of the Clean Waters Acts in Maine, 1941–1961*, 14 ENVTL. HIST. REV. 50 (1990).

112. *Id.* at 53.

113. *Id.* at 54.

114. *Id.* at 57.

115. *Id.* at 59.

116. *Id.* at 60.

It was in this climate that Edmund Muskie became governor in 1953. For the next four years, his administration championed New Deal-style statewide economic redevelopment.¹¹⁷ Muskie recognized that clean water would provide an “inducement for industries to locate in this State,” but he nonetheless expedited approval of permits for a new tannery after being assured by residents that the river was already so bad that another factory would be worth far more in jobs than it would cost in additional pollution.¹¹⁸ By 1955, water pollution was a dominant issue in the State legislature, and by 1957 the legislature had before it a proposed water quality classification of over twelve thousand miles of rivers and coastal waters and four hundred individual recommendations for streams or sections of streams.¹¹⁹ Following industry and the Maine Municipal Association’s objections to the classifications, a redraft from the Natural Resources Committee lowered the classifications, in many cases below existing stream quality.¹²⁰

The problem was not that Maine political leaders were interested in further weakening regulation, and degrading water quality, as a way to attract industry. As Governor, Muskie perceived that the national problem was precisely the opposite, that industries were “racing to locate at the dwindling number of sites along our major water bodies . . . where large volumes of satisfactory water can still be secure without excessive expense for treatment.”¹²¹ Moreover, with the advent of the interstate highway system, the benefits of clean water for Maine’s burgeoning tourist industry were increasingly appreciated by Muskie and other state political leaders.¹²²

That both existing industry and Maine municipalities so strongly opposed water pollution regulation is explained not by their unwillingness to invest in water treatment, but rather by the investments they had *already made*. As a Maine Department of Development official aptly described the dilemma:

Every industry . . . would dearly like clean water to use, but by agreement among them each mill, plant, and factory spends money to purify the water it uses and adds its wastes to the pollution of our streams and rivers when it would cost no more to build disposal plants to keep waste out of the water . . . [T]he problem of attracting any industry needing clean water in its

117. *Id.*

118. *Id.* at 61 (citation omitted) (internal quotation marks omitted).

119. *Id.* at 62–63.

120. *Id.* at 63.

121. *Id.* at 63–64.

122. *Id.* at 64.

process to the State of Maine is obviously doubled if that industry must make arrangements for a water purification system before it can start operation.¹²³

In the late 1950s, two developments broke the stalemate in Maine state-water pollution law. Postwar affluence and enhanced leisure made Maine's relatively undeveloped state an asset rather than a liability as its forests and coastlines were discovered by a new generation of recreational users. Even more importantly, 1956 Amendments to the 1948 Water Pollution Control Act allocated \$500 million over a ten-year period for community sewage facility construction on a thirty percent matching basis.¹²⁴ This was sufficient inducement for small towns to begin sewage treatment construction programs.¹²⁵ After being reelected in 1957, Muskie succeeded in getting the state legislature to follow with a state program under which the state would fund an additional twenty percent of the cost of sewage treatment construction, thus giving Maine towns a combined fifty percent state-federal subsidy. In 1959, both state and federal grants were increased.¹²⁶

The sewage treatment subsidy dramatically changed the state's political landscape. Whereas the Maine Municipal Association had long been allied with industry in opposing water pollution regulation, it switched and became a very strong supporter of clean water and industrial controls.¹²⁷ In 1961, reclassification of the heavily polluted Kennebec (to be suitable for recreational fishing and boating) met with hardly any opposition; significantly, political leaders from Augusta, traditional allies of industrial polluters upstream, supported the reclassification and were confident that the city "could manage treatment costs over the comfortable fifteen year time limit."¹²⁸ By 1966, with the reclassification of the Penobscot and Androscoggin, the three largest rivers in the state had been reclassified to provide for fish restoration, recreation, industrial water supply and a seventy-percent reduction in organic pollutants.¹²⁹

2. Effective State Action for Clean Water in the Rust Belt

Admittedly, it was not water pollution problems in remote and sparsely populated Maine that made the headlines in the 1960s and

123. *Id.* (citation omitted) (internal quotation marks omitted).

124. *Id.* at 65.

125. *Id.*

126. *Id.* at 65–66.

127. *Id.* at 66.

128. *Id.* at 67.

129. *Id.*

1970s. But the political and economic story in Maine was functionally the same as in Chicago, Cleveland, St. Louis, and Detroit. The problems on the Androscoggin—old industries and old cities, each facing large costs of moving from a system based on cleaning up water before it was used to one in which wastewater was to be treated before being discharged—were the same as those found on the Calumet (carrying pollution from Gary, Indiana, factories), Delaware, Detroit, Hudson, and perhaps most infamously, Cuyahoga Rivers.

The evidence from these watersheds is increasingly clear on two crucial points. First, state regulation preceded federal regulation, set the basic pattern for federal regulation, and continued even when federal regulations were weakened. Thus, there is no evidence of a race-to-the-bottom. Second, and even more significantly, these watersheds were cleaned up primarily because of large, centralized cleanup subsidies that helped finance the construction of new publicly owned wastewater treatment works.

Any notion of a race-to-the-bottom is confounded by the clear history of successful state action in improving water quality. Consider two of the most notorious examples: the Delaware River and the Great Lakes. Up until World War II, most municipal wastes along the Delaware were discharged into that River with little or no treatment.¹³⁰ Only twenty percent of the wastes from Camden and Philadelphia were treated (and then only at the primary level, by screening out large solids).¹³¹ Industrial pollution was also a problem; by 1941, over two hundred industries discharged ninety-thousand tons per year of solid and semisolid wastes either directly into the Delaware or through sewers.¹³² The level of noxious hydrogen sulfide gas generated as a byproduct of bacterial decomposition of the wastes discharged into the river was so great that during World War II, the metal used in assembling naval radar equipment corroded while on the assembly line, and “[s]teamship crews would quit after one night aboard, complaining of the foul-smelling gases.”¹³³

Little was done about Delaware’s pollution problems during World War II, when the basin was the major wartime shipbuilding center and the overriding concern was to keep production levels as

130. Shad runs on the Delaware declined from fifteen million to five million pounds between 1896 and 1904, BRUCE STUTZ, *NATURAL LIVES—MODERN TIMES: PEOPLE AND PLACES OF THE DELAWARE RIVER* 200 (1992), and by 1946, “the U.S. Fish and Wildlife Service found twenty miles of the upper estuary anoxic from the surface to the bottom.” *Id.* at 201 (citation omitted) (internal quotation marks omitted).

131. RUTH PATRICK ET AL., *SURFACE WATER QUALITY: HAVE THE LAWS BEEN SUCCESSFUL?* 10 (1992).

132. *Id.*

133. *Id.* at 10–11.

high as possible. But progress had in fact already been made. Between 1936 and 1942, the Interstate Commission on the Delaware River Basin (Incodel) had already successfully persuaded riverfront communities to spend more than ten million dollars to build sewage collection and treatment systems.¹³⁴ In 1937, Pennsylvania passed the Clean Stream Law, which put industrial wastes under legal control.¹³⁵ After the conclusion of World War II, great progress was made in dealing with both municipal and industrial pollution. In 1946, Philadelphia initiated an eighty-million-dollar sewer improvement and treatment program, and by 1955, the city had opened two new (primary) treatment plants serving the southwest and southeast sections of the city.¹³⁶ By 1961, seventy-one percent of industries in Pennsylvania treated their wastes before discharging them into rivers, versus only eight percent in 1941.¹³⁷

Similar improvements had occurred in the Great Lakes region. This area, later known as the “Rust Belt,” was the heart of postwar American industrial expansion, with value added by manufacture more than doubling in every major metropolitan area on the shores of the Great Lakes between 1947 and 1963.¹³⁸ With this tremendous manufacturing expansion came both an increase in water pollution and a dramatic increase in demand for local water-based recreational activities.¹³⁹ State water pollution control officials had made tremendous progress in reducing both municipal and industrial discharges during the 1950s. Between 1952 and 1957, Ohio doubled its statewide sewage treatment capacity, and in 1959, the Michigan Water Resources Commission reported that sewage from over ninety percent of the state’s population was treated before being discharged into waterways.¹⁴⁰ Indiana state regulators stated that thirty-five of the thirty-seven industrial plants in the Calumet River Basin that discharged into Lake Michigan were providing adequate treatment for their wastes, while 132 of 198 industries discharging wastes into Lake Erie or its tributaries were classified as having adequate treatment.¹⁴¹

By the 1960s, however, local newspapers in the urban centers of the lower Great Lakes had begun continuing and strident coverage of

134. *Id.* at 10.

135. *Id.* at 13.

136. *Id.* at 11–13.

137. *Id.* at 13.

138. TERENCE KEHOE, CLEANING UP THE GREAT LAKES: FROM COOPERATION TO CONFRONTATION 45 (1997).

139. *Id.* at 45–46.

140. *Id.* at 44.

141. *Id.* at 45.

the environmental apocalypse that was soon to befall local waters. In 1962, the *Detroit News* warned that “the Great Lakes could become another Dead Sea,” while the *Cleveland Plain Dealer’s* two-day front-page coverage of the Cuyahoga’s sorry state made that river into a national cause célèbre.¹⁴² Sunday newspaper supplements carried color photos of the worst cases of industrial pollution.¹⁴³ For decades, the standard interpretation of this media outcry has been to conclude that the problems were indeed severe and the direct fault of state regulators who cared more about industry than about water quality.

This is much too superficial. The most widely respected state regulators of this era, such as Michigan’s Loring Oeming, seemed quite clearly to be surprised by the rapid escalation in the public’s demand for water quality. In a paper presented at the annual meeting of the National Water Pollution Control Federation in 1963, Oeming observed that:

[T]he public seems to be demanding a quality of water higher than that which is now accepted by pollution control authorities as providing adequate protection. . . . Aesthetic considerations [and the demand that] the very best obtainable in sanitary quality is none too good, can be expected to result in gradual elevation of present quality objectives.¹⁴⁴

Speaking before the same group in 1965, a longtime Illinois water quality official commented on the new federal approach: “Suddenly, the conservationist, the recreationist, the purist burst forth to dominate the scene and to take over to a large extent the administrative control of the federal program.”¹⁴⁵

The existing historical evidence suggests that at least some state regulators really were surprised by rapidly escalating demands for local regulatory action to reduce water pollution. For instance, after spending or appropriating well over one million dollars to develop Sterling State Park on Lake Erie, Michigan authorities were forced to close the beach in August 1961 because of water contamination.¹⁴⁶ This was the only public beach on Lake Erie in the state of Michigan, and its close proximity to I-75, the interstate highway between

142. *Id.* at 55 (internal quotation marks omitted).

143. *Id.*

144. Roy F. Weston, Frank J. Trelease, Leonard B. Dworsky & Loring F. Oeming, *Water Quality Management—Legal, Technical, and Administrative Aspects*, 36 J. WATER POLLUTION CONTROL FED’N, 1082, 1106 (1964).

145. KEHOE, *supra* note 138, at 82 (citation omitted) (internal quotation marks omitted).

146. *Id.* at 56.

Detroit and Toledo, had made it a prime local mass recreation spot, with park attendance increasing from roughly 100,000 in 1952 to more than 1.2 million in 1959.¹⁴⁷ The same story took place in Cleveland and Chicago. The very prosperity that polluted local waters had also generated the affluence and leisure time that increased local recreational demand for those waters. In Cleveland, for instance, the first groups to cry that Lake Erie was dying were commercial and sport fishermen and local conservationists.¹⁴⁸ The citizen leader of campaign to clean up Cleveland-area waters was an affluent Shaker Heights automobile dealer who was also an avid fisherman and boater.¹⁴⁹ In Chicago, local newspapers focused on the oil contamination at Calumet Park Beach, with pictures of boat oars and swimmers coated with oil.¹⁵⁰

It is true that some Great Lakes pollution problems had an obvious interstate aspect—as in southern Lake Michigan, where wastes discharged from plants in Gary, Indiana, contaminated Illinois beaches.¹⁵¹ Still, in terms of the recreational user groups affected, all the major water pollution problems of the late 1960s Environmentalist era were intensely local. A 1963 federal study of Lake Michigan found that water quality in the main body of the Lake was “very high,” with only the southwest shoreline showing high coliform readings, excessive algae growth, and high phenol and ammonia levels.¹⁵² The beaches and waters adjacent to Chicago, Detroit, and Cleveland were used by the residents of those cities, not by distant users from other parts of the United States or other countries. People who suffered the most harm from local pollution were also the beneficiaries of local development; indeed, they would not have had the wealth and leisure time for outdoor recreation without local development.

III. EXPLAINING FEDERALIZATION: CENTRALIZED ENVIRONMENTAL REGULATION AS REGIONAL ECONOMIC PROTECTIONISM AND POLITICAL PORK

These summary histories of late twentieth-century state and local efforts to curb air and water pollution are stories of relative success, but they also depict how state and local environmental regulatory

147. *Id.*

148. *Id.* at 61.

149. *Id.*

150. *Id.* at 65.

151. *Id.* The City of Chicago had long since reversed the direction of the Chicago River to carry its own effluent downstream, into the Illinois River system and ultimately to the Mississippi, where it became the problem of downstream cities such as St. Louis.

152. *Id.*

efforts were slowed by an appreciation of the cost of environmental improvement. What they reveal most dramatically, perhaps, is how widespread the perception was that cleaning up local environments could also hurt local economies. As I argue below, federalization of both air and water pollution control succeeded when a sufficiently large number of U.S. states had reached the stage where they could agree not so much on the optimal level of pollution reduction but on the need to shift at least part of that cost to other, less developed states.

A. The Clean Water Act: Succeeding Through Subsidies

If, as argued above, both industry and local citizens in heavily industrialized localities with water pollution problems wanted water pollution reduced, then simple public choice economics suggests that there should have been no barrier to the passage of locally efficient pollution control measures. That is, with both the benefits and costs of pollution control being internalized to a particular locality, that locality would have the proper incentive to reduce pollution. However, concerns of loss of industry were real, and cost is cost. Where there is a way for industrialized localities to receive the benefits of cleaner waterways but shift at least part of the cost elsewhere, then such a move would have made such localities better off relative to a world in which they bore the entire cost. The best solution for such industrialized communities would be to have other less polluted and less developed localities help pay for water pollution reduction.

1. Water Pollution Control Federalization

The stage for comprehensive federal water pollution regulation was set during the 1960s. It was during this period that the causes and costs of rectifying the water pollution problem afflicting industrialized areas was clearly identified. Federal-state conferences held under the Federal Water Pollution Control Act of 1961 pointed to both industry and municipal sewage treatment (or the lack thereof) as the prime culprits in the water pollution problems facing Cleveland, Detroit, and other Great Lakes metropolitan centers.¹⁵³ Yet these conferences repeatedly foundered on the issue of the degree of sewage treatment needed from municipalities. The head of Detroit's water and sewer system was concerned that the cost entailed by higher treatment standards would deter suburban communities from hooking up to Detroit's system; the massive cost of digging up Cleveland's antiquated combined sewer system (in which street runoff and sanitary sewage were combined, overloading treatment facilities during intense rain events) led to continuing local political

153. *Id.* at 56–65.

opposition.¹⁵⁴ Cities such as Detroit and Cleveland were clear that their willingness to upgrade wastewater treatment facilities was contingent upon the federal government coming through with the promised subsidies.¹⁵⁵ The stalemate was broken only when Great Lakes governors succeeded in lobbying for a much larger federal construction grant program to finance the construction and upgrading of municipal sewage treatment facilities.¹⁵⁶

These lobbying efforts succeeded in the Clean Water Restoration Act of 1966.¹⁵⁷ In passing that law, Congress ignored the Johnson Administration's river basin approach to pollution abatement—an approach that would have tended to reduce state-level authority—and instead vastly increased federal funding for municipal waste treatment plants from \$150 million to \$450 million for fiscal year 1968, rising steadily to \$1.25 billion in fiscal year 1971.¹⁵⁸ The Act removed the ceilings on the federal share of individual projects and set a fifty-percent federal share for projects in states that paid twenty-five percent and established enforceable water quality standards.¹⁵⁹

The Vietnam War intervened, however, and federal contributions throughout the 1960s fell short of the promised amounts, with only \$214 million of the \$700 million authorized for 1969 actually appropriated.¹⁶⁰ By 1972, the federal government had contributed only seven percent of New York's Pure Waters construction program.¹⁶¹ At the same time, upgrading municipal treatment facilities became increasingly important because a larger and larger share of industrial wastes were being discharged into municipal treatment systems. In Milwaukee, for instance, the biological oxygen demand of the industrial effluent sent to the city system was equal to that from a

154. *Id.*

155. *Id.* at 86.

156. *Id.* at 64. The boldest such “lobbying” effort was Nelson Rockefeller’s 1964 Pure Waters Program for New York state. Rockefeller proposed a \$1.7 billion sewage treatment facility construction program, which assumed a thirty percent contribution from the federal government, a contribution far greater than current federal law allowed. Convinced that the problem in large urban states like New York was so severe that the federal grant limits would eventually increase, Rockefeller “pre-financed” the federal government’s share of projects—he used the proceeds of state bond sales to pay for total project construction costs in anticipation that the federal government would eventually pay its share. *Id.* at 83.

157. Clean Water Restoration Act of 1966, Pub. L. No. 89-753, 80 Stat. 1246.

158. KEHOE, *supra* note 138, at 84–85.

159. *Id.* at 85.

160. *Id.*

161. *Id.* at 127.

city of approximately 1.6 million. Since the Milwaukee system served a population of approximately one million, the industrial load made up well more than half of the (BOD measured) total load sent to that city's system.¹⁶² The vastly increased industrial load on municipal wastewater treatment systems gave municipalities an additional argument in seeking increased federal funding in the 1972 Clean Water Act.

The stated goals of the Federal Water Pollution Control Act Amendments of 1972¹⁶³ (FWPCA) are to obtain zero discharge of pollutants into the nation's waters by 1985, and as an interim goal, to get all waters to the fishable and swimmable state by 1983.¹⁶⁴ Like the CAA, the FWPCA represents a stab at cooperative federalism, under which the federal government has both standard-setting and enforcement authority but States retain the primary role in reducing water pollution. In the water quality area, cooperative federalism means that each State is responsible for categorizing bodies of water within the state. While the FWPCA itself directly authorizes pressure from the federal EPA on States to eliminate water quality use categories below fishable-swimmable (i.e., industrial use, or low water quality), there are over one hundred different categories used by States across the country. Moreover, aside from high quality watersheds (for which there are uniform anti-degradation criteria) there are no uniform standards for what counts as fishable-swimmable or any other use designation.¹⁶⁵

2. Cooperative Federalism Under the Clean Water Act: Federal Subsidies, Local Standards

Perhaps the most important aspect of the Clean Water Act's "cooperative federalism" approach was the requirement (added by the 1977 Amendments) that the EPA set separate "pretreatment" standards for industrial discharges into publicly owned treatment works (POTW's).¹⁶⁶ Although the federal law clearly requires the

162. *Id.* at 86.

163. Federal Water Pollution Control Act Amendments of 1972, Pub. L. No. 92-500, 86 Stat. 816 (codified in scattered sections of 33 U.S.C.).

164. *Id.* § 101(a)(1)–(2), 86 Stat. 816.

165. EVAN J. RINGQUIST, ENVIRONMENTAL PROTECTION AT THE STATE LEVEL: POLITICS AND PROGRESS IN CONTROLLING POLLUTION 54 (1993).

166. "Pretreatment" refers to the treatment of a pollutant by an industrial facility prior to putting its wastewater into a public sewer system. *See* 40 C.F.R. § 403.3(s) (2012). The pretreatment requirements are set out in the Clean Water Act of 1977, Pub. L. No. 95-217, § 54(a), 91 Stat. 1566, 1591 (codified at 33 U.S.C. § 1317(b)(1) (2006)), and 40 C.F.R. § 403.3(s) (2012).

EPA to require industrial facilities that discharge into POTW's to meet a nationally uniform "best available technology" based cleanup standard,¹⁶⁷ the EPA took over almost ten years to promulgate its first set of categorical pretreatment standards (industry-wide standards for particular specified toxic pollutants).¹⁶⁸ Moreover, the standards are actually implemented and enforced at the local level. It is the POTW's themselves who have the job of permitting industries that are discharging into their systems and monitoring permit compliance.¹⁶⁹ The only federal requirement for industries that discharge into POTW's is a semi-annual discharge report and notification of additional loads that would interfere with the operation of the POTW.¹⁷⁰ Over ten years after the pretreatment program was written into the Clean Water Act, local implementation was, according to one prominent commentator, "in a state of chaos."¹⁷¹ Most pertinently, he observed that "if the purpose of a *national* discharge program were to offset the political pressures on states to relax their programs, the pressures are even more formidable at the local level, producing a wide variety of standards and levels of compliance among the local municipal systems."¹⁷² On a state regulatory failure theory of federal environmental controls, the way that the Clean Water Act regulates discharges into POTW's is indeed pathological.

To understand the delegation to localities of the implementation of pretreatment standards, one must understand also that the main impact of the FWPCA has not been through uniform national water quality standards, but rather through the Municipal Wastewater Treatment grant program. As explained above, the water pollution problem was stalemated at the state level largely because of the longstanding municipal practice of dumping untreated (or barely treated, e.g. by passage through settling ponds) sewage directly into lakes, rivers, and oceans.¹⁷³ The municipal wastewater grant program in the 1972 FWPCA broke the stalemate by providing federal funding for seventy-five percent of the cost of constructing municipal

167. See Clean Water Act of 1977 § 53(a), 91 Stat. 1589–90 (codified at 33 U.S.C. § 1317(a)(2)); 40 C.F.R. § 401.12 (2012).

168. See U.S. ENVTL. PROT. AGENCY, EPA/625/10·86/005, ENVIRONMENTAL REGULATIONS AND TECHNOLOGY: THE NATIONAL PRETREATMENT PROGRAM (1986).

169. *Id.* at 10–11. See 40 C.F.R. § 403.8(f) (2012).

170. 40 C.F.R. § 403.12(e) (2012).

171. Oliver A. Houck, *Ending the War: A Strategy to Save America's Coastal Zone*, 47 MD. L. REV. 358, 384 (1988).

172. *Id.* at 385–86 (footnotes omitted).

173. RINGQUIST, *supra* note 165, at 54.

wastewater treatment plants meeting the FWPCA requirement of secondary treatment (removal of eighty-five of most pollutants and nutrients).¹⁷⁴ Even after Amendments to Clean Water Act in 1981 reduced the federal government's share of the cost of new wastewater treatment works to fifty-five percent, by 1988 the federal government had spent somewhere between forty-five billion dollars and sixty-nine billion dollars (between roughly \$90 and \$138 billion in 2014 dollars) paying for new municipal wastewater treatment facilities.¹⁷⁵ This expenditure is a substantial fraction of the estimated total of \$300 billion spent on water pollution control during this period.¹⁷⁶

As a leading student of state environmental programs has pointed out:

The municipal wastewater treatment grant program was probably equal parts environmental policy and development policy. Serious water quality problems were limiting the potential growth in some municipalities, and wastewater treatment plants removed this obstacle to growth. In addition, every state was entitled to at least one-half of 1 percent of the total wastewater treatment grant budget, regardless of need, which reinforced the redistributive (some would say pork barrel) character of the program.¹⁷⁷

Pork barrel or not, the grant program succeeded in doubling the number of municipal wastewater treatment plants providing secondary treatment or better between 1977 and 1983,¹⁷⁸ and in decreasing the amount of wastes (measured by biological oxygen demand) leaving such facilities by forty-six percent between 1972 and 1982.¹⁷⁹ Between 1970 and 1985, the fraction of the U.S. population served by wastewater treatment increased from forty-two percent to seventy-four percent.¹⁸⁰

Despite the centrality of the grant program to realized reductions in point source pollution under the FWPCA, the program merits little attention in environmental law casebooks. These texts focus instead on the National Pollutant Discharge Elimination System (NPDES),

174. *Id.* at 54. The federal subsidies are authorized by the Clean Water Act of 1977, Pub. L. No. 95-217, §§ 9-54(a), 91 Stat. 1566, 1568-1591 (codified at 33 U.S.C. §§ 1281-1299 (2006)).

175. *See* RINGQUIST, *supra* note 165, at 55, 172.

176. *Id.* at 172.

177. *Id.* at 54-55.

178. *Id.* at 173.

179. *Id.* at 174.

180. WORLD RESOURCES INST., WORLD RESOURCES 1992-1993, at 167 tbl.11.2 (1992).

under which industrial and municipal facilities that discharge pollutants into navigable waters must meet technology-based effluent standards that are uniform within a particular industry. While it is true that industrial facilities have significantly reduced their effluent discharge since the passage of the FWPCA, much of this improvement has come about because industrial polluters no longer *directly* discharge pollutants into waterways. Instead, since the mid-1970s roughly half of all industrial polluters have discharged their wastes into municipal wastewater treatment systems.¹⁸¹ Indeed, by 1990, only twenty-seven percent of industrial oxygen-demanding wastes and thirty-nine percent of industrial suspended solids were discharged directly into waterways.¹⁸² Thus, well over half of the seventy-one percent decrease in industrial waste discharge loads that occurred between 1974 and 1981¹⁸³ was due simply to the diversion of industrial wastes into municipal wastewater systems for treatment by POTW's.

On my theory, the FWPCA was a way for heavily industrialized and polluted localities to reduce water pollution while shifting part of the cost to taxpayers in less polluted places. This redistributive theory explains these two key features of the FWPCA: the delegation of the implementation of POTW pretreatment standards to the POTW's themselves, and the massive federal grants to improve such POTW's. Because the water pollution problem was local, and because that problem was dealt with primarily by converting direct dischargers into indirect dischargers to local POTW's, it is hardly surprising that local POTW's set the standards that local polluters are required to meet. Improvements in local water quality came about primarily from the federal POTW grant program. That program was not intended to force local municipalities to do anything. It represented instead an overt and massive transfer of federal funds to industry and local governments in old industrialized localities and the promise of future funds for newer industrializing localities. It enabled older, developed regions to cleanup local environments that had been despoiled by decades of relatively uncontrolled growth. In newer regions that were just entering their growth phases, it provided a significant subsidy for what would otherwise be locally funded, and locally beneficial, public infrastructure.

A large number of localities could expect to benefit from increased federal POTW subsidies—indeed, only a locality that was neither industrialized nor expected to attract new industries in the future would have seen a net cost from the subsidies. The federal water

181. RINGQUIST, *supra* note 165, at 174.

182. *Id.*

183. Richard A. Smith, Richard B. Alexander & M. Gordon Wolman, *Water-Quality Trends in the Nation's Rivers*, 235 SCI. 1607, 1609 (1987).

pollution control laws—both the 1972 Federal Water Pollution Control Act and the Clean Water Restoration Act of 1966 (which, recall, removed the dollar ceilings on individual projects)—were thus a form of legislative universalism: political pork benefiting virtually all members of Congress.¹⁸⁴ Voting on these two pieces of legislation strikingly confirms this universalism. The 1966 Clean Water Restoration Act was approved by a 312 to 0 vote in the House and by 90 to 0 in the Senate.¹⁸⁵ The FWPCA of 1972 was approved 86 to 0 in the Senate¹⁸⁶ and by a vote of 380 to 14 in the House.¹⁸⁷

Finally, on my theory, one ought not to be surprised by the fact that the total amount of pollutants entering the nation's waters from sewage treatment plants did not decline despite massive federal subsidies to upgrade and build new treatment works.¹⁸⁸ The federal program was *intended* to subsidize continued economic growth, and the continued increases in municipal wastes that such growth entails.

B. The Clean Air Act: Federal Minimum Standards as Regional Protectionism and Local Counter-Majoritarianism

The belief that the Federal Clean Air Act of 1970 resulted from the States' complete inability or unwillingness to promulgate air quality standards is today so widespread as to make citation superfluous.¹⁸⁹ It is in fact true that although the federal Air Quality Act of 1967 authorized States to establish air quality standards, by 1970, no State had completed the standard-setting task.¹⁹⁰ But it is a huge and empirically unwarranted leap to infer a race-to-the-bottom among the states from this administrative failure. Unwarranted first because as already discussed, as of 1970, most states did have a generalized air pollution problem. Up until the 1960s, by far the most widespread and salient air pollution problem in America was smoke from the burning of coal, and this problem had always been dealt with by local rather than state government. Cities and counties had demonstrated, moreover, tremendous success in dealing with the

184. Barry R. Weingast & William J. Marshall, *The Industrial Organization of Congress; or, Why Legislatures, Like Firms, Are Not Organized as Markets*, 96 J. POL. ECON. 132 (1988) (predicting that political pork barrel is conferred in universalistic ways).

185. KEHOE, *supra* note 138, at 85.

186. 117 CONG. REC. 38864–65 (1971).

187. 118 CONG. REC. 10803–04 (1972).

188. *Significant Progress on Water Pollution Reported*, N.Y. TIMES, Feb. 12, 1984, at 31.

189. See, e.g., GARY C. BRYNER, *BLUE SKIES, GREEN POLITICS: THE CLEAN AIR ACT OF 1990 AND ITS IMPLEMENTATION* 98 (2d ed. 1995).

190. *Id.* at 98–99.

smoke problem. Unwarranted finally because as a matter of political economy, the federal Clean Air Act became viable simply because local air pollution from automobiles had become a problem in a sufficient amount of urban areas to make the problem “national” in scope. Even more significantly, the federal Clean Air Act was implemented only when it was amended in 1977 to include a Prevention of Significant Deterioration requirement that reduced the comparative advantage of less-developed, less-polluted states in competing for new industrial plants.

After briefly overviewing the 1970 Clean Air Act, this Part explains the simple but powerful economics driving the passage of the kind of federal minimum standards that are at the heart of the Clean Air Act. I then detail the story of the passage of the key minimum standard in the Clean Air Act, the Prevention of Significant Deterioration (PSD) Standard.

1. The 1970 Clean Air Act

As the federal courts never tire of repeating, the original, 1970 version of the Clean Air Act set out a two-stage process for federal air pollution regulation. At the first stage, the federal EPA is required by Section 109 to set National Ambient Air Quality Standards for six commonly found air pollutants. These criteria pollutants are particulate matter, ground-level ozone, carbon monoxide, sulfur oxides, nitrogen oxides, and lead. There are two types of air quality standards. Under Section 109(b)(1), the EPA is instructed to set primary air quality standards at levels “requisite to protect the public health” with an “adequate margin of safety.”¹⁹¹ Under Section 109(b)(2), the EPA is also tasked with the job of setting secondary air quality standards at a level that “is requisite to protect the public welfare from any known or anticipated adverse effects associated with the presence of such air pollutant in the ambient air.” Secondary standards must be at least as stringent as the primary standards. Importantly, both primary and secondary NAAQs are nationally uniform minimum ambient air quality standards.

Importantly, when Congress passed the CAA in 1970, it understood air pollution as a “localized phenomenon that is best handled as a state program with minimum federal involvement.”¹⁹² Unsurprisingly given this understanding, under the Clean Air Act’s original structure, Congress delegated to the States the job of figuring out how to reduce pollution from existing sources. States are required to develop State Implementation Plans (SIPs) to ensure that the

191. 42 U.S.C. § 1857c-4(b)(1) (1976) (current version at 42 U.S.C. § 7409(b)(1) (2006)).

192. ARNOLD W. REITZE JR., *STATIONARY SOURCE AIR POLLUTION LAW* 126 (2005).

nationally uniform NAAQs are met in each air quality region within the state.¹⁹³ Regions generally cut across a number of counties, and are supposed to correspond to airsheds (e.g., Metropolitan Los Angeles, or the San Francisco Bay Area). State discretion in crafting SIPs was limited by Congress; Section 110(a)(2) sets out a long list of requirements that SIPs must contain,¹⁹⁴ and Section 110(a)(3) requires each state to get federal EPA approval for its SIP.¹⁹⁵

With respect to new stationary sources of air pollution, the 1970 Clean Air Act exhibited much less trust in state regulatory authority. The CAA instructed the federal EPA to set standards for new or modified sources of air pollution within source categories (e.g., commercial-industrial steam generating units of a certain minimum generating capacity).¹⁹⁶ The new source performance standards (NSPS) are to be based on the “best system of emission reduction which (taking into account the cost of achieving such reduction and any non-air quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated.”¹⁹⁷ Thus with respect to new sources, the CAA required national source-specific emission standards that were uniform across sources in particular categories.

The other core feature of the original CAA was its regulation of mobile sources of air pollution—primarily automobiles. Here, the basic structure adopted by the CAA was drawn directly from the earlier federal Air Pollution Control Act of 1967; the federal EPA sets technology-based auto exhaust emission standards, requiring a mix of combustion and post-combustion controls that reduce emissions of carbon monoxide, nitrogen oxides, volatile organic compounds and other unburned hydrocarbons and (from diesel engines) particulate matter.¹⁹⁸ Under the CAA, only California was allowed to set tougher auto emission standards than those set by the federal EPA.¹⁹⁹ Thus, aside from potentially even tougher standards in California, the

193. § 1857c-2(a) (1970) (current version at § 7407(a) (2006)); 40 C.F.R. § 81 (2012) (listing air quality control regions in Appendix A).

194. *See, e.g.*, 42 U.S.C. § 1857c-5(a)(2)(B) (1970) (current version at 42 U.S.C. § 7410(a)(2)(A) (2006) (Every SIP must include “enforceable emission limitations and other control measures, means, or techniques . . . as may be necessary or appropriate to meet the applicable [CAA] requirements.”).

195. § 1857c-5(a)(2) (1970) (current version at § 7410(a)(3)(B) (2006)).

196. § 1857c-6(a)(1) (1970) (current version at § 7411(a)(1) (2006)).

197. *Id.*

198. *See* Arnold W. Reitze Jr., *Mobile Source Air Pollution Control*, 6 ENVTL. LAW. 309, 321–25, 338–43 (2000).

199. *See* BAILEY, *supra* note 101, at 134–35; Clean Air Act of 1977, Pub. L. No. 95–95, § 177, 91 Stat. 680, 750 (codified at 42 U.S.C. § 7507 (2006)).

CAA set nationally uniform, technology-based standards for auto exhaust emissions.

2. Explaining the Clean Air Act: The Simple Economics of (Locally) Counter-Majoritarian Federal Minimum Environmental Standards

The key to demonstrating how federal environmental laws were passed by a majority in the U.S. Congress is in recognizing that for the most part, those laws imposed nationally uniform minimum environmental standards. Whenever such minimum federal standards bind, they force relatively undeveloped jurisdictions to require more stringent environmental controls than their residents would choose under decentralized decision-making. Inasmuch as higher levels of environmental cleanup and control are increasingly costly on the margin, such federal minima increase the cost to businesses of locating in or relocating to undeveloped jurisdictions relative to what the costs would be under decentralized regulation. On the margin, federal minima discourage businesses from relocating to take advantage of the cheaper labor and raw materials found in the undeveloped jurisdiction.²⁰⁰ They thereby cut the economic cost of pollution reduction—in terms of lost industries, jobs and taxes—to developed jurisdictions. Federal minima are a form of economic protectionism, protecting developed jurisdictions from competition by lesser-developed jurisdictions for mobile capital.

One can show that regardless of whether there is any actual “federal” problem—such as spillovers across jurisdictions—the existence of a federal legislature itself is enough to ensure majority support for federal minimum standards. More precisely, federal minimum standards will almost always get majoritarian support in a federal legislature.²⁰¹ Figure 1 shows why this is so. The figure depicts the frequency distribution of voter preferences for pollution reduction

200. Pashigian, *supra* note 27, at 558 (“If the rents of remaining factors specific to a location declined when factors moved as a consequence of the cost of complying with more stringent local regulations, the owners of the location specific factors would support federal policies that reduced mobility. . . . By raising the cost of mobility, any improvement in local air quality could be achieved but with a smaller reduction in the rents of factors specific to the locality.”). While recognizing the importance of the anticompetitive motive in PSD policy, Pashigian failed to see that it explains many other instances of federal environmental regulation as well.

201. See Jacques Crémer & Thomas R. Palfrey, *Federal Mandates by Popular Demand*, 108 J. POL. ECON. 905, 912 (2000) [hereinafter Crémer & Palfrey, *Popular Demand*] (showing that the federal standard would equal the average standard throughout the districts); Jacques Crémer & Thomas R. Palfrey, *Federal Mandates with Local Agenda Setters*, 7 REV. ECON. DESIGN 279 (2002) (developing a model that investigates how local voters respond to federal mandates).

in a simple three-jurisdiction world. Each voter has what are known as Euclidean preferences, meaning that the voter's utility from the actual public policy outcome declines linearly with the outcome's distance from the voter's ideal point. As can be seen from the Figure, the jurisdictions can be ranked in terms of the preferences for pollution reduction of the median voter in each: high, moderate, and low. The respective median points— e_h , e_m , and e_l —are the pollution control standards under decentralization, that is, the standards that would get majority voter support were a referendum held in each jurisdiction.²⁰²

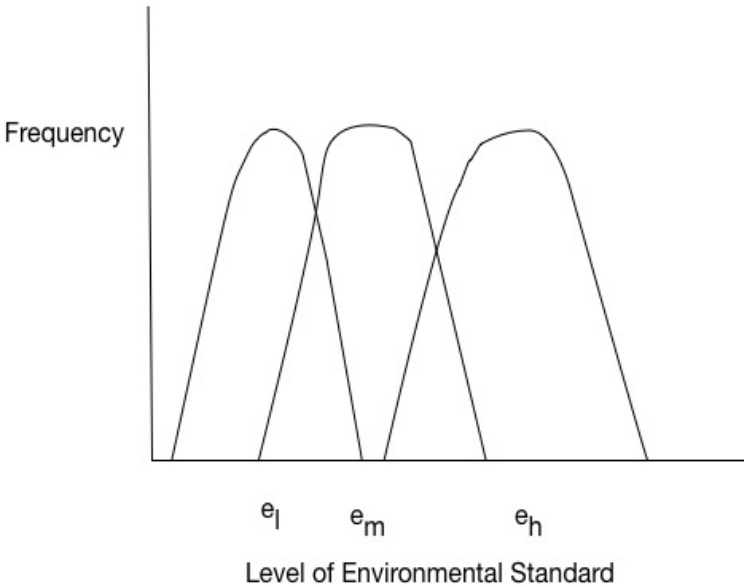


FIGURE 1: *Majoritarian Choice of a Federal Minimum Standard*

Now consider a federal referendum in which voters choose a minimum pollution control standard for all three jurisdictions. The federal minimum chosen in such a referendum would be e_m . This can be understood by looking at each jurisdiction. The federal minimum does not prevent the high demand jurisdiction from going ahead and setting local mandates that are much higher, and so voters there are relatively indifferent to the level of the federal minimum standard.

202. The median voter theorem—that majoritarian elections produce the median voter's preferred outcome—is truly a theorem, in that there are a number of assumptions regarding both voter preferences and the electoral process that must be true for the result to obtain. It does hold in the simplified world considered by Crémer and Palfrey. *See generally* GEOFFREY BRENNAN & LOREN LOMASKY, *DEMOCRACY & DECISION: THE PURE THEORY OF ELECTORAL PREFERENCE* 76–81 (1993) (discussing the limitations of the median voter theorem).

Voters in the moderate demand jurisdiction can simply vote their preferences, and end up with the federal minimum being set at a level that they would have set independently. Regardless of what voters in the low demand jurisdiction adopt as a voting strategy, they cannot prevent e_m from being chosen.

Observe that this federal minimum standard binds and alters the regulatory outcome only in the low demand jurisdiction. Observe also, however, that for a minority of voters in the low demand jurisdiction, the federal minimum is closer to their preferred level of environmental cleanup than is the level e_l that is chosen by local residents of their jurisdiction (in the Figure, all voters in the low demand jurisdiction who prefer a level of pollution control at or above e_m are better off with the federal minimum). Hence for the minority in the generally low demand jurisdiction, that jurisdiction's membership in the federation gives them the ability to get much tougher pollution control standards than they would be able to achieve under local control.

This result holds even when the model is extended from standards chosen by popular referenda to standards chosen by legislatures.²⁰³ It predicts that the prime beneficiaries of the passage of federal laws mandating minimum federal pollution control standards for the states will be the strongly pro-environmental minority in states that would otherwise not regulate so stringently. For this reason, it may be called the "counter-majoritarian" motive for federal mandates. It is not the developed jurisdiction majority who benefit from counter-majoritarian federal mandates, but rather the strongly pro-environmental minority in undeveloped jurisdictions. Because the local environment in undeveloped jurisdictions is relatively undisturbed but wealth and income are relatively low, it is plausible that the median voter in such a jurisdiction does not prefer such strong pollution control and is willing to tolerate relatively high levels of pollution in exchange for development. In such jurisdictions, stringent environmental controls are desired by a local minority who wish to preserve a pristine albeit relatively poor local environment.

The anticompetitive and counter-majoritarian motives for federal environmental cleanup mandates are complementary. What drives the anticompetitive motive is the concern of the developed community majority that they will lose jobs and income if they mandate locally desired but costly pollution reduction. Costly federal pollution control mandates prevent lesser-developed jurisdictions from benefiting from the natural competitive advantage provided by cheap land, labor and raw materials. What drives the counter-majoritarian motive is the concern of a strongly pro-environmental minority in undeveloped

203. See Crémer & Palfrey, *Popular Demand*, *supra* note 201, at 908–12.

jurisdictions that local residents prefer economic growth and development at the expense of some environmental degradation.

As a matter of positive prediction, the anticompetitive and counter-majoritarian models identify two groups of voters who should support federal minimum environmental standards: the majority of developed jurisdiction voters, and a limited but potentially intense minority in undeveloped jurisdictions. What drives federal minima are differing preferences for environmental cleanup. Inasmuch as they are anticompetitive, such federal minima reflect different preferences across jurisdictions—they enable developed jurisdiction voters to force lesser-developed jurisdictions to adopt tougher standards than their residents prefer. Inasmuch as they are counter-majoritarian, federal minima reflect preference differences both across jurisdictions and within jurisdictions. They force a higher level of environmental cleanup than the median voter in the lesser-developed jurisdiction wants, thereby giving residents of that jurisdiction who have a high demand for environmental amenities something that they could not get through the local, decentralized political process.

3. From PSD to the Rise of Technology-Based Standards Under the Clean Air Act

The positive theory of protectionist and counter-majoritarian federal environmental standards can be applied to explain both the centrality of the PSD program to the passage of the CAA, and the subsequent evolution of federal minimum standards under the CAA.

a. The PSD Standards and the Passage of the CAA

In its original, skeletal form, the Clean Air Act could well have been understood as based on a cooperative federalism model, which preserved an important role for the states and allowed at least some flexibility to the states to weigh the localized costs and benefits of pollution reduction. As the Court said in one of its first opportunities to interpret the CAA, “so long as the ultimate effect of a State’s choice of emission limitations is compliance with the national standards for ambient air, the State is at liberty to adopt whatever mix of emission limitations it deems best suited to its particular situation.”²⁰⁴ And, in reiterating many years later that the federal EPA may not consider the compliance cost of alternative standards in setting NAAQs, the Court stressed it would be “impossible” for states to design SIPs “without considering which abatement technologies are most efficient, and most economically feasible—which is why we have said that ‘the most important forum for consideration of claims of

204. *Train v. Natural Resources Def. Council, Inc.*, 421 U.S. 60, 79 (1975).

economic and technological infeasibility is before the state agency formulating the implementation plan.”²⁰⁵

As recounted earlier, however, when the Federal Clean Air Act was passed in 1970, it was against a background of rapidly escalating state and local air pollution regulation. Indeed, when the federal EPA issued the first draft NAAQS in January 1971, environmentalists in California, Massachusetts, and Colorado argued that the proposed federal standards were weaker than the standards that their own states had already adopted.²⁰⁶ In other states, a vocal minority protested that the new federal air standards were not tough enough. The complaints came from citizen and environmental groups located in two regions in particular: the Southwestern states, where residents were concerned about the effects on tourist demand for pristine air from emissions at massive new proposed coal-fired power plants located in the Four Corners region; and the heavily industrial Rust Belt area, where the local effects of pollution from the burning of coal were most pronounced.²⁰⁷ Such complaints were to be expected. From the early 1960s, two national interest groups strongly supported the movement for federal air pollution control.²⁰⁸ One group, spearheaded by the Citizens Committee on Natural Resources, emphasized the harm to local public health caused by air pollution in highly developed, urban areas.²⁰⁹ Another group, led by the Sierra Club and the National Wildlife Federation, was interested primarily in protecting undeveloped natural resources from commercial development.²¹⁰ These groups were concerned not with dirty air, but with clean air; not with cleaning up fouled airsheds in heavily developed parts of the country, but in preventing the pollution of clean airsheds in undeveloped parts of the country.

This preservationist goal was at the heart of evolving federal air pollution policy from the very beginning. The Preamble to the 1967 federal Air Quality Act stated that the purpose of federal air pollution legislation was “to protect and enhance the quality of the Nation’s air resources so as to promote the public health and welfare and the productive capacity of its population.”²¹¹ The very first administrative interpretations of the 1967 Act understood federal law as requiring

205. *Whitman v. Am. Trucking Ass’ns*, 531 U.S. 457, 470 (2001) (quoting *Union Elec. Co. v. EPA*, 427 U.S. 246, 266 (1976)).

206. VIETOR, *supra* note 100, at 163.

207. *Id.* at 161–63.

208. *Id.* at 135–37, 197–98.

209. *Id.* at 135, 147.

210. *Id.* at 197–98.

211. 42 U.S.C. § 1857(b)(1) (1970) (current version at 42 U.S.C. § 7401(b)(1) (2006)) (emphasis added).

the prevention of “significant deterioration” (“PSD”) of air quality in relatively pristine areas of the country.²¹² In public hearings across the country, the new federal air regulators made quite clear their interpretation that under the 1967 law, “standard setting activity by the State is called for even if the level of air quality in the region is better than that which the criteria would require.”²¹³

The retention of the “protect and enhance” language in the 1970 Clean Air Act was the product of intense lobbying by national conservation groups such as the Sierra Club, and such groups continued to lobby the EPA to include PSD requirements in initial proposed guidelines for the state implementation plans required by the Act.²¹⁴ Led by a coalition of coal producers and users, industry succeeded in exerting sufficient pressure in regulatory lobbying to prevent the inclusion of a PSD requirement in the EPA’s 1971 implementation guidelines.²¹⁵

Without such a requirement, the only constraint on the ability of relatively undeveloped Western and Southern states to compete away industry from the Northeast and Rust Belt regions would have been the new source review technology-based pollution standards imposed on new sources of pollution. A SIP written by a State already in attainment with the NAAQs could have allowed as many new sources of pollution as it wished, provided that the NAAQs were not exceeded. For this reason, the environmental groups filed suit soon after the passage of the CAA, arguing in *Sierra Club v. Ruckelshaus*²¹⁶ that the PSD requirements found in the 1967 federal clean air law should also be read into the 1970 Act.

Their argument hinged entirely upon general language in Section 110(b) of the CAA (the statutory purpose section), stating a Congressional purpose “to protect and enhance the quality of the Nation’s air resources so as to promote the public health and welfare.”²¹⁷ There was no provision in the 1970 Clean Air Act saying anything specifically about a non-deterioration policy. On a basic principle of statutory interpretation, standing alone, a provision setting out a general purpose of a statute mandates nothing. However,

212. See VIETOR, *supra* note 100, at 199 (discussing National Air Pollution Control Administration interpretation in early 1968).

213. *Id.* (internal quotation marks omitted).

214. *Id.* at 202–03.

215. VIETOR, *supra* note 100, at 203.

216. 344 F. Supp. 253 (D.D.C.), *aff’d*, 2 Env’tl. L. Rep. (Env’tl. Law. Inst.) 20,656 (D.C. Cir. 1972), *aff’d by an equally divided court sub nom. Fri v. Sierra Club*, 412 U.S. 541 (1973).

217. *Id.* at 255 (quoting 42 U.S.C. § 1857(b)(1) (1970)) (internal quotation marks omitted).

relying on a statement in the Senate Report (and, even worse, testimony by HEW administrators) that SIPs must provide for non-degradation of air quality in areas already in attainment with national air quality standards, the district court ruled that SIPs must provide for PSD.²¹⁸

The EPA immediately initiated rulemaking in 1973 to incorporate PSD requirements into SIPs.²¹⁹ This 1973 decision triggered what one historian has called a “storm of protest from the industrial community.”²²⁰ The coal industry in particular was outraged. Throughout the postwar era, the coal industry had been steadily and swiftly losing ground to oil, natural gas and nuclear energy sources that had all enjoyed massive federal subsidies as coal languished. Just when the energy crisis of the early 1970s had promised to finally reverse the coal industry’s fortunes, the PSD program came along.²²¹ Industry leaders recognized that the PSD program was not about public health but about growth control.²²² A Shell Oil vice president commented that “I am not at all sure, . . . of some of the proponents [of PSD]—in fact, it appears that genuine concern for our environment is being used by others to achieve quite different objectives.”²²³ A U.S. Chamber of Commerce representative forecast that PSD would “mandate undeveloped areas [of the United States] into eternal poverty.”²²⁴ As of the mid-1970s, if economic development was to proceed in relatively undeveloped parts of the United States, it would be powered by coal. And if PSD was required, economic development in such areas would be slowed, perhaps significantly.

By 1975, the PSD issue was the central problem confronting Congress in considering how to amend the Clean Air Act. It was of course not the only issue. In the midst of the energy crisis and prolonged economic recession of the 1970s, neither the automobile manufacturers nor polluted urban areas had made any progress at all toward achieving the emissions reductions and ambient air quality levels required by the 1970 Clean Air Act. Still, from the point of

218. The District Court decision in *Sierra Club v. Ruckelshaus* would almost surely have been overturned by a majority of the Supreme Court, had the full Court actually sat on the case. However, as his old law firm had submitted an amicus brief on behalf of industry, Justice Lewis Powell recused himself from the case, leading to an affirmation of the lower court by virtue of a 4–4 tie. Richard Lazarus, *A Tall Tale That Happens to Be True*, ENVTL. F. July–Aug. 2012, at 12, 12.

219. *Fri*, 412 U.S. at 541; VIETOR, *supra* note 100, at 203–04.

220. VIETOR, *supra* note 100, at 203.

221. *Id.* at 205–07.

222. *Id.* at 208.

223. *Id.* at 206–07 (internal quotation marks omitted).

224. *Id.* at 207 (internal quotation marks omitted).

view of many actors, the PSD requirement was the primary focus. Ford Administration Interior Secretary Morton told Senator Muskie's oversight committee that "since coal conversion is the keystone of an effective energy program . . . we have problems resulting from court decisions with respect to significant air quality deterioration."²²⁵ The Sierra Club's congressional testimony spoke only about the weakness of the EPA's proposed PSD program and the need for far tougher standards. Perhaps most importantly, through the National League of Cities and U.S. Conference of Mayors, urban mayors and Eastern industrial states strongly supported a strong PSD program.²²⁶ Indeed, their brief to the Supreme Court in *Sierra Club v. Ruckelshaus* had clearly and succinctly summarized the protectionist rationale underlying the PSD program:

The health of the economies of the urban-industrial regions is dependent upon industrial continuation and growth. It is in the best economic interest of these regions that sources [of air pollution] remain in them and utilize the emission controls necessary. . . . The requirement of no-significant deterioration prevents rural regions from allowing lenient emission controls that are so much less expensive that an industry will have a financial incentive to relocate . . . [N]o significant deterioration removes the possibility of economic coercion between competing regions.²²⁷

Congressional representatives from older, more heavily developed jurisdictions were more than responsive to this argument. For instance, in defending uniform national new source performance standards and the mandatory PSD programs under the Clean Air Act, Senator Cooper stated that such national standards would "eliminate a large element of 'forum shopping' that is possible if new facilities are not required to meet the level of pollution control,"²²⁸ Representative Prior said, "if we do not have national standards, we find what has happened is that States begin to bid against each other

225. *Id.* at 210 (quoting *Implementation of the Clean Air Act—1975: Hearings Before the Subcomm. on Envtl. Pollution of the S. Comm. on Pub. Works*, 94th Cong., 280 (1975) [hereinafter *Implementation of the Clean Air Act*] (statement of Hon. Rogers C. B. Morton, Secretary of the Interior)) (internal quotation marks omitted).

226. *Id.* at 212.

227. *Id.* at 212 (quoting *Implementation of the Clean Air Act*, *supra* note 225, at 852 (statement of Richard M. Lahn, Washington Rep. of the Sierra Club, Accompanied by Bruce Terris)) (internal quotation marks omitted).

228. 116 CONG. REC. 33116 (1970).

to attract polluting industries.”²²⁹ Such statements say nothing explicit about a regulatory race-to-the-bottom. What they do clearly show is that Congress was well aware that federal legislation can prevent interstate competition for economic development opportunities.

Facing such a diverse but united constituency in favor of the PSD requirement, industry united in proposing the polar opposite: the complete elimination of the PSD concept from federal air pollution law.²³⁰ In 1975, eight of the largest oil companies in the world sued to enjoin the EPA from implementing its recently written PSD requirements. The plaintiff corporations—all involved in mining or developing coal and all holding vast coal reserves—presented studies showing that PSD regulations would destroy as much as eighty-six percent of the market for West Virginia coal,²³¹ while “[i]n the West, with its extensive deposits of oil shale and uranium in addition to coal, the inhibitive effects of the regulations would be even more severe[,] . . . rais[ing] serious concern[s] for the economic survival of the rural areas of the Nation.”²³² As Congress appeared headed toward retaining the PSD requirement, industrial emphasis on the growth-retarding consequences of PSD grew even stronger. The head of the National Coal Association told coal operators that “no-significant deterioration . . . has already caused the coal and electric industries more harm than any other single interpretation of the Clean Air Act. . . . This decision can and, no doubt, will be used to halt development across the land.”²³³ By 1977, the American Mining Congress argued against PSD on the ground that “federal regulation of growth in this context should be confined to providing procedural guidelines that will assist the States to arrive at rational judgments.”²³⁴

As environmental historian Richard Vietor has perceptively observed, by the time of the 1977 Amendments, the debate over PSD had become an explicit debate about the appropriateness of federal controls on economic growth and development “as if twenty years had brought the conflict between the energy industry and

229. *Id.* at 19213. The argument was also made in the relevant committee reports. See H.R. REP. NO. 96-294, at 133–35 (1977); H.R. REP. NO. 91-1146, at 3 (1970).

230. VIETOR, *supra* note 100, at 213.

231. *Id.* at 215.

232. *Id.* at 215–16 (citation omitted) (internal quotation marks omitted).

233. *Id.* at 217 (internal quotation marks omitted).

234. *Id.* at 223 (quoting *Clean Air Act Amendments of 1977, Hearings Before the Subcomm. on Envtl. Pollution of the S. Comm. on Pub. Works*, 95th Cong. 506 (1977)) (internal quotation marks omitted).

environmentalists full circle, once again arguing federal versus state authority, but on a different issue—that of limiting growth rather than of actually cleaning up the environment.”²³⁵

Congress ultimately wrote the PSD requirement into the 1977 Amendments to the Clean Air Act. Those PSD requirements are complex, but briefly if incompletely summarized, the PSD program prohibits major new sources of air pollution from being constructed in areas already meeting (in attainment with) NAAQs unless they (1) install “the best available technology” (BACT)²³⁶ to control any criteria pollutant emitted in potentially “significant” amounts and (2) also have results from approved computer air quality models showing that the additional pollution will not “cause or contribute” to too large an increase in the “baseline [ambient] concentration” of the pollutant in that area.

This complexity directly reflects the intense regional contest over the PSD requirements that took place within the U.S. Senate. An amendment in the Senate that would have placed a moratorium on the PSD program was supported by Southern conservative Democrats, Western energy states with multiple national parks (and therefore very severe non-deterioration requirements), and Appalachian coal states. The amendment was opposed, successfully, by Eastern, Central and Pacific state senators.²³⁷ A clearer division between the interest of relatively undeveloped, rural states and older, more heavily developed and polluted states could hardly be imagined. This division ensured that the PSD requirement included in the 1977 Amendments were filled with loopholes (baseline levels of ambient pollution, for example) that effectively allowed the construction of new power plants in undeveloped regions of the country.²³⁸

235. *Id.* at 224.

236. Under 42 U.S.C. § 7479(3) (2006), BACT is “an emission limitation based on the maximum degree of [pollutant] reduction . . . which the permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such facility.” Clean Air Act Amendments of 1977, Pub. L. No. 95-95, § 169(3), 91 Stat. 685, 741, 42 U.S.C. § 7479(3) (2006).

237. See VIETOR, *supra* note 100, at 218–19 (discussing the history of an amendment proposed by Senator Frank Moss to delay PSD for a year pending further study). Part of the difference across regions may reflect varying preferences for environmental quality, but Pashigian, *supra* note 27, at 562–70, found that there was much greater regional variation in congressional voting on PSD policy than on auto emission policy and a portfolio of economic issues. Since PSD policy had much stronger regional redistribution effects, this finding is strong evidence that regional redistribution was driving the PSD vote. *Id.* at 569–70.

238. VIETOR, *supra* note 100, at 224.

It is tempting to see the PSD program as something that Congressional representatives of older, industrial and heavily polluted regions got in exchange for agreeing to legislatively do something about their regions' non-attainment of national air quality standards.²³⁹ It is true that the 1977 Amendments did establish a federal, technology-based standard for new sources of air pollution in non-attainment areas and prohibited the states from allowing such new source unless there were sufficient reductions in existing sources to "offset" the addition brought by new construction.²⁴⁰

Still, relative to the situation that would have prevailed under decentralized, state-level regulation, the non-attainment and PSD programs together increased the required level of pollution control in less-developed states with little—if any—effect on pollution control requirements in more developed states. In its stationary source regulatory regime, therefore, the Clean Air Act significantly lowered the competitive cost of pollution control to older, more polluted industrial states and constituted a form of regulatory protectionism for those states.

b. Did the PSD Standards Work? The Limitations of Existing Empirical Evidence

It is not enough that a theory exists to explain the stylized facts of federalization. It is also important to verify that the theory is consistent with the available empirical evidence. Economists have generated a good deal of empirical evidence about things such as the environmental Kuznets curve. They have also spent considerable time and effort testing the race-to-the-bottom hypothesis. The existing empirical work does not, however, address the predictions of the regulatory protectionism theory set out here.

On that theory, States that had the worst pollution problems were already beginning to regulate to reduce pollution, imposing costs on industry that were contributing to nascent industrial flight to lesser developed, less polluted regions. The CAA, and in particular the PSD requirements, were designed to impose regulatory requirements on less polluted regions, requirements that were more stringent than the regulations that those unpolluted regions would have undertaken under decentralized regulation. If the PSD requirements worked as my account holds and actually imposed costs on industry that would not have been imposed without PSD requirements, then one would expect that after PSD requirements began to be imposed, holding all else equal, there was an observable

239. ROBERT V. PERCIVAL ET AL., ENVIRONMENTAL REGULATION: LAW, SCIENCE AND POLICY 609 (7th ed. 2013).

240. *Id.* at 597.

slowing of industrial migration (in the sense of new plant openings) in relatively undeveloped, attainment areas of the United States.

Economists have not investigated this hypothesis empirically. The hypothesis that they have investigated is the race-to-the-bottom (also called the pollution haven) hypothesis. One such body of work has exploited geographic variation in environmental regulatory stringency induced by the PSD requirement and by other changes made by the 1977 Amendments to the Clean Air Act. As noted above, the 1977 Amendments required the adoption of BACT technologies in less polluted attainment regions. In more polluted non-attainment areas, the 1977 Amendments required that SIPs could allow new sources only if they met the “lowest achievable emission rate” (LAER), which is defined as the most stringent emissions limitation that is achieved in practice for a given source type.²⁴¹ LAER requirements are generally more expensive, and sometimes much more expensive, than BACT requirements. Recent empirical work has shown that holding all else equal, the tougher LAER antipollution requirements imposed on new sources in non-attainment areas deter firms from opening new plants there, so that plant growth is higher in cleaner, attainment areas than in non-attainment areas.²⁴²

This work confirms not only that environmental regulations do matter to firms in deciding where to locate their plants, but also that they are not the only thing that matters, that other geographic characteristics, such as the availability of cheap inputs to the production process, also impact plant location.²⁴³ Thus, this

241. Clean Air Act Amendments of 1977, Pub. L. No. 95-95, § 172, 91 Stat. 685, 746–747, 42 U.S.C. § 7502(b)(2) (2006).

242. See Randy A. Becker & Vernon Henderson, *Effects of Air Quality Regulations on Polluting Industries*, 108 J. POL. ECON. 379 (2000); Michael Greenstone, *The Impacts of Environmental Regulations on Industrial Activity: Evidence from the 1970 and 1977 Clean Air Act Amendments and the Census of Manufactures*, 110 J. POL. ECON. 1175 (2002); Matthew E. Kahn & Erin T. Mansur, *Do Local Energy Prices and Regulation Affect the Geographic Concentration of Employment?*, 101 J. PUB. ECON. 105 (2013). More recent evidence using plant-level census data reveals a reason for these firm decisions about plant location—tougher air pollution regulations in non-attainment areas significantly reduce plant-level productivity. Michael Greenstone et al., *The Effects of Environmental Regulation on the Competitiveness of U.S. Manufacturing*, (Nat’l Bureau of Econ. Research, Working Paper No. 18392, 2012). At the county level, however, the impact of tough environmental standards is likely to be less (in terms of lost plant openings) when the county has abundant labor (high unemployment) or significant industrial concentration (with attendant agglomeration economies). Daniel L. Millimet & John A. List, *The Case of Missing Pollution Haven Hypothesis*, 26 J. REGULATORY ECON. 239, 241 (2004).

243. Millimet, *supra* note 11, at 1693 (summarizing the state of this literature: “second generation studies—utilizing better data to identify

presumption of my theory seems confirmed by existing evidence. As discussed above (and also briefly below), states retain the authority to enact tougher air pollution standards than the federal minima, and also are responsible for permitting, monitoring and enforcing against particular sources of air pollution. There is evidence that some states have indeed regulated more stringently (in both standard-setting and enforcement), than is federally required.²⁴⁴ Even more to the point, there is evidence that states react strategically to the regulatory requirements of other states by toughening their requirements after adjacent states toughen their own regulations.²⁴⁵

Thus while there is no study that attempts something like a before and after study of the PSD requirements, there is evidence that plant location choice is strongly influenced by environmental regulatory stringency, and that states are willing to impose tougher environmental regulatory requirements despite the potential cost in terms of reduced new plant openings within their borders. Both of these are important stylized facts in my account of American environmental federalization.

c. The Continuing Rise of Technology-Based Standards in the Clean Air Act of 1990

On my account, the courts and the EPA were correct—as Congress confirmed with the 1977 Clean Air Act Amendments—to think that the 1970 CAA would never have been passed were it not understood that new sources even in attainment areas would be required to meet uniform technologically-based emission standards. The 1977 Amendments not only required major sources in attainment areas to install best available control technology (“BACT”)—the PSD program—but also required the use of LAER technologies and

the causal effect of environmental policy—have consistently documented a meaningful effect of environmental stringency on the location of economic activity. That said, the findings must be interpreted carefully. . . . [f]or the vast majority of industries, environmental costs are a small fraction of overall costs and location decisions are dominated by other factors.” As Millimet further cautions, in econometric studies of the impact of environmental regulatory stringency on industrial location, “other important determinants of the location of economic activity are not held fixed such as a location’s endowment of physical and human capital.”

244. See, e.g., Matthew Potoski, *Clean Air Federalism: Do States Race to the Bottom?*, 61 PUB. ADMIN. REV. 335 (2001) (concluding that states often “exceed federal EPA standards”).

245. See Per G. Fredriksson & Daniel L. Millimet, *Strategic Interaction and the Determinants of Environmental Policy Across U.S. States*, 51 J. URBAN ECON. 101 (2002); David M. Konisky, *Regulatory Competition and Environmental Enforcement: Is There a Race to the Bottom?*, 51 AM. J. POL. SCI. 853 (2007).

emission offsetting for major sources in non-attainment areas. Inasmuch as many heavily polluted states were already about to require as tough or even tougher emission control standards, the CAA as amended in 1977—the version that actually began to be enforced—amounted to a regime of uniform minimum standards for cleaner attainment areas of the country and a regime of potentially maximum standards for dirtier non-attainment areas.²⁴⁶

This is as my theory would predict. However, after the 1977 Amendments, the CAA was left in an internally inconsistent form. On the one hand, as environmental groups championed, the federal Clean Air Act of 1970 “marked a significant departure from prior approaches” by setting up NAAQs.²⁴⁷ And for new sources of air pollution, the law also required nationally uniform technology-based emission controls that were specific to particular industrial source categories (and attainment versus non-attainment regions). However, the CAA of 1970 also ostensibly allowed states great leeway in deciding how to meet the NAAQs. Under the CAA’s version of cooperative federalism, states were apparently to be trusted to figure out ways to reduce pollution from existing sources, but were not to be entirely trusted to set pollution control standards for new plants.

From 1977 through 1990, States containing many of the older and more polluted areas of the country repeatedly missed statutory deadlines for meeting the NAAQs and in many areas of the country that had been in attainment with national standards, air quality actually worsened. The 1990 Amendments responded to the perceived problem of continuing non-attainment in two rather inconsistent ways. On the one hand, Congress essentially gave up on the goal of nationwide uniformity by creating up to six different categories of nonattainment areas for ozone, with different statutory compliance deadlines for each category.²⁴⁸ On the other hand, the 1990 Amendments required for the first time that all major sources²⁴⁹ of air

246. States that want to incur the costs of more stringent regulation are free to do so. In practice, however, once the Federal EPA has said that a certain ambient level of pollution is “allowing an adequate margin of safety, . . . requisite to protect the public health,” the case for an even stricter standard disappears. Clean Air Act Amendments of 1970, Pub. L. No. 91-604, § 109(b)(1), 84 Stat. 1676, 1680 (codified at 42 U.S.C. § 7409(b)(1) (2006)).

247. PERCIVAL ET AL., *supra* note 239, at 527–28.

248. In the 1990 Amendments to the Clean Air Act, Congress finally gave up on the goal of nationwide air quality attainment, and created six different categories of nonattainment for ozone, three for carbon monoxide, and two for particulates, with compliance deadlines that vary by category. *See* 1990 Amendments to the Clean Air Act of 1970, §§ 171–78.

249. Major sources are defined as sources that emit or have the potential to emit one hundred tons or more per year of any pollutant, ten tons or

pollution must obtain a federal operating permit.²⁵⁰ Under the Amendments, major sources were forbidden to operate without applying for and obtaining these federal operating permits.²⁵¹

Environmentalists reacted with outrage to the abandonment of nationally uniform schedules for states to come into attainment with the NAAQs, viewing this as a political concession that was completely inconsistent with the principles underlying the Clean Air Act.²⁵² But as the statutory structure of the CAA itself clearly shows, that law was never intended by Congress to make any part of the federal government a credible enforcer of state efforts to meet the NAAQs. The Clean Air Act says that the federal EPA must impose one of two sanctions on any State that has failed to submit an adequate SIP: either the loss of federal highway funds, or the imposition of tougher standards for new polluting industries.²⁵³ However, at the same time, Congress specified that EPA cannot take away highway funding in “attainment” airsheds, and that even within dirtier, “nonattainment” areas, federal highway funds remain available for projects that “resolve a demonstrated safety problem and likely will result in significant reduction in, or avoidance of, accidents.”²⁵⁴ Even after Congress gave them more time in the 1990 Amendments, very few States in fact met the November 1994 deadline for submitting revised SIP’s for serious, severe or extreme ozone non-attainment areas,²⁵⁵ and

more per year of any hazardous air pollutant (“HAP”) or twenty-five tons or more per year of any combination of HAPs. 42 U.S.C. § 7602(j).

250. *Id.* § 7661.

251. *Id.* § 7661a(a).

252. *See Action Needed to Force States to Comply with Clean Air Act Amendments, Groups Say*, 25 ENVTL. REP. 1373, 1373 (1994) (discussing criticism of efforts to regulate air quality).

253. I use “adequacy” as a summary for the various findings that have to be made by EPA under Sections 179(a)(1)–(4) of the Act before a “deficiency” in an SIP is declared. *See* 42 U.S.C. § 7509(a)(1)–(4). The State then has eighteen months to correct the problem with its plan. If it fails to do so, Sections 179(b)(1)–(2) 42 U.S.C. Sections 7509(b)(1)–(2) then require EPA to assess sanctions. The “tougher standards” I refer to are an increase in the offset requirement for new stationary sources within non-attainment areas, which means that new sources of air pollution cannot be built unless they somehow obtain a 2/1 reduction in the total area emissions of a specified pollutant. Within two years of finding that a State has failed to submit an adequate SIP, Section 110(c)(1) of the CAA requires EPA to prepare a federal implementation plan for the State.

254. Clean Air Act § 179(b)(1)(A), 42 U.S.C. § 7509(b)(1)(A). *See* *Virginia v. Browner*, 80 F.3d 869 (4th Cir. 1996) (upholding constitutionality of sanctioning scheme under Tenth Amendment).

255. *Action Needed to Force States to Comply*, *supra* note 252.

yet the EPA failed to levy sanctions against any State. Indeed, in the forty-plus year history of the Clean Air Act, the EPA has *never* sanctioned a State by freezing its federal highway funding in non-attainment areas.²⁵⁶

On my theory, the failure of any state to ever be federally sanctioned for failing to attain the NAAQs is hardly surprising. If the purpose of federalization is to lessen the competitive advantage of less-developed, less-polluted regions, then it can hardly be the older, more polluted regions—the primary beneficiaries of federalization—who actually face serious penalties for failing to drastically reduce pollution by slowing development and imposing costly, industry-unfriendly emission reduction requirements. An extension of deadlines and (de facto) relaxation of pollution reduction requirements for older, heavily polluted regions is exactly what on my theory one would predict.

The Title V major source-permitting program created by the 1990 Amendments is on my theory also precisely what one would predict. Such federal permits have turned out to provide an important (though by no means exclusive) avenue by which the federal EPA has eliminated state discretion in favor of nationally uniform, technology-based standards. This is not because states have formally been divested of their traditional roles under the CAA. It is state, not federal, regulators who actually decide how to implement the nationally uniform technology-based standards by writing them into individual, source-specific permits.²⁵⁷ State regulators are responsible for inspections and monitoring to ensure that sources are in compliance with such permits, and state regulators are the primary enforcers against permit violations.²⁵⁸

Notwithstanding this continuing state role, Title V permits have been a way for the Federal EPA to assert more and more direct authority over the pollution abatement steps that individual plants must take under the CAA. One method by which the EPA has asserted such control is by promulgating technology-based standards at a finer and finer grained level of applicability.²⁵⁹ For example:

256. Indeed, the decision in *Environmental Defense Fund v. EPA*, 167 F.3d 641 (D.C. Cir. 1999), was considered earth-shattering, for there the Court found that when Congress amended the CAA in 1990 to require that transportation planning in non-attainment areas be in conformity with the SIP requirements for such areas, it also *required* EPA to deny highway funding to any area which was currently not in attainment under its plan.

257. REITZE JR., *supra* note 192, at 64, 229–31.

258. *Id.* at 237–39; *see also id.* at 125 n.1330 (“Most of the effort to enforce [the CAA] is at the state level.”).

259. Eric L. Hiser, *Air Quality Permitting: An Increasingly Limited Tool for a Sustainable Future*, 43 ARIZ. ST. L.J. 761, 774 (2011).

[T]he Gas Distribution Facility MACT standard applies to anyone who stores gasoline in a stationary container, and the Reciprocating Internal Combustion Engine (“RICE”) MACT standard applies to almost all stationary internal combustion engines regardless of size, which potentially captures someone who purchases an emergency generator at Home Depot or Lowe’s and chains it in place.²⁶⁰

The other (and among state regulators, notorious) way that the federal EPA has used the permitting process as a way to directly regulate is by overriding permitting decisions. It might seem that Congress precluded such a federal regulatory role. For example, the § 169(3) BACT standard for major new sources in attainment areas subject to the PSD program is to be determined by the “permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs.”²⁶¹ A state agency, not the federal EPA, is the “permitting authority” responsible for making BACT determinations.²⁶² As the statute expressly states that this BACT determination is to be made on a “case by case” basis involving the considering of both environmental as well as economic “impacts and costs,” it would seem that States do indeed retain an important role, even in a regime of technology-based standards.

However, the CAA also says that the federal EPA may “take such measures, including issuance of an order, or seeking injunctive relief, as necessary to prevent the construction or modification of a major emitting facility which does not conform to [PSD] requirements.”²⁶³ The federal EPA has interpreted this provision as giving it the authority to reject source-specific BACT determinations made by state permitting agencies, and in *Alaska Department of Environmental Conservation v. EPA*,²⁶⁴ (*ADEC*) the Supreme Court agreed.

That case involved a PSD permit for the Red Dog zinc mine, located about one hundred miles north of the Arctic circle, near the native villages of Kivalina and Noatak.²⁶⁵ The area is relatively pristine and therefore subject to PSD requirements. From 1988 until 1996, the Red Dog Mine got its power from six diesel-powered 5000-

260. *Id.* (footnotes omitted).

261. 42 U.S.C. § 7479(3) (2006).

262. *See* REITZE JR., *supra* note 192, at 81–82 (outlining the requirements states need to meet for “severe areas” and “extreme areas”).

263. 42 U.S.C. § 7477 (2006).

264. 540 U.S. 461 (2004).

265. This description of the facts is drawn from the Ninth Circuit’s opinion in the case. *Alaska Dep’t of Env’tl. Conservation v. EPA*, 298 F.3d 814 (9th Cir. 2002), *aff’d* 540 U.S. 461 (2004).

watt generators.²⁶⁶ In order to expand production in 1998, the mine agreed with the Alaska Department of Environment and Conservation that it would install a relatively inexpensive high combustion technology to reduce nitrogen oxide emissions on all six of its existing generators, including those that were not major sources, plus on a new seventh generator it needed to expand production. ADEC had originally proposed a more expensive catalytic reduction technology for the two generators that were subject to BACT requirements, but it accepted Red Dog's proposal because (assuming that under typical operating conditions, one or more generators would be in stand-by mode, and not operating) installing the high combustion technology on all its generators would achieve the same reduction in nitrogen oxide emissions as ADEC's catalytic reduction proposal but at lower cost.²⁶⁷

At this point, the federal EPA intervened, arguing that the catalytic reduction technology was BACT for the two generators that were increasing output, and that "the PSD program does not allow the imposition of a limit that is less stringent than BACT even if the equivalent emission reductions are obtained by imposing new controls on other emission units." The ADEC fought back, issuing a permit for Red Dog's expansion finding that catalytic reduction was not economically feasible and that low NOX (the high combustion alternative) was preferred. The EPA responded that the mine owners had failed to show why catalytic reduction was infeasible. Eventually, after further resistance by ADEC, the federal EPA made a formal finding that ADEC's authorization of Cominco's construction and installation of new equipment was not in compliance with PSD requirements under the Clean Air Act and issued an order to Red Dog's owners preventing the company from beginning construction of the new generator until it had demonstrated to the EPA's satisfaction compliance with the Act and the SIP.

Both the Ninth Circuit and the Supreme Court sided with the EPA. Most significantly, the Court accepted the EPA's argument that the BACT statutory definition includes an unstated limitation that state air permitting authorities only have the "authority to make *reasonable* BACT determinations"²⁶⁸ and that to "restrain the interjurisdictional pressures to which Congress was alert" the federal EPA must exercise "surveillance of a State's BACT designation."²⁶⁹ The Court approved the EPA's reference to the explanation given in

266. *Id.* at 816.

267. *Id.* at 816–17.

268. *Alaska Dep't*, 540 U.S. at 485 (citation omitted) (internal quotations omitted).

269. *Id.* at 486.

a House Report accompanying the 1977 CAA Amendments that Federal PSD standards and federal EPA “surveillance” were necessary so that a “State deciding to protect its clean air resources” would not have to face the threat that it “would lose existing industrial plants to more permissive States . . . [and] become the target of ‘economic-environmental blackmail’ from new industrial plants that will play one State off against another with threats to locate in whichever State adopts the most permissive pollution controls.”²⁷⁰

As the dissenting justices in *ADEC* observed, accepting EPA’s argument that “state agencies are not to be trusted” lest they engage in a “race to the bottom,” where jurisdictions compete with each other to lower environmental standards to attract new industries and keep existing industries within their borders” flew in the face of CAA language clearly giving States the “exclusive role in making BACT determinations.”²⁷¹ According to the dissenting justices, “Congress made the overriding judgment that States are more responsive to local conditions and can strike the right balance between preserving environmental quality and advancing competing objectives.”²⁷² Moreover, the dissent argued, the Congressional decision to leave “certain functions to the States” so that “they would have a stake in implementing the environmental objectives of the [CAA]” had been borne out by the “real-world experience” that the states had, “by and large, take[n] their statutory responsibility seriously.”²⁷³

The economics of fiscal federalism supplies a very strong justification for the dissenting justices’ argument in *ADEC*. If one assumes that state regulators are in the best position to evaluate the actual benefits of pollution reduction in a particular location, then it is those regulators who can best balance costs and benefits of alternative pollution reduction techniques proposed by a local polluting firm. During the period roughly between 1994 and 2008, environmental “regulatory reform” meant in large part giving state regulators greater discretion to make just such place-specific judgments. The Alaska regulators’ decision at the Red Dog mine in *ADEC*—to allow the firm to adopt the cheaper high combustion technique at all seven generators, rather than the much more expensive catalytic reduction technique at just two generators—exemplified the kind of “win-win” solution that decentralization could find. It was the practical realization of fiscal federalism’s matching principle.

270. *Id.* (quoting H.R. REP NO. 96-294, at 134 (1977)).

271. *Id.* at 506–07 (Kennedy, J., dissenting).

272. *Id.* at 507.

273. *Id.*

As a matter of statutory interpretation, of identifying Congressional intent in passing (and amending) the Clean Air Act, it was the majority and not the dissenters who were correct in *ADEC v. EPA*. As argued above, the congressional majority behind the CAA wanted to cushion the anticompetitive impact on older, more developed states of requiring costly pollution reduction. The PSD requirements were in the CAA to stop state regulators in less developed attainment regions from allowing rapid industrialization at the expense of older industrial areas, regardless of whether or not the environmental costs of new industry in attainment regions were greatly outweighed by other benefits (or vice versa). The movement toward a more comprehensive system of nationally uniform technology-based emission standards, to be accomplished via the new Title V major permit requirement, was likewise a response to the fact that despite PSD requirements, attainment regions had been growing more rapidly than the more heavily developed, non-attainment regions. However much one might decry the loss of state autonomy and economic efficiency represented by the *ADEC v. EPA* decision, one must admit that a Congress that federalized environmental air pollution regulation to provide economic protectionism would have wanted precisely that result.

IV. THE FAILURE OF FEDERALIZATION: CLIMATE CHANGE AS A CASE STUDY

If my theory of environmental federalization is indeed capturing something important about that process, then it should also explain instances where environmental regulatory federalization has failed. Perhaps the most striking failure of federalization has been the lack of success in passing federal climate change legislation. Since the year 2000, at least three comprehensive climate change bills have been introduced in the U.S. Congress. The McCain-Lieberman Climate Stewardship Act,²⁷⁴ introduced in the Senate in both 2003 and 2005, failed 59–37, with ten Democrats voting against it.²⁷⁵ In 2007, the Global Warming Pollution Reduction Act of 2007²⁷⁶ (introduced by Senators Boxer of California and Sanders of Vermont) died in committee.²⁷⁷ And in 2009, the American Clean Energy Security

274. S. 1151, 109th Cong. (2005).

275. *Id.*

276. S. 309, 110th Cong. (2007).

277. *Id.*

(ACES) Act of 2009²⁷⁸ was approved by the House by a close 219–212 vote but then died in the Senate.²⁷⁹

The theory set out above readily explains Congressional failure to pass climate change legislation. Recall first that circa 1970, Americans living in heavily industrialized areas across the country were confronted with precisely the same problem: rivers and airsheds that were heavily polluted by industry and the automobile. This pollution problem was not episodic—around for a few days and then gone—but a continuing presence that was limiting both recreational use of local resources and also further local industrial development.

Even assuming an anthropogenic contribution to climate change, anthropogenic greenhouse gas emissions have not yet generated anything like the polluted air and waterways that confronted industrial America circa 1970. Heat waves, droughts, tornadoes, and hurricanes are said by some politicians (and even some scientists)²⁸⁰ to be a result of climate change. But not only are these pronouncements highly contested—with the majority of climate scientists at most willing to say that some extreme weather events may have become more likely as a result of anthropogenic climate change,²⁸¹ while no individual weather episode can be said to be “caused” by climate change—there is quite literally nothing that can be done now to

278. H.R. 2454, 111th Cong. (2009).

279. See Greg G. Hitt & Stephan Power, *House Passes Climate Bill*, WALL ST. J., June 27–28, 2009, at A1.

280. See, for example, a recent *Huffington Post* story in which Rutgers University scientist Jennifer Francis states that super storms such as Sandy are what would be expected if greenhouse gases continue to accumulate, http://huffingtonpost.com/2013/03/11/hurricane-sandy-arctic-ice-climate-change_n_2853220.html; see also Sam Eaton, *Climate Change and Sandy*, PBS NOVA (Nov. 15, 2012), <http://www.pbs.org/wgbh/nova/earth/climate-change-sandy.html> (reporting that “many” climate scientists believed that “climate change may well have played an important role in the destruction caused by Sandy as well as other recent extreme weather events”).

281. This may well be an overstatement of the kind of causal attribution statements climate scientists are willing to make. A more accurate description of what most climate scientists seem to be saying is “we don’t know.” See, e.g., Kenneth E. Kunkel et al., *Monitoring and Understanding Trends in Extreme Storms*, 94 BULL. AM. METEOROLOGICAL SOC’Y 499, 507 (April 2013) (a literature survey with twenty-five climate scientist coauthors concluded that “robust detection of trends in Atlantic and western North Pacific TC [tropical cyclone] activity is significantly constrained by data heterogeneity and deficient quantification of internal variability. Attribution of past TC changes is further challenged by a lack of consensus on the physical linkages between climate forcing and TC activity. As a result, attribution of any observed trends in TC activity in these basins to anthropogenic forcing remains controversial”).

generate a short-term reduction in either the frequency or severity of such extreme but short-lived weather events. Contemporaneous weather events are taken by advocates of greenhouse gas reduction policies to show that climate change is real and to support the argument that in order to protect future generations from even worse such events, the United States should pass legislation to reduce greenhouse gas emissions. The argument in favor of such legislation has not been that it will generate concrete climate benefits in the near term.

The fact that a sizeable number of members of Congress have voted in favor of one or more of the climate change bills mentioned above suggests that there must be some perceived benefits to at least some states and congressional districts from such legislation. One such benefit is the satisfaction of an ideological preference for action on climate change. A recent econometric study has in fact shown that congressional ideology—liberal versus conservative on a broad measure of voting on environmental issues—is indeed a statistically significant predictor of congressional voting on the 2009 ACES Act.²⁸² Ideology, especially environmental ideology, is now highly correlated with political party affiliation. Voting on climate change legislation has thus become a political party “brand name” signal. Back in the early 1970s, environmental federalization enjoyed broad bi-partisan support; environmental regulation had not become an ideological issue. By 2000, however, environmental regulation was a highly ideological and polarizing issue, with the Republican “brand” associated with opposition to costly new environmental regulation and Democrats supporting such initiatives. Moreover, even within the set of environmental regulatory issues, climate change is perhaps the most ideologically polarizing.²⁸³ Thus while Democrats perceive a huge benefit, if not a political obligation, to vote in favor of climate change federalization, Republicans have precisely the opposite preference.

It is not just the ideological polarization of the climate change issue that has caused the failure to enact a federal climate change law. The non-ideological benefits of costly action to reduce greenhouse gas emissions vary dramatically across states and Congressional districts. Whereas virtually every industrialized locality benefited in 1970 from reducing air and water pollution, many states would incur huge net costs were a federal law to limit and impose costs and carbon dioxide emissions. As of 2002, for example, in Wyoming and West Virginia, well over ninety-five percent of the electric power generated in each

282. Michael I. Cragg et al., *Carbon Geography: The Political Economy of Congressional Support for Legislation Intended to Mitigate Greenhouse Gas Production*, 51 *ECON. INQUIRY* 1640 (2012).

283. Dan Kahan, *Why We Are Poles Apart on Climate Change*, 488 *NATURE*, Aug. 16, 2012, at 255.

state came from coal-fired generating units.²⁸⁴ For another eighteen states, over half of the electric power generated in the state came from burning coal.²⁸⁵ A federal law taxing or limiting generation of electric power from burning coal has the effect of disproportionately increasing the costs of locating a manufacturing plant in states that are so heavily reliant on coal. Conversely, as of 2002, there were nine states in which coal-burning electric utility generating facilities provided less than twenty-five percent of the power generated within the state.²⁸⁶ For such states, a federal law taxing or limiting carbon dioxide emissions would have relatively little impact on the electric power costs of industries within such states, improving the competitive position of such states in keeping and attracting industry. And this is just the power industry. When one considers industries that directly emit carbon dioxide—such as cement and steel—the impact of any federal law attaching costs to carbon dioxide and other greenhouse gas emissions would have an enormous impact on the relative competitiveness of different states.

What has doomed federal climate change legislation is the fact that whether a state can expect to win or lose from federal legislation imposing costs on carbon dioxide emissions is highly correlated with the ideology and political party of that state's Congressional representatives, and party happens to be highly correlated with whether a state would be net short term winner or loser from imposing costs on carbon dioxide emissions. Ideological conservatives on environmental issues are overwhelmingly Republican,²⁸⁷ and such environmentally conservative legislators overwhelmingly come from states that would be big net losers from a federal law imposing costs on carbon dioxide emissions. More precisely, Republican congressional representatives come primarily from the South and Midwest, which are exactly the regions that can expect to be big short-term losers from climate change legislation. Moreover, the states that have nothing much to lose from imposing costs on carbon dioxide emissions are in a distinct minority among states. Those states—the net short-term winners from federal climate change legislation—are those that are unusually reliant on hydropower (Oregon, Washington, and California) or nuclear power (New Hampshire, New Jersey, New York,

284. *2001–2012 Net Generation by State by Type of Producer by Energy Source*, U.S. ENERGY INFO. ADMIN., www.eia.gov/electricity/data/state (follow link to download “XLS” spreadsheet) [hereinafter U.S. EIA].

285. *Id.*

286. *Id.*

287. Jon P. Nelson, “Green” Voting and Ideology: LCV Scores and Roll-Call Voting in the U.S. Senate, 1988–1998, 84 REV. ECON. & STAT. 518 (2002).

and Vermont).²⁸⁸ Over the period since 2000, there have been some instances when a senator's political party affiliation or ideology does not line up with a state's interest in a law imposing costs on carbon dioxide emissions—for example, in 2003, when both Republican Senator Lugar and Democrat Senator Bayh from Indiana (a likely net loser from carbon dioxide taxes or fees) voted in favor of federal climate change legislation.²⁸⁹ But those have been the exception and not the rule.

The contrast between climate change circa 2014 and air and water pollution circa 1970 is stark. Federal legislation setting mandatory minimum standards for emissions of air pollutants brought very concrete and immediate environmental benefits to virtually every industrialized area of the country and at the same time lessened the competitive advantage of lesser-developed places. Federal water pollution legislation actually subsidized water pollution reduction in such industrialized areas. Federal climate change legislation would generate very large, anti-competitive cost increases for regions of the country constituting a majority in the U.S. Senate while generating no discernible short-term climate benefits anywhere. Indeed, according to the Environmental Protection Agency, the only short-term environmental benefit from reducing greenhouse gas emissions would be indirect, in the form of a reduction in conventional air pollutants (primarily fine particulates).²⁹⁰ Given that a majority of states would be net losers were costs imposed on carbon dioxide emissions, it is hardly surprising that the minority of states that would enjoy a competitive advantage from such cost imposition have failed to pass federal climate change legislation. On my theory, this failure is precisely what one ought to have predicted.

288. For data over the entire 2001–2012 period, see U.S. EIA, *supra* note 284. Note that it is precisely such states where both Senators, from the same party, have voted in favor of climate change federalization. For example, the states with both Senators voting in favor of the 2003 McCain-Lieberman climate change bill were California, Connecticut, Delaware, Indiana, Maine, Maryland, Massachusetts, New Jersey, New York, Rhode Island, and Washington.

289. See 108 CONG. REC. 26, 583 (2003).

290. See Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 79 Fed. Reg. 34,830 (June 18, 2014) (to be codified at 40 C.F.R. pt. 60).