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# Reforming EPA's Organizational Structure: Establishing an Adaptable Agency through Eco-Regions\*\*\*

## ABSTRACT

*Numerous scholars and practitioners have called for major reform of the environmental laws implemented by the Environmental Protection Agency (EPA). But less attention has been paid to the organization of EPA itself. Assessment of EPA's organizational structure is both timely and important. Based on an assessment of the ecological and political context within which EPA operates, we contend that the agency should be organized in a less programmatic and more adaptable manner. Specifically, we propose the realignment of EPA's regional offices on an eco-regional basis. An eco-region based organizational structure has many advantages over the current structure of the agency and may assist EPA in efforts to address the dynamic challenges it faces now and in the future.*

## I. INTRODUCTION

Among the most prominent federal agencies responsible for shaping the nation's environmental policy and implementing its environmental laws is the U.S. Environmental Protection Agency (EPA). Although EPA is often thought of solely as a pollution control agency, it addresses a broad array of environmental issues including land use and natural resources management.<sup>1</sup> EPA is charged with enforcing laws that

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1. For example, EPA reviews Environmental Impact Statements (EISs) prepared pursuant to the National Environmental Policy Act, 42 U.S.C. §§ 4321-4345 (1994); EPA shares responsibility with the Army Corps of Engineers for implementation of federal wetlands law (i.e., Section 404 of the Clean Water Act, 33 U.S.C. § 1344 (1994)); and EPA is now shaping federal brownfields policy. Other executive branch organizations ranging from the Department of Interior to the Nuclear Regulatory Commission address vital, but more narrowly focused, environmental matters.

involve the agency in matters at the local, state, national, and international levels on a routine basis. EPA also plays an important role in emerging matters at the nexus of environment and society such as environmental justice and smart growth.<sup>2</sup> The broad reach of EPA distinguishes it from similar independent federal regulatory agencies (e.g., the Food and Drug Administration) and makes it an important candidate for innovative organizational approaches.

Numerous scholars and practitioners have called for major reform of the environmental laws implemented by EPA.<sup>3</sup> Less attention has been paid to the organization of EPA itself.<sup>4</sup> The proposal to make EPA a cabinet-level agency (a symbolic rather than substantive change to the agency) is the only change to the organizational structure of EPA that has received significant attention.<sup>5</sup> We contend that it is both timely and important to assess EPA's organizational structure. Indeed, priorities for legal change may flow more readily from a reorganization of EPA itself.

Part II identifies the agency's mission. Parts III and IV respectively consider the ecological and political context within which EPA operates. A typology of organizational structures is provided in Part V. EPA's operational context dictates the need for an organizational structure that is adaptable and structured around eco-regions. Part VI provides a vision for

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2. See Draft Title VI Guidance for EPA Assistance Recipients Administering Environmental Permitting Programs (Draft Recipient Guidance) and Draft Revised Guidance for Investigating Title VI Administrative Complaints Challenging Permits (Draft Revised Investigation Guidance), 65 Fed. Reg. 39,650 (June 27, 2000); U.S. ENVTL. PROT. AGENCY, SMART GROWTH STRATEGIES FOR NEW ENGLAND (1999). The role of EPA expands further into the mounting extinction crisis as the pressures of sprawl and pollution degrade habitats around the country.

3. See, e.g., TOWARD SUSTAINABLE COMMUNITIES: TRANSITION AND TRANSFORMATIONS IN ENVIRONMENTAL POLICY (Daniel A. Mazmanian & Michael E. Kraft eds., 1999); MICHAEL S. GREVE, THE DEMISE OF ENVIRONMENTALISM IN AMERICAN LAW (1996); NAT'L ACAD. OF PUB. ADMIN., SETTING PRIORITIES, GETTING RESULTS (1995); DEWITT JOHN, CIVIC ENVIRONMENTALISM (1994); Robert W. Hahn, *Toward a New Environmental Paradigm*, 102 YALE L.J. 1719 (1993); SCI. ADVISORY BD., ENVTL. PROT. AGENCY, REDUCING RISK: SETTING PRIORITIES AND STRATEGIES FOR ENVIRONMENTAL PROTECTION (1990) [hereinafter SCI. ADVISORY BD.]; ROBERT N. STAVINS ET AL., PROJECT 88: HARNESSING MARKET FORCES TO PROTECT THE ENVIRONMENT (1988); Bruce A. Ackerman & Richard B. Stewart, *Reforming Environmental Law*, 37 STAN. L. REV. 1333 (1985); R. SHEP MELNICK, REGULATION AND THE COURTS: THE CASE OF THE CLEAN AIR ACT (1983). The literature cited represents a range of perspectives on the need for reform.

4. For recent exceptions, see NAT'L ACAD. OF PUB. ADMIN., ENVIRONMENT.GOV: TRANSFORMING ENVIRONMENTAL PROTECTION FOR THE 21ST CENTURY (2000); NAT'L ACAD. OF PUB. ADMIN., LEARNING FROM INNOVATIONS IN ENVIRONMENTAL PROTECTION (2000).

5. See DANIEL J. FIORINO, MAKING ENVIRONMENTAL POLICY 42-43 (1995); Paul S. Weiland et al., *The Evolution, Operation, and Future of Environmental Policy in the United States*, in ENVIRONMENTAL LAW AND POLICY IN THE EUROPEAN UNION AND THE UNITED STATES 97, 102 (Randall Baker ed., 1997).

the direction in which we contend the organizational structure of EPA should shift.

## II. EPA'S MISSION

Before considering EPA's organizational structure, it is useful to establish a benchmark for evaluation.<sup>6</sup> When Congress and the President created EPA and its primary enabling legislation in 1970, the mission of the agency seemed to most people to be clear and simple.<sup>7</sup> To many people (including lawmakers), environmental problems appeared to be discrete issues with scientific solutions. The mission of the agency was therefore to set scientific (*i.e.*, objective) standards and use its legal authority to penalize polluters.<sup>8</sup> EPA was created as an independent regulatory agency to accomplish this mission. Program offices were established for a number of the major federal environmental laws (created partly from the remnants of

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6. The mission of the agency does not provide the only possible benchmark. Marc K. Landy, Marc J. Roberts, and Stephen R. Thomas judge EPA by four criteria: fidelity to the technical merits, promoting civic education, responsiveness to the public, and building institutional capacity. MARC K. LANDY ET AL., *THE ENVIRONMENTAL PROTECTION AGENCY: ASKING THE WRONG QUESTIONS* 6-9 (1990). Others have evaluated EPA based on data designed to track actual improvement in environmental quality (*e.g.*, lessening of air pollution in metropolitan areas). *See, e.g.*, *PUBLIC POLICIES FOR ENVIRONMENTAL PROTECTION* (Paul R. Portney ed., 1990). The author of a more recent study chose to evaluate EPA on the basis of its record in the U.S. Court of Appeals for the District of Columbia Circuit. *See* JONATHAN ADLER, *ENVIRONMENTAL PERFORMANCE ON THE BENCH: THE EPA'S RECORD IN FEDERAL COURT* (2000).

7. One account of the history of EPA describes the mission of William Ruckelshaus, EPA's first Administrator, as follows: "Ruckelshaus's original mission appeared simple enough: clean up America." DENNIS C. WILLIAMS, *THE GUARDIAN: EPA'S FORMATIVE YEARS, 1970-1973*, at 1 (1993), available at <http://www.epa.gov/history/publications/formative.htm>. Accord Odelia Funke, *Struggling with Integrated Environmental Policy: The EPA Experience*, 12 POL'Y STUD. REV. 137, 137 (1993) ("In its early years, EPA was busy trying to address imminent environmental threats—burning rivers and belching stacks signaled clear and immediate problems."); Daniel J. Fiorino, *Can Problems Shape Priorities? The Case of Risk-Based Environmental Planning*, 50 PUB. ADMIN. REV. 82, 82 (1990) ("When the national environmental program emerged in the late 1960s and early 1970s, the problems for the most part were visible and their causes identifiable.... Solving these problems appeared to be a matter of harnessing the political will and legal muscle to set action-forcing technological standards and to crack down on polluters that failed to meet them.").

8. In the words of President Nixon, "EPA would be charged with protecting the environment by abating pollution." Environmental Reorganization Plan of July 9, 1970, reprinted in CONGRESSIONAL QUARTERLY ALMANAC 118-A, 119-A-120-A (1970). Evidence that Congress shared this sentiment may be inferred from the Clean Air Act of 1970 and the Clean Water Act of 1972. "The EPA was required to achieve specific air and water quality goals within a fixed—and short—period of time. The 1970 Clean Air Act required that EPA achieve healthy air by 1975, and the 1972 Federal Water Pollution Control Act (FWPCA) required that EPA eliminate discharges into the nation's waterways by 1985." Alfred Marcus, *Environmental Protection Agency*, in *THE POLITICS OF REGULATION* 267, 267-68 (James Q. Wilson ed., 1980).

offices started in other departments) and arrayed around the Office of the General Counsel (OGC).<sup>9</sup>

The complexity and interconnectedness of environmental problems have become increasingly apparent over time. "Objective" scientists are often unable to specify data and solutions with a high level of certainty. Cumulative impacts of multiple pollutants from multiple sources are difficult and costly to evaluate. EPA's regulatory purview encompasses many actors and realms of government policymaking.<sup>10</sup> Moreover, political and legal boundaries established by humans often do not correspond with ecological realities.<sup>11</sup> In short, environmental problems are not discrete and their solutions cannot be defined objectively.

Various alternative descriptions of EPA's mission have emerged since the formation of the agency in 1970. For example, a mission statement adopted by EPA in 1994 states in part:

[W]e work with our partners to protect human health, ecosystems, and the beauty of our environment using the best available science. We value and promote innovative and effective solutions to environmental problems. We strive to protect and sustain the productivity of the natural resources on which all life and human activity depend.<sup>12</sup>

Here the agency recognizes that its primary purpose is not just to enforce the law, but also to help state and local partners solve the nation's environmental problems using the "best available science."<sup>13</sup>

The National Academy of Public Administration (NAPA) alternatively sees priority setting through risk assessment as the key element of EPA's mission.<sup>14</sup> The NAPA mission statement is based upon

9. William Ruckelshaus, EPA's first Administrator, was an attorney who used litigation to achieve high-profile enforcement action. Many subsequent EPA Administrators also have been attorneys.

10. Theodore Lowi writes that "[t]he whole universe is covered by the EPA's jurisdiction." THEODORE J. LOWI, *THE END OF LIBERALISM: THE SECOND REPUBLIC OF THE UNITED STATES* 120 (2d ed. 1979).

11. The struggle to define wetlands subject to federal jurisdiction under Section 404 of the Clean Water Act, 33 U.S.C. § 1344 (1994) provides an instructive example of the disjuncture between boundaries established by humankind and environmental problems. This matter is addressed in section III.A., *infra*.

12. U.S. ENVTL. PROT. AGENCY, *THE NEW GENERATION OF ENVIRONMENTAL PROTECTION: A SUMMARY OF EPA'S FIVE-YEAR STRATEGIC PLAN* (1994).

13. *Id.*

14. NAPA devised the following mission statement:

The mission of the Environmental Protection Agency is to provide national leadership in setting goals and priorities for environmental protection. The agency sets national standards for environmental protection and undertakes a variety of activities to ensure that the standards are met. To that end, EPA

recognition that finite resources will be expended upon efforts to protect the environment. The authors of the statement thus emphasize risk assessment as a tool that might allow the agency to allocate those resources most effectively. Additionally, this mission statement emphasizes the importance of intergovernmental cooperation as a mechanism to achieve environmental protection.

EPA's most recent mission statement is notably different from earlier mission statements because it is a complex mixture of goals. The basic statement is simple enough, "the mission of the U.S. Environmental Protection Agency is to protect human health and to safeguard the natural environment—air, water, and land—upon which life depends."<sup>15</sup> Yet it also lists purposes such as enforcing the nation's environmental laws, considering impacts on other policy areas (*e.g.*, international trade), providing environmental information for the public, developing a sustainable economy, and even acknowledging the importance of U.S. leadership in reaching major global accords.<sup>16</sup> EPA's most recent mission statement also reinforces the notion of risk assessment. It recognizes the limits of science and the central role of science in environmental policy. Finally, it recognizes the nexus that exists between environment and society.

EPA's fundamental mission is to protect and enhance human health and environmental quality,<sup>17</sup> yet the wide scope and subjective nature of this mission make it difficult to accomplish. Increasingly, the same regulation designed to preserve the right to a clean environment tends to infringe upon other rights enjoyed by the public.<sup>18</sup> It is EPA's challenge to determine the appropriate level of regulation while maintaining this delicate balance of rights. The agency's task is to remediate existing pollution; maintain a clean environment; and, where possible, enhance environmental quality all without causing severe economic dislocation or a political backlash against major federal environmental laws.

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builds knowledge about opportunities to reduce risks to human health and the environment, enforces some standards and oversees state enforcement of national standards, and assists states and communities in designing and implementing their environmental protection strategies.

NAT'L ACAD. OF PUB. ADMIN., *supra* note 3, at 11.

15. U.S. ENVTL. PROT. AGENCY, DOC. NO. EPA/190-R-97-002, EPA STRATEGIC PLAN 16 (1997), available at [www.epa.gov/ocfo/plan/epastrat.pdf](http://www.epa.gov/ocfo/plan/epastrat.pdf).

16. *See id.*

17. *See* U.S. ENVTL. PROT. AGENCY, DOC. NO. EPA/190-R-00-002, STRATEGIC PLAN 2 (2000), available at <http://www.epa.gov/ocfo/plan/2000strategicplan.pdf>.

18. For example, air pollution control regulations may curtail or increase the costs associated with automobile usage.

Although it sometimes lies dormant, broad public support exists for environmental protection.<sup>19</sup> These views are an important reservoir of bureaucratic power for the agency.<sup>20</sup> Thus, maintaining and enhancing public support is an essential component of the agency's mission. Garnering public support requires EPA to assess environmental values accurately when creating policies that balance the vital interests and aspirations of the public.

### III. ECOLOGICAL CONTEXT

Before devising any proposal to alter the organizational structure of EPA, it is necessary to understand attributes of the natural environment. Such attributes distinguish environmental protection from other regulatory milieus in important ways.

#### A. Boundaries

One key attribute associated with environmental problems is the fact that they cross human boundaries. Cooperation is often necessary to address environmental problems. In legal terms, cross boundary problems are related to jurisdiction.<sup>21</sup> The jurisdiction of all units of government is limited at least with respect to geographic area. For example, boundaries demarcate the geographic authority of state governments.<sup>22</sup> Thus, New York solid waste disposal laws do not apply to disposal facilities located in Indiana.<sup>23</sup>

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19. See generally Lydia Saad & Riley E. Dunlap, *Americans Are Environmentally Friendly, but Issue not Seen as Urgent Problem*, at <http://www.gallup.com/poll/releases/pr000417.asp> (Apr. 17, 2000); DANIEL A. FARBER, *ECO-PRAGMATISM: MAKING SENSIBLE ENVIRONMENTAL DECISIONS IN AN UNCERTAIN WORLD* 3 (1999); WALTER A. ROSENBAUM, *ENVIRONMENTAL POLITICS AND POLICY* 41-43 (4th ed. 1998).

20. See, e.g., KENNETH J. MEIER, *POLITICS AND THE BUREAUCRACY: POLICY-MAKING IN THE FOURTH BRANCH OF GOVERNMENT* 57-61 (3d ed. 1993); FRANCIS E. ROURKE, *BUREAUCRACY, POLITICS, AND PUBLIC POLICY* 50 (3d ed. 1984).

21. "Jurisdiction" is a "government's general power to exercise authority over all persons and things within its territory." *BLACK'S LAW DICTIONARY* 855 (Bryan A. Garner ed., 7th ed. 1999).

22. This statement is generally true; however, there are instances in which the jurisdiction of a state may extend beyond its borders. Jurisdiction is a complex area of legal doctrine. For an excellent summary of jurisdiction of the federal government, see ERWIN CHERMERINSKY, *FEDERAL JURISDICTION* (3d ed. 1999).

23. While accurate, this statement is complicated by the facts that (1) solid waste generated in New York may be transported to Indiana for disposal and (2) solid waste generated within New York still may be subject to New York law. Although each state manages facilities and resources within its own jurisdiction, other states may enact laws that affect those facilities or resources.

The jurisdiction of all governmental units in the United States is also limited with respect to subject matter. For example, the doctrine of preemption limits the subject matter over which states have authority.<sup>24</sup> The source of federal preemption is the Supremacy Clause of the Constitution.<sup>25</sup> Congress and the courts have invoked the doctrine of federal preemption to limit the ability of states to regulate in a wide variety of areas of environmental concern including automobile emission standards,<sup>26</sup> hazardous waste management,<sup>27</sup> nuclear waste management,<sup>28</sup> oil pollution prevention,<sup>29</sup> and pesticide labeling.<sup>30</sup>

In economic terms, cross boundary problems are referred to as externalities.<sup>31</sup> A negative externality exists when an agent does not bear all of the costs associated with the agent's action.<sup>32</sup> For instance, if Facility A is located on a river upstream from Facility B and Facility A releases effluent into the river, this action may result in no adverse consequences for Facility A although it does have adverse consequences for Facility B. At least some of the costs associated with Facility A's action are externalized; that is, they are not borne by Facility A but are imposed upon Facility B.

Negative externalities may differ significantly in kind and degree. In contrast to the relatively simple example described above, consider the management of a species that migrates through habitat that includes portions of states W, X, Y, and Z. If State W does damage to the habitat, all four of the states may suffer adverse consequences (e.g., the extinction of the species). In fact, the extinction of the species may have adverse consequences beyond the boundaries of its habitat. Thus, some portion of

24. For an explanation, see 1 LAURENCE H. TRIBE, *AMERICAN CONSTITUTIONAL LAW* 1172-212 (3d ed. 2000).

25. The Supremacy Clause has a preemptive effect only when coupled with another clause in the Constitution that permits federal government action.

26. See 42 U.S.C. § 7543(a) (1994). See also *Ass'n of Int'l Auto. Mfrs., Inc. v. Comm'r, Mass. Dept. of Envtl. Protection*, 208 F.3d 1, 8 (1st Cir. 2000).

27. See, e.g., *Gade v. Nat'l Solid Wastes Mgmt. Assoc.*, 505 U.S. 88 (1992); *Ensco, Inc. v. Dumas*, 807 F.2d 743 (8th Cir. 1986).

28. See generally *Jersey Cent. Power & Light Co. v. Township of Lacey*, 772 F.2d 1103 (3d Cir. 1985).

29. See generally *U.S. v. Locke*, 529 U.S. 89 (2000).

30. See 7 U.S.C. § 136v(b) (1994 & Supp. III 1997).

31. The extent to which negative externalities exist, the causes of such externalities, and possible solutions are the subject of a vast literature. See, e.g., Richard L. Revesz, *Federalism and Interstate Environmental Externalities*, 144 U. PA. L. REV. 2341 (1996); Daniel C. Esty, *Revitalizing Environmental Federalism*, 95 MICH. L. REV. 570 (1996).

32. See TOM TIETENBERG, *ENVIRONMENTAL AND NATURAL RESOURCE ECONOMICS* 51-52 (3d ed. 1992); DAVID L. WEIMER & AIDAN R. VINING, *POLICY ANALYSIS: CONCEPTS AND PRACTICE* 57-58 (2d ed. 1992).



the costs associated with State *W*'s action is externalized.<sup>33</sup> Many pollution control and resource management problems may be conceptualized as externalities.

Human boundaries confound efforts to manage human-environment relations. To overcome the problems associated with such boundaries, it is necessary for people and institutions to cooperate. Cooperation to protect or enhance the natural world is only possible after parties have agreed that cooperation is necessary and specified the nature and extent of such cooperation. This agreement may be elusive due to value differences and scientific uncertainty.

## B. Scientific Uncertainty

Although the twentieth century brought important new understandings in medical science and the ecosystem concept, gaps in human knowledge of the natural world are still extensive.<sup>34</sup> Furthermore, new empirical data continue to contradict fundamental theories and assumptions upon which we base much of our understanding of the natural world and our relationship to it. Scientific uncertainty is thus another key attribute associated with environmental problems.

Scientific uncertainty manifests itself in a number of different ways. First, human knowledge of biotic nature is incomplete. Humankind lacks the raw data necessary to begin to comprehend the biological fabric of our planet. For example, estimates of the total number of species on the planet vary 3.6 million to 111.7 million.<sup>35</sup> By comparison, the number of known species is estimated to be 1.5 million.<sup>36</sup> New species continue to be identified

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33. This example may also be conceptualized as a public goods problem. "Public goods are defined as those which exhibit consumption indivisibilities and are fully accessible to all." TIETENBERG, *supra* note 32, at 56. Whereas negative externalities are over produced, public goods are over consumed. Negative externalities and public goods can be thought of as two sides of the same coin. For example, in an unregulated market, if factories produce emissions that deteriorate air quality, the emissions are described as negative externalities and the clean air is described as a public good. The emissions are over-produced and the clean air is over-consumed.

34. See U.S. GEN. ACCOUNTING OFFICE, ENVIRONMENTAL INFORMATION: EPA NEEDS BETTER INFORMATION TO MANAGE RISKS AND MEASURE RESULTS 3 (2000) (stating that "very little is known about the risks of potential exposures to chemicals and environmental conditions for workers, the general public, and plant and animal life"); FRANK BENJAMIN GOLLEY, A HISTORY OF THE ECOSYSTEM CONCEPT IN ECOLOGY: MORE THAN THE SUM OF ITS PARTS 1-66 (1993) (tracing the historical development of the ecosystem concept).

35. See EDWARD O. WILSON, THE DIVERSITY OF LIFE xiv (1999). Wilson points out that the species concept has itself been subject to revision. See *id.* at xii-xiii.

36. See *id.*

at a rate of 13,000 per year.<sup>37</sup> At the same time, it is estimated that species are becoming extinct at a rate of between 1 and 10 percent per decade.<sup>38</sup>

Likewise, understanding of the ecological and human health risks associated with synthetic chemicals accumulating in the environment is woeful. For nearly all of these chemicals we lack key information about pathways of exposure, potential interactivity with existing chemicals, and the dose received by different members of the human population. Without these data, we cannot accurately estimate risk, and without accurate estimates, it is impossible to determine the extent to which regulation is necessary to protect human health and the environment.<sup>39</sup>

Scientific uncertainty also manifests itself through incomplete understanding of natural processes. For example, until relatively recently, a prominent concept both among ecologists and lawmakers was the notion of a balance of nature. This notion, which posits the proposition that the natural world is in a state of dynamic equilibrium, is the basis for many laws enacted and policies adopted. It has been thoroughly discredited.<sup>40</sup>

A final way in which scientific uncertainty becomes manifest is through humankind's inability to understand the implications of its own technologies, even those designed for greater safety or a cleaner environment. It is often the case that the adverse environmental consequences associated with human actions are unforeseen. Chlorofluorocarbons (CFCs), for example, are synthetic chemicals first created in 1928 by DuPont and General Motors.<sup>41</sup> These seemingly benign and stable chemicals were used for decades as refrigerants, fire retardants, and blowing agents. By the mid-1970s, scientists were beginning to suspect that CFCs might have adverse impacts on the Earth's stratospheric ozone layer, and by the late 1980s the international community had achieved

37. See *id.* at xiii.

38. See *id.* at xviii.

39. David Roe & William S. Pease, *Toxic Ignorance*, ENVTL. F., May/June 1998, at 24, 24 (stating that "[f]or nearly all of the important industrial chemicals in U.S. commerce, government lacks the basic information needed to calculate the degree of danger—or lack of danger—that a chemical poses when it is used").

40. Regarding the demise of the balance of nature, see generally DANIEL BOTKIN, *DISCORDANT HARMONIES: A NEW ECOLOGY FOR THE TWENTY-FIRST CENTURY* (1990); A. Dan Tarlock, *The Nonequilibrium Paradigm in Ecology and the Partial Unraveling of Environmental Law*, 27 LOY. L.A. L. REV. 1121 (1994); Jonathan Baert Wiener, *Beyond the Balance of Nature*, 7 DUKE ENVTL. L. & POL'Y F. 1 (1996).

41. See Edward A. Parson, *Protecting the Ozone Layer*, in INSTITUTIONS FOR THE EARTH: SOURCES OF EFFECTIVE INTERNATIONAL ENVIRONMENTAL PROTECTION 27, 28 (Peter M. Haas et al. eds., 1993).

sufficient consensus regarding the devastating effects of CFCs to begin the phase out of CFC production and consumption.<sup>42</sup>

Use of methyl tertiary-butyl ether (MTBE) as an oxygenate in gasoline provides another example of the unintended and unforeseen consequences associated with human actions. The Clean Air Act Amendments of 1990 required the use of reformulated gasoline (RFG) in nonattainment areas (*i.e.*, areas of the United States that are in violation of the standards identified in the Clean Air Act and associated regulations) in order to improve air quality.<sup>43</sup> RFG must contain a specified percentage of oxygen, and MTBE is one of two oxygenates used to meet this requirement.<sup>44</sup> The use of RFG has resulted in a significant reduction in air pollution in nonattainment areas.<sup>45</sup>

MTBE is a volatile organic compound composed of small molecules that are soluble in water.<sup>46</sup> As a result, MTBE in gasoline that spills or leaks from tanks moves into groundwater more rapidly than other gasoline constituents.<sup>47</sup> The health effects of MTBE consumption in drinking water are unclear, but studies completed after MTBE was released into the environment indicate potential carcinogenic characteristics.<sup>48</sup> Beginning in 1992, the use of MBTE in gasoline increased significantly. By the late 1990s, concern about groundwater contamination caused by MBTE increased dramatically.<sup>49</sup>

MTBE is a particularly important case of scientific uncertainty because it illustrates the problem of cross-media pollution, a problem only exacerbated by the current structure of EPA. Use of MTBE to address air

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42. See RICHARD ELLIOT BENEDICK, *OZONE DIPLOMACY: NEW DIRECTIONS IN SAFEGUARDING THE PLANET* 10-11, 68-97 (enlarged ed. 1998); Owen Greene, *The System for Implementation Review in the Ozone Regime*, in *THE IMPLEMENTATION AND EFFECTIVENESS OF INTERNATIONAL ENVIRONMENTAL COMMITMENTS: THEORY AND PRACTICE* 89 (David G. Victor et al. eds., 1998).

43. 42 U.S.C. § 7545(k) (1994).

44. U.S. ENVTL. PROT. AGENCY, PUB. NO. EPA-822-F-97-009, *FACT SHEET, DRINKING WATER ADVISORY: CONSUMER ACCEPTABILITY ADVICE AND HEALTH EFFECTS ANALYSIS ON METHYL TERTIARY-BUTYL ETHER (MTBE)* 1 (Dec. 1997).

45. See *id.*

46. See *id.*

47. See *id.* MTBE also becomes a problem in lakes with recreational boats and jet skis, since it is one of the constituents that leak from notoriously inefficient two-stroke boat engines.

48. See Richard O. Faulk & John S. Gray, *MTBE: Can the Controversy Be Contained?*, 14 *Toxics L. Rep.* (BNA) 603, 604 (1999).

49. By the late 1990s, a number of states were taking steps to limit MTBE. For example, on March 25, 1999, Governor Gray Davis of California announced that he was phasing out the use of MTBE in gasoline in the state, and on May 24, 2000, Governor George Pataki of New York signed a bill that will prohibit the sale or use of MTBE beginning January 1, 2004. See *Governor Orders Phaseout of MTBE, Seeks Waiver of Air Act Fuel Mandate*, 29 *Env't Rep.* (BNA) 2382, 2382 (Apr. 2, 1999); *Governor Signs Acid Rain Controls, Ban on MTBE Use as Gasoline Additive*, 31 *Env't Rep.* (BNA) 1180, 1180 (June 2, 2000).

pollution caused new water pollution problems. Air pollution regulators who made the key decisions surrounding the introduction of MTBE did not have adequate animal studies to assess the risks of drinking and swimming water contamination.<sup>50</sup> They also failed to communicate with other regulators about the problem of leaking underground storage tanks or understand the special geological significance of MTBE's solubility as a pathway into groundwater.<sup>51</sup>

The degree of scientific uncertainty that exists may seem overwhelming because society engages in so many activities that affect the natural world in so many different ways.<sup>52</sup> Furthermore, the tools devised to integrate scientific knowledge into environmental law and policy remain crude. As a result, there is often a lag between emerging scientific knowledge and the application of that knowledge through environmental law and policy. For example, except for acute toxicity, risk assessment retains an almost singular focus upon the carcinogenic effects associated with environmental contaminants.<sup>53</sup>

50. See OFFICE OF RESEARCH & DEV., U.S. ENVTL. PROT. AGENCY, DOC. NO. EPA/600/R-93/206, ASSESSMENT OF POTENTIAL HEALTH RISKS OF GASOLINE OXYGENATED WITH METHYL TERTIARY BUTYL ETHER (MTBE) (1993), available at <http://www.epa.gov/ncea/pdfs/mtbe/gasmte.pdf>.

51. The University of California Blue Ribbon Commission issued an extensive report to Governor Gray Davis on health and environmental assessment of MTBE. See generally UNIV. OF CALIFORNIA, HEALTH AND ENVIRONMENTAL ASSESSMENT OF MTBE (1998), available at <http://www.tsrtf.ucdavis.edu/mtberpt/Homepage.html> (last visited Apr. 1, 2002).

52. Human knowledge of the effects of individual chemicals that have been thoroughly studied for decades is continually subject to revision. For example, recently EPA completed a reassessment of dioxin exposure on human health. See generally OFFICE OF RESEARCH & DEV., U.S. ENVTL. PROT. AGENCY, INFORMATION SHEET 1: DIOXIN: SUMMARY OF DIOXIN REASSESSMENT SCIENCE (June 2000); OFFICE OF RESEARCH & DEV., U.S. ENVTL. PROT. AGENCY, Information Sheet 2: Dioxin: Scientific Highlights from Draft Reassessment (June 2000). The Health Effects Institute recently completed a study of particulate matter less than 10 mm in diameter (PM10) that suggests a link between exposure to PM10 and mortality rates. See JONATHAN M. SAMET ET AL., THE NATIONAL MORBIDITY, MORTALITY, AND AIR POLLUTION STUDY PART II: MORBIDITY, MORTALITY, AND AIR POLLUTION IN THE UNITED STATES 1 (2000). The cumulative effects of multiple chemicals are generally beyond our understanding. The study of such impacts is a relatively recent phenomenon. See generally COUNCIL ON ENVTL. QUALITY, CONSIDERING CUMULATIVE IMPACTS UNDER THE NATIONAL ENVIRONMENTAL POLICY ACT (1997).

53. See STEPHEN BREYER, BREAKING THE VICIOUS CYCLE: TOWARD EFFECTIVE RISK REGULATION 6 (1993) (stating that cancer is "the engine that drives much of health risk regulation"); John S. Applegate & Celia Campbell-Mohn, *Risk Assessment: Science, Law and Policy*, 14 NAT. RESOURCES & ENV'T 219, 220 (2000); see also THEO COLBORN, DIANE DUMANOSKI, & JOHN PETERSON MYERS, OUR STOLEN FUTURE 38 (1996) (noting that, unlike cancer, birth defects may be caused by very small, short term exposures to certain synthetic chemicals during gestation). In addition, even scholars who are not philosophically opposed to the use of risk assessment recognize its significant limitations. See, e.g., FARBER, *supra* note 19, at 163 (stating that "risk assessment is shrouded in uncertainty").

### C. Time

A third key attribute associated with environmental problems is that they often unfold over long time periods. As a result, environmental problems may be difficult or impossible to detect at their early stages of development. Consider again, for example, the issue of stratospheric ozone depletion resulting from the emission of certain chemicals including most notably CFCs.<sup>54</sup> Although CFCs were first discovered in 1928 and produced at steadily increasing rates through the mid-1970s, it was not until 1974 that scientists began to suspect that CFCs (which persist over time) would gradually make their way into the stratosphere.<sup>55</sup> EPA promulgated regulations banning the use of CFCs in a variety of applications soon after scientists identified the problem.<sup>56</sup> Yet CFCs may persist in the environment for decades or longer, and CFC production is a global phenomenon that has taken place over a period of decades. Stratospheric ozone depletion will therefore continue to be a problem for a considerable period.<sup>57</sup>

Issues of equity also frequently arise due to the fact that environmental problems unfold over long time periods. It is necessary to determine what value should be placed on future problems as compared to present problems. In turn, a comparison must be made between future lives and present lives. One option is to begin with intergenerational equity, the notion that a future life has the same value as a present life.<sup>58</sup> An alternative is to discount the value of future lives. Discounting is premised on the idea that the value of a future life is less than the value of a present life.<sup>59</sup> The federal government uses discounting in its efforts to evaluate environmental laws and regulations.<sup>60</sup> When discounting is used as a tool

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54. See *supra* notes 41-42 and accompanying text for a discussion of CFCs.

55. See generally Mario J. Molina & F. Sherwood Rowland, *Stratospheric Sink for Chlorofluoromethanes: Chlorine Atomic Catalysed Destruction of Ozone*, 249 NATURE 810 (1974).

56. See 43 Fed. Reg. 11301 (Mar. 17, 1978); 43 Fed. Reg. 11318 (Mar. 17, 1978). These regulations were enacted pursuant to the Toxic Substances Control Act, 15 U.S.C. § 2605 (1994).

57. Indeed, the ultimate consequences associated with CFCs already released is not yet known. The effects of these releases on stratospheric ozone depend in part on such variables as large volcanic eruptions (which, in addition to ice in the polar regions, could provide the ozone for the heterogeneous chemical reactions that destroy ozone). See KAREN LITFIN, OZONE DISCOURSES: SCIENCE AND POLITICS IN GLOBAL ENVIRONMENTAL COOPERATION 52 (1994).

58. See JOHN RAWLS, A THEORY OF JUSTICE § 44 (rev. ed. 1999); EDITH BROWN WEISS, IN FAIRNESS TO FUTURE GENERATIONS: INTERNATIONAL LAW, COMMON PATRIMONY, AND INTERGENERATIONAL EQUITY (1989); see also WORLD COMM'N ON ENV'T & DEV., OUR COMMON FUTURE 43 (1987).

59. See Lisa Heinzerling, *The Perils of Precision*, ENVTL. F., Sept./Oct. 1998, at 38, 39.

60. See generally Lisa Heinzerling, *Discounting Our Future*, 34 LAND & WATER L. REV. 39 (1999) (describing current federal policy relative to discounting).

to evaluate environmental laws and regulations, substantial variation may exist due to the choice of discount rate.<sup>61</sup>

#### IV. POLITICAL CONTEXT

In addition to the ecological context, it is necessary to take into account the political context in which EPA operates. By designing EPA to be an independent federal agency in the initial reorganization that created the agency, the Ash Council sought to minimize the impact of partisan politics on EPA's activities. Nevertheless, EPA has been buffeted by partisan winds at several points in its 30-year history. Therefore, the political context in which the agency operates cannot be ignored. Any effective organizational structure for EPA will incorporate tools to garner the public legitimacy that can protect it in partisan storms.

##### A. Centralized Control

As Terry Moe notes, presidential control of EPA began even before the creation of the agency and has continued to affect the agency's effectiveness.<sup>62</sup> The range between benevolent and malicious control of EPA has been relatively broad in the agency's history. Presidential and administrative control could only be described as the latter during the Reagan years. The scandal-plagued administration of Ann Gorsuch-Burford and the manipulation of hazardous waste regulations for partisan purposes have been well documented.<sup>63</sup>

Centralization of EPA makes the President's role exceedingly important in environmental policymaking, and the President may reduce the federal role in environmental protection efforts to provide relief to regulated entities or the states. To insure their popularity with voters, presidents take measures ostensibly aimed at stimulating the economy. When this occurs, EPA may be portrayed as one of a number of obstacles to economic growth that must be controlled. This was the crisis faced by the agency in the Reagan Administration, a crisis all the more ironic for the public's oft-detected support of environmental protection even when it is

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61. See FARBER, *supra* note 19, at 88-90, 138-44.

62. See Terry M. Moe, *The Politics of Bureaucratic Structure*, in CAN THE GOVERNMENT GOVERN? 267, 322-23 (John E. Chubb & Paul E. Peterson eds., 1989).

63. See Steven A. Cohen, *EPA: A Qualified Success*, in CONTROVERSIES IN ENVIRONMENTAL POLICY 174, 190-93 (Sheldon Kamieniecki et al. eds., 1986); J. Clarence Davies, *Environmental Institutions and the Reagan Administration*, in ENVIRONMENTAL POLICY IN THE 1980S: REAGAN'S NEW AGENDA 143, 154-57 (Norman J. Vig & Michael E. Kraft eds., 1984); WALTER A. ROSENBAUM, ENVIRONMENTAL POLITICS AND POLICY 232-33 (2d ed. 1991).

in conflict with economic growth.<sup>64</sup> More recently, this was reflected in President George W. Bush's budget proposal for 2002.<sup>65</sup>

What is less well understood, however, is the tolerance of the public for the inexact science of making EPA responsive through presidential elections.<sup>66</sup> In the election of a single person, voters are unable to express their specific desires about environmental policies. This leaves EPA without steady political direction, and thus threatens the agency's support in the public arena. Both the Reagan Administration and EPA were fortunate to be able to turn to William Ruckelshaus to restore public confidence in the agency in the wake of the Gorsuch-Burford scandal. But the agency's reliance on the credibility of a single figure in its greatest moment of crisis only underscores the tenuousness of its political position under centralized control.

Whether centralized control of EPA is benevolent or malicious, centralization of agency control creates information management and priority-setting problems. As Dryzek and Lester point out, "[t]he maintenance of central control can be costly in terms of the amount of coercion required; centralized bureaucracies are insensitive to their errors, and are unlikely to correct them; and they can easily lose touch with changing conditions."<sup>67</sup> The sustainable communities approach to environmental protection, recently identified as a growing trend, tries to solve such fundamental problems with centralized management, especially in the area of information needs and data management.<sup>68</sup>

Problems with information management occur in centralized organizations because there assessing base-line measures of environmental quality is difficult.<sup>69</sup> Without a discrete jurisdictional unit in which to measure ecosystem health, a centralized organization faces an information

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64. Gallup Poll data show a solid majority of the American public supports environmental protection even at the risk of curbing economic growth. See The Gallup Organization, *Americans Still Committed to Environmental Protection, but less concerned than last year*, at <http://www.gallup.com/poll/releases/pr020422.asp> (Apr. 22, 2002).

65. See OFFICE OF MGMT. & BUDGET, BUDGET OF THE UNITED STATES GOVERNMENT 228 (2001).

66. See Riley E. Dunlap, *Public Opinion and Environmental Policy*, in ENVIRONMENTAL POLITICS AND POLICY: THEORIES AND EVIDENCE 63, 106 (James P. Lester ed., 2d ed. 1995) (stating that "the extent to which pro-environmental opinions are translated into political impacts is unclear").

67. John S. Dryzek, & James P. Lester, *Alternative Views of the Environmental Problematic*, in ENVIRONMENTAL POLITICS AND POLICY: THEORIES AND EVIDENCE 314, 329 (James P. Lester ed., 1989).

68. See TOWARD SUSTAINABLE COMMUNITIES: TRANSITION AND TRANSFORMATION IN ENVIRONMENTAL POLICY, *supra* note 3, at 26.

69. See U.S. GEN. ACCOUNTING OFFICE, EPA: PROTECTING HUMAN HEALTH AND THE ENVIRONMENT THROUGH IMPROVED MANAGEMENT 82-111 (1988) [hereinafter GAO].

overload, especially in the context of systems-oriented research.<sup>70</sup> A centralized organization also "does not support the systematic exploration of the view of field-level enforcement officials and legitimates a 'purist' approach to regulation writing by 'specialists' cloistered in their headquarters offices."<sup>71</sup> Communication is generally uni-directional in a centralized organization.

Centralized control may also hinder priority setting. Risks identified by EPA as the most pressing differ from the risks that EPA spends the most money to control.<sup>72</sup> When the national office attempts to set priorities among various risks, it is hindered by the magnitude of the task. The result is that no single person or group really sets the priorities. Rather, "the programs (and their support groups in Congress and elsewhere) set the agendas, and the administrator resolves conflicts among programs."<sup>73</sup>

## B. Fragmentation

In 1963, Lynton K. Caldwell recognized the effects fragmentation could have within the realm of environmental policy when he wrote, "It can be demonstrated that many of the worst environmental errors are direct or indirect results of segmental public decision-making, of failing to perceive specific environmental situations in comprehensive environmental terms."<sup>74</sup> This point has been echoed more recently.<sup>75</sup> The organization of federal, state, and local agencies continues to cause fragmentation in the realm of environmental policy.<sup>76</sup> Wetlands policy provides an illustrative example: the Army Corps of Engineers has jurisdiction to review permit applications under Section 404 of the Clean Water Act, with input from EPA and the Fish and Wildlife Service;<sup>77</sup> at the state level one or more agencies may have authority to implement state authorized wetlands legislation as well as the

70. On data overload in systems-oriented assessments, see generally BRADEN ALLENBY, *INDUSTRIAL ECOLOGY: POLICY FRAMEWORK AND IMPLEMENTATION* (1999).

71. EUGENE BARDACH & ROBERT A. KAGAN, *GOING BY THE BOOK: THE PROBLEM OF REGULATORY UNREASONABLENESS* 85 (1982).

72. See NAT'L ACAD. OF PUB. ADMIN., *supra* note 3, at 25; SCI. ADVISORY BD., *supra* note 3, at 13.

73. Jurgen Schmandt, *Managing Comprehensive Rule Making: EPA's Plan for Integrated Environmental Management*, 45 PUB. ADMIN. REV. 309, 316 (1985).

74. See Lynton K. Caldwell, *Environment: A New Focus for Public Policy?*, 23 PUB. ADMIN. REV. 132, 138 (1963).

75. See, e.g., FIORINO, *supra* note 5, at 7 ("A weakness in the current process for making environmental policy is that problem definition, analysis, and decision making are fragmented.")

76. See GAO, *supra* note 69, at 30.

77. See 33 U.S.C. § 1344 (1994).



federally mandated Water Quality Certification program;<sup>78</sup> and locally both non-zoning and zoning wetlands laws may exist (these local laws are often implemented by separate entities).<sup>79</sup> Other agencies may be involved pursuant to a variety of statutory mandates if the wetlands are located along a river or in a coastal area.<sup>80</sup>

The problem of fragmentation also exists within EPA because the agency is organized by medium (*i.e.*, air, water, solid waste) and by expertise (*e.g.*, lawyers, administrators, and scientists).<sup>81</sup> In cross-media cases, information sharing and communication may play a vital role in deciding the point at which it is best to intervene in the pollution cycle. Yet organization along media lines makes it difficult to persuade program managers to invest in cross-media projects, and program offices may aggregate data in incompatible ways.<sup>82</sup> Furthermore, single-media attempts to control pollution may simply transfer the pollution to new media.<sup>83</sup>

In the case of agency expertise, fragmentation causes a lack of effective interdisciplinary coordination. For instance, attorneys in the agency may not understand the difficulty faced by scientists in giving conclusive answers as expert witnesses.<sup>84</sup> Working more closely with scientists on specific environmental issues could help attorneys use the

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78. See 33 U.S.C. § 1341 (1994). An example of state authorized wetlands legislation is the Massachusetts Wetlands Protection Act and its implementation regulations. See MASS. GEN. LAWS ch. 131, § 40 (1998).

79. For example, in Massachusetts, local Conservation Commissions typically have authority to implement local non-zoning wetlands bylaws or ordinances and local Planning Boards have authority to implement zoning bylaws or ordinances that may include provisions regulating wetlands.

80. For example, the Army Corps of Engineers may have jurisdiction pursuant to the Rivers and Harbors Act, 33 U.S.C. § 403 (1994), or a state environmental agency may have jurisdiction pursuant to the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1465 (1994).

81. See Daniel J. Fiorino, *Environmental Policy as Learning: A New View of an Old Landscape*, 61 PUB. ADMIN. REV. 322, 326 (2001) ("The fragmentation of policy strategies began with the statutory framework and was reinforced by professional specialization, program organization in the EPA and in the states, congressional oversight, and issue networks that grew up around each problem."). This fragmented structure is a relic of the initial reorganization that created EPA and was supposed to be phased out over time. See WILLIAMS, *supra* note 7, at 5; Marcus, *supra* note 8, at 276-77.

82. See GAO, *supra* note 69, at 196; see also Funke, *supra* note 7, at 138.

83. Consider, for example, the case of MTBE discussed above. See *supra* notes 43-49 and accompanying text. Other examples include the creation of sludge as a byproduct of wastewater treatment and the emission of air pollutants as a byproduct of municipal solid waste incineration.

84. See Angus MacIntyre, *Administrative Initiative and Theories of Implementation: Federal Pesticide Policy*, in PUBLIC POLICY AND THE NATURAL ENVIRONMENT 205, 216 (Helen Ingram & Kenneth Godwin eds., 1985).

scientist's expertise more effectively in court. Conversely, scientists may learn how to produce information that is directly useful for policymaking.<sup>85</sup>

### C. Litigation

The relative level of detail of federal legislation that provides EPA with authority to implement environmental policies varies. In some cases, legislation contains very vague language (e.g., the 1970 Clean Air Act). In other cases, legislation written under the guidance of technical experts (e.g., the 1984 Hazardous and Solid Waste Amendments to the Resource Conservation and Recovery Act) contains extremely specific language.<sup>86</sup> EPA must have administrative discretion to implement legislation because of the attributes associated with environmental issues.<sup>87</sup> Yet legally mandated activities dominate EPA's agenda and limit its flexibility, especially when it is called to account in front of Congress or in the courts.<sup>88</sup>

Problems with legislative direction and uncertain science often result in challenges to agency action both by environmental advocates and industry.<sup>89</sup> The initiation of court proceedings reduces the flow of information to the agency and is a time consuming and expensive process that destroys cooperation between the agency, regulated entities, and the public.<sup>90</sup> Additionally, judges can act only when a litigant presents a case.<sup>91</sup> Therefore, involvement by the courts in the process of policy formulation and implementation is "sporadic, fragmented and episodic."<sup>92</sup>

85. Recognizing the degree of interconnection in natural ecosystems makes resolving fragmentation in EPA appear even more critical. As one ecologist working on the path-breaking Hubbard Brook research on ecosystems put it: "unless we stop addressing such complex problems in a fragmented way, management actions will be piecemeal and often ineffectual." GOLLEY, *supra* note 34, at 25.

86. Such legislation may be rendered obsolete by rapidly evolving scientific understanding and environmental challenges.

87. See *supra* part III. Administrative discretion is necessary because environmental problems cross boundaries, commonly are misunderstood due to scientific uncertainty, and unfold over long periods of time. These attributes necessitate a flexible regulatory approach.

88. See Fiorino, *supra* note 7, at 86. Congress and the courts have actively limited EPA's discretion in their respective oversight capacities. See RICHARD N. L. ANDREWS, *MANAGING OUR ENVIRONMENT, MANAGING OURSELVES* 239-42 (1999); Moe, *supra* note 62, at 318. Regarding the activist posture taken by Congress in overseeing EPA, see generally Richard J. Lazarus, *The Neglected Question of Congressional Oversight of EPA: Quis Custodiet Ipsos Custodiet (Who Shall Watch the Watchers Themselves)?*, 54 L. & CONTEMP. PROBS. 205 (1991).

89. A recent example is *Whitman v. American Trucking Ass'ns*, 531 U.S. 457 (2001).

90. See BARDACH & KAGAN, *supra* note 71, at 117-19.

91. See MELNICK, *supra* note 3, at 14.

92. Paul S. Weiland & Daniel S. Imber, *Congress, the Courts and the Interstate Transport of Solid Waste*, 4 DICK. J. ENVTL. L. & POL'Y 77, 86 (1994) (citing JEREMY RABKIN, *JUDICIAL COMPULSIONS: HOW PUBLIC LAW DISTORTS PUBLIC POLICY* 6 (1989); MARTIN SHAPIRO, *THE*

When they do act, courts frequently force EPA to reprogram.<sup>93</sup> Funds and personnel are transferred between offices to comply with court ordered action, and especially to meet deadlines. As Rosemary O'Leary writes, "From a 'macro' or agency-wide perspective, compliance with court orders has become one of the agency's top priorities, at times overtaking congressional mandates."<sup>94</sup> She has clarified a number of consequences of judicial oversight, including reduced discretion and autonomy for EPA officials. Courts have also harmed EPA by compelling it to seek less popular policy options, using deadlines and other means to force the agency's agenda.<sup>95</sup>

Drawbacks to litigation have forced EPA to search for different means of settling policy disputes. One study revealed a closed-door process of bargaining in a tripartite arrangement involving EPA, environmental interests, and regulated interests.<sup>96</sup> Another study shows the prevalence of a negotiated-compliance model in water policy enforcement despite official program literature that stresses consistent standard operating procedures.<sup>97</sup>

EPA works hard to minimize conflicts between values when constructing environmental policy. Bargaining begins internally at the earliest level of policy formulation as the program officials, the lead officials on policy formulation, work to create a policy that is consonant with the expectations of the national office. Program employees, for example, have referred to the Economic Analysis Division (EAD) (a national office that reviews policy) as the "in-house Office of Budget and Management."<sup>98</sup> In this way, bargaining becomes part of agency culture and shapes policymaking.

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SUPREME COURT AND ADMINISTRATIVE AGENCIES 61 (1968)).

93. Two types of reprogramming are common. Reprogramming may be specific to the relevant programmatic area addressed in a case. *See, e.g.,* *Natural Res. Def. Council v. Train*, 8 Env't Rep. Cas. (BNA) 2120 (D.D.C. 1976.). It may be cross-programmatic. *See, e.g.,* *Corrosion Proof Fittings v. Env'tl. Prot. Agency*, 947 F.2d 1201 (5th Cir. 1991).

94. ROSEMARY O'LEARY, *ENVIRONMENTAL CHANGE: FEDERAL COURTS AND THE EPA* 168 (1993).

95. *See* ALFRED MARCUS, *PROMISE AND PERFORMANCE: CHOOSING AND IMPLEMENTING AN ENVIRONMENTAL POLICY* 157-59 (1980).

96. *See, e.g.,* Daniel J. Fiorino, *Regulatory Negotiation as a Policy Process*, 48 *PUB. ADMIN. REV.* 764 (1988).

97. *See generally* Susan Hunter & Richard W. Waterman, *Determining an Agency's Regulatory Style: How Does the EPA Water Office Enforce the Law?*, 45 *W. POL. Q.* 403 (1992).

98. Mary Ellen Mogee, *Risk Assessment in the Regulatory Process: Rule Making in the Environmental Protection Agency*, in *PUBLIC POLICY AND THE NATURAL ENVIRONMENT* 185, 191 (Helen M. Ingram & R. Kenneth Godwin eds., 1985).

Although bargaining may be a useful tool for limiting litigation,<sup>99</sup> it does not help EPA garner public support because it fails to inform or assess the public's environmental values. In negotiation, values may be sublimated because agreement is the only test of the new rule.<sup>100</sup> Without a public accounting of tough value-based questions, EPA has at times shirked an important duty, civic education.<sup>101</sup> It is difficult to develop an ecological ethic conducive to public support if the agency fails to educate. Finally, bargaining fails to assess a wide scope of public values since only groups powerful enough to mount court challenges are included in the process. Once in negotiation, community groups may be "taken to the cleaners" by groups better able to afford experts and data.<sup>102</sup>

## V. TYPOLOGY OF ORGANIZATIONAL STRUCTURES

To identify the organizational structure best suited to EPA, it is useful to first explore the key differences among contrasting types of bureaucracy. Following Max Weber, the earliest concepts of bureaucracy involved the careful attribution of individual discretion to centralized authority.<sup>103</sup> It was believed that a carefully defined operating procedure combined with a clear chain of command could produce effective and quick action. This highly mechanized view has been replaced with a more human approach that recognizes the importance of informal organization. As the complexity of the world increases, it is evident that "bureaucracy with its nicely defined chain of command, its rules, and its rigidities is ill-adapted

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99. Many commentators and scholars have extolled the virtues of mediation or alternative dispute resolution. See, e.g., Cynthia Croce, *Negotiation Instead of Confrontation*, EPA J., Apr. 1985, at 23; Douglas J. Amy, *Environmental Mediation: An Alternative Approach to Policy Stalemates*, 15 POL'Y SCI. 345 (1983). But see Charles C. Caldart & Nicholas A. Ashford, *Negotiation as a Means of Developing and Implementing Environmental and Occupational Health and Safety Policy*, 23 HARV. ENVTL. L. REV. 141 (1999) (finding that negotiation does not necessarily result in improved environmental outcomes); Cary Coglianese, *Assessing Consensus: The Promise and Performance of Negotiated Rulemaking*, 46 DUKE L.J. 1255 (1997) (finding that negotiation does not significantly reduce the likelihood of litigation).

100. See THEODORE J. LOWI, *THE END OF LIBERALISM: IDEOLOGY, POLICY, AND THE CRISIS OF PUBLIC AUTHORITY* 125-27 (1st ed. 1969).

101. See LANDY ET AL., *supra* note 6, at 279. Accord Caldart & Ashford, *supra* note 99, at 202 (concluding that when negotiation is used to formulate and implement policy, "the relative bargaining power of the stakeholders largely determines the outcome, unless it is checked at the end of the process by a government agency with a strong sense of trusteeship for the congressional policy it is charged with implementing").

102. Douglas Amy, *Environmental Dispute Resolution: The Promise and the Pitfalls*, in ENVIRONMENTAL POLICY IN THE 1990S 211, 222-23 (Norman J. Vig & Michael E. Kraft eds., 1st ed. 1990).

103. See generally FROM MAX WEBER: ESSAYS IN SOCIOLOGY (H. Gerth & C. Wright Mills eds., 1946).

to the rapid change the (organizational) environment now demands."<sup>104</sup> Informal groups arise as individual bureaucrats attempt to fill the gap between formal organization and a rapidly changing world. Increasingly, the manager's role is to coordinate such informal groups within an "adaptive structure."

Previous work on bureaucratic structure suggests a typology of bureaucracy that may be usefully suited to the discussion of EPA's organizational attributes. Table 1 distinguishes between programmatic and adaptable structures.<sup>105</sup>

In this typology, a programmatic structure is run primarily from the top down. Decisions are made by a central authority, and instructions are then passed on to "front-line" bureaucrats, such as in the military. Many programmatic structures contain the right of appeal described by Max Weber: if the orders seem unjust in a particular situation, those affected may appeal to the top. Yet, in programmatic structures, decisions are not only appealed to the top, they also originate there. Lastly, programmatic structures tend toward specialization. As orders are passed down from the top, they are assigned to units subdivided by function. Differing units are often insensitive to overlapping responsibilities as each sector strives to carry out its own orders.

Adaptable structures are the opposite of programmatic bureaucracies. They are run primarily from the bottom up, granting maximum flexibility to "street-level" bureaucrats.<sup>106</sup> Specific policies formulated in adaptable structures may be widely disparate, depending upon differing geographic, scientific, and political contexts. Adaptable structures also provide for flexibility in setting priorities and incorporating learning from the field. Unlike programmatic structures, adaptable structures integrate their functions toward a set of common, albeit broad, goals.<sup>107</sup> The decentralized nature of adaptable structures makes this possible by allowing for comprehensive (*i.e.*, integrated) environmental management in a limited geographic area.

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104. William Scott, *Organization Theory: An Overview and Appraisal*, in READINGS IN PUBLIC ADMINISTRATION 188 (Felix A. Nigro & Loyd G. Nigro eds., 1983).

105. See Paul Berman, *Thinking about Programmed and Adaptive Implementation: Matching Strategies to Situations*, in WHY POLICIES SUCCEED OR FAIL 205, 205-13 (Helen M. Ingram & Dean E. Mann eds., 1980). A similar typology of bureaucracies has been proposed to distinguish structures that promote public participation from structures designed for efficiency. Regarding this typology, see DOUGLAS YATES, BUREAUCRATIC DEMOCRACY: THE SEARCH FOR DEMOCRACY AND EFFICIENCY IN AMERICAN GOVERNMENT (1982).

106. See Berman, *supra* note 105, at 211-12.

107. See *id.*

Table 1 - Bureaucratic Typology Defined for EPA

PROGRAMMATIC STRUCTURE	ADAPTABLE STRUCTURE
<p style="text-align: center;"><b>Management System</b></p> <p>Fragmented by Media</p> <ul style="list-style-type: none"> <li>• Air and Radiation, Water, Solid Waste and Emergency Response, etc.</li> </ul> <p>Fragmented by Function</p> <ul style="list-style-type: none"> <li>• Enforcement and Compliance Assurance, Research &amp; Development, General Counsel, etc.</li> </ul>	<p>Integrated by Eco-region</p> <p>Flexible working groups for:</p> <ul style="list-style-type: none"> <li>• riparian systems</li> <li>• priority toxic risks</li> <li>• priority industrial sectors</li> <li>• habitat conservation</li> <li>• sustainable community initiatives</li> <li>• etc.</li> </ul>
<p style="text-align: center;"><b>Decision-Making Framework</b></p> <p>Centralized</p> <ul style="list-style-type: none"> <li>• Bargaining Among Organized Interests</li> </ul>	<p>Decentralized</p> <ul style="list-style-type: none"> <li>• Public Access/Citizen Participation</li> </ul>
<p>Centralized Research for National Rules Communication Mainly from Top to Bottom</p>	<p style="text-align: center;"><b>Learning</b></p> <p>Decentralized Research Organized by Eco-region</p> <ul style="list-style-type: none"> <li>• partnerships with local universities and colleges</li> <li>• interagency data development and sharing</li> </ul> <p>Communication to Promote Trial and Error Learning</p>

Table 1-Continued

PROGRAMMATIC STRUCTURE	ADAPTABLE STRUCTURE
Primarily Command and Control Primarily Technology-Based	Enforcement <ul style="list-style-type: none"> <li>• Flexibility</li> <li>• Offers Range of Enforcement Strategies</li> <li>• permit systems</li> <li>• public information systems</li> <li>• private rights of legal action</li> <li>• collaborative agreements with firms or governments</li> <li>• pollution fee systems</li> <li>• use or elimination of public subsidies</li> <li>• technical assistance</li> </ul>

In adaptable structures, managers must utilize multiple feedback mechanisms to incorporate learning from the field. Whereas the flow of information in programmatic structures is generally uni-directional from the top down or bi-directional if well-developed feedback mechanisms exist, information flow within adaptable structures is multi-dimensional. Not only does information flow up and down the chain of command, it also flows horizontally throughout the organization.

Although most bureaucracies, including EPA, present a mixture of these two divergent types, an explicit recognition of operating conditions suggests an emphasis of one structure over the other. EPA is not in a position to operate with a programmatic bureaucracy because it lacks explicit and non-contradictory legislative direction and faces continual changes in both problems and solutions. The bureaucracy of EPA must be adaptable if the agency is to pursue its mission successfully.

A number of elements of the environmental *problematique* compel EPA to consider an adaptable structure. The first element concerns the geographical disparity of environmental problems and ecosystem features.<sup>108</sup> It is difficult for one central bureaucracy in Washington, D.C., or even the existing regional structure of EPA to dictate a single set of priorities for environmental protection. In part, demographic variation influences the problems posed and possible solutions. Environmental problems and opportunities for solutions also vary greatly by the industrial sector and the type of infrastructure available in a given place.<sup>109</sup> Different types of ecosystems also require varying amounts and kinds of regulation.

Second, as described above, the scope of environmental regulation is large and highly uncertain.<sup>110</sup> At times, there seems to be no limit to the sources of natural and synthetic substances that can wreak havoc within the earth's environment. The ecosystem that supports life is complex and interrelated. As we discover more about the complexity of ecosystems, regulations must encompass a greater diversity of sources, including individual behavior. The state of control technology is also highly uncertain. EPA must be able to adapt regulations as new technologies emerge and create strategies that drive the development of clean technologies.

108. This element may also be described in terms of boundaries. See *supra* part III.A.

109. See, for example, Bechtel Corporation's report on their Industrial Materials Exchange (IME) model, where they studied firms in Brownsville, Texas, and developed a complex model linking major industrial sectors so that wastes from some firms become feedstocks for others. See Bechtel Corp., Texas Engineering Extension Service & The University of Texas at Austin, Final Report: Brownsville/Matamoros Regional Industrial Symbiosis Project. Phase I: Development of Technically Feasible Exchange Scenarios; see also generally ALLENBY, *supra* note 70.

110. On uncertainty, see *supra* part III.B.



Time is the third element that compels EPA to consider an adaptable structure.<sup>111</sup> Humankind's understanding of environmental processes and human-environment relations is incomplete and constantly changing with new research. EPA must be organized in a manner that allows the agency to continually evaluate policies and regulations and adjust them in response to scientific advances.

The fourth element concerns EPA's need to maintain public support. As a regulatory agency, EPA is caught in a bind. Environmental regulation often imposes immediate and harsh sanctions on a few in order to benefit the long-term and general interests of many. An adaptable structure can help to foster a dialogue with the public, allowing EPA to both gauge environmental values and act as a "civic-educator."<sup>112</sup>

## VI. ESTABLISHING ADAPTABLE AGENCY

At EPA's creation, the Ash Council made an explicit call for a cross-media approach to environmental protection in the new agency.<sup>113</sup> As the agency's priorities and regulations issued through the years amply demonstrate, it is an objective that has never been met fully. In 1993, with the idea of ecosystem management gaining greater prominence, EPA once again sought to address this issue.<sup>114</sup> Yet this time EPA was called upon to adapt its priorities and regulations to an even broader set of concerns, including biodiversity and other natural resource issues (for example, the "Edgewater Consensus," see *infra*).

Despite periodic calls and renewed efforts for greater integration of policymaking at EPA, the agency has never succeeded entirely in meeting the challenge. Each time the agency moves toward greater integration, the demands and incentives that derive from the agency's programmatic structure eventually overwhelm the effort. Adopting the ecoregion as a new jurisdictional unit to replace the current regional structure within EPA can help the agency move towards a more adaptable structure, finally providing institutional inertia for integrated policymaking.

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111. Regarding time, see *supra* part III.C.

112. See LANDY ET AL., *supra* note 6 at 7-8.

113. See Alfred A. Marcus, *EPA's Organizational Structure*, LAW & CONTEMP. PROBS., Autumn 1991, at 5, 18.

114. Confidential Telephone Interview with EPA Official and Internal EPA Documents (Nov. 8, 2000) [hereinafter Interview].

## A. Defining Eco-Regions

To understand the idea of eco-regions, it is useful to distinguish it from the concept of the bioregion.<sup>115</sup> This term precedes the notion of an eco-region and emerged from a movement known as bioregionalism, a distinct branch of the broader radical environmental movement.<sup>116</sup> Bioregionalism envisions a community of people who know and live within the ecology, potential, and limits of a given region. Bioregions are made up of characteristics like river basins, valleys, mountain ranges, air sheds, watersheds, as well as floral and faunal traits.<sup>117</sup> Because of a shared understanding about the importance of living within the limits of these elements, human behavior, development, and economic enterprises are adapted to the traits of each bioregion.<sup>118</sup>

In bioregionalism, like much of the radical environmental movement, the ideal of a pure, untouched nature is seen as the touchstone for circumscribing human activity.<sup>119</sup> The prescriptive ideal in bioregionalism imagines that intact biological entities may be defined prior to human involvement, and then may be used to "contain" people and their activities.<sup>120</sup> Thus, bioregionalism would seek to reduce radically the import and export of natural resources or goods among bioregions, as well as to stem the migration of humans between such areas. Concerns surrounding economic stagnation and xenophobia are both important criticisms of bioregionalism.<sup>121</sup>

115. Jonathan Z. Cannon, EPA's general counsel for three years during the Clinton Administration, has been talking about building institutions for environmental protection around bioregions. See, e.g., Jonathan Z. Cannon, *The West Tower Philosopher*, 15 ENVTL. F. 35 (1998). As is clear below, we believe the concept deserves careful examination and that it is important to distinguish the idea of the "eco-region."

116. Jonathan Olsen, *The Perils of Rootedness: On Bioregionalism and Right Wing Ecology in Germany*, 19 LANDSCAPE J. 73, 73 (2000).

117. Regarding the bio-regional movement in general, see KIRKPATRICK SALE, *DWELLERS IN THE LAND: THE BIOREGIONAL VISION* (1985).

118. Regarding the bio-regional vision in general, see *HOME! A BIOREGIONAL READER* (Van Andruss ed., 1990).

119. For a criticism of the wilderness ideal from an historical vantage point, see WILLIAM CRONON, *UNCOMMON GROUND: TOWARD REINVENTING NATURE* (1995).

120. See Terence Young, *Belonging not Containing: The Vision of Bioregionalism*, 19 LANDSCAPE J. 46 (2000).

121. See Olsen, *supra* note 116, at 76; Young, *supra* note 120, at 48. Taken to an extreme, bioregionalism could result in economic protectionism. The resulting barriers to free trade could reduce the flow of goods and services into and out of regions and, thereby, cause economic stagnation. Likewise, an extreme form of bioregionalism may be accompanied by antagonism toward minority groups within the region or (more likely) groups foreign to the region.

While the idea of bioregions puts humans in second place, the concept of an eco-region seeks to blend a respect for natural features of the land with an understanding of how humans already live with natural systems in terms of economic production and cultural identification.<sup>122</sup> Thus, eco-regions may be defined with reference to the relative density of overlapping natural and social characteristics. They will rarely follow traditional political boundaries, and even may not be of uniform size. Rather than just a set of biophysical systems, they will be places that people relate to.<sup>123</sup>

The notion of restructuring EPA along the lines of newly defined eco-regions is closely akin to the concept of ecosystem management. In the Clinton Administration, the Department of the Interior used ecosystem management with some success in an attempt to resolve protracted and bitter disputes over federal lands and endangered species.<sup>124</sup> Ecosystem management incorporates both humans and nature, rejecting definitions of ecosystems that treat man as external to the environment.<sup>125</sup> As human cultural factors play a role in defining eco-regions, the concept is even more fluid than the already scientifically contested idea of the bioregion.

Natural criteria, derived from scientific investigation, are key to defining a bioregion or an eco-region. Government agencies have made numerous efforts to define eco-regions.

- As part of their effort to adopt an ecosystem management approach, the U.S. Fish and Wildlife Service divided the United States into 53 eco-regions based in large part on U.S. Geological

122. See Ortwin Renn, *A Regional Concept of Qualitative Growth and Sustainability*, in Report of the Akademie fuer Technikfolgenabschaetzung in Baden-Wuerttemberg Germany 13-14 (1995).

123. See Young, *supra* note 120, at 49.

124. Cortner and Moote define ecosystem management with four criteria: (1) socially defined goals and objectives, (2) holistic and integrated science, (3) adaptive management, and (4) collaborative decision making. HANNA J. CORTNER & MARGARET A. MOOTE, *THE POLITICS OF ECOSYSTEM MANAGEMENT* 40 (1999). The concept moves away from the idea of maximum sustained yield that was prevalent in early, machine-like depictions of ecosystems. See GOLLEY, *supra* note 34, at 24. It also encompasses humans in the most common definition of ecosystems, "a distinct and coherent ecological community of organisms and the physical environment in which they interact." See D. Scott Slocombe, *Implementing Ecosystem-Based Management: Development of Theory, Practice, and Research for Managing a Region*, 43 *BIOSCIENCE* 612, 612 (1993). In Renn's terms, the focus is on the long-term resilience of anthropogenic ecosystems, in order that ecosystems will maintain productivity through disease and climate variability. See Renn, *supra* note 122, at 16.

125. See CORTNER & MOOTE, *supra* note 124, at 37-45. Accord David T. Cleland et al., *National Hierarchical Framework of Ecological Units*, in *ECOSYSTEM MANAGEMENT APPLICATIONS FOR SUSTAINABLE FOREST AND WILDLIFE RESOURCES* 181 (M. S. Boyce & A. Haney eds., 1997).

Survey data regarding watersheds.<sup>126</sup> Teams of professionals were developed within each eco-region to improve resource management and protection.<sup>127</sup>

- As early as 1976, the U.S. Forest Service developed a general description of the ecosystem geography of the United States.<sup>128</sup> During the 1990s, the Forest Service developed a national hierarchical framework of ecological units as part of its effort to implement ecosystem management.<sup>129</sup> Forest Service personnel completed studies that identify and describe eco-regions and ecological subregions of the United States.<sup>130</sup>
- In short-term experimental research demonstrating the eco-region concept, EPA's Corvallis laboratory divided the U.S. into 76 "eco-regions" that were then used to aggregate ecosystem data.<sup>131</sup>
- In 1992, the California EPA also proposed using eco-regions to ease the permit process, locating seven logical regions in the state.<sup>132</sup>

In addition, working at global scales, biogeographers have established comparable types of eco-regions resulting from the interaction of temperature, precipitation, soil types, vegetation, and fauna.<sup>133</sup> These past efforts demonstrate the feasibility of identifying eco-regions.

126. See U.S. FISH & WILDLIFE SERV., ECOSYSTEM APPROACH TO FISH AND WILDLIFE CONSERVATION § 1.6(A)(3) (Apr. 19, 1996).

127. See *id.* § 1.7(A).

128. See ROBERT G. BAILEY, DESCRIPTION OF THE ECOREGIONS OF THE UNITED STATES i (1995); JAMES R. MAXWELL ET AL., A HIERARCHICAL FRAMEWORK OF AQUATIC ECOLOGICAL UNITS IN NORTH AMERICA (NEARCTIC ZONE) 1 (1995).

129. See generally ROBERT G. BAILEY ET AL., ECOREGIONS AND SUBREGIONS OF THE UNITED STATES (1994).

130. See generally *id.* HENRY McNAB & PETER E. AVERS, ECOLOGICAL SUBREGIONS OF THE UNITED STATES (1994).

131. See GAO, *supra* note 69, at 91.

132. California has also adopted a bioregional approach for the purposes of protecting biodiversity under its landmark 1991 Natural Communities Conservation Planning Act (NCCP), CAL. FISH & GAME CODE §§ 2800-2840 (West 1991). The state has located nine logical "bioregions" for planning to protect biodiversity.

133. See ROBERT G. BAILEY, ECOREGIONS: THE ECOSYSTEM GEOGRAPHY OF THE OCEANS AND CONTINENTS 5, 48 (1997). Bailey adopts a definition rooted only in natural criteria, writing, "Any large portion of the Earth's surface over which ecosystems have characteristics in common is called an ecosystem region, or ecoregion." *Id.* at 2. Accord DAVID M. OLSON ET AL., FRESHWATER ECOREGIONS OF NORTH AMERICA: A CONSERVATION ASSESSMENT (1999); DAVID M. OLSON ET AL., TERRESTRIAL ECOREGIONS OF NORTH AMERICA: A CONSERVATION ASSESSMENT (1999).

As important as natural criteria are, however, they are hardly unambiguous.<sup>134</sup> There are at least three basic natural features that must be considered, including watersheds, geomorphology, and shifts in biotic characteristics. Biotic characteristics can rarely be demarcated with precision, but rather elide from the predominance of one to another. Watersheds often overlap one to another with increasing scale, and geomorphology may not correspond directly to either.<sup>135</sup> When social systems and human cultural factors are added, the complexity increases significantly.

Clearly, scientific and technical expertise cannot by themselves determine eco-regional boundaries. Since a major reason for reorganizing along eco-regional boundaries is to bolster public support for EPA, the agency would be served best by using an inclusive stakeholder process to choose among the possibilities identified by scientists. This would increase the public's sense of citizenship in and stewardship for the biotic community EPA is working to protect.<sup>136</sup> Once natural and social scientists had identified sets of overlapping functional relationships in watersheds, airsheds, and industrial sectors, consulting with citizens and stakeholders would let vernacular feelings for places and biota specify boundaries.<sup>137</sup>

## B. Advantages to Reorganizing by Eco-Region

Restructuring the agency by eco-regions would provide the opportunity to finally overcome the difficulties of fragmentation through integrated ecosystem management. The major goals of environmental protection, including improved public health, economic well-being, and intrinsic ecological values are all related to the understanding and protection of ecosystems. An understanding of ecosystem dynamics that

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134. As Terence Young writes, "the literature contains many contradictory suggestions on how to identify a bioregion; how many there are; and where they are located. Settling these contradictions remains a central challenge for bioregionalism." Young, *supra* note 120, at 48.

135. See Byron Taylor, *Bioregionalism: An Ethics of Loyalty to Place*, 19 *LANDSCAPE J.* 50, 61 (2000).

136. This can be seen in EPA's Community-Based Environmental Protection (CBEP) program where the citizens initiate agency action around especially meaningful ecosystems (e.g., Chesapeake Bay, etc.). Thus, the eco-region concept is able to retain at least some of the biophilia that is central to bioregionalism. See Olsen, *supra* note 116, at 75.

137. In 1998, a research team published an assessment of the efforts of the Fish and Wildlife Service to adopt an ecosystem approach including the establishment of eco-regions and management teams within each region. See generally U.S. FISH & WILDLIFE SERV., *ECOSYSTEM APPROACH TO FISH AND WILDLIFE CONSERVATION* (1998). The team verified concerns about eco-region boundaries but also concluded that the eco-regions established by the Fish and Wildlife Service should be left intact. See *id.*

reveals exposure paths and dose amounts is a prerequisite to the effective use of risk assessment in protecting public health.<sup>138</sup>

Eco-regions facilitate better collection and organization of ecological information. In the Corvallis experiment, for example, standardized tests of a range of organisms were developed to trace pollutants in the ecosystem.<sup>139</sup> If the Corvallis approach were carried out across time, data could be aggregated in each eco-region, providing a baseline for planning. Such data would permit the agency to evaluate a program's effectiveness and track emerging environmental problems. The eco-region could also enhance the efficiency of research since it increases contact between decision makers and researchers, drawing together the data of a number of governmental and non-governmental units.

Although integration in the eco-region would provide a more comprehensive picture of the ecosystem, many scientific uncertainties would remain. An important virtue of the eco-region is that it would facilitate bureaucratic learning in a trial and error or "incremental" process.<sup>140</sup> Dean Mann has defined bureaucratic learning as "the process of reducing uncertainty of all kinds: scientific; economic; administrative; and political."<sup>141</sup> He asserts that "the only way one can plan for this is to design management systems that can learn from trial and error."<sup>142</sup>

The eco-region may promote such learning by adapting information and communication for the various ecological and scientific contexts in which EPA operates. Sharing information across media and industry sectors may speed the learning process and assist those attempting to avoid pitfalls that others have already faced. The efficiency with which knowledge is transferred throughout EPA largely determines the capacity for bureaucratic learning.

Efforts to promote ecosystem management in the Great Lakes region have been enhanced by the use of the Great Lakes Information Network (GLIN) developed by governmental and non-governmental organizations (including EPA).<sup>143</sup> GLIN provides people throughout the Great Lakes region with information through the Internet. One way GLIN

138. See SCI. ADVISORY BD., *supra* note 3, at 18.

139. See GAO, *supra* note 69, at 91

140. This is a hallmark of adaptive management. See KAI LEE, COMPASS AND GYROSCOPE: INTEGRATING SCIENCE AND POLICY FOR THE ENVIRONMENT 53 (1993); REPORT OF THE INTERAGENCY ECOSYSTEM MANAGEMENT TASK FORCE, THE ECOSYSTEM APPROACH: HEALTHY ECOSYSTEMS AND SUSTAINABLE ECONOMIES VOLUME I—OVERVIEW 51 (1995).

141. Dean Mann, *Environmental Learning in a Decentralized Political World*, 44 J. INT'L AFFAIRS 301, 336 (1991).

142. *Id.*

143. For information about GLIN, see GLIN homepage, at <http://www.great-lakes.net> (last visited Apr. 5, 2002).

has been used is as a forum for coordinators of remedial action plans throughout the Great Lakes region who often face the same types of challenges as they attempt to clean up specific areas of concern within the region. The use of technology in conjunction with a new eco-regional structure may result in efficient communication and more effective learning.

EPA officials in each eco-region could fine tune policies as uncertainty is reduced and make adaptable changes in bureaucratic structures to confront emerging problems. Within eco-regions, working groups might be prioritized for specific chemical pollutants, industrial sectors,<sup>144</sup> habitat conservation initiatives, and sustainable community goals.<sup>145</sup> Other principles for organizing working-groups might be discovered to meet specific goals in each eco-region.

An eco-regional approach to toxic pollution would involve a careful materials balance (including exposure and dose for a priority chemical) and a review of regulatory options. While using quantitative risk assessment to help define priorities is often promoted, it is only feasible with much more highly developed data than we currently have.<sup>146</sup> Working groups on toxic pollution could develop and compile such data in partnership with state officials and university researchers.

Another working group might use an industrial sector approach, in which they would assess all the emissions from a particular industrial sector that predominated in the region.<sup>147</sup> When EPA Region I was reorganized along cross-media principles, the agency was able to target specific sectors, reducing delays and increasing pollution prevention technical assistance.<sup>148</sup> Strategic plans mixing current and potential

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144. See generally Daniel J. Fiorino, *Toward a New System of Environmental Regulation: The Case for an Industry Sector Approach*, 26 ENVTL. L. 457 (1996).

145. See generally TOWARD SUSTAINABLE COMMUNITIES: TRANSITION AND TRANSFORMATION IN ENVIRONMENTAL POLICY, *supra* note 3 (describing the broad range of measures and goals in the emerging movement for sustainable communities, including community goals such as reduced commuting time, lower energy use, and watershed restoration).

146. See generally Walter A. Rosenbaum, *The EPA at Risk: Conflicts over Institutional Reform*, in ENVIRONMENTAL POLICY IN THE 1990S 143 (Norman J. Vig & Michael E. Kraft eds., 3d ed. 1997) (summarizing the many calls for the use of comparative risk assessment in setting priorities at EPA). The need for more and better data is particularly true from an environmental justice perspective. See Roe & Pease, *supra* note 39, at 24 (pointing out that we lack adequate data on the exposure levels of different segments of the public, and on interaction with existing health problems).

147. See Schmandt, *supra* note 73, at 313.

148. JODI PERRAS, *REINVENTING EPA NEW ENGLAND: AN EPA REGIONAL OFFICE TESTS INNOVATIVE APPROACHES TO ENVIRONMENTAL PROTECTION* 8-11 (2000).

regulatory and non-regulatory tools could be developed for priority sectors.<sup>149</sup>

Using eco-regions might also help the agency prioritize its activities. Although EPA has substantial budgetary re-programming authority, studies of the national office have shown that re-programming was rarely used in the past. When used, re-programming tended to operate against agency-defined priorities.<sup>150</sup> If re-programming authority were decentralized to eco-regions, there would be a more manageable set of issues from which to choose priorities.<sup>151</sup> Agency experts in charge of monitoring and information in each eco-region could help administrators shift funding towards priority problems.

The use of working groups within eco-regions could help to target staff and resources more flexibly and efficiently. If strong enforcement is the best path forward, a particular working group might have more attorneys. In contrast, a working group providing technical assistance might have only engineers or industry specialists. Yet a third group might be composed primarily of scientists seeking a better understanding of some aspect of the region's ecology.

One problem often noted in recruiting and retaining excellent employees at EPA is the limited opportunities for career advancement, especially for agency scientists. The decentralization of leadership that would occur in reorganization by eco-regions would make the agency more adaptable and open up new management positions.<sup>152</sup> Many of these might be well suited to agency scientists since working groups would be grounded in scientific and legal goals.<sup>153</sup>

Eco-regions might also make flexible enforcement programs like emissions trading or offsets more feasible. One barrier to such enforcement programs is the difficulty of specifying trading regions.<sup>154</sup> The eco-region

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149. STEVEN COHEN & SHELDON KAMIENIECKI, ENVIRONMENTAL REGULATION THROUGH STRATEGIC PLANNING (1991).

150. See GAO, *supra* note 69, at 73.

151. Perras found that when EPA reorganized Region I in the mid-1990s, the new Office of Ecosystem Protection was better able to target federal resources by taking a watershed approach to the Charles River. See PERRAS, *supra* note 148, at 26-30. Although EPA was constrained by basic legal requirements from completely abandoning the point source permit system, the agency did target a greater share of resources at priority, non-point source pollutants.

152. See CORTNER & MOOTE, *supra* note 124, at 65 (explaining that decentralized leadership was a major advantage in ecosystem management at the Department of the Interior).

153. If EPA were to develop technical information on the basis of the new eco-regions, as suggested above, there would be leadership positions for scientists to direct the new environmental information systems, working in partnership with universities, state agencies, and local governments.

154. See generally BARDACH & KAGAN, *supra* note 71.



would diminish this problem by providing a jurisdiction, roughly bounded for the dispersion of many common pollutants, in which to implement such programs. This would extend the bubble concept, which treats a collection of pollution sources as one entity for regulatory purposes.<sup>155</sup> This method can reduce pollution at the most efficient points of the process. Savings from well-designed flexible enforcement programs have been extensively documented.<sup>156</sup>

Whether or not market mechanisms are chosen, flexible enforcement could be accomplished by assessing individual requests for variation in the context of the environmental goals of the eco-region. When considering legal settlements by consent decree, the agency might be able to better target cleanup goals and settlement funds. For example, local governments in violation of their water treatment permits might spend some portion of settlement funds to restore and protect wetlands as well as on treatment plant construction. Restoring wetlands would both improve water quality and provide crucial habitat. Understanding the ecosystem goals could lead EPA toward a settlement with greater net environmental benefits.

No doubt the move toward flexible enforcement in the eco-region would be a significant shift in the culture of EPA. It would mean measuring successful performance not by the number of enforcement actions, but by ecological results. These sorts of measures are subtle and long-term, and the media are less accustomed to reporting them.<sup>157</sup> However, new performance-based measurements should be easier to gather at the smaller scale of the eco-region. EPA officials in each eco-region would need to learn creative ways to communicate these to the public.

Eco-regions might also foster greater public participation in policy decisions. It is nearly axiomatic that a reduced scale of decision making enhances the participation of citizens. Since eco-regions are closely matched to ecological resources, which are the formative basis of environmental

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155. Regarding the bubble concept, see Tom H. Tietenberg, *Economic Instruments for Environmental Regulation*, in *ECONOMICS OF THE ENVIRONMENT* 373, 375-76 (Robert N. Stavins ed., 4th ed. 2000).

156. See, e.g., *id.* at 381-82.

157. Perras found that this created additional challenges for the reorganization of EPA's Region I. See PERRAS, *supra* note 148, at 38-40. In this case, enforcement resources and programs were distributed among several new multi-media offices. While traditional enforcement activities dropped somewhat, the region targeted enforcement against the worst violators. Record fines resulting from these actions drew visibility and lessened criticism of the agency in the press. See *id.* at 38. Given EPA's tumultuous history under the Reagan Administration, this type of reform may be more difficult under a Republican Presidential Administration.

movements, participation might be amplified.<sup>158</sup> When wider participation occurs, the agency becomes better aware of each community's values and aspirations.

Such increased awareness would help EPA to garner public support. Of course, EPA is likely to be quite unpopular, especially with certain stakeholders from time to time. This is in the nature of an agency that imposes private costs for public benefit. While EPA must not shy away from these controversial moves, reorganizing by eco-regions may help EPA to choose its battles wisely, both from scientific and political perspectives.

### C. Initiatives and Impediments at EPA

An important question is whether a less far-reaching proposal might not do equally well to set EPA on the path to accomplishing its mission. Although EPA has made tentative steps in the direction of greater integration and adaptability, the organizational structure of the agency has been a significant impediment to lasting change. Innovative programs under the Community Based Environmental Protection approach, like the Office of Sustainable Ecosystems and Communities (OSEC), have faced outright cancellation.<sup>159</sup> Deeper organizational changes are required to overcome the bureaucratic inertia in 30-year traditions of media programs and top-down direction.<sup>160</sup>

Community Based Environmental Protection (CBEP) is an initiative in place-based approaches to environmental protection at EPA.<sup>161</sup> As such, it incorporates some of the elements of the regional, cross-media approach identified above.<sup>162</sup> Because it is an approach and not a program office, it

158. See PERRAS, *supra* note 148, at 40-44 (finding that the Office of Ecosystem Protection developed in the reorganization of Region I created strong partnerships between EPA and other major policy actors because it was organized around protecting places that people understood and to which they related).

159. See Interview, *supra* note 114.

160. Any proposal to change EPA's organizational structure will incite apprehension within the agency. EPA's program offices, in particular, may be expected to resist proposals for organizational change. The program offices have their own statutory support system and are the most important operational units within the agency. See Rosenbaum, *supra* note 146, at 154; see also Funke, *supra* note 7, at 138, 150-51. Because apprehension regarding reform of EPA's organizational structure is inevitable, the leadership of the President and the Administrator is a prerequisite for such change. See PERRAS, *supra* note 148, at 18-20.

161. ENVTL. PROT. AGENCY, EPA'S FRAMEWORK FOR COMMUNITY-BASED ENVIRONMENTAL PROTECTION 5 (1999).

162. The idea of using place-based partnerships emerged from the ecosystem management concept that was taking shape in fisheries and forest management plans. Formative interagency discussions included participants from EPA, NOAA, DOI, and USDA. Combining pollution control technologies and better land-use management to reduce non-point source water pollution were among the most immediate applications for CBEP. Therefore, watershed-

has only one full-time staff person at headquarters. CBEP relies on voluntary commitments from staff on permanent assignment in regional and national program offices to collaborate for place-based environmental protection.

The CBEP approach was first identified at EPA starting with interagency discussions on ecosystem protection in late 1993 and was established formally in 1994.<sup>163</sup> In March of 1994, EPA developed the "Edgewater Consensus," an internal memorandum that calls for work across traditional media boundaries in "nationally significant" places (e.g., Everglades, Great Lakes, Chesapeake Bay). As a result of the Edgewater consensus and internal discussions, EPA headquarters also established OSEC by shifting resources within the Policy Office in 1995.<sup>164</sup> In February of 1999, OSEC was disbanded. This was due in large part to the departure of influential and supportive staff at the agency. It was also related to controversies over budgeting between OSEC and the national program offices, and ultimately to EPA's organizational structure.

Another example of the struggle over budgeting is the fate of the CBEP-Regional Geographic Initiative (RGI) Fund. In 1996, OSEC brokered an agreement among four EPA media program offices, the RGI, and the EPA's regions to create the CBEP-RGI Fund.<sup>165</sup> The fund was targeted to support regional priorities for eliminating cross-media pollution. This effort lasted only one year, investing just \$2 million, split among all ten regional offices of EPA.<sup>166</sup> The national program offices declined to participate beyond the first year because of concerns with the pilot projects, and the desire to hold the purse strings more closely at headquarters. Outcomes of the projects under development were criticized for being more focused on process than on results, and for an inadequate focus on statutory goals. Although the effort did result in greater public participation in traditional, programmatic activities, the goal of true cross-media regulation was not met.

Early in its implementation, the 1993 Government Performance and Results Act (GPRA) seemed to be supportive of CBEP.<sup>167</sup> This law compelled the agency to set goals that are closely tied to the statutory framework of the agency's enabling legislation. By connecting CBEP to goal-setting under discretionary funding, a goal was set for EPA to establish partnerships for sustainable development in 50 places by 2005 (Goal 8 (6-2)).

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level permitting to achieve goals under the Clean Water Act was a central component from the start. See Interview, *supra* note 114.

163. See Interview, *supra* note 114.

164. See *id.*

165. See *id.*

166. See *id.*

167. See *id.*

This ambitious goal clearly required significant additional resources, and 20 percent of budgets in the five national media programs were earmarked in 1996 for collaboration and cross-media work.

Under this initiative, several important sustainability partnerships between EPA and local stakeholders began during OSEC's existence. One of these was a three-year project in South Florida, where funds of approximately \$1 million were used to conduct community meetings, map infrastructure, and set sustainable development goals.<sup>168</sup> This program was also part of the RGI and was directed primarily at reducing sprawl into the Everglades by promoting infill development in the inner city, especially on urban brownfields.

But the GPRA turned out to be another impediment to moving toward place-based approaches. OSEC's initiative to motivate the national program offices to use place-based approaches cut against other goals that the assistant administrators are under pressure to deliver under the GPRA. The assistant administrators viewed these programmatic goals as priorities. Tied to the enabling legislation of each office, these goals involve basic command and control functions like the number of rules published, the number of permits issued, the number of enforcement actions taken, or the number of outstanding liability claims settled. The tendency, even under prodding from OSEC, was for program offices simply to recast existing activity with added community involvement, rather than also redesigning implementation along cross-media and ecosystem protection lines.

Powerful incentives from the GPRA drove the program offices in this direction. Programmatic goals are especially amenable to one and two year time frames, and thus fit closely with the desire to demonstrate performance enhancement under the GPRA. In contrast, the desired endpoints of sustainable development are not so easily depicted in short time spans. Here, stochastic processes of species colonization and economic development may frustrate efforts to measure results in less than five or ten year increments.

The dismantling of OSEC and the elimination of Goal 8(6-2) is a setback in the move toward an adaptable agency. Implementation of regional approaches and sustainable development within EPA are impeded by the agency's organizational structure. Even EPA regions are too centralized relative to the geographical area that staff must cover. Thus, EPA is not a main player in most ecologically significant places. Increased institutional focus through reorganization by eco-region would likely enhance resource commitments for multi-media, ecosystem-oriented, and community driven projects.

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168. See *id.*

In spite of these setbacks, CBEP lives on at EPA, especially in the regional offices. To a lesser degree, but much as might be expected in reorganization by eco-regions, the varying ecological contexts of the current regions have led to different CBEP strengths. Heavily urbanized regions, for example, have found the CBEP approach works well for dealing with multiple pathways and sources of toxic exposure and linking brownfields redevelopment (infill) with the struggle against sprawl. Regions with complex, overlapping biomes have found CBEP is a way to support the application of GIS technologies and landscape ecology views.

At various times, the connection of EPA's structure to the legal framework of its enabling legislation, the vicissitudes of budgeting, and the goals set under the GPRA, have impeded change. Some of these proximate factors impeding change are more susceptible to executive action than others,<sup>169</sup> but agency leadership may be able to use reorganization as an ultimate causal factor to push change forward. For example, the new eco-regions could be vested with GPRA goals—especially long-term ecosystem protection goals. Congress and the courts might then react quite differently to the agency, pushing forward adjustments in its legal framework over the long term.

#### D. Striking a Balance: National and Eco-Region Roles

Often proposals to improve bureaucratic performance that involve the integration and decentralization of decision making lack the "checks and balances" of republican government.<sup>170</sup> But the shift towards an adaptable bureaucracy depicted here would retain several important checks on the authority of the eco-region, including the congressional and judicial oversight, state and local governments, and the national office. In an adaptable EPA, the staffing levels and roles of the national office would be reduced and corresponding increases would occur in the new regions, but functions would still be divided between the national and eco-region offices. While the adaptability of the eco-region is generally more effective in meeting the agency's mission, a programmatic bureaucracy—and thus the national office—may be more appropriate to accomplish certain functions.

Transboundary environmental problems, such as global warming, stratospheric ozone depletion, oceans and fisheries management, and acid

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169. Of course, budgeting is the factor least susceptible to executive action. It is worth pointing out here that reorganization is made more difficult by fiscal austerity. See PERRAS, *supra* note 148, at 19-20. Reorganization is likely to have some up front costs. If it were done as a budget cutting strategy, it would likely be a disaster for the agency.

170. See YATES, *supra* note 105, at 110.

precipitation, may be mitigated through actions taken at the local level.<sup>171</sup> But coordination by a central authority may be critical to the success of mitigation efforts.<sup>172</sup> Individual eco-regions are part of a larger integrated system.<sup>173</sup> When sulfur dioxide from the Midwest's coal burning power plants transforms into acid precipitation in the Northeast, the required response must bridge eco-region boundaries. One function of EPA's national office is to address such transboundary environmental problems.

A second, related function of the national office is to combat the "not in my back yard" (NIMBY) problem. Too much devolution of authority to the eco-regions could exacerbate the existing NIMBY problem. The national office may monitor the flow of resources and pollutants across eco-regions, particularly because the ability of the states to control the flow is limited by the dormant Commerce Clause.<sup>174</sup> When necessary, the national office could compel communities to address environmental problems by curtailing the flow of resources or pollutants. Such action would provide an incentive to communities to manage resources and pollutants carefully (*e.g.*, through the adoption of waste reduction strategies and development of safe transport, processing, and disposal of wastes).<sup>175</sup>

Third, the national office also will continue to play a critical role in the area of information gathering, assessment, and dissemination. Although much data gathering and analysis is best done at the eco-regional level, the national office may facilitate such efforts. Furthermore, the national office could create a centralized pool of information that would allow for

171. Regarding boundary problems in environmental law and policy, see *supra* Section III A.

172. Transboundary problems are, necessarily, collective action problems. Regarding such problems, see MANCUR OLSON, JR., *THE LOGIC OF COLLECTIVE ACTION* (1965); H. Scott Gordon, *The Economic Theory of a Common Property Resource: The Fishery*, 62 J. POL. ECON. 124 (1954). Whether such problems require a centralized response or simply coordination among decentralized entities is the subject of scholarly debate. Compare Garrett Hardin, *The Tragedy of the Commons*, 162 SCIENCE 1243 (1968) with ELINOR OSTROM, *GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION* (1990). Either as a central authority or as a coordinator, EPA's national office has a role to play in the response to such problems.

173. For one interesting assessment of this integrated system, see JAMES LOVELOCK, *GAIA: A NEW LOOK AT LIFE ON EARTH* (3d ed. 2000).

174. See U.S. CONST. art. I, § 8, cl. 3; see also *C & A Carbone, Inc. v. Town of Clarkstown*, N.Y., 511 U.S. 383 (1994); *City of Phila. v. N.J.*, 437 U.S. 617 (1978). Regarding solid waste management and the dormant Commerce Clause, see Paul Weiland & Rosemary O'Leary, *Federalism and Environmental Policy: The Case of Solid Waste Management*, 27 AM. REV. PUB. ADMIN. 211, 213 (1997).

175. See DANIEL MAZMANIAN & DAVID MORELL, *BEYOND SUPERFAILURE: AMERICA'S TOXICS POLICY FOR THE 1990S* 191-204 (1992). Requiring communities to bear their fair share of the burdens associated with environmental degradation increases the likelihood that no single community will bear a disproportionate share. This is responsive to the concerns raised by many in the environmental justice community.

assessment of problems within and across eco-regions. By so doing, the national office would facilitate learning by the regions, which could draw upon the collective experiences of other regions. Some research and development (e.g., related to pollution prevention and control technologies) could remain in the national office to take advantage of economies of scale. Other efforts at the eco-regional level could be monitored by the national office to avoid duplication.

Fourth, the national office may address particularly difficult environmental challenges that require a programmatic response. For example, it may be appropriate to set nationwide uniform minimum standards for highly toxic materials that pose serious risks such as acceptable levels of lead in drinking water.<sup>176</sup> It also may be necessary to establish uniform maximum standards applicable to certain activities or industries to create a uniform and predictable business environment.<sup>177</sup>

### E. State and Local Roles

The decentralization advocated in this article should not be confused with the new federalism policy of former President Reagan and his administration. It is distinct in a number of ways. Rather than making EPA more adaptable, Reagan maintained the programmatic bureaucracy of EPA in a smaller and relatively under-funded form (adjusting for inflation, the agency budget was cut by more than one-third between 1981 and 1983).<sup>178</sup> What was proclaimed aboveboard as an attempt to bolster state authority was actually a below-board attempt to scale back environmental regulation indiscriminately, using the federal budget to accomplish the task. Although adaptation to regional conditions and preferences is a laudable aim, devolving programs to the state level will not have the same results. State boundaries hardly match ecosystem boundaries, and spillover effects between states can cause problems for interstate regulation.<sup>179</sup> States and localities also vary in the ability to handle the technical complexity of environmental regulation.<sup>180</sup> Finally, as a range of scholars have concluded,

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176. See Paul S. Weiland, *Federal and State Preemption of Environmental Law: A Critical Analysis*, 24 HARV. ENVTL. L. REV. 237, 241-42 (2000).

177. See *id.* at 242-43.

178. Norman J. Vig, *Presidential Leadership: From the Reagan to the Bush Administration*, in ENVIRONMENTAL POLICY IN THE 1990S 33, 38 (Norman J. Vig & Michael E. Kraft eds., 1990).

179. See Esty, *supra* note 31, at 587-97.

180. Regarding varied state capacity, see Barry Rabe, *Power to the States: The Promise and Pitfalls of Decentralization*, in ENVIRONMENTAL POLICY IN THE 1990S 31, 40-42 (Norman J. Vig & Michael E. Kraft eds., 3d ed. 1997). On the need for increased capacity at the local level, see Carol J. Cimitile, et al., *Balancing Risk and Finance: The Challenge of Implementing Unfunded Environmental Mandates*, 57 PUB. ADMIN. REV. 63, 68-69 (1997); David L. Markell, *Preliminary*

when states make policies alone, they are generally more in tune with economic investment than with environmental protection.<sup>181</sup>

Yet, if the broad and powerful goals mandated in federal legislation are to be implemented, states and localities will have to play a role. The control that local governments, in particular, exercise over land-use policy is an important common denominator in a wide range of environmental policies. State and local efforts may be focused most effectively on projects that require their authority to achieve environmental goals.

Eco-regions would be able to cooperate closely with state and local governments and foster cooperation among the jurisdictions in solving regional problems. Jodi Perras reports that the geographically compact nature of EPA's Region I facilitates contact between EPA and officials in state and local governments.<sup>182</sup> The decentralized nature of reorganization by eco-regions would promote such contact, which would in turn provide the agency with information about environmental values in each community.

A wide range of scholars acknowledges the political importance of a strong federal role in environmental protection. Paul Peterson's city limits theory suggests that localities and states have less political capacity than the federal government to manage economic growth for environmental protection.<sup>183</sup> Although highly supportive of state and local roles, Dewitt John is careful to note the limits of the "comparative advantages" that state and local governments possess.<sup>184</sup> Denise Scheberle grounds her study of relationships between federal and state program officials on the premise that strong federal oversight and funding are key.<sup>185</sup> Without federal oversight, states would vary even more deeply than they already do in commitment to various environmental programs. In the words of William Ruckelshaus, the first EPA administrator, the agency must remain the "federal gorilla in the [state's] closet."<sup>186</sup>

The reforms advocated here recognize the reality of this situation. Rather than cede authority to the states, the goal of reorganizing by eco-region is to decentralize the resources, power, and the national perspective

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*Thoughts on Future Policy Directions for the Management of Solid and Hazardous Waste*, 7 ALB. L.J. SCI. & TECH. 119, 140 (1996).

181. See Rabe, *supra* note 180, at 44.

182. See PERRAS, *supra* note 148, at 15.

183. See generally PAUL E. PETERSON, CITY LIMITS (1981).

184. See generally JOHN, *supra* note 3.

185. See DENISE SCHEBERLE, FEDERALISM AND ENVIRONMENTAL POLICY: TRUST AND THE POLITICS OF IMPLEMENTATION 1 (1997).

186. See *id.* at 8.



of EPA on a regional basis.<sup>187</sup> Ortwin Renn argues persuasively that sustainable development can be operationalized most effectively over regions.<sup>188</sup> In the United States, there is a long-running historical failure of state and local governments in making regional governance work.<sup>189</sup> Both inside and across state borders, many experiments in regional government have been short-lived or incomplete.<sup>190</sup> Sustainable development likely requires a strong federal role in making regional governance work.<sup>191</sup>

## VII. CONCLUSION

EPA is faced with an enormous legal mandate and expansive mission. The agency's efforts to carry out its mandate and achieve its mission are hampered by the geographic disparity of environmental problems, uncertain science, and the scope of regulation (which is large and ever changing). Furthermore, the political context in which EPA operates and the budgetary pressures compound the challenge the agency faces. As a result, EPA must inevitably choose priorities among elements of this mandate and mission. Reorganization by eco-region would give EPA new tools to make better decisions for both its own future and the environment.

Reorganization by eco-region would make EPA a more adaptable organization. As such, EPA would be more likely to overcome fragmentation, collect and analyze information, learn from mistakes using principles of adaptive management, improve priority setting, adopt a flexible approach to enforcement, and enhance public participation. The success of such an approach is dependent on (1) the level of political commitment to eco-regions within the Executive Office of the President and EPA's appointed leaders and (2) the ability of EPA's professional staff to

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187. Cortner and Moote report on the success of this formula in bringing better management to federal lands. See CORTNER & MOOTE, *supra* note 124, at 99-105.

188. See Renn, *supra* note 122, at 24.

189. Attempts at regional governance in the modern United States may be traced back to Lewis Mumford's efforts with the Regional Planning Association of America (RPAA) in the 1930s. The RPAA offered a vision of organic regions where culture would be maintained through economic integration. Land-use plans would be cooperatively developed among state and local governments to promote the economic interests of the region. However, structures of regional governance have nearly always lacked the resources or authority to ameliorate the self-interest of localities. See STEPHANIE S. PINCETL, *TRANSFORMING CALIFORNIA: A POLITICAL HISTORY OF LAND USE AND DEVELOPMENT* 134 (1999).

190. The air quality management districts in California are a partial success in terms of regional government and demonstrate the value of federal power for bringing about regional cooperation. However, these are medium-specific entities, not comprehensive regional governments. See Mazmanian, *Los Angeles' Transition from Command-and-Control to Market-Based Clear Air Policy Strategies and Implementation*, in *TOWARD SUSTAINABLE COMMUNITIES*, *supra* note 3, at 77, 86.

191. See Rabe, *supra* note 180, at 42-43.

recognize the value of the eco-region approach and use the discretion that would accompany the eco-region approach to accomplish EPA's mission.