

AN ANALYSIS OF THE RIGHTS-BASED JUSTIFICATION FOR FEDERAL INTERVENTION IN ENVIRONMENTAL REGULATION

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INTRODUCTION

Until 1970, the federal government's involvement in environmental regulation was extremely limited; the primary responsibility for dealing with environmental problems was entrusted not to the federal government, but rather to the states.¹ To the extent that the federal government enacted environmental regulations prior to 1970, "the primary targets . . . were federal agencies rather than private industry."² The federalization of environmental law began in earnest when President Nixon's signing of the National Environmental Policy Act³ was nationally televised on January 1, 1970.⁴ Between 1970 and 1980, the federal government enacted no less than ten major envi-

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1. See, e.g., Christopher K. Leman & Robert H. Nelson, *The Rise of Managerial Federalism: An Assessment of Benefits and Costs*, 12 ENVTL. L. 981, 1021 (1982).

2. Robert V. Percival, *Environmental Federalism: Historical Roots and Contemporary Models*, 54 MD. L. REV. 1141, 1158 (1995). One example of a pre-1970 regulation that targeted federal agencies instead of private industry is the National Historic Preservation Act of 1966 (NHPA), 16 U.S.C. § 470 (1994). For more on the NHPA, see, e.g., Nicole B. Wilkes, *Public Responsibilities of Private Owners of Cultural Property: Toward a National Art Preservation Statute*, 24 COLUM.-VLA J.L. & ARTS 177, 198-99 (2001).

3. 42 U.S.C. §§ 4321-4370(a) (1994). For more on the National Environmental Policy Act (NEPA), see *infra* notes 109-112 and accompanying text.

4. See Matthew J. Lindstrom, *Procedures Without Purpose: The Withering Away of the National Environmental Policy Act's Substantive Law*, 20 J. LAND RESOURCES & ENVTL. L. 245, 245 (2000); Robert V. Percival, *Separation of Powers, the Presidency and the Environment*, 21 J. LAND RESOURCES & ENVTL. L. 25, 33-34 (2001).

ronmental regulatory schemes.⁵ However, beginning in the early 1990s, the major rationales for federal intervention have been reexamined in the academic literature.

Prominent economic justifications for federal intervention, such as the race-to-the-bottom and public choice accounts, have been questioned.⁶ Similarly, although the existence of interstate externalities provides a compelling case for federal intervention,⁷ the regulatory regime has been challenged as inconsistent with this justification.⁸ In response to these critiques, proponents of a strong federal regulatory role have advocated a number of other reasons for federal intervention in addition to these three traditional justifications. Like the three traditional justifications, most of these newer reasons are economic in nature. For example, some scholars have argued that centralized regulation has strong economies of scale advantages. By “centralizing research, standard setting, control-measure selection, implementation, or enforcement,” the federal government “can absorb these costs so that states do not have to repetitively perform these functions.”⁹ Another economic justification is rooted in uniformity concerns: Federal regulation may benefit a manufacturer who relies on economies of scale in the production process because some federal environmental standards—such as those for pesticides and mobile sources—serve both as regulatory floors and ceilings, thus al-

5. See ROBERT V. PERCIVAL ET AL., ENVIRONMENTAL REGULATION: LAW, SCIENCE, AND POLICY 105-07 (3d ed. 2000) (providing a chronology of significant federal environmental legislation).

6. See 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). For a synopsis of the debate surrounding the race-to-the-bottom rationale, see Richard L. Revesz, *Federalism and Environmental Regulation: A Public Choice Analysis*, 115 HARV. L. REV. 553, 556 n.2 (2001). For a critique of the public choice rationale, see *id.*

7. The interstate externalities rationale provides a compelling case for federal intervention in situations where one state realizes all the benefits of a pollution-generating activity but does not bear the entirety of the costs. Such is often the case for air pollution. Richard L. Revesz, *The Race to the Bottom and Federal Environmental Regulation: A Response to Critics*, 82 MINN. L. REV. 535, 540 (1997).

8. Richard L. Revesz, *Federalism and Interstate Environmental Externalities*, 144 U. PA. L. REV. 2341 (1996).

9. Joshua D. Sarnoff, *The Continuing Imperative (But Only From a National Perspective) for Federal Environmental Protection*, 7 DUKE ENVTL. L. & POL'Y F. 225, 251 (1997); see also, e.g., Rena I. Steinzor, *Devolution and the Public Health*, 24 HARV. ENVTL. L. REV. 351, 366-69 (2000); Richard B. Stewart, *A New Generation of Environmental Regulation?*, 29 CAP. U. L. REV. 21, 153-54 (2001). But see Revesz, *supra* note 7, at 543-44 (arguing that, although the economies-of-scale argument is plausible in the early regulatory stages, such as the determination of environmental risks, it is "far less compelling at the standard-setting phase").

lowing for standardization.¹⁰ In addition to these economic justifications, proponents of federal regulation have advanced a non-economic justification, which I shall refer to as the “rights-based justification” for federal intervention.

The rights-based justification holds that the federal government is obligated to control pollution levels because its citizens possess certain environmental rights. Commentators have advanced at least four distinct reasons for vesting environmental rights in U.S. citizens.¹¹ The first reason is that individuals possess a right to bodily integrity that is violated by high levels of environmental pollution. The second reason is that all citizens possess the right to live in, and to enjoy, a clean environment. A third rationale is distributional in nature. Some commentators, pointing to studies that conclude that poor people and racial minorities are exposed to disproportionate levels of environmental risk, argue that the federal government should intervene to combat “environmental racism.”¹² A final argument underlying the rights-based justification focuses on the potentially catastrophic impacts of elevated pollution levels. Some authors argue that the great risks that environmental contamination poses to the planet and to future generations justifies federal intervention.

The rights-based justification’s proponents utilize the justification in two ways. First, they use the justification as a reason to oppose devolution of responsibility for environmental protection to the states.¹³ Second, they proffer the justification as a reason for the federal government to implement additional regulations.

10. Sarnoff, *supra* note 9, at 252-53 (“Federal uniform requirements that preempt the field and thus exclude state and local regulation may protect interstate commerce from burdensome and diverse controls . . .”).

11. For a more extensive explanation of these rationales, *see infra* Part I.

12. One commentator has noted that “[t]he terms ‘environmental justice,’ ‘environmental racism,’ and ‘environmental equity’ are viewed as having different nuances and origins.” Marc R. Poirier, *Environmental Justice and the Beach Access Movements of the 1970s in Connecticut and New Jersey: Stories of Property and Civil Rights*, 28 CONN. L. REV. 719, 722 n.8 (1996). Commentators often carefully select which term they will employ. *See, e.g., id.*; *see also* LUKE W. COLE & SHEILA R. FOSTER, FROM THE GROUND UP: ENVIRONMENTAL RACISM AND THE RISE OF THE ENVIRONMENTAL JUSTICE MOVEMENT 15-16 (2001); Colin Crawford, *Strategies for Environmental Justice: Rethinking CERCLA Medical Monitoring Lawsuits*, 74 B.U. L. REV. 267, 268 n.1 (1994); Marc R. Poirier, *Environmental Justice/Racism/Equity: Can We Talk?*, 96 W. VA. L. REV. 1083, 1083 n.1 (1994). In this context, the term “environmental racism” is appropriate because that is the precise charge that has been leveled upon the states. *See infra* note 88 and accompanying text.

13. For current concerns about potential rollbacks of federal regulatory responsibility following the Republicans’ 2002 midterm victory, *see, e.g.*, Mike Allen, *Bush to Shorten Forest Environmental Reviews*, WASH. POST, Nov. 28, 2002, at A1 (noting that some commentators be-

Various kinds of criticism may be directed at the rights-based justification. For example, it may be objected that, insofar as the environmental rights being advocated can be linked to the public health, "it is difficult to understand why the federal government should have such a preeminent role in environmental regulation when it does relatively little with respect to the provision of general health care."¹⁴ Moreover, there is no objective standard by which we can determine how much pollution constitutes "too much." Rather, policy judgments are inherently involved in determining the level of pollution beyond which rights will be violated. Perhaps it is preferable for the states—rather than the federal government—to themselves weigh the value of an additional unit of environmental quality against the resulting reduction in revenue.¹⁵

This Article does not attempt to answer these questions about the rights-based justification's inherent validity; indeed, a detailed examination and evaluation of the justification itself is beyond the scope of the Article. Rather, for the purposes of this Article, I assume that the justification is plausible. I argue that, even if the rights-based justification is seen as a compelling reason for federal intervention, it fits poorly with the present regulatory system. The federal government's current approach to environmental regulation is both overinclusive and underinclusive with respect to the rights-based justification. The regulatory system is overinclusive because federal regulations apply even in areas where aggregate pollution levels are low enough that citizens' environmental rights are not violated. The regulatory system is simultaneously underinclusive because it does not guarantee any minimal level of environmental quality. Instead of directly controlling environmental risk levels to which citizens or communities may be exposed, "[r]egulation typically proceeds medium-by-medium, pol-

lieve that the Bush administration's plans to streamline the environmental review process before allowing logging on national forests "is a harbinger of rollbacks of environmental regulations to come next year, when Republicans will control the Senate as well as the House"); Editorial, *TENNESSEAN*, Dec. 3, 2002, at 12A (opining that, "[j]ust weeks after the midterm election, it has become painfully apparent that this administration intends to reverse decades of environmental regulation and progress"); Marc Sandalow, *Pelosi Plays House Role Against Stacked Deck; Accomplishing Demo Agenda Seen as Next to Impossible*, *S.F. CHRON.*, Jan. 14, 2003, at A3 (noting Republican plans to "limit environmental regulations").

14. Revesz, *supra* note 7, at 545.

15. See Wallace E. Oates & Robert M. Schwab, *Economic Competition Among Jurisdictions: Efficiency Enhancing or Distortion Inducing?*, 35 *J. PUB. ECON.* 333 (1988); see also Revesz, *supra* note 7, at 539 ("[C]ompetitive jurisdictions will set an environmental standard that is defined by equating the willingness to pay for an additional unit of environmental quality with the corresponding change in wages.").

lutant-by-pollutant, statute-by-statute, and industry-by-industry.”¹⁶ This method of regulation is simply incapable of preventing high pollution levels, particularly where a number of different pollutants in various media emanate from multiple industries. Even if no federal environmental standards are violated within a given community, citizens—as well as the areas where they live, work and play—may be exposed to inordinately high levels of environmental pollution.

Because of these problems with the right-based justification’s fit to the regulatory system, the justification’s proponents should be circumspect in their use of the justification. When the justification is proffered as a reason for responsibility for an existing federal regulation should not be transferred to the states, or a reason that the federal government should enact an additional regulation, the regulation’s costs should be carefully considered in light of the poor fit between the justification and the regulatory system. Regulations naturally impose compliance costs upon the regulated parties and impose administrative costs upon the government,¹⁷ and these costs are magnified when the regulations shift what seem to be localized policy decisions from the states to the federal government.¹⁸ Moreover, regulatory benefits—insofar as the justification is concerned—may be greatly overestimated when the regulation in question is unable to effectively protect citizens’ environmental rights.

Given the costs of regulation and the fact that the regulatory system’s underinclusiveness diminishes the rights-based benefits that it produces, it is necessary to ask whether there is a method of safeguarding citizens’ environmental rights that is superior to the present medium-by-medium, pollutant-by-pollutant and industry-by-industry regulatory system. To be clearly superior to the present system, such an alternative would have to guarantee citizens’ environmental rights at least as well as the status quo, and also, in contrast to the present system’s sweeping overinclusiveness, would have to be tailored specifically to the task of protecting citizens’ environmental rights. This view accords with the European Community’s principle of proportionality in environmental protection, which requires “that a measure be reasonable and suitable, the least restrictive possible, and not dis-

16. Bradley C. Karkkainen, *Information as Environmental Regulation: TRI and Performance Benchmarking, Precursor to a New Paradigm*, 89 GEO. L.J. 257, 266 (2001).

17. See *infra* notes 103-104 and accompanying text.

18. See *supra* note 15 and accompanying text.

proportionate or excessive.”¹⁹ Such a superior alternative exists, in the form of flexible, cost-effective direct regulation of the cumulative levels of environmental risk to which citizens and communities can be exposed.²⁰ Thus, after I explain the poor fit between the rights-based justification and the regulatory status quo,²¹ I discuss how such a layer of flexible, cost-effective direct regulation could be implemented.²²

I. THE RIGHTS-BASED JUSTIFICATION

A number of commentators have contended that the protection of citizens’ environmental rights is a sound reason for a strong federal regulatory role.²³ For example, one scholar argues that when a state fails to provide a minimum level of environmental protection, its citizens have a legitimate grievance against the federal government because “Americans, as citizens of a unified nation, have rights and expectations that transcend the capacity and limitations of their state and local jurisdictions.”²⁴

19. Juliane Kokott, Book Review, 93 AM. J. INT’L. L. 269, 269 (1999) (reviewing ANDREAS R. ZIEGLER, TRADE AND ENVIRONMENTAL LAW IN THE EUROPEAN COMMUNITY (1996) and DAMIEN GERADIN, TRADE AND THE ENVIRONMENT: A COMPARATIVE STUDY OF EC AND US LAW (1997)).

Along with the principle of proportionality, the European Community also employs the principle of subsidiarity, which is incorporated into the EC Treaty:

In areas which do not fall within its exclusive competence, the Community shall take action, in accordance with the principle of subsidiarity, only if and insofar as the objectives of the proposed action cannot be sufficiently achieved by the Member States and can therefore, by reason of the scale or effects of the proposed action, be better achieved by the Community.

Consolidated version of the treaty establishing the European Community, art. 5, O.J. C 340/3, at 44 (1997).

20. I do not actually advocate these reforms, as this Article takes no position on whether the rights-based justification is indeed a compelling reason for federal intervention. *See supra* notes 14-15 and accompanying text. Rather, my goal is to critically examine the implications of the justification.

21. *See infra* Parts II and III.

22. *See infra* Part IV.

23. *E.g.*, James Huffman, *Governing America's Resources: Federalism in the 1980's*, 12 ENVTL. L. 863, 890 (1982) (“A pollution level that is detrimental to human health in one part of the country will be detrimental to human health in all parts of the country. . . . [F]ederal government action to protect individuals against coercion by pollution is the best way to guarantee the liberty of all individuals.”); Steinzor, *supra* note 9, at 366-74; *see also* Robert Bejesky, *An Analytical Appraisal of Public Choice Value Shifts in Environmental Protection in the United States & Mexico*, 11 IND. INT’L & COMP. L. REV. 251, 267 (2001) (“The federal government became comprehensively involved in environmental regulation and protection shortly after the 1960s *Rights Revolution* since this was not only a period of additional government expansion but was also known for extending new substantive and procedural rights.”).

24. Steinzor, *supra* note 9, at 370.

Other commentators have argued that the Constitution itself provides citizens with environmental rights. Some scholars contend that high pollution levels violate an individual's right to bodily integrity,²⁵ while others claim that U.S. citizens have a constitutional right to enjoy a clean environment.²⁶ Although courts have repeatedly rejected the contention that the Constitution provides citizens with environmental rights,²⁷ the arguments supporting the constitutional claim also provide *policy* support for the rights-based justification. In fact, these arguments are likely stronger when removed from the legal context, since "[l]aw is essentially formalistic, and morality is not in the slightest degree formalistic."²⁸ While the legal arguments for environmental rights may not satisfy the Constitution's formal requirements, they may constitute a compelling moral case.

25. See *infra* Part I.A.

26. See *infra* Part I.B.

27. See *Ely v. Velde*, 451 F.2d 1130, 1139 (4th Cir. 1971) ("While a growing number of commentators argue in support of a constitutional protection for the environment, this newly-advanced constitutional doctrine has not yet been accorded judicial sanction; and appellants do not present a convincing case for doing so."); *Hagedorn v. Union Carbide Corp.*, 363 F. Supp. 1061, 1064-65 (N.D. W. Va. 1973); *Tanner v. Armco Steel Corp.*, 340 F. Supp. 532, 536 (S.D. Tex. 1972) ("Although there has been something of a boom recently in what Judge Seals of this Court has described as 'grandiose claims of the right of the general populace to enjoy a decent environment', such claims 'have been more successful in theory than in operation.'") (citations omitted); *Envtl. Def. Fund v. Corps of Eng'rs of the U.S. Army*, 325 F. Supp. 728, 738-39 (E.D. Ark. 1971) (mem.) ("[T]he Court concludes that the plaintiffs have not stated facts which would under the present state of the law constitute a violation of their constitutional rights . . ."); *Envtl. Def. Fund Inc. v. Hoerner Waldorf Corp.*, 3 *Envtl. L. Rep. (Envtl. L. Inst.)* 20,794 (D. Mont. 1970); see also *Fed. Employees for Non-Smokers' Rights v. United States*, 446 F. Supp. 181, 183-85 (D.D.C. 1978) (rejecting the right to a clean environment in the environmental tobacco smoke context). For a synopsis of these cases, see Carole L. Gallagher, *The Movement to Create an Environmental Bill of Rights: From Earth Day, 1970 to the Present*, 9 *FORDHAM ENVTL. L.J.* 107, 112-17 (1997). For a discussion of why courts have rejected these claims, see *infra* notes 38-50 and accompanying text.

In light of the courts' repeated rejection of the argument that citizens possess a constitutional right to a clean environment, some scholars have advocated a constitutional amendment granting citizens environmental rights. See, e.g., Rodger Schlickeisen, *Protecting Biodiversity for Future Generations: An Argument for Constitutional Amendment*, 8 *TUL. ENVTL. L.J.* 181 (1994). Several such amendments have in fact been proposed in Congress. See, e.g., H.R.J. Res. 1205, 91st Cong. (1970) (amendment proposed by Rep. Richard Ottinger); H.R.J. Res. 1321, 90th Cong., 2d Sess. (1968) ("Every person has the inalienable right to a decent environment. The United States and every State shall guarantee this right."). For a synopsis of these efforts, see Gallagher, *supra*, at 120-29. For a critique of such constitutional amendments, see Theodore C. Sorensen, *The American Constitution: Basic Charter or First Draft?*, 40 *ARIZ. L. REV.* 709, 710-11 (1998).

28. Larry Alexander, "With Me, It's All er Nuthin'": *Formalism in Law and Morality*, 66 *U. CHI. L. REV.* 530, 530 (1999).

At least four distinct arguments support the rights-based justification. They will be discussed in turn.

A. *The Right to Bodily Integrity*

The first argument for the rights-based justification is that individuals possess a fundamental right to bodily integrity that is compromised by high levels of pollution. In 1914, then-Judge Cardozo explained that “[e]very human being of adult years and sound mind has a right to determine what shall be done with his own body.”²⁹ A commentator has observed that “[s]ince then, both federal and state courts have recognized that a basic ‘right of an individual’ is ‘that his . . . person be held inviolable.’”³⁰ Significantly, the Supreme Court has recognized the importance of this right.³¹

While no court has suggested that high pollution levels violate this constitutional right, the legal recognition of the right to bodily integrity demonstrates that our society places a high value upon the inviolability of each individual’s person. Our society does not feel that individual rights are violated whenever citizens are exposed to *any* amount of pollution, no matter how small. After all, American courts have never held—and the American public has never believed—that individuals have a right to inviolability of their persons regardless of the social cost. Instead, the Supreme Court has noted that “against the right of an individual that his person be held inviolable . . . must be set the interests of society.”³² Certain levels of pollution are unavoidable in modern society. If “the issue [were] simply leaving the earth as it is . . ., only remaining as cave dwellers would have been ac-

29. *Schloendorff v. Soc’y of N.Y. Hosp.*, 211 N.Y. 125, 129 (1914).

30. Vic Sher, *Breaking Out of the Box: Toxic Risk, Government Actions, and Constitutional Rights*, 13 J. ENVTL. L. & LITIG. 145, 157 (1998) (quoting *Breithaupt v. Abram*, 352 U.S. 432, 439 (1957)). For examples of cases recognizing this right to bodily integrity, see, e.g., *United States v. Crowder*, 543 F.2d 312, 321 (D.C. Cir. 1976) (mentioning “the right of an individual that his person be held inviolable” in a criminal case where the district court had received in evidence a bullet which had been surgically removed from the defendant’s forearm without his consent); *Collins v. Howard*, 156 F. Supp. 322, 325 (S.D. Ga. 1957) (mentioning the right to bodily integrity in a case brought by an employee who was terminated based on blood alcohol test results); *In re Guardianship of Richard Roe*, 383 Mass. 415 (1981) (holding that noninstitutionalized but mentally incompetent persons possess a protected liberty interest in refusing treatment with antipsychotic drugs).

31. *Breithaupt*, 352 U.S. at 439; see also *Cruzan v. Dir., Mo. Dept. of Health*, 497 U.S. 261, 278 (1990).

32. *Breithaupt*, 352 U.S. at 439.

ceptable.”³³ Nonetheless, it is not at all unreasonable to apply the principles underlying the right to bodily integrity to individuals’ exposure to pollution. Although there seems to be no objective threshold beyond which individuals’ exposure to environmental risk becomes too great,³⁴ it can be reasonably held that at *some point* elevated levels of pollution do violate the right to bodily integrity.³⁵ Hence, this argument contends that there should be some regulatory constraint on the harm that pollution inflicts on American citizens.

B. *The Right to a Healthy Environment*

A second argument in favor of the rights-based justification is that the Constitution grants Americans the right to enjoy a healthy environment. This position was first introduced in academic journals around 1970, and has been advanced by “numerous commentators.”³⁶ These commentators contend that the right to “life, liberty and property” provided by the Fifth and Fourteenth Amendments combines with the Ninth Amendment’s protection of unenumerated rights to provide citizens with a constitutional interest in a clean environment. Environmentalist litigants also advanced the argument for a constitutional right to a clean environment before U.S. courts in the early 1970s.

33. Joseph L. Sax, *The Search for Environmental Rights*, 6 J. OF LAND USE & ENVTL. L. 93, 103 (1990); see also, e.g., Janusz Symonides, *The Human Right to a Clean, Balanced and Protected Environment*, 20 INT’L J. LEGAL INFO. 24, 28 n.11 (1992) (“The right to a clean environment cannot be interpreted as the right to ‘an ideal environment.’ In the world today, a certain degree of pollution is inevitable.”); Stephen F. Williams, *The Era of “Risk-Risk” and the Problem of Keeping the APA Up to Date*, 63 U. CHI. L. REV. 1375, 1376 (1996) (“There appears to be a fairly broad social consensus that some pollution is not merely inevitable but justifiable, in the sense that at some point the incremental costs of pollution control exceed any incremental gain.”).

34. See *supra* note 15 and accompanying text.

35. Cf. Steinzor, *supra* note 9, at 370 (“[I]t may well prove very difficult to achieve broad agreement on the precise level of protection that defines an essential federal floor. However, . . . in many states the level of protection has fallen well below the norm provided in the more competent jurisdictions.”).

36. Daryl S. Landy, Comment, *The Constitutional Implications of Government Pesticide Spraying: The Case for Limited Judicial Intervention and an Intermediate Standard of Review*, 76 CAL. L. REV. 221, 236 (1988). For early academic work advocating a constitutional right to a clean environment, see, e.g., John C. Esposito, *Air and Water Pollution: What to Do While Waiting for Washington*, 5 HARV. C.R.-C.L. L. REV. 32 (1970); William D. Kirchick, *The Continuing Search for a Constitutionally Protected Environment*, 4 ENVTL. AFF. 515 (1975); Ronald E. Klipsch, *Aspects of a Constitutional Right to a Habitable Environment: Towards an Environmental Due Process*, 49 IND. L.J. 203 (1974); John Y. Pearson, Jr., Note, *Toward a Constitutionally Protected Environment*, 56 VA. L. REV. 458 (1970).

The courts have uniformly rejected the suggestion that the Constitution vests environmental rights in American citizens.³⁷ *Tanner v. Armco Steel Corp.*³⁸ is particularly instructive in its explication of why courts have refused to recognize such environmental rights. The *Tanner* plaintiffs brought suit against private defendants, arguing that the defendants' petroleum refineries and plants caused them injury.³⁹ The defendants moved to dismiss the lawsuit, arguing that federal jurisdiction was lacking, and that the plaintiffs had not stated a claim upon which relief could be granted.⁴⁰ In response, the plaintiffs asserted a number of constitutional bases for their claim, including the Due Process Clause of the Fifth Amendment, the Ninth Amendment, and the Fourteenth Amendment in conjunction with Section 1983.⁴¹

The court quickly disposed of the plaintiffs' Fifth and Ninth Amendment claims. It rejected the former claim because the Fifth Amendment only restrains the federal government's actions, and does not constrain the actions of private individuals.⁴² The court also rejected the argument that the right to a healthy environment was one of the unenumerated rights to which the Ninth Amendment refers. The court stated that it would be ahistorical to hold that the Ninth Amendment encompasses environmental rights, and that such a holding would essentially cause the court to engage in policymaking—a task that the Constitution entrusts to the legislative branch.⁴³ The court somewhat snidely added that “[t]he Ninth Amendment,

37. See *supra* note 27 and accompanying text.

38. *Tanner v. Armco Steel Corp.*, 340 F. Supp. 532 (S.D. Tex. 1972).

39. *Id.* at 534.

40. While the defendants filed motions to dismiss pursuant to FED. R. CIV. P. 12(b)(1) & (b)(6), the court stated that, “[t]o the extent that plaintiffs' response, accompanied by affidavit, has introduced material dehors the pleadings, the motions shall be treated as prayers for summary judgment, as authorized by Rule 12(b), Fed. R. Civ. P.” *Tanner*, 340 F. Supp. at 534.

41. 42 U.S.C. § 1983 (2000).

The plaintiffs also contended that the Constitution “in its entirety” provided a basis for their claim. *Tanner*, 340 F. Supp. at 534. The court rejected this position because the argument was “not a plain statement of the ground upon which the Court's jurisdiction depends, and is therefore insufficient pleading under Rule 8(a)(1).” *Id.*

42. *Tanner*, 340 F. Supp. at 534-35. See also *Corrigan v. Buckley*, 271 U.S. 323, 330 (1926) (“The Fifth Amendment ‘is a limitation only upon the powers of the General Government,’ and is not directed against the action of individuals.”) (citation omitted); *Talton v. Mayes*, 163 U.S. 376, 382 (1896) (“[I]t has been settled that the Fifth Amendment to the Constitution of the United States is a limitation only upon the powers of the General Government, that is, that the amendment operates solely on the Constitution itself by qualifying the powers of the National Government . . .”).

43. *Tanner*, 340 F. Supp. at 535.

through its ‘penumbra’ or otherwise, embodies no legally assertable right to a healthful environment.”⁴⁴

Most instructive is *Tanner’s* disposition of the plaintiffs’ Fourteenth Amendment claims. The plaintiffs contended that their injuries were actionable through the Fourteenth Amendment in conjunction with Section 1983. To recover under Section 1983, plaintiffs must demonstrate that they were denied “a right secured by the ‘Constitution and laws’ of the United States,” and “that the defendant acted ‘under color of law.’”⁴⁵ The court found that the plaintiffs did not allege state or municipal regulatory involvement sufficient “to clothe defendants with the mantle of the State for the purposes of Section 1983.”⁴⁶ The court also found that, even if the plaintiffs could demonstrate the requisite state action, they could not satisfy the constitutional deprivation requirement. The court provided four distinct reasons for this determination. First, neither the language nor the history of the Fourteenth Amendment suggests that it protects environmental rights.⁴⁷ Second, the Fourteenth Amendment lacks “decisional standards to guide a court in determining whether the plaintiffs’ hypothetical environmental rights have been infringed.”⁴⁸ Third, the judiciary lacks institutional competence in determining environmental rights, as courts are poorly suited to undertake “the delicate balancing of competing social interests,” and lack the “specialized expertise” in this area that other branches of government possess.⁴⁹ Finally, to

44. *Id.*

45. *Adickes v. S.H. Kress & Co.*, 398 U.S. 144, 150 (1970). Section 1983 reads, in relevant part:

Every person who, under color of any statute, ordinance, regulation, custom, or usage of any State or Territory or the District of Columbia, subjects, or causes to be subjected, any citizen of the United States or other person within the jurisdiction thereof to the deprivation of any rights, privileges, or immunities secured by the Constitution and laws, shall be liable to the party injured in an action at law, suit in equity, or other proper proceeding for redress. For the purposes of this section, any Act of Congress applicable exclusively to the District of Columbia shall be considered to be a statute of the District of Columbia.

42 U.S.C. § 1983 (1994).

46. *Tanner*, 340 F. Supp. at 536.

47. *Id.* (“[T]here is not a scintilla of persuasive content in the words, origin, or historical setting of the Fourteenth Amendment to support the assertion that environmental rights were to be accorded its protection.”).

48. *Id.* Just as “[t]he Fourteenth Amendment does not enact Mr. Herbert Spencer’s *Social Statics*,” *Lochner v. New York*, 198 U.S. 45, 75 (1905) (Holmes, J., dissenting), neither does it enact Ms. Rachel Carson’s *Silent Spring*.

49. *Tanner*, 340 F. Supp. at 536-37.

It is true that in other contexts judicial decisions both hinge upon the use of scientific or statistical data, *see, e.g.*, *Brown v. Bd. of Educ.*, 347 U.S. 483, 493-94 (1954), and also set social policy for the country, *see, e.g.*, *Gratz v. Bollinger*, 123 S. Ct. 2411 (2003) (affirmative action); *Grut-*

the extent environmental controversies are justiciable, the court stated that they should be resolved under nuisance doctrines rather than through “the wholesale transformation of state tort suits into federal cases.”⁵⁰

Although the courts have repeatedly rejected the notion that environmental rights are constitutionally protected, some courts have provided encouraging words for the unsuccessful plaintiffs. For example, one district court stated that “[s]uch claims, even under our present Constitution, are not fanciful and may, indeed, some day, in one way or another, obtain judicial recognition.”⁵¹ Another district court, in a case that one commentator has described as “the closest any federal court has ever come to recognizing a constitutionally-protected right to a healthful and clean environment,”⁵² stated:

I have no difficulty in finding that the right to life and liberty and property are constitutionally protected. Indeed the Fifth and Fourteenth Amendments provide that these rights may not be denied without due process of law, and surely a person's health is what, in a most significant degree, sustains life. So it seems to me that each of us is constitutionally protected in our natural and personal state of life and health.⁵³

However, that court ultimately rejected the plaintiffs' constitutional claims due to insufficient allegations of either federal or state action.⁵⁴

In addition to the encouragement that courts have provided occasionally for these constitutional claims, some scholars continue to

ter v. Bollinger, 123 S. Ct. 2325 (2003) (same); Wash. v. Glucksberg, 521 U.S. 702 (1997) (assisted suicide); Cruzan v. Dir., Mo. Dept. of Health, 497 U.S. 261 (1990) (passive euthanasia); Roe v. Wade, 410 U.S. 113 (1973) (abortion). However, environmental policymaking is substantially more complex than these other areas in which courts have been heavily involved. In the context of abortion or affirmative action, for example, courts need only determine whether the challenged policy violates a constitutional right. In contrast, if the Constitution were held to encompass environmental rights, courts would not only have to determine whether a right was violated, but also the precise reduction in environmental risk that the Constitution mandates, and perhaps even the manner in which this reduction in pollution should occur. Such questions are more suited to the expertise of administrative agencies than are other questions of social policy in which the judiciary is regularly involved.

50. *Tanner*, 340 F. Supp. at 537.

51. *Envtl. Def. Fund v. Corps of Eng'rs of the U.S. Army*, 325 F. Supp. 728, 739 (E.D. Ark. 1971).

52. Gallagher, *supra* note 27, at 114.

53. *Envtl. Def. Fund v. Hoerner Waldorf Corp.*, 3 *Envtl. L. Rep.* (Envtl. L. Inst.) 20,794, 20,794-95 (D. Mont. 1970).

54. *Id.* at 20,794-95. The *Hoerner Waldorf* plaintiffs sought injunctive relief against a paper mill company. The court found that there were no allegations of federal action, and that the state of Montana likewise took no action in relation to the paper mill plant that could constitute a violation of the plaintiffs' Fourteenth Amendment rights. *Id.*

argue for a constitutional right to a healthy environment. For example, Professor Ledewitz concedes that the recognition of a constitutional right to a clean environment is unlikely “in the immediate political/jurisprudential context,”⁵⁵ but believes that environmental problems will become so grave in the future that they will spur a jurisprudential shift.⁵⁶ He argues that when this shift in judicial outlook occurs, the right to a clean environment can grow out of “traditional judicial categories”⁵⁷—in particular substantive due process⁵⁸ and equal protection.⁵⁹

Although the judiciary has repeatedly rejected the notion that the Constitution protects environmental rights, the arguments supporting a constitutional right to a clean environment are more persuasive in the policy world than the legal world.⁶⁰ After all, courts have often seemed receptive to plaintiffs’ moral arguments, but have sim-

55. Bruce Ledewitz, *Establishing a Federal Constitutional Right to a Healthy Environment in Us and in Our Posterity*, 68 MISS. L.J. 565, 569 (1998).

56. *Id.* at 569-83. For a description of the kinds of major environmental crises that may spur such a jurisprudential shift, see *infra* notes 89-93 and accompanying text.

57. Ledewitz, *supra* note 55, at 656.

58. The Supreme Court has held that substantive due process rights must be “deeply rooted in this Nation’s history and tradition,” *Washington v. Glucksberg*, 521 U.S. 702, 721 (1997) (quoting *Moore v. City of East Cleveland*, 431 U.S. 494, 503 (1977); *Snyder v. Massachusetts*, 291 U.S. 97, 105 (1934)), and “implicit in the concept of ordered liberty,” such that “neither liberty nor justice would exist if they were sacrificed.” *Id.* (quoting *Palko v. Connecticut*, 302 U.S. 319, 325, 326 (1937)). The Court also requires “a ‘careful description’ of the asserted fundamental liberty interest.” *Id.* (quoting *Reno v. Flores*, 507 U.S. 292, 302 (1993); *Collins v. Harker Heights*, 503 U.S. 115, 125 (1992); *Cruzan v. Dir., Mo. Dept. of Health*, 497 U.S. 261, 277-78 (1990)).

Professor Ledewitz argues that the right to a healthy environment is deeply rooted in the country’s history and legal traditions:

In terms of our history, at least since Frederick Jackson Turner announced the end of the American frontier in 1893, we have had a sense of environmental limit. In terms of legal tradition, the enormous body of environmental regulation, state constitutional environmental provisions and common law restrictions reinforce a right to environmental protection. Our practices are largely consistent with history and our laws. No citizen would think there is a right to pollute the air or land of his or her neighbor.

Ledewitz, *supra* note 55, at 646.

Professor Ledewitz concedes the difficulty of providing a “careful description” of the right at issue. *Id.* Although he suggests that this may mean that “our usual legal categories are outdated,” *id.* at 647, Professor Ledewitz does attempt a more specific description of the right to a healthy environment by arguing that one implication that could be drawn from such a right is that “other rights should be viewed within an environmental perspective.” *Id.* at 652. This would have implications, for example, for the Takings Clause and for standing requirements. *Id.* at 652-55.

59. Professor Ledewitz’s equal protection claim is that the Equal Protection Clause should encompass future generations, and that if it does, then our current discounting of their interests violates their equal protection rights. This argument is discussed in *infra* Part I.D.

60. See *supra* notes 27-28 and accompanying text.

ply not found the right to a healthy environment anywhere in the Constitution.

C. *Discrimination*

A third rationale for the rights-based justification is that the location of pollution is discriminatory in nature. A number of studies indicate “that the hazards posed by pollution and hazardous waste are borne disproportionately by people of color and the poor.”⁶¹ The U.S. General Accounting Office (GAO) conducted the seminal study in 1983.⁶² The GAO study examined the demographics of four host communities for hazardous waste landfills in the southeast, and found that three of the four communities were predominantly African-American.⁶³ Another early study by sociologist Robert Bullard found that six of the eight incinerators and fifteen of the seventeen landfills in Houston, Texas were located in predominantly African-American communities, even though African-Americans constituted only twenty-eight percent of Houston’s population.⁶⁴

These two early studies spurred greater interest in the pollution risks borne by minority communities, and prompted another prominent early study by the United Church of Christ’s Commission for Racial Justice (CRJ).⁶⁵ The CRJ study found that “[c]ommunities with the greatest number of commercial hazardous waste facilities had the highest composition of racial and ethnic residents.”⁶⁶ Later studies challenged the notion that race was the most determinative factor in siting decisions.⁶⁷

61. Sher, *supra* note 30, at 156.

62. U.S. GEN. ACCOUNTING OFFICE, GAO/RCED-83-168, SITING OF HAZARDOUS WASTE LANDFILLS AND THEIR CORRELATION WITH RACIAL AND ECONOMIC STATUS OF SURROUNDING COMMUNITIES (GAO 1983).

63. *Id.* at 3-4.

64. Robert Bullard, *Solid Waste Sites and the Black Houston Community*, 53 SOC. INQUIRY 273 (1983).

65. UNITED CHURCH OF CHRIST COMMISSION FOR RACIAL JUSTICE, TOXIC WASTES AND RACE: A NATIONAL REPORT ON THE RACIAL AND SOCIO-ECONOMIC CHARACTERISTICS OF COMMUNITIES WITH HAZARDOUS WASTE SITES (1987).

66. *Id.* at xiii.

67. See, e.g., Christopher Boerner et al., *Environmental Justice?* (1994), reprinted in part in ENVIRONMENTAL PROTECTION AND JUSTICE 167 (Kenneth A. Manaster ed., 1995); Terence J. Centner et al., *Environmental Justice and Toxic Releases: Establishing Evidence of Discriminatory Effect Based on Race and Not Income*, 3 WIS. ENVTL. L.J. 119 (1996); see also Paul Mohai & Bunyan Bryant, *Environmental Injustice: Weighing Race and Class as Factors in the Distribution of Environmental Hazards*, 63 U. COLO. L. REV. 921, 926 & tbl.1 (1992) (comparing ten studies that examine the relative importance of race and income in the distribution of environmental risks, of which seven found race to be more important and three found income to be

Our legal regime includes a number of measures broadly prohibiting discrimination, both constitutional and statutory. The Fourteenth Amendment prohibits the states from “denying to any person . . . the equal protection of the laws.”⁶⁸ Federal statutory provisions designed to combat discrimination include Title VI of the Civil Rights Act of 1964⁶⁹ and Section 1983.⁷⁰ Additionally, “many states have similar constitutional and statutory prohibitions against discriminatory action by government agencies.”⁷¹ These aspects of the legal regime demonstrate our society’s categorical condemnation of racial discrimination. Yet despite the legal regime’s broad guarantees of equality, lawsuits challenging the location of highly polluting facilities as racially discriminatory have overwhelmingly met with failure.⁷²

The major constitutional provision that has been used to challenge disproportionate siting of municipal solid waste facilities in minority neighborhoods is the Equal Protection Clause of the Fourteenth Amendment, under which the courts subject government actions that are based on race to strict scrutiny.⁷³ However, plaintiffs in equal protection suits face the burden of demonstrating that the government’s actions were motivated by intentional discrimination,

more significant). For an excellent synopsis of the debate over whether race or income is a more determinative factor in siting decisions, see Vicki Been, *Environmental Justice and Equity Issues*, in ZONING AND LAND USE CONTROLS § 25D.02 (Patrick J. Rohan ed., 1995).

68. U.S. CONST. amend. XIV, § 1.

69. 42 U.S.C. § 2000d *et seq.* (1994). For more on Title VI, see *infra* notes 76-85 and accompanying text.

70. See *supra* note 45 and accompanying text.

71. Sher, *supra* note 30, at 157.

72. For treatments of environmental justice litigation, see, e.g., Craig Anthony Arnold, *Planning Milagros: Environmental Justice and Land Use Regulation*, 76 DENV. U. L. REV. 1, 49-69 (1998); Been, *supra* note 67, at § 25D.03; Janet V. Siegel, *Negotiating for Environmental Justice: Turning Polluters Into "Good Neighbors" Through Collaborative Bargaining*, 10 N.Y.U. ENVTL. L.J. 147, 152-71 (2001).

73. See *Gratz v. Bollinger*, 123 S. Ct. 2411, 2427 (2003); *Grutter v. Bollinger*, 123 S. Ct. 2325, 2337-38 (2003); *Adarand Constructors, Inc. v. Peña*, 515 U.S. 200, 202 (1995); *Regents of the University of Cal. v. Bakke*, 438 U.S. 265, 357 (1978).

and not merely that they resulted in a disparate impact.⁷⁴ No plaintiff has been able to meet this requirement.⁷⁵

Environmental justice plaintiffs have met with no greater success when their claims were based on federal statutory law, rather than on the Constitution. For example, in the late 1990s a number of commentators focused on Title VI as a promising mechanism for environmental justice litigation.⁷⁶ Section 601 of Title VI provides that “[n]o person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.”⁷⁷ Although “most state and many local government entities that regulate environmental matters or issue permits to regulated facilities receive funding from the

74. See *Arlington Heights v. Metro. Housing Development Corp.*, 429 U.S. 252 (1977); *Washington v. Davis*, 426 U.S. 229 (1976); see also *R.I.S.E., Inc. v. Kay*, 768 F. Supp. 1144 (E.D. Va. 1991) (holding that discriminatory intent is required in an equal protection challenge to a siting decision); *E.-Bibb Twiggs Neighborhood Ass'n v. Macon Bibb County Planning and Zoning Comm'n*, 706 F. Supp. 880 (M.D. Ga. 1989), *aff'd*, 896 F.2d 1264 (11th Cir. 1989) (same); *Bean v. Southwestern Waste Mgmt.*, 482 F. Supp. 673, 677 (S.D. Tex. 1979) (“[T]he plaintiffs must show not just that the decision to grant the permit is objectionable or even wrong, but that it is attributable to an intent to discriminate on the basis of race.”).

75. Arnold, *supra* note 72, at 51; Luke W. Cole, *Environmental Justice Litigation: Another Stone in David's Sling*, 21 *FORDHAM URB. L.J.* 523, 538 (1994); Michael B. Gerrard, *Reflections on Environmental Justice*, 65 *ALB. L. REV.* 357, 358 (2001) (“[T]he courts require a showing of discriminatory intent before allowing an equal protection claim, and no one has ever been able to prove discriminatory intent in the environmental justice context of a litigation.”).

While plaintiffs can attempt to prove discriminatory intent through statistical evidence, *Bean*, 482 F. Supp. at 677, commentators have noted that “the attempt to use statistics in environmental justice litigation has been generally unsuccessful,” largely because of the degree of deference afforded to governmental agencies. Julie H. Hurwitz & E. Quita Sullivan, *Using Civil Rights Laws to Challenge Environmental Racism: From Bean to Guardians to Chester to Sandoval*, 2 *J.L. SOC'Y* 5, 22 (2001); see also Cole, *supra*, at 540-41 (noting that, because of the intent requirement, civil rights lawyers have come to see environmental justice cases based on the Equal Protection Clause as “certain losers”); Siegel, *supra* note 72, at 155 (“[T]he courts have been unwilling to infer discriminatory intent, even when there is overwhelming evidence of patterns of discriminatory effects resulting from siting decisions.”).

76. Title VI was considered promising because “most state and many local government entities that regulate environmental matters or issue permits to regulated facilities receive funding from the EPA or other federal agencies.” Siegel, *supra* note 72, at 156; see also Michael Fisher, *Environmental Racism Claims Brought Under Title VI of the Civil Rights Act*, 25 *ENVTL. L.* 285, 287 (1995) (“If the actions of those federally-funded state agencies create a racially discriminatory distribution of pollution, then a violation of Title VI has occurred.”); Alice Kaswan, *Environmental Justice: Bridging the Gap Between Environmental Laws and "Justice"*, 47 *AM. U. L. REV.* 221, 248 (1997) (“Title VI may provide a potential remedy for distributional injustice.”); R. Gregory Roberts, Comment, *Environmental Justice and Community Empowerment: Learning From the Civil Rights Movement*, 48 *AM. U. L. REV.* 229, 236 (1998) (“One strategy that may hold some promise of success is Title VI of the Civil Rights Act.”).

77. 42 U.S.C. § 2000d (1994).

EPA or other federal agencies,”⁷⁸ it has proven extremely difficult for plaintiffs to prevail in § 601 lawsuits because the courts have held that plaintiffs are required to demonstrate more than mere “instances of discriminatory effect or disparate impact.”⁷⁹ Rather, plaintiffs must prove that greater environmental risks exist in minority neighborhoods because of intentional discrimination.⁸⁰ This intent requirement poses the same barrier that plaintiffs have been unable to satisfy in lawsuits brought under the Equal Protection Clause.⁸¹ Section 602 of Title VI⁸² allows agencies to promulgate regulations that employ the less stringent “discriminatory effect” standard: Thus agency regulations may “apply not only to intentional discrimination but also to policies and practices that have a discriminatory effect.”⁸³ Although the EPA has adopted § 602 regulations that use the discriminatory effect standard,⁸⁴ these regulations will not bolster environmental justice plaintiffs’ legal position, as the Supreme Court recently held that there is no private right of action for “a failure to comply with regulations promulgated under § 602 that is not also a failure to comply with § 601” and its intentional discrimination standard.⁸⁵

78. Siegel, *supra* note 72, at 156.

79. *Chester Residents Concerned for Quality Living v. Seif*, 132 F.3d 925, 929 (3d Cir. 1997), *dismissed as moot*, 524 U.S. 974 (1998).

80. *Alexander v. Sandoval*, 532 U.S. 275, 280 (2001) (“[I]t is . . . beyond dispute . . . that § 601 prohibits only intentional discrimination.”); *Alexander v. Choate*, 469 U.S. 287, 293 (1985) (“Title VI itself directly reaches only instances of intentional discrimination.”); *Chester Residents Concerned for Quality Living*, 132 F.3d at 929.

81. *See* Siegel, *supra* note 72, at 156 (“Because it is extremely difficult to prove intent based solely on disparate impacts among racial groups, this type of challenge is not available to the vast majority of individuals.”); Suzanne Smith, Note, *Current Treatment of Environmental Justice Claims: Plaintiffs Face a Dead End in the Courtroom*, 12 B.U. PUB. INT. L.J. 223, 235 (2002) (“Similar to the Equal Protection cases discussed above, prevailing on a Title VI claim has proven difficult because courts require a plaintiff to prove discriminatory intent.”).

82. 42 U.S.C. § 2000d-1 (1994).

83. Memorandum from Janet Reno, United States Attorney General, to Heads of Departments and Agencies that Provide Federal Financial Assistance 1 (July 14, 1994) (quoted in Siegel, *supra* note 72, at 156 n.49).

84. For example, the EPA has implemented regulations prohibiting the siting of facilities in a location that “has the purpose or effect” of subjecting protected classes to discrimination. 40 C.F.R. § 7.35(c) (2003); *see also id.* § 7.35(b) (prohibiting recipients of EPA funds from using criteria or methods of administering their programs which “have the effect of subjecting individuals to discrimination because of their race, color, national origin, or sex”).

85. *Sandoval*, 532 U.S. at 286, 293. This holding was based on the Court’s view that § 602 does not confer a private right of action to enforce disparate-impact regulations. The Court reached this conclusion after analyzing the text and structure of Title VI. *See id.* at 288-91. Although the Court held that there is no private right of action to enforce § 602 regulations that employ the discriminatory effect standard, the EPA can enforce such regulations by terminating funding to programs that transgress the regulations.

Environmental justice plaintiffs attempting to bring claims based on common law rights, such as toxic tort or nuisance actions, also face a number of evidentiary barriers. Plaintiffs in toxic tort suits may have trouble establishing causation,⁸⁶ while plaintiffs in nuisance suits will be disadvantaged by the fact that nuisance remedies take into account the social utility of the defendant's actions.⁸⁷

Thus, despite our society's categorical condemnation of racial discrimination, plaintiffs challenging the seemingly discriminatory distribution of environmental risk have not found recourse through the judicial system. Some proponents of the rights-based justification argue that this lack of legal recourse justifies additional federal regulation, while others argue that the prevalence of environmental racism

Some commentators have suggested that litigants should attempt to duck the barrier that *Sandoval* creates for suing under § 602 regulations by bringing § 1983 claims to enforce the § 602 disparate-impact regulations. See Hurwitz & Sullivan, *supra* note 75, at 36-47. However, the success of such a strategy hinges on whether regulations implemented pursuant to Title VI create rights enforceable under § 1983. Unfortunately for environmental justice plaintiffs, three of the four circuits to consider the issue have held that they do not. See *S. Camden Citizens in Action v. N.J. Dep't of Env'tl. Prot.*, 274 F.3d 771, 787-88 (3d Cir. 2001); *Harris v. James*, 127 F.3d 993, 1009-10 (11th Cir. 1997); *Smith v. Kirk*, 821 F.2d 980, 984 (4th Cir. 1987) ("An administrative regulation . . . cannot create an enforceable § 1983 interest not already implicit in the enforcing statute."). *But see* *Loschiavo v. City of Dearborn*, 33 F.3d 548, 551 (6th Cir. 1994) (holding that, because administrative regulations have the force of law, they create rights enforceable under § 1983). Siegel states that, although plaintiffs might find greater success in other circuits, "with three circuits conclusively rejecting the § 1983 argument, there are numerous legal obstacles to overcome." Siegel, *supra* note 72, at 159.

86. See, e.g., M. Neil Browne et al., *The Epistemological Role of Expert Witnesses and Toxic Torts*, 36 AM. BUS. L.J. 1, 3 (1998) ("Th[e] requirement of proving causation is often a heavy burden for a toxic tort plaintiff."); Steven L. Humphreys, Comment, *An Enemy of the People: Prosecuting the Corporate Polluter as a Common Law Criminal*, 39 AM. U. L. REV. 311, 323 (1990) (noting that toxic tort suits "typically involve insurmountable causation problems," which are "especially pronounced in situations in which the instrumentality causing the harm is a chemical that enters the body unnoticed, has an immediate effect on the body that is undetectable, and whose toxicity to humans is unknown or is in dispute"); Scott Richardson, Comment, *Attorney General's Warning: Legislation May Now be Hazardous to Tobacco Companies' Health*, 28 AKRON L. REV. 291, 295 (1995) ("One of the largest problems with toxic tort cases has been the ability to prove actual causation."). These causation problems are due to "the scientific difficulty of proving that a given injury or ailment was proximately caused by a specific pollutant emitted by the defendant, and that no other environmental exposure or health habits contributed to the injury." Siegel, *supra* note 72, at 168.

87. For cases in which courts balanced the social utility of the defendant's conduct against the harm to the plaintiff, see, e.g., *Fla. East Coast Props., Inc. v. Metropolitan Dade County*, 572 F.2d 1108 (5th Cir. 1978); *Boomer v. Atlantic Cement Co.*, 257 N.E.2d 870 (N.Y. 1970); *Riblet v. Spokane Portland Cement Co.*, 248 P.2d 380 (Wash. 1952); see also MICHAEL B. GERRARD, *WHOSE BACKYARD, WHOSE RISK: FEAR AND FAIRNESS IN TOXIC AND NUCLEAR WASTE SITING* 72 (1994) (noting that, because courts consider the social utility of the defendant's activity, "many people injured by activities deemed by the courts to be socially necessary" are denied redress).

means that devolution of environmental responsibilities to the states is fraught with peril. For example, Bullard writes that “[i]ndividuals who suffered under the era of ‘states rights’ (during the height of ‘Jim Crow’) are leery of the federal government’s delegating more responsibility for environmental protection, enforcement, and permitting to the states that routinely disregard the rights of their citizens.”⁸⁸

D. *Environmental Crisis*

A final argument underlying the rights-based justification, which I refer to as the “environmental crisis” rationale, focuses more on the rights of future generations than the present one. The environmental crisis rationale holds that a number of environmental problems could develop into major crises capable of dramatically affecting life on earth, perhaps even threatening the human race.⁸⁹ Although some commentators, such as Professor Ledewitz, focus on the potential impact of global warming,⁹⁰ climate change is only one of a number of

88. ROBERT D. BULLARD, *DUMPING IN DIXIE: RACE, CLASS, AND ENVIRONMENTAL QUALITY* 158 (3d ed. 2000).

89. *See, e.g.*, Esposito, *supra* note 36, at 34 (“With regard to environmental questions, one might go further and say that human life—not to mention human progress—may end completely if new uses cannot be made from old legal implements.”); Schlickeisen, *supra* note 27, at 181 (“Scientists have predicted that a significant proportion of the world’s plant and animal species will become extinct within the next several decades despite present conservation efforts. This trend has serious implications for the human future . . .”). *But see* GREGG EASTERBROOK, *A MOMENT ON EARTH: THE COMING AGE OF ENVIRONMENTAL OPTIMISM* xi (1995) (predicting the eradication of pollution “within our lifetimes”); BJØRN LOMBORG, *THE SKEPTICAL ENVIRONMENTALIST: MEASURING THE REAL STATE OF THE WORLD* (2001) (criticizing environmental organizations’ use of scientific evidence as highly selective, and hence misleading).

90. *See* Ledewitz, *supra* note 55, at 579. The case that the earth is getting warmer is based on computer models, *see* Prepared Statement of Michael C. MacCracken, FED. NEWS SERV., Mar. 6, 1996, LEXIS, News Library, News Group File (“[M]odels are at the cutting edge of what we understand. . . . [O]nly models can provide quantitative projections of future conditions.”), satellite data, *see* *Satellite Data Signal Hot Future; Climatologists’ Study Challenges Old Findings*, ST. LOUIS POST-DISPATCH (Missouri), Mar. 12, 1997, at 8A, and observational trends, *see* Ross Gelbspan, *The Heat is On: The Warming of the World’s Climate Sparks a Blaze of Denial*, HARPER’S MAG., Dec. 1995, LEXIS, News Library, News Group File (outlining “geophysical events and scientific findings” that suggest a trend toward a warmer climate). Because of these observational trends, some scientists believe that we are already experiencing the effects of climate change. For example, one study found that “global warming is helping spread disease” in humans and wildlife. Andrea Dorfman & Michael D. Lemonick, *More Frogs, Fewer Monarchs*, TIME, July 1, 2002, at 57 (describing a new study in *Science*). Also, following an incident in which a Rhode Island-sized piece of ice broke off from the Larsen B ice shelf, a scientist commented, “With the disappearance of ice shelves that have existed for thousands of years, you rather rapidly run out of . . . explanations [other than global warming].” Andrew C. Revkin, *Large Ice Shelf in Antarctica Disintegrates at Great Speed*, N.Y. TIMES, Mar. 20, 2002, at A13 (quoting Dr. Theodore A. Scambos). Some authors argue that, because of the catastrophic impacts that global warming could produce, the “precautionary principle” dictates that action be

environmental problems that these commentators believe to be capable of developing into major ecological catastrophes. Other environmental problems include species loss,⁹¹ deforestation,⁹² and ozone depletion.⁹³

taken to stem climate change now, rather than waiting until absolute scientific certainty is attained. See CHRISTOPHER FLAVIN & ODIL TUNALI, *CLIMATE OF HOPE: NEW STRATEGIES FOR STABILIZING THE WORLD'S ATMOSPHERE* 20 (Worldwatch Paper No. 130, June 1996).

For discussion of the problems that global warming could produce, see, e.g., STEPHEN OPHULS, *ECOLOGY AND THE POLITICS OF SCARCITY REVISITED* 133 (1992) ("If climate changes are of the magnitude that a majority of scientists are predicting . . . [m]any species will not be able to adapt quickly enough, and extinctions will dwarf any that have been predicted, because habitats will shift, shrink, or disappear."); Samuel J. Rascoff & Richard L. Revesz, *The Biases of Risk Tradeoff Analysis: Towards Parity in Environmental Health-and-Safety Regulation*, 69 U. CHI. L. REV. 1763, 1830-31 (2002); Jennifer Woodward, Comment, *Turning Down the Heat: What United States Laws Can Do to Help Ease Global Warming*, 39 AM. U. L. REV. 203, 213-17 (1989).

For a more skeptical view of global warming, see, e.g., RONALD BAILEY, *ECO-SCAM* 152-53 (1993) (arguing that if increased carbon dioxide did produce a warmer climate, it would be "nothing like the climate disaster predicted by the apocalyptics"); LOMBORG, *supra* note 89, at 258-324; DIXY LEE RAY, *ENVIRONMENTAL OVERKILL* 18 (1993) (arguing that any warming of the climate would be slow, allowing humans to adapt); Bjørn Lomborg, *The Environmentalists Are Wrong*, N.Y. TIMES, Aug. 26, 2002, at A15 ("[D]espite our intuition that we need to do something drastic about global warming, economic analyses show that it will be far more expensive to cut carbon dioxide emissions radically than to pay the costs of adapting to the increased temperatures.").

91. See, e.g., Susan George et al., *The Public in Action: Using State Citizen Suit Statutes to Protect Biodiversity*, 6 U. BALT. J. ENVTL. L. 1, 5 (1997) ("[A]pproximately fifty thousand species disappear from the planet each year. Although extinction is a natural process, humans have greatly accelerated historical rates of extinction by one hundred to one thousand times."); Francesca Ortiz, *Biodiversity, the City, and Sprawl*, 82 B.U. L. REV. 145, 150-56 (2002); Schlickeisen, *supra* note 27, at 186-87 (explaining that species loss diminishes the potential for medical breakthroughs, threatens food supplies, and "could impair the ability of natural ecosystems to regulate atmospheric gases, purify water, decompose wastes, generate fertile soils, provide food directly, cycle vital nutrients and control insects and wildlife diseases that destroy crops and otherwise impact human health"); Ajay K. Sharma, *The Global Loss of Biodiversity: A Perspective in the Context of the Controversy Over Intellectual Property Rights*, 4 U. BALT. INTELL. PROP. L.J. 1, 4 (1995) ("The potential importance, in economic terms, of this undiscovered mass of biodiversity cannot be underestimated, for even the rubber tree 'was just another Amazonian tree species of unknown economic value' until it was discovered.").

For the view that the problem of species loss is overstated, see, e.g., LOMBORG, *supra* note 89, at 249-57; Ariel E. Lugo, *Biodiversity and Public Policy: The Middle of the Road*, in *PROTECTION OF GLOBAL BIODIVERSITY* 33, 34 (Lakshman D. Guruswamy & Jeffrey A. McNeely eds., 1998) (suggesting that, as additional data is gathered, "species loss estimates are likely to be lower than those normally given today"); David Schoenbrod, *The Mau-Mauing of Bjørn Lomborg*, COMMENT., Sept. 2002, at 51, 54 ("[M]ost mainstream scientific estimates of species loss actually run much lower, on the order of 0.7 percent over the next 50 years: 'not a catastrophe, but a problem—one of many that mankind still needs to solve.'").

92. See, e.g., Priya Alagiri, Comment, *Give Us Sovereignty or Give Us Debt: Debtor Countries' Perspective on Debt-for-Nature Swaps*, 41 AM. U. L. REV. 485, 487 (1992) ("Deforestation threatens one-half of the earth's life forms, including thousands of indigenous groups living off the forests. These groups depend on the forest for fuel, cooking, energy, and medicine. Defores-

The ecological problems that these commentators focus on are more likely to have a significant effect on future generations than on the present one. Thus, advocates of the environmental crisis rationale for federal intervention argue that future generations should be afforded environmental rights in the present. Some scholars' arguments are rooted in the values expressed by the Constitution, while others present a purely moral case.

Professor Ledewitz's argument is rooted in constitutional values. He argues that future generations should be protected by the Constitution because they are bound by it.⁹⁴ Moreover, he frames the Constitution as "an intra-family relationship."⁹⁵ Although Professor Ledewitz concedes that the family structure does not prevent one generation from squandering all the resources that could otherwise be enjoyed by future generations, he contends that "it would not be wrong, nor incoherent, nor keeping out of the structure of a family, to permit . . . intergenerational intervention."⁹⁶ If future generations are indeed afforded rights under the Constitution, then, Professor Ledewitz contends, environmental destruction that is likely to harm their well-being may violate their equal protection rights.

tation would consequently [impoverish] approximately one billion people."); Jacqueline Klosek, Note, *The Destruction of the Brazilian Amazon: An International Problem*, 6 CARDOZO J. INT'L & COMP. L. 119 (1998); Erin B. Newman, Note & Comment, *Earth's Vanishing Medicine Cabinet: Rain Forest Destruction and Its Impact on the Pharmaceutical Industry*, 20 AM. J. L. & MED. 479, 484-87 (1994).

For a different view of the problems that deforestation poses, see, e.g., WALLACE KAUFMAN, NO TURNING BACK 72 (1994); LOMBORG, *supra* note 89, at 110-17 (concluding that "[b]asically, . . . our forests are not under threat").

93. See, e.g., Nancy D. Adams, Comment, *Title VI of the 1990 Clean Air Act Amendments and State and Local Initiatives to Reverse the Stratospheric Ozone Crisis: An Analysis of Preemption*, 19 B.C. ENVTL. AFF. L. REV. 173, 174-81 (1991) (examining the scientific case that ozone depletion is occurring, and outlining its harms to humans and the environment); Edward D. McCutcheon, Note, *Think Globally, (En) Act Locally: Promoting Effective National Environmental Regulatory Infrastructures in Developing Nations*, 31 CORNELL INT'L L.J. 395, 404 (1998) ("Although difficult to predict, ozone depletion and increased ultra-violet radiation may have long term consequences such as health problems and less productive fishing and agriculture development.").

For the view that ozone depletion does not pose a major threat, see LOMBORG, *supra* note 89, at 273-76.

94. Ledewitz, *supra* note 55, at 661-62 ("[T]hose future generations that find themselves part of the 'deal' ought to get something out of it."). (But don't those future generations get something out of the "deal" through the rights enshrined in the Constitution, and through the system of government that it establishes?)

95. *Id.*; see also PAUL W. KAHN, LEGITIMACY AND HISTORY: SELF-GOVERNMENT IN AMERICAN CONSTITUTIONAL THEORY 4 (1992) ("[T]o participate in constitutional governance is to participate in an intergenerational project.").

96. Ledewitz, *supra* note 55, at 662.

The Equal Protection Clause provides special protection to any group that can be considered a “discrete and insular minority.”⁹⁷ Professor Ledewitz argues that future generations should be considered a discrete and insular minority because “equal protection ‘precludes a refusal to represent’ any group that has a right to representation in the political process.”⁹⁸ To that extent, Professor Ledewitz argues that future generations’ political representation will be ineffective unless the Equal Protection Clause protects their environmental rights:

Our refusal to act [to prevent an impending ecological crisis] is completely rational. The odd thing is that we ever do anything for future generations. Given a ten percent discount rate, “the present value of saving a life one hundred years from now is only \$ 581.” And even this observation assumes that we care at all about lives saved a hundred years from now. Frankly, why should we?⁹⁹

On the other hand, Professor Weiss’s argument for intergenerational equity is not based on constitutional values, but instead is purely moral in nature. Professor Weiss argues that the lack of *a priori* knowledge each generation possesses about at what point in time it will exist creates a moral imperative for that generation to protect the environment for future generations:

In order to define what intergenerational fairness means in using and conserving our common patrimony, it is useful to view the human community as a partnership among all generations. . . . The purpose of human society must be to realize and protect the welfare and well-being of every generation. This requires sustaining the life-support systems of the planet, the ecological processes, environmental conditions, and cultural resources important for the survival and well-being of the human species, and a healthy and decent human environment.

Although all generations are members of this partnership, no generation knows before it is a living generation at what point in time it will be the living generation, nor how many members it will have, nor even how many generations there will ultimately be. . . .

[I]t is appropriate to assume the perspective of a generation that is placed somewhere along the spectrum of time, but does not know in advance where it will be located. Such a generation would want

97. See, e.g., *Hudson v. Palmer*, 468 U.S. 517, 557 (1984) (Stevens, J., concurring in part and dissenting in part); *Sugarman v. Dougall*, 413 U.S. 634, 642 (1973); *United States v. Carolene Prods. Co.*, 304 U.S. 144, 152-53 n.4 (1938).

98. Ledewitz, *supra* note 55, at 667 (quoting JOHN HART ELY, *DEMOCRACY AND DISTRUST* 82 (1980)).

99. *Id.* at 666 (quoting Michael B. Gerrard, *Demons and Angels in Hazardous Waste Regulation: Are Justice, Efficiency, and Democracy Reconcilable?*, 92 NW. U. L. REV. 706, 742-43 (1998)).

to inherit the common patrimony of the planet in as good condition as it has been for any previous generation and to have as good access to it as previous generations. This requires that each generation pass the planet on in no worse condition than it received it and provide equitable access to its resources and benefits.¹⁰⁰

In addition to the arguments for affording environmental rights to future generations, some philosophers argue that we should act now to prevent major ecological crises because nature itself possesses intrinsic value.¹⁰¹

The environmental crisis rationale suggests that the federal government should impose constraints on overall levels of environmental harm, because a regulatory system that provides such limits on pollution would help to safeguard the environment.

II. THE FEDERAL REGULATORY SYSTEM

One criticism that can be directed at the rights-based justification's advocates is that they have not sufficiently outlined the justification's implications. However, if the rights-based justification is seen as a compelling reason for federal intervention, then two basic principles for the regulatory system with respect to the justification seem logically inescapable. First, the regulatory system should effectively guarantee citizens' environmental rights. Second, however, the justification's persuasive force diminishes as a regulation's relationship to the justification becomes more attenuated.¹⁰² The present system violates the first of these principles and pays insufficient attention to the second, as the regulatory system is both overinclusive and underinclusive with respect to the rights-based justification.

The regulatory system is overinclusive because federal regulations apply even where aggregate pollution levels are low enough that citizens' environmental rights are not violated. Regulatory overinclu-

100. EDITH BROWN WEISS, IN FAIRNESS TO FUTURE GENERATIONS: INTERNATIONAL LAW, COMMON PATRIMONY, AND INTERGENERATIONAL EQUITY 23-24 (1989); *see also* Schlickeisen, *supra* note 27, at 190-97 (explaining philosophers' arguments concerning society's moral responsibility to future generations).

101. *See, e.g.*, Frank B. Cross, *Natural Resource Damage Valuation*, 42 VAND. L. REV. 269, 293 (1989) ("According to modern 'deep ecologists,' all living things 'have inherent value and have moral significance independent of their use by human beings, or even of human existence.'") (quoting P.S. Elder, *Legal Rights for Nature—The Wrong Answer to the Right(s) Question*, 22 OSGOODE HALL L.J. 285, 286 (1984)); Sarah Krakoff, *Mountains Without Handrails . . . Wilderness Without Cellphones*, 27 HARV. ENVTL. L. REV. 417, 418 (2003) ("The non-anthropocentric view maintains that nature has inherent value, apart from any value to humans.").

102. *See supra* note 19 and accompanying text.

siveness is problematic for three reasons. First, regulations inherently impose costs on the regulated parties. Even if regulated entities are in no danger of exceeding the statutory limitation on emissions, they will have to expend resources “finding out what the law is, how it applies to them, what they must do to comply, and how they must demonstrate compliance to a regulator.”¹⁰³ Costs are especially likely to be imposed on regulated entities because the regulatory system does not account for cumulative risks. Thus, while pollution levels in a certain region may be extraordinarily low, and the environment relatively pristine, there may be high levels of a particular pollutant—for example, carbon monoxide. We may not consider these carbon monoxide levels particularly problematic insofar as the rights-based justification is concerned because environmental risk in the area is so low that the presence of carbon monoxide does not violate citizens’ environmental rights. Nonetheless, firms in the area must comply with carbon monoxide regulations because the regulatory system does not consider cumulative risk levels, and thus does not account for the low aggregate environmental risk in that region. Second, environmental regulations inherently involve administrative costs.¹⁰⁴ Third, these costs are magnified when the regulations shift seemingly localized policy questions from the states to the federal government.¹⁰⁵

The system is also underinclusive because it fails to guarantee any minimal level of environmental quality. Absent some threshold that environmental risk cannot exceed, the regulatory system cannot ensure that an individual is not exposed to unacceptable levels.¹⁰⁶ However, rather than providing a cap on environmental risk, the regulatory system is composed of firm-by-firm, pollutant-by-pollutant, and medium-by-medium environmental standards that do not, and cannot, provide such a constraint.¹⁰⁷

103. RICHARD A. EPSTEIN, *SIMPLE RULES FOR A COMPLEX WORLD* 31 (1995); see also Ernest S. Rosenberg, *Clean Air Act Reform: A Necessity for the Act's Survival*, 14 *PACE ENVTL. L. REV.* 115, 120 (1996) (discussing problems involved in demonstrating compliance with the 1990 Clean Air Act Amendments).

104. See, e.g., EPSTEIN, *supra* note 103, at 30; Stewart, *supra* note 9, at 28 (“[T]he U.S. environmental regulatory system suffers from a number of well-known shortcomings, including . . . high compliance and administrative costs.”).

105. See *supra* note 15 and accompanying text.

106. On this point, the concept of side constraints is informative. See ROBERT NOZICK, *ANARCHY, STATE, AND UTOPIA* 29-33 (1974).

107. Numerous commentators have criticized the firm-by-firm, pollutant-by-pollutant, and medium-by-medium manner in which federal regulation proceeds. See, e.g., John C. Dernbach, *The Unfocused Regulation of Toxic and Hazardous Pollutants*, 21 *HARV. ENVTL. L. REV.* 1, 26-29, 43-51 (1997); Stuart L. Deusch, *Setting Priorities: Principles to Improve Environmental Pol-*

This Part examines the structure of environmental regulations, and argues that the regulatory system fits poorly with the rights-based justification. My analysis divides the status quo into two regulatory paradigms: technology-based standards and ambient standards. Although these are not the only two federal regulatory paradigms, they are the only two models that directly mandate a reduction in environmental risk. For example, there is also an information-based regulatory model. Two prominent information-based regulations focus on disseminating information about environmental conditions to the public¹⁰⁸ and making federal agencies consider the environmental consequences of their actions.¹⁰⁹ While such regulations may ultimately reduce aggregate pollution levels,¹¹⁰ they do not do so directly.

icy, 68 CHI.-KENT L. REV. 43, 51 (1992); E. Donald Elliot, *Toward Ecological Law and Policy*, in THINKING ECOLOGICALLY: THE NEXT GENERATION OF ENVIRONMENTAL POLICY 170 (Marian R. Chertow & Daniel C. Esty eds., 1997) ("[M]ost of today's environmental law violates the basic principles of ecology. Nature teaches the connected-ness of all activities, but most current-generation law regulates separate pollutants with little consideration of ecosystems as a whole."); Frances H. Irwin, *An Integrated Framework for Preventing Pollution and Protecting the Environment*, 22 ENVTL. L. 1, 6-18 (1992); Keith Pezzoli, *Environmental Management Systems (EMSs) and Regulatory Innovation*, 36 CAL. W. L. REV. 335, 345-46 (2000); Paulette L. Stenzel, *Can the ISO 14000 Series Environmental Management Standards Provide a Viable Alternative to Government Regulation?*, 37 AM. BUS. L.J. 237, 256-57 (2000); Stewart, *supra* note 9, at 27-33.

This criticism has even been raised by EPA Administrators. For example, Carol Browner leveled this criticism during the Common Sense Initiative's unveiling. *EPA Unveils Plan to Consolidate Rules for Certain Industries*, WALL ST. J., July 21, 1994, at A16 (quoting Browner as saying that "too often our environmental activities have been compartmentalized, law by law, pollutant by pollutant"). Both Browner and William K. Reilly have written about the issue. See Carol M. Browner, *Symposium Foreword*, 18 U. PA. J. INT'L ECON. L. 447, 449 (1997) (stating that the Common Sense Initiative's approach "recognizes that merely regulating on a pollutant-by-pollutant basis was not enough"); William K. Reilly, *The Future of Environmental Law*, 6 YALE J. ON REG. 351, 355 (1989) (stating that the regulatory system's "pollutant by pollutant, facility by facility, medium by medium" approach should be reevaluated).

108. The Emergency Planning and Community Right-to-Know Act (EPCRA), 42 U.S.C. §§ 11001-11050 (1994), requires corporations to provide information about their use of specified toxic substances. EPCRA does not place any limitations upon the emission of these toxic substances.

109. NEPA requires, *inter alia*, that all federal agencies prepare environmental impact statements for major actions likely to significantly affect the quality of the environment, 42 U.S.C. § 4332(2)(C), and study alternatives to actions involving unresolved resource conflicts, *id.* § 4332(2)(E). The Supreme Court has held that NEPA is only a procedural tool, and does not require specific substantive outcomes. *Vermont Yankee Nuclear Power Corp. v. Natural Res. Def. Council, Inc.*, 435 U.S. 519, 558 (1978).

110. For example, commentators argue that NEPA's Environmental Impact Statement (EIS) requirement brings the ecological consequences of proposed projects to the public's attention. Stephen S. Edelson, *The Management of Oil and Gas Leasing on Federal Wilderness Lands*, 10 B.C. ENVTL. AFF. L. REV. 905, 928 (1982); Richard B. Stewart, *Models for Environmental Regulation: Central Planning Versus Market-Based Approaches*, 19 B.C. ENVTL. AFF. L.

Instead, they either depend on public pressure to spur reductions in pollution¹¹¹ or assume that federal agencies will implement more environmentally sensitive policies after examining the ecological effects of their proposed actions.¹¹²

A. *Technology-Based Standards*

1. Synopsis

The goal of technology-based standards is to regulate the pollution control technology employed by major emitters of the regulated pollutants. The two major technology-based standards are design standards and performance standards. Design standards are more onerous, as they actually "specify how a certain plant, piece of machinery, or pollution control apparatus should be designed."¹¹³ Performance standards allow firms more leeway in determining how they will control their pollution output.¹¹⁴ Rather than mandating specific technologies, these standards set a performance level that the firm must meet, and allow firms to determine how they will achieve it. Because

REV. 547, 549 (1992). In turn, public pressure may "induce a federal agency to find less damaging ways of achieving [its] mission." Stewart, *supra*, at 549.

The Toxic Release Inventory (TRI), which is a part of EPCRA, can also generate public pressure. See Gary D. Bass & Alair MacLean, *Enhancing the Public's Right-to-Know About Environmental Issues*, 4 VILL. ENVTL. L.J. 287, 291-303 (1993) (providing background on TRI); Barbara Ann Clay, Note & Comment, *The EPA's Proposed Phase-III Expansion of the Toxic Release Inventory (TRI) Reporting Requirements: Everything and the Kitchen Sink*, 15 PACE ENVTL. L. REV. 293, 304-09 (1997) (same). For example, "[s]hortly after the first TRI was released in 1989, citizen groups placed a full-page advertisement in the *New York Times* listing 'the corporate top ten' land, water, and air polluters." ROBERT C. ANDERSON & ANDREW Q. LOHOF, *THE UNITED STATES EXPERIENCE WITH ECONOMIC INCENTIVES IN ENVIRONMENTAL POLLUTION CONTROL POLICY* 9-6 (1997) (report prepared for the Environmental Law Institute), at <http://yosemite.epa.gov/EE/epa/erm.nsf/vwRepNumLookup/EE0216A?OpenDocument>. Subsequently, a number of the named corporations entered into voluntary agreements to reduce their effluent outputs. *Id.*

111. Tseming Yang, *Environmental Regulation, Tort Law and Environmental Justice: What Could Have Been*, 41 WASHBURN L.J. 607, 615 n.32 (2002) (noting that EPCRA "rest[s] on the assumption that regulators and polluters will be more responsive to and take better care of environmental interests if they can be held accountable by political processes and public pressure").

112. See Stewart, *supra* note 110, at 549.

113. PERCIVAL ET AL., *supra* note 5, at 153.

114. Stephen Breyer, *Analyzing Regulatory Failure: Mismatches, Less Restrictive Alternatives, and Reform*, 92 HARV. L. REV. 547, 573 (1979) ("The regulator often will have to choose between 'design' standards, which are readily enforceable, and 'performance' standards, which encourage the development of new technology."); Lorena Bark Malecha et al., *San Francisco Bay Area Boatyards: A Case Study in Regulating Small Polluters*, 20 B.C. ENVTL. AFF. L. REV. 453, 474-75 (1993) ("Even within the ambit of command and control regulation, significant emphasis is placed now on the value of the flexibility that performance standards afford relative to design standards.").

of the greater flexibility that they allow, performance standards are now more widely used than design standards.

The Clean Air Act's (CAA) New Source Performance Standards (NSPS)¹¹⁵ are a paradigmatic example of performance standards. The NSPS apply to all new stationary sources that the EPA determines to cause, "or contribute[] significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare."¹¹⁶ After the EPA designates such sources, the agency promulgates regulations that establish performance standards for them.¹¹⁷ The CAA specifies that these performance standards should reflect the pollution reductions achievable through "the application of the best system of emission reduction which . . . the Administrator determines has been adequately demonstrated."¹¹⁸ In setting this standard, the Administrator can take into account both the costs of reduction and "any non-air quality health and environmental impact and energy requirements."¹¹⁹

A second example of technology-based standards can be found in the Clean Water Act (CWA).¹²⁰ The CWA required that all point sources that discharged pollution into U.S. waters (other than publicly owned treatment works¹²¹) were to comply with "best available" technology (BAT) standards by 1977, and "best practicable" technology (BPT) standards by 1983.¹²² The CWA specifies the factors that the Administrator must consider in promulgating both BAT and BPT standards. For example, it mandates that in assessing BPT standards, the Administrator should consider

the total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application, . . . the age of the equipment and the facilities involved, the process employed, the engineering aspects of the application of various types of con-

115. 42 U.S.C. §§ 7401-7671(q) (1994).

116. *Id.* § 7411(b)(1)(A). For this section of the CAA, "new source" means any stationary source the construction or modification of which began after the regulations were published. *Id.* § 7411(a)(2).

Similar standards also apply for certain pollutants emitted by sources that pre-existed the regulations. The CAA provides that the EPA should establish a procedure by which states are required to submit a plan for performance standards for pollutants emitted by existing sources that would have been covered by the NSPS if they came from new sources. *Id.* § 7411(d)(1).

117. *Id.* § 7411(b)(1)(B).

118. *Id.* § 7411(a)(1).

119. *Id.*

120. 33 U.S.C. §§ 1251-1387 (1994).

121. Publicly owned treatment works were required to implement pollution reductions based on "secondary treatment." *Id.* § 1311(b)(1)(B); *see also id.* § 1314(d)(1) (explaining secondary treatment information).

122. *Id.* § 1311(b).

trol techniques, process changes, non-water quality environmental impact (including energy requirements), and such other factors as the Administrator deems appropriate.¹²³

A number of other federal statutes also employ technology-based standards. One example is the Resource Conservation and Recovery Act (RCRA),¹²⁴ which regulates hazardous wastes. Enacted in 1976 as a response to the growth in hazardous waste sites,¹²⁵ RCRA established permit requirements for facilities that treat, store, and dispose of hazardous waste,¹²⁶ and a system designed to track hazardous wastes.¹²⁷ The permit requirements are designed "to ensure hazardous wastes are directed to and maintained by a suitable facility."¹²⁸ This goal is accomplished through a system of regulations that sets minimum requirements for facilities treating, storing or disposing of hazardous wastes, and prohibits land disposal of untreated wastes of which the EPA does not explicitly approve.¹²⁹ RCRA's standards apply facility by facility, and do not place a limit on the number of hazardous waste-generating facilities that can be located within a community.¹³⁰ Another example is the Safe Drinking Water Act

123. *Id.* § 1314(b)(1)(B). The factors that the Administrator should consider in promulgating the BAT standards are similar. *See id.* § 1314(b)(2)(B).

124. 42 U.S.C. §§ 6901-6992 (1994). For an overview of RCRA, *see* Randolph L. Hill, *An Overview of RCRA: The "Mind Numbing" Provisions of the Most Complicated Environmental Statute*, 21 ENVTL. L. REP. 10,254 (1991).

125. Theodore Waugh, *Where Do We Go from Here: Legal Controls and Future Strategies for Addressing the Transportation of Hazardous Wastes Across International Borders*, 11 FORDHAM ENVTL. L.J. 477, 483 (2000); David A. Rich, Comment, *Personal Liability for Hazardous Waste Cleanup: An Examination of CERCLA Section 107*, 13 B.C. ENVTL. AFF. L. REV. 643, 643 (1986).

126. 42 U.S.C. § 6925 (1994).

127. *Id.* § 6922.

128. Stefan A. Noe, Comment, "Willful Blindness": A Better Doctrine for Holding Corporate Officers Criminally Responsible for RCRA Violations, 42 DEPAUL L. REV. 1461, 1464 (1993).

129. 42 U.S.C. § 6924 (1994).

130. It is also worth mentioning the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. §§ 9601-9675 (1994), as it and RCRA have "complementary objectives." PERCIVAL ET AL., *supra* note 5, at 201. RCRA functions as the ex ante component of hazardous waste regulation, and CERCLA functions as the ex post component.

CERCLA was enacted in the wake of the media whirlwind that the Love Canal incident produced. *Id.* at 263-64. Professor Percival describes the incident:

In 1953, the Hooker Chemical and Plastics Corporation had transferred title to a 16-acre site to the Niagara Falls Board of Education for the sum of one dollar. The company acknowledged that it had buried chemicals on the site, which it had covered with a layer of clay, and the deed of sale stated that the company would not be responsible for any injuries that might occur. A school and 100 homes were built on the site, which became known as Love Canal. Following heavy rains in 1978, a chemical soup began seeping into residential basements. More than 80 chemical compounds were found, including many known carcinogens. Ultimately, 1,000 families were relocated and homes along the canal were demolished. Love Canal became a national media event that crys-

(SDWA),¹³¹ which requires the EPA to establish maximum contaminant levels (MCLs) that place limitations on the amount of pollutants that can be emitted into public drinking water systems.¹³² The SDWA specifies that the MCLs, which operate on a firm-by-firm basis, should come as close as feasible to “the level at which no known or anticipated adverse effects on the health of persons occur and which allows an adequate margin of safety.”¹³³ The feasibility test that the SDWA employs takes into account the “best technology . . . available.”¹³⁴

Additionally, the two regulations designed to combat toxic health risks, the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA)¹³⁵ and the Toxic Substances Control Act of 1976 (TSCA),¹³⁶ also employ technology-based standards. FIFRA is the preeminent federal law regulating the pesticide industry.¹³⁷ Its twin goals are to protect humans and the environment from the harms of pesticides, and to allow growers to use pesticides effectively for pest control.¹³⁸ FIFRA requires that manufacturers register pesticides before selling them on the marketplace.¹³⁹ In their registration application, manufacturers are required to present to the agency all data they possess concerning the pesticide’s safety, and the EPA may require any additional data that it believes necessary to demonstrate the pesticide’s safety.¹⁴⁰ In addition to the registration process, FIFRA authorizes the

tallized a festering problem in terms that provoked an emotional response from the public.

Id. at 263. For more on the Love Canal incident, *see, e.g.*, Timur Kuran & Cass R. Sunstein, *Availability Cascades and Risk Regulation*, 51 STAN. L. REV. 683, 691-98 (1999). CERCLA was designed to remedy problems encountered while attempting to respond to the Love Canal release through legislation that existed at that time. PERCIVAL ET AL., *supra* note 5, at 264.

The core of CERCLA consists of liability provisions for the costs of hazardous waste removal and remedial action, 42 U.S.C. § 9607 (1994), and authorization for the EPA to spend Superfund monies for removal and remediation operations, *id.* § 9611.

131. 42 U.S.C. §§ 300(f)-300(j)(26) (1994).

132. *Id.* §§ 300f(3), 300g-1.

133. *Id.* § 300g-1(b)(4).

134. *Id.* § 300g-1(b)(4)(D).

135. 7 U.S.C. §§ 136-136y (1994). For an overview of FIFRA, *see* WILLIAM H. RODGERS, ENVIRONMENTAL LAW ch. 5 (2d ed. 1994).

136. 15 U.S.C. §§ 2601-2692 (1994 & Supp. III 1998).

137. *See* John M. Megara, Comment, *The Rose Industry Exception for Early Entry into Pesticide Treated Greenhouses: Romance in Regulation*, 25 B.C. ENVTL. AFF. L. REV. 941, 941 (1998).

138. Linda J. Fisher et al., *A Practitioner's Guide to the Federal Insecticide, Fungicide, and Rodenticide Act: Part I*, 24 ENVTL. L. REP. 10,449, 10,450 (1994).

139. 7 U.S.C. § 136a (1994).

140. *Id.* § 136a(c).

EPA to ban unreasonably dangerous pesticides.¹⁴¹ FIFRA does not, however, regulate the cumulative levels of pesticide-based risk in foods. Likewise, TSCA requires manufacturers to provide the EPA with pre-manufacture notice of their intention to produce a new chemical at least ninety days in advance, and to demonstrate that the chemical will not present “an unreasonable risk of injury to health or the environment.”¹⁴² If the EPA believes the chemical would pose an unreasonable risk, it can revoke registration.¹⁴³ Like FIFRA, TSCA’s goal is not to control the cumulative levels of pesticide-based risk in foods, but rather to prevent pesticides that pose unreasonable risks from coming to market.

2. Evaluation

Technology-based standards are both overinclusive and underinclusive insofar as the rights-based justification is concerned. The standards are overinclusive because nothing prevents technology-based standards from applying in areas where the cumulative environmental risk is so low that environmental rights are not violated.¹⁴⁴ The standards are simultaneously underinclusive because they “make[] no effort to determine aggregate exposure levels; therefore, some individuals may in fact be less protected than the minimum.”¹⁴⁵ The major reason that technology-based standards fail to constrain aggregate exposure levels is that they operate on a firm-by-firm basis, with no regard to the *quantity* of firms that are concentrated in a specific area.¹⁴⁶ The NSPS program, for one, illustrates this failure: The program only ensures that each *individual* firm complies with the mandated emission standards, and does not prevent a massive concentration of polluting firms. This problem is endemic to all of the regulatory programs discussed in *supra* Part II.A.1 that employ technology-based standards.

141. *Id.* § 136d.

142. 15 U.S.C. § 2604(a)(1), (b)(2)(B).

143. *Id.* § 2605.

144. *See* Revesz, *supra* note 7, at 545 (noting that the present system “regulates more than that which has a claim to quasi-constitutional legitimacy”).

145. *Id.*

146. *See, e.g.,* Michael Gregory, *Environment, Sustainable Development, Public Participation and the NAFTA: A Retrospective*, 7 J. ENVTL. L. & LITIG. 99, 137 (1992) (criticizing technology-based standards for “ignor[ing] the aggregate effects of multiple pollution sources”); Kenneth M. Murchison, *Environmental Law in Australia and the United States: A Comparative Overview*, 22 B.C. ENVTL. AFF. L. REV. 503, 530 (1995) (noting that technology-based standards “may fail to produce an acceptable ambient environment if . . . polluters are numerous”).

A second reason why technology-based standards do not constrain aggregate risk levels is that the standards do not account for the polluters' size.¹⁴⁷ Performance standards are generally proportional to firm size. For example, the EPA has promulgated regulations pursuant to the NSPS legislation limiting electric utilities to 1.2 pounds of sulfur dioxide per million BTU of heat inputs.¹⁴⁸ Hence, pollution levels may be great in areas where firms have high heat inputs.

Third, technology-based standards operate on a medium-by-medium basis. The CAA is every bit as unconcerned that a large amount of hazardous waste-based risk exists in a certain neighborhood as RCRA is about air pollution-based risk. Even if technology-based standards are effective at limiting individual exposure to environmental risk and local degradation within a given medium, pollutants from *other* media could overwhelm these successes.

However, technology-based standards may not even effectively reduce environmental risk within a given medium because they operate in a pollutant-by-pollutant manner. For example, a regulation that mandates a reduction in particulate matter, carbon monoxide and sulfur dioxide does not prevent polluters from increasing their emissions of lead and nitrogen dioxide.

B. *Ambient Standards*

1. Synopsis

Although technology-based standards are ineffective at controlling aggregate pollution levels within a community even for those pollutants that they regulate, ambient regulatory standards are more effective in this regard. The most prominent example of federal ambient standards can be found in the CAA, which features national ambient air quality standards (NAAQS) for "criteria pollutants."¹⁴⁹ The name "criteria pollutants" derives from the fact that the EPA publishes a list of pollutants whose emissions are anticipated to endanger public health or welfare, and issues criteria for them indicating the levels at which the pollutants are believed to threaten life or

147. This is particularly true of design standards, which mandate only that firms use specific kinds of pollution control technology.

148. See Standards of Performance for New Stationary Sources, 36 Fed. Reg. 24,876, 24,879 (Dec. 23, 1971) (codified at 40 C.F.R. § 60.43 (2003)).

149. 42 U.S.C. §§ 7408-7409 (1994).

property.¹⁵⁰ The six criteria pollutants are ozone, particulate matter, carbon monoxide, nitrogen oxides, lead, and sulfur dioxide.¹⁵¹

After the EPA has promulgated NAAQS, the CAA requires states to adopt state implementation plans (SIPs) to implement, maintain, and enforce the NAAQS.¹⁵² In the SIPs, "each state determines the quantity of pollutants each source within that state is allowed to emit."¹⁵³ Each state then submits its SIP to the EPA for approval.¹⁵⁴ Even after accepting a SIP, the EPA may require later revisions if the state plan is found inadequate to attain or maintain the NAAQS or "to otherwise comply with any requirement of" the CAA.¹⁵⁵

The CAA specifies that primary ambient standards should be set at a level "requisite to protect the public health," and that secondary standards should be set at a level "requisite to protect the public welfare."¹⁵⁶ The CAA defines the "public welfare" broadly. Under the statute, the public welfare includes adverse effects on soil, water quality, agriculture, wildlife, property, transportation, visibility and comfort.¹⁵⁷ The CAA states that air quality criteria should "accurately reflect the latest scientific knowledge."¹⁵⁸ In particular, the criteria should reflect "variable factors" such as atmospheric conditions that can alter the effects of pollution, and should take into account possible interactions with other pollutants that may magnify the overall health or ecological impact.¹⁵⁹

If a state is noncompliant with the NAAQS, it is classified as a nonattainment area. Nonattainment areas are required to make reasonable further progress every year, with the goal of meeting the am-

150. *Id.* § 7408(a)(1); see also Bennett A. Caplan, Comment, *The Applicability of Clean Air Act Section 115 to Canada's Transboundary Acid Precipitation Problem*, 11 B.C. ENVTL. AFF. L. REV. 539, 559-60 (1984).

151. 40 C.F.R. § 50 (2003).

152. The CAA creates air quality control regions that consist of "any interstate area or major intrastate area" which the EPA "deems necessary or appropriate for the attainment and maintenance" of NAAQS. 42 U.S.C. § 7407(c). Each state must submit a SIP to the EPA describing how the state plans to achieve and maintain the NAAQS for all air quality control regions within its jurisdiction. *Id.*

153. Caplan, *supra* note 150, at 560.

154. 42 U.S.C. § 7410(a)(1).

155. *Id.* § 7410(k)(5).

156. *Id.* § 7409(b).

157. *Id.* § 7402(h). For a discussion of problems faced in the promulgation of these standards, see PERCIVAL ET AL., *supra* note 5, at 551-52.

158. 42 U.S.C. § 7408(a)(2).

159. *Id.*

bient standards.¹⁶⁰ However, Congress has often postponed ambient air quality compliance requirements “to accommodate economic and energy concerns.”¹⁶¹

2. Evaluation

Like technology-based standards, ambient standards are overinclusive. The NAAQS, for example, apply even citizens’ environmental rights are not violated because cumulative risks are low. Moreover, while ambient standards are at least capable—in theory—of providing a constraint on aggregate pollution within the medium that they regulate, they are still underinclusive with respect to the rights-based justification.

The main reason that ambient standards are underinclusive is because they only apply on a medium-by-medium basis. Pollutants from other media could create threats to individual health or local environmental quality that overwhelm the effect of the ambient standards. For example, the NAAQS apply only to air pollution; risk levels produced by hazardous waste and water pollution could overwhelm the ambient standards’ protection.

Also, while ambient standards are theoretically capable of constraining pollution within the medium that they regulate, in practice these standards are implemented on a pollutant-by-pollutant basis. The NAAQS, for example, only apply to the six listed criteria pollutants, and thus fall far short of regulating air pollution as a medium:

160. *Id.* § 7502(a)(2)(A).

161. Todd B. Adams, *New Source Review Under the Clean Air Act: Time for More Market-Based Incentives?*, 8 BUFF. ENVTL. L.J. 1, 11 (2000). For example, Congress has repeatedly waived automobile emissions standards to help car manufacturers. *Id.*; see also GARY C. BRYNER, *BLUE SKIES, GREEN POLITICS: THE CLEAN AIR ACT OF 1990*, at 81-85 (1995). Congress has also provided additional time for areas to meet the ambient standards in both the 1977 and 1990 Clean Air Act Amendments. *Id.* at 103, 107; Adams, *supra*, at 11.

In contrast to nonattainment areas, attainment areas—those that comply with the NAAQS—are covered by the prevention of significant deterioration (PSD) program. 42 U.S.C. § 7470 (1994). The PSD program provides each attainment area with an allowable increase from its baseline concentration of pollution. *Id.* § 7473(b). The allowable increase depends on whether the area is designated as Class I, Class II, or Class III. Class I areas, which are either parks or wilderness areas, are allowed the least increase in pollution. *Id.* §§ 162, 163. One policy explanation for the PSD program is that the NAAQS alone would be inadequate to protect national parks because it is designed to protect the entire country, not the most pristine areas. On the other hand, the public choice account suggests that members of Congress from nonattainment states wanted to impose an additional burden on those states that complied with the NAAQS. See B. Peter Pashigian, *Environmental Regulation: Whose Self-Interests are Being Protected?*, 23 ECON. INQUIRY 551, 553 (1985).

They do not control the emission of air pollutants other than those six.

Even for the regulated pollutants, ambient standards may not constrain environmental risk. The NAAQS regulate each criteria pollutant *individually*, rather than taking into account the cumulative effect produced by the combination of all regulated pollutants. Each of the six criteria pollutants in a given region can be very close to the statutory maximum without actually violating the regulatory standards. Thus, it is possible that environmental risk levels will be unacceptable even for the six regulated pollutants.

III. EMPIRICAL UNDERINCLUSIVENESS

Part II demonstrates that as a theoretical matter, our current regulatory system is both underinclusive and overinclusive with respect to the rights-based justification. This Part extends that analysis by showing that the regulatory system's underinclusiveness is significant in practice. Despite the presence of federal regulations, many communities are exposed to high levels of pollution that result in both a contaminated environment and consequent harms to human health.

Part III.A explains that it is difficult to determine the exact amount of cumulative environmental risk that exists in various communities. Despite the quantification problems, however, it is evident that certain communities experience disproportionately high levels of environmental risk under the present system. One such community—Chester, Pennsylvania—is examined in Part III.B.

A. *Quantification Problems*

Quantifying the cumulative health risks that different communities face is difficult because there is a paucity of data, and several factors make the existing data unreliable as an indicator of risk. No national database reports on the cumulative pollution risks that different communities face. Prominent among the databases that could potentially be used as a tool for assessing risks to the public health is the Toxic Release Inventory (TRI).¹⁶² TRI requires compa-

162. 42 U.S.C. § 11023 (1994). TRI was mandated as a part of EPCRA. For more on EPCRA, see the text accompanying notes 108-111, *supra*.

Some recently-developed databases may be qualitatively superior to TRI for measuring cumulative risks. See Telephone Interview with Michael Callahan, Chair, Technical Panel Preparing the Framework for Cumulative Risk Assessment (July 2, 2002) [hereinafter Callahan Interview]. One database that Callahan specifically mentions is the National-Scale Air Toxics Assessment. U.S. Environmental Protection Agency, The National-Scale Air Toxics Assessment,

nies with ten or more full-time employees that are engaged in manufacturing, processing or otherwise using more than a threshold quantity of listed chemicals to file standardized forms with the EPA disclosing their annual releases.¹⁶³ The information supplied is compiled in the TRI, and has been available to the public through a national computerized database. However, a number of shortcomings prevent TRI from effectively measuring cumulative environmental risks.

First, all TRI releases are measured uniformly in pounds regardless of toxicity.¹⁶⁴ However, TRI-listed chemicals are far from uniform in their toxicity: In fact, the toxicity of TRI-listed chemicals can vary more than 10,000-fold.¹⁶⁵ Thus, a firm might reduce its TRI-reported emissions even while increasing ecological risk through the substitution of lower-volume pollutants that are higher in toxicity.¹⁶⁶ Alexander Volokh provides an illustration of how this could occur:

[S]uppose a facility released 1,000,000 pounds of methanol to a wastewater-treatment facility and also had 1,000 pounds of fugitive air releases of perchloroethylene. Also suppose that the methanol was effectively degraded with virtually no residue. The facility's total releases would be 1,001,000 pounds. Suppose that the next year, the facility made changes resulting in only 500,000 pounds of methanol releases, but fugitive emissions of perchloroethylene increased to 5,000 pounds. Total releases would show a decline from 1,001,000 pounds to 505,000 pounds—"clearly" an improvement.

<http://www.epa.gov/ttn/atw/nata> (last visited June 29, 2003). However, although the National-Scale Air Toxics Assessment appears to be a promising tool for estimating environmental risks related to the pollutants that it covers, the database encompasses only thirty-three air pollutants. *See id.*

The EPA also relatively recently created the Sector Facility Indexing Project (SFIP), "a web-accessible database that combines TRI data with other data already available to the agency, including air, water, and RCRA compliance history and reported chemical spills for approximately 640 facilities in five industry sectors." Karkkainen, *supra* note 16, at 357; *see also* Office of Enforcement and Compliance Assurance, EPA, Sector Facility Indexing Project Home Page, available at <http://www.epa.gov/oeca/sfi/> (last visited June 29, 2003). Also, the EPA is "attempting to standardize, streamline, and consolidate all environmental reporting into a single, unified database," under the Reinventing Environmental Information (REI) initiative. Karkkainen, *supra* note 16, at 358. This database is expected to be more complete than SFIP. *Id.* at 358-59. Yet even this database falls short of being a full-scale pollution release and transfer registry because, "[a]part from TRI, reporting is limited to those substances for which reporting is required under conventional regulatory statutes." *Id.* at 359.

163. 42 U.S.C. § 11023 (1994).

164. ANDERSON & LOHOF, *supra* note 110, at 9-5 ("Releases are not weighted according to toxicity . . .").

165. Alexander Volokh, *The Pitfalls of the Environmental Right-to-Know*, 2 UTAH L. REV. 805, 820 (2002) ("Releasing twenty million pounds of acetone to the air is much less harmful than similarly emitting 1000 pounds of phosgene gas.").

166. Karkkainen, *supra* note 16, at 332.

But since perchloroethylene is a suspected carcinogen while methanol is far less dangerous, potential risks from the facility's releases are greater in the second year, perhaps by several orders of magnitude.¹⁶⁷

Although the evidence seems to indicate that few firms "game" their TRI data in this manner,¹⁶⁸ the fact that they can do so indicates a fundamental obstacle to using TRI data to determine cumulative environmental risks.

Second, TRI data is incomplete in two regards. Initially, because TRI only measures toxic releases, "[a] firm with superior TRI data might nonetheless produce large volumes of conventional pollutants or solid waste."¹⁶⁹ Conventional pollutants—such as particulate matter, sulfur dioxides, and carbon monoxide—can have a significant effect on human health and the environment.¹⁷⁰ Since TRI does not

167. Volokh, *supra* note 165, at 820.

168. Karkkainen, *supra* note 16, at 332.

169. *Id.* at 331.

170. See Lakshman Guruswamy, *Integrating Thoughtways: Re-Opening of the Environmental Mind?*, 1989 WIS. L. REV. 463, 526 n.321 (1989) (noting that particulate matter, sulfur dioxides and carbon monoxide are all conventional pollutants).

High fine particulate matter concentrations are known to threaten human health. EPA Office of Air and Radiation, Latest Findings on National Air Quality: 2000 Status and Trends—Nitrogen Dioxide (NO₂) (Sept. 2001), at <http://www.epa.gov/oar/aqtrnd00/nitrodox.html>; see also NATURAL RESOURCES DEFENSE COUNCIL, BREATH TAKING: PREMATURE MORTALITY DUE TO PARTICULATE AIR POLLUTION IN 239 CITIES 1 (1996) (claiming that particulate pollution causes 64,000 premature deaths every year by hastening heart and lung disease); PARTICLES IN OUR AIR: CONCENTRATIONS AND HEALTH EFFECTS (Richard Wilson & John D. Spengler eds., 1996) (collecting ten essays that examine the health effects of airborne particulate matter). It is widely believed that in London's "Killer Fog" of 1952, extremely high particulate matter levels "led to 4,000 excess deaths in a week." *Am. Trucking Ass'ns v. EPA*, 175 F.3d 1027, 1038 (D.C. Cir. 1999) (citing W.P.D. Logan, *Mortality in the London Fog Incident, 1952*, LANCET, Feb. 4, 1953, at 336-38), modified on petition for reh'g, 195 F.3d 4 (D.C. Cir. 1999), *aff'd in part and rev'd in part*, *Whitman v. Am. Trucking Ass'ns*, 531 U.S. 457 (2001).

High sulfur dioxide concentrations can exacerbate asthma and heart and lung disease. EPA Office of Air and Radiation, Latest Findings on National Air Quality: 2000 Status and Trends—Sulfur Dioxide (Sept. 2001), at <http://www.epa.gov/oar/aqtrnd00/sulfur.html> (noting that short-term exposures to sulfur dioxide can impair asthmatic individuals, while longer term exposures can produce "respiratory illness, alterations in the lungs' defenses, and aggravation of existing cardiovascular disease"); New York State Dep't Envtl. Conservation, 1996 Air Quality Report, at http://www.dec.state.ny.us/website/dar/reports/96annrpt/96ar_maj.html (last visited Jan. 20, 2003) ("Human exposure to sulfur dioxide can result in irritation of the respiratory system which can cause both temporary and permanent damage."). Sulfur dioxide is also a major factor in the production of acid rain. OFFICE OF ACID DEPOSITION, ENVTL. MONITORING, AND QUALITY ASSURANCE, EPA, THE ACIDIC DEPOSITION PHENOMENON AND ITS EFFECTS: CRITICAL ASSESSMENT DOCUMENT 3, 9-10 (Aug. 1985).

Carbon monoxide can enter the bloodstream and weaken heart contractions. New York State Dep't Envtl. Conservation, *supra*. In some instances, "[e]xposure to carbon monoxide can be fatal." Ellis B. Murov, Comment, *Environmental Law: Attaining and Maintaining Air Quality*

measure these conventional releases, its data does not account for a significant component of the environmental risks that communities experience.

Moreover, TRI's data for toxic releases is also incomplete. This data is incomplete in part because TRI does not list chemicals that "are not used in large enough quantities to justify the additional reporting burden."¹⁷¹ This creates an incentive for firms to use non-listed chemicals in place of listed chemicals. However, much of this substitution may simply replace one toxic substance with another.¹⁷² And "[e]ven if a substitute chemical is less toxic, it may be more volatile, be more easily absorbed, or otherwise create greater exposure and greater risk than the original, listed chemical."¹⁷³ The toxics data is also incomplete because the basic information needed to determine whether a significant number of toxic pollutants should be listed in TRI is lacking. The EPA has acknowledged that it lacks "the basic information needed to determine whether [the majority of the highest-volume organic chemicals] should be listed on the TRI."¹⁷⁴ A 1994 GAO study reported that only about 320 of over 70,000 chemicals in commercial use in the country are included in the database.¹⁷⁵ One consequence of TRI's incomplete toxic release data, the GAO study concludes, is that "companies may maintain or even increase their usage of toxic chemicals while concurrently reducing the chemicals that are reported to EPA."¹⁷⁶ Because the non-listed chemicals dwarf those that are included, TRI provides only a small snapshot of the whole range of pollution risks that any community faces.¹⁷⁷ A final reason that TRI's toxics data is incomplete is because its coverage of facilities is not comprehensive. Firms are only required to report their data if they have ten or more employees, are in specified Standard Industrial Classification (SIC) codes, and either use 10,000 pounds or import, manufacture or process 25,000 pounds of a listed chemical.¹⁷⁸

Standards Under the 1977 Clean Air Act Amendments, 53 TUL. L. REV. 907, 908 n.9 (1979).

171. Volokh, *supra* note 165, at 837; *see also* Karkkainen, *supra* note 16, at 334.

172. Volokh, *supra* note 165, at 837.

173. *Id.*

174. OFFICE OF POLLUTION PREVENTION AND TOXICS, EPA, WHAT DO WE REALLY KNOW ABOUT THE SAFETY OF HIGH PRODUCTION VOLUME CHEMICALS? EPA'S BASELINE OF HAZARD INFORMATION THAT IS READILY AVAILABLE TO THE PUBLIC 8 (1998).

175. *See* ANDERSON & LOHOF, *supra* note 110, at 9-3 (describing the GAO study).

176. *Quoted in id.*

177. *See* Karkkainen, *supra* note 16, at 334 (stating that TRI's picture of health and environmental risks is "radically underinclusive").

178. 42 U.S.C. § 11023(b), (f).

In 1988, the EPA estimated that this ten-employee requirement exempted 48 percent of the manufacturing facilities in the specified SIC codes from reporting their data to TRI.¹⁷⁹ As a result “TRI captures only a small percent of actual releases and transfers.”¹⁸⁰

Third, TRI pays insufficient attention to factors relevant to calibrating the actual effect of pollutants on human health. Failure to account for “proximity to population, exposure route, dispersion, persistence, [and] sensitivity of exposed populations” makes an extrapolation of TRI data to the risks posed to human health extremely difficult.¹⁸¹ TRI released a National Report in 1991 which admitted as much when it stated that the report “contain[ed] aggregate information . . . which alone does not indicate the risk these chemicals pose to human health or to the environment.”¹⁸² Thus, rather than serving as a proxy for cumulative risks, TRI data only serves as “an indicator of the environmental *performance* of a limited class of sources.”¹⁸³

A fourth problem with TRI is that, even as an incomplete indicator of “the environmental *performance* of a limited class of sources,” TRI’s data quality is suspect. Although TRI reports that toxic releases have been in steady decline since 1988,¹⁸⁴ the EPA notes that such changes may not be attributable to actual reductions in toxic emissions, but rather they may be caused by “errors, changes in facilities’ estimation or calculation techniques, changes in reporting guidance and facilities’ interpretation of that guidance, and facilities’ use of exemptions.”¹⁸⁵ The EPA has not issued guidelines for the data re-

179. Toxic Chemical Release Reporting; Community Right-to-Know, 53 Fed. Reg. 4500, 4523 (Feb. 16, 1988).

180. THOMAS A. BURKE & NADIA M. SHALAUTA, UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, PILOT MULTI-MEDIA HEALTH CHARACTERIZATION STUDY OF SOUTH AND SOUTHWEST PHILADELPHIA E-12 (1997).

181. *Id.*; see also ANDERSON & LOHOF, *supra* note 110, at 9-5 (noting that TRI data does not take into account “the dangers posed by various methods of disposing of various types of chemicals and do[es] not indicate exposure or potential effects on human health and the environment”); David Abell, *Emergency Planning and Community Right to Know: The Toxics Release Inventory*, 47 SMU L. REV. 581, 596 (1994); Jennifer Lukas Jackson, Note, *Environmental Audit Privilege Laws: Stripping the Public’s Right to Know*, 49 CLEV. ST. L. REV. 539, 549 (2001) (“[T]he TRI data does not reflect the public’s exposure to those chemicals and is not sufficient to calculate potential adverse health effects.”).

182. EPA OFFICE OF PESTICIDES & TOXIC SUBSTANCES, TOXICS IN THE COMMUNITY: NATIONAL AND LOCAL PERSPECTIVES, THE 1989 TOXICS RELEASE INVENTORY NATIONAL REPORT, EPA/560/4-91-014, at 19-20 (1991).

183. Karkkainen, *supra* note 16, at 333.

184. Volokh, *supra* note 165, at 815.

185. ANDERSON & LOHOF, *supra* note 110, at 9-3.

ported to TRI, and firms can thus reduce their reported emissions by altering the techniques they employ in their estimates.¹⁸⁶ The probability that reported decreases will not reflect actual reductions is magnified by the fact that “[n]either the EPA nor the states are required to check the self-reported numbers.”¹⁸⁷

It is true that the EPA is trying to develop its research methods and capabilities. One commentator has noted that research on the effects of pollution has become increasingly sophisticated, and scientists “are increasingly able to measure the synergistic and cumulative effects of routine exposures.”¹⁸⁸ Yet despite improvements in the EPA’s ability to measure environmental risks, at present cumulative risks cannot be effectively measured. Professor Kakkainen has noted that throughout the field of environmental regulation, “no consideration is given to the problem of co-causation—the synergistic, interactive, or cumulative effects of multiple toxic pollutants.”¹⁸⁹ The EPA has admitted to shortcomings in both its data and methods of analysis:

The ability to assess environmental risks, compare them, and select strategies to reduce them all depend on the availability and sophistication of the relevant data and analytical tools. The weakness in [a 1987 EPA publication] stems in large part from the weakness of the data and analytical tools used, and those weaknesses still exist. If EPA’s efforts to assess, compare, and reduce risks are to improve in the future, the data and analytical tools must improve as well.¹⁹⁰

In a similar vein, Reginald Harris, who led the group of scientists that assembled the protocol for a cumulative risk study in Chester,

186. *Id.*

187. Volokh, *supra* note 165, at 815.

188. Rena I. Steinzor, *Unfunded Environmental Mandates and the "New (New) Federalism": Devolution, Revolution, or Reform?*, 81 MINN. L. REV. 97, 168 (1996); *see also* Telephone Interview with Reginald Harris, Senior Toxicologist and Environmental Justice Coordinator, EPA’s Region III (July 1, 2002) [hereinafter Harris Interview] (“The data gathering is definitely better. It gets better all the time, and our understanding of how data can be used gets better over time.”).

189. Karkkainen, *supra* note 16, at 334.

190. U.S. EPA, REDUCING RISK: SETTING PRIORITIES AND STRATEGIES FOR ENVIRONMENTAL PROTECTION 18 (1990); *see also* Steinzor, *supra* note 188, at 168 (stating that “there is still an enormous research agenda left to accomplish.”).

The EPA has also acknowledged this shortcoming in two recent colloquia designed to improve the process of determining cumulative risks by establishing a framework for their evaluation. EASTERN RESEARCH GROUP, U.S. ENVIRONMENTAL PROTECTION AGENCY, SUMMARY OF THE U.S. EPA COLLOQUIUM ON A FRAMEWORK FOR HUMAN HEALTH RISK ASSESSMENT: COLLOQUIUM #1 (1997); EASTERN RESEARCH GROUP, U.S. ENVIRONMENTAL PROTECTION AGENCY, SUMMARY OF THE U.S. EPA COLLOQUIUM ON A FRAMEWORK FOR HUMAN HEALTH RISK ASSESSMENT: COLLOQUIUM #2 (1998); *see also* Callahan Interview, *supra* note 162 (“The framework is the first step in a much longer process.”).

Pennsylvania,¹⁹¹ reports that the Chester study was limited by the incomplete data sets that they employed.¹⁹² Because of the data's limitations, the team was often forced to model information based on the best data available.¹⁹³ Harris doubts that a truly comprehensive database will ever be created, because "people would be collecting data forever" if that degree of research were attempted.¹⁹⁴

Thus, at present, neither TRI nor the EPA's other databases can be used to effectively estimate cumulative environmental risks. Indeed, most of the EPA's databases were not designed with cumulative risk estimates as a major goal.¹⁹⁵ This point is illustrated in a recent risk assessment study of the South and Southwest Philadelphia area. The study states that although a "tremendous volume" of data on environmental quality was available, "there is little information available on the actual exposure levels of urban residents to pollutants in their environment."¹⁹⁶ In fact, the study states that, after conducting an extensive search, the research team found "virtually no available measurements of individual exposures in the Study Area."¹⁹⁷

B. Chester, Pennsylvania Case Study

Despite problems with the EPA's data, there is enough information to know that certain communities are subjected to high levels of environmental risk despite the existence of federal regulations. This disparity in environmental risk levels vividly illustrates that the regulatory system is underinclusive with respect to the rights-based justification. This Section discusses Chester, Pennsylvania as a case study. I selected Chester to illustrate the regulatory system's underinclusiveness because the EPA has produced an excellent environmental risk study for Chester. Since studies that attempt to measure cumulative risks are rare, it seemed ideal to use an area for which a competent study has been performed.

191. See *infra* Part III.B (describing the Chester study).

192. Harris Interview, *supra* note 188.

193. *Id.*

194. *Id.*

195. See Callahan Interview, *supra* note 162. Callahan states that data would have been compiled in a much different manner if cumulative risk analysis had been one of the purposes behind TRI. *Id.* ("You'd have more chemical-by-chemical breakdowns; rather than a facility-by-facility release number you would have it broken down unit-by-unit within the facility.")

196. BURKE & SHALAUTA, *supra* note 180, at E-12.

197. *Id.*

Chester is regularly cited in the academic literature as an example of environmental racism.¹⁹⁸ Chester is an urban city of approximately 42,000 residents located about fifteen miles southwest of Philadelphia along the Delaware River,¹⁹⁹ and its population is around 65% African-American.²⁰⁰ A large number of commercial waste facilities are located in Chester: Of the seven permits for commercial waste facilities that the Pennsylvania Department of Environmental Protection issued between 1986 and 1996, five were in Chester.²⁰¹ Beyond that, “over 60% of the waste-processing industries in Delaware County are located in Chester.”²⁰²

Prompted by the high concentration of waste facilities in Chester, the EPA undertook an extensive study of the city, which was released in the fall of 1994. The study examined six different kinds of environmental risks that have a direct impact on human health.²⁰³ The results indicate that there are high levels of pollution in multiple media that seemingly present a great level of environmental risk. This is the archetypal situation in which the regulatory system will be unable to safeguard citizens’ environmental rights, because numerous pollutants in multiple media pose a considerable risk to the public health, yet no federal statutes have been violated.²⁰⁴ As Reginald Harris reports, “the facilities [in Chester] seem to be operating pretty much within their permits.”²⁰⁵

The Chester study first examined groundwater and drinking water. It found that a number of anthropogenic hazardous waste sources

198. See, e.g., COLE & FOSTER, *supra* note 12, at 34 (“The story of Chester, Pennsylvania, is in many ways a classic case of environmental racism . . .”); Jerome Balter, *The EPA Needs a Workable Environmental Justice Protocol*, 12 TUL. ENVTL. L.J. 357, 357 (1999); Sheila Foster, *Justice From the Ground Up: Distributive Inequities, Grassroots Resistance, and the Transformative Politics of the Environmental Justice Movement*, 86 CAL. L. REV. 775, 778 (1998).

199. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, ENVIRONMENTAL RISK STUDY FOR CITY OF CHESTER, PENNSYLVANIA 1 (Draft Report, May 1995) [hereinafter CHESTER STUDY].

200. *Chester Residents Concerned for Quality Living v. Seif*, 132 F.3d 925, 927 n.1 (3d Cir. 1997), *dismissed as moot*, 524 U.S. 974 (1998) (“The City of Chester is located in Delaware County, Pennsylvania, and has a population of approximately 42,000, of which 65% is black and 32% is white.”). Chester’s demographics can be contrasted with those of Delaware County, where Chester is located. Excluding Chester, Delaware County’s population is 6.2% black and 91% white. *Id.*

201. Foster, *supra* note 198, at 779-80.

202. *Id.* at 780.

203. It also examined foul odors and noise pollution in the Chester area. CHESTER STUDY, *supra* note 199, at 63-68.

204. See CHESTER STUDY, *supra* note 199, Part II.

205. Harris Interview, *supra* note 188.

polluted Chester's groundwater.²⁰⁶ The groundwater contained "[s]ignificant levels of organic and inorganic contaminants," and appeared to be highly contaminated.²⁰⁷ The study also identified three major pollutants in the drinking water that could affect human health. First, a number of trihalomethanes exceeded their risk-based concentrations (RBCs).²⁰⁸ Second, the study found positive coliform results in several samples of the drinking water supply between 1989 and 1993.²⁰⁹ Finally, although exposure to volatile organic compounds in the drinking water was not expected to increase overall cancer or non-cancer risk, the study found that carbon tetrachloride and tetrachloroethene exceeded their RBCs.²¹⁰

Second, the study explored lead pollution, to which humans can be exposed by inhalation, ingestion with food, drinking water, soil and house dust, or through exposure when it crosses the placenta.²¹¹ The study found that ambient levels of lead did not violate national standards.²¹² Despite this, blood analysis indicated that "lead intake among area children may exceed national averages by about 130 ug/day."²¹³ Even at low levels of lead exposure, "lead poisoning causes intelligence quotient deficiencies, reading and learning disabilities, impaired hearing, reduced attention span, hyperactivity, behavior problems, and interference with growth."²¹⁴ The health effects are greater at high levels of exposure: High exposure levels can result in blindness, brain damage, cancer, and even death.²¹⁵

Third, the study examined potential hazardous waste sites under CERCLA and the Superfund Reauthorization Amendments Act, as well as RCRA Treatment, Storage and Disposal facilities (TSDFs).

206. CHESTER STUDY, *supra* note 199, at 21.

207. *Id.*

208. *Id.* at 22. The RBCs represent "the chemical concentrations that would correspond to the lower end of the target screening risk range . . ." *Id.* at 6. They "are compared to the site data during the data evaluation stage to rule out chemicals that will not contribute significantly to risks at the site." *Id.*

209. *Id.* at 24.

210. *Id.* at 26.

211. *Id.* at 33.

212. *Id.* at 36.

213. *Id.* at 37.

214. Jennifer L. Bush, Comment, *The Federal Lead Poisoning Prevention Program: Inadequate Guidance for an Expedient Solution*, 23 B.C. ENVTL. AFF. L. REV. 645, 647 (1996).

215. *Id.* at 647-48; see also William G. Kelly, Comment, *Ericka and Myron: Canaries in the Mines*, 13 ALB. L.J. SCI. & TECH. 173, 175 (2002); Amy E. Souchuns, Comment, *Old Pain, New Laws: Achieving Effective Compliance With the Residential Lead-Based Paint Hazard Reduction Act*, 47 CATH. U. L. REV. 1411, 1414 (1998).

Under CERCLA, the study found four sources in the Chester area that produced “unacceptable” hazardous waste risks.²¹⁶ In particular, there were “several instances” of soil contamination.²¹⁷ A number of pollutants of potential concern surrounded the TSDFs, including lead and other metals in soil, arsenic and phenanthrene in the soil, and asbestos and toluene in the air.²¹⁸

Fourth, the study examined surface water, sediment and fish tissue. Since researchers had observed people fishing in the Delaware River in September, exposure to contaminants in fish through either occasional or subsistence fishing seemed possible.²¹⁹ At one site, the study found cancer risk “based on arsenic and beryllium in a drainage ditch water sample.”²²⁰ It also found cancer risks at four other sites, based on such pollutants as arsenic, polycyclic aromatic hydrocarbons, and beryllium.²²¹ The study also found “risks associated with . . . consumption” of locally-caught fish due to the presence of such pollutants as chlordane, DDT, and mercury.²²² The EPA believes that the bioaccumulation of mercury in fish can threaten both human health and wildlife.²²³

Fifth, the study examined TRI data regarding local toxic releases. It discussed six local facilities that released a variety of toxic pollutants, including ethylene oxide, benzene, chloroform, hydrochloric acid and sulfuric acid.²²⁴ Particularly instructive in this section of the study is a discussion of the problems encountered in attempting to extrapolate environmental risks from the TRI data: The study notes that “the proximity of [the TRI] releases relative to potentially exposed populations has not been established. The determination of a potential health threat of the volumes released depends on the

216. CHESTER STUDY, *supra* note 199, at 43.

217. *Id.* at 42.

218. *Id.* at 40.

219. *Id.* at 46.

220. *Id.* at 47. However, it was unclear to the authors of the study whether people actually swam in the ditch. *Id.*

221. *Id.* at 47-48.

222. *Id.* at 48.

223. Regulatory Finding on the Emissions of Hazardous Air Pollutants from Electric Utility Steam Generating Units, 65 Fed. Reg. 79,825, 79,827 (Dec. 20, 2000); *see also* U.S. EPA, TOXICS IN THE COMMUNITY, NATIONAL AND LOCAL PERSPECTIVES 272-73 (1991) (finding that severe mercury poisoning may produce irreversible brain damage).

224. CHESTER STUDY, *supra* note 199, at 52-54.

proximity of the stack to residential areas, the surrounding terrain and the meteorological conditions.”²²⁵

The sixth and final medium that the study covered was air pollution. Although there were no NAAQS violations, the study concluded that “several chemicals were predicted to exist in air at concentrations of potential concern.”²²⁶ As a result, “[c]umulative carcinogenic and non-cancer threats are predicted to exceed benchmarks at several locations in Chester City.”²²⁷

An EPA Region III official has noted that the Chester study does not measure complete cumulative risks; instead, it is “more of an aggregated risk study because there is an unknown nature of interrelated exposures.”²²⁸ Although the study was not able to measure such potentially synergistic effects, it was nonetheless able to conclude that “[b]oth cancer and non-cancer risks from the pollution sources at locations in the city of Chester exceed levels which the USEPA believes are acceptable.”²²⁹ Despite the EPA’s conclusion that aggregate environmental risk levels emanating from pollution sources in and around the city of Chester are unacceptable, the relevant facilities have complied with their permit requirements and no regulatory standards appear to have been violated.²³⁰ Chester thus illustrates the fact that the regulatory system is underinclusive with respect to the rights-based justification.

Aside from Chester, a number of other areas are reputed to have high levels of environmental risk, and may also demonstrate the regulatory system’s underinclusiveness. One example is the eighty-five-mile stretch in Louisiana popularly known as “Cancer Alley.”²³¹ The waterways that run through this area have had a large amount of

225. *Id.* at 52. This observation obviously bolsters my conclusion in Part III.A that it is extremely difficult to determine environmental risk from TRI data.

226. CHESTER STUDY, *supra* note 199, at 56.

227. *Id.*

228. Samantha P. Fairchild, *Environmental Justice: An Overview*, 18 TEMP. ENVTL. L. & TECH. 111, 119 (2000).

229. CHESTER STUDY, *supra* note 199, at 2. A number of commentators noted the EPA’s conclusion. *See, e.g.*, Fairchild, *supra* note 228, at 119; Foster, *supra* note 198, at 782; Valerie P. Mahoney, Note, *Environmental Justice: From Partial Victories to Complete Solutions*, 21 CARDOZO L. REV. 361, 361-62 (1999).

230. *See* Harris Interview, *supra* note 205 and accompanying text.

231. *See* Robert R. Kuehn, *Denying Access to Legal Representation: The Attack on the Tulane Environmental Law Clinic*, 4 WASH. U. J.L. & POL’Y 33, 38-39 (2000); Rachel Brasso Razon, Comment, *What is Good for the Market, Can be Bad for the Health: Emissions Trading Under SCAQMD’s Rule 1610 and the Unjust Environmental Effects*, 29 GOLDEN GATE U. L. REV. 539, 545 (1999).

toxics dumped into them, and air pollution also seems to be pervasive.²³² A study performed by an Advisory Committee to the U.S. Commission on Civil Rights found that the communities along “Cancer Alley” faced disproportionate environmental risk from the “permitting and expansion of hazardous waste and chemical facilities.”²³³ These pollution levels have reportedly caused residents a number of health problems.²³⁴ Another example is the industrial area in the south side of Chicago popularly known as the “Toxic Doughnut.”²³⁵ The “Toxic Doughnut” is essentially a 140-square-mile ring comprised of “a chemical incinerator, a water and sewage treatment facility, steel mills, paint factories, scrap yards and at least 52 landfills.”²³⁶ This high concentration of polluters has reportedly caused both a high level of

232. J. Michael Kennedy, *Danger in Louisiana's "Cancer Alley"*, L.A. TIMES, May 14, 1989, at 1 (explaining that in 1987, according to data that the chemical industry submitted to the EPA, “774 million pounds of toxics were dumped into Louisiana's waterways” and “another 134 million pounds of toxics were released into the air”). After visiting “Cancer Alley,” one journalist wrote that “the catfish tasted oily, the river shrimp had vanished and, at night, acrid odors drove people inside off their porches.” Mary T. Schmich, “*Chemical Soup*” of Mississippi River Worries Residents, ORANGE COUNTY REG., Nov. 20, 1988, at A12.

233. LOUISIANA ADVISORY COMM. TO THE U.S. COMM’N ON CIVIL RIGHTS, THE BATTLE FOR ENVIRONMENTAL JUSTICE IN LOUISIANA . . . GOVERNMENT, INDUSTRY, AND THE PEOPLE 63 (1993).

234. For example, it has been reported that residents within one mile of the Borden plant “have a 4.5% greater chance of contracting lung cancer than those living one to three miles away.” Omar Saleem, *Overcoming Environmental Discrimination: The Need for a Disparate Impact Test and Improved Notice Requirements in Facility Siting Decisions*, 19 COLUM. J. ENVTL. L. 211, 230 n.80 (1994). For a critique of the environmental justice literature discussing “Cancer Alley,” see CHRISTOPHER H. FOREMAN JR., THE PROMISE AND PERIL OF ENVIRONMENTAL JUSTICE 75-76 (1998) (“The current scientific consensus is that behavioral and some occupational factors have been associated with cancer incidence in Louisiana, but that there is no overall ‘cancer epidemic’ in that state or in the so-called cancer alley.”).

Bunyan Bryant has argued that “Cancer Alley” demonstrates how the regulatory system overlooks cumulative environmental risk:

[I]n cancer alley you have all of the corporations each dumping hundreds and thousands of pounds of chemicals into the air and the water and the EPA and the State government issuing permits as if that is the only company that is doing it. There's no concern about the cumulative effect.

Environmental Protection Agency Cabinet Elevation—Environmental Equity Issues: Hearings Before the Subcomm. On Legislation and National Security of the House Comm. on Government Operations, 103d Cong. 96 (statement of Bunyan Bryant).

235. See James S. Freeman & Rachel D. Godsil, *The Question of Risk: Incorporating Community Perceptions into Environmental Risk Assessments*, 21 FORDHAM URB. L.J. 547, 549 (1994); Hurwitz & Sullivan, *supra* note 75, at 66.

236. Natalie M. Hammer, *Title VI as a Means of Achieving Environmental Justice*, 16 N. ILL. U. L. REV. 693, 693 (1996); see also Heather M. Little, *Toxin Shock*, CHI. TRIB., Jan. 15, 1995, at 3. A total of 100 factories and 103 abandoned waste dumpsites are located in south side minority communities. Robert P. Bullard, *Environmental Justice: A New Framework for Action*, ENVTL. L. NEWS, Spring 1996, at 14-15, 18.

environmental risk in south side Chicago and extensive soil and groundwater contamination.²³⁷ A number of other communities are also known for having disproportionately high levels of environmental risk.²³⁸

IV. IMPLICATIONS

Earlier, I outlined two basic regulatory principles that seem logically compelled if the rights-based justification is seen as a valid reason for federal intervention. First, I stated that the regulatory system should effectively guarantee citizens' environmental rights. However, I also explained that the justification becomes far less persuasive when used to support regulations that are only marginally related to it.

The previous two Parts demonstrate that the regulatory system is underinclusive because it fails to effectively guarantee citizens' environmental rights, but is simultaneously overinclusive because it applies even in areas where aggregate pollution levels are low enough that citizens' environmental rights are not violated. Thus, the rights-based justification does not provide strong support for the present regulatory system.

Of course, there are a few individual regulations under the present system for which the rights-based justification does provide strong support. These regulations fall under the third rationale for the rights-based justification: They are designed to ameliorate discrimination in the placement of environmental risk. The best-known of these regulations is Executive Order 12,898, which President Clinton issued in 1994.²³⁹ That Executive Order requires federal agencies to incorporate environmental justice concerns into their missions by addressing the disproportionate environmental impact of the agencies' operations on minority and low-income populations.²⁴⁰ The Executive Order also creates an Interagency Working Group on Environmental Justice, which is designed to assist federal agencies in identifying disproportionate environmental effects on minority and low-income popula-

237. Clarice E. Gaylord & Geraldine W. Twitty, *Protecting Endangered Communities*, 21 *FORDHAM URB. L.J.* 771-73 (1994).

238. It has been noted that "[c]ertain neighborhoods have become notorious among environmental justice activists and in the media as toxic battlegrounds due to high concentrations of polluting facilities." Freeman & Godsil, *supra* note 235, at 549. These neighborhoods include South Central and East Los Angeles, and West Harlem and the South Bronx in New York City. *Id.* at 549.

239. See Exec. Order No. 12,989, 59 Fed. Reg. 7629 (Feb. 16, 1994).

240. *Id.*

tions, and to help the agencies develop strategies to address these environmental justice concerns.²⁴¹ Moreover, the Executive Order touches upon research, data collection and analysis relevant to environmental justice concerns. The Order requires, *inter alia*, that environmental health research include diverse segments of the population in epidemiological and clinical studies, that environmental health analyses “identify multiple and cumulative exposures” where practicable, and that each federal agency collect and analyze information “assessing and comparing environmental and human health risks borne by population identified by race, national origin, or income.”²⁴²

The rights-based justification provides strong support for Executive Order 12,898 because, although the Executive Order does not prevent discrimination in the placement of environmental risk, it is designed to appreciably reduce environmental risks that fall disproportionately on minorities and the poor. Moreover, the Executive Order is not overinclusive with respect to the rights-based justification. Thus, the Executive Order’s fit to the rights-based justification is better than that of most environmental regulations.²⁴³

However, the strong fit between Executive Order 12,898 and the rights-based justification is the exception, rather than the rule. The regulatory system generally has major underinclusiveness and overinclusiveness problems with respect to the rights-based justification, and thus the justification does not provide strong support for the regulatory system as a whole.

This discontinuity between the rights-based justification and the bulk of federal regulations is significant because an alternative exists that can effectively guarantee citizens’ environmental rights while avoiding the major overinclusiveness problems inherent to the present regulatory system. Insofar as the rationale for federal regulation is grounded in the rights of citizens, these rights can be protected through flexible, cost-effective direct regulation of the cumulative levels of environmental risk to which citizens and communities can be exposed.²⁴⁴ This cumulative risk-based regulation is better supported

241. *Id.* at 7629-30.

242. *Id.* at 7631.

243. *See supra* note 19 and accompanying text.

244. Although policymakers could attempt to address the regulatory system’s underinclusiveness problems by increasing the stringency of existing regulations across the board, such an approach would not solve the problems described in this Article. Making all regulations more stringent would obviously greatly increase the regulatory system’s problems of overinclusiveness with respect to the rights-based justification. Moreover, increasing the stringency of all regulations would not necessarily safeguard citizens’ environmental rights: The regulatory system

by the rights-based justification than is the present system. Flexible direct regulation of cumulative risk levels would effectively guarantee whatever level of freedom from environmental risk that policymakers believe the federal government should provide; consistent with the principle of proportionality in regulation, it would be the least restrictive way to safeguard these environmental rights, and would be neither disproportionate nor excessive.²⁴⁵ I will first discuss how such a layer of direct regulation of cumulative risks could be implemented, and then provide two examples of similarly flexible, cost-minimizing regulations.

A. *Implementation*

A layer of regulation geared at controlling environmental risk levels would be similar to ambient standards in that it would function on a region-by-region basis. However, instead of addressing environmental risk in a pollutant-by-pollutant manner, this risk-based standard would directly regulate cumulative risk levels. After a maximum level of environmental risk that local pollution levels should not exceed has been established, the EPA would monitor the regulated regions and enforce the cumulative risk standard.

Such a layer of regulation could be precisely tailored to what policymakers consider to be the minimal level of protection from environmental risk that the federal government should provide. It would thus obviate the need for any further federal regulation designed to protect citizens' rights; that is, if this layer of cumulative risk-based regulation provided the minimal level of freedom from environmental risk that policymakers believe the federal government should provide, then insofar as further federal regulation is justified thereafter, it must be justified by economic, rather than rights-based, rationales for federal intervention.

Of course, before the EPA could effectively monitor risk levels and enforce this regulation, the agency would have to ameliorate at least some of the informational problems discussed above.²⁴⁶ There are two major ways that the data gaps could be addressed: a focus on improving the quality of data, and development of consistent formulae that can be utilized for the estimation of cumulative risks. In regard to the first of these options, the EPA could strive to create a da-

would still be composed of firm-by-firm, pollutant-by-pollutant, and medium-by-medium environmental standards that do not provide a constraint on aggregate levels of environmental risk.

245. *See supra* note 19 and accompanying text.

246. *See supra* Part III.A.

tabase that can account for the environmental risks of pollutants across different media, which would possess the capacity to determine which communities have complied with the cumulative risk standard. Recently, the EPA has made some positive strides toward the measurement of cumulative risks. One such positive development is the National-Scale Air Toxics Assessment, which has the explicit purpose of “[c]haracterizing potential public health risk due to inhalation of air toxics including both cancer and non-cancer effects.”²⁴⁷ The EPA could expedite similar improvements in data quality by devoting more resources to such projects. The EPA can also improve its data quality by creating reporting requirements that fill in obvious data gaps that would otherwise hamper an extrapolation to cumulative environmental risks. In the case of TRI, for example, the EPA could develop reporting requirements that at least approximate different factors that are determinative of health effects, such as the proximity to population and exposure routes.²⁴⁸ In regard to the second of these options, the EPA can create formulae for estimating cumulative risks. Although such formulae will of necessity rely on estimates, the key consideration is that the agency create a uniform and objective method of estimating risks in order to facilitate direct regulation of cumulative risk levels.²⁴⁹

After a risk-based regulatory standard has been created, and after the EPA has developed its methods of measuring cumulative risks, the agency would monitor risk levels within the regulated regions to determine when a region has fallen into non-compliance. If the agency found that cumulative environmental risk levels in a certain region exceeded the regulatory maximum, the EPA would order pollution reductions sufficient to bring that area into compliance. After the agency has ordered the initial reduction in environmental risk, firms’ new permissible emission levels either could be grandfathered, based on each firm’s historical emission levels, or else allocated through an auction. In other regulatory contexts, the latter option appears to make for better policy because it presents less barriers for

247. U.S. Environmental Protection Agency, *supra* note 162. There have also been other positive developments, such as the EPA’s creation of publicly accessible databases that combine TRI data with other data available to the agency. *See supra* note 162 and accompanying text.

248. *See supra* notes 181-183 and accompanying text.

249. *Cf.* William D. Ruckelshaus, *Risk, Science and Democracy*, ISSUES IN SCI. AND TECH., Spring 1985, at 19 (arguing that risk assessment should employ a neutral process of evaluation).

new entrants to a market, but the former option has been more politically feasible.²⁵⁰

Regardless of how the initial reduction in environmental risk is allocated, after it takes place the agency could employ a system of localized tradable permits to maintain acceptable levels of environmental risk.²⁵¹ The EPA would determine the appropriate size of relevant trading regions, and would only allow *intra*-region trades: Inter-region trading would interrupt any region's ability to safeguard its citizens' environmental rights. The trading regions for a permit system that is designed to safeguard citizens' environmental rights would necessarily be small in scope: Larger trading regions could potentially result in pollution "hot spots" that would violate environmental rights.²⁵² A system of localized cumulative risk-based trading would efficiently allocate the costs of pollution reduction, in that such costs would fall on those firms that could reduce environmental risks at the lowest expense.²⁵³ If costs of pollution reduction were particularly high for a given firm, it could purchase permits from another firm whose reduction costs were lower.²⁵⁴ One of the EPA's major concerns in administering such a program should be that cumulative risk levels are controlled in as flexible and efficient a manner as possible.

B. Regulatory Flexibility

The current environmental regime includes several examples of flexible, cost-minimizing regulation similar to the layer of regulation geared at controlling environmental risk levels that this Article dis-

250. See Nathaniel O. Keohane et al., *The Choice of Regulatory Instruments in Environmental Policy*, 22 HARV. ENVTL. L. REV. 313, 315-17 & n.19 (1998); but see Jonathan Remy Nash, *Too Much Market? Conflict Between Tradable Pollution Allowances and the "Polluter Pays" Principle*, 24 HARV. ENVTL. L. REV. 465, 507 (2000) ("Although auction-based initial allocations of emissions allowances may seem unlikely to become reality in the near future, there is some empirical evidence to the contrary.").

251. See Keohane et al., *supra* note 250, at 316; Robert N. Stavins, *Policy Instruments for Climate Change: How Can National Governments Address a Global Problem?*, 1997 U. CHI. LEGAL F. 293, 306 (1997); Evan Goldenberg, Comment, *The Design of an Emissions Permit Market for RECLAIM: A Holistic Approach*, 11 UCLA J. ENVTL. L. & POL'Y 297, 302 (1993).

252. See, e.g., Jeffrey M. Hirsch, *Emissions Allowance Trading Under the Clean Air Act: A Model for Future Environmental Regulations?*, 7 N.Y.U. ENVTL. L.J. 352, 373 (1999).

253. See, e.g., Jonathan Remy Nash & Richard L. Revesz, *Markets and Geography: Designing Marketable Permit Schemes to Control Local and Regional Pollutants*, 28 ECOLOGY L.Q. 569, 617 (2001) (noting that "lowest-cost reduction of pollution to the desired level" is "one of the primary promises of tradable permit schemes").

254. Ronald H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1 (1960); W. David Montgomery, *Markets in Licenses and Efficient Pollution Control Programs*, 5 J. ECON. THEORY 395 (1972).

cusses. Two examples are the EPA's Project XL, and the Endangered Species Act's (ESA) Habitat Conservation Plans (HCPs). I will discuss, in turn, how both regulatory programs demonstrate the viability of regulatory flexibility.

1. Project XL

The EPA introduced Project XL, which stands for eXcellence and Leadership, in May 1995. Project XL was a response to a document that President Clinton had issued that March entitled *Reinventing Environmental Regulation*, which directed the EPA to "implement pilot programs to develop innovative alternatives to the current regulatory system."²⁵⁵ The first sentence of EPA's Project XL announcement stated that the fundamental purpose of Project XL was to "give regulated sources the flexibility to develop alternative strategies that will replace or modify specific regulatory requirements on the condition that they produce greater environmental benefits."²⁵⁶ Project XL is particularly relevant in the context of the rights-based justification because of its promise to combine greater flexibility and efficiency with firms' ability to "produce greater environmental benefits." This combination of results and efficiency is necessary for a risk-based environmental standard that minimizes its burden on industry.

When introduced in May 1995, Project XL featured programs targeted at individual facilities, industry sectors, and government agencies.²⁵⁷ In November, an XL program targeting communities was added.²⁵⁸ Through Project XL, the EPA told regulated parties that "if you have an idea that offers better results than what would be achieved under current requirements, then we will work with you and other interested parties to put those ideas to the test."²⁵⁹ Parties interested in taking part in Project XL submit their proposal to the agency, and attempt to demonstrate that the proposed alternative would indeed produce better results than the otherwise applicable requirements.

255. *Regulatory Reinvention (XL) Pilot Projects*, 60 Fed. Reg. 27,282 (May 23, 1995).

256. *Id.* at 27,283.

257. *Id.* at 27,282-83.

258. *Regulatory Reinvention (XL) Pilot Projects: XL Community Pilot Program*, 60 Fed. Reg. 55,569 (Nov. 1, 1995). Although EPA still separates Project XL for communities (XLC), the various components of Project XL all function in roughly the same manner. See EPA, *What is Project XLC?*, at <http://www.epa.gov/projectxl/file7.htm> (last visited Oct. 28, 2003).

259. *PROJECT XL: FROM PILOT TO PRACTICE 1* (Environ. Protection Agency Office of Reinvention ed., 1999).

To determine whether a proposed XL project should be used in lieu of the normal regulatory regime, the EPA first “develops a quantitative baseline estimate of what would happen to the environment without the project, and then . . . compares the anticipated results under the project with that baseline.”²⁶⁰ A review group, consisting of representatives from the EPA as well as state and tribal environmental agencies,²⁶¹ then scrutinizes the proposal. The review group considers eight factors in determining whether the XL project’s environmental performance will exceed the baseline and hence whether a change in EPA’s rules is justified: 1) environmental results; 2) cost savings and paperwork reduction; 3) stakeholder support;²⁶² 4) innovation/multimedia pollution prevention; 5) transferability; 6) feasibility; 7) monitoring, reporting and evaluation; and 8) shifting of risk burden.²⁶³

The most important of these factors is the first one, that the environmental results must be superior to the results of compliance with present and anticipated future regulation.²⁶⁴ Project XL defines better results in the following manner: “‘Cleaner results’ can be achieved directly through the environmental performance of the project or through the reinvestment of the cost savings from the project in ac-

260. James Briggs, Comment, *Ski Resorts and National Forests: Rethinking Forest Service Management Practices for Recreational Use*, 28 B.C. ENVTL. AFF. L. REV. 79, 108 (2000).

261. Regulatory Reinvention (XL) Pilot Projects, *supra* note 255, at 27,283; *see also* EPA, Starting an XL Project, at <http://www.epa.gov/projectxl/file3.htm> (last updated Feb. 21, 2003) (“Since most XL projects require state as well as federal regulatory flexibility, EPA works with the state or tribal government to assess the merits of the proposal”).

Non-federal regulatory agencies play a significant role in determining whether the agency should accept a proposal. EPA ensures early involvement of these non-federal agencies by directing project proponents to “coordinate with and gain the support of their state and tribal environmental agencies that have regulatory responsibility within the scope of the project” because the local agencies will participate either as “co-regulators” with the EPA or as stakeholders. Regulatory Reinvention (XL) Pilot Projects, *supra* note 255, at 27,283. Similarly, cumulative risk-based environmental standards would necessarily be federal, but implementation of those standards could involve state actors, particularly because risk disparities are concentrated in specific communities, such as Chester, Pennsylvania. For examples of federal regulatory standards that are implemented by state regulators, *see, e.g.*, 42 U.S.C. § 7410 (1994).

262. For the purposes of Project XL, “[s]takeholders may include communities near the project, local or state governments, businesses, environmental and other public interest groups, or other similar entities.” Regulatory Reinvention (XL) Pilot Projects, *supra* note 255, at 27,287.

263. *Id.*; *see also* EPA, What is Project XL?, at <http://www.epa.gov/projectxl/file2.htm> (last updated April 25, 2002) (noting that Project XLC has additional criteria).

In addition, the EPA requires that entities who wish to participate in Project XL meet a “good actor” requirement. Briggs, *supra* note 260, at 109. Through the “good actor” requirement, the EPA “seeks to choose leaders of a given industry, while closely scrutinizing facilities subject to ongoing enforcement actions or that have a history of environmental violations.” *Id.*

264. Regulatory Reinvention (XL) Pilot Projects, *supra* note 255, at 27,287.

tivities that produce greater environmental results. Explicit definitions and measures of 'cleaner results' should be included in the project agreement negotiated among stakeholders."²⁶⁵ EPA acknowledges that these comparisons require estimation and uncertainty.²⁶⁶

If the EPA agrees that the party's proposed alternative is superior to the otherwise applicable regulations, the agency enters into an agreement with that party formalizing the proposed alternative. That agreement "becomes the new set of environmental standards under which the designated company operates."²⁶⁷ The company thereafter need only comply with the terms of its agreement with the EPA, and not with environmental requirements that would otherwise regulate the areas covered by the agreement.

It is true that a great amount of criticism has been leveled at Project XL. James Briggs summarizes the criticism:

Critics point to a weakening of monitoring and reporting requirements and a shift away from uniform national standards as detrimental to environmental protection. A shift to more individual, or site-specific agreements between entities and permitting agencies could create the risk of weakening the public's ability to challenge industry, thereby producing inconsistencies, and opening the door for "sweetheart" deals. Another source of controversy concerns enforcement of project terms. EPA itself anticipates that, even though

265. *Id.*

266. *Id.* at 27,286.

In 1999, EPA announced new guidance for the project development process. Notice of Process Improvements Under Project XL, 64 Fed. Reg. 16,450 (April 5, 1999). The new guidance did not alter the basic structure of Project XL. See EPA, What is Project XL?, at <http://www.epa.gov/projectxl/file2.htm> (last visited Oct. 28, 2003) (listing the current selection criteria, which are almost identical to the criteria outlined in 1995). Instead the new guidance incorporated the "lessons learned" since the beginning of Project XL. Notice of Process Improvements Under Project XL, *supra*, at 16,450. The primary effect of the new guidance was to reduce transaction costs and speed up the project application process. *Id.* at 16,450-51. Though the specific revisions are not important for the design of a risk-based regulatory structure, they demonstrate that Project XL is "evolving" and that, from the EPA's perspective, a flexible regulatory structure is viable even if more clarity, speed or predictability should later be provided.

Besides surviving one round of new guidance, the basic structure of Project XL also survived the change in administrations. Over two years after President Bush took office, Project XL still utilizes the same eight selection criteria, led by the "superior environmental results" requirement. The Bush administration's first EPA Administrator, Christine Whitman, specifically praised Project XL as a model "of how EPA should work with all environmental stakeholders." Christine Whitman, Remarks at National Environmental Policy Institute (March 8, 2001), available at http://www.epa.gov/projectxl/whitman_03_08_01.htm (last visited Oct. 28, 2003).

267. Keith M. Casto & Tiffany Billingsley Potter, *Environmental Audits: Barriers, Opportunities and a Recommendation*, 5 HASTINGS W.-NW. J. ENV. L. & POL'Y 233, 240 (1999).

overall performance is expected to be superior, certain practices may lead to non-compliance with certain regulations, such as the Clean Air Act.²⁶⁸

Because of these potential problems, some environmental groups have stated mockingly that “XL stands for ‘eXtra Leniency.’”²⁶⁹ Other critics have argued that there are flaws in Project XL’s regulatory structure. For example, Professor Steinzor argues that, because Project XL employs “complex and ambiguous criteria,” it will be unable “to remedy the most significant problems with the current system and is unlikely to produce ‘cleaner, cheaper, smarter’ results.”²⁷⁰ Specifically, she contends that the current process of determining whether a project achieves superior environmental results fails to function as a “transparent set of unequivocal standards for judging the overall merits of XL proposals.”²⁷¹ Other critics argue that Project XL provides inadequate incentives for industry participation.²⁷²

The EPA disputes these criticisms. The agency argues, for example, that firms that participate in Project XL are held to a “higher standard of accountability for demonstrating negotiated results,” as failure to meet the negotiated agreement would cause the EPA to cancel the project and instead apply the normal regulations.²⁷³ Most of the attacks on Project XL are specific to the manner in which that program was implemented, and do not implicate the theory that flexible regulation can increase efficiency and open the door to superior environmental results. Some of the criticisms directed at Project XL are basically inapplicable to a cumulative risk-based regime. For example, unlike Project XL, a cumulative risk-based standard is unlikely to weaken either monitoring or reporting requirements: Indeed, the reporting regime would probably be strengthened somewhat by the EPA’s attempts to approximate cumulative risk levels. The agency should pay keen attention to some of the other criticisms in implementing a cumulative risk-based standard. For example, if non-compliance has been a problem under Project XL, then the EPA

268. Briggs, *supra* note 260, at 111.

269. See Thomas E. Caballero, *Project XL: Making It Legal, Making It Work*, 17 STAN. ENVTL. L.J. 399, 451 (1998); Briggs, *supra* note 260, at 111.

270. Rena I. Steinzor, *Reinventing Environmental Regulation: The Dangerous Journey from Command to Self-Control*, 22 HARV. ENVTL. L. REV. 103, 139-40 (1998).

271. *Id.* at 130.

272. Professor Stewart argues that the “EPA has not been able to overcome the problem of low industry participation,” since “[o]nly a relatively few agreements have been concluded.” Stewart, *supra* note 9, at 67.

273. Briggs, *supra* note 260, at 112.

should consider this in determining how much regulatory flexibility to allow, and in determining whether to allow departures from permit requirements. The agency would also do well to consider potential problems in the determination of cumulative risk in order to ensure that the cumulative risk-based regulation functions properly.²⁷⁴

2. HCPs

HCPs allow regulated entities to bypass specific statutory requirements in exchange for taking action to overcome the harm of the statutory violation. The authority for HCPs derives from § 10(a) of the ESA.²⁷⁵ Under § 10(a), the Secretary of the Interior can permit takings prohibited under § 9 of the Act if the taking is incidental to an otherwise lawful activity.²⁷⁶ In order for the Secretary to permit such takings, the party applying for permission must submit a HCP. The HCP must specify: 1) the likely impact of the taking; 2) the measures the applicant will use to “minimize and mitigate” the impact; 3) the alternatives the applicant considered, and an explanation of why the alternatives were not selected; and 4) other measures required by the Secretary.²⁷⁷ A permit will issue and the HCP will be approved if: 1) the taking is incidental; 2) the applicant minimizes and mitigates the impact; 3) the applicant adequately funds the plan; 4) the taking will not reduce the likelihood of the survival and recovery of the species in the wild; and 5) the other measures required by the Secretary are met.²⁷⁸

274. For example, in her discussion of Project XL, Professor Steinzor suggests that the process of comparing regulatory results to a baseline may be “difficult, even impossible” if monitoring data is not adequate. Steinzor, *supra* note 270, at 132. For a discussion of how current problems with risk-related data could be remedied, *see supra* notes 246-249 and accompanying text.

Professor Steinzor also suggests that this inadequacy of data makes Project XL’s reliance on cross-media trades “dangerous.” Steinzor, *supra* note 270, at 137. Cross-media regulation requires “the evaluation of complex tradeoffs between emissions that are regulated versus those that are not and the environmental benefits of regulation versus the environmental benefits provided by unregulated activities.” *Id.* at 136. A risk-based regulatory regime would directly confront and presumably improve upon this evaluation. However, Professor Steinzor’s concern that site-specific evaluations “will miss the synergistic, cumulative effects of pollution at the regional and national levels,” is relevant both to the compilation and use of data in a risk-oriented regime and also to determining how flexible to make the risk-based regulation. *Id.* at 138.

275. 16 U.S.C. § 1539(a) (2000).

276. *Id.* § 1539(a)(1)(B).

277. *Id.* § 1539(a)(2). The statute also specifies that the permit will include necessary reporting requirements.

278. *Id.*

The Department of the Interior delegated implementation of HCPs to the Fish and Wildlife Service (FWS).²⁷⁹ Permit applications to FWS must comply with statutory requirements, and must describe both the activity that may cause the incidental taking and the species covered by the permit.²⁸⁰ A number of factors influence the duration of a permit, but the duration must be “sufficient to provide adequate assurances to the permittee to commit funding necessary for the activities authorized by the permit, including conservation activities and land use restrictions.”²⁸¹

Crucial to the increased popularity of HCPs in the 1990s was the “no surprises” policy, which provides assurance that if permittees comply with the terms of the HCP, they will not be required “to undertake any further mitigation measures deemed necessary in the future, even when ‘unforeseen circumstances’ arise.”²⁸² This policy would, for example, prevent the FWS from “imposing further mitigation measures in the future due to . . . a determination that a species’ habitat needs are greater than previously thought or migration of a previously absent listed species onto the landowner’s property.”²⁸³ Under this policy, in the case of changed (but foreseen) circumstances, a permittee must implement mitigation measures agreed to in the conservation plan, but FWS cannot require additional measures not provided in the plan unless the permittee consents.²⁸⁴ In the case of unforeseen circumstances, FWS can require additional measures “only if such measures are limited to modifications within conserved habitat areas, if any, or to the conservation plan’s operating conservation program for the affected species, and maintain the original terms of the conservation plan to the maximum extent possible.”²⁸⁵ Even in unforeseen circumstances, FWS cannot require additional measures that involve the commitment of land, water, or money—or restrictions upon their use—without the permittee’s consent.²⁸⁶ One commentator described the “no surprises” policy as “the single most im-

279. 50 C.F.R. § 17.22 (2003).

280. *Id.* § 17.22(b).

281. *Id.* § 17.22(b)(4).

282. Shi-Ling Hsu, *A Game-Theoretic Approach to Regulatory Negotiation and a Framework for Empirical Analysis*, 26 HARV. ENVTL. L. REV. 33, 60 n.155 (2002); see 50 C.F.R. § 17.22 (2003).

283. Hsu, *supra* note 282, at 60 n.155.

284. 50 C.F.R. § 17.22(b)(5) (2003).

285. *Id.* FWS will determine whether circumstances qualify as unforeseen based on factors that relate to the situation of the species. *Id.*

286. *Id.*

portant catalyst in stimulating renewed interest in Habitat Conservation Planning.”²⁸⁷

HCPs rely on the same basic logic as Project XL: Environmental results are more important than (and do not always coincide with) statutory requirements. Also like Project XL, HCPs tailor regulatory enforcement to specific circumstances, rather than relying on uniform requirements. This tailoring is performed within the broad constraint of achieving superior results. A flexible risk-based layer of regulation would utilize the same theory of regulatory flexibility to accomplish new goals.

Although HCPs rely on the same basic logic as Project XL, HCPs differ from Project XL in their approach to identifying the environmental baseline. Project XL compares projects to a baseline that references the results anticipated by compliance with present regulation, and confronts the fact that the results of complying with existing regulations are not always environmentally superior. In contrast, HCPs address enforcement difficulties, implicitly recognizing that § 9 is incapable of perfect enforcement: “A driving concern during the development of the [‘no surprises’] policy was the absence of adequate incentives for non-Federal landowners to factor endangered species conservation into their day-to-day land management activities.”²⁸⁸ The underlying assumption of HCPs is that using an exception to the § 9 takings prohibition as an incentive will protect species better than attempting to maximize enforcement.²⁸⁹

HCPs are more widespread than XL pilot projects, and apply at a narrower level. While only 48 XL projects are in the implementation phase, there are more than 500 HCPs.²⁹⁰ HCPs deal with a more focused background of regulation than Project XL. They only deal a single section of one environmental statute, while Project XL spans the entire regulatory regime.

287. Donald J. Barry, *Opportunity in the Face of Danger: The Pragmatic Development of Habitat Conservation Plans*, 4 HASTINGS W.-NW. J. ENVTL. L. & POL'Y 129, 130 (1998).

288. Habitat Conservation Plan Assurances (“No Surprises”) Rule, 63 Fed. Reg. 8859, 8860 (Feb. 23, 1998).

289. A risk-based environmental standard would incorporate both conceptions of the baseline. Achieving a desired level of risk requires solutions that overcome both gaps between existing statutory requirements and the desired amount of risk and also enforcement gaps.

290. See EPA, Implementation and Evaluation, at <http://www.epa.gov/projectxl/implemen.htm> (last visited Oct. 28, 2003) (listing forty-six Project XL projects in the implementation phase); FWS, Endangered Species Habitat Conservation Planning, at <http://endangered.fws.gov/hcp/index.html> (last visited Oct. 28, 2003) (“As of Oct. 9, 2003, 407 Habitat Conservation Plans have been approved, covering approximately 38 million acres and protecting more than 526 species.”).

The criticism of HCPs is very similar to the criticism directed at Project XL. Critics' primary argument is that the growth in HCPs weakens the ESA.²⁹¹ Critics have also argued that HCPs provide no opportunity for "meaningful public participation,"²⁹² and that the HCP program is flawed because it lacks uniform standards.²⁹³ Like the criticism of Project XL, most of the attacks on HCPs are specific to the manner in which they are implemented, and do not implicate regulatory flexibility in general. However, also like the criticism of Project XL, the agency should pay attention to the critics of HCPs in determining how flexible to make its cumulative risk-based regulation.

Both Project XL and the FWS's expanded use of HCPs demonstrate the viability of incorporating reinvention-style flexibility into a layer of risk-based environmental regulation. Even the critics of Project XL and HCPs acknowledge the trend toward reinvention and regulatory flexibility. The trend toward flexibility in regulatory efforts could be applied to regulation of cumulative environmental risks, and could help to minimize the costs of such regulation.

CONCLUSION

Even if the rights-based justification is seen as a compelling reason for federal intervention, the regulatory system is both overinclusive and underinclusive with respect to the justification: Federal regulations apply even in areas where aggregate pollution levels are low enough that citizens' environmental rights are not violated, yet the regulatory system does not guarantee any minimal level of envi-

291. See Karin P. Sheldon, *Habitat Conservation Planning: Addressing the Achilles Heel of the Endangered Species Act*, 6 N.Y.U. ENVTL. L.J. 279, 281 (1998) ("In its rush to mollify economic interests, however, the Interior Department has angered a significant portion of the environmental community which sees some of the new policies as an illegal sell-out of imperiled wildlife."); see also Shi-Ling Hsu, *The Potential and the Pitfalls of Habitat Conservation Planning Under the Endangered Species Act*, 29 ENVTL. L. REP. 10,592 (1999) (arguing that, by giving into opponents of the ESA, HCPs set a precedent that "invites further intimidation"); Hsu, *supra* note 282, at 34 (applying a "simple economic game-theoretic model to analyze the relationship between the increasing discontent with federal regulation and the increasingly conciliatory attitudes of the federal regulators").

292. Stewart, *supra* note 9, at 67 ("Practical barriers to meaningful public participation, including especially resource limitations, have become one of the most controversial aspects of Project XL."); see also Graham M. Lyons, *Habitat Conservation Plans: Restoring the Promise of Conservation*, 23 ENVIRONS ENVTL. L. & POL'Y J. 83, 84 (1999) (arguing that HCPs lack "opportunity for public review and enforcement").

293. Lyons, *supra* note 292, at 84.

ronmental quality. If the justification is valid,²⁹⁴ then—because of the awkward fit between the justification and the regulatory system—it does not provide a compelling case for the present regulatory system: Rather, it supports flexible, cost-effective direct regulation of the cumulative levels of environmental risk to which citizens and communities can be exposed. Such flexible and cost-minimizing regulation of cumulative environmental risks is consistent with the European Community's principle of proportionality in environmental protection, as it is the least restrictive possible measure for guaranteeing citizens' environmental rights, and is neither disproportionate nor excessive in relation to the regulatory goal.

294. *See supra* notes 14-15 and accompanying text.